SECTION DLN
DRIVELINE

CONTENTS

TRANSFER: TY21B

PRECAUTION

PRECAUTIONS

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

INFOID:0000000012199346

The Supplemental Restraint System such as “AIR BAG” and “SEAT BELT PRE-TENSIONER”, used along with a front seat belt, helps to reduce the risk or severity of injury to the driver and front passenger for certain types of collision. This system includes seat belt switch inputs and dual stage front air bag modules. The SRS system uses the seat belt switches to determine the front air bag deployment, and may only deploy one front air bag, depending on the severity of a collision and whether the front occupants are belted or unbelted. Information necessary to service the system safely is included in the “SRS AIR BAG” and “SEAT BELT” of this Service Manual.

WARNING:

Always observe the following items for preventing accidental activation.

- **To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision that would result in air bag inflation, it is recommended that all maintenance and repair be performed by an authorized NISSAN/INFINITI dealer.**
- **Improper repair, 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 “SRS AIR BAG”.**
- **Never 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:

Always observe the following items for preventing accidental activation.

- **When working near the Air Bag Diagnosis Sensor Unit or other Air Bag System sensors with the ignition ON or engine running, never 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 or batteries, and wait at least 3 minutes before performing any service.**

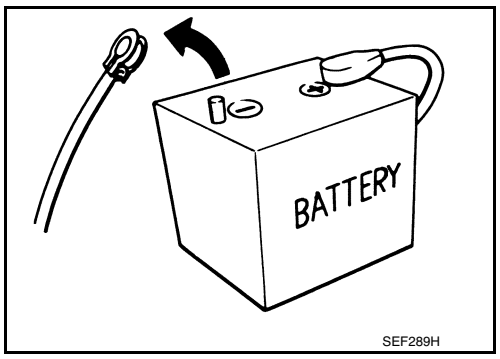
Precautions for Removing Battery Terminal

INFOID:0000000012833568

When disconnecting the battery terminal, pay attention to the following.

- Always use a 12V battery as power source.
- Never disconnect battery terminal while engine is running.
- When removing the 12V battery terminal, turn OFF the ignition switch and wait at least 30 seconds.
- For vehicles with the engine listed below, remove the battery terminal after a lapse of the specified time:

D4D engine	: 20 minutes	YS23DDT	: 4 minutes
HRA2DDT	: 12 minutes	YS23DDTT	: 4 minutes
K9K engine	: 4 minutes	ZD30DDTi	: 60 seconds
M9R engine	: 4 minutes	ZD30DDTT	: 60 seconds
R9M engine	: 4 minutes		
V9X engine	: 4 minutes		
YD25DDTi	: 2 minutes		



NOTE:

ECU may be active for several tens of seconds after the ignition switch is turned OFF. If the battery terminal is removed before ECU stops, then a DTC detection error or ECU data corruption may occur.

- After high-load driving, if the vehicle is equipped with the V9X engine, turn the ignition switch OFF and wait for at least 15 minutes to remove the battery terminal.

NOTE:

- Turbocharger cooling pump may operate in a few minutes after the ignition switch is turned OFF.
- Example of high-load driving
  - Driving for 30 minutes or more at 140 km/h (86 MPH) or more.
  - Driving for 30 minutes or more on a steep slope.

- For vehicles with the 2-batteries, be sure to connect the main battery and the sub battery before turning ON the ignition switch.
  NOTE:
  If the ignition switch is turned ON with any one of the terminals of main battery and sub battery disconnected, then DTC may be detected.
- After installing the 12V battery, always check "Self Diagnosis Result" of all ECUs and erase DTC.
  NOTE:
  The removal of 12V battery may cause a DTC detection error.

Service Notice or Precautions for Transfer

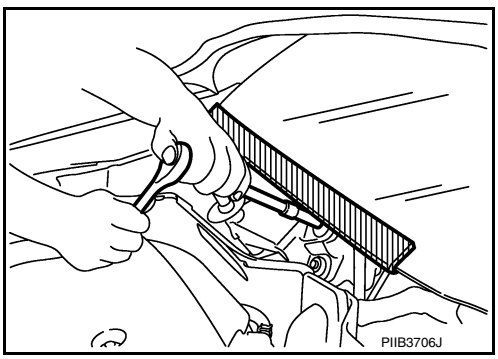
INFOID:0000000012199348

- After overhaul refill the transfer with new transfer oil.
- Check the oil level or replace the oil only with the vehicle parked on level surface.
- During removal or installation, keep inside of transfer clear of dust or dirt.
- Replace all tires at the same time. Always use tires of the proper size and the same brand and pattern. Fitting improper size and unusual wear tires applies excessive force to vehicle mechanism and can cause longitudinal vibration.
- 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 matching marks 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 one if necessary.
- Gaskets, seals and lock nuts should be replaced any time when the transfer is disassembled.
- When replacing the parts, use the genuine parts.
- 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.
- Never damage sliding surfaces and mating surfaces.
- 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.
- When loosening pinion lock nut, replace collapsible spacer.
- Dispose of the waste oil using the methods prescribed law, ordinance, etc., after replacing transfer oil.
- After removing transfer assembly from the vehicle, when replace transfer case oil seals (right and left).
  NOTE:
  Transfer case oil seals (right and left) cannot be replaced on vehicle, because there is not enough room.

Precaution for Procedure without Cowl Top Cover

INFOID:0000000012991388

When performing the procedure after removing cowl top cover, cover the lower end of windshield with urethane, etc to prevent damage to windshield.



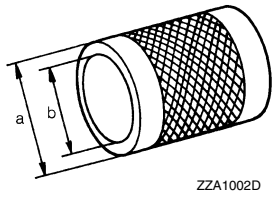
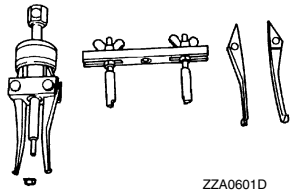
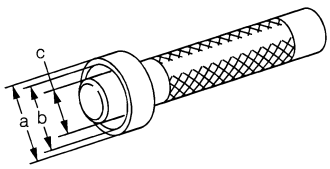
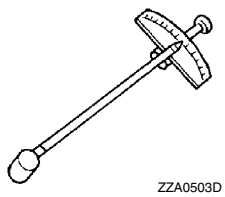
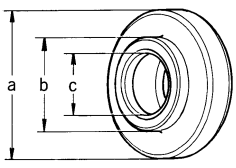
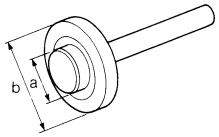
PREPARATION

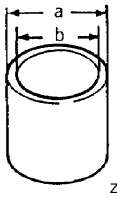
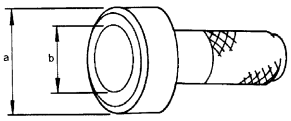
PREPARATION

Special Service Tools

INFOID:0000000012199349

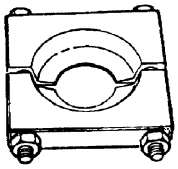
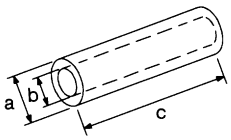
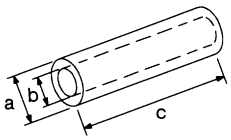
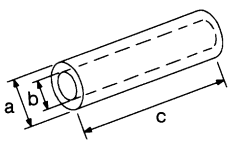
The actual shapes of TechMate tools may differ from those of special service tools illustrated here.

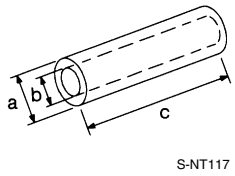
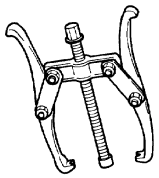
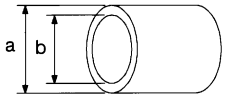
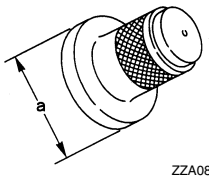
Tool number (TechMate No.) Tool name	Description
ST33200000 (J-26082) Drift a: 60 mm (2.36 in) dia. b: 44.5 mm (1.752 in) dia.  ZZA1002D	Removing inner race of ring gear bearing (right).
KV381054S0 (J-34286) Puller  ZZA0601D	• Removing drive shaft oil seal. • Removing drive pinion oil seal.
ST33230000 (J-25805-01) Drift a: 51 mm (2.01 in) dia. b: 41 mm (1.61 in) dia. c: 28.5 mm (1.122 in) dia.  ZZA1046D	• Installing drive shaft oil seal. • Installing outer race of pinion bearing (rear).
ST3127S000 (J-25765-A) Preload gauge  ZZA0503D	Measuring pinion bearing preload and total preload.
ST35272000 (J-26092) Drift a: 80 mm (3.15 in) dia. b: 38 mm (1.50 in) dia. c: 31 mm (1.22 in) dia.  ZZA0978D	Installing inner race of pinion bearing (front).
ST37830000 (—) Drift a: 39 mm (1.54 in) dia. b: 62 mm (2.44 in) dia.  ZZA0836D	Installing outer race of pinion bearing (front).

Tool number (TechMate No.) Tool name	Description
ST27863000 (—) Drift a: 62 mm (2.44 in) dia. b: 52 mm (2.05 in) dia.  ZZA0832D	Installing transfer case oil seal (left).
ST35271000 (J-26091) Drift a: 72 mm (2.83 in) dia. b: 63 mm (2.48 in) dia.  ZZA0811D	Installing transfer case oil seal (right).

Commercial Service Tools

INFOID:0000000012199350

Tool name	Description
Replacer  ZZA0700D	• Remove inner race of ring gear bearing (left). • Remove inner race of ring gear bearing (right). • Remove inner race of pinion bearing (front).
Drift a: 54 – 55 mm (2.13 – 2.17 in) dia. b: 51 – 52 mm (2.01 – 2.05 in) dia. c: 85 mm (3.35 in) or more  S-NT117	Install inner race of ring gear bearing (left).
Drift a: 64 – 66 mm (2.52 – 2.60 in) dia. b: 60 – 62 mm (2.36 – 2.44 in) dia. c: 50 mm (1.97 in) or more  S-NT117	Install inner race of ring gear bearing (right).
Drift a: 60 – 61 mm (2.36 – 2.40 in) dia. b: 57 – 58 mm (2.24 – 2.28 in) dia. c: 85 mm (3.35 in) or more  S-NT117	Compressing ring gear assembly with ring gear bearing.

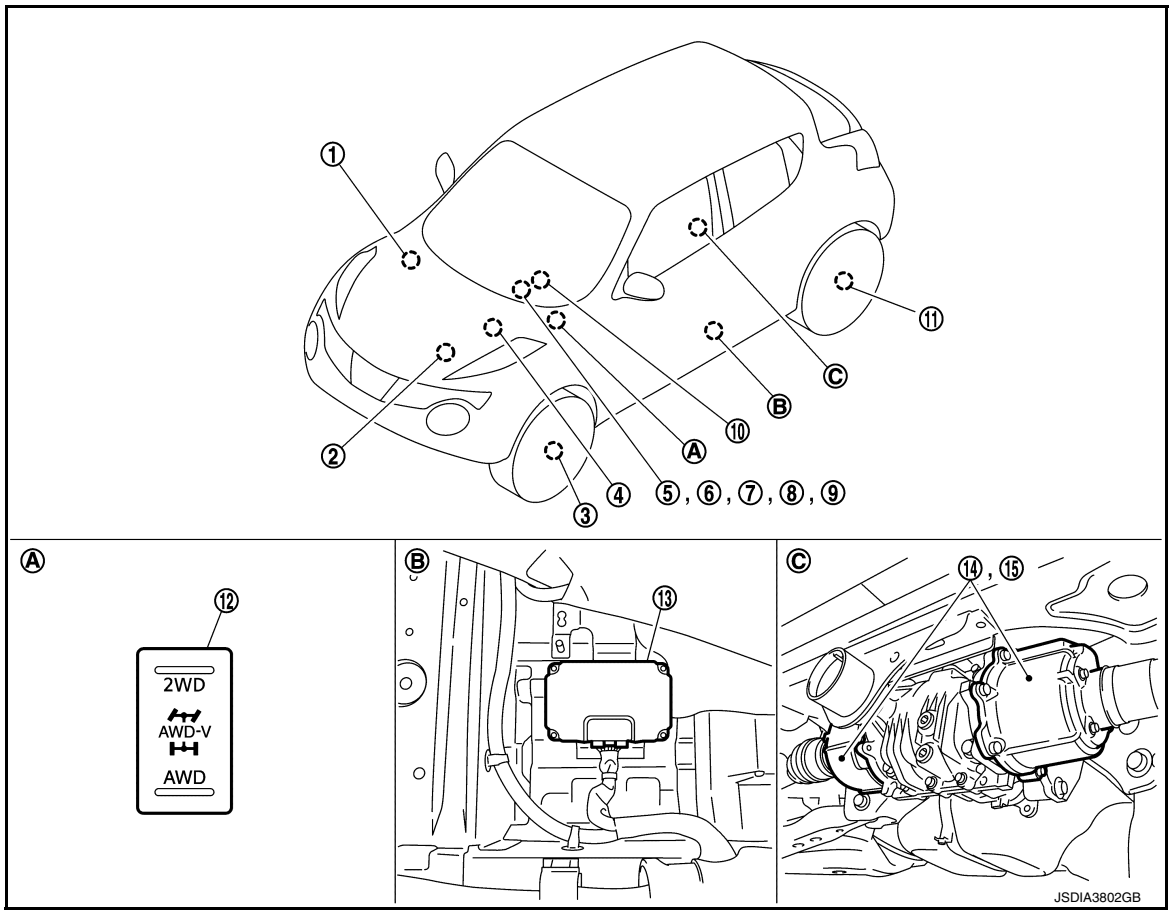
Tool name	Description
Drift a: 73 – 74 mm (2.87 – 2.91 in) dia. b: 70 – 71 mm (2.76 – 2.80 in) dia. c: 30 mm (1.18 in) or more  S-NT117	Compressing ring gear assembly with ring gear bearing.
Puller  ZZA0119D	Remove companion flange.
Drift a: 53 – 56 mm (2.09 – 2.13 in) dia. b: 48 – 51 mm (1.81 – 2.01 in) dia.  S-NT474	Installing drive pinion oil seal.
Drift a: 55 mm (2.17 in) dia. or more  ZZA0882D	Installing transfer case oil seal (left).

SYSTEM DESCRIPTION

COMPONENT PARTS

Component Parts Location

INFOID:0000000012199351



1. ABS actuator and electric unit (control unit)
   Refer to BRC-9, "Component Parts Location".
2. ECM
   Refer to EC-600, "ENGINE CONTROL SYSTEM : Component Parts Location" (Except for NISMO RS), EC-27, "ENGINE CONTROL SYSTEM : Component Parts Location" (For NISMO RS).
3. Front wheel sensor
   Refer to BRC-9, "Component Parts Location".
4. TCM
   Refer to TM-156, "CVT CONTROL SYSTEM : Component Parts Location" (RE0F10B), TM-361, "CVT CONTROL SYSTEM : Component Parts Location" (RE0F10D).
5. Combination meter
   Refer to MWI-6, "METER SYSTEM : Component Parts Location".
6. AWD warning lamp
   (In combination meter)
7. AWD mode indicator lamp (AWD-V)
   (In combination meter)
8. AWD mode indicator lamp (AWD)
   (In combination meter)
9. Torque distribution indicator
   (In combination meter)
10. Steering angle sensor
    Refer to BRC-9, "Component Parts Location".
11. Rear wheel sensor
    Refer to BRC-9, "Component Parts Location".
12. AWD mode switch
13. AWD control module
14. AWD solenoid
    (Inside rear final drive)
15. Electric controlled coupling
    (Inside rear final drive)

A. Instrument driver lower panel
B. Under front (left side) seat
C Rear final drive

Component Description

INFOID:0000000012199352

Component parts	Reference/Function
AWD control module	DLN-11, "AWD Control Module"
AWD solenoid	DLN-11, "AWD Solenoid"
Electric controlled coupling	DLN-11, "Electric Controlled Coupling"
AWD mode switch	DLN-11, "AWD Mode Switch"
AWD warning lamp	DLN-12, "AWD Warning Lamp"
AWD mode indicator lamp (AWD-V, AWD)	DLN-12, "AWD Mode Indicator Lamp"
Torque distribution indicator	DLN-12, "Torque Distribution Indicator"
ABS actuator and electric unit (control unit)·	Transmits/receives the signals for control of AWD system via CAN communication line to/from AWD control module. For transmitting/receiving mainly signals, refer to DLN-16, "AWD SYSTEM : System Diagram".
Wheel sensor	BRC-11, "Wheel Sensor and Sensor Rotor"
Yaw rate/side/decel G sensor	BRC-13, "Yaw Rate/Side/Decel G Sensor"
ECM	Transmits/receives the signals for control of AWD system via CAN communication line to/from AWD control module. For transmitting/receiving mainly signals, refer to DLN-16, "AWD SYSTEM : System Diagram".
Accelerator pedal position sensor	EC-606, "Accelerator Pedal Position Sensor" (Except for NISMO RS), EC-33, "Accelerator Pedal Position Sensor" (For NISMO RS)
TCM	Transmits/receives the signals for control of AWD system via CAN communication line to/from AWD control module. For transmitting/receiving mainly signals, refer to DLN-16, "AWD SYSTEM : System Diagram".
Combination meter	Transmits/receives the signals for control of AWD system via CAN communication line to/from AWD control module. For transmitting/receiving mainly signals, refer to DLN-16, "AWD SYSTEM : System Diagram".
Steering angle sensor	Transmits/receives the signals for control of AWD system via CAN communication line to/from AWD control module. For transmitting/receiving mainly signals, refer to DLN-16, "AWD SYSTEM : System Diagram".

AWD Control Module

INFOID:0000000012199353

- AWD control module controls driving force distribution by signals from each sensor from front wheel driving mode (100:0) to 4-wheel driving mode (50:50).
- Driving torque between both rear wheels is automatically controlled between 100:0 and 0:100 during acceleration and cornering.
- Make the vehicle fail-safe condition if malfunction is detected in AWD system. For fail-safe function, refer to DLN-28, "Fail-safe".
- AWD actuator relay is integrated with AWD control module, and supplies AWD solenoid with voltage.
- Self-diagnosis can be done with CONSULT.

AWD Solenoid

INFOID:0000000012199354

AWD solenoid is integrated with each electric controlled coupling, and controls electric controlled couplings by command current from AWD control module.

Electric Controlled Coupling

INFOID:0000000012199355

Electric controlled couplings are integrated with rear final drive and transmits driving force to rear drive shaft. For operation, refer to DLN-14, "Operation Principle".

AWD Mode Switch

INFOID:0000000012199356

- AWD mode is selectable among 2WD, AWD-V, and AWD by operating the AWD mode switch while the ignition switch is ON or the engine is running.
- Tilting the switch to the 2WD/AWD side allows mode selection between 2WD and AWD. To switch mode to AWD-V, simply position the switch in AWD-V (neutral position).

AWD Warning Lamp

INFOID:0000000012199357

- After the AWD system is activated, the AWD warning lamp turns OFF during front and rear wheels driving torque distribution.
- After the AWD system is deactivated by fail-safe function and torque distribution of front and rear wheels is stopped, the AWD warning lamp turns ON to indicate that the state is in 2WD.
  NOTE:
  The AWD warning lamp does not turn ON when only torque distribution of both rear wheels is stopped by the fail-safe function.
- The AWD warning lamp blinks to indicate that the state is in 2WD when the AWD system is temporarily stopped by the protection function.
- Also turns ON when ignition switch is turned ON, for the purpose of lamp check. Turns OFF after the engine starts if system is normal.

Condition	AWD warning lamp
Lamp check	Turns ON when ignition switch is turned ON. (Turns OFF approx. 1 second after the engine start.)
AWD system is malfunction	ON*
Protection function is activated due to heavy load to electric controlled coupling. (AWD system is not malfunctioning and AWD system changes to front wheel drive.)	Quick blinking: 2 times/second (Blinking in approx. 1 minute and then turning OFF)
Large difference in diameter of front/rear tires	Slow blinking: 1 time/2 seconds (Continuing to blink until turning ignition switch OFF)
Other than above (System is normal)	OFF

*: The AWD warning lamp does not turn ON when only torque distribution of both rear wheels is stopped.
NOTE:
AWD warning lamp also turns ON due to data reception error, CAN communication error etc.

AWD Mode Indicator Lamp

INFOID:0000000012199358

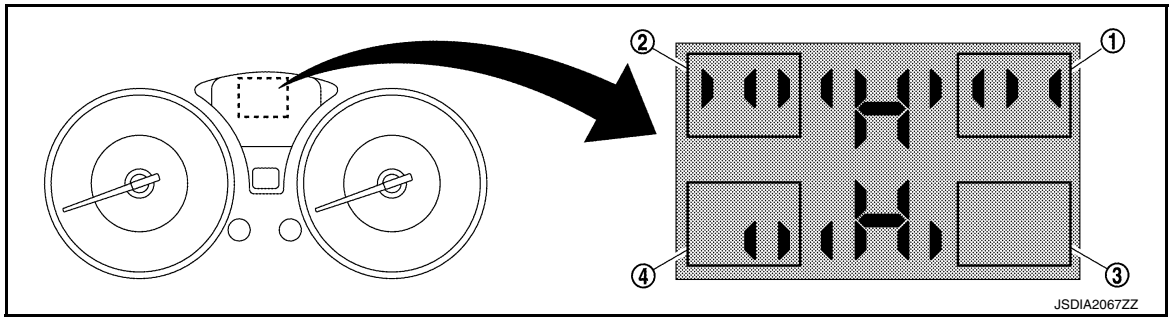
The following is the indications of AWD mode indicator lamp.

Condition	AWD mode indicator lamp	
	AWD-V	AWD
Lamp check	—	Turns ON when ignition switch is turned ON for aprrox. 1 second and then turns OFF.
2WD mode	OFF	OFF
AWD-V mode	ON	OFF
AWD mode	OFF	ON

Torque Distribution Indicator

INFOID:0000000012199359

- Torque distribution indicator is displayed when the ODO/TRIP indication on the combination meter is switched.
- The number of bars shows driving force distributed to each tire. (Maximum bars: 3)



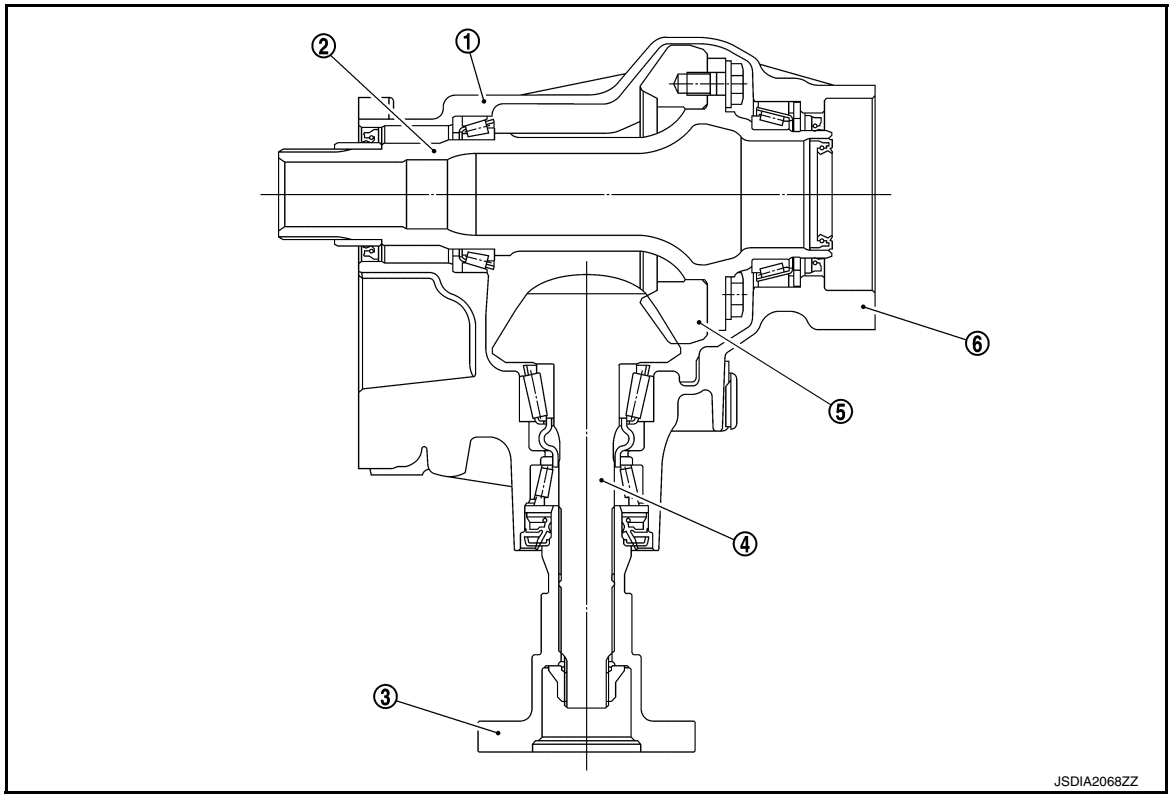
1. Front right side driving torque
2. Front left side driving torque
3. Rear right side driving torque
4. Rear left side driving torque

NOTE:
The driving force distribution may not match actual one. This is not a system malfunction.

STRUCTURE AND OPERATION

Sectional View

INFOID:0000000012199360

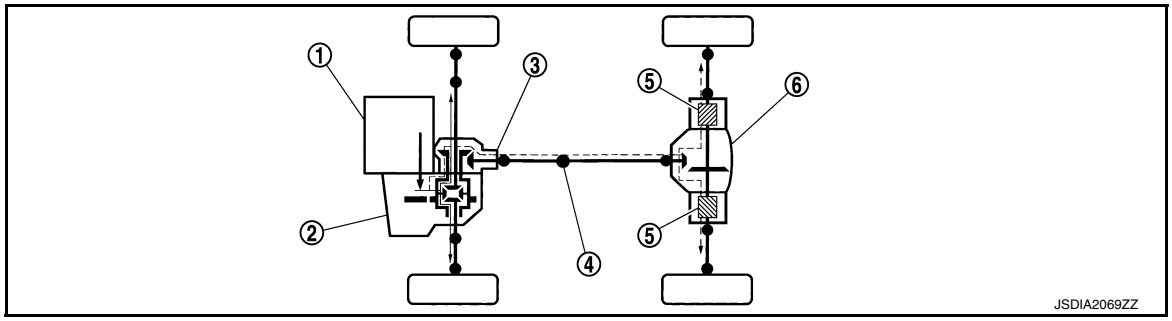


1. Transfer cover
2. Ring gear shaft
3. Companion flange
4. Drive pinion
5. Ring gear
6. Transfer case

Operation Principle

INFOID:0000000012199361

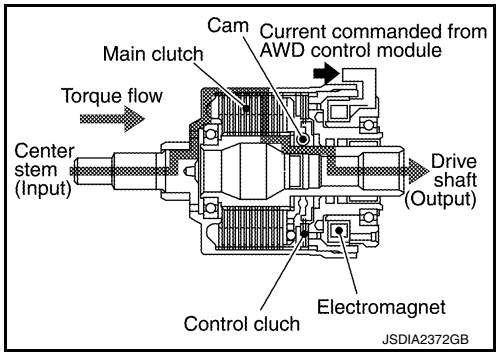
POWER TRANSFER DIAGRAM



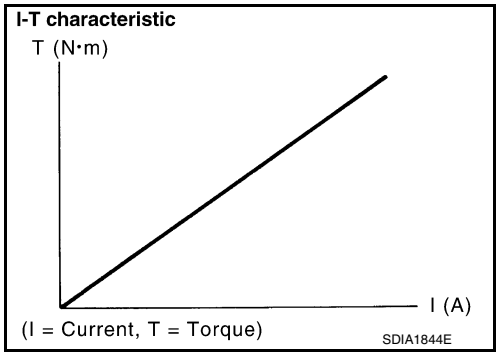
1. Engine
2. Transaxle
3. Transfer
4. Propeller shaft
5. Electric controlled coupling
6. Rear final drive

ELECTRIC CONTROLLED COUPLING

1. The AWD control module supplies command current to each electric controlled coupling (AWD solenoid).
2. Each of control clutch is engaged by electromagnet and torque is detected in control clutch.
3. The cam operates in response to control clutch torque and applies pressure to main clutch.
4. Each of main clutch transmits torque to right and left rear wheels according to pressing power.
   NOTE:
   Change each pressing power according to AWD mode status and cornering conditions.

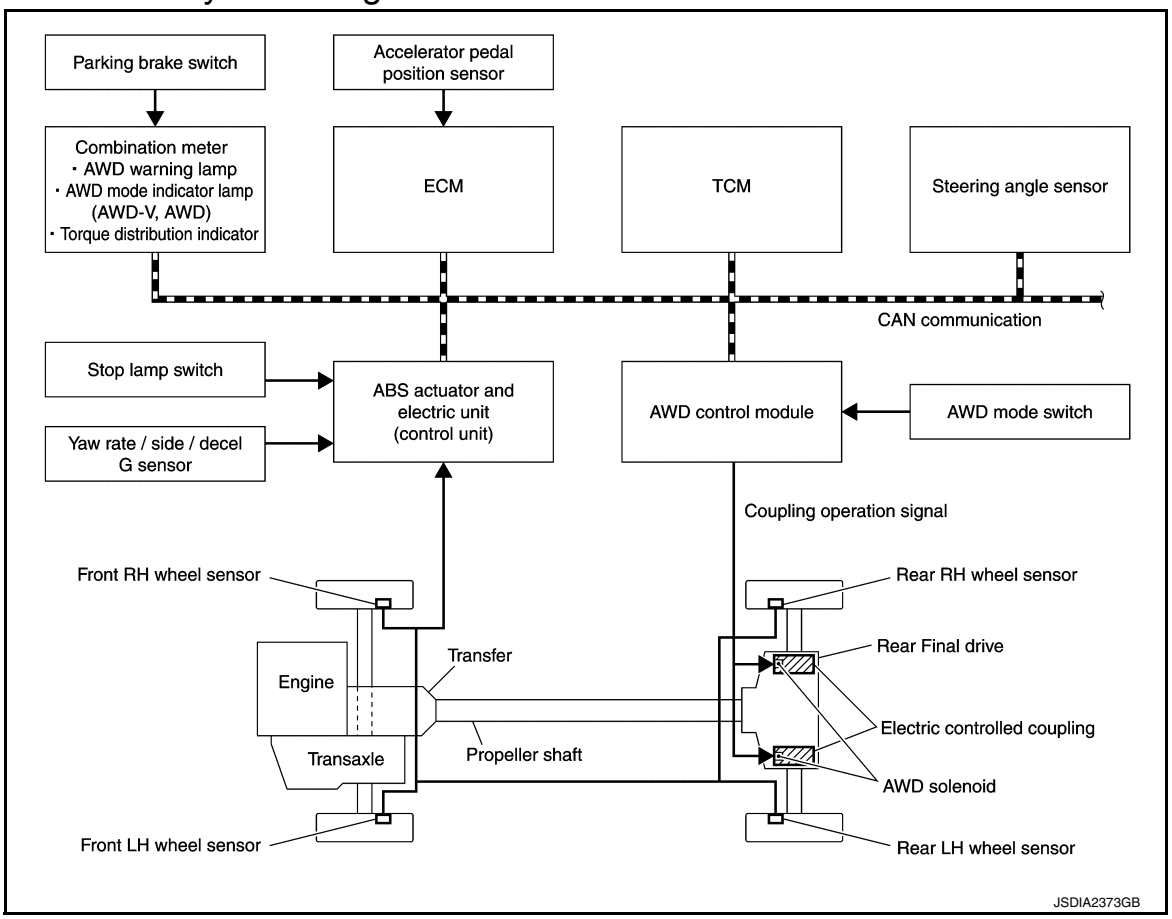


- Transmission torque to the right and left rear wheels is determined according to command current.



SYSTEM
AWD SYSTEM
AWD SYSTEM : System Diagram

INFOID:0000000012199362



INPUT/OUTPUT SIGNAL

It transmits/receives each signal from the following AWD control module via CAN communication line.

Component parts	Signal item
ABS actuator and electric unit (control unit)·	Mainly transmits the following signals via CAN communication line to AWD control module. • Vehicle speed signal (ABS) • Stop lamp switch signal (brake signal) • Yaw rate signal • Side G sensor signal • Decel G sensor signal
ECM	Mainly transmits the following signals via CAN communication line to AWD control module. • Accelerator pedal position signal • Engine speed signal • Engine torque signal
TCM	Mainly transmits the following signals via CAN communication line to AWD control module. • Next gear position signal • Current gear position signal • Input shaft revolutional signal • Output shaft revolutional signal • CVT ratio signal

Component parts	Signal item
Combination meter	Mainly transmits the following signals via CAN communication line to AWD control module. • Parking brake switch signal
	Mainly receives the following signals via CAN communication line from AWD control module. • AWD warning lamp signal • AWD mode indicator lamp signal • Torque distribution indicator signal
Steering angle sensor	Mainly transmits the following signals via CAN communication line to AWD control module. • Steering angle sensor signal

AWD SYSTEM : System Description

INFOID:0000000012199363

- AWD mode is selectable among 2WD, AWD-V, and AWD by operating the AWD mode switch.
- When judging driving conditions and road surface conditions based on signals transmitted from each sensor and switch, the AWD system automatically controls torque distribution of front and rear wheels and both front wheels, depending on the situation.
- In accordance with fail-safe function, when system is malfunctioning, AWD control stops, and the system becomes front wheel drive. Refer to DLN-18, "AWD SYSTEM : Fail-safe".
- When a high load status continues for electric controlled coupling, AWD control temporarily becomes front wheel drive, according to protection function. Refer to DLN-20, "AWD SYSTEM : Protection Function".

AWD SYSTEM : Torque Split Control

INFOID:0000000012199364

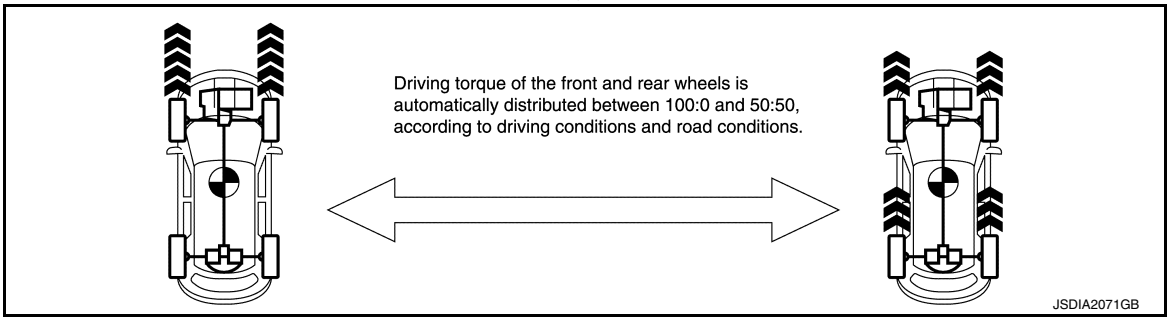
2WD mode

- Vehicle is in front-wheel drive.

AWD-V mode

Normal Control

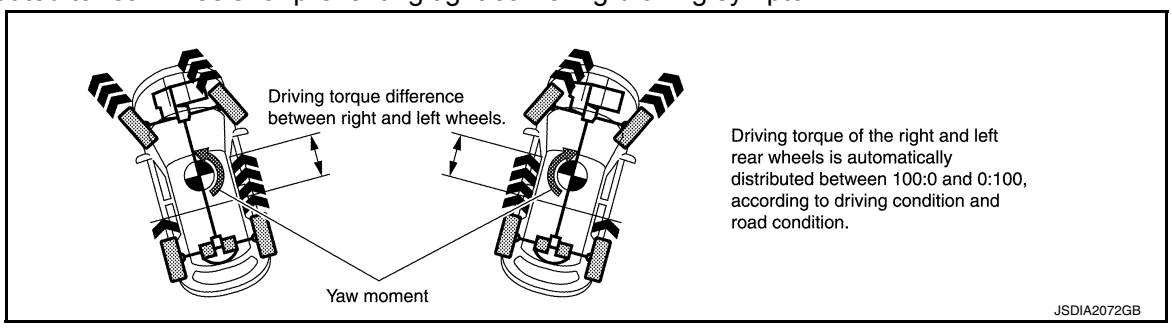
- Pressing force of multiple disc clutch is controlled by electric control. Driving torque distribution of front and rear wheels changes automatically between approximately 100 : 0 (Front wheel drive) and 50 : 50 (AWD) to have an optimized torque distribution adapted to road condition change.
- When slip occurs on front wheel, distribute optimum torque to rear wheel and keep stable driving.
- On roads which do not require AWD, it contributes to improved fuel economy by driving in conditions close to front-wheel drive and it results in better fuel efficiency.



Cornering Control

- Torque between both rear wheels is automatically changed between 100 : 0 and 0 : 100 for distributing optimum torque that depends on the driving conditions and road surface conditions.
- Producing a difference between both rear wheels enables sporty and smooth handling.

- The vehicle cornering status is judged according to information from each sensor, and the optimum torque is distributed to rear wheels for preventing tight cornering/braking symptom.



AWD mode

- The AWD mode controls torque for obtaining suitable torque for driving on slippery roads (e.g. snow-covered roads) and provides more stable driving, compared to AWD-V.

AWD SYSTEM : Fail-safe

INFOID:0000000012199365

When a system malfunction occurs, the AWD warning lamp turns ON and the AWD control becomes 2WD state.

Detected DTC	Possible cause	AWD warning lamp status	Vehicle condition
P1804	Internal malfunction of AWD control module	OFF	Normal control continues.
P1808	• ABS actuator and electric unit (control unit) - Malfunction of ABS actuator and electric unit (control unit) circuit error - Wheel speed sensor error • AWD control module • CAN communication line	ON	Front and rear distribution control stops.
P1809	Internal malfunction of AWD control module		
P1811	• Malfunction of AWD control module power supply circuit (open or short) • Malfunction of AWD control module • Battery		
P1813	• AWD mode switch - Internal malfunction of AWD mode switch - Malfunction of AWD mode switch circuit • AWD control module		
P181B	Self-shut of AWD control module is incomplete.	OFF	Normal control continues.
P181D	• ECM • AWD control module • CAN communication line	ON	Front and rear distribution control stops. **NOTE:** The state becomes AWD only when a turning difference occurs between front and rear wheels.
P181E	• Steering angle sensor - Steering angle sensor error - Malfunction of steering angle sensor circuit • Malfunction of AWD control module • CAN communication line	OFF	Right and left rear wheels difference control stops.
P181F	Writing unit characteristics is incomplete.	ON	Front and rear distribution control stops.
P1820	• ECM • AWD control module • CAN communication line	OFF	Normal control continues.

Detected DTC	Possible cause	AWD warning lamp status	Vehicle condition
P1829	• ECM • AWD control module • CAN communication line	ON	Front and rear distribution control stops.
P182D	• Internal malfunction of electric controlled coupling (left) • Malfunction of AWD solenoid (left) power supply circuit (open or short) • Malfunction of AWD control module		
P182E	• Internal malfunction of electric controlled coupling (right) • Malfunction of AWD solenoid (right) power supply circuit (open or short) • Malfunction of AWD control module		
P1830	• ABS actuator and electric unit (control unit) • AWD control module • CAN communication line	OFF	Normal control continues.
P1831	• ABS actuator and electric unit (control unit) • AWD control module • CAN communication line		
P1832	• ABS actuator and electric unit (control unit) • AWD control module • CAN communication line		
P183B	• Malfunction of AWD solenoid power supply circuit • Malfunction of AWD control module • Malfunction of AWD control module power supply circuit (open or short) • Battery	ON	Front and rear distribution control stops.
P183C	• ABS actuator and electric unit (control unit) • Yaw rate/side/decel G sensor (Decel G sensor signal) • AWD control module • CAN communication line	OFF	Right and left rear wheels difference control stops.
P183D	• ABS actuator and electric unit (control unit) • Yaw rate/side/decel G sensor (Side G senesor signal) • AWD control module • CAN communication line		
P183E	• ABS actuator and electric unit (control unit) • Yaw rate/side/decel G sensor (Yaw rate signal) • AWD control module • CAN communication line		
P183F	• Sensor related to CVT • TCM • AWD control module • CAN communication line		
P1840	• Sensor related to CVT • TCM • AWD control module • CAN communication line		
P1864	• Sensor related to CVT • TCM • AWD control module • CAN communication line		
P1865	• Sensor related to CVT • TCM • AWD control module • CAN communication line		
U1000	CAN communication error	ON	Front and rear distribution control stops.
U1010	Internal malfunction of AWD control module		

AWD SYSTEM : Protection Function

INFOID:0000000012199366

AWD system activates its protection function (shuts down AWD system temporarily) if AWD system detects high load continuously, the front wheel tire size differs from the rear tire size or the rear right wheel tire size differs from the rear left tire size. (AWD system is automatically restored if AWD system no longer detects any overload or the tire size difference is eliminated.)

Detected DTC	Warning lamp	Possible cause	Vehicle condition
—	Quick blinking*1	Turning difference remains between front and rear wheels or between right and left rear wheels, resulting in an oil temperature rise in drive train related parts. **NOTE:** It is not malfunction.	Shuts down AWD system temporarily
—	Slow blinking*2	Malfunction in each tire or different tire diameter	

*1: 2 times/second (blinking for approximately 1 minute and then turned OFF)
*2: 1 time/2 seconds (continuing to blink until ignition switch is turned OFF)

NOTE:

- If the warning lamp blinks slowly during driving but remains OFF after the engine is restarted, the system is normal. If it again blinks slowly after driving for some time, vehicle must be inspected.
- When there is a difference of revolution speed between the front and rear wheel the shift occasionally changes to direct 4-wheel driving conditions automatically. This is not a malfunction.

DIAGNOSIS SYSTEM (AWD CONTROL MODULE)

CONSULT Function

INFOID:0000000012199367

APPLICATION ITEMS

CONSULT can display each diagnostic item using the diagnostic test modes as follows.

Diagnostic test mode	Function
ECU Identification	AWD control module part number can be read.
Self Diagnostic Result	Self-diagnostic results and freeze frame data can be read and erased quickly.*
Data Monitor	Input/Output data in the AWD control module can be read.
Active Test	Diagnostic Test Mode in which CONSULT drives some actuators apart from the AWD control module and also shifts some parameters in a specified range.
Work support	This mode enable a technican to adjust some devices faster and more accurately by following the indication on the CONSULT.

*: The following diagnosis information is erased by erasing.
- DTC
- Freeze frame data (FFD)

ECU IDENTIFICATION

AWD control module part number can be read.

SELF DIAGNOSTIC RESULT

Refer to DLN-31, "DTC Index".

When “PRSNT” is displayed on self-diagnosis result.
- The system is presently malfunctioning.

When “PAST” is displayed on self-diagnosis result.
- System malfunction in the past is detected, but the system is presently normal.

FREEZE FRAME DATA (FFD)

The following vehicle status is recorded when DTC is detected and is displayed.

Freeze Frame Data Item	Description
SOLENOID VOLT	Power supply voltage of AWD solenoid is displayed.
TRGT SOL CRNT LH	AWD solenoid (left) target current is displayed.
SOLENOID CRNT LH	AWD solenoid (left) control current is displayed.
TRGT SOL CRNT RH	AWD solenoid (right) target current is displayed.
SOLENOID CRNT RH	AWD solenoid (right) control current is displayed.
COMPR VHCL SPEED	Vehicle speed calculated by AWD control module is displayed.
VHCL/S SEN-FR	Vehicle speed (front) average calculated by AWD control module is displayed.
VHCL/S SEN-RR	Vehicle speed (rear) average calculated by AWD control module is displayed.
WHEEL SPD SEN FR	Wheel speed (front right) calculated by AWD control module is displayed.
WHEEL SPD SEN FL	Wheel speed (front left) calculated by AWD control module is displayed.
WHEEL SPD SEN RR	Wheel speed (rear right) calculated by AWD control module is displayed.
WHEEL SPD SEN RL	Wheel speed (rear left) calculated by AWD control module is displayed.
ABS OPERATION SIG	ABS operation status via CAN communication line is displayed.
VDC OPERATION SIG	VDC operation status via CAN communication line is displayed.
TCS OPERATION SIG	TCS operation status via CAN communication line is displayed.
HIGH M FLG 1 [0/1]	Measured friction of load is displayed when vehicle starts. • When “0” is displayed: It indicates that friction of load is not high. • When “1” is displayed: It indicates that friction of load is high.

Freeze Frame Data Item	Description
HIGH M FLG 2 [0/1]	Measured friction of load is displayed when vehicle throttles down. • When “0” is displayed: It indicates that friction of load is not high. • When “1” is displayed: It indicates that friction of load is high.
SLCT LVR POSI	Current transmission gear via CAN communication line is displayed.
OPERATION MODE	Control status of AWD mode is displayed.
IGN COUNTER [0 - 39]	The number of times that ignition switch is turned ON after the DTC is detected is displayed. • When “0” is displayed: It indicates that the system is presently malfunctioning. • When except “0” is displayed: It indicates that system malfunction in the past is detected, but the system is presently normal. **NOTE:** Each time when ignition switch is turned OFF to ON, numerical number increases in 1→2→3...38→39. When the operation number of times exceeds 39, the number do not increase and “39” is displayed until self-diagnosis is erased.

DATA MONITOR

NOTE:

The following table includes information (items) inapplicable to this vehicle. For information (items) applicable to this vehicle, refer to CONSULT display items.

X: Applicable

Monitor item [Unit]	SELECT MONITOR ITEM		Remarks
	ECU INPUT SIGNALS	MAIN SIGNALS	
SWITCH 1 [On/Off]	X		AWD mode switch status (2WD) is displayed.
SWITCH 2 [On/Off]	X		AWD mode switch status (AWD-V or AWD) is displayed.
SWITCH 3 [On/Off]	X		AWD mode switch status (AWD) is displayed.
IGN SW [On/Off]	X		Ignition switch status is displayed.
WARNING LAMP [On/Off]		X	Control status of AWD warning lamp is displayed.
R POSITION SW [On/Off]	X	X	CVT shift selector is displayed.
ABS OPERATION SIG [On/Off]			ABS operation status via CAN communication line is displayed.
VDC OPERATION SIG [On/Off]			VDC operation status via CAN communication line is displayed.
TCS OPERATION SIG [On/Off]			TCS operation status via CAN communication line is displayed.
PKB SW [On/Off]		X	Parking brake switch signal status via CAN communication line is displayed.
STOP LAMP SW [On/Off]		X	Stop lamp switch signal status via CAN communication line is displayed.
4WD MODE SW [2WD/4WD-A]		X	AWD mode switch status is displayed.
ACTUATOR RELAY [On/Off]			AWD actuator relay (integrated in AWD control module) operation status is displayed.
OPERATION MODE [2WD/4WD-V/4WD-A]		X	Control status of AWD mode is displayed.
INDICATOR [2WD/4WD-V/4WD-A]		X	Control status of AWD mode indicator lamp is displayed.
DRIVE MODE [1/2]		X	AWD mode status is displayed.
TORQU DISTR RR LH [1/1-2/1-3/1-4/OFF]			Control status of torque distribution indicator (rear left) is displayed.
TORQU DISTR RR RH [1/1-2/1-3/1-4/OFF]			Control status of torque distribution indicator (rear right) is displayed.
TORQU IND FRONT [1/1-2/1-3/1-4/OFF]			Control status of torque distribution indicator (front) is displayed.
TEMP SEN LEFT [V]	X		Temperature sensor is not equipped, but displayed.

Monitor item [Unit]	SELECT MONITOR ITEM		Remarks
	ECU INPUT SIGNALS	MAIN SIGNALS	
TEMP SEN RIGHT [V]	X		Temperature sensor is not equipped, but displayed.
CONT MODUL VOLT [V]	X		Power supply voltage of AWD control module is displayed.
SOLENOID VOLT [V]	X		Power supply voltage of AWD solenoid is displayed.
TRGT SOL CRNT LH [A]	X		AWD solenoid (left) target current is displayed.
SOLENOID CRNT LH [A]	X		AWD solenoid (left) control current is displayed.
TRGT SOL CRNT RH [A]	X		AWD solenoid (right) target current is displayed.
SOLENOID CRNT RH [A]	X		AWD solenoid (right) control current is displayed.
COMPR VHCL SPEED [km/h] or [MPH]		X	Vehicle speed calculated by AWD control module is displayed.
VHCL/S SEN-FR [km/h] or [MPH]			Vehicle speed (front) average calculated by AWD control module is displayed.
VHCL/S SEN-RR [km/h] or [MPH]			Vehicle speed (rear) average calculated by AWD control module is displayed.
THRTL POS SEN [%]			Accelerator pedal status via CAN communication line is displayed.
SLCT LVR POSI [2ND / 3RD / 4TH / 5TH / 6TH / 7TH / 8TH / R / N/P / D]		X	Current transmission gear via CAN communication line is displayed.
TRGT DRIVE TORQU [Nm]			Request drive torque from AWD control module to ECM is displayed.
RQST DRIVE TORQU [Nm]			Request drive torque from ABS actuator and electric unit (control unit) to AWD control module is displayed.
WHEEL SPD SEN FR [km/h] or [MPH]			Wheel speed (front right) calculated by AWD control module is displayed.
WHEEL SPD SEN FL [km/h] or [MPH]			Wheel speed (front left) calculated by AWD control module is displayed.
WHEEL SPD SEN RR [km/h] or [MPH]			Wheel speed (rear right) calculated by AWD control module is displayed.
WHEEL SPD SEN RL [km/h] or [MPH]			Wheel speed (rear left) calculated by AWD control module is displayed.

ACTIVE TEST

Use this mode to determine and identify the details of a malfunction based on self-diagnostic results or data monitor. AWD control module gives drive signal to actuator with receiving command from CONSULT to check operation of actuator.

Test item	Condition	Description
SOLENOID LEFT	• Vehicle stopped • Engine running • No DTC detected	Change command current value to AWD solenoid (left), and then change driving mode. (Monitor value is normal if it is within approx. ±10% of command value.) • Qu: Increase current value in increments of 0.2 A • Qd: Decrease current value in increments of 0.2 A • UP: Increase current value in increments of 0.02 A • DOWN: Decrease current value in increments of 0.02 A
SOLENOID RIGHT	• Vehicle stopped • Engine running • No DTC detected	Change command current value to AWD solenoid (right), and then change driving mode. (Monitor value is normal if it is within approx. ±10% of command value.) • Qu: Increase current value in increments of 0.2 A • Qd: Decrease current value in increments of 0.2 A • UP: Increase current value in increments of 0.02 A • DOWN: Decrease current value in increments of 0.02 A

CAUTION:

Never energize continuously for a long time.

WORK SUPPORT

Item	Usage
UNIT CHARACTERISTICS DATA	Display the unit characteristics of electric controlled coupling written to AWD control module.
UNIT CHARACTERISTICS WRITE	Writes the unit characteristics of electric controlled coupling to AWD control module.

ECU DIAGNOSIS INFORMATION

AWD CONTROL MODULE

Reference Value

INFOID:0000000012199368

VALUES ON THE DIAGNOSIS TOOL

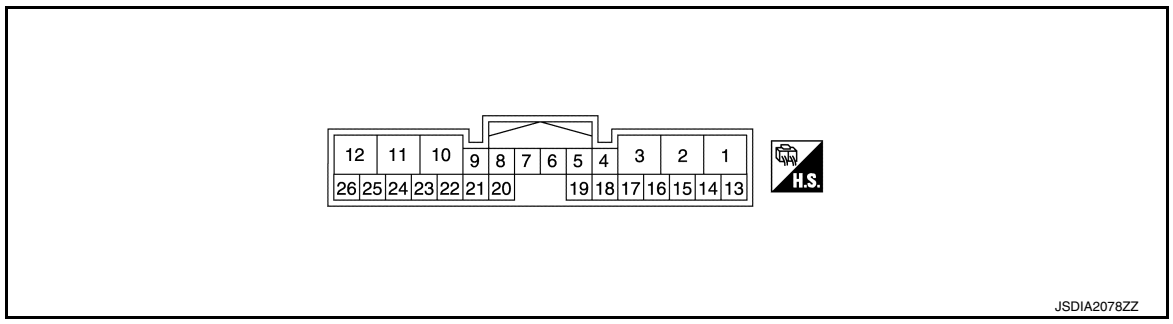
NOTE:
The following table includes information (items) inapplicable to this vehicle. For information (items) applicable to this vehicle, refer to CONSULT display items.

Monitor item	Condition	Value/Status
SWITCH 1	AWD mode switch: 2WD	On
	AWD mode switch: AWD-V or AWD	Off
SWITCH 2	AWD mode switch: AWD-V or AWD	On
	AWD mode switch: 2WD	Off
SWITCH 3	AWD mode switch: AWD	On
	AWD mode switch: 2WD or AWD-V	Off
IGN SW	Ignition switch: ON	On
	Ignition switch: OFF	Off
WARNING LAMP	AWD warning lamp: ON	On
	AWD warning lamp: OFF	Off
R POSITION SW	CVT shift selector: R	On
	CVT shift selector: Except R	Off
ABS OPERATION SIG	ABS is operating	On
	ABS is not operating	Off
VDC OPERATION SIG	VDC is operating	On
	VDC is not operating	Off
TCS OPERATION SIG	TCS is operating	On
	TCS is not operating	Off
PKB SW	Parking brake is operated	On
	Parking brake is not operated	Off
STOP LAMP SW	Brake pedal is depressed	On
	Brake pedal is released	Off
4WD MODE SW	AWD mode switch: 2WD	2WD
	AWD mode switch: AWD-V or AWD	4WD-A
ACTUATOR RELAY	Engine stopped (Ignition switch: ON)	Off
	Engine running	On
OPERATION MODE	2WD mode	2WD
	AWD-V mode	4WD-V
	AWD mode	4WD-A
INDICATOR	AWD mode indicator (AWD-V): OFF AWD mode indicator (AWD): OFF	2WD
	AWD mode indicator (AWD-V): ON AWD mode indicator (AWD): OFF	4WD-V
	AWD mode indicator (AWD-V): ON AWD mode indicator (AWD): ON	4WD-A
DRIVE MODE	Except AWD mode	1
	AWD mode	2

Monitor item	Condition	Value/Status
TORQU DISTR RR LH	The number of bars of torque distribution indicator (rear LH): 0	OFF
	The number of bars of torque distribution indicator (rear LH): 1	1
	The number of bars of torque distribution indicator (rear LH): 2	1-2
	The number of bars of torque distribution indicator (rear LH): 3	1-3
	The number of bars of torque distribution indicator (rear LH): 4	1-4
TORQU DISTR RR RH	The number of bars of torque distribution indicator (rear RH): 0	OFF
	The number of bars of torque distribution indicator (rear RH): 1	1
	The number of bars of torque distribution indicator (rear RH): 2	1-2
	The number of bars of torque distribution indicator (rear RH): 3	1-3
	The number of bars of torque distribution indicator (rear RH): 4	1-4
TORQU IND FRONT	The number of bars of torque distribution indicator (front): 0	OFF
	The number of bars of torque distribution indicator (front): 1	1
	The number of bars of torque distribution indicator (front): 2	1-2
	The number of bars of torque distribution indicator (front): 3	1-3
	The number of bars of torque distribution indicator (front): 4	1-4
TEMP SEN LEFT	Always	0 V
TEMP SEN RIGHT	Always	0 V
CONT MODUL VOLT	Always	11 – 13 V
SOLENOID VOLT	Always	11 – 13 V
TRGT SOL CRNT LH	Vehicle stopped	0.00 A
	Vehicle starting (Straight-ahead start on a dry road with accelerator angle 25%) **NOTE:** Confirm accelerator angle in monitor item “THRTL POS SEN”.	Approx. 1.00 A
SOLENOID CRNT LH	Vehicle stopped	0.00 A
	Vehicle starting (Straight-ahead start on a dry road with accelerator angle 25%) **NOTE:** Confirm accelerator angle in monitor item “THRTL POS SEN”.	Approx. 1.00 A
TRGT SOL CRNT RH	Vehicle stopped	0.00 A
	Vehicle starting (Straight-ahead start on a dry road with accelerator angle 25%) **NOTE:** Confirm accelerator angle in monitor item “THRTL POS SEN”.	Approx. 1.00 A
SOLENOID CRNT RH	Vehicle stopped	0.00 A
	Vehicle starting (Straight-ahead start on a dry road with accelerator angle 25%) **NOTE:** Confirm accelerator angle in monitor item “THRTL POS SEN”.	Approx. 1.00 A
COMPR VHCL SPEED	Vehicle stopped	0.00 km/h (0.00 mph)
	Vehicle driving **CAUTION:** **Check air pressure of tire under standard condition.**	Approx. equal to the indication on speedometer (inside of ±10%)
VHCL/S SEN-FR	Vehicle stopped	0.00 km/h (0.00 mph)
	Vehicle driving **CAUTION:** **Check air pressure of tire under standard condition.**	Approx. equal to the indication on speedometer (inside of ±10%)

Monitor item	Condition		Value/Status
VHCL/S SEN-RR	Vehicle stopped		0.00 km/h (0.00 mph)
	Vehicle driving **CAUTION:** **Check air pressure of tire under standard condition.**		Approx. equal to the indication on speedometer (inside of ±10%)
THRTL POS SEN	When depressing accelerator pedal (Value rises gradually in response to accelerator pedal position)		0 - 100%
SLCT LVR POSI	Engine running	CVT shift selector: Manual mode	1ST 2ND 3RD 4TH 5TH 6TH 7TH 8TH
		CVT shift selector: R	REVERSE
		CVT shift selector: N or P	N/P
		CVT shift selector: D	D
TRGT DRIVE TORQU	Request from AWD control module to ECM.		0 - 507 Nm
	No request from AWD control module to ECM.		508 Nm
RQST DRIVE TORQU	Request from ABS actuator and electric unit (control unit) to AWD control module.		0 - 1274 Nm
	No request from ABS actuator and electric unit (control unit) to AWD control module.		1275 Nm
WHEEL SPD SEN FR	Vehicle stopped		0.00 km/h (0.00 mph)
	Vehicle driving **CAUTION:** **Check air pressure of tire under standard condition.**		Approx. equal to the indication on speedometer (inside of ±10%)
WHEEL SPD SEN FL	Vehicle stopped		0.00 km/h (0.00 mph)
	Vehicle driving **CAUTION:** **Check air pressure of tire under standard condition.**		Approx. equal to the indication on speedometer (inside of ±10%)
WHEEL SPD SEN RR	Vehicle stopped		0.00 km/h (0.00 mph)
	Vehicle driving **CAUTION:** **Check air pressure of tire under standard condition.**		Approx. equal to the indication on speedometer (inside of ±10%)
WHEEL SPD SEN RL	Vehicle stopped		0.00 km/h (0.00 mph)
	Vehicle driving **CAUTION:** **Check air pressure of tire under standard condition.**		Approx. equal to the indication on speedometer (inside of ±10%)

TERMINAL LAYOUT



PHYSICAL VALUES

Terminal No. (Wire color)		Description		Condition		Value (Approx.)
+	-	Signal name	Input/ Output			
1 (GR)	Ground	Battery power supply (AWD control module)	Input	Always		11 - 13 V
3 (LG)	Ground	Ignition power supply	Input	Ignition switch: ON		11 - 13 V
				Ignition switch: OFF		0 V
4 (L)	—	CAN-H	Input/ Output	—		—
5 (P)	—	CAN-L	Input/ Output	—		—
9 (W)	Ground	AWD mode switch (Except 2WD)	Input	Ignition switch: ON	AWD mode switch: 2WD	4.5 - 5 V
					AWD mode switch: AWD-V or AWD	0 V
10 (B)	Ground	Ground	—	Always		0 V
11 (B)	Ground	Ground	—	Always		0 V
12 (Y)	Ground	Battery power supply (AWD solenoid)	Input	Always		11 - 13 V
13 (G)	Ground	AWD mode switch (2WD)	Input	Ignition switch: ON	AWD mode switch: 2WD	0 V
					AWD mode switch: AWD-V or AWD	4.5 - 5 V
21 (Y)	Ground	AWD mode switch (AWD)	Input	Ignition switch: ON	AWD mode switch: 2WD or AWD-V	4.5 - 5 V
					AWD mode switch: AWD	0 V
23 (R)	Ground	AWD solenoid (left) power supply	Output	Engine speed: At idle		0 V
				Engine speed: 3,000 or more constant		2.5 V*
24 (V)	Ground	AWD solenoid (left) ground	Input	Always		1.5 V or less
25 (W)	Ground	AWD solenoid (right) power supply	Output	Engine speed: At idle		0 V
				Engine speed: 3,000 or more constant		2.5 V*
26 (Y)	Ground	AWD solenoid (right) ground	Input	Always		1.5 V or less

*: The values are changed by throttle opening and engine speed.

CAUTION:

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

Fail-safe

INFOID:0000000012199369

When a system malfunction occurs, the AWD warning lamp turns ON and the AWD control becomes 2WD state.

Detected DTC	Possible cause	AWD warning lamp status	Vehicle condition
P1804	Internal malfunction of AWD control module	OFF	Normal control continues.
P1808	• ABS actuator and electric unit (control unit) - Malfunction of ABS actuator and electric unit (control unit) circuit error - Wheel speed sensor error • AWD control module • CAN communication line	ON	Front and rear distribution control stops.
P1809	Internal malfunction of AWD control module		
P1811	• Malfunction of AWD control module power supply circuit (open or short) • Malfunction of AWD control module • Battery		
P1813	• AWD mode switch - Internal malfunction of AWD mode switch - Malfunction of AWD mode switch circuit • AWD control module		
P181B	Self-shut of AWD control module is incomplete.	OFF	Normal control continues.
P181D	• ECM • AWD control module • CAN communication line	ON	Front and rear distribution control stops. **NOTE:** The state becomes AWD only when a turning difference occurs between front and rear wheels.
P181E	• Steering angle sensor - Steering angle sensor error - Malfunction of steering angle sensor circuit • Malfunction of AWD control module • CAN communication line	OFF	Right and left rear wheels difference control stops.
P181F	Writing unit characteristics is incomplete.	ON	Front and rear distribution control stops.
P1820	• ECM • AWD control module • CAN communication line	OFF	Normal control continues.
P1829	• ECM • AWD control module • CAN communication line	ON	Front and rear distribution control stops.
P182D	• Internal malfunction of electric controlled coupling (left) • Malfunction of AWD solenoid (left) power supply circuit (open or short) • Malfunction of AWD control module		
P182E	• Internal malfunction of electric controlled coupling (right) • Malfunction of AWD solenoid (right) power supply circuit (open or short) • Malfunction of AWD control module		
P1830	• ABS actuator and electric unit (control unit) • AWD control module • CAN communication line	OFF	Normal control continues.
P1831	• ABS actuator and electric unit (control unit) • AWD control module • CAN communication line		
P1832	• ABS actuator and electric unit (control unit) • AWD control module • CAN communication line		

Detected DTC	Possible cause	AWD warning lamp status	Vehicle condition
P183B	• Malfunction of AWD solenoid power supply circuit • Malfunction of AWD control module • Malfunction of AWD control module power supply circuit (open or short) • Battery	ON	Front and rear distribution control stops.
P183C	• ABS actuator and electric unit (control unit) • Yaw rate/side/decel G sensor (Decel G sensor signal) • AWD control module • CAN communication line	OFF	Right and left rear wheels difference control stops.
P183D	• ABS actuator and electric unit (control unit) • Yaw rate/side/decel G sensor (Side G senesor signal) • AWD control module • CAN communication line		
P183E	• ABS actuator and electric unit (control unit) • Yaw rate/side/decel G sensor (Yaw rate signal) • AWD control module • CAN communication line		
P183F	• Sensor related to CVT • TCM • AWD control module • CAN communication line		
P1840	• Sensor related to CVT • TCM • AWD control module • CAN communication line		
P1864	• Sensor related to CVT • TCM • AWD control module • CAN communication line		
P1865	• Sensor related to CVT • TCM • AWD control module • CAN communication line		
U1000	CAN communication error	ON	Front and rear distribution control stops.
U1010	Internal malfunction of AWD control module		

Protection Function

INFOID:0000000012199370

AWD system activates its protection function (shuts down AWD system temporarily) if AWD system detects high load continuously, the front wheel tire size differs from the rear tire size or the rear right wheel tire size differs from the rear left tire size. (AWD system is automatically restored if AWD system no longer detects any overload or the tire size difference is eliminated.)

Detected DTC	Warning lamp	Possible cause	Vehicle condition
—	Quick blinking*1	Turning difference remains between front and rear wheels or between right and left rear wheels, resulting in an oil temperature rise in drive train related parts. **NOTE:** It is not malfunction.	Shuts down AWD system temporarily
—	Slow blinking*2	Malfunction in each tire or different tire diameter	

*1: 2 times/second (blinking for approximately 1 minute and then turned OFF)
*2: 1 time/2 seconds (continuing to blink until ignition switch is turned OFF)

NOTE:

- If the warning lamp blinks slowly during driving but remains OFF after the engine is restarted, the system is normal. If it again blinks slowly after driving for some time, vehicle must be inspected.

- When there is a difference of revolution speed between the front and rear wheel the shift occasionally changes to direct 4-wheel driving conditions automatically. This is not a malfunction.

DTC Inspection Priority Chart

INFOID:0000000012199371

If some DTCs are displayed at the same time, perform inspections one by one based on the following priority chart.

Priority	Detected items (DTC)
1	P182D SOLENOID LEFT
2	P182E SOLENOID RIGHT
3	P1813 4WD MODE SW
4	P183B SOL POWER SUPPLY
5	P1811 BATTERY VOLTAGE
6	P1808 VHCL SPEED SEN-ABS
7	P1829 THROTTLE POSI SEN
8	U1010 CONTROL UNIT (CAN)
9	U1000 CAN COMM CIRCUIT
10	P1809 CONTROL UNIT 4
11	P1830 ABS OP SIG
12	P1831 VDC OP SIG
13	P1832 TCS OP SIG
14	P183C DECEL G SENSOR
15	P183D SIDE G SENSOR
16	P183E YAWRATE SENSOR
17	P1865 GEAR RATIO
18	P1840 OUTPUT SPEED SIGNAL
19	P1864 INPUT SPEED SIGNAL
20	P181E STR ANGLE SEN
21	P1820 ENGINE SPEED SIG
22	P181D ENGINE SYSTEM
23	P183F GEAR POSI SIGNAL
24	P181B INCOMP SELF SHUT
25	P1804 CONTROL UNIT 3
26	P181F INCOMP CALIBRATION

DTC Index

INFOID:0000000012199372

DTC	Items (CONSULT screen items)	Reference
P1804	CONTROL UNIT 3	DLN-43, "DTC Logic"
P1808	VHCL SPEED SEN-ABS	DLN-44, "DTC Logic"
P1809	CONTROL UNIT 4	DLN-43, "DTC Logic"
P1811	BATTERY VOLTAGE	DLN-45, "DTC Logic"
P1813	4WD MODE SW	DLN-47, "DTC Logic"
P181B	INCOMP SELF SHUT	DLN-50, "DTC Logic"
P181D	ENGINE SYSTEM	DLN-52, "DTC Logic"
P181E	STR ANGLE SEN	DLN-53, "DTC Logic"
P181F	INCOMP CALIBRATION	DLN-54, "DTC Logic"

DTC	Items (CONSULT screen items)	Reference
P1820	ENGINE SPEED SIG	DLN-55, "DTC Logic"
P1829	THROTTLE POSI SEN	DLN-56, "DTC Logic"
P182D	SOLENOID LEFT	DLN-57, "DTC Logic"
P182E	SOLENOID RIGHT	DLN-60, "DTC Logic"
P1830	ABS OP SIG	DLN-63, "DTC Logic"
P1831	VDC OP SIG	DLN-64, "DTC Logic"
P1832	TCS OP SIG	DLN-65, "DTC Logic"
P183B	SOL POWER SUPPLY	DLN-66, "DTC Logic"
P183C	DECEL G SENSOR	DLN-68, "DTC Logic"
P183D	SIDE G SENSOR	DLN-69, "DTC Logic"
P183E	YAWRATE SENSOR	DLN-70, "DTC Logic"
P183F	GEAR POSI SIGNAL	DLN-71, "DTC Logic"
P1840	OUTPUT SPEED SIGNAL	DLN-72, "DTC Logic"
P1864	INPUT SPEED SIGNAL	DLN-73, "DTC Logic"
P1865	GEAR RATIO	DLN-74, "DTC Logic"
U1000	CAN COMM CIRCUIT	DLN-75, "DTC Logic"
U1010	CONTROL UNIT (CAN)	DLN-76, "DTC Logic"

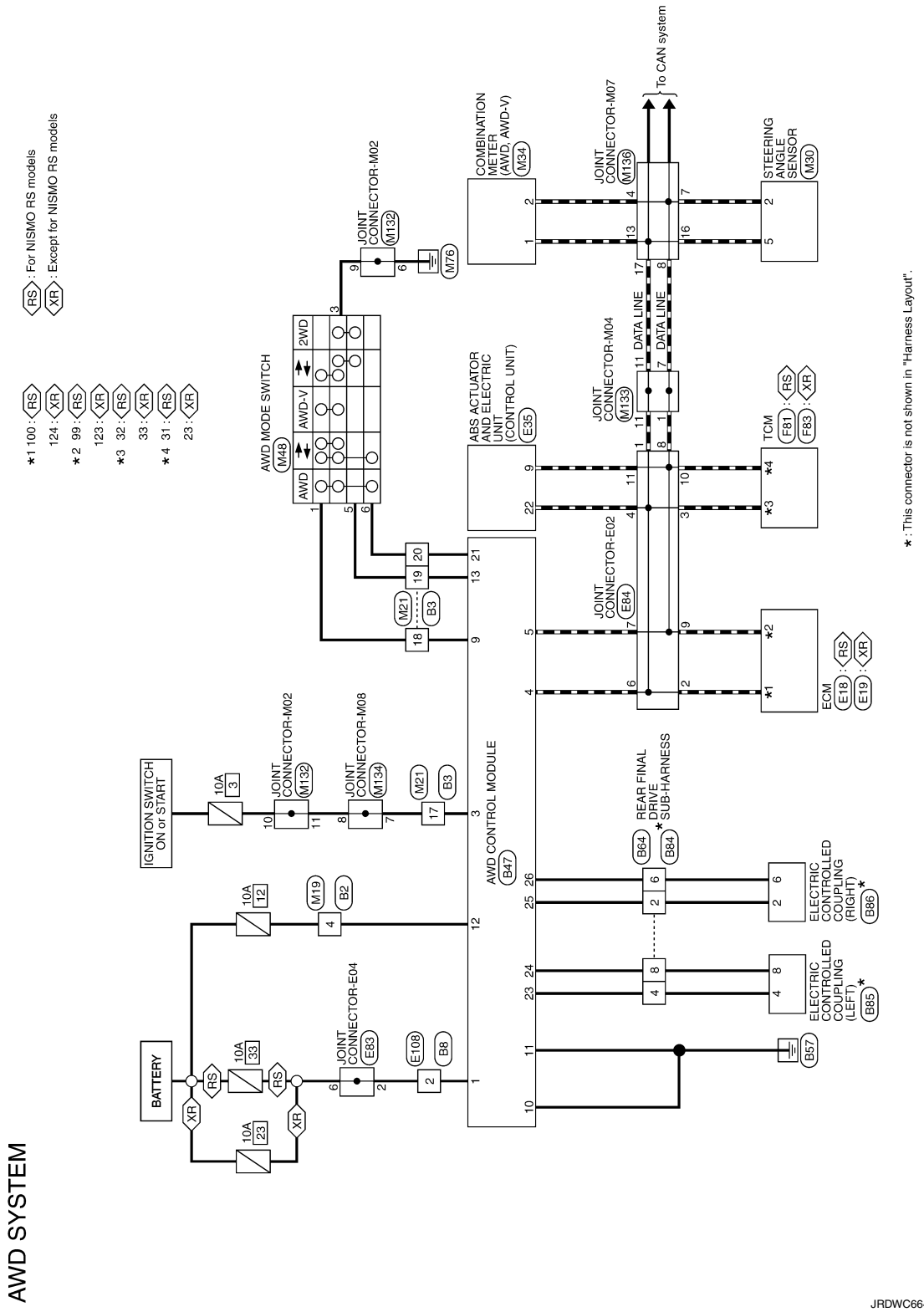
NOTE:
If some DTCs are displayed at the same time, refer to DLN-31, "DTC Inspection Priority Chart".

WIRING DIAGRAM

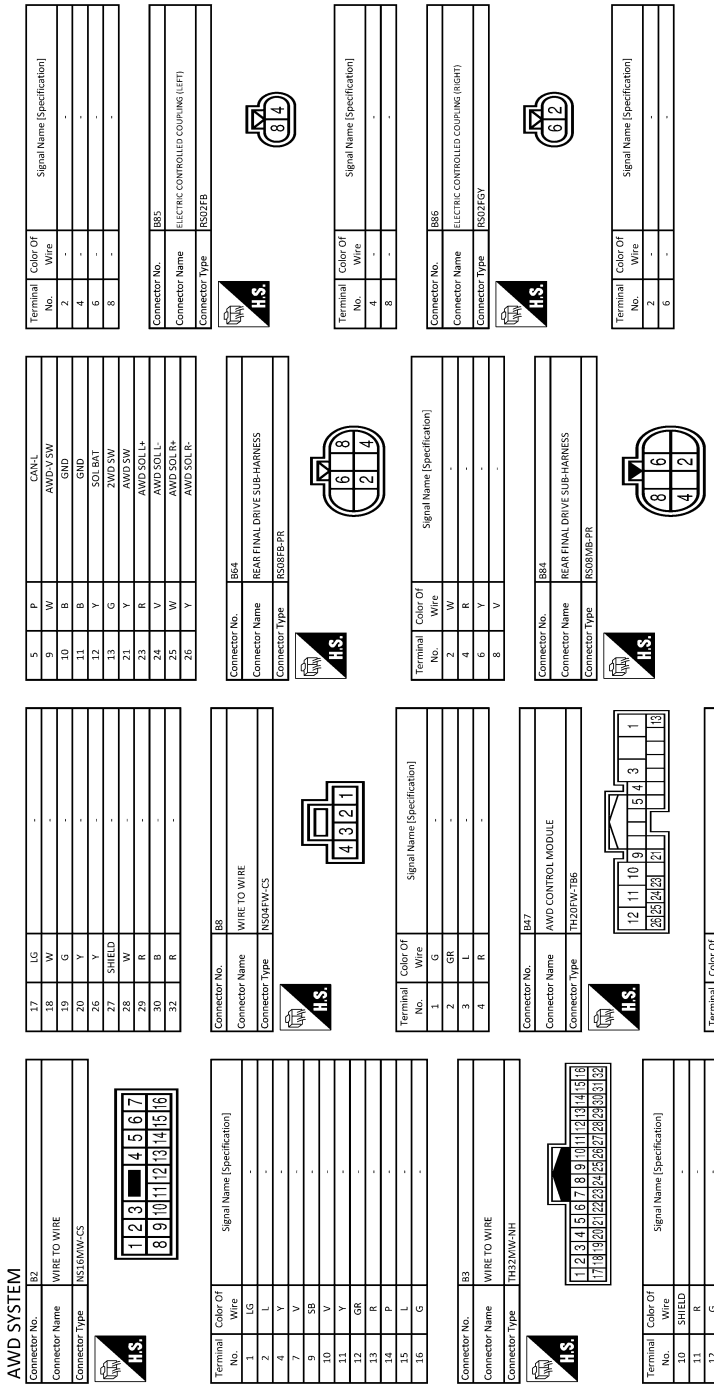
AWD SYSTEM

Wiring Diagram

INFOID:0000000012199373



AWD SYSTEM



JRDWC6643GB

AWD SYSTEM

Connector No.	E18
Connector Name	ECM
Connector Type	RH24FGY-RZ8-R-RH

H.S.

Terminal No.	Color Of Wire	Signal Name [Specification]
99	P	CAN COMMUNICATION LINE (CAN-L)
100	L	CAN COMMUNICATION LINE (CAN-H)
101	V	SENSOR POWER SUPPLY
102	R	ACCELERATOR PEDAL POSITION SENSOR 1
103	BR	PNP SIGNAL
104	R	DATA LINK CONNECTOR
105	GR	SENSOR GROUND
106	Y	POWER SUPPLY FOR ECM (BACKUP)
108	GR	CLUTCH PEDAL POSITION SWITCH
109	O	IGNITION SWITCH
110	P	ASCD STEERING SWITCH
111	B	SENSOR GROUND
112	BR	ECM RELAY (SELF SHUT-OFF)
115	R	STOP LAMP SWITCH
116	G	BRAKE PEDAL POSITION SWITCH
117	Y	FUEL PUMP RELAY
118	O	SENSOR POWER SUPPLY
119	W	ACCELERATOR PEDAL POSITION SENSOR 2
120	Y	SENSOR GROUND
121	G	POWER SUPPLY FOR ECM
122	G	THROTTLE CONTROL MOTOR POWER SUPPLY
123	GR	ECM GROUND
124	GR	ECM GROUND
125	L	A/F SENSOR 1 HEATER
126	W	HEATED OXYGEN SENSOR 2 HEATER
127	GR	ECM GROUND

Connector No.	E19
Connector Name	ECM
Connector Type	RH24FB-RZ8-L-LH

H.S.

Terminal No.	Color Of Wire	Signal Name [Specification]
121	L	EVAP CONTROL SYSTEM PRESSURE SENSOR
123	P	CAN COMMUNICATION LINE (CAN-L)
124	L	CAN COMMUNICATION LINE (CAN-H)
125	G	SENSOR POWER SUPPLY
128	SB	FUEL TANK TEMPERATURE SENSOR
132	GR	CLUTCH PEDAL POSITION SWITCH
133	LG	IGNITION SWITCH
134	P	ASCD STEERING SWITCH
135	B	SENSOR GROUND
139	R	STOP LAMP SWITCH
140	G	BRAKE PEDAL POSITION SWITCH
141	L	EVAP CANISTER VENT CONTROL VALVE
142	O	SENSOR POWER SUPPLY
143	W	ACCELERATOR PEDAL POSITION SENSOR 2
144	Y	SENSOR GROUND
145	G	POWER SUPPLY FOR ECM
146	V	SENSOR POWER SUPPLY
147	GR	ECM GROUND
148	Y	SENSOR GROUND
149	GR	ECM GROUND
150	R	ACCELERATOR PEDAL POSITION SENSOR 1
151	GR	SENSOR GROUND
152	GR	ECM GROUND

Connector No.	E35
Connector Name	ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)
Connector Type	RH28FB-NU4-LH

H.S.

Terminal No.	Color Of Wire	Signal Name [Specification]
1	W	BAT (MTR)
2	L	BAT (SOL)
3	B	GND (SOL)
4	B	GND (MTR)
5	R	VDC_OFF_SW
6	G	ASCD_CANCEL_SW
8	R	STOP_LAMP_SW
9	P	CAN-L
11	BR	DP RR
12	W	DS FR
13	G	VCC
14	R	SERIAL+
15	Y	DS RR
16	V	IGN
17	W	REVERSE SIGNAL
21	Y	DP FR
22	L	CAN-H
23	LG	DP FL
26	G	RR_LH_SENS_VB
27	BR	DS FL
28	B	GND
29	W	SERIAL-
30	BE	RR_LH_SENS_SIG

Connector No.	E83
Connector Name	JOINT CONNECTOR-E04
Connector Type	RH10FB

H.S.

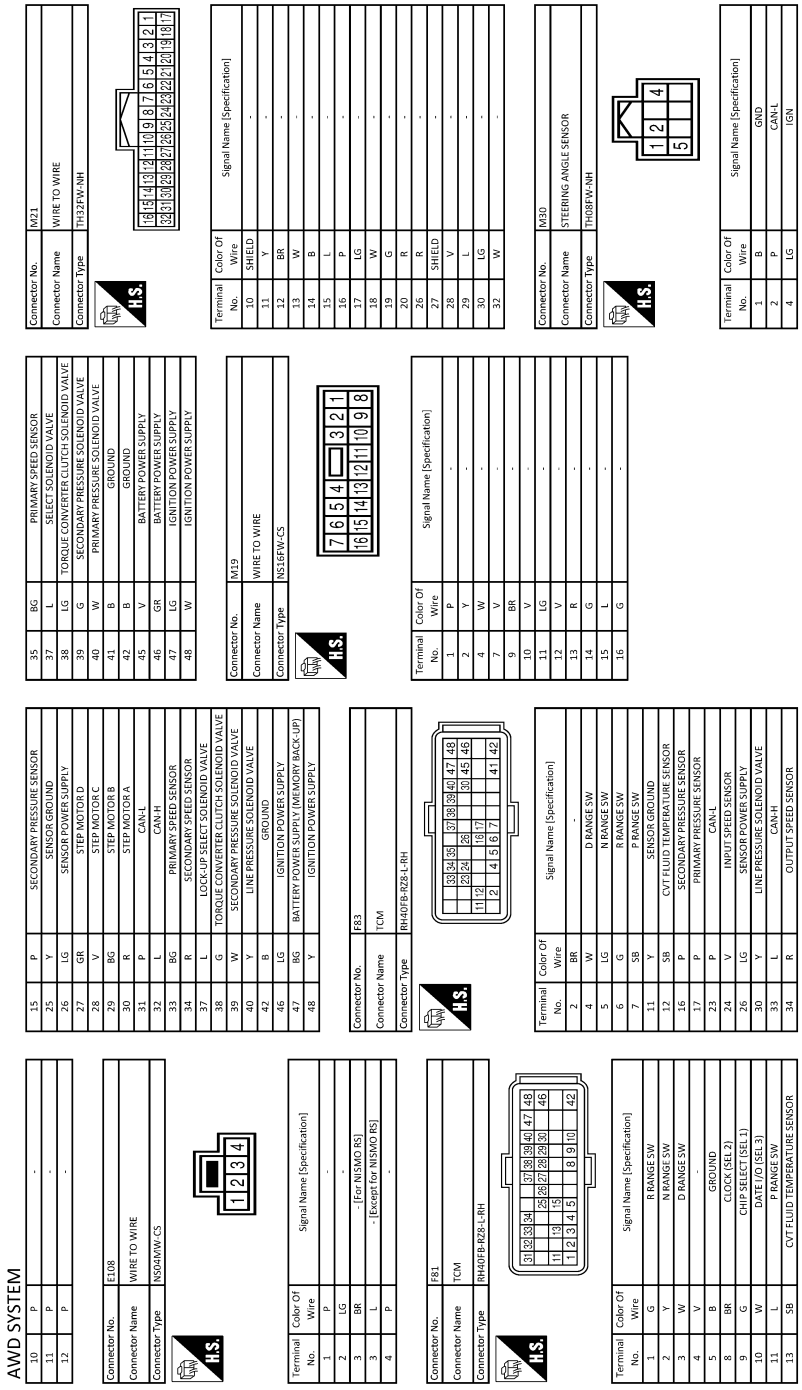
Terminal No.	Color Of Wire	Signal Name [Specification]
1	LG	- [For NISMO RS]
1	V	- [Except for NISMO RS]
2	LG	-
3	Y	-
4	Y	-
5	Y	-
6	LG	- [For NISMO RS]
6	V	- [Except for NISMO RS]
8	V	-
9	V	-
10	V	-

Connector No.	E84
Connector Name	JOINT CONNECTOR-E02
Connector Type	A12FL

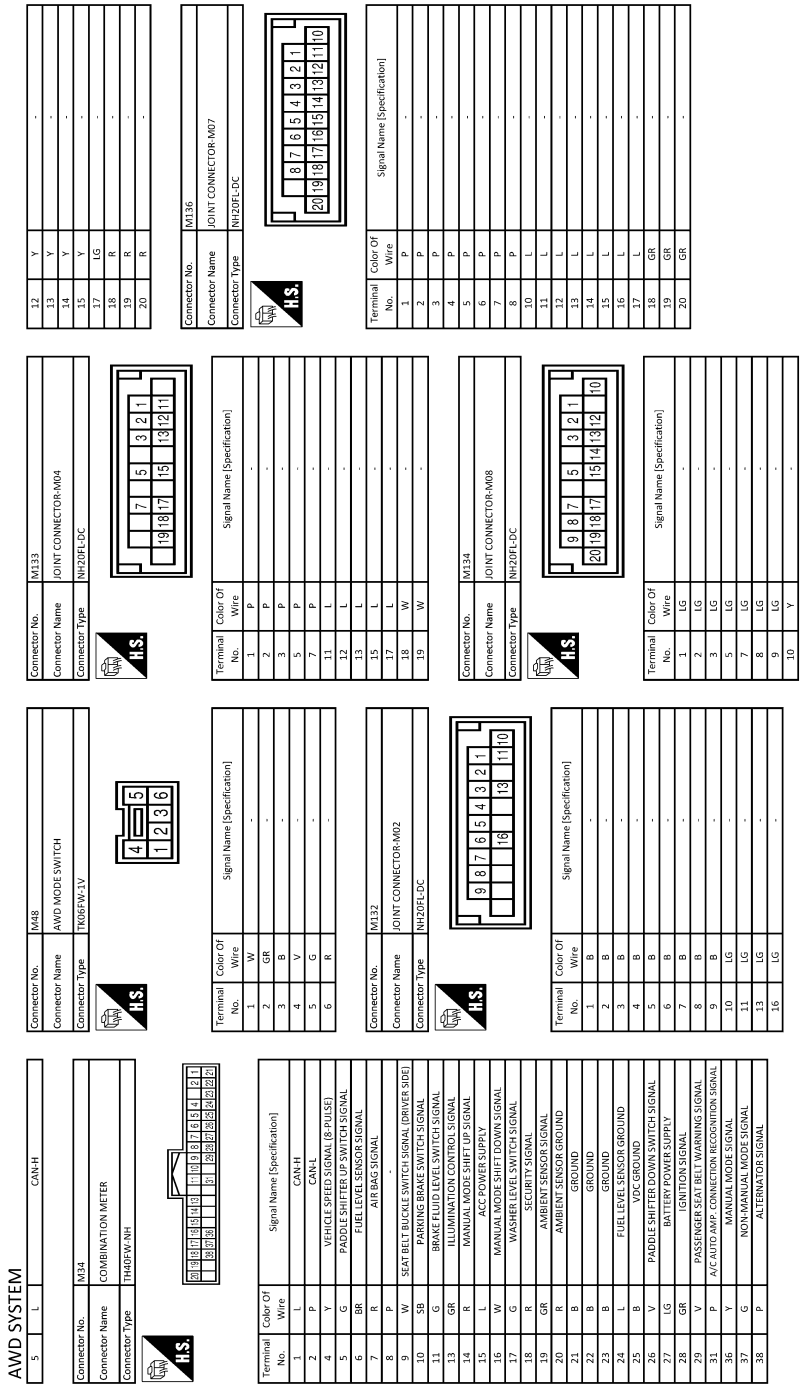
H.S.

Terminal No.	Color Of Wire	Signal Name [Specification]
1	L	-
2	L	-
3	L	-
4	L	-
5	L	-
6	L	-
7	P	-
8	P	-
9	P	-

JRDWC6644GB



JRDWC6645GB



JRDWC6646GB

BASIC INSPECTION

DIAGNOSIS AND REPAIR WORK FLOW

Work Flow

INFOID:0000000012199374

DETAILED FLOW

1.INTERVIEW FROM THE CUSTOMER

Clarify customer complaints before inspection. First of all, perform an interview utilizing DLN-39, "Diagnostic Work Sheet" and reproduce symptoms as well as fully understand it. Ask customer about his/her complaints carefully. Check symptoms by driving vehicle with customer, if necessary.

CAUTION:

Customers are not professional. Never guess easily like “maybe the customer means that...,” or “maybe the customer mentions this symptom”.

>> GO TO 2.

2.CHECK SYMPTOM

Reproduce the symptom that is indicated by the customer, based on the information from the customer obtained by interview. Also check that the symptom is not caused by protection function. Refer to DLN-30, "Protection Function".

CAUTION:

When the symptom is caused by normal operation, fully inspect each portion and obtain the understanding of customer that the symptom is not caused by a malfunction.

>> GO TO 3.

3.PERFORM SELF-DIAGNOSIS

With CONSULT

Perform self-diagnosis for “ALL MODE AWD/4WD”.

Is any DTC detected?

YES >> Record or print self-diagnosis results. GO TO 4.
NO >> GO TO 6.

4.RECHECK SYMPTOM

With CONSULT

1. Erase self-diagnostic results for “ALL MODE AWD/4WD”.
2. Perform DTC confirmation procedures for the error detected system.

NOTE:

If some DTCs are detected at the same time, determine the order for performing the diagnosis based on DLN-31, "DTC Inspection Priority Chart".

Is any DTC detected?

YES >> GO TO 5.
NO >> Check harness and connectors based on the information obtained by interview. Refer to GI-45, "Intermittent Incident".

5.REPAIR OR REPLACE ERROR-DETECTED PARTS

- Repair or replace error-detected parts.
- Reconnect part or connector after repairing or replacing.
- When DTC is detected, erase self-diagnostic results for “ALL MODE AWD/4WD”.

>> GO TO 7.

6.IDENTIFY ERROR-DETECTED SYSTEM BY SYMPTOM DIAGNOSIS

Estimate error-detected system based on symptom diagnosis and perform inspection.

Can the error-detected system be identified?

YES >> GO TO 7.
NO >> Check harness and connectors based on the information obtained by interview. Refer to GI-45, "Intermittent Incident".

7. FINAL CHECK

With CONSULT
1. Check the reference value for AWD control module.
2. Recheck the symptom and check that symptom is not reproduced on the same conditions.

Is the symptom reproduced?

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

Diagnostic Work Sheet

INFOID:0000000012199375

Description

- In general, customers have their own criteria for a problem. Therefore, it is important to understand the symptom and status well enough by asking the customer about his/her concerns carefully. To systemize all the information for the diagnosis, prepare the interview sheet referring to the interview points.
- In some cases, multiple conditions that appear simultaneously may cause a DTC to be detected.

Interview sheet sample

Interview sheet					
Customer name	MR/MS	Registration number		Initial year registration	
		Vehicle type		VIN	
Storage date		Engine		Mileage	km (Mile)
Symptom		☐Vehicle does not enter AWD mode.			
		☐AWD warning lamp turns on.			
		☐Heavy tight-corner braking symptom occurs			
		☐Noise ☐Vibration			
		☐Decrease in turning performance.			
		☐Others ( )			
First occurrence		☐Recently ☐Others ( )			
Frequency of occurrence		☐Always ☐Under a certain conditions of ☐Sometimes (time(s)/day)			
Climate conditions		☐Irrelevant			
	Weather	☐Fine ☐Cloud ☐Rain ☐Snow ☐Others ( )			
	Temperature	☐Hot ☐Warm ☐Cool ☐Cold ☐Temperature (Approx. °C)			
	Relative humidity	☐High ☐Moderate ☐Low			
Road conditions		☐Urban area ☐Suburb area ☐High way ☐Mounting road (uphill or down hill) ☐Rough road			
Operation conditions, etc.		☐Irrelevant ☐When engine starts ☐During idling ☐During driving ☐During acceleration ☐At constant speed driving ☐During deceleration ☐During cornering (right curve or left curve)			

Interview sheet

Customer name	MR/MS	Registration number		Initial year registration	
		Vehicle type		VIN	
Storage date		Engine		Mileage	km (Mile)
Other conditions					

Memo

ADDITIONAL SERVICE WHEN REPLACING AWD CONTROL MODULE

Description

INFOID:0000000012199376

When replacing AWD control module, unit characteristics writing is required. Refer to DLN-41, "Work Procedure".

Work Procedure

INFOID:0000000012199377

1.PERFORM WRITING UNIT CHARACTERISTICS

Perform writing unit characteristics of electric controlled coupling.

>> Refer to DLN-42, "Description".

UNIT CHARACTERISTICS WRITING

Description

INFOID:0000000012199378

When replacing AWD control module, rear final drive assembly and/or electric controlled coupling, unit characteristics of electric controlled coupling writing is required. Refer to DLN-42, "Work Procedure".

Work Procedure

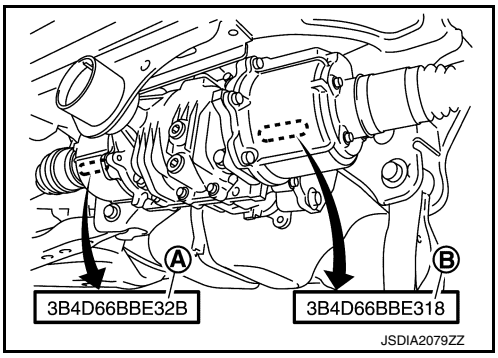
INFOID:0000000012199379

1.UNIT CHARACTERISTICS WRITING

With CONSULT

1. Confirm the unit characteristics (A and B) of electric controlled coupling (left and right).
   NOTE:
   - This illustration is sample.
   - For the illustration, the unit characteristics are following.

   Left side: 3B4D66BBE32B
   Right side: 3B4D66BBE318



2. Turn the ignition switch OFF to ON.
3. Select “UNIT CHARACTERISTICS WRITE” in “WORK SUPPORT” for “ALL MODE AWD/4WD”.
4. Input unit characteristics.
5. Select “Start”.
6. Check that “UNIT CHARACTERISTICS WRITE COMPLETED” is displayed.

>> WORK END

DTC/CIRCUIT DIAGNOSIS

P1804, P1809 AWD CONTROL MODULE

DTC Logic

INFOID:0000000012199380

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
P1804	CONTROL UNIT 3	Malfunction is detected in the memory (EEPROM) system of AWD control module.	Internal malfunction of AWD control module.
P1809	CONTROL UNIT 4	AD converter system of AWD control module is malfunctioning.	

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

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

>> GO TO 2.

2. PERFORM DTC CONFIRMATION

With CONSULT
1. Turn the ignition switch OFF to ON.
2. Perform self-diagnosis for “ALL MODE AWD/4WD”.

Is DTC “P1804 or P1809” detected?

YES >> Proceed to DLN-43, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000012199381

1. PERFORM SELF-DIAGNOSIS AGAIN

With CONSULT
Perform “DTC CONFIRMATION PROCEDURE” (self-diagnosis) again. Refer to DLN-43, "DTC Logic".

Is DTC “P1804 or 1809” detected?

YES >> Replace AWD control module. Refer to DLN-91, "Removal and Installation".
NO >> Check AWD control module pin terminals for damage or loose connection with harness connector. If any items are damaged, repair or replace error-detected parts.

P1808 WHEEL SPEED SENSOR

DTC Logic

INFOID:0000000012199382

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
P1808	VHCL SPEED SEN-ABS	• Malfunction is detected in vehicle speed signal that is output from ABS actuator and electric unit (control unit) through CAN communication. • Improper signal is input while driving.	• ABS actuator and electric unit (control unit) - Malfunction of ABS actuator and electric unit (control unit) circuit error - Wheel speed sensor error • AWD control module • CAN communication line

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

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

>> GO TO 2.

2.PERFORM DTC CONFIRMATION

With CONSULT

1. Start the engine and drive at 30 km/h (19 MPH) or more for approximately 1 minute.
2. Stop the vehicle.
3. Perform self-diagnosis for “ALL MODE AWD/4WD”.

Is DTC “P1808” detected?

YES >> Proceed to DLN-44, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000012199383

1.PERFORM ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) SELF-DIAGNOSIS

With CONSULT

Perform self-diagnosis for “ABS”.

Is any DTC detected?

YES >> Perform trouble diagnosis for detected DTC. Refer to BRC-50, "DTC Index".
NO >> GO TO 2.

2.ERASE SELF-DIAGNOSTIC RESULT

With CONSULT

1. Erase self-diagnostic results for “ALL MODE AWD/4WD”.
2. Start the engine and drive at 30 km/h (19 MPH) or more for approximately 1 minute.
3. Stop the vehicle.
4. Check that ABS warning lamp turns OFF.

Does ABS warning lamp turn OFF?

YES >> GO TO 3.
NO >> Refer to BRC-136, "Component Function Check".

3.CHECK TERMINALS AND HARNESS CONNECTORS

Check AWD control module pin terminals for damage or loose connection with harness connector.

Is inspection result normal?

YES >> After turning the ignition switch OFF, perform DTC confirmation procedure again. If DTC “P1808” is detected, Replace AWD control module. Refer to DLN-91, "Removal and Installation".
NO >> Repair or replace error-detected parts.

P1811 POWER SUPPLY CIRCUIT FOR AWD CONTROL MODULE

DTC Logic

INFOID:0000000012199384

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
P1811	BATTERY VOLTAGE	When AWD control module power supply is lower or higher than normal	• Malfunction of AWD control module power supply circuit (open or short) • Malfunction of AWD control module • Battery

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

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

>> GO TO 2.

2.PERFORM DTC CONFIRMATION

With CONSULT

1. Turn the ignition switch OFF to ON.
2. Perform self-diagnosis for “ALL MODE AWD/4WD”.

Is DTC “P1811” detected?

YES >> Proceed to DLN-45, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000012199385

1.CHECK AWD CONTROL MODULE POWER SUPPLY (1)

1. Turn the ignition switch OFF.
2. Disconnect AWD control module harness connector.
3. Check the voltage between AWD control module harness connector and ground.

AWD control module		—	Voltage
Connector	Terminal		
B47	1	Ground	11 – 13 V

4. Turn the ignition switch ON.
   CAUTION:
   Never start the engine.
5. Check the voltage between AWD control module harness connector and ground.

AWD control module		—	Voltage
Connector	Terminal		
B47	1	Ground	11 – 13 V

Is the inspection result normal?

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

2.CHECK AWD CONTROL MODULE POWER SUPPLY (2)

1. Turn the ignition switch OFF.
2. Check the 10A fuse (Except for NISMO RS models: #23, For NISMO RS models: #33).
3. Check the harness for open or short between AWD control module harness connector No.1 terminal and 10A fuse (Except for NISMO RS models: #23, For NISMO RS models: #33).

Is the inspection result normal?

YES >> Perform the trouble diagnosis for power supply circuit. Refer to PG-12, "Wiring Diagram - BATTERY POWER SUPPLY -".
NO >> Repair or replace error-detected parts.

3. CHECK AWD CONTROL MODULE POWER SUPPLY (3)

1. Turn the ignition switch OFF.
2. Check the voltage between AWD control module harness connector and ground.

AWD control module		—	Voltage
Connector	Terminal		
B47	3	Ground	0 V

3. Turn the ignition switch ON.
CAUTION:
Never start the engine.
4. Check the voltage between AWD control module harness connector and ground.

AWD control module		—	Voltage
Connector	Terminal		
B47	3	Ground	11 – 13 V

Is the inspection result normal?

YES >> GO TO 5.
NO >> GO TO 4.

4. CHECK AWD CONTROL MODULE POWER SUPPLY (4)

1. Turn the ignition switch OFF.
2. Check the 10A fuse (#3).
3. Check the harness for open or short between AWD control module harness connector No.3 terminal and 10A fuse (#3).

Is the inspection result normal?

YES >> Perform the trouble diagnosis for ignition power supply circuit. Refer to PG-43, "Wiring Diagram - IGNITION POWER SUPPLY -".
NO >> Repair or replace error-detected parts.

5. CHECK AWD CONTROL MODULE GROUND

1. Turn the ignition switch OFF.
2. Check the continuity between AWD control module harness connector and ground.

AWD control module		—	Continuity
Connector	Terminal		
B47	10	Ground	Existed
	11		

Is the inspection result normal?

YES >> GO TO 6.
NO >> Repair or replace error-detected parts.

6. CHECK TERMINALS AND HARNESS CONNECTORS

Check the AWD control module pin terminals for damage or loose connection with harness connector.

Is the inspection result normal?

YES >> Replace AWD control module. Refer to DLN-91, "Removal and Installation".
NO >> Repair or replace error-detected parts.

P1813 AWD MODE SWITCH

DTC Logic

INFOID:0000000012199386

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
P1813	4WD MODE SW	Multiple signals received from AWD mode switch are detected.	• AWD mode switch - Internal malfunction of AWD mode switch - Malfunction of AWD mode switch circuit • AWD control module

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

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

>> GO TO 2.

2.PERFORM DTC CONFIRMATION

With CONSULT

1. Turn the ignition switch OFF to ON.
2. Change AWD mode switch following order.

Changing order : 2WD→AWD-V→AWD→AWD-V→2WD

3. Perform self-diagnosis for “ALL MODE AWD/4WD”.

Is DTC “P1813” detected?

YES >> Proceed to DLN-47, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000012199387

1.CHECK AWD MODE SWITCH

Check AWD mode switch. Refer to DLN-48, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 2.
NO >> Replace AWD mode switch. Refer to DLN-93, "Removal and Installation".

2.CHECK AWD MODE SWITCH CIRCUIT (1)

1. Disconnect AWD control module harness connector.
2. Check the continuity between AWD control module harness connector and AWD mode switch harness connector.

AWD control module		AWD mode switch		Continuity
Connector	Terminal	Connector	Terminal	
B47	9	M48	1	Existed
			5	Not existed
			6	Not existed
	13		1	Not existed
			5	Existed
			6	Not existed
	21		1	Not existed
			5	Not existed
			6	Existed

Is the inspection result normal?

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

3.CHECK AWD MODE SWITCH CIRCUIT (2)

Check the continuity between AWD mode switch harness connector and ground.

AWD mode switch		—	Continuity
Connector	Terminal		
M48	3	Ground	Not existed

Is the inspection result normal?

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

4.CHECK TERMINALS AND HARNESS CONNECTORS

- Check AWD control module pin terminals for damage or loose connection with harness connector.
- Check AWD mode switch pin terminals for damage or loose connection with harness connector.

Is the inspection result normal?

YES >> Replace AWD control module. Refer to DLN-91, "Removal and Installation".
NO >> Repair or replace error-detected parts.

Component Inspection

INFOID:0000000012199388

1.CHECK AWD MODE SWITCH

1. Turn the ignition switch OFF.
2. Remove AWD mode switch. Refer to DLN-93, "Removal and Installation".
3. Check the continuity between AWD mode switch harness connector terminals.

AWD switch assembly		Condition	Continuity
Terminal			
1	3	AWD mode switch: 2WD	Not existed
		AWD mode switch: AWD-V or AWD	Existed
5	3	AWD mode switch: 2WD	Existed
		AWD mode switch: AWD-V or AWD	Not existed
6	3	AWD mode switch: 2WD or AWD-V	Not existed
		AWD mode switch: AWD	Existed

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace AWD mode switch. Refer to DLN-93, "Removal and Installation".

P181B INCOMPLETE SELFSHUT

DTC Logic

INFOID:0000000012199389

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
P181B	INCOMP SELF SHUT	When ignition switch is OFF and AWD control module power supply is lower or higher than normal	Self-shut of AWD control module is incomplete.

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

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

>> GO TO 2.

2.PERFORM DTC CONFIRMATION

With CONSULT

1. Turn the ignition switch OFF, and wait for several seconds.
2. Perform self-diagnosis for “ALL MODE AWD/4WD”.

Is DTC “P181B” detected?

YES >> Proceed to DLN-50, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000012199390

1.CHECK AWD CONTROL MODULE POWER SUPPLY (1)

1. Turn the ignition switch OFF.
2. Disconnect AWD control module harness connector.
3. Check the voltage between AWD control module harness connector and ground.

AWD control module		—	Voltage
Connector	Terminal		
B47	1	Ground	11 – 13 V

4. Turn the ignition switch ON.
   CAUTION:
   Never start the engine.
5. Check the voltage between AWD control module harness connector and ground.

AWD control module		—	Voltage
Connector	Terminal		
B47	1	Ground	11 – 13 V

Is the inspection result normal?

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

2.CHECK AWD CONTROL MODULE POWER SUPPLY (2)

1. Turn the ignition switch OFF.
2. Check the 10A fuse (Except for NISMO RS models: #23, For NISMO RS models: #33).
3. Check the harness for open or short between AWD control module harness connector No.1 terminal and 10A fuse (Except for NISMO RS models: #23, For NISMO RS models: #33).

Is the inspection result normal?

YES >> Perform the trouble diagnosis for power supply circuit. Refer to PG-12, "Wiring Diagram - BATTERY POWER SUPPLY -".
NO >> Repair or replace error-detected parts.

3. CHECK AWD CONTROL MODULE GROUND

1. Turn the ignition switch OFF.
2. Check the continuity between AWD control module harness connector and ground.

AWD control module		—	Continuity
Connector	Terminal		
B47	10	Ground	Existed
	11		

Is the inspection result normal?

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

4. CHECK TERMINALS AND HARNESS CONNECTORS

Check AWD control module pin terminals for damage or loose connection with harness connector.

Is inspection result normal?

YES >> After turning the ignition switch OFF, perform DTC confirmation procedure again. If DTC “P181B” is detected, Replace AWD control module. Refer to DLN-91, "Removal and Installation".
NO >> Repair or replace error-detected parts.

P181D ENGINE TORQUE SIGNAL

DTC Logic

INFOID:0000000012199391

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
P181D	ENGINE SYSTEM	Malfunction is detected in engine torque signal that is output from ECM through CAN communication.	• ECM • AWD control module • CAN communication line

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

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

>> GO TO 2.

2.PERFORM DTC CONFIRMATION

With CONSULT

1. Start the engine and drive at 30 km/h (19 MPH) or more for approximately 1 minute.
2. Stop the vehicle.
3. Perform self-diagnosis for “ALL MODE AWD/4WD”.

Is DTC “P181D” detected?

YES >> Proceed to DLN-52, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000012199392

1.PERFORM ECM SELF-DIAGNOSIS

With CONSULT

Perform self-diagnosis for “ENGINE”.

Is any DTC detected?

YES >> Perform trouble diagnosis for detected DTC. Refer to EC-706, "DTC Index" (Except for NISMO RS), EC-115, "DTC Index" (For NISMO RS).
NO >> GO TO 2.

2.CHECK TERMINALS AND HARNESS CONNECTORS

Check AWD control module pin terminals for damage or loose connection with harness connector.

Is inspection result normal?

YES >> After turning the ignition switch OFF, perform DTC confirmation procedure again. If DTC “P181D” is detected, Replace AWD control module. Refer to DLN-91, "Removal and Installation".
NO >> Repair or replace error-detected parts.

P181E STEERING ANGLE SENSOR

DTC Logic

INFOID:0000000012199393

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
P181E	STR ANGLE SEN	Malfunction is detected in steering angle sensor signal through CAN communication.	• Steering angle sensor - Steering angle sensor error - Malfunction of steering angle sensor circuit • Malfunction of AWD control module • CAN communication line

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

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

>> GO TO 2.

2.PERFORM DTC CONFIRMATION

With CONSULT

1. Turn the ignition switch OFF to ON.
2. Perform self-diagnosis for “ALL MODE AWD/4WD”.

Is DTC “P181E” detected?

YES >> Proceed to DLN-53, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000012199394

1.PERFORM ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) SELF-DIAGNOSIS

With CONSULT

Perform self-diagnosis for “ABS”.

Is DTC “C1143” detected?

YES >> Proceed to BRC-108, "Diagnosis Procedure".
NO >> GO TO 2.

2.CHECK TERMINALS AND HARNESS CONNECTORS

Check AWD control module pin terminals for damage or loose connection with harness connector.

Is inspection result normal?

YES >> After turning the ignition switch OFF, perform DTC confirmation procedure again. If DTC “P181E” is detected, Replace AWD control module. Refer to DLN-91, "Removal and Installation".
NO >> Repair or replace error-detected parts.

P181F INCOMPLETE CALIBRATION

DTC Logic

INFOID:0000000012199395

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
P181F	INCOMP CALIBRATION	When incomplete writing unit characteristics of rear final drive is detected.	Writing unit characteristics is incomplete.

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

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

>> GO TO 2.

2.PERFORM DTC CONFIRMATION

With CONSULT

1. Turn the ignition switch OFF to ON.
2. Perform self-diagnosis for “ALL MODE AWD/4WD”.

Is DTC “P181F” detected?

YES >> Proceed to DLN-54, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000012199396

1.PERFORM WRITING UNIT CHARACTERISTICS

1. Erase self-diagnostic result for “ALL MODE AWD/4WD”.
2. Perform writing unit characteristics. Refer to DLN-42, "Work Procedure".
3. Perform self-diagnosis for “ALL MODE AWD/4WD”.

Is any DTC except “P181F” detected?

YES >> Perform trouble diagnosis for detected DTC. Refer to DLN-31, "DTC Index".
NO >> GO TO 2.

2.PERFORM SELF-DIAGNOSIS AGAIN

With CONSULT

Perform “DTC CONFIRMATION PROCEDURE” (self-diagnosis) again. Refer to DLN-54, "DTC Logic".

Is DTC “P181F” detected?

YES >> Replace AWD control module. Refer to DLN-91, "Removal and Installation".
NO >> Check AWD control module pin terminals for damage or loose connection with harness connector. If any items are damaged, repair or replace error-detected parts.

P1820 ENGINE SPEED SIGNAL

DTC Logic

INFOID:0000000012199397

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
P1820	ENGINE SPEED SIG	Malfunction is detected in engine speed signal that is output from ECM through CAN communication.	• ECM • AWD control module • CAN communication line

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

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

>> GO TO 2.

2.PERFORM DTC CONFIRMATION

With CONSULT

1. Start the engine and drive at 30 km/h (19 MPH) or more for approximately 1 minute.
2. Stop the vehicle.
3. Perform self-diagnosis for “ALL MODE AWD/4WD”.

Is DTC “P1820” detected?

YES >> Proceed to DLN-55, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000012199398

1.PERFORM ECM SELF-DIAGNOSIS

With CONSULT

Perform self-diagnosis for “ENGINE”.

Is any DTC detected?

YES >> Perform trouble diagnosis for detected DTC. Refer to EC-706, "DTC Index" (Except for NISMO RS), EC-115, "DTC Index" (For NISMO RS).
NO >> GO TO 2.

2.CHECK TERMINALS AND HARNESS CONNECTORS

Check AWD control module pin terminals for damage or loose connection with harness connector.

Is inspection result normal?

YES >> After turning the ignition switch OFF, perform DTC confirmation procedure again. If DTC “P1820” is detected, Replace AWD control module. Refer to DLN-91, "Removal and Installation".
NO >> Repair or replace error-detected parts.

P1829 ACCELERATOR PEDAL POSITION SENSOR

DTC Logic

INFOID:0000000012199399

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
P1829	THROTTLE POSI SEN	Malfunction is detected in accelerator pedal position signal that is output from ECM through CAN communication.	• ECM • AWD control module • CAN communication line

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

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

>> GO TO 2.

2.PERFORM DTC CONFIRMATION

With CONSULT

1. Start the engine and drive at 30 km/h (19 MPH) or more for approximately 1 minute.
2. Stop the vehicle.
3. Perform self-diagnosis for “ALL MODE AWD/4WD”.

Is DTC “P1829” detected?

YES >> Proceed to DLN-56, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000012199400

1.PERFORM ECM SELF-DIAGNOSIS

With CONSULT

Perform self-diagnosis for “ENGINE”.

Is any DTC detected?

YES >> Perform trouble diagnosis for detected DTC. Refer to EC-706, "DTC Index" (Except for NISMO RS), EC-115, "DTC Index" (For NISMO RS).
NO >> GO TO 2.

2.CHECK TERMINALS AND HARNESS CONNECTORS

Check AWD control module pin terminals for damage or loose connection with harness connector.

Is inspection result normal?

YES >> After turning the ignition switch OFF, perform DTC confirmation procedure again. If DTC “P1829” is detected, Replace AWD control module. Refer to DLN-91, "Removal and Installation".
NO >> Repair or replace error-detected parts.

P182D AWD SOLENOID (LEFT)

DTC Logic

INFOID:0000000012199401

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
P182D	SOLENOID LEFT	Malfunction related to AWD solenoid (left) has been detected.	• Internal malfunction of electric controlled coupling (left) • Malfunction of AWD solenoid (left) power supply circuit (open or short) • Malfunction of AWD control module

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

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

>> GO TO 2.

2.PERFORM DTC CONFIRMATION (1)

With CONSULT
1. Turn the ignition switch OFF to ON, and then wait for 5 seconds or more.
2. Turn the ignition switch OFF.
3. Turn the ignition switch ON, and then wait for 5 seconds or more.
4. Perform self-diagnosis for “ALL MODE AWD/4WD”.

Is DTC “P182D” detected?

YES >> Proceed to DLN-57, "Diagnosis Procedure".
NO >> GO TO 3.

3.PERFORM DTC CONFIRMATION (2)

With CONSULT
1. Lift up the vehicle.
2. Start the engine, and run at idle for 1 second.
3. Stop the engine.
4. Perform self-diagnosis for “ALL MODE AWD/4WD”.

Is DTC “P182D” detected?

YES >> Proceed to DLN-57, "Diagnosis Procedure".
NO >> GO TO 4.

4.PERFORM DTC CONFIRMATION (3)

With CONSULT
1. Drive the vehicle at 30 km/h (19 MPH) or less for approximately 1 minute.
2. Stop the vehicle.
3. Drive the vehicle at 30 km/h (19 MPH) or less for approximately 1 minute again.
4. Stop the vehicle.
5. Perform self-diagnosis for “ALL MODE AWD/4WD”.

Is DTC “P182D” detected?

YES >> Proceed to DLN-57, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000012199402

1.CHECK AWD SOLENOID CIRCUIT (1)

1. Turn the ignition switch OFF.
2. Disconnect AWD control module harness connector.
3. Check the resistance between AWD control module harness connector.

AWD control module			Condition	Resistance (Approx.)
Connector	Terminal			
B47	23	24	10°C (50°F)	2.55 Ω
			20°C (68°F)	2.65 Ω
			30°C (86°F)	2.76 Ω

Is the inspection result normal?

YES >> GO TO 5.
NO >> GO TO 2.

2.CHECK AWD SOLENOID CIRCUIT (2)

1. Disconnect rear final drive sub-harness connector.
2. Check the continuity between AWD control module harness connector and rear final drive sub-harness connector.

AWD control module		Rear final drive sub-harness		Continuity
Connector	Terminal	Connector	Terminal	
B47	23	B64	4	Existed
	24		8	

3. Check the continuity between AWD control module harness connector and the ground.

AWD control module		—	Continuity
Connector	Terminal		
B47	23	Ground	Not existed
	24		

Is the inspection result normal?

YES >> GO TO 3.
NO >> Repair or replace the error-detected parts.

3.CHECK REAR FINAL DRIVE SUB-HARNESS

1. Disconnect electric controlled coupling (left) harness connector.
2. Check the continuity between rear final drive sub-harness connector and electric controlled coupling (left) harness connector.

Rear final drive sub-harness		Electric controlled coupling (left)		Continuity
Connector	Terminal	Connector	Terminal	
B84	4	B85	4	Existed
	8		8	

Is the inspection result normal?

YES >> GO TO 4.
NO >> Replace rear final drive sub-harness. Refer to DLN-145, "Exploded View".

4.CHECK AWD SOLENOID

Check AWD solenoid. Refer to DLN-59, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 5.
NO >> AWD solenoid (left) is malfunctioning. Replace electric controlled coupling (left). Refer to DLN-145, "Removal and Installation".

5.CHECK TERMINALS AND HARNESS CONNECTORS

1. Check AWD control module pin terminals for damage or loose connection with harness connector.
2. Check rear final drive sub-harness pin terminals for damage or loose connection with harness connector.

3. Check electric controlled coupling (left) pin terminals for damage or loose connection with harness connector.

Is the inspection result normal?

YES >> Replace AWD control module. Refer to DLN-91, "Removal and Installation".
NO >> Repair or replace the error-detected parts.

Component Inspection

INFOID:0000000012199403

1.CHECK AWD SOLENOID

1. Turn the ignition switch OFF.
2. Disconnect electric controlled coupling (left) harness connector.
3. Check the resistance between electric controlled coupling (left) connector terminals.

Electric controlled coupling (left) Terminal		Condition	Resistance (Approx.)
4	8	10°C (50°F)	2.55 Ω
		20°C (68°F)	2.65 Ω
		30°C (86°F)	2.76 Ω

Is the inspection result normal?

YES >> INSPECTION END
NO >> AWD solenoid (left) is malfunctioning. Replace electric controlled coupling (left). Refer to DLN-145, "Removal and Installation".

P182E AWD SOLENOID (RIGHT)

DTC Logic

INFOID:0000000012199404

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
P182E	SOLENOID RIGHT	Malfunction related to AWD solenoid (right) has been detected.	• Internal malfunction of electric controlled coupling (right) • Malfunction of AWD solenoid (right) power supply circuit (open or short) • Malfunction of AWD control module

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

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

>> GO TO 2.

2.PERFORM DTC CONFIRMATION (1)

With CONSULT

1. Turn the ignition switch OFF to ON, and then wait for 5 seconds or more.
2. Turn the ignition switch OFF.
3. Turn the ignition switch ON, and then wait for 5 seconds or more.
4. Perform self-diagnosis for “ALL MODE AWD/4WD”.

Is DTC “P182E” detected?

YES >> Proceed to DLN-60, "Diagnosis Procedure".
NO >> GO TO 3.

3.PERFORM DTC CONFIRMATION (2)

With CONSULT

1. Lift up the vehicle.
2. Start the engine, and run at idle for 1 second.
3. Stop the engine.
4. Perform self-diagnosis for “ALL MODE AWD/4WD”.

Is DTC “P182E” detected?

YES >> Proceed to DLN-60, "Diagnosis Procedure".
NO >> GO TO 4.

4.PERFORM DTC CONFIRMATION (3)

With CONSULT

1. Drive the vehicle at 30 km/h (19 MPH) or less for approximately 1 minute.
2. Stop the vehicle.
3. Drive the vehicle at 30 km/h (19 MPH) or less for approximately 1 minute again.
4. Stop the vehicle.
5. Perform self-diagnosis for “ALL MODE AWD/4WD”.

Is DTC “P182E” detected?

YES >> Proceed to DLN-60, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000012199405

1.CHECK AWD SOLENOID CIRCUIT (1)

1. Turn the ignition switch OFF.
2. Disconnect AWD control module harness connector.
3. Check the resistance between AWD control module harness connector.

AWD control module			Condition	Resistance (Approx.)
Connector	Terminal			
B47	25	26	10°C (50°F)	2.55 Ω
			20°C (68°F)	2.65 Ω
			30°C (86°F)	2.76 Ω

Is the inspection result normal?

YES >> GO TO 5.
NO >> GO TO 2.

2.CHECK AWD SOLENOID CIRCUIT (2)

1. Disconnect rear final drive sub-harness connector.
2. Check the continuity between AWD control module harness connector and rear final drive sub-harness connector.

AWD control module		Rear final drive sub-harness		Continuity
Connector	Terminal	Connector	Terminal	
B47	25	B64	2	Existed
	26		6	

3. Check the continuity between AWD control module harness connector and the ground.

AWD control module		—	Continuity
Connector	Terminal		
B47	25	Ground	Not existed
	26		

Is the inspection result normal?

YES >> GO TO 3.
NO >> Repair or replace the error-detected parts.

3.CHECK REAR FINAL DRIVE SUB-HARNESS

1. Disconnect electric controlled coupling (right) harness connector.
2. Check the continuity between rear final drive sub-harness connector and electric controlled coupling (right) harness connector.

Rear final drive sub-harness		Electric controlled coupling (right)		Continuity
Connector	Terminal	Connector	Terminal	
B84	2	B86	2	Existed
	6		6	

Is the inspection result normal?

YES >> GO TO 4.
NO >> Replace rear final drive sub-harness. Refer to DLN-145, "Exploded View".

4.CHECK AWD SOLENOID

Check AWD solenoid. Refer to DLN-62, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 5.
NO >> AWD solenoid (right) is malfunctioning. Replace electric controlled coupling (right). Refer to DLN-145, "Removal and Installation".

5.CHECK TERMINALS AND HARNESS CONNECTORS

1. Check AWD control module pin terminals for damage or loose connection with harness connector.
2. Check rear final drive sub-harness pin terminals for damage or loose connection with harness connector.

3. Check electric controlled coupling (right) pin terminals for damage or loose connection with harness connector.

Is the inspection result normal?

YES >> Replace AWD control module. Refer to DLN-91, "Removal and Installation".
NO >> Repair or replace the error-detected parts.

Component Inspection

INFOID:0000000012199406

1.CHECK AWD SOLENOID

1. Turn the ignition switch OFF.
2. Disconnect electric controlled coupling (right) harness connector.
3. Check the resistance between electric controlled coupling (right) connector terminals.

Electric controlled coupling (right)		Condition	Resistance (Approx.)
Terminal			
2	6	10°C (50°F)	2.55 Ω
		20°C (68°F)	2.65 Ω
		30°C (86°F)	2.75 Ω

Is the inspection result normal?

YES >> INSPECTION END
NO >> AWD solenoid (right) is malfunctioning. Replace electric controlled coupling (right). Refer to DLN-145, "Removal and Installation".

P1830 ABS OPERATION SIGNAL

DTC Logic

INFOID:0000000012199407

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
P1830	ABS OP SIG	Malfunction is detected in ABS operation signal that is output from ABS actuator and electric unit (control unit) through CAN communication.	• ABS actuator and electric unit (control unit) • AWD control module • CAN communication line

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

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

>> GO TO 2.

2.PERFORM DTC CONFIRMATION

With CONSULT
1. Start the engine and drive at 30 km/h (19 MPH) or more for approximately 3 minute.
2. Stop the vehicle.
3. Perform self-diagnosis for “ALL MODE AWD/4WD”.

Is DTC “P1830” detected?

YES >> Proceed to DLN-63, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000012199408

1.PERFORM ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) SELF-DIAGNOSIS

With CONSULT
Perform self-diagnosis for “ABS”.

Is any DTC detected?

YES >> Perform trouble diagnosis for detected DTC. Refer to BRC-50, "DTC Index".
NO >> GO TO 2.

2.ERASE SELF-DIAGNOSTIC RESULT

With CONSULT
1. Erase self-diagnostic results for “ALL MODE AWD/4WD”.
2. Start the engine and drive at 30 km/h (19 MPH) or more for approximately 3 minute.
3. Stop the vehicle.
4. Check that ABS warning lamp turns OFF.

Does ABS warning lamp turn OFF?

YES >> GO TO 3.
NO >> Refer to BRC-136, "Component Function Check".

3.CHECK TERMINALS AND HARNESS CONNECTORS

Check AWD control module pin terminals for damage or loose connection with harness connector.

Is inspection result normal?

YES >> After turning the ignition switch OFF, perform DTC confirmation procedure again. If DTC “P1830” is detected, Replace AWD control module. Refer to DLN-91, "Removal and Installation".
NO >> Repair or replace error-detected parts.

P1831 VDC OPERATION SIGNAL

DTC Logic

INFOID:0000000012199409

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
P1831	VDC OP SIG	Malfunction is detected in VDC operation signal that is output from ABS actuator and electric unit (control unit) through CAN communication.	• ABS actuator and electric unit (control unit) • AWD control module • CAN communication line

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

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

>> GO TO 2.

2.PERFORM DTC CONFIRMATION

With CONSULT
1. Start the engine and drive at 30 km/h (19 MPH) or more for approximately 3 minute.
2. Stop the vehicle.
3. Perform self-diagnosis for “ALL MODE AWD/4WD”.

Is DTC “P1831” detected?

YES >> Proceed to DLN-64, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000012199410

1.PERFORM ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) SELF-DIAGNOSIS

With CONSULT
Perform self-diagnosis for “ABS”.

Is any DTC detected?

YES >> Perform trouble diagnosis for detected DTC. Refer to BRC-50, "DTC Index".
NO >> GO TO 2.

2.ERASE SELF-DIAGNOSTIC RESULT

With CONSULT
1. Erase self-diagnostic results for “ALL MODE AWD/4WD”.
2. Start the engine and drive at 30 km/h (19 MPH) or more for approximately 3 minute.
3. Stop the vehicle.
4. Check that ABS warning lamp turns OFF.

Does ABS warning lamp turn OFF?

YES >> GO TO 3.
NO >> Refer to BRC-136, "Component Function Check".

3.CHECK TERMINALS AND HARNESS CONNECTORS

Check AWD control module pin terminals for damage or loose connection with harness connector.

Is inspection result normal?

YES >> After turning the ignition switch OFF, perform DTC confirmation procedure again. If DTC “P1831” is detected, Replace AWD control module. Refer to DLN-91, "Removal and Installation".
NO >> Repair or replace error-detected parts.

P1832 TCS OPERATION SIGNAL

DTC Logic

INFOID:0000000012199411

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
P1832	TCS OP SIG	Malfunction is detected in TCS operation signal that is output from ABS actuator and electric unit (control unit) through CAN communication.	• ABS actuator and electric unit (control unit) • AWD control module • CAN communication line

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

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

>> GO TO 2.

2.PERFORM DTC CONFIRMATION

With CONSULT
1. Start the engine and drive at 30 km/h (19 MPH) or more for approximately 3 minute.
2. Stop the vehicle.
3. Perform self-diagnosis for “ALL MODE AWD/4WD”.

Is DTC “P1832” detected?

YES >> Proceed to DLN-65, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000012199412

1.PERFORM ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) SELF-DIAGNOSIS

With CONSULT
Perform self-diagnosis for “ABS”.

Is any DTC detected?

YES >> Perform trouble diagnosis for detected DTC. Refer to BRC-50, "DTC Index".
NO >> GO TO 2.

2.ERASE SELF-DIAGNOSTIC RESULT

With CONSULT
1. Erase self-diagnostic results for “ALL MODE AWD/4WD”.
2. Start the engine and drive at 30 km/h (19 MPH) or more for approximately 3 minute.
3. Stop the vehicle.
4. Check that ABS warning lamp turns OFF.

Does ABS warning lamp turn OFF?

YES >> GO TO 3.
NO >> Refer to BRC-136, "Component Function Check".

3.CHECK TERMINALS AND HARNESS CONNECTORS

Check AWD control module pin terminals for damage or loose connection with harness connector.

Is inspection result normal?

YES >> After turning the ignition switch OFF, perform DTC confirmation procedure again. If DTC “P1832” is detected, Replace AWD control module. Refer to DLN-91, "Removal and Installation".
NO >> Repair or replace error-detected parts.

P183B SOLENOID POWER SUPPLY

DTC Logic

INFOID:0000000012199413

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
P183B	SOL POWER SUPPLY	When AWD solenoid power supply voltage is lower or higher than normal.	• Malfunction of AWD solenoid power supply circuit • Malfunction of AWD control module • Malfunction of AWD control module power supply circuit (open or short) • Battery

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

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

>> GO TO 2.

2.PERFORM DTC CONFIRMATION

With CONSULT

1. Turn the ignition switch OFF to ON.
2. Perform self-diagnosis for “ALL MODE AWD/4WD”.

Is DTC “P183B” detected?

YES >> Proceed to DLN-66, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000012199414

1.CHECK AWD SOLENOID POWER SUPPLY (1)

1. Turn the ignition switch OFF.
2. Disconnect AWD control module harness connector.
3. Check the voltage between AWD control module harness connector and ground.

AWD control module		—	Voltage
Connector	Terminal		
B47	12	Ground	11 – 13 V

4. Turn the ignition switch OFF to ON.
   CAUTION:
   Never start the engine.
5. Check the voltage between AWD control module harness connector and ground.

AWD control module		—	Voltage
Connector	Terminal		
B47	12	Ground	11 – 13 V

Is the inspection result normal?

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

2.CHECK AWD SOLENOID POWER SUPPLY (2)

1. Turn the ignition switch OFF.
2. Check the 10A fuse (#12).

3. Check the harness for open or short between AWD control module harness connector No.12 and the 10A fuse (#12).

Is the inspection result normal?

YES >> Perform the trouble the diagnosis for power supply circuit. Refer to PG-12, "Wiring Diagram - BATTERY POWER SUPPLY -".
NO >> Repair or replace error-detected parts.

3.CHECK AWD CONTROL MODULE POWER SUPPLY (1)

1. Turn the ignition switch OFF.
2. Check the voltage between AWD control module harness connector and ground.

AWD control module		—	Voltage
Connector	Terminal		
B47	3	Ground	0 V

3. Turn the ignition switch ON.
CAUTION:
Never start the engine.
4. Check the voltage between AWD control module harness connector and ground.

AWD control module		—	Voltage
Connector	Terminal		
B47	3	Ground	11 – 13 V

Is the inspection result normal?

YES >> GO TO 5.
NO >> GO TO 4.

4.CHECK AWD CONTROL MODULE POWER SUPPLY (2)

1. Turn the ignition switch OFF.
2. Check the 10A fuse (#3).
3. Check the harness for open or short between AWD control module harness connector No.3 terminal and 10A fuse (#3).

Is the inspection result normal?

YES >> Perform the trouble diagnosis for ignition power supply circuit. Refer to PG-43, "Wiring Diagram - IGNITION POWER SUPPLY -".
NO >> Repair or replace error-detected parts.

5.CHECK AWD SOLENOID GROUND

Check the continuity between AWD control module harness connector and ground.

AWD control module		—	Continuity
Connector	Terminal		
B47	10	Ground	Existed
	11		

Is the inspection result normal?

YES >> GO TO 6.
NO >> Repair or replace the error-detected parts.

6.CHECK TERMINALS AND HARNESS CONNECTORS

1. Check AWD control module pin terminals for damage or loose connection with harness connector.
2. Check AWD solenoid pin terminals for damage or loose connection with harness connector.

Is the inspection result normal?

YES >> Replace AWD control module. Refer to DLN-91, "Removal and Installation".
NO >> Repair or replace the error-detected parts.

P183C DECEL G SENSOR

DTC Logic

INFOID:0000000012199415

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
P183C	DECEL G SENSOR	Malfunction is detected in decel G sensor signal that is output from ABS actuator and electric unit (control unit) through CAN communication.	• ABS actuator and electric unit (control unit) • Yaw rate/side/decel G sensor (Decel G sensor signal) • AWD control module • CAN communication line

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

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

>> GO TO 2.

2.PERFORM DTC CONFIRMATION

With CONSULT

1. Start the engine and drive at 30 km/h (19 MPH) or more for approximately 1 minute.
2. Stop the vehicle.
3. Perform self-diagnosis for “ALL MODE AWD/4WD”.

Is DTC “P183C” detected?

YES >> Proceed to DLN-68, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000012199416

1.PERFORM ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) SELF-DIAGNOSIS

With CONSULT

Perform self-diagnosis for “ABS”.

Is any DTC detected?

YES >> Perform trouble diagnosis for detected DTC. Refer to BRC-50, "DTC Index".
NO >> GO TO 2.

2.ERASE SELF-DIAGNOSTIC RESULT

With CONSULT

1. Erase self-diagnostic results for “ALL MODE AWD/4WD”.
2. Start the engine and drive at 30 km/h (19 MPH) or more for approximately 1 minute.
3. Stop the vehicle.
4. Check that ABS warning lamp turns OFF.

Does ABS warning lamp turn OFF?

YES >> GO TO 3.
NO >> Refer to BRC-136, "Component Function Check".

3.CHECK TERMINALS AND HARNESS CONNECTORS

Check AWD control module pin terminals for damage or loose connection with harness connector.

Is inspection result normal?

YES >> After turning the ignition switch OFF, perform DTC confirmation procedure again. If DTC “P183C” is detected, Replace AWD control module. Refer to DLN-91, "Removal and Installation".
NO >> Repair or replace error-detected parts.

P183D SIDE G SENSOR

DTC Logic

INFOID:0000000012199417

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
P183D	SIDE G SENSOR	Malfunction is detected in side G sensor signal that is output from ABS actuator and electric unit (control unit) through CAN communication.	• ABS actuator and electric unit (control unit) • Yaw rate/side/decel G sensor (Side G sensor signal) • AWD control module • CAN communication line

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

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

>> GO TO 2.

2.PERFORM DTC CONFIRMATION

With CONSULT

1. Start the engine and drive at 30 km/h (19 MPH) or more for approximately 1 minute.
2. Stop the vehicle.
3. Perform self-diagnosis for “ALL MODE AWD/4WD”.

Is DTC “P183D” detected?

YES >> Proceed to DLN-69, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000012199418

1.PERFORM ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) SELF-DIAGNOSIS

With CONSULT

Perform self-diagnosis for “ABS”.

Is any DTC detected?

YES >> Perform trouble diagnosis for detected DTC. Refer to BRC-50, "DTC Index".
NO >> GO TO 2.

2.ERASE SELF-DIAGNOSTIC RESULT

With CONSULT

1. Erase self-diagnostic results for “ALL MODE AWD/4WD”.
2. Start the engine and drive at 30 km/h (19 MPH) or more for approximately 1 minute.
3. Stop the vehicle.
4. Check that ABS warning lamp turns OFF.

Does ABS warning lamp turn OFF?

YES >> GO TO 3.
NO >> Refer to BRC-136, "Component Function Check".

3.CHECK TERMINALS AND HARNESS CONNECTORS

Check AWD control module pin terminals for damage or loose connection with harness connector.

Is inspection result normal?

YES >> After turning the ignition switch OFF, perform DTC confirmation procedure again. If DTC “P183D” is detected, Replace AWD control module. Refer to DLN-91, "Removal and Installation".
NO >> Repair or replace error-detected parts.

P183E YAW RATE SENSOR

DTC Logic

INFOID:0000000012199419

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
P183E	YAWRATE SENSOR	Malfunction is detected in yaw rate sensor signal that is output from ABS actuator and electric unit (control unit) through CAN communication.	• ABS actuator and electric unit (control unit) • Yaw rate/side/decel G sensor (Yaw rate signal) • AWD control module • CAN communication line

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

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

>> GO TO 2.

2.PERFORM DTC CONFIRMATION

With CONSULT

1. Start the engine and drive at 30 km/h (19 MPH) or more for approximately 1 minute.
2. Stop the vehicle.
3. Perform self-diagnosis for “ALL MODE AWD/4WD”.

Is DTC “P183E” detected?

YES >> Proceed to DLN-70, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000012199420

1.PERFORM ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) SELF-DIAGNOSIS

With CONSULT

Perform self-diagnosis for “ABS”.

Is any DTC detected?

YES >> Perform trouble diagnosis for detected DTC. Refer to BRC-50, "DTC Index".
NO >> GO TO 2.

2.ERASE SELF-DIAGNOSTIC RESULT

With CONSULT

1. Erase self-diagnostic results for “ALL MODE AWD/4WD”.
2. Start the engine and drive at 30 km/h (19 MPH) or more for approximately 1 minute.
3. Stop the vehicle.
4. Check that ABS warning lamp turns OFF.

Does ABS warning lamp turn OFF?

YES >> GO TO 3.
NO >> Refer to BRC-136, "Component Function Check".

3.CHECK TERMINALS AND HARNESS CONNECTORS

Check AWD control module pin terminals for damage or loose connection with harness connector.

Is inspection result normal?

YES >> After turning the ignition switch OFF, perform DTC confirmation procedure again. If DTC “P183E” is detected, Replace AWD control module. Refer to DLN-91, "Removal and Installation".
NO >> Repair or replace error-detected parts.

P183F GEAR POSITION SIGNAL

DTC Logic

INFOID:0000000012199421

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
P183F	GEAR POSI SIGNAL	Malfunction is detected in current gear position signal that is output from TCM through CAN communication.	• Sensor related to CVT • TCM • AWD control module • CAN communication line

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

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

>> GO TO 2.

2.PERFORM DTC CONFIRMATION

With CONSULT

1. Start the engine.
   CAUTION:
   Never drive the vehicle.
2. Perform self-diagnosis for “ALL MODE AWD/4WD”.

Is DTC “P183F” detected?

YES >> Proceed to DLN-71, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000012199422

1.PERFORM TCM SELF-DIAGNOSIS

With CONSULT

Perform self-diagnosis for “TRANSMISSION”.

Is any DTC detected?

YES >> Perform trouble diagnosis for detected DTC. Refer to TM-203, "DTC Index" (RE0F10B), TM-414, "DTC Index" (RE0F10D).
NO >> GO TO 2.

2.CHECK TERMINALS AND HARNESS CONNECTORS

Check AWD control module pin terminals for damage or loose connection with harness connector.

Is inspection result normal?

YES >> After turning the ignition switch OFF, perform DTC confirmation procedure again. If DTC “P183F” is detected, Replace AWD control module. Refer to DLN-91, "Removal and Installation".
NO >> Repair or replace error-detected parts.

P1840 OUTPUT SPEED SIGNAL

DTC Logic

INFOID:0000000012199423

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
P1840	OUTPUT SPEED SIGNAL	Malfunction is detected in output shaft revolution signal that is output from TCM through CAN communication.	• Sensor related to CVT • TCM • AWD control module • CAN communication line

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

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

>> GO TO 2.

2.PERFORM DTC CONFIRMATION

With CONSULT

1. Start the engine and drive at 30 km/h (19 MPH) or more for approximately 1 minute.
2. Stop the vehicle.
3. Perform self-diagnosis for “ALL MODE AWD/4WD”.

Is DTC “P1840” detected?

YES >> Proceed to DLN-72, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000012199424

1.PERFORM TCM SELF-DIAGNOSIS

With CONSULT

Perform self-diagnosis for “TRANSMISSION”.

Is any DTC detected?

YES >> Perform trouble diagnosis for detected DTC. Refer to TM-203, "DTC Index" (RE0F10B), TM-414, "DTC Index" (RE0F10D).
NO >> GO TO 2.

2.CHECK TERMINALS AND HARNESS CONNECTORS

Check AWD control module pin terminals for damage or loose connection with harness connector.

Is inspection result normal?

YES >> After turning the ignition switch OFF, perform DTC confirmation procedure again. If DTC “P1840” is detected, Replace AWD control module. Refer to DLN-91, "Removal and Installation".
NO >> Repair or replace error-detected parts.

P1864 INPUT SPEED SIGNAL

DTC Logic

INFOID:0000000012199425

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
P1864	INPUT SPEED SIGNAL	Malfunction is detected in input shaft revolution signal that is output from TCM through CAN communication.	• Sensor related to CVT • TCM • AWD control module • CAN communication line

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

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

>> GO TO 2.

2.PERFORM DTC CONFIRMATION

With CONSULT

1. Start the engine and drive at 30 km/h (19 MPH) or more for approximately 1 minute.
2. Stop the vehicle.
3. Perform self-diagnosis for “ALL MODE AWD/4WD”.

Is DTC “P1864” detected?

YES >> Proceed to DLN-73, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000012199426

1.PERFORM TCM SELF-DIAGNOSIS

With CONSULT

Perform self-diagnosis for “TRANSMISSION”.

Is any DTC detected?

YES >> Perform trouble diagnosis for detected DTC. Refer to TM-203, "DTC Index" (RE0F10B), TM-414, "DTC Index" (RE0F10D).
NO >> GO TO 2.

2.CHECK TERMINALS AND HARNESS CONNECTORS

Check AWD control module pin terminals for damage or loose connection with harness connector.

Is inspection result normal?

YES >> After turning the ignition switch OFF, perform DTC confirmation procedure again. If DTC “P1864” is detected, Replace AWD control module. Refer to DLN-91, "Removal and Installation".
NO >> Repair or replace error-detected parts.

P1865 GEAR RATIO SIGNAL

DTC Logic

INFOID:0000000012199427

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
P1865	GEAR RATIO	Malfunction is detected in CVT ratio signal that is output from TCM through CAN communication.	• Sensor related to CVT • TCM • AWD control module • CAN communication line

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

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

>> GO TO 2.

2.PERFORM DTC CONFIRMATION

With CONSULT

1. Start the engine and drive at 30 km/h (19 MPH) or more for approximately 1 minute.
2. Stop the vehicle.
3. Perform self-diagnosis for “ALL MODE AWD/4WD”.

Is DTC “P1865” detected?

YES >> Proceed to DLN-74, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000012199428

1.PERFORM TCM SELF-DIAGNOSIS

With CONSULT

Perform self-diagnosis for “TRANSMISSION”.

Is any DTC detected?

YES >> Perform trouble diagnosis for detected DTC. Refer to TM-203, "DTC Index" (RE0F10B), TM-414, "DTC Index" (RE0F10D).
NO >> GO TO 2.

2.CHECK TERMINALS AND HARNESS CONNECTORS

Check AWD control module pin terminals for damage or loose connection with harness connector.

Is inspection result normal?

YES >> After turning the ignition switch OFF, perform DTC confirmation procedure again. If DTC “P1865” is detected, Replace AWD control module. Refer to DLN-91, "Removal and Installation".
NO >> Repair or replace error-detected parts.

U1000 CAN COMM CIRCUIT

Description

INFOID:0000000012199429

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 line, CAN-L line) allowing a high rate of information transmission with less wiring. Each control unit communicate data but selectively reads required data only.

DTC Logic

INFOID:0000000012199430

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
U1000	CAN COMM CIRCUIT	AWD control module is not transmitting/ receiving CAN communication signal for 2 seconds or more.	• CAN communication error • Malfunction of AWD control module

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

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

>> GO TO 2.

2.PERFORM DTC CONFIRMATION

With CONSULT

1. Turn the ignition switch OFF to ON.
2. Perform self-diagnosis for “ALL MODE AWD/4WD”.

Is DTC “U1000” detected?

YES >> Proceed to DLN-75, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000012199431

Proceed to LAN-17, "Trouble Diagnosis Flow Chart".

U1010 CONTROL UNIT (CAN)

Description

INFOID:0000000012199432

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 line, CAN-L line) allowing a high rate of information transmission with less wiring. Each control unit communicate data but selectively reads required data only.

DTC Logic

INFOID:0000000012199433

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
U1010	CONTROL UNIT (CAN)	Detecting error during the initial diagnosis of CAN controller of AWD control module.	Internal malfunction of AWD control module

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

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

>> GO TO 2.

2.PERFORM DTC CONFIRMATION

With CONSULT

1. Turn the ignition switch OFF to ON.
2. Perform self-diagnosis for “ALL MODE AWD/4WD”.

Is DTC “U1010” detected?

YES >> Proceed to DLN-76, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000012199434

1.CHECK AWD CONTROL MODULE

Check AWD control module harness connector for disconnection and deformation.

Is the inspection result normal?

YES >> Replace AWD control module. Refer to DLN-91, "Removal and Installation".
NO >> Repair or replace error-detected parts.

POWER SUPPLY AND GROUND CIRCUIT

Diagnosis Procedure

INFOID:0000000012199435

1.CHECK AWD CONTROL MODULE POWER SUPPLY (1)

1. Turn the ignition switch OFF.
2. Disconnect AWD control module harness connector.
3. Check the voltage between AWD control module harness connector and ground.

AWD control module		—	Voltage
Connector	Terminal		
B47	1	Ground	11 – 13 V

4. Turn the ignition switch ON.
   CAUTION:
   Never start the engine.
5. Check the voltage between AWD control module harness connector and ground.

AWD control module		—	Voltage
Connector	Terminal		
B47	1	Ground	11 – 13 V

Is the inspection result normal?

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

2.CHECK AWD CONTROL MODULE POWER SUPPLY (2)

1. Turn the ignition switch OFF.
2. Check the 10A fuse (Except for NISMO RS models: #23, For NISMO RS models: #33).
3. Check the harness for open or short between AWD control module harness connector No.1 terminal and 10A fuse (Except for NISMO RS models: #23, For NISMO RS models: #33).

Is the inspection result normal?

YES >> Perform the trouble diagnosis for power supply circuit. Refer to PG-12, "Wiring Diagram - BATTERY POWER SUPPLY -".
NO >> Repair or replace error-detected parts.

3.CHECK AWD CONTROL MODULE POWER SUPPLY (3)

1. Turn the ignition switch OFF.
2. Check the voltage between AWD control module harness connector and ground.

AWD control module		—	Voltage
Connector	Terminal		
B47	3	Ground	0 V

3. Turn the ignition switch ON.
   CAUTION:
   Never start the engine.
4. Check the voltage between AWD control module harness connector and ground.

AWD control module		—	Voltage
Connector	Terminal		
B47	3	Ground	11 – 13 V

Is the inspection result normal?

YES >> GO TO 5.
NO >> GO TO 4.

4. CHECK AWD CONTROL MODULE POWER SUPPLY (4)

1. Turn the ignition switch OFF.
2. Check the 10A fuse (#3).
3. Check the harness for open or short between AWD control module harness connector No.3 terminal and 10A fuse (#3).

Is the inspection result normal?

YES >> Perform the trouble diagnosis for ignition power supply circuit. Refer to PG-43, "Wiring Diagram - IGNITION POWER SUPPLY -".
NO >> Repair or replace error-detected parts.

5. CHECK AWD SOLENOID POWER SUPPLY (1)

1. Turn the ignition switch OFF.
2. Disconnect AWD control module harness connector.
3. Check the voltage between AWD control module harness connector and ground.

AWD control module		—	Voltage
Connector	Terminal		
B47	12	Ground	11 – 13 V

4. Turn the ignition switch OFF to ON.
   CAUTION:
   Never start the engine.
5. Check the voltage between AWD control module harness connector and ground.

AWD control module		—	Voltage
Connector	Terminal		
B47	12	Ground	11 – 13 V

Is the inspection result normal?

YES >> GO TO 7.
NO >> GO TO 6.

6. CHECK AWD SOLENOID POWER SUPPLY (2)

1. Turn the ignition switch OFF.
2. Check the 10A fuse (#12).
3. Check the harness for open or short between AWD control module harness connector No.12 and the 10A fuse (#12).

Is the inspection result normal?

YES >> Perform the trouble the diagnosis for power supply circuit. Refer to PG-12, "Wiring Diagram - BATTERY POWER SUPPLY -".
NO >> Repair or replace error-detected parts.

7. CHECK AWD CONTROL MODULE GROUND

1. Turn the ignition switch OFF.
2. Check the continuity between AWD control module harness connector and ground.

AWD control module		—	Continuity
Connector	Terminal		
B47	10	Ground	Existed
	11		

Is the inspection result normal?

YES >> INSPECTION END
NO >> Repair or replace error-detected parts.

AWD WARNING LAMP

Component Function Check

INFOID:0000000012199436

1.CHECK AWD WARNING LAMP FUNCTION

Check that AWD warning lamp turns ON when turn the ignition switch ON. Then, AWD warning lamp turns OFF approx. 1 second after the engine start.

Is the inspection result normal?

YES >> INSPECTION END
NO >> Proceed to DLN-79, "Diagnosis Procedure".

Diagnosis Procedure

INFOID:0000000012199437

1.CHECK POWER SUPPLY AND GROUND CIRCUIT

Perform the trouble diagnosis for power supply and ground circuit. Refer to DLN-77, "Diagnosis Procedure".

Is the inspection result normal?

YES >> GO TO 2.
NO >> Repair or replace the error-detected parts.

2.PERFORM SELF-DIAGNOSIS

With CONSULT

Perform self-diagnosis for “ALL MODE AWD/4WD”.

Is any DTC detected?

YES >> Perform trouble diagnosis for detected DTC. Refer to DLN-31, "DTC Index".
NO >> GO TO 3.

3.CHECK AWD WARNING LAMP SIGNAL

With CONSULT

1. Turn the ignition switch ON.
   CAUTION:
   Never start the engine.
2. Check “WARNING LAMP” in “DATA MONITOR” for “ALL MODE AWD/4WD”.

Does the item on “DATA MONITOR” indicate “On”?

YES >> Perform the trouble diagnosis for combination meter power supply circuit. Refer to MWI-53, "COMBINATION METER : Diagnosis Procedure".
NO >> Replace AWD control module. Refer to DLN-91, "Removal and Installation".

AWD MODE INDICATOR LAMP (AWD-V)

Component Function Check

INFOID:0000000012199438

1.AWD MODE INDICATOR LAMP OPERATION CHECK

1. Turn the ignition switch ON.
2. Set AWD mode switch to “AWD-V”.
3. Check that AWD mode indicator lamp (AWD-V) turns on.

Is the inspection result normal?

YES >> INSPECTION END
NO >> Proceed to DLN-80, "Diagnosis Procedure".

Diagnosis Procedure

INFOID:0000000012199439

1.CHECK AWD WARNING LAMP

1. Start the engine and drive at 30 km/h (19 MPH) or more for approximately 1 minute.
2. Stop the vehicle.

Does AWD warning lamp turn ON?

YES >> Proceed to DLN-79, "Diagnosis Procedure".
NO >> GO TO 2.

2.CHECK AWD MODE SWITCH

Perform the trouble diagnosis for AWD mode switch. Refer to DLN-47, "Diagnosis Procedure".

Is the inspection result normal?

YES >> GO TO 3.
NO >> Repair or replace the error-detected parts.

3.CHECK AWD MODE INDICATOR LAMP SIGNAL

With CONSULT

1. Start the engine.
   CAUTION:
   Never drive the vehicle.
2. Change AWD mode switch to “AWD-V” from “2WD”.
3. Check “INDICATOR” in “DATA MONITOR” for “ALL MODE AWD/4WD”.

Does the item on “DATA MONITOR” indicate “AWD-V”?

YES >> GO TO 4.
NO >> Replace AWD control module. Refer to DLN-91, "Removal and Installation".

4.CHECK COMBINATION METER POWER SUPPLY CIRCUIT

Perform the trouble diagnosis for combination meter power supply circuit. Refer to MWI-53, "COMBINATION METER : Diagnosis Procedure".

Is the inspection result normal?

YES >> INSPECTION END
NO >> Repair or replace the error-detected parts.

AWD MODE INDICATOR LAMP (AWD)

Component Function Check

INFOID:0000000012199440

1.AWD MODE INDICATOR LAMP OPERATION CHECK

Check that AWD mode indicator lamp (AWD) turns on for approximately 1 second after the ignition switch is turned ON.

Is the inspection result normal?

YES >> INSPECTION END
NO >> Proceed to DLN-81, "Diagnosis Procedure".

Diagnosis Procedure

INFOID:0000000012199441

1.CHECK AWD WARNING LAMP

1. Start the engine and drive at 30 km/h (19 MPH) or more for approximately 1 minute.
2. Stop the vehicle.

Does AWD warning lamp turn ON?

YES >> Proceed to DLN-79, "Diagnosis Procedure".
NO >> GO TO 2.

2.CHECK AWD MODE SWITCH

Perform the trouble diagnosis for AWD mode switch. Refer to DLN-47, "Diagnosis Procedure".

Is the inspection result normal?

YES >> GO TO 3.
NO >> Repair or replace the error-detected parts.

3.CHECK AWD MODE INDICATOR LAMP SIGNAL

With CONSULT

1. Start the engine.
   CAUTION:
   Stop the vehicle.
2. Change AWD mode switch to “AWD” from “AWD-V”.
3. Check “INDICATOR” in “DATA MONITOR” for “ALL MODE AWD/4WD”.

Does the item on “DATA MONITOR” indicate “AWD”?

YES >> GO TO 4.
NO >> Replace AWD control module. Refer to DLN-91, "Removal and Installation".

4.CHECK COMBINATION METER POWER SUPPLY CIRCUIT

Perform the trouble diagnosis for combination meter power supply circuit. Refer to MWI-53, "COMBINATION METER : Diagnosis Procedure".

Is the inspection result normal?

YES >> INSPECTION END
NO >> Repair or replace the error-detected parts.

SYMPTOM DIAGNOSIS

AWD WARNING LAMP DOES NOT TURN ON

Description

INFOID:0000000012199442

AWD warning lamp does not turn ON when the ignition switch is turned to ON.

Diagnosis Procedure

INFOID:0000000012199443

1.CHECK AWD WARNING LAMP

Perform the trouble diagnosis for AWD warning lamp. Refer to DLN-79, "Diagnosis Procedure".

Is the inspection result normal?

YES >> Check each harness connector pin terminal for malfunction or disconnection.
NO >> Repair or replace the error-detected parts.

AWD WARNING LAMP DOES NOT TURN OFF

Description

INFOID:0000000012199444

AWD warning lamp does not turn OFF approx. 1 second after the engine started.

Diagnosis Procedure

INFOID:0000000012199445

1.PERFORM SELF-DIAGNOSIS

With CONSULT

Perform self-diagnosis for “ALL MODE AWD/4WD”.

Is any DTC detected?

YES >> Perform trouble diagnosis for detected DTC. Refer to DLN-31, "DTC Index".
NO >> GO TO 2.

2.CHECK AWD WARNING LAMP

Perform the trouble diagnosis of the AWD warning lamp. Refer to DLN-79, "Diagnosis Procedure".

Is the inspection result normal?

YES >> GO TO 3.
NO >> Repair or replace the error-detected parts.

3.CHECK AWD CONTROL MODULE POWER SUPPLY AND GRAND CIRCUIT

Perform the trouble diagnosis of power supply and ground circuit. Refer to DLN-77, "Diagnosis Procedure".

Is the inspection result normal?

YES >> Check each harness connector pin terminal for malfunction or disconnection.
NO >> Repair or replace the error-detected parts.

HEAVY TIGHT-CORNER BRAKING SYMPTOM OCCURS

Description

INFOID:0000000012199446

Heavy tight-corner braking symptom occurs when the vehicle is driven and the steering wheel is turned fully to either side after the engine is started.

NOTE:

Light tight-corner braking symptom may occur depending on driving conditions. This is not malfunction.

Diagnosis Procedure

INFOID:0000000012199447

1.PERFORM ECM SELF-DIAGNOSIS

With CONSULT

Perform self-diagnosis for “ENGINE”.

Is any DTC detected?

YES >> Perform trouble diagnosis for detected DTC. Refer to EC-706, "DTC Index" (Except for NISMO RS), EC-115, "DTC Index" (For NISMO RS).

NO >> GO TO 2.

2.PERFORM SELF-DIAGNOSIS

With CONSULT

Perform self-diagnosis for “ALL MODE AWD/4WD”.

Is any DTC detected?

YES >> Perform trouble diagnosis for detected DTC. Refer to DLN-31, "DTC Index".

NO >> GO TO 3.

3.CHECK AWD SOLENOID

Perform the trouble diagnosis of the AWD solenoid. Refer to DLN-57, "Diagnosis Procedure" (Left side), DLN-60, "Diagnosis Procedure" (Right side).

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair or replace the error-detected parts.

4.CHECK ELECTRIC CONTROLLED COUPLING

1. Turn the ignition switch OFF.
2. Set the transaxle to neutral. Release the parking brake.
3. Lift up the vehicle.
4. Rotate the propeller shaft by hand.
5. Hold rear wheel of right and left lightly.

Does rear wheel rotate?

YES >> Replace electric controlled coupling for mechanical malfunction (clutch sticking etc.). Refer to DLN-145, "Removal and Installation".

NO >> Check each harness connector pin terminal for disconnection.

VEHICLE DOES NOT ENTER AWD MODE

Description

INFOID:0000000012199448

Vehicle does not enter 4-wheel drive mode even though AWD warning lamp turned to OFF.

Diagnosis Procedure

INFOID:0000000012199449

1.CHECK AWD WARNING LAMP

Turn the ignition switch ON.

CAUTION:

Never start the engine.

Does AWD warning lamp turn ON?

YES >> GO TO 2.

NO >> Proceed to DLN-79, "Diagnosis Procedure".

2.CHECK PARKING BRAKE SWITCH SIGNAL

With CONSULT

Check “PKB SW” in “DATA MONITOR” for “ALL MODE AWD/4WD”.

Monitor Item	Condition	Status
PKB SW	When the parking brake switch is operation.	On
	When the parking brake switch is not operation.	Off

Is the inspection result normal?

YES >> GO TO 3.

NO >> Proceed to BRC-129, "Diagnosis Procedure".

3.CRUISE TEST

Drive the vehicle for a period of time.

Does any symptom occur?

YES >> Replace electric controlled coupling for mechanical malfunction (mechanical engagement of clutch is not possible). Refer to DLN-145, "Removal and Installation".

NO >> Check each harness connector pin terminal for disconnection.

AWD WARNING LAMP BLINKS QUICKLY

Description

INFOID:0000000012199450

While driving, AWD warning lamp blinks 2 times in 1 second and it turns OFF after 1 minute.

NOTE:

- This symptom protects drivetrain parts when a heavy load is applied to the electric controlled coupling and multiple disc clutch temperature increases. Also, optional distribution of torque sometimes becomes rigid before lamp blinks quickly. Both cases are not malfunction. Refer to DLN-30, "Protection Function".
- When this symptom occurs, stop vehicle and allow it to idle for some times. Blinking will stop and system will be restored.

AWD WARNING LAMP BLINKS SLOWLY

Description

INFOID:0000000012199451

AWD warning lamp blinks at approximately 2 seconds intervals while driving.

Diagnosis Procedure

INFOID:0000000012199452

1.CHECK VEHICLE SPEED SIGNAL

With CONSULT

1. Turn the ignition switch ON.
2. Check that each value of “WHEEL SPD SEN FR”, “WHEEL SPD SEN FL”, “WHEEL SPD SEN RR”, and “WHEEL SPD SEN RL” in “DATA MONITOR” for “ALL MODE AWD/4WD” is almost equal.

Is the inspection result normal?

YES >> GO TO 2.
NO >> Proceed to DLN-44, "Diagnosis Procedure".

2.CHECK TIRE

Check the following.

- Tire pressure
- Tire wear condition
- Front and rear tire size (There is no difference between front and rear tires.)

Is the inspection result normal?

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

3.TERMINAL INSPECTION

Check AWD control module harness connector for disconnection.

Is the inspection result normal?

YES >> Replace AWD control module. Refer to DLN-91, "Removal and Installation".
NO >> Repair or replace the error-detected parts.

DECREASE IN TURNING PERFORMANCE

Description

INFOID:0000000012199453

Turning performance decreases when driving in AWD-V mode or AWD mode.

Diagnosis Procedure

INFOID:0000000012199454

1.PERFORM EPS CONTROL UNIT SELF-DIAGNOSIS

With CONSULT

Perform self-diagnosis for “EPS”.

Is any DTC detected?

YES >> Perform trouble diagnosis for detected DTC. Refer to STC-13, "DTC Index".
NO >> GO TO 2.

2.PERFORM SELF-DIAGNOSIS

With CONSULT

Perform self-diagnosis for “ALL MODE AWD/4WD”.

Is any DTC detected?

YES >> Perform trouble diagnosis for detected DTC. Refer to DLN-31, "DTC Index".
NO >> GO TO 3.

3.CHECK AWD SOLENOID

Perform the trouble diagnosis of the AWD solenoid. Refer to DLN-57, "Diagnosis Procedure" (Left side), DLN-60, "Diagnosis Procedure" (Right side).

Is the inspection result normal?

YES >> GO TO 4.
NO >> Repair or replace the error-detected parts.

4.CHECK ELECTRIC CONTROLLED COUPLING

1. Turn the ignition switch OFF.
2. Set the transaxle to neutral. Release the parking brake.
3. Lift up the vehicle.
4. Rotate the propeller shaft.
5. Hold the rear wheel of right and left lightly.

Does the rear wheel rotate?

YES >> Replace electric controlled coupling for mechanical malfunction (clutch sticking etc.). Refer to DLN-145, "Removal and Installation".
NO >> Check each harness connector pin terminal for disconnection.

NOISE, VIBRATION AND HARSHNESS (NVH) TROUBLESHOOTING

NVH Troubleshooting Chart

INFOID:0000000012199455

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

Reference		DLN-90, "Inspection"			DLN-96, "Exploded View"	DLN-96, "Exploded View"	DLN-109, "Inspection"	DLN-115, "Inspection"
SUSPECTED PARTS (Possible cause)		TRANSFER OIL (Level low)	TRANSFER OIL (Wrong)	TRANSFER OIL (Level too high)	LIQUID GASKET (Damaged)	OIL SEAL (Worn or damaged)	GEAR (Worn or damaged)	BEARING (Worn or damaged)
Symptom	Noise	1	2			3	3	3
	Transfer oil leakage		3	1	2	2		

PERIODIC MAINTENANCE

TRANSFER OIL

Inspection

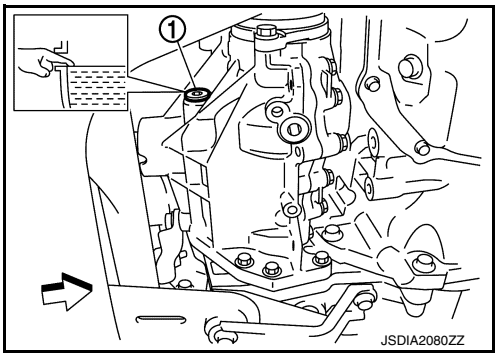
INFOID:0000000012199456

OIL LEAKAGE

Check transfer surrounding area (oil seal, drain plug, filler plug, and transfer case etc.) for oil leakage.

OIL LEVEL

1. Remove filler plug (1) and gasket. Then check that oil is filled up from mounting hole for the filler plug.



⇦: Vehicle front

CAUTION:
Never start engine while checking oil level.

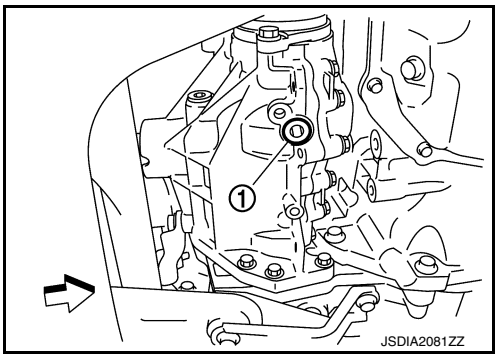
2. Before installing filler plug, set a new gasket. Install filler plug on transfer and tighten to the specified torque. Refer to DLN-116, "Exploded View".

CAUTION:
Never reuse gasket.

Draining

INFOID:0000000012199457

1. Run the vehicle to warm up the transfer unit sufficiently.
2. Stop the engine and remove the drain plug (1) and gasket to drain the transfer oil.



⇦: Vehicle front

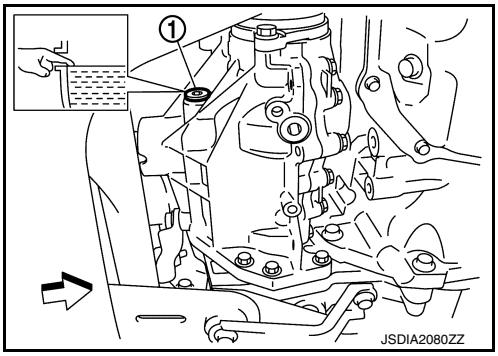
3. Before installing drain plug, set a new gasket. Install drain plug on the transfer and tighten to the specified torque. Refer to DLN-116, "Exploded View".

CAUTION:
Never reuse gasket.

Refilling

INFOID:0000000012199458

1. Remove filler plug (1) and gasket. Then fill oil up to mounting hole for the filler plug.



⇦: Vehicle front

Oil and viscosity	**: Refer to MA-11, "Fluids and Lubricants".**
Oil capacity	**: Refer to DLN-120, "General Specifications".**

CAUTION:
Carefully fill the oil. (Fill up for approximately 3 minutes.)

2. Leave the vehicle for 3 minutes, and check the oil level again.
3. Before installing filler plug, set a new gasket. Install filler plug on transfer and tighten to the specified torque. Refer to DLN-116, "Exploded View".

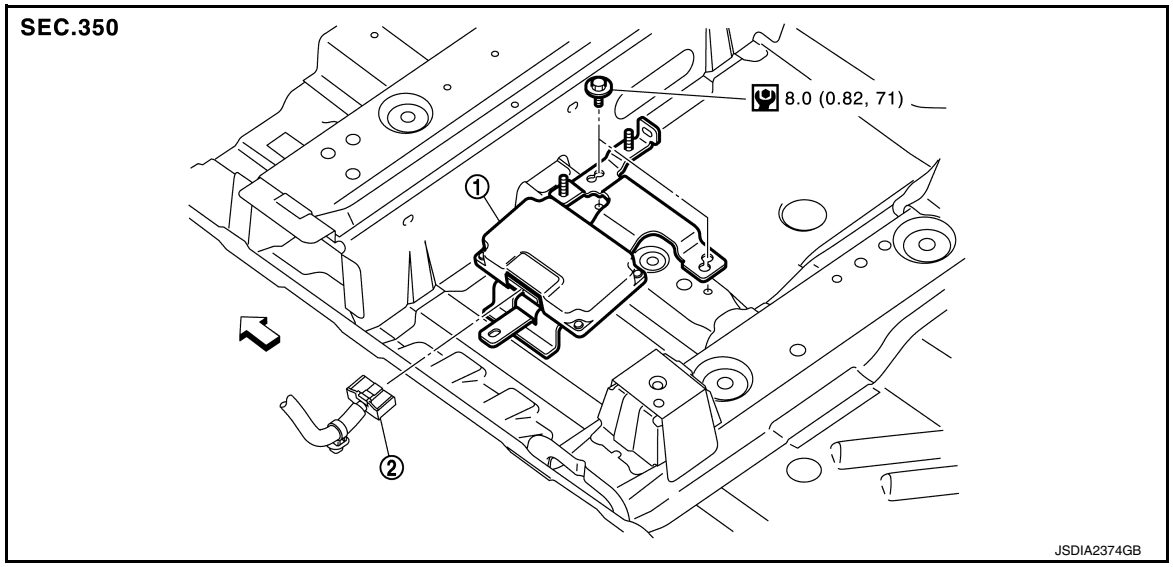
CAUTION:
Never reuse gasket.

REMOVAL AND INSTALLATION

AWD CONTROL MODULE

Exploded View

INFOID:0000000012199459



1. AWD control module
2. AWD control module harness connector

: Vehicle front

: N·m (kg-m, in-lb)

Removal and Installation

INFOID:0000000012199460

REMOVAL

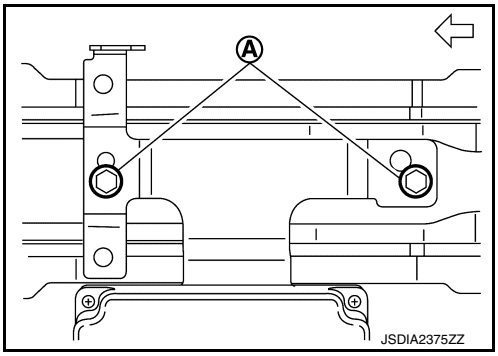
1. Turn the ignition switch OFF.
2. Remove front seat (left side). Refer to SE-21, "Removal and Installation".
3. Remove dush side finisher (left side). Refer to INT-21, "DASH SIDE FINISHER : Removal and Installation".
4. Remove front and rear kicking plate inner. Refer to INT-19, "KICKING PLATE INNER : Removal and Installation".
5. Remove rear seat cushion. Refer to SE-32, "SEAT CUSHION : Removal and Installation".
6. Remove outer anchor of front seat belt (passenger side). Refer to SB-5, "Exploded View".
7. Remove harness clip.
8. Turn floor carpet. Refer to INT-24, "Removal and Installation".
9. Disconnect AWD control module harness connector.
10. Remove AWD control module mounting nuts.
11. Remove AWD control module.

INSTALLATION

Note the following, and install in the reverse order of removal.

- When installing AWD control module, install it following procedure.

1. Align the securing holes (A) of bracket as shown in the figure and temporarily tighten mounting bolts.



⇦: Vehicle front

2. When replace AWD control module, hold AWD control module and remove protector paper on the adhesion area of bracket to bond to the front floor (LH).
3. Tighten mounting bolts to the specified torque.

- When replacing AWD control module, perform writing unit parameter. Refer to DLN-42, "Work Procedure".

AWD MODE SWITCH

Removal and Installation

INFOID:0000000012199461

REMOVAL

1. Remove instrument lower panel. Refer to IP-12, "Exploded View".
2. Remove AWD mode switch.

INSTALLATION

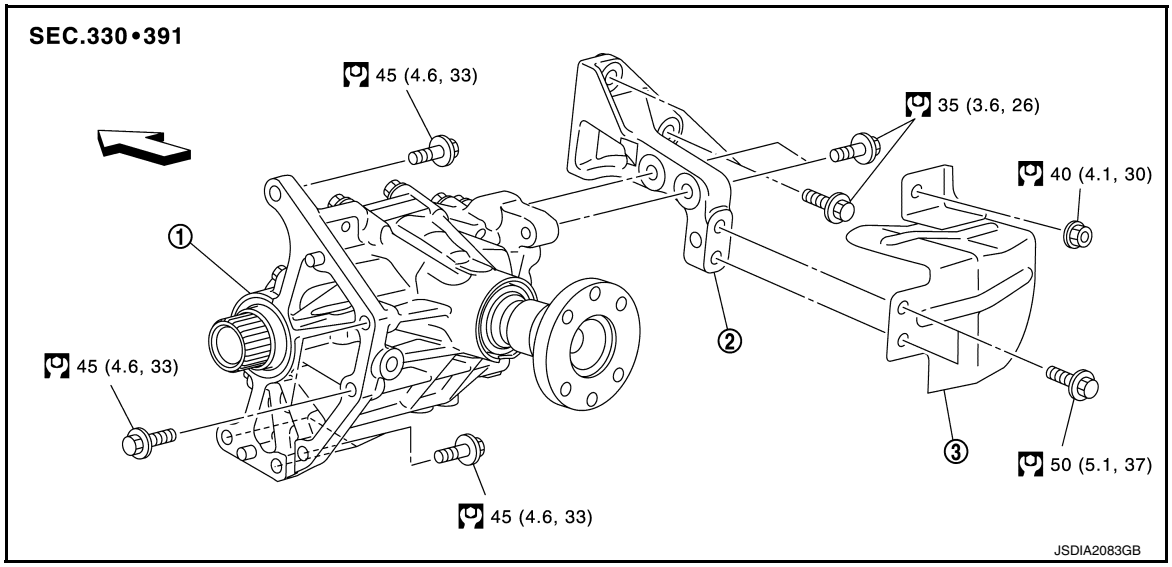
Install in the reverse order of removal.

UNIT REMOVAL AND INSTALLATION

TRANSFER ASSEMBLY

Exploded View

INFOID:0000000012199462



1. Transfer assembly
2. Transfer gusset
3. Heat insulator

⇦: Vehicle front

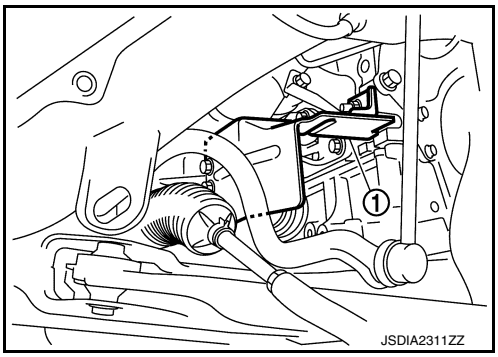
: N·m (kg-m, ft-lb)

Removal and Installation

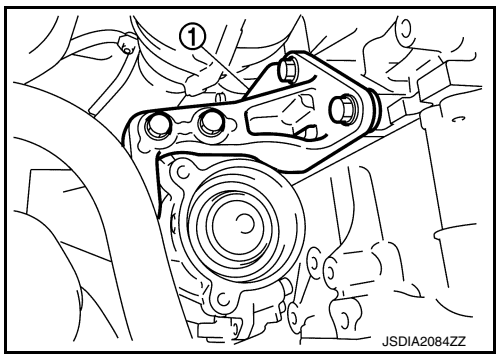
INFOID:0000000012199463

REMOVAL

1. Separate the propeller shaft from transfer. Then suspend it by wire, etc. Refer to DLN-124, "Removal and Installation".
   CAUTION:
   Constant velocity joint must be handled with care.
2. Remove right side drive shaft. Refer to FAX-97, "AWD : Removal and Installation" (Except for NISMO RS), FAX-45, "AWD : Removal and Installation" (For NISMO RS).
3. Remove catalytic converter bracket (Except for NISMO RS) or catalyst convertor support bracket (upper) (For NISMO RS). Refer to EM-235, "AWD : Exploded View" (Except for NISMO RS), EM-37, "AWD : Exploded View" (For NISMO RS).
4. Remove heat insulator (1).



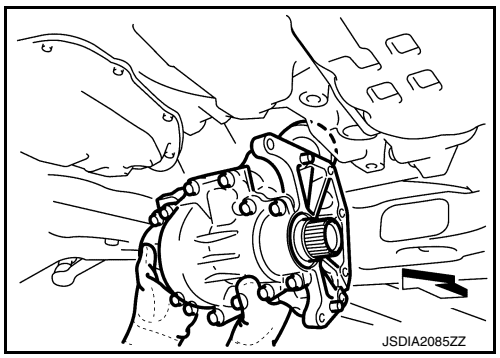
5. Remove transfer gusset (1).
6. Remove catalytic converter adapter bracket (Except for NISMO RS) or catalyst convertor support bracket (lower) (For NISMO RS). Refer to EM-235, "AWD : Exploded View" (Except for NISMO RS), EM-37, "AWD : Exploded View" (For NISMO RS).
7. Remove rear torque rod and rear torque rod bracket. Refer to EM-221, "AWD : Removal and Installation" (Except for NISMO RS), EM-68, "AWD : Removal and Installation" (For NISMO RS).
8. Remove bolts fixing transaxle assembly and transfer assembly.



9. Remove transfer assembly from the vehicle.

⇦: Vehicle front

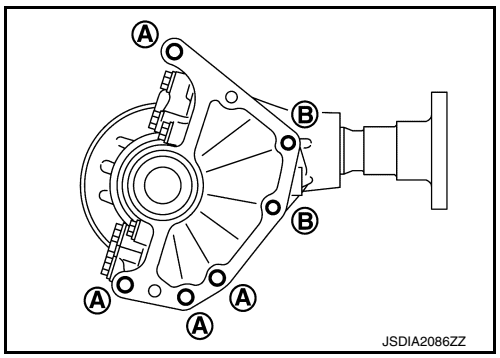
CAUTION:
- **Never damage ring gear shaft.**
- **Be careful when removing transfer assembly form the vehicle because it is heavy.**



INSTALLATION

Note the following, and install in the reverse order of removal.
- When installing the transfer assembly to the transaxle assembly, install the mounting bolts following the standard below.

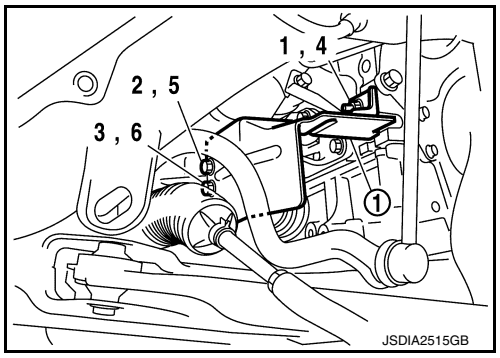
Bolt symbol	A	B
Installation direction	Transfer ⇒ Transaxle	Transaxle ⇒ Transfer



CAUTION:
- **When installing transfer assembly to transaxle assembly, replace differential side oil seal (Converter housing side) of transaxle. Refer to TM-340, "Removal and Installation" (RE0F10B), TM-566, "Removal and Installation" (RE0F10D).**
- **Never damage differential side oil seal (Converter housing side) of transaxle.**

- When installing heat insulator (1), tighten the mounting bolts and nut in numerical order.

Temporary tightening	: 1 → 2 → 3
Final tightening (Specified torque)	: 4 → 5 → 6



- Perform inspection after installation. Refer to DLN-95, "Inspection".

Inspection

INFOID:0000000012199464

INSPECTION AFTER INSTALLATION

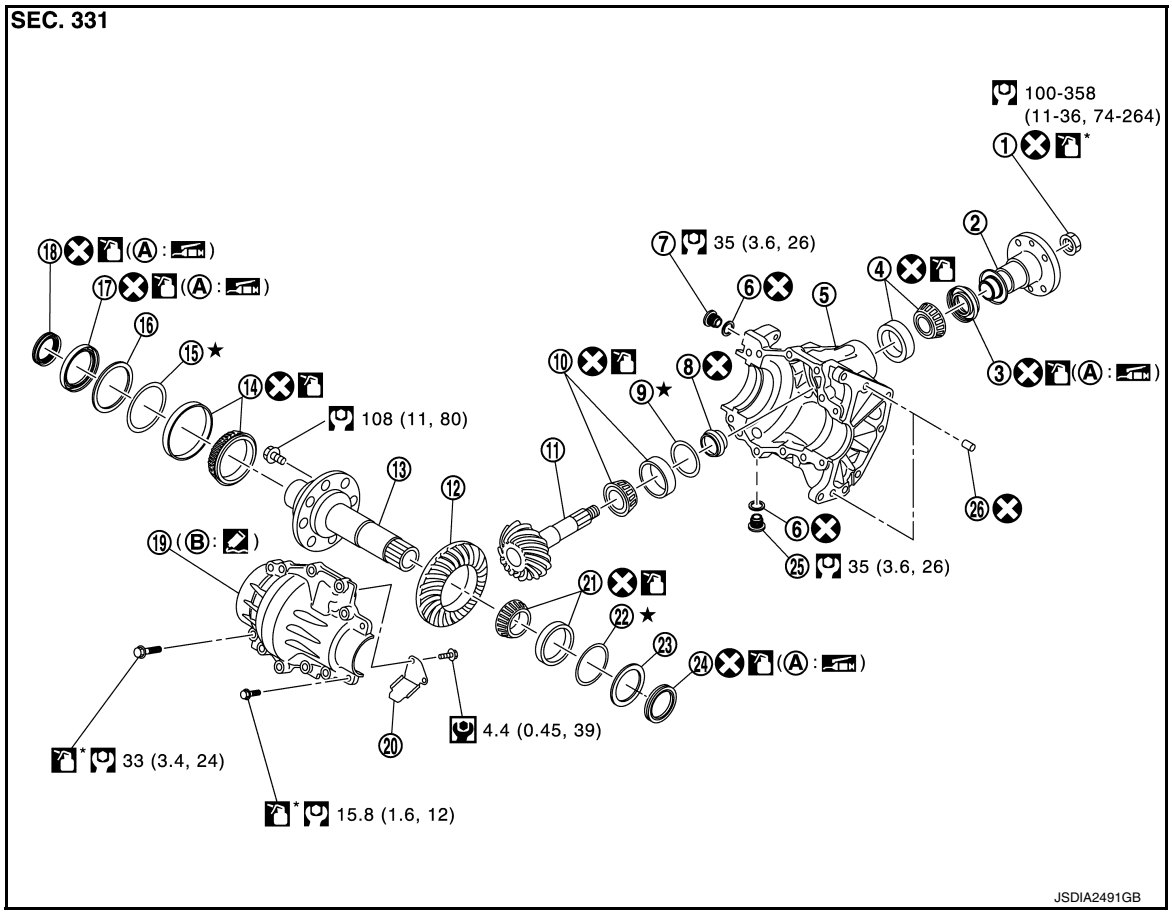
Check oil level and check for oil leakage. Refer to DLN-90, "Inspection".

UNIT DISASSEMBLY AND ASSEMBLY

RING GEAR SHAFT

Exploded View

INFOID:0000000012199465



1. Pinion lock nut
2. Companion flange
3. Drive pinion oil seal
4. Pinion bearing (rear)
5. Transfer case
6. Gasket
7. Filler plug
8. Collapsible spacer
9. Drive pinion adjusting shim
10. Pinion bearing (front)
11. Drive pinion
12. Ring gear
13. Ring gear shaft
14. Ring gear bearing (right)
15. Ring gear bearing adjusting shim (right)
16. Spacer (right)
17. Transfer case oil seal (right)
18. Drive shaft oil seal
19. Transfer cover
20. Oil defense
21. Ring gear bearing (left)
22. Ring gear bearing adjusting shim (left)
23. Spacer (left)
24. Transfer case oil seal (left)
25. Drain plug
26. Dowel pin
A. Oil seal lip
B. Transfer case mounting face

: Always replace after every disassembly.

★: Select with proper thickness.

: N·m (kg-m, in-lb)

: N·m (kg-m, ft-lb)

: Apply gear oil.

: Apply multi purpose grease

*: Apply anti-corrosive oil.

: Apply Genuine Silicone RTV or equivalent. Refer to GI-22, "Recommended Chemical Products and Sealants".

Disassembly

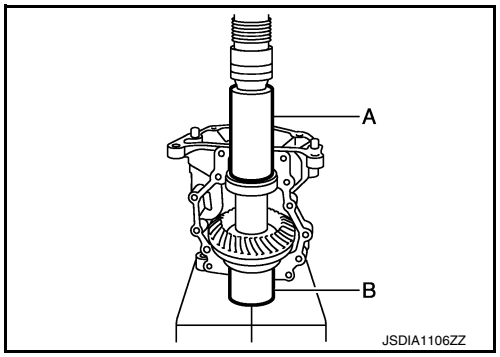
INFOID:0000000012199466

1. Remove transfer cover. Refer to DLN-117, "Disassembly".
2. Remove transfer case oil seal (right and left).
3. Remove ring gear shaft assembly from transfer case. If ring gear shaft cannot be removed, remove as follows.

CAUTION:
Never damage transfer case.

- Set the drifts (A and B) to right and left spacers individually. Compress ring gear shaft assembly with ring gear bearing to remove ring gear shaft assembly from transfer case.

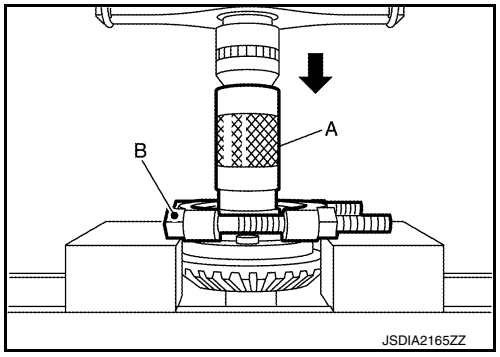
A : Drift (Commercial service tool)
B : Drift (Commercial service tool)



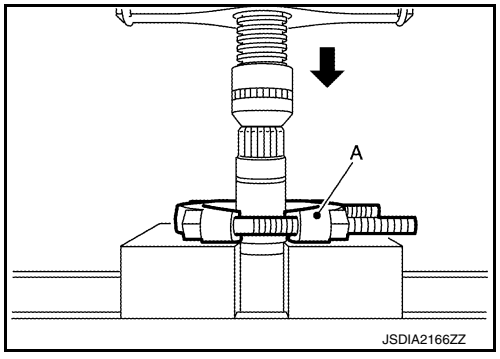
CAUTION:
- **The drift shall be placed on the center of the spacers.**
- **The pressure shall be as low as to remove ring gear shaft assembly from transfer case. The maximum pressure shall be 10 kN (1 ton, 1.0 lmp ton).**
- **If the adjusting shims and spacers are installed by tapping, the transfer case may be damaged. Avoid tapping.**

4. Remove spacer (right and left) from ring gear shaft assembly.
5. Remove ring gear bearing adjusting shim (right and left) from ring gear shaft assembly.
6. Remove outer races of ring gear bearing (right and left) from ring gear shaft assembly.
7. Remove inner race of ring gear bearing (right) from ring gear shaft with the drift (A) and the replacer (B).

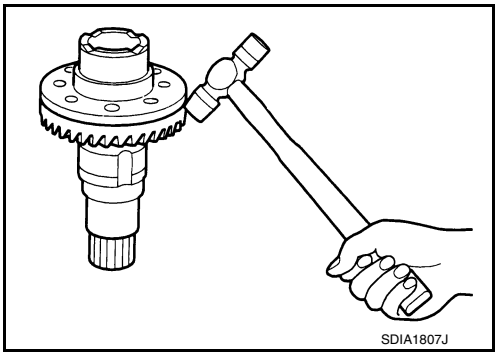
A : Drift [SST: ST33200000 (J-26082)]
B : Replacer (Commercial service tool)



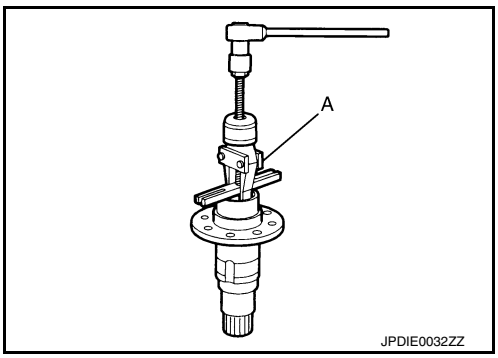
8. Remove inner race of ring gear bearing (left) from ring gear shaft with the replacer (A) (Commercial service tool).
9. Remove the ring gear mounting bolts.



10. Lightly tap ring gear with a plastic hammer to remove ring gear from ring gear shaft.



11. Remove drive shaft oil seal from the ring gear shaft with the puller (A) [SST: KV381054S0 (J-34286)].
12. Perform inspection after disassembly. Refer to DLN-109, "Inspection".



Assembly

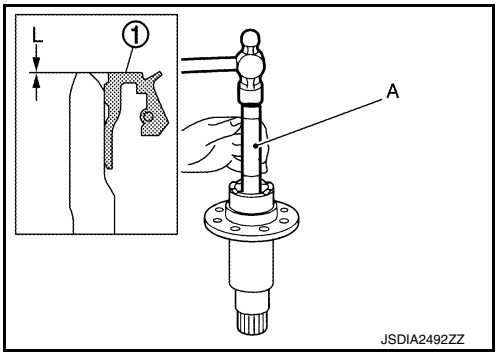
INFOID:0000000012199467

1. Select ring gear bearing adjusting shim (right and left). Refer to DLN-99, "Adjustment".
2. Using the drift (A) [SST: ST33230000 (J-25805-01)], install drive shaft oil seal (1) within the dimension (L) shown as follows.

L : 0 – 0.6 mm (0 – 0.024 in)

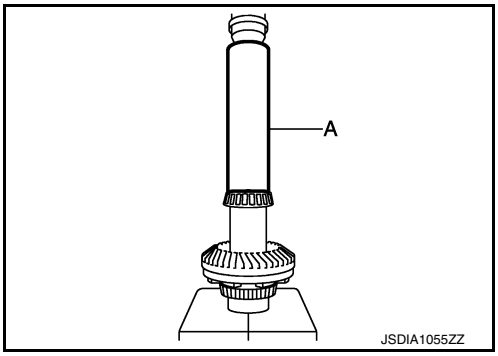
CAUTION:
- **Never reuse the oil seal.**
- **When installing, never incline oil seal.**
- **Apply multi-purpose grease to oil seal lip, and gear oil onto the circumference.**

3. Install the ring gear to ring gear shaft.

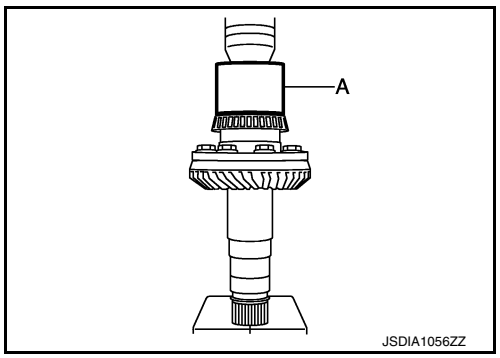


4. Install the inner race of ring gear bearing (left) to ring gear shaft with the drift (A) (Commercial service tool).

CAUTION:
- **Never reuse the ring gear bearing.**
- **Apply gear oil to ring gear bearing.**

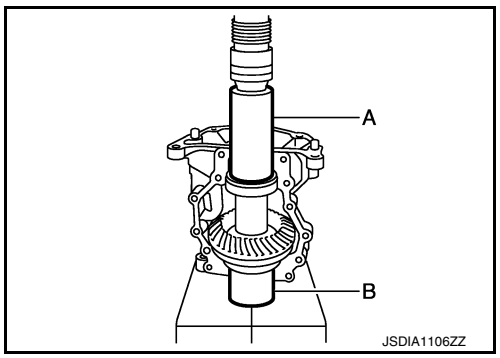


5. Install the inner race of ring gear bearing (right) to ring gear shaft with the drift (A) (Commercial service tool).
CAUTION:
- **Never reuse the ring gear bearing.**
- **Apply gear oil to ring gear bearing.**



6. Install outer races of ring gear bearing (right and left) to ring gear shaft assembly.
CAUTION:
- **Never reuse the ring gear bearing.**
- **Apply gear oil to ring gear bearing.**
7. Install selected ring gear bearing adjusting shim (right and left) to ring gear shaft assembly.
8. Install spacer (right and left) to ring gear shaft assembly.
9. Set the drifts (A and B) to right and left spacers individually. Compress ring gear shaft assembly with ring gear bearing to install ring gear shaft assembly to transfer case.

A : Drift (Commercial service tool)
B : Drift (Commercial service tool)



CAUTION:
- **The drift shall be placed on the center of the spacers.**
- **The pressure shall be as low as to install ring gear shaft assembly into transfer case. The maximum pressure shall be 10 kN (1 ton, 1.0 lmp ton).**
- **If the adjusting shims and spacers are installed by tapping, the transfer case may be damaged. Avoid tapping.**

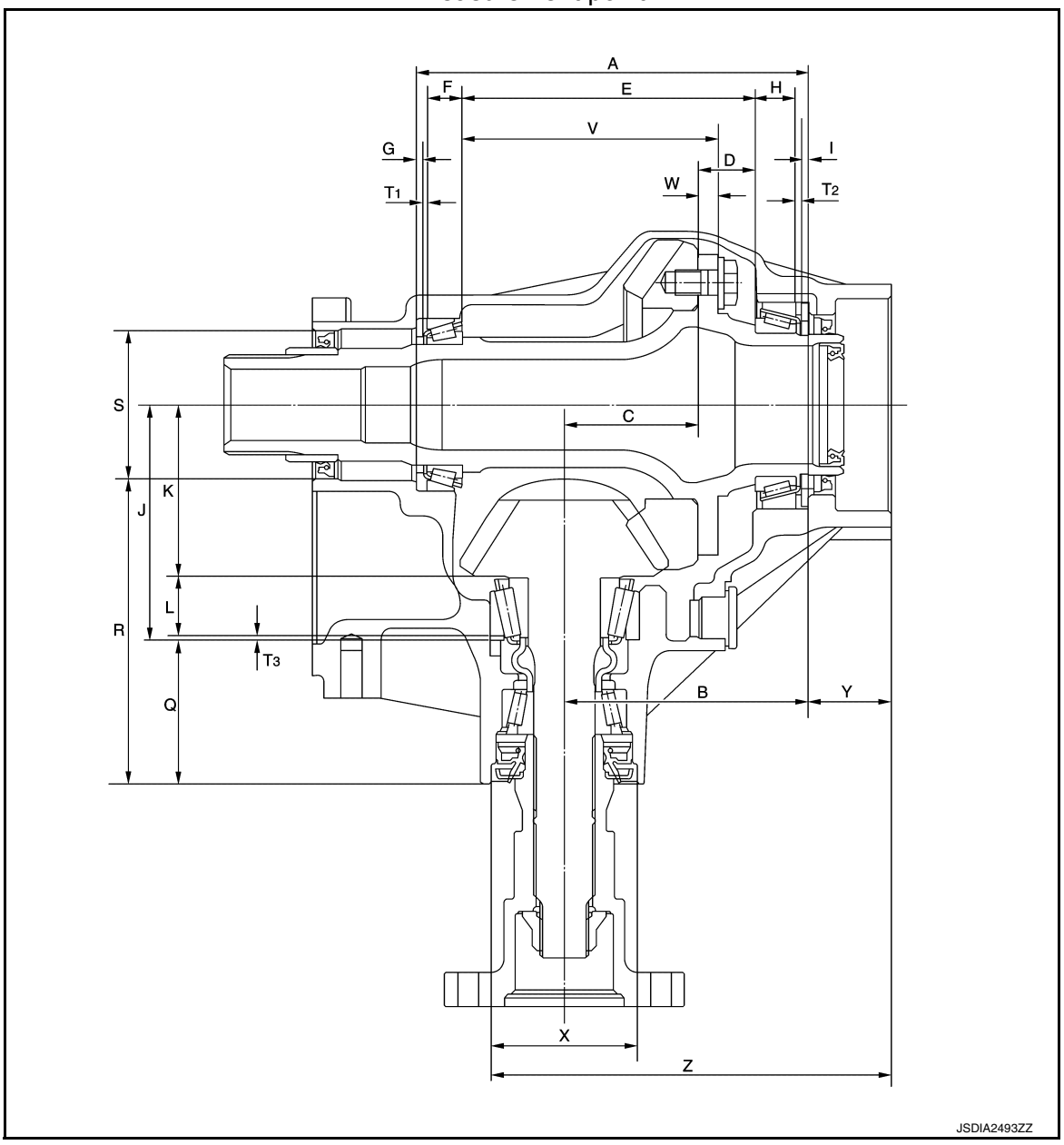
10. Install transfer cover to check and adjust each part. Refer to DLN-117, "Assembly".
CAUTION:
Never apply liquid gasket.
11. Check backlash, tooth contact, and total preload. Refer to DLN-99, "Adjustment".
CAUTION:
Measure the total preload without the transfer case oil seal.
12. Reinstall transfer cover for applying liquid gasket. Refer to DLN-117, "Assembly".
13. Install the transfer case oil seal (left and right). Refer to DLN-117, "Assembly".

Adjustment

INFOID:0000000012199468

Adjusting shim selection

Measurement point



Ring gear bearing adjusting shim (left)

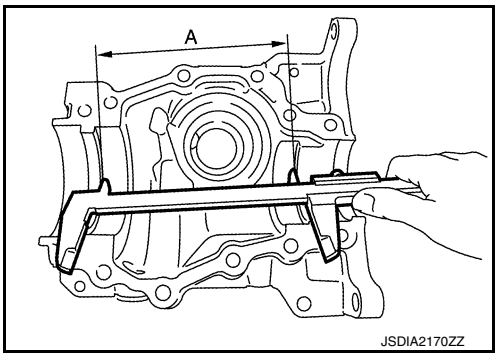
1. Measure the dimensions of each measuring point with the following procedure:

Dimension “A” measurement

- Measure dimension (A) of transfer case with a pair of vernier calipers. Refer to “Measuring point”.

CAUTION:

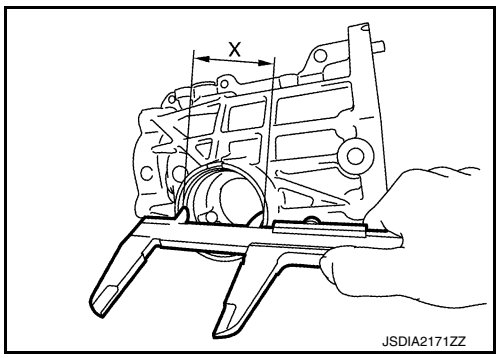
Never damage transfer case.



Dimension “X” measurement

- Measure the diameter (X) of transfer case with a pair of vernier calipers. Refer to “Measuring point”.

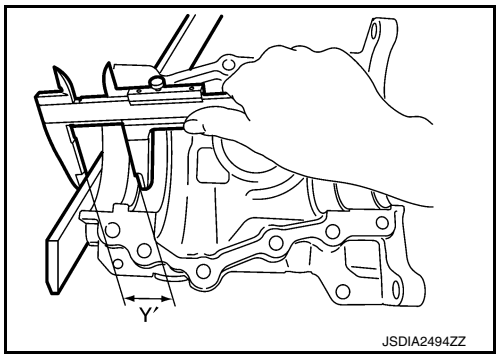
CAUTION:
Never damage transfer case.



Dimension “Y” measurement

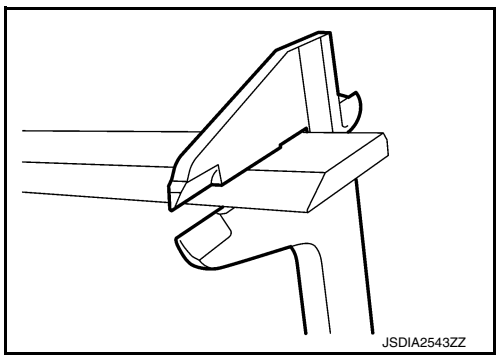
- Measure dimension (Y′) of transfer case (including the thickness of straightedge) with a pair of vernier calipers and straightedge. Refer to “Measuring point”.

CAUTION:
Never damage transfer case.



- Measure the thickness of straightedge.
- Calculate the dimension “Y” by formula below.

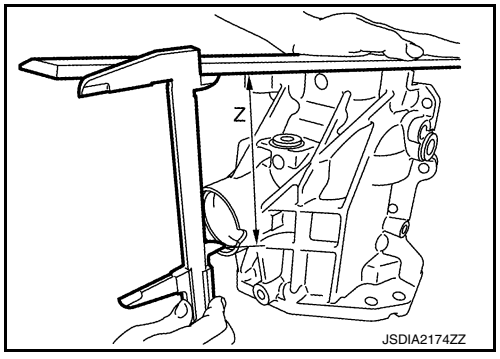
Y = Y′ – “Thickness of straightedge”



Dimension “Z” measurement

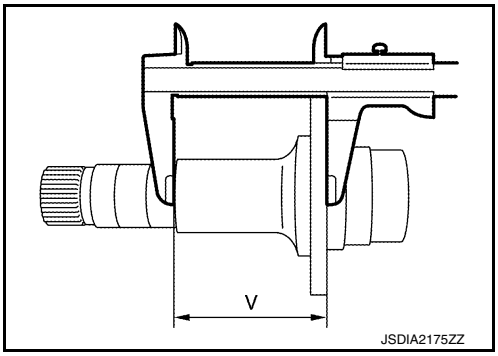
- Measure dimension (Z) of transfer case with a pair of vernier calipers and straightedge. Refer to “Measuring point”.

CAUTION:
Never damage transfer case.



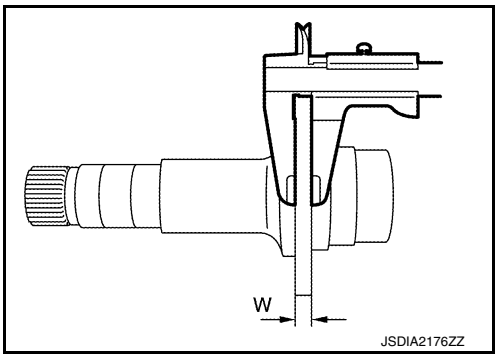
Dimension “V” measurement

- Measure dimension (V) of ring gear shaft with a pair of vernier calipers. Refer to “Measuring point”.



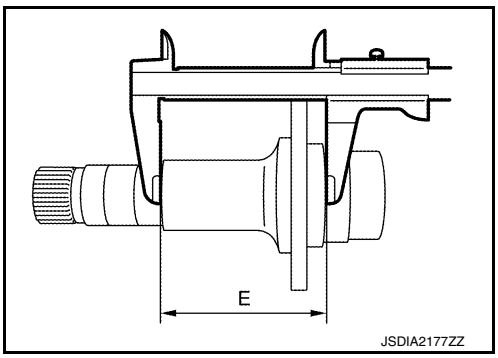
Dimension “W” measurement

- Measure dimension (W) of ring gear shaft with a pair of vernier calipers. Refer to “Measuring point”.



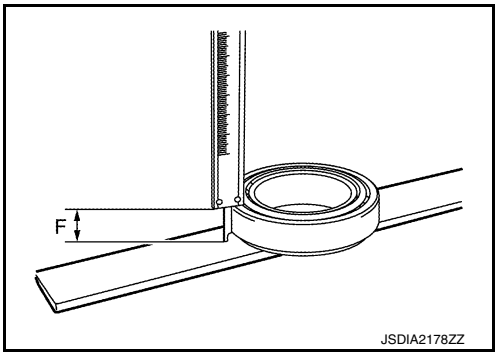
Dimension “E” measurement

- Measure dimension (E) of ring gear shaft with a pair of vernier calipers. Refer to “Measuring point”.



Dimension “F” measurement

- Measure dimension (F) from outer race edge surface of ring gear bearing (left) to inner race edge surface with depth gauge. Refer to “Measuring point”.



Dimension “G” measurement

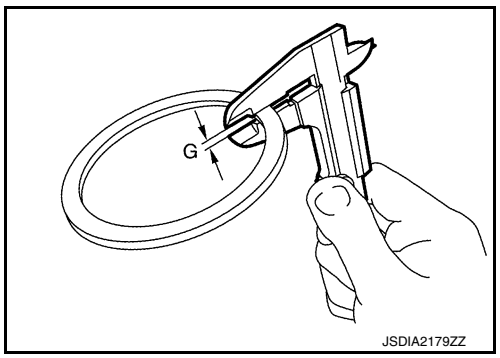
- Measure thickness (G) of spacer (left) with a pair of vernier calipers. Refer to “Measuring point”.

2. Calculate dimension “B” by the formula below.

B = Z – Y – (X × 0.5)

3. Calculate dimension “D” by the formula below.

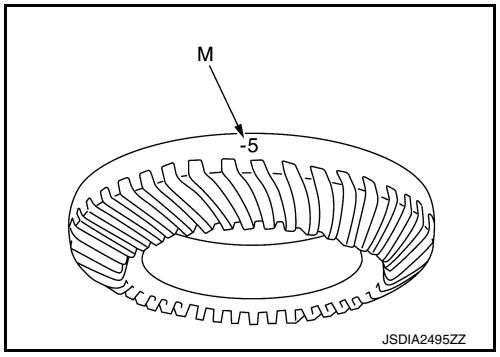
D = E – V + W



4. Check dimension (M) on the ring gear side face.
NOTE:
Dimension “M” indicates the difference between the optimum engagement and standard dimensions in increments of 0.01 mm (0.0004 in) written on the ring gear side face.
5. Calculate the thickness of the ring gear bearing adjusting shim (left) “T_1” by the formula below.

T_1 = A – B + C + D – E – F – G – (M / 100) + 0.045 mm (0.0018 in)

NOTE:
Calculate dimension “C” as 56.0 mm (2.20 in)

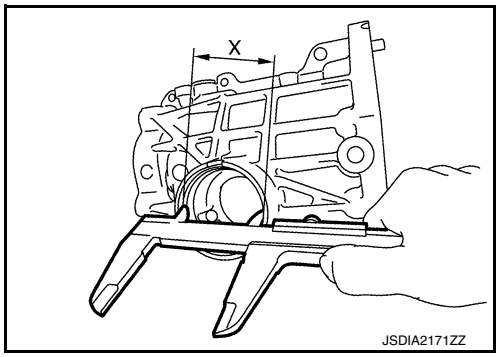


6. Select ring gear bearing adjusting shim (left).
For selection adjusting shim, refer to the latest parts information.
CAUTION:
- **Only one adjusting shim can be selected.**
- **Select the closest one, favoring thicker over thinner when necessary if no adjusting shim with the calculated value is available.**

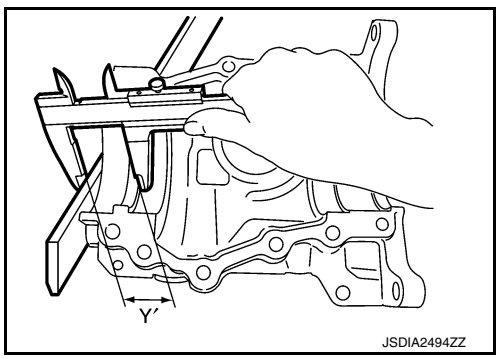
Ring gear bearing adjusting shim (right)

1. Measure the dimensions of each measuring point with the following procedure:

Dimension “X” measurement
- Measure the diameter (X) of transfer case with a pair of vernier calipers. Refer to “Measuring point”.
CAUTION:
Never damage transfer case.

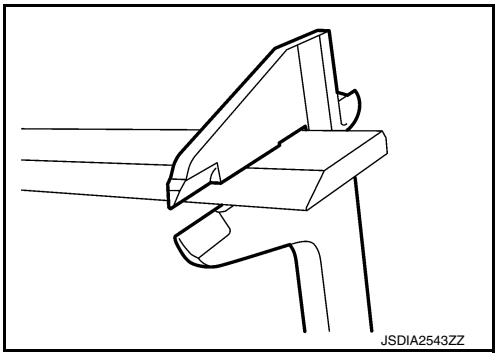


Dimension “Y” measurement
- Measure dimension (Y′) of transfer case (including the thickness of straightedge) with a pair of vernier calipers and straightedge. Refer to “Measuring point”.
CAUTION:
Never damage transfer case.



- Measure the thickness of straightedge.
- Calculate the dimension “Y” by formula below.

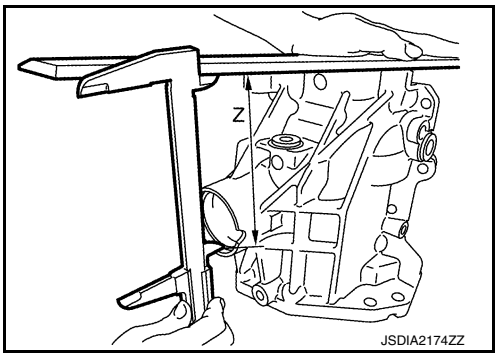
Y = Y′ – “Thickness of straightedge”



Dimension “Z” measurement

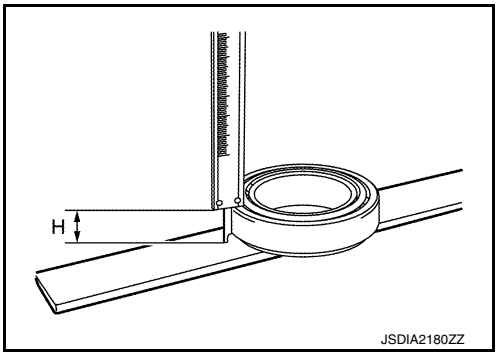
- Measure dimension (Z) of transfer case with a pair of vernier calipers and straightedge. Refer to “Measuring point”.

CAUTION:
Never damage transfer case.



Dimension “H” measurement

- Measure dimension (H) from outer race edge surface of ring gear bearing (right) to inner race edge surface with depth gauge. Refer to “Measuring point”.



Dimension “I” measurement

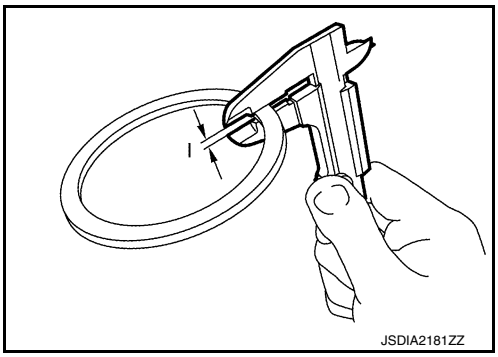
- Measure thickness (I) of spacer (right) with a pair of vernier calipers. Refer to “Measuring point”.

2. Calculate dimension “B” by the formula below.

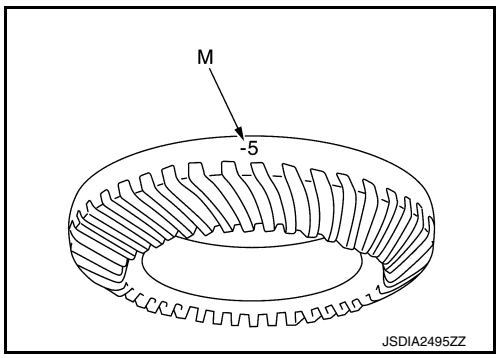
B = Z – Y – (X × 0.5)

3. Calculate dimension “D” by the formula below.

D = E – V + W



4. Check dimension (M) on the ring gear side face.
NOTE:
Dimension “M” indicates the difference between the optimum engagement and standard dimensions in increments of 0.01 mm (0.0004 in) written on the ring gear side face.



5. Calculate the thickness of the ring gear bearing adjusting shim (right) “T_2” by the formula below.

$$T_2 = B - C - D - H - I + (M / 100) + 0.045 \text{ mm } (0.0018 \text{ in})$$

NOTE:
Calculate dimension “C” as 56.0 mm (2.20 in)

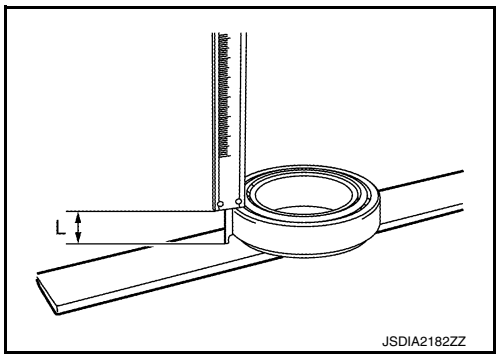
6. Select ring gear bearing adjusting shim (right).
For selection adjusting shim, refer to the latest parts information.
CAUTION:
- **Only one adjusting shim can be selected.**
- **Select the closest one, favoring thicker over thinner when necessary if no adjusting shim with the calculated value is available.**

Drive pinion adjusting shim

1. Measure the dimensions of each measuring point with the following procedure:

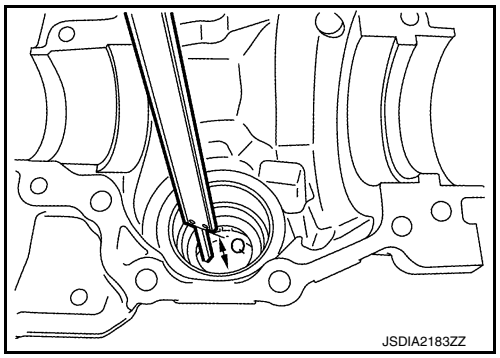
Dimension “L” measurement

- Measure dimension (L) from outer race edge surface of pinion bearing (front) to inner race edge surface with depth gauge. Refer to “Measuring point”.



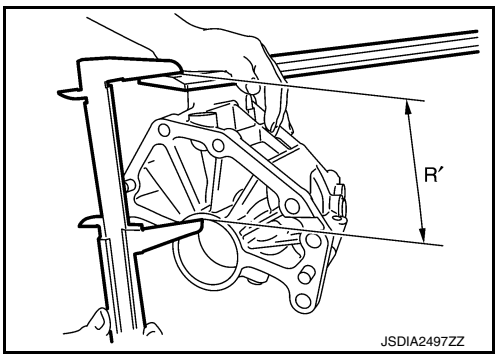
Dimension “Q” measurement

- Measure dimension (Q) of transfer case with depth gauge and straightedge. Refer to “Measuring point”.
CAUTION:
Never damage transfer case.



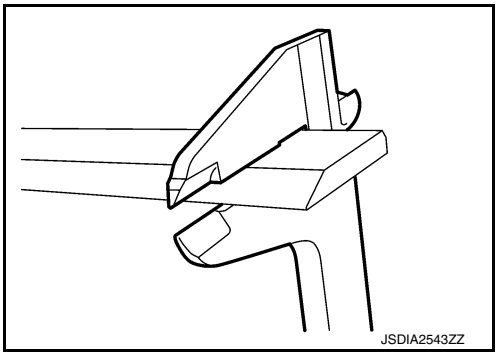
Dimension “R” measurement

- Measure dimension (R′) of transfer case (including the thickness of straightedge) with a pair of vernier calipers and straightedge. Refer to “Measuring point”.
  CAUTION:
  Never damage transfer case.



- Measure the thickness of straightedge.
- Calculate the dimension “R” by formula below.

R = R′ – “Thickness of straightedge”

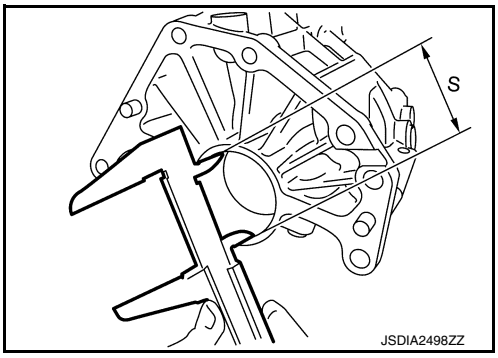


Dimension “S” measurement

- Measure the diameter (S) of transfer case with a pair of vernier calipers. Refer to “Measuring point”.
  CAUTION:
  Never damage transfer case.

2. Calculate dimension “J” by the formula below.

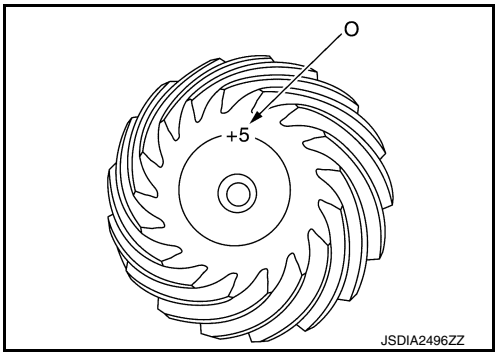
J = R – Q + (S × 0.5)



3. Check dimension (O) on the gear end of drive pinion.
   NOTE:
   Dimension “O” indicates the difference between the optimum engagement and the standard dimensions in increments of 0.01 mm (0.0004 in) written on the gear end of drive pinion.
4. Calculate the thickness of the drive pinion adjusting shim “T_3” by the formula below.

T_3 = J – K – L + (O / 100)

NOTE:
Calculate dimension “K” as 70.85 mm (2.7894 in)



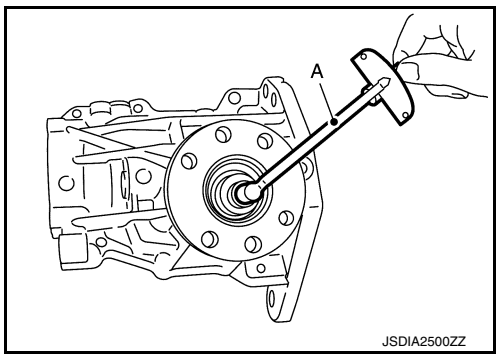
5. Select drive pinion adjusting shim.
   For selection adjusting shim, refer to the latest parts information.
   CAUTION:
   - **Only one adjusting shim can be selected.**
   - **Select the closest one, favoring thicker over thinner when necessary if no adjusting shim with the calculated value is available.**

DRIVE PINION BEARING PRELOAD

1. Remove ring gear shaft assembly from the transfer case. Refer to DLN-97, "Disassembly".

2. Rotate the companion flange back and forth from 2 to 3 times to check for unusual noise, binding, sticking, and so on.
3. Rotate the companion flange at least 20 times to check for smooth operation of the bearing.
4. Measure the drive pinion bearing preload with the preload gauge (A) [SST: ST3127S000 (J-25765-A)].

Drive pinion bearing preload : Refer to DLN-120, "Preload Torque".

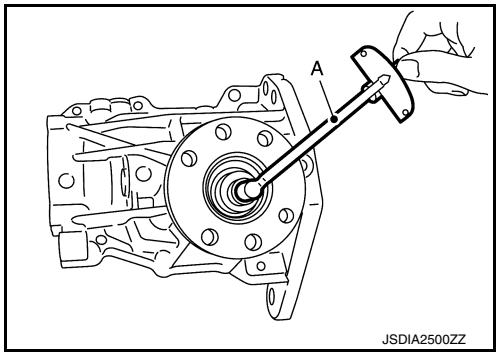


CAUTION:
Each rotational part should rotate smoothly with the specified gear oil.
- If outside the standard, disassemble the drive pinion assembly to check and adjust each part.

TOTAL PRELOAD

1. Measure drive pinion bearing preload.
CAUTION:
Check that the drive pinion bearing preload is within the standard.
2. Assemble the ring gear shaft assembly to the transfer case. Refer to DLN-98, "Assembly"
3. Install transfer cover to check and adjust each part. Refer to DLN-117, "Assembly".
CAUTION:
Never apply liquid gasket.
4. Rotate the companion flange at least 20 times to check for smooth operation of the bearing.
5. Measure the total preload with the preload gauge (A) [SST: ST3127S000 (J-25765-A)].

Total preload :Refer to DLN-120, "Preload Torque".



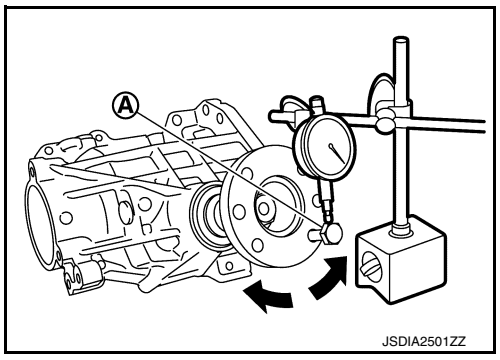
CAUTION:
Each rotational part should rotate smoothly with the specified gear oil.
- If outside the standard, disassemble the transfer assembly to check and adjust each part. Measure it with the transfer case oil seals removed when measuring total preload after disassembly. Then install transfer case oil seals.

6. Reinstall transfer cover for applying liquid gasket. Refer to DLN-117, "Assembly".

BACKLASH

1. Install the bolt to the companion flange.
2. Fit a dial indicator onto the bolt (A).
3. Measure the circumference backlash of the companion flange.

Backlash : Refer to DLN-120, "Backlash".

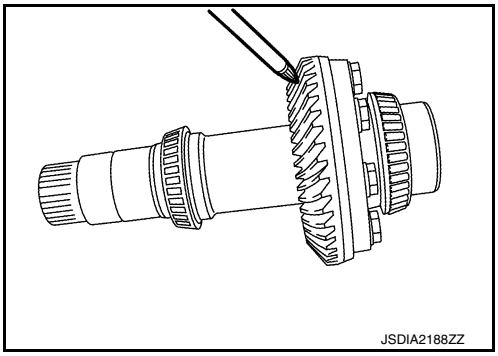


- If outside the standard, disassemble the transfer assembly to check and adjust each part.

TOOTH CONTACT

1. Remove transfer cover. Refer to DLN-117, "Disassembly".
2. Remove ring gear shaft assembly from transfer case. Refer to DLN-97, "Disassembly".

3. Apply red lead onto the ring gear.
CAUTION:
Apply red lead to both faces of 3 to 4 gears at 4 locations evenly spaced on the ring gear.


JSDIA2188ZZ

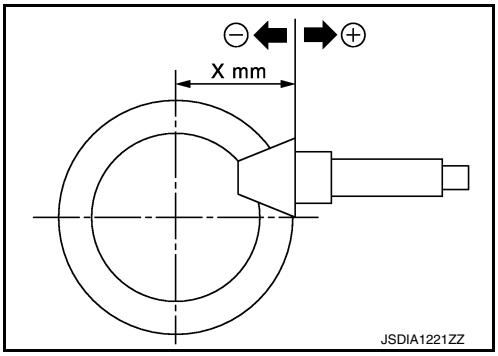
4. Assemble the ring gear shaft assembly to the transfer case. Refer to DLN-98, "Assembly".
5. Install transfer cover to check and adjust each part. Refer to DLN-117, "Assembly".
CAUTION:
Never apply liquid gasket.
6. Rotate the companion flange back and forth several times.
7. Remove ring gear shaft assembly from transfer case. Then check drive pinion to ring gear tooth contact

Tooth Contact Judgment Guide

Drive pinion adjusting shim selection value mm(in)		Tooth contact condition		Need for adjustment
		Drive side	Back side	
Thinner ↑	−0.09 (−0.0035)	Heel side / Toe side	Toe side / Heel side	Yes
	−0.06 (−0.0024)			
	−0.03 (−0.0012)			No
	0			
Thicker ↓	+0.03 (+0.0012)			
	+0.06 (+0.0024)			Yes
	+0.09 (+0.0036)			

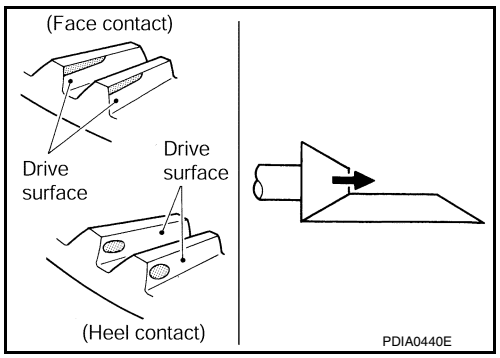
JSDIA2502GB

8. Follow the procedure below to adjust pinion height (dimension X) if tooth contact is improper. For selecting adjusting shim, refer to the latest parts information.
CAUTION:
If no adjusting shim with the calculated value is available, select the thicker and closest one.



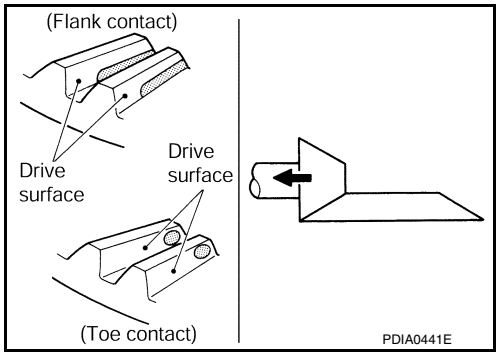
JSDIA1221ZZ

- Thicken the drive pinion adjusting shim to move the drive pinion closer to the ring gear in case of face contact or heel contact.
  CAUTION:
  Only one adjusting shim can be selected.



- Thin the drive pinion adjusting shim to move the drive pinion farther from the ring gear in case of flank contact or toe contact.
  CAUTION:
  Only one adjusting shim can be selected.

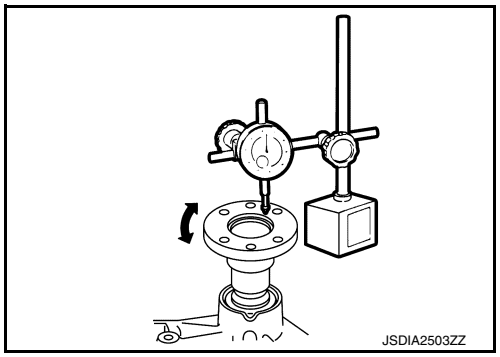
9. Reinstall transfer cover for applying liquid gasket. Refer to DLN-117, "Assembly".



COMPANION FLANGE RUNOUT

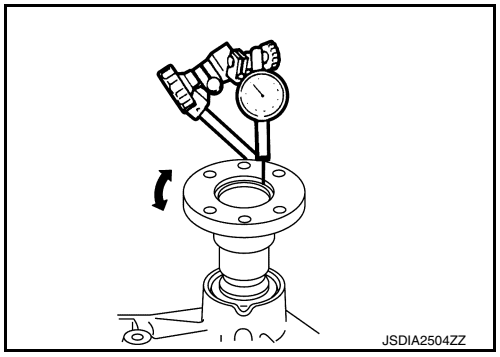
1. Fit a dial indicator onto the companion flange face (inner side of the propeller shaft bolt holes).
2. Rotate the companion flange to check for runout.

Companion flange runout : Refer to DLN-120, "Companion Flange Runout".



3. Fit a test indicator to the inner side of the companion flange (socket diameter).
4. Rotate the companion flange to check for runout.

Companion flange runout : Refer to DLN-120, "Companion Flange Runout".



5. Follow the procedure below to adjust if runout value is outside the repair limit.
   CAUTION:
   Replace collapsible spacer to check and adjust each part when companion flange is adjusted or replaced.

a. Check for runout while changing the phase between companion flange and drive pinion in 90° steps. Then search for the minimum point.
b. Replace companion flange if runout value is still outside the limit after the phase has been changed.
c. Adjust assembly status of the pinion bearings and drive pinion, or replace drive pinion bearings if runout is outside the standard after the companion flange is replaced.

Inspection

INFOID:0000000012199469

INSPECTION AFTER DISASSEMBLY

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

Gear and Shaft

Check gear face and shaft for wear, cracks, damage, and seizure.

CAUTION:

Replace ring gear and drive pinion as a set (hypoid gear set) if any malfunction is detected on the ring gear or drive pinion.

Bearing

Check for seizure, peeling, wear, corrosion, sticking, unusual noise, roughness in hand turning, and other damage.

CAUTION:

Always replace inner race and outer race as a pair when replacing the bearing.

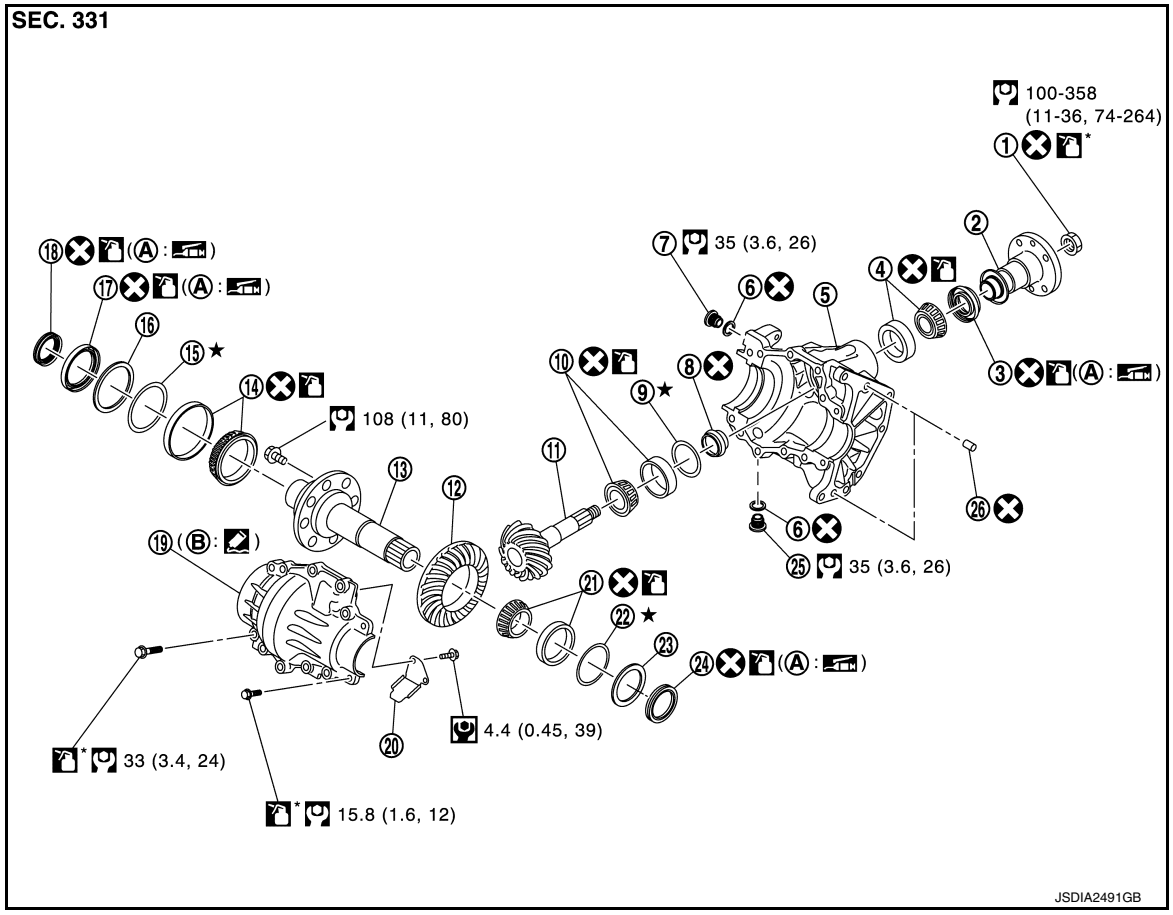
Shim

Check for seizure, damage, and unusual wear.

DRIVE PINION

Exploded View

INFOID:0000000012199470



1. Pinion lock nut
2. Companion flange
3. Drive pinion oil seal
4. Pinion bearing (rear)
5. Transfer case
6. Gasket
7. Filler plug
8. Collapsible spacer
9. Drive pinion adjusting shim
10. Pinion bearing (front)
11. Drive pinion
12. Ring gear
13. Ring gear shaft
14. Ring gear bearing (right)
15. Ring gear bearing adjusting shim (right)
16. Spacer (right)
17. Transfer case oil seal (right)
18. Drive shaft oil seal
19. Transfer cover
20. Oil defense
21. Ring gear bearing (left)
22. Ring gear bearing adjusting shim (left)
23. Spacer (left)
24. Transfer case oil seal (left)
25. Drain plug
26. Dowel pin
A. Oil seal lip
B. Transfer case mounting face

: Always replace after every disassembly.

★: Select with proper thickness.

: N·m (kg-m, in-lb)

: N·m (kg-m, ft-lb)

: Apply gear oil.

: Apply multi purpose grease

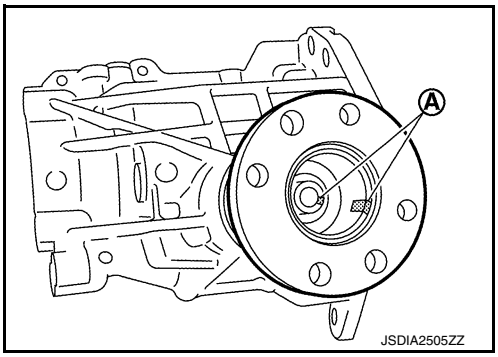
: Apply anti-corrosive oil.

: Apply Genuine Silicone RTV or equivalent. Refer to GI-22, "Recommended Chemical Products and Sealants".

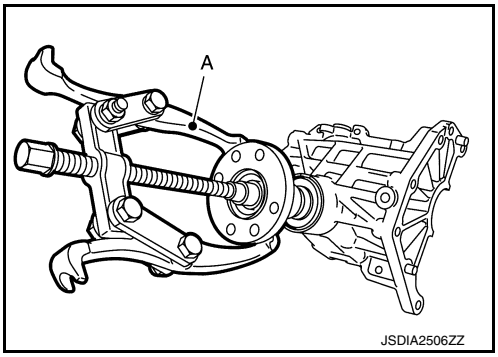
Disassembly

INFOID:0000000012199471

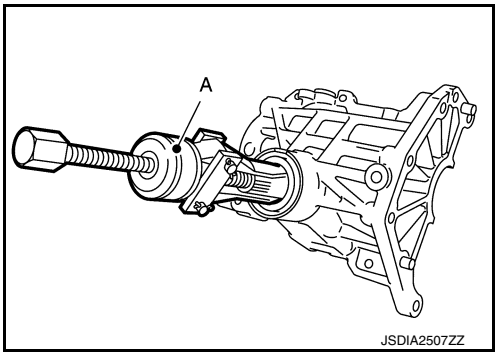
1. Remove transfer cover. Refer to DLN-117, "Disassembly".
2. Remove ring gear shaft assembly. Refer to DLN-97, "Disassembly".
3. Remove pinion lock nut from the drive pinion.
4. Put matching marks (A) on screw ends of drive pinion and companion flange.
   CAUTION:
   Use paint to avoid scratching the surface.



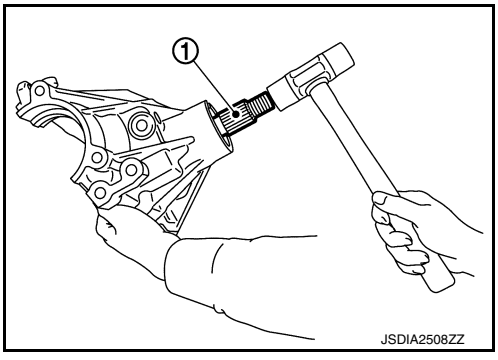
5. Remove companion flange from drive pinion with the puller (A) (Commercial service tool).



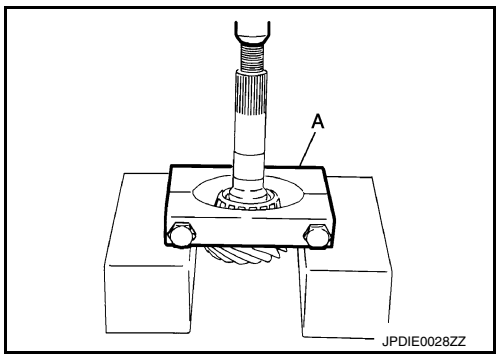
6. Remove drive pinion oil seal from the transfer case with the puller (A) [SST: KV381054S0 (J-34286)].
   CAUTION:
   Never damage transfer case.



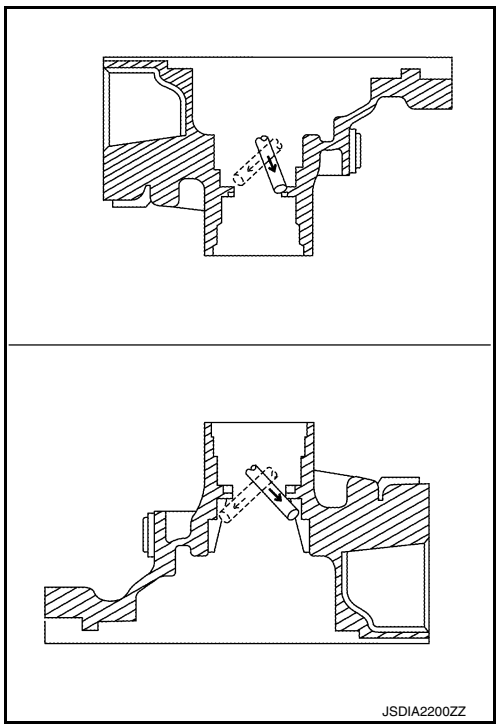
7. Remove drive pinion assembly (1) from transfer case while tapping the drive pinion lightly with a plastic hammer.
   CAUTION:
   Never drop the drive pinion assembly.
8. Remove collapsible spacer from the drive pinion.
9. Remove inner race of pinion bearing (rear) from transfer case.



10. Remove inner race of pinion bearing (front) from drive pinion with the replacer (A) (Commercial service tool).



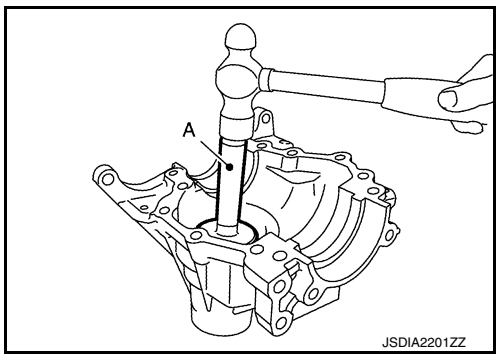
11. Tap the outer race of pinion bearing (rear) from transfer case with a brass rod to remove outer race of pinion bearing (rear).
CAUTION:
Never damage transfer case.
12. Remove drive pinion adjusting shim.
13. Perform inspection after disassembly. Refer to DLN-115, "Inspection".



Assembly

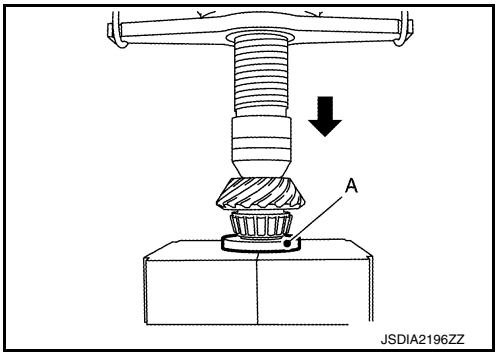
INFOID:0000000012199472

1. Select drive pinion adjusting shim. Refer to DLN-99, "Adjustment".
2. Install selected drive pinion adjusting shim to transfer case.
3. Install outer race of pinion bearing (rear) to the transfer case with the drift (A) [SST: ST37830000 (—)].
CAUTION:
- **Never reuse pinion bearing.**
- **Apply gear oil to the pinion bearing.**



4. Install inner race of pinion bearing (front) to drive pinion with the drift (A) [SST: ST35272000 (J-26092)].
CAUTION:
- **Never reuse pinion bearing.**
- **Apply gear oil to the pinion bearing.**

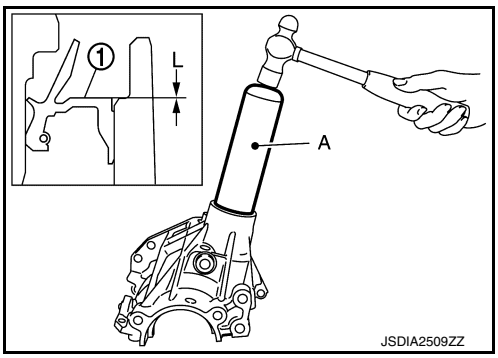
5. Assemble inner race of pinion bearing (rear) into the transfer case.
CAUTION:
- **Never reuse pinion bearing.**
- **Apply gear oil to the pinion bearing.**



6. Using the drifts (A) (Commercial service tool), install drive pinion oil seal (1) to transfer case within the dimension (L) shown as follows.

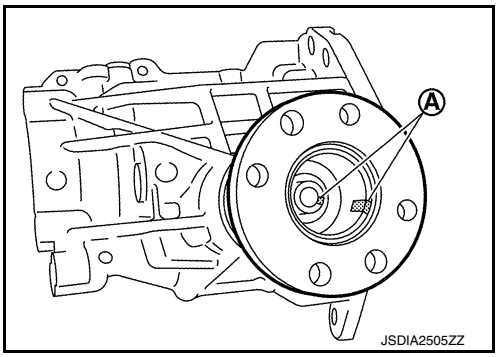
L : 0 – 0.6 mm (0 – 0.024 in)

CAUTION:
- **Never reuse oil seal.**
- **When installing, never incline oil seal.**
- **Apply multi-purpose grease onto oil seal lips, and gear oil onto the circumference.**



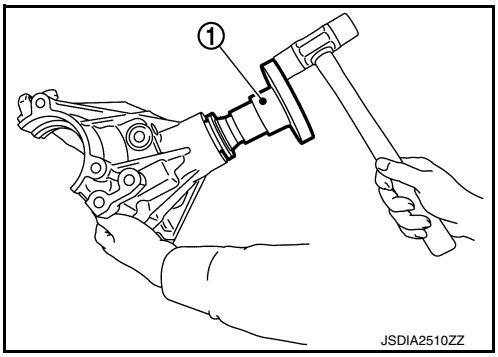
7. Assemble a collapsible spacer onto the drive pinion.
CAUTION:
Never reuse the collapsible spacer.

8. Assemble drive pinion assembly into the transfer case, and then install companion flange to drive pinion.
NOTE:
Align matching marks (A) on the thread edge of drive pinion and companion flange, and install companion flange if drive pinion is reused.

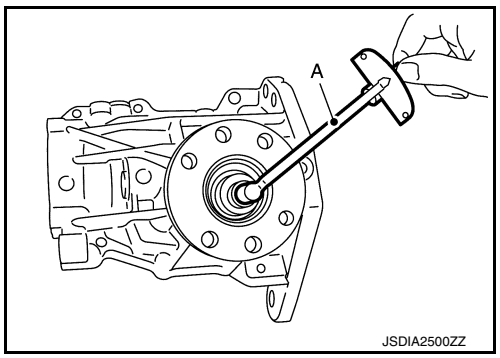


9. Tap the companion flange (1) with a plastic hammer as far as the pinion lock nut can be tightened.
CAUTION:
Never damage drive pinion oil seal.

10. Apply anti-corrosive oil to the thread and seat of the pinion lock nut, and temporarily tighten pinion lock nut to the drive pinion.
CAUTION:
Never reuse pinion lock nut.



11. Tighten pinion lock nut within the specified torque range with the preload gauge (A) [SST: ST3127S000 (J-25765-A)] so that the drive pinion bearing preload is within standard.



Drive pinion bearing preload : Refer to DLN-120, "Preload Torque".

CAUTION:
- **Start the tightening of pinion lock nut from lower limit of the specified torque. Check the preload every 5° to 10° while tightening the pinion lock nut.**
- **Replace the collapsible spacer and tighten it again to adjust if preload exceeds the specified value. Never loosen pinion lock nut to adjust preload.**
- **After adjustment, rotate the drive pinion back and forth from 2 to 3 times to check for unusual noise, sticking, binding, and so on.**

12. Install ring gear shaft assembly. Refer to DLN-98, "Assembly".
13. Install transfer cover to check and adjust each part. Refer to DLN-117, "Assembly".
    CAUTION:
    Never apply liquid gasket.
14. Check backlash, tooth contact, total preload and companion flange runout. Refer to DLN-99, "Adjustment".
    CAUTION:
    Measure the total preload without the transfer case oil seal.
15. Reinstall transfer cover for applying liquid gasket. Refer to DLN-117, "Assembly".
16. Install the transfer case oil seal (left and right). Refer to DLN-117, "Assembly".

Adjustment

INFOID:0000000012199473

Selecting drive pinion adjusting shim, and checking backlash, tooth contact, total preload and companion flange runout, refer to DLN-99, "Adjustment".

Inspection

INFOID:0000000012199474

INSPECTION AFTER DISASSEMBLY

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

Gear and Shaft

Check gear face and shaft for wear, cracks, damage, and seizure.

CAUTION:
Replace ring gear and drive pinion as a set (hypoid gear set) if any malfunction is detected on the ring gear or drive pinion.

Bearing

Check for seizure, peeling, wear, corrosion, sticking, unusual noise, roughness in hand turning, and other damage.

CAUTION:
Always replace inner race and outer race as a pair when replacing the bearing.

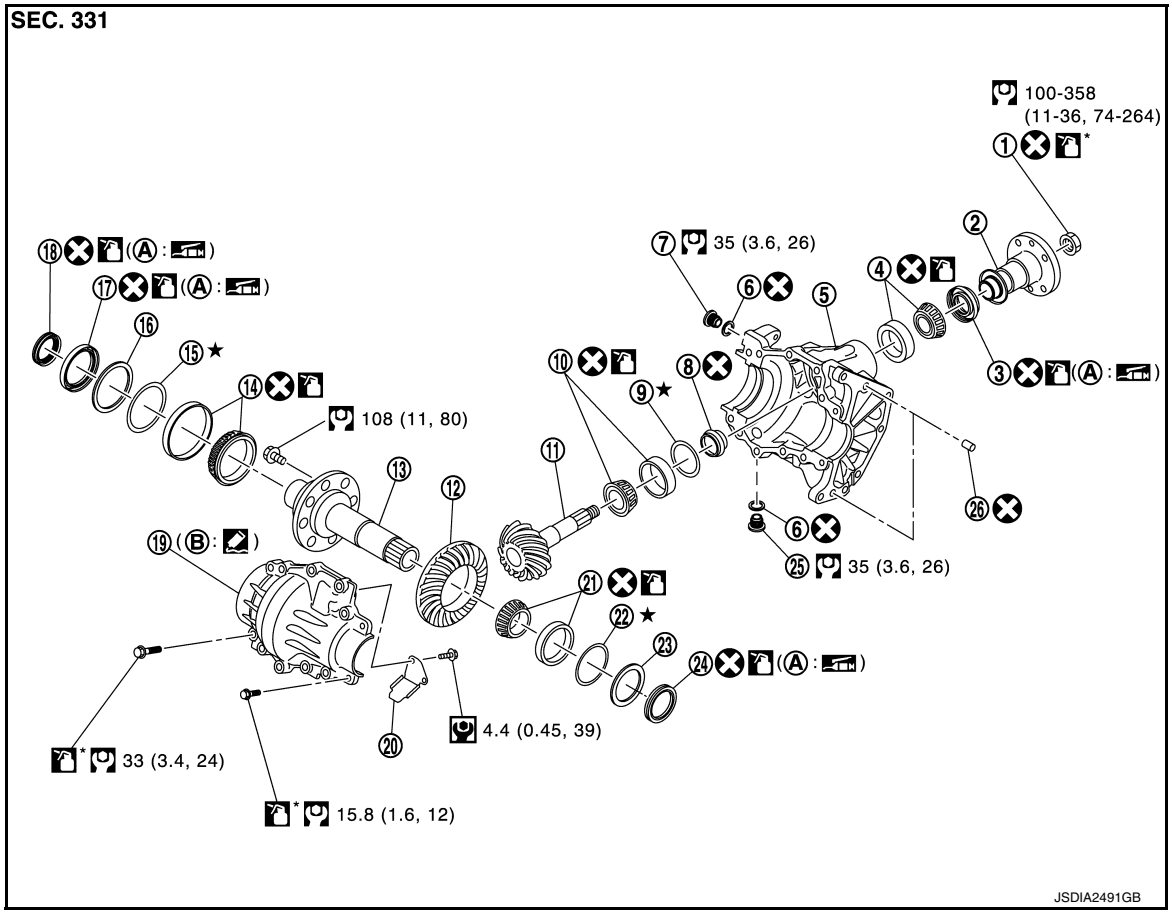
Shim

Check for seizure, damage, and unusual wear.

TRANSFER CASE

Exploded View

INFOID:0000000012199475



1. Pinion lock nut
2. Companion flange
3. Drive pinion oil seal
4. Pinion bearing (rear)
5. Transfer case
6. Gasket
7. Filler plug
8. Collapsible spacer
9. Drive pinion adjusting shim
10. Pinion bearing (front)
11. Drive pinion
12. Ring gear
13. Ring gear shaft
14. Ring gear bearing (right)
15. Ring gear bearing adjusting shim (right)
16. Spacer (right)
17. Transfer case oil seal (right)
18. Drive shaft oil seal
19. Transfer cover
20. Oil defense
21. Ring gear bearing (left)
22. Ring gear bearing adjusting shim (left)
23. Spacer (left)
24. Transfer case oil seal (left)
25. Drain plug
26. Dowel pin
A. Oil seal lip
B. Transfer case mounting face

: Always replace after every disassembly.

★: Select with proper thickness.

: N·m (kg-m, in-lb)

: N·m (kg-m, ft-lb)

: Apply gear oil.

: Apply multi purpose grease

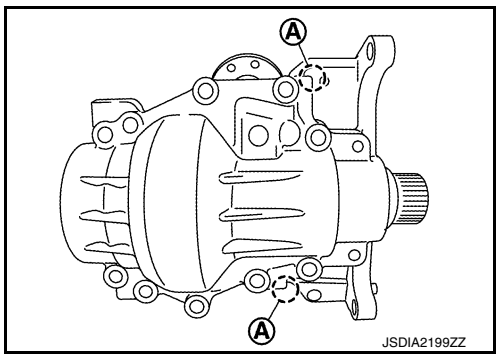
*: Apply anti-corrosive oil.

: Apply Genuine Silicone RTV or equivalent. Refer to GI-22, "Recommended Chemical Products and Sealants".

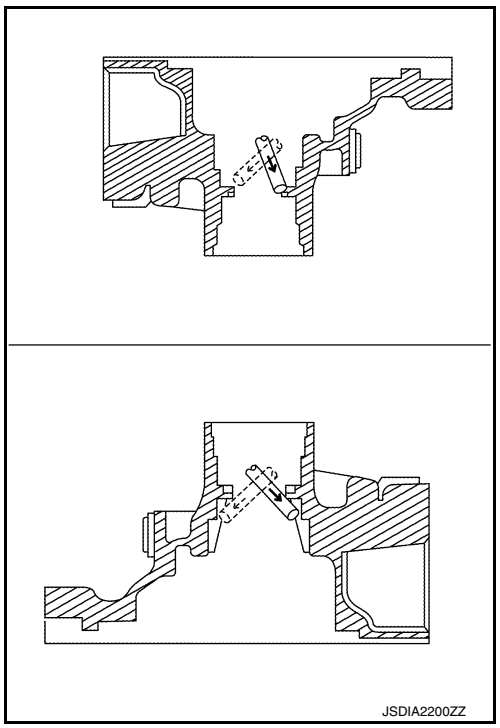
Disassembly

INFOID:0000000012199476

1. Remove transfer cover mounting bolts.
2. Lightly tap position (A) of transfer cover with a plastic hammer to remove transfer cover.
   CAUTION:
   When tapping of transfer cover, be sure to tap the back of cover.
3. Remove transfer case oil seal (right and left).
4. Remove ring gear shaft assembly. Refer to DLN-97, "Disassembly".
   NOTE:
   When the ring gear shaft removed, the following parts are simultaneously removed:
   - Spacer (right and left)
   - Ring gear bearing adjusting shim (right and left)
   - Outer race of ring gear bearing (right and left)
5. Remove drive pinion assembly from transfer case. Refer to DLN-112, "Disassembly".



6. Tap the outer races of pinion bearing (front and rear) from transfer case with a brass rod to remove outer races of pinion bearing (front and rear).
   CAUTION:
   Never damage transfer case.
7. Remove drive pinion adjusting shim.
8. Remove dowel pin.
   CAUTION:
   Never remove dowel pin, if it is not necessary to replace.
9. Remove the filler plug and drain plug from the transfer case, and then remove each gasket.
10. Remove oil defense from transfer cover.
11. Perform inspection after disassembly. Refer to DLN-119, "Inspection".

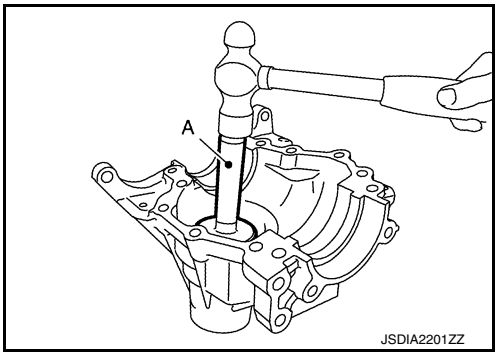


Assembly

INFOID:0000000012199477

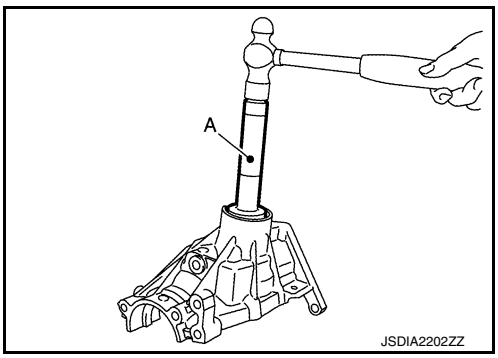
1. Install the oil defense to transfer cover.
2. Install gaskets onto filler plug and drain plug and install them into transfer case.
   CAUTION:
   - **Never reuse gasket.**
   - **Install filler plug after oil is filled.**
3. Install the dowel pin to transfer case.
   CAUTION:
   Never reuse the dowel pin.
4. Select drive pinion adjusting shim, and install it to transfer case. Refer to DLN-99, "Adjustment".

5. Install outer race of pinion bearing (front) to the transfer case with the drift (A) [SST: ST37830000 (—)].



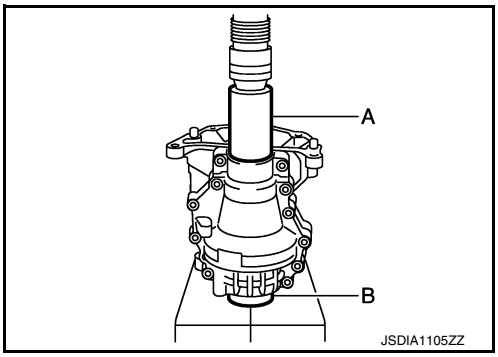
CAUTION:
- **Never reuse pinion bearing.**
- **Apply gear oil to the pinion bearing.**

6. Install outer race of pinion bearing (rear) to transfer case with the drift (A) [SST: ST33230000 (J-25805-01)].



CAUTION:
- **Never reuse pinion bearing.**
- **Apply gear oil to the pinion bearing.**

7. Install drive pinion assembly to transfer case. Refer to DLN-113, "Assembly".
8. Install ring gear shaft assembly to transfer case. Refer to DLN-98, "Assembly".
9. Set the drifts (A and B) to right and left side spacers individually. Compress ring gear shaft assembly with ring gear bearing to install transfer cover to transfer case.



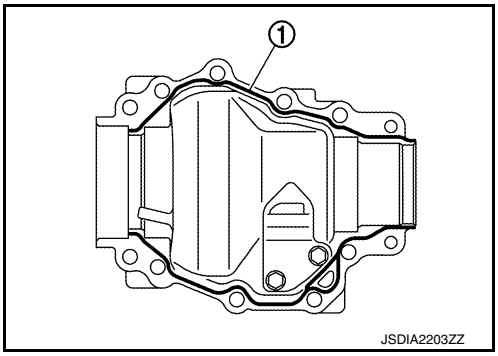
A : Drift (Commercial service tool)
B : Drift (Commercial service tool)

CAUTION:
- **Never apply gasket fluid on the mounting surface.**
- **Clean the mounting surface of transfer case and transfer cover to degrease sufficiently.**
- **The drift shall be placed on the center of the spacers.**
- **The pressure shall be as low as to install ring gear shaft assembly into transfer case. The maximum pressure shall be 10 kN (1 ton, 1.0 Imp ton).**
- **If the adjusting shims and spacers are installed by tapping, the transfer cover may be damaged. Avoid tapping.**

10. Check backlash, tooth contact, and total preload. Refer to DLN-99, "Adjustment".

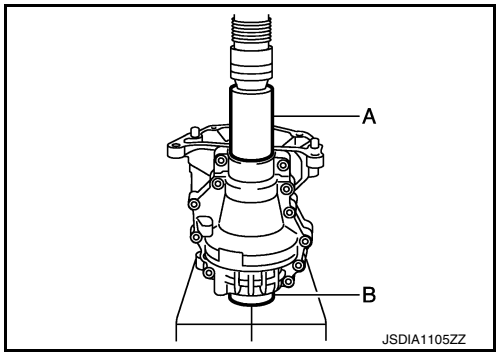
CAUTION:
Measure the total preload without the transfer case oil seals.

11. Remove transfer cover. Refer to DLN-117, "Disassembly".
12. Apply liquid gasket (1) to mating surface of transfer cover.
    - Use Genuine Silicone RTV or equivalent. Refer to GI-22, "Recommended Chemical Products and Sealants".



CAUTION:
- **Remove old gasket adhering to the mounting surfaces. Also remove any moisture, oil, or foreign material adhering to the mounting surfaces.**
- **The width of sealant bend is 2 – 3 mm (0.08 – 0.012 in).**
- **Overlap both ends of the bead for at least 3 mm (0.012 in).**
- **Immediately install transfer cover after installing applying gasket.**

13. Set the drifts (A and B) to right and left side spacers individually. Compress ring gear shaft assembly with ring gear bearing to install transfer cover to transfer case.

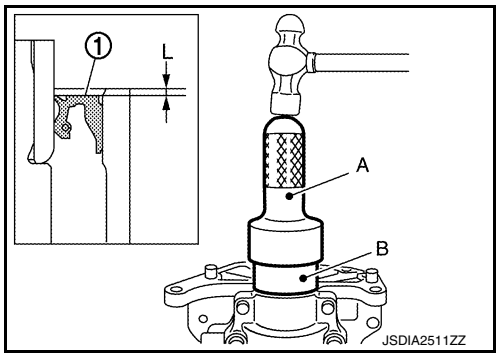


A : Drift (Commercial service tool)
B : Drift (Commercial service tool)

CAUTION:
- **Immediately install after applying gasket.**
- **The drift shall be placed on the center of the spacers.**
- **The pressure shall be as low as to install ring gear shaft assembly into transfer case. The maximum pressure shall be 10 kN (1 ton, 1.0 Imp ton).**
- **If the adjusting shims and spacers are installed by tapping, the transfer cover may be damaged. Avoid tapping.**

14. Tighten transfer cover mounting bolts to the specified torque.

15. Using the drifts (A and B), install transfer case oil seal (left) (1) within the dimension (L) shown as follows.

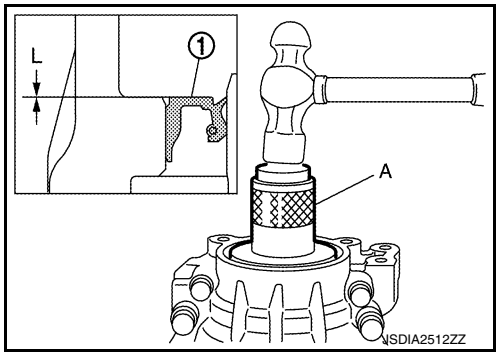


A : Drift (Commercial service tool)
B : Drift [SST: ST27863000 (—)]

L : 1.0 – 1.6 mm (0.040 – 0.063 in)

CAUTION:
- **Never reuse oil seals.**
- **When installing, never incline oil seals.**
- **Apply multi-purpose grease onto oil seal lips, and gear oil onto the circumference of oil seal.**
- **Immediately install after installing transfer cover.**
- **After installing oil seal, immediately wipe out gasket squeezed out inward of transfer case.**

16. Using the drifts (A) [SST: ST35271000 (J-26091)], install transfer case oil seal (right) (1) within the dimension (L) shown as follows.



L : 0 – 0.6 mm (0 – 0.024 in)

CAUTION:
- **Never reuse oil seals.**
- **When installing, never incline oil seals.**
- **Apply multi-purpose grease onto oil seal lips, and gear oil onto the circumference of oil seal.**
- **Immediately install after installing transfer cover.**
- **After installing oil seal, immediately wipe out gasket squeezed out inward of transfer case.**

Inspection

INFOID:0000000012199478

INSPECTION AFTER DISASSEMBLY

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

Case and Cover

Check the cracks, damages, and bearing mounting surface for wear.

CAUTION:
Replace transfer case and transfer cover as a set if any malfunction is detected on transfer case or transfer cover.

SERVICE DATA AND SPECIFICATIONS (SDS)

SERVICE DATA AND SPECIFICATIONS (SDS)

General Specifications

INFOID:0000000012199479

Applied model		MR16DDT
Transfer model		TY21B
Oil capacity (Approx.)	ℓ (US pt, Imp pt)	0.37 (3/4, 5/8)
Gear ratio		0.404
Number of teeth	Ring gear	42
	Drive pinion	17

Preload Torque

INFOID:0000000012199480

Unit: N·m (kg-m, in-lb)

Item		Standard
Drive pinion bearing preload		0.30 – 0.80 (0.03 – 0.08, 3.0 – 7.0)
Total preload	With all oil seals	P_1 + 0.55 – 0.80 (0.06 – 0.08, 5.0 – 7.0)
	Without transfer case oil seal	P_1 + 0.35 – 0.60 (0.04 – 0.06, 3.0 – 5.0)

Backlash

INFOID:0000000012199481

Unit: mm (in)

Item	Standard
Ring gear to drive pinion	0.13 – 0.18 (0.0051 – 0.0071)

Companion Flange Runout

INFOID:0000000012199482

Unit: mm (in)

Item	Limit
Companion flange face (inner side of the propeller shaft bolt holes)	0.15 (0.0059)
Inside of companion flange (socket diameter)	0.2 (0.008)

PRECAUTION

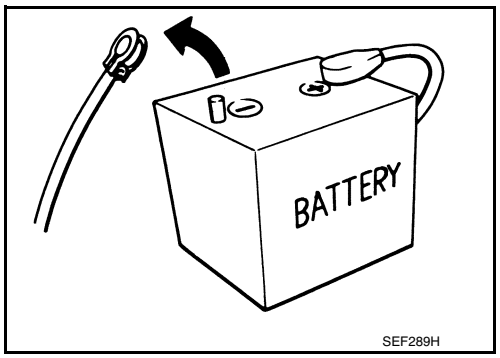
PRECAUTIONS

Precautions for Removing Battery Terminal

INFOID:0000000012833563

When disconnecting the battery terminal, pay attention to the following.
- Always use a 12V battery as power source.
- Never disconnect battery terminal while engine is running.
- When removing the 12V battery terminal, turn OFF the ignition switch and wait at least 30 seconds.
- For vehicles with the engine listed below, remove the battery terminal after a lapse of the specified time:

D4D engine	: 20 minutes	YS23DDT	: 4 minutes
HRA2DDT	: 12 minutes	YS23DDTT	: 4 minutes
K9K engine	: 4 minutes	ZD30DDTi	: 60 seconds
M9R engine	: 4 minutes	ZD30DDTT	: 60 seconds
R9M engine	: 4 minutes		
V9X engine	: 4 minutes		
YD25DDTi	: 2 minutes		



NOTE:
ECU may be active for several tens of seconds after the ignition switch is turned OFF. If the battery terminal is removed before ECU stops, then a DTC detection error or ECU data corruption may occur.
- After high-load driving, if the vehicle is equipped with the V9X engine, turn the ignition switch OFF and wait for at least 15 minutes to remove the battery terminal.

NOTE:
- Turbocharger cooling pump may operate in a few minutes after the ignition switch is turned OFF.
- Example of high-load driving
  - Driving for 30 minutes or more at 140 km/h (86 MPH) or more.
  - Driving for 30 minutes or more on a steep slope.
- For vehicles with the 2-batteries, be sure to connect the main battery and the sub battery before turning ON the ignition switch.

NOTE:
If the ignition switch is turned ON with any one of the terminals of main battery and sub battery disconnected, then DTC may be detected.
- After installing the 12V battery, always check "Self Diagnosis Result" of all ECUs and erase DTC.

NOTE:
The removal of 12V battery may cause a DTC detection error.

Service Notice or Precautions for Rear Propeller Shaft

INFOID:0000000012199484

- Replace the propeller shaft assembly if there is a breakage or deflection on tube.
- Never hit the tube or apply an impact on it during repair service. Never damage the tube as well.
- The joint cannot be disassembled. Never disassemble it.
- If constant velocity joint was bent during propeller shaft assembly removal, installation, or transportation, its boot may be damaged. Wrap boot interference area to metal part with shop cloth or rubber to protect boot from breakage.

SYMPTOM DIAGNOSIS

NOISE, VIBRATION AND HARSHNESS (NVH) TROUBLESHOOTING

NVH Troubleshooting Chart

INFOID:0000000012199485

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

Reference		DLN-123, "Inspection"	DLN-126, "Inspection"	—	DLN-126, "Inspection"	—	DLN-126, "Inspection"	DLN-123, "Inspection"	NVH of REAR FINAL DRIVE in this section	NVH in FAX, RAX, FSU and RSU section	NVH in WT section	NVH in WT section	NVH in FAX and RAX section	NVH in BR section	NVH in ST section
Possible cause and SUSPECTED PARTS		Uneven rotating torque	Center bearing improper installation	Excessive center bearing axial end play	Center bearing mounting (insulator) cracks, damage or deterioration	Excessive joint angle	Rotation imbalance	Excessive runout	DIFFERENTIAL	AXLE AND SUSPENSION	TIRE	ROAD WHEEL	DRIVE SHAFT	BRAKE	STEERING
Symptom	Noise	×	×	×	×	×	×	×	×	×	×	×	×	×	×
	Shake		×			×				×	×	×	×	×	×
	Vibration	×	×	×	×	×	×	×		×	×		×		×

×: Applicable

PERIODIC MAINTENANCE

REAR PROPELLER SHAFT

Inspection

INFOID:0000000012199486

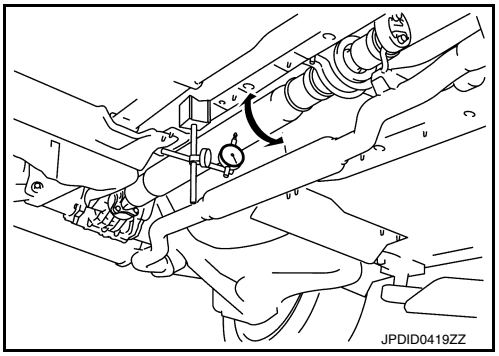
APPEARANCE AND NOISE

- Check the propeller shaft tube surface for dents or cracks. If damaged, replace propeller shaft assembly.
- If center bearing is noisy or damaged, replace propeller shaft assembly.

VIBRATION

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

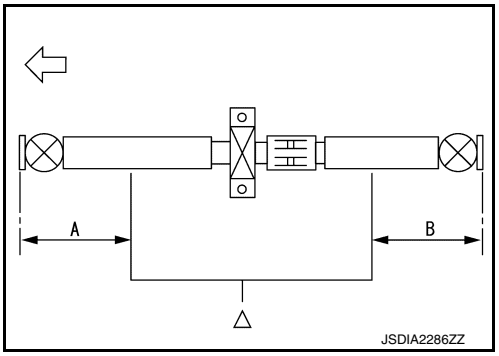
1. With a dial indicator, measure propeller shaft runout at runout measuring points by rotating final drive companion flange with hands.



Propeller shaft runout **: Refer to DLN-128, "Propeller Shaft Runout".**

- Propeller shaft runout measuring point (Point "△")

⇦ : Front



Dimension **A: 542 mm (21.34 in)**
B: 516.5 mm (20.33 in)

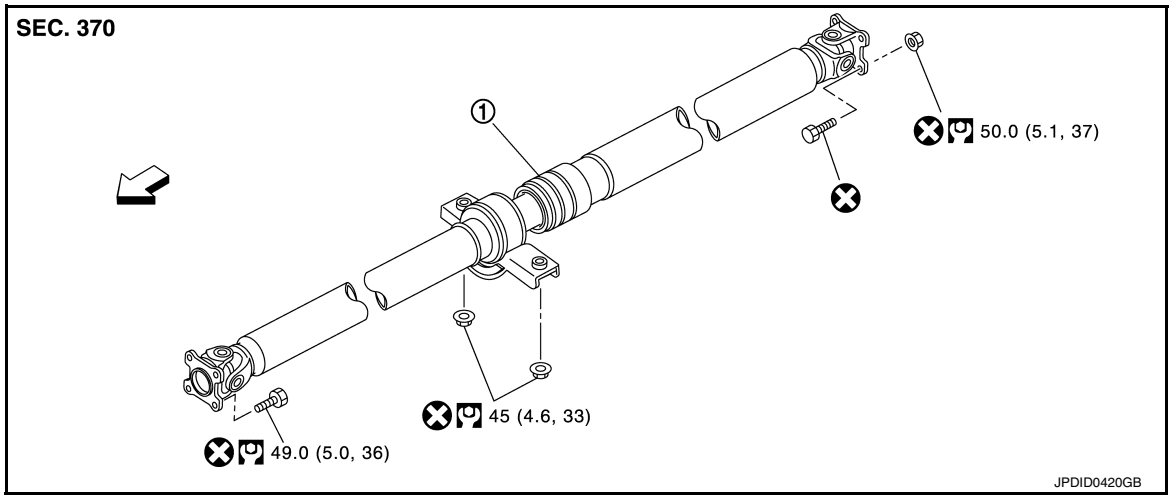
2. If runout still exceeds specifications, separate propeller shaft at final drive companion flange or transfer companion flange; then change the phase between companion flange and propeller shaft by the one bolt hole at a time and install propeller shaft.
3. Check runout again. If runout still exceeds specifications, replace propeller shaft assembly.
4. Check the vibration by driving vehicle.

REMOVAL AND INSTALLATION

REAR PROPELLER SHAFT

Exploded View

INFOID:0000000012199487



1. Propeller shaft assembly

⇦: Vehicle front

: N·m (kg-m, ft-lb)

: Always replace after every disassembly.

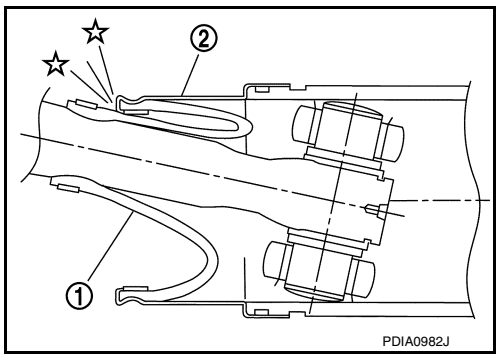
Removal and Installation

INFOID:0000000012199488

REMOVAL

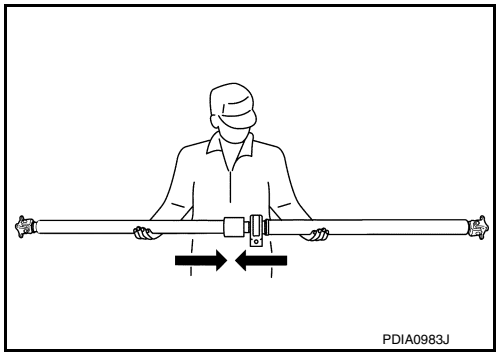
1. Shift the transaxle to the neutral position, and then release the parking brake.
2. Put matching marks on propeller shaft flange yoke and final drive companion flanges.
   CAUTION:
   For matching marks, use paint. Never damage propeller shaft flange yoke and final drive companion flange.
3. Put matching marks on propeller shaft flange yoke and transfer companion flanges.
   CAUTION:
   For matching marks, use paint. Never damage propeller shaft flange yoke and transfer companion flange.
4. Loosen mounting nuts of center bearing mounting bracket.
   NOTE:
   Tighten mounting nuts temporarily.
5. Remove propeller shaft assembly fixing bolts and nuts.
6. Remove center bearing mounting bracket fixing nuts.
7. Remove propeller shaft assembly.
   CAUTION:
   - **This procedure requires 2 workers. Constant velocity joint must be handled with care.**

- **If constant velocity joint was bent during propeller shaft assembly removal, installation, or transportation, its boot (1) may be damaged. Wrap boot interference area to metal part (2) with shop cloth or rubber to protect boot from breakage.**



- **Since no retaining pin is included in sliding direction, the boot may be damaged or dropped if the constant velocity joint is slid out 25 mm (0.98 in) or more from the original length. Therefore, handle constant velocity joint by sliding it inward.**

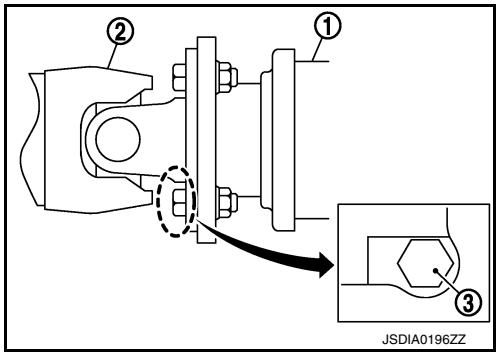
8. Perform inspection after removal. Refer to DLN-126, "Inspection".



INSTALLATION

Note the following, and install in the reverse order of removal.

- Align matching marks to install propeller shaft assembly to final drive and transfer companion flanges.
- To install, adjust front and rear position of mount bracket to avoid deflection (front-rear direction of the vehicle) to the center bearing insulator.
- Perform inspection after installation. Refer to DLN-126, "Inspection".
- After tightening the bolts and nuts to the specification torque, check that the bolts (3) on the flange side is tightened as shown in the figure.

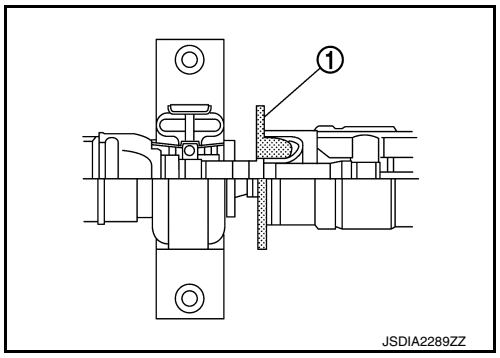


1. Final drive assembly
2. Propeller shaft assembly

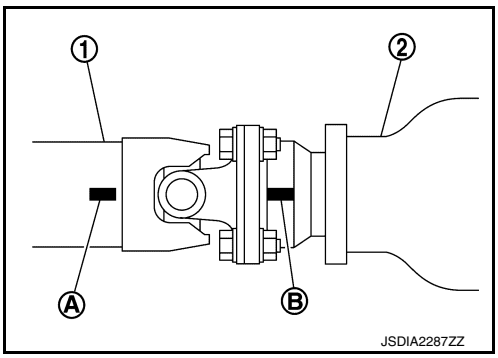
- If propeller shaft assembly or final drive assembly has been replaced, connect them as follows:

CAUTION:

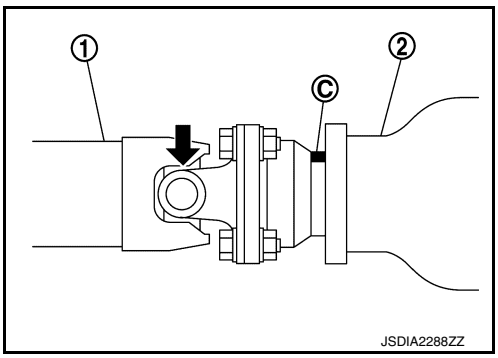
Constant velocity joint of a new propeller shaft has a preinstalled protector (1). Protector must be removed after installing propeller shaft.



1. Install propeller shaft (1) while aligning its matching mark (A) of propeller shaft with the matching mark (B) of final drive (2) on the joint as close as possible.
2. Temporary tighten bolts and nuts.



3. Press down propeller shaft (1) with matching mark (C) of final drive (2) facing upward. Then tighten fixing bolts and nuts to the specified torque.



Inspection

INFOID:0000000012199489

INSPECTION AFTER REMOVAL

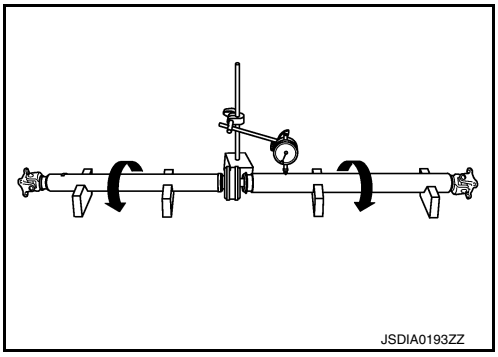
Appearance

Check the propeller shaft for bend and damage. If damage is detected, replace propeller shaft assembly.

Propeller Shaft Runout

Check propeller shaft runout at measuring points with a dial indicator. If runout exceeds specifications, replace propeller shaft assembly.

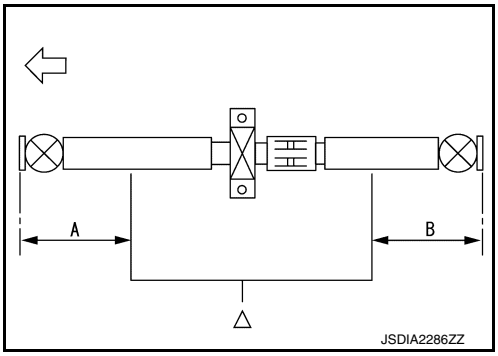
Propeller shaft runout **: Refer to DLN-128, "Propeller Shaft Runout".**



- Propeller shaft runout measuring point (Point "△")

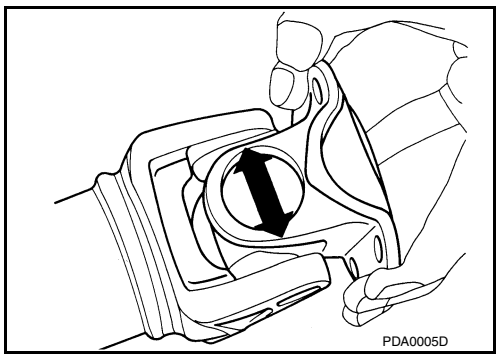
⇦ : Front

Dimension **A: 542 mm (21.34 in)**
B: 516.5 mm (20.33 in)



Journal Axial Play

As shown in the figure, while fixing yoke on one side, check axial play of joint. If it is outside the standard, replace propeller shaft assembly.



Journal axial play	**: Refer to DLN-128, "Journal Axial Play".**

CAUTION:
Never disassemble joints.

Center Bearing

Check center bearing for noise and damage. If noise or damage is detected, replace propeller shaft assembly.

CAUTION:
Never disassemble center bearing.

INSPECTION AFTER INSTALLATION

After assembly, perform a driving test to check propeller shaft vibration. If vibration occurred, separate propeller shaft from final drive or transfer. Reinstall companion flange by changing the phase between companion flange and propeller shaft by the one bolt hole at a time. Then perform driving test and check propeller shaft vibration again at each point.

SERVICE DATA AND SPECIFICATIONS (SDS)

SERVICE DATA AND SPECIFICATIONS (SDS)

General Specifications

INFOID:0000000012199490

Applied model		MR16DDT
Propeller shaft model		3Fϕ16-ETJ75
Number of joints		3
Shaft length	1st (Spider to CVJ joint center)	1051 mm (41.38 in)
	2nd (CVJ joint center to spider)	1000 mm (39.37 in)
Shaft outer diameter	1st	57 mm (2.500 in)
	2nd	75 mm (2.95 in)
Type of journal bearings (Non-disassembly type)	1st joint	Sell type
	2nd joint	CVJ type
	3rd joint	Shell type
Coupling method	Transfer side	Flange type
	Rear final drive side	Flange type

Propeller Shaft Runout

INFOID:0000000012199491

Unit: mm (in)

Item	Limit
Propeller shaft runout	1.0 (0.031)

Journal Axial Play

INFOID:0000000012199492

Unit: mm (in)

Item	Standard
Journal axial play	0 (0)

PRECAUTION

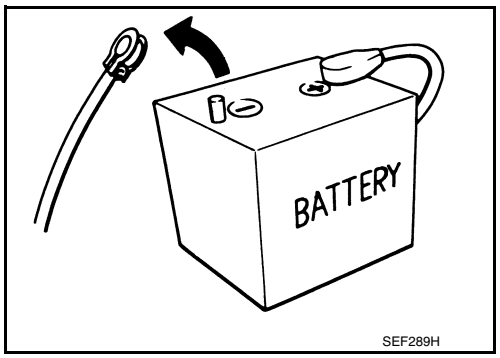
PRECAUTIONS

Precautions for Removing Battery Terminal

INFOID:0000000012833561

When disconnecting the battery terminal, pay attention to the following.
- Always use a 12V battery as power source.
- Never disconnect battery terminal while engine is running.
- When removing the 12V battery terminal, turn OFF the ignition switch and wait at least 30 seconds.
- For vehicles with the engine listed below, remove the battery terminal after a lapse of the specified time:

D4D engine	: 20 minutes	YS23DDT	: 4 minutes
HRA2DDT	: 12 minutes	YS23DDTT	: 4 minutes
K9K engine	: 4 minutes	ZD30DDTi	: 60 seconds
M9R engine	: 4 minutes	ZD30DDTT	: 60 seconds
R9M engine	: 4 minutes		
V9X engine	: 4 minutes		
YD25DDTi	: 2 minutes		



NOTE:
ECU may be active for several tens of seconds after the ignition switch is turned OFF. If the battery terminal is removed before ECU stops, then a DTC detection error or ECU data corruption may occur.
- After high-load driving, if the vehicle is equipped with the V9X engine, turn the ignition switch OFF and wait for at least 15 minutes to remove the battery terminal.

NOTE:
- Turbocharger cooling pump may operate in a few minutes after the ignition switch is turned OFF.
- Example of high-load driving
  - Driving for 30 minutes or more at 140 km/h (86 MPH) or more.
  - Driving for 30 minutes or more on a steep slope.
- For vehicles with the 2-batteries, be sure to connect the main battery and the sub battery before turning ON the ignition switch.

NOTE:
If the ignition switch is turned ON with any one of the terminals of main battery and sub battery disconnected, then DTC may be detected.
- After installing the 12V battery, always check "Self Diagnosis Result" of all ECUs and erase DTC.

NOTE:
The removal of 12V battery may cause a DTC detection error.

Service Notice or Precautions for Rear Final Drive

INFOID:0000000012199494

- Check for the correct installation status prior to removal or disassembly. If matching marks are required, be certain they do not interfere with the function of the parts when applied.
- Overhaul should be done in a clean work area, it is preferable to work in dustproof area.
- Before disassembly, using steam or white gasoline, completely remove sand and mud from the exterior of the unit, preventing them from entering into the unit during disassembly or assembly.
- Check appearance of the disassembled parts for damage, deformation, and unusual wear. Replace them with a new one if necessary.
- Gaskets and seals should be replaced any time when the unit is disassembled.
- In principle, tighten bolts or nuts gradually in several steps working diagonally from inside to outside. If tightening sequence is specified, observe it.
- Clean and flush the parts sufficiently and blow-dry them.
- Never damage sliding surfaces and mating surfaces.
- When applying sealant, remove the old sealant from the mounting surface; then remove any moisture, oil, and foreign materials from the application and mounting surfaces.
- Always use shop paper for cleaning the inside of components.
- Avoid using cotton gloves or shop rags to prevent entering of lint.
- During assembly, observe the specified tightening torque, and apply new gear oil, petroleum jelly, or multi-purpose grease as specified for each vehicle, if necessary.

- Dispose of the waste oil using the methods prescribed law, ordinance, etc., after replacing gear oil.

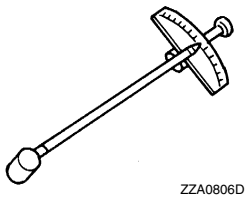
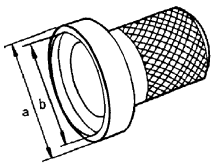
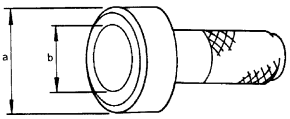
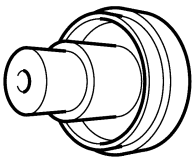
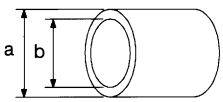
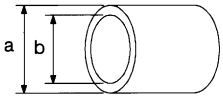
PREPARATION

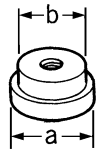
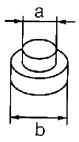
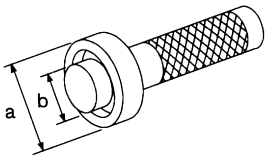
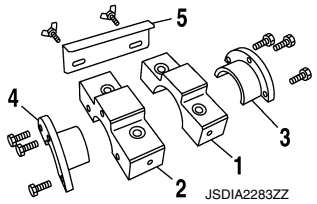
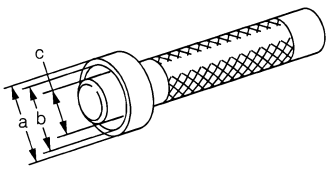
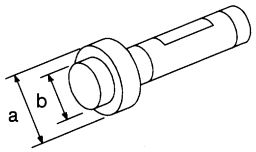
PREPARATION

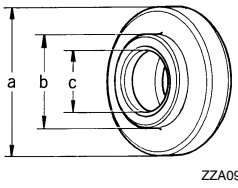
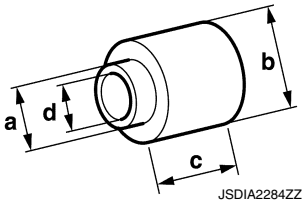
Special Service Tools

INFOID:0000000012199495

The actual shapes of TechMate tools may differ from those of special service tools illustrated here.

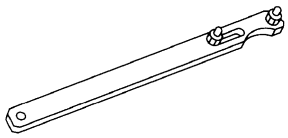
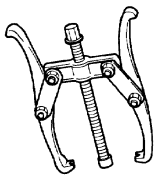
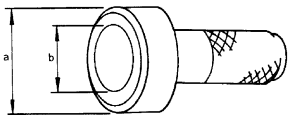
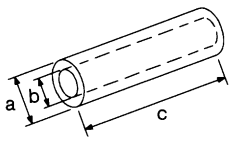
Tool number (TechMate No.) Tool name	Description
ST3127S000 (J-25765-A) Preload gauge  ZZA0806D	Measuring pinion bearing preload and total preload.
ST33400001 (J-26082) Drift a: 60 mm (2.36 in) dia. b: 47 mm (1.85 in) dia.  ZZA0814D	Installing side oil seal (right).
KV38100500 (—) Drift a: 85 mm (3.35 in) dia. b: 60 mm (2.36 in) dia.  ZZA0811D	Installing side oil seal (left).
KV38109700 (—) Drift  JSDIA2282ZZ	Installing electric controlled coupling oil seal.
KV38109820 (—) Drift a: 54.6 mm (2.150 in) dia. b: 34 mm (1.34 in) dia.  S-NT474	Compressing center stem assembly with side bearing.
KV38109810 (—) Drift a: 79.9 mm (3.146 in) dia. b: 60 mm (2.36 in) dia.  S-NT474	Compressing center stem assembly with side bearing.

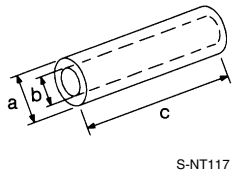
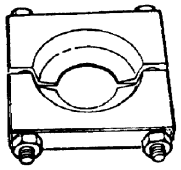
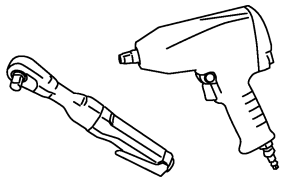
Tool number (TechMate No.) Tool name	Description
ST33052000 (—) Drift a: 28 mm (1.10 in) dia. b: 22 mm (0.87 in) dia.  ZZA1000D	• Removing inner race of side bearing (right). • Installing center stem.
ST02371000 (—) Drift a: 40 mm (1.57 in) dia. b: 50 mm (1.97 in) dia.  ZZA0969D	Removing inner race of side bearing (left).
ST33220000 (J-25804-01) Drift a: 37 mm (1.46 in) dia. b: 22 mm (0.87 in) dia.  NT084	Removing center stem.
KV381096S0 (—) Dummy cover set 1. KV38109610 (—) Bearing guide 90 2. KV38109620 (—) Bearing guide 68 3. KV38109630 (—) Dummy cap spacer 90 4. KV38109640 (—) Dummy cap spacer 68 5. KV38109650 (—) Angle  JSDIA2283ZZ	• Checking drive gear runout. • Checking tooth contact. • Checking backlash.
ST33190000 (—) Drift a: 52 mm (2.05 in) dia. b: 45.5 mm (1.791 in) dia. c: 34 mm (1.34 in) dia.  ZZA1046D	Installing outer race of pinion bearing (front).
ST37830000 (—) Drift a: 62 mm (2.44 in) dia. b: 39 mm (1.54 in) dia.  NT049	Installing outer race of pinion bearing (rear).

Tool number (TechMate No.) Tool name	Description
ST33032000 (—) Drift a: 80 mm (3.15 in) dia. b: 38 mm (1.50 in) dia. c: 31 mm (1.22 in) dia.  ZZA0978D	Installing inner race of pinion bearing (rear).
KV37710000 (—) Drift a: 38 mm (1.50 in) dia. b: 60 mm (2.36 in) dia. c: 77 mm (3.03 in) d: 30 mm (1.18 in) dia.  JSDIA2284ZZ	Installing inner race of pinion bearing (front).

Commercial Service Tools

INFOID:0000000012199496

Tool name	Description
Flange wrench  NT035	Removing and installing drive pinion lock nut.
Puller  ZZA0119D	• Removing companion flange. • Removing inner race of side bearing (right). • Removing inner race of side bearing (left).
Drift a: 63 – 76 mm (2.48 – 2.99 in) dia. b: 55 – 60 mm (2.17 – 2.36 in) dia.  ZZA0811D	Installing front oil seal.
Drift a: 45 – 47 mm (1.77 – 1.85 in) dia. b: 41 – 43 mm (1.57 – 1.69 in) dia. c: 25 mm (0.98 in) or more  S-NT117	Installing inner race of side bearing (right).

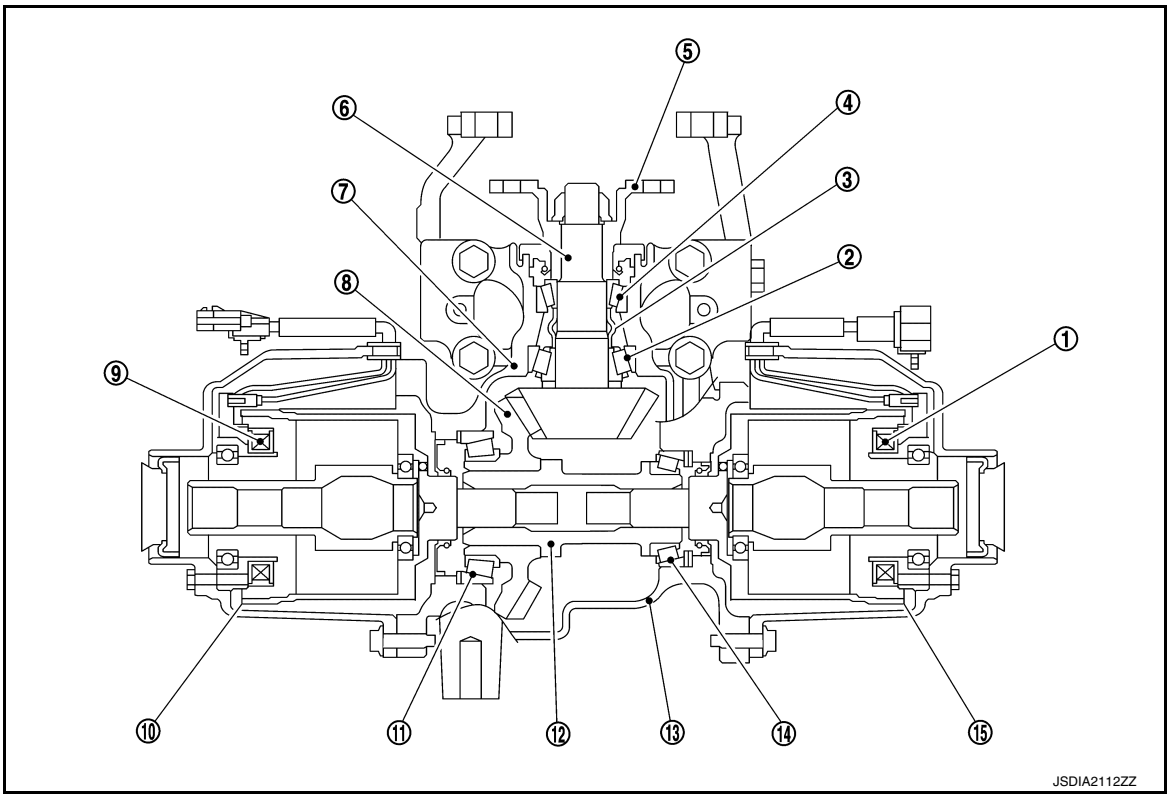
Tool name	Description
Drift a: 60 – 62 mm (2.36 – 2.44 in) dia. b: 56 – 58 mm (2.20 – 2.28 in) dia. c: 25 mm (0.98 in) or more  S-NT117	Installing inner race of side bearing (left).
Replacer  ZZA0700D	• Removing inner race of pinion bearing (rear). • Removing inner race of side bearing (right). • Removing inner race of side bearing (left).
Power tool  PBIC0190E	Loosening bolts and nuts

SYSTEM DESCRIPTION

STRUCTURE AND OPERATION

Sectional View

INFOID:0000000012199497



1. AWD solenoid (right)
2. Pinion bearing (rear)
3. Collapsible spacer
4. Pinion bearing (front)
5. Companion flange
6. Drive pinion
7. Gear carrier
8. Drive gear
9. AWD solenoid (left)
10. Electric controlled coupling (left)
11. Side bearing (left)
12. Center stem
13. Rear cover
14. Side bearing (right)
15. Electric controlled coupling (right)

Electric controlled coupling

INFOID:0000000012199498

The electric controlled coupling operates as the AWD system. For the operation, refer to DLN-14, "Operation Principle".

SYMPTOM DIAGNOSIS

NOISE, VIBRATION AND HARSHNESS (NVH) TROUBLESHOOTING

NVH Troubleshooting Chart

INFOID:0000000012199499

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

Reference		DLN-166, "Inspection"	DLN-162, "Adjustment"	DLN-166, "Inspection"	DLN-162, "Adjustment"	DLN-162, "Adjustment"	DLN-137, "Inspection"	NVH of PROPELLER SHAFT in this section	NVH in FAX, RAX, FSU and RSU sections	NVH in WT section	NVH in WT section	NVH in FAX and RAX section	NVH in BR section	NVH in ST section
Possible cause and SUSPECTED PARTS		Gear tooth rough	Gear contact improper	Tooth surfaces worn	Backlash incorrect	Companion flange excessive runout	Gear oil improper	PROPELLER SHAFT	AXLE AND SUSPENSION	TIRE	ROAD WHEEL	DRIVE SHAFT	BRAKE	STEERING
Symptom	Noise	×	×	×	×	×	×	×	×	×	×	×	×	×

×: Applicable

PERIODIC MAINTENANCE

REAR DIFFERENTIAL GEAR OIL

Inspection

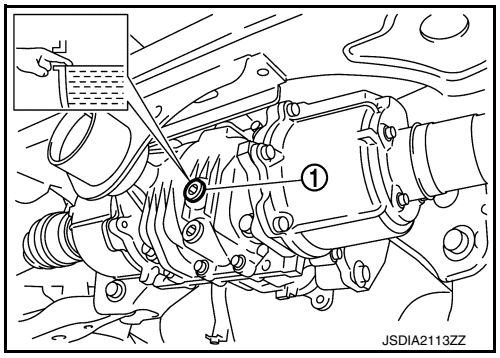
INFOID:0000000012199500

OIL LEAKAGE

Check rear final drive surrounding area (oil seal, drain plug, filler plug, and gear carrier, etc.) for oil leakage.

OIL LEVEL

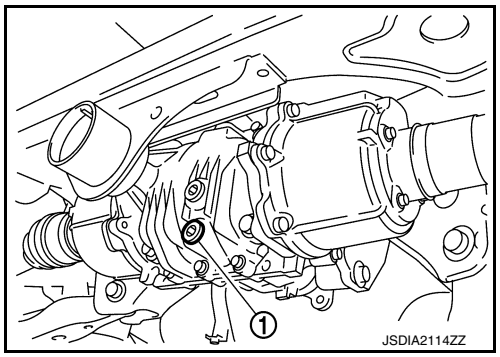
1. Remove filler plug (1) and check oil level from filler plug mounting hole as shown in the figure.
   CAUTION:
   Never start engine while checking oil level.
2. Set a new gasket on filler plug and install it on final drive assembly. Refer to DLN-158, "Exploded View".
   CAUTION:
   Never reuse gasket.



Draining

INFOID:0000000012199501

1. Stop engine.
2. Remove drain plug (1) and drain gear oil.
3. Set a new gasket on drain plug and install it to final drive assembly and tighten to the specified torque. Refer to DLN-158, "Exploded View".
   CAUTION:
   Never reuse gasket.



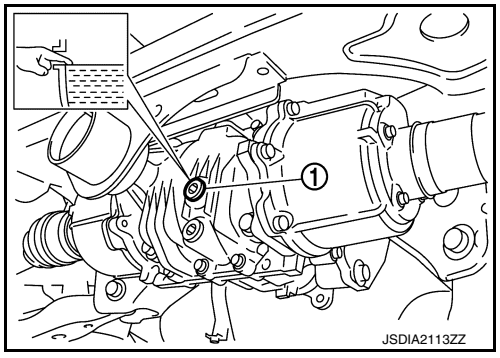
Refilling

INFOID:0000000012199502

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

Oil grade and viscosity	**: Refer to MA-11, "Fluids and Lubricants".**
Oil capacity	**: Refer to DLN-175, "General Specification".**

2. After refilling oil, check oil level. Set a new gasket to filler plug, then install it to final drive assembly. Refer to DLN-158, "Exploded View".
   CAUTION:
   Never reuse gasket.

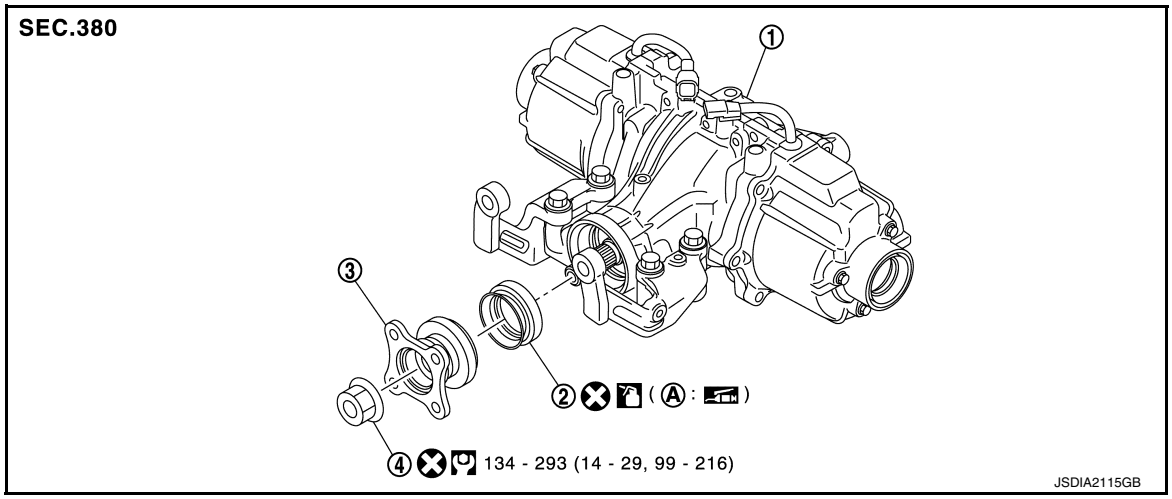


REMOVAL AND INSTALLATION

FRONT OIL SEAL

Exploded View

INFOID:0000000012199503



1. Rear final drive assembly
2. Front oil seal
3. Companion flange
4. Companion flange lock nut
A. Oil seal lip

: Always replace after every disassembly

: N·m (kg-m, ft-lb)

: Apply multi purpose grease

: Apply gear oil.

Removal and Installation

INFOID:0000000012199504

REMOVAL

CAUTION:

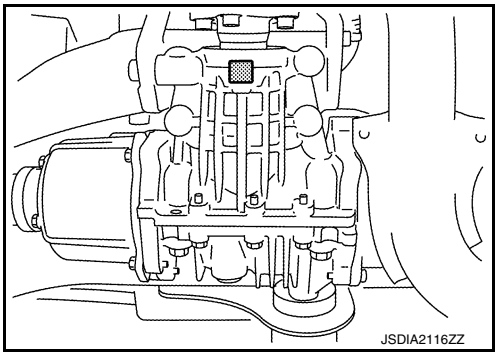
Verify identification stamp of replacement frequency put in the lower part of gear carrier to determine replacement for collapsible spacer when replacing front oil seal. Refer to "Identification stamp of replacement frequency of front oil seal". If collapsible spacer replacement is necessary, remove final drive assembly and disassemble it to replace front oil seal and collapsible spacer. Refer to DLN-151, "Removal and Installation" and DLN-169, "Disassembly".

NOTE:

The reuse of collapsible spacer is prohibited in principle. However, it is reusable on a one-time basis only in cases when replacing front oil seal.

Identification stamp of replacement frequency of front oil seal

- The diagonally shaded area in the figure shows stamping point for replacement frequency of front oil seal.
- The following table shows if collapsible spacer replacement is needed before replacing front oil seal.
  When collapsible spacer replacement is required, disassemble final drive assembly to replace collapsible spacer and front oil seal. Refer to DLN-169, "Disassembly".



Stamp	Collapsible spacer replacement
No stamp	Not required

Stamp	Collapsible spacer replacement
“0” or “0” on the far right of stamp	Required
“01” or “1” on the far right of stamp	Not required

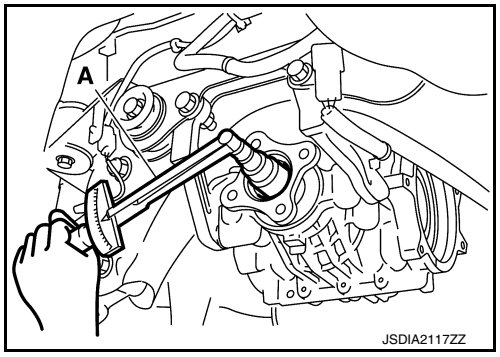
CAUTION:
Make a stamping after replacing front oil seal.

- After replacing front oil seal, make a stamping on the stamping point in accordance with the table below in order to identify replacement frequency.

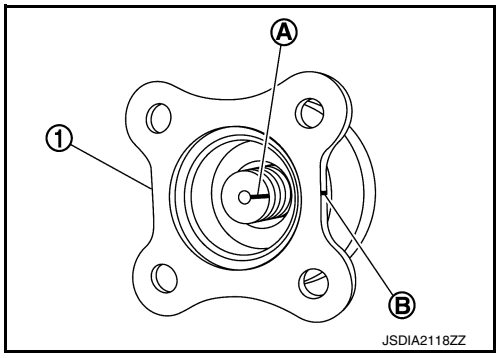
CAUTION:
Make a stamping from left to right.

Stamp before stamping	Stamping on the far right	Stamping
No stamp	0	0
“0” (Front oil seal was replaced once.)	1	01
“01” (Collapsible spacer and front oil seal were replaced last time.)	0	010
“0” is on the far right. (Only front oil seal was replaced last time.)	1	...01
“1” is on the far right. (Collapsible spacer and front oil seal were replaced last time.)	0	...010

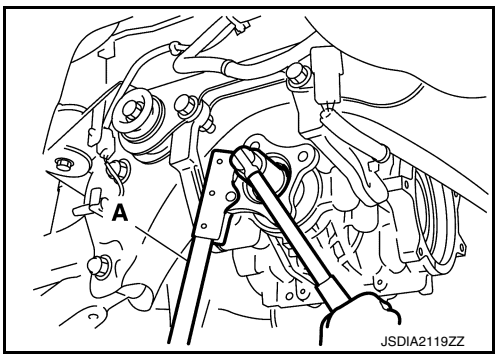
1. Drain gear oil. Refer to DLN-137, "Draining".
2. Make a judgment if a collapsible spacer replacement is required.
3. Remove propeller shaft. Refer to DLN-124, "Removal and Installation".
4. Remove rear drive shaft. Refer to RAX-19, "Removal and Installation".
5. Remove electric controlled couplings. Refer to DLN-145, "Removal and Installation".
6. Measure the total preload with the preload gauge (A) [SST: ST3127S000 (J-25765-A)].
   NOTE:
   Record the preload measurement.



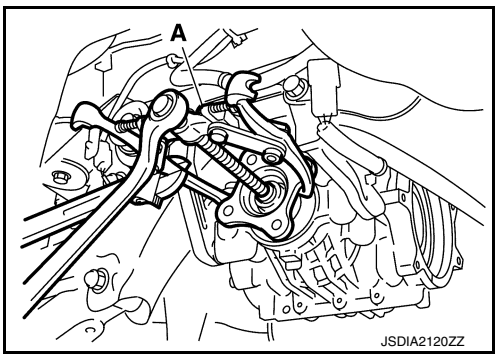
7. Put matching mark (A) on the end of the drive pinion. The matching mark should be in line with the matching mark (B) on companion flange (1).
   CAUTION:
   For matching mark, use paint. Never damage companion flange and drive pinion.



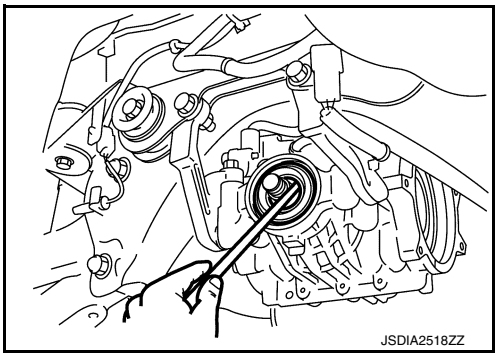
8. Remove companion flange lock nut using the flange wrench (A) (Commercial service tool).



9. Remove companion flange using the puller (A) (Commercial service tool).

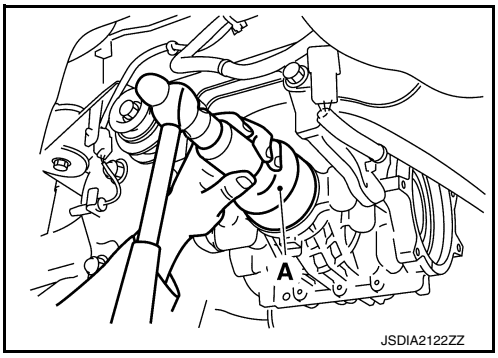


10. Remove front oil seal using the suitable oil seal remover.
CAUTION:
Never damage gear carrier and drive pinion.

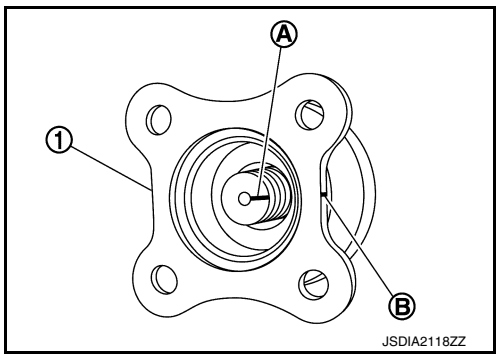


INSTALLATION

1. Apply multi-purpose grease to front oil seal lips.
2. Using the drift (A) (Commercial service tool), drive front oil seal until it becomes flush with the gear carrier end.
CAUTION:
- **Never reuse oil seal.**
- **Never incline oil seal when installing.**



3. Align the matching mark (A) of drive pinion with the matching mark (B) of companion flange (1), and then install the companion flange.

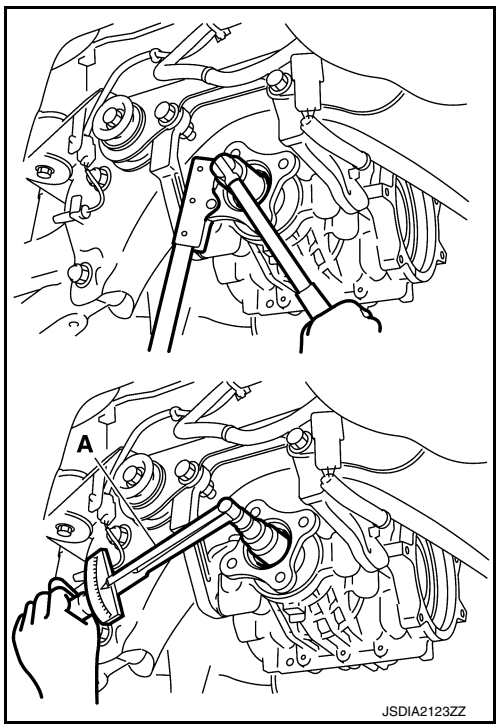


4. Temporarily tighten drive pinion lock nut to drive pinion, using the flange wrench (Commercial service tool).
CAUTION:
- **Never reuse drive pinion lock nut.**
- **Apply anti-corrosion oil to the thread and seat of new drive pinion lock nut.**

5. Tighten drive pinion lock nut within the limits of specified torque so as to keep the pinion bearing preload within a standard values, using the preload gauge (A) [SST: ST3127S000 (J-25765-A)].

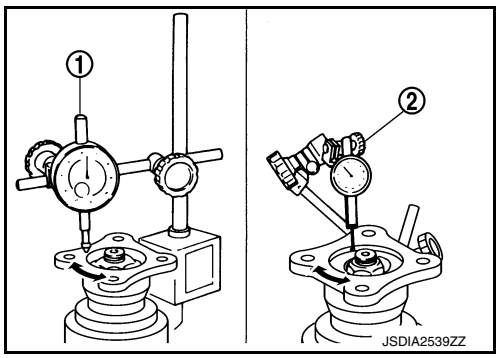
Total preload torque : A value that add 0.1 – 0.4 N·m (0.01 – 0.04 kg-m, 1.0 – 3.0 in-lb) to the measured value before removing.

CAUTION:
- **Adjust to the lower limit of the drive pinion lock nut tightening torque first.**
- **If the preload torque exceeds the specified value, replace collapsible spacer and tighten it again to adjust. Never loosen drive pinion lock nut to adjust the preload torque.**



6. Check for companion flange runout as follows:
- For companion flange face, fit a dial indicator (1) onto the companion flange face (inner side of the propeller shaft mounting bolt holes). For inner side of the companion flange, fit a test indicator (2) to the inner side of companion flange (socket diameter).
- Rotate companion flange to check for runout.

Companion flange runout : Refer to DLN-175, "Companion Flange Runout".



- If the runout value is outside the runout limit, follow the procedure below to adjust.
- Check for runout while changing the phase between companion flange and drive pinion by 90° step, and search for the position where the runout is the minimum.
- If the runout value is still outside of the limit after the phase has been changed, replace companion flange.
- If the runout value is still outside of the limit after companion flange has been replaced, possible cause will be an assembly malfunction of drive pinion.

7. Make a stamping for identification of front oil seal replacement frequency. Refer to “Identification stamp of replacement frequency of front oil seal”.
CAUTION:
Make a stamping after replacing front oil seal.

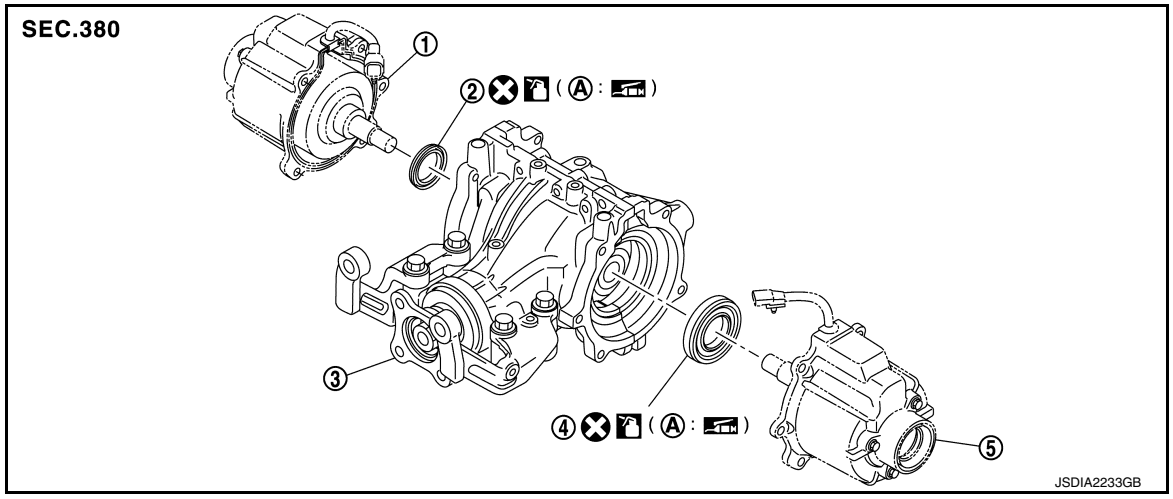
8. Install electric controlled couplings. Refer to DLN-145, "Removal and Installation".

9. Install rear drive shaft. Refer to RAX-19, "Removal and Installation".
10. Install propeller shaft. Refer to DLN-124, "Removal and Installation".
11. Refill gear oil to the final drive and check level. Refer to DLN-137, "Refilling".
12. Check the final drive for oil leakage. Refer to DLN-137, "Inspection".

SIDE OIL SEAL

Exploded View

INFOID:0000000012199505



1. Electric controlled coupling (right)
2. Side oil seal (right)
3. Rear final drive assembly
4. Side oil seal (left)
5. Electric controlled coupling (left)

A. Oil seal lip

: Always replace after every disassembly.

: Apply multi purpose grease

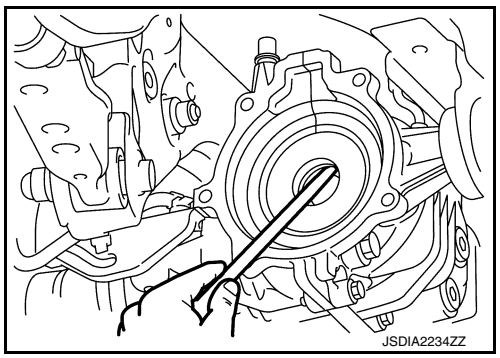
: Apply gear oil.

Removal and Installation

INFOID:0000000012199506

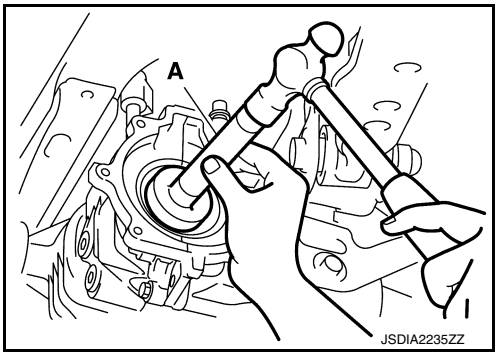
REMOVAL

1. Drain gear oil. Refer to DLN-137, "Draining".
2. Remove electric controlled couplings. Refer to DLN-145, "Removal and Installation".
3. Remove side oil seal with the suitable oil seal remover.
   CAUTION:
   Never damage gear carrier and rear cover.

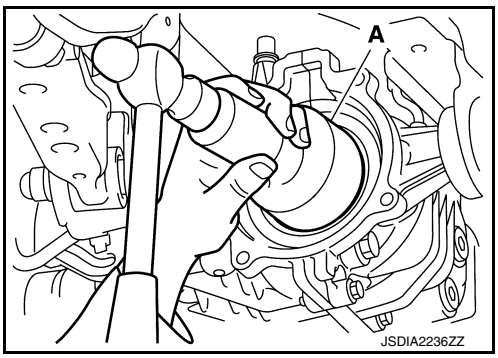


INSTALLATION

1. Install side oil seal (right) until it becomes flush with the gear carrier end, using the drift (A) [SST: ST33400001 (J-26082)].
   CAUTION:
   - **Never reuse oil seal.**
   - **When installing, never incline oil seal.**
   - **Apply multi-purpose grease onto oil seal lip, and gear oil onto the circumference of oil seal.**



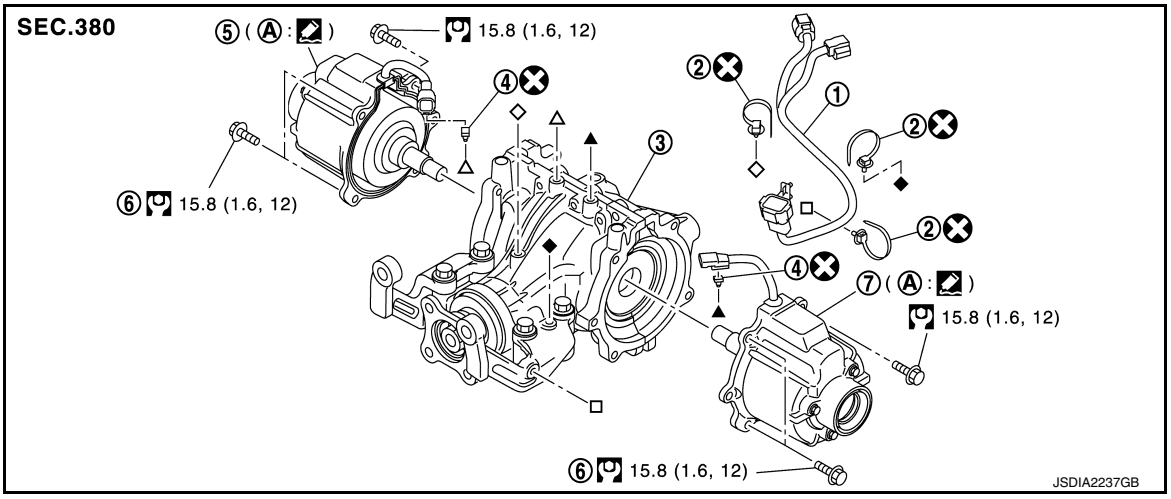
2. Install side oil seal (left) until it becomes flush with the gear carrier end, using the drift (A) [SST: KV38100500 (—)].
   CAUTION:
   - **Never reuse oil seal.**
   - **When installing, never incline oil seal.**
   - **Apply multi-purpose grease onto oil seal lip, and gear oil onto the circumference of oil seal.**
3. Install electric controlled couplings. Refer to DLN-145, "Removal and Installation".
4. Refill gear oil to the final drive and check level. Refer to DLN-137, "Refilling".
5. When oil leaks while removing, check oil level after the installation. Refer to DLN-137, "Inspection".



ELECTRIC CONTROLLED COUPLING

Exploded View

INFOID:0000000012199507



1. Sub-harness
2. Band clip
3. Rear final drive assembly
4. Connector clip
5. Electric controlled coupling (right)
6. Reamer bolt
7. Electric controlled coupling (left)
A. Gear carrier mounting face

⊗: Always replace after every disassembly.

: N·m (kg-m, ft-lb)

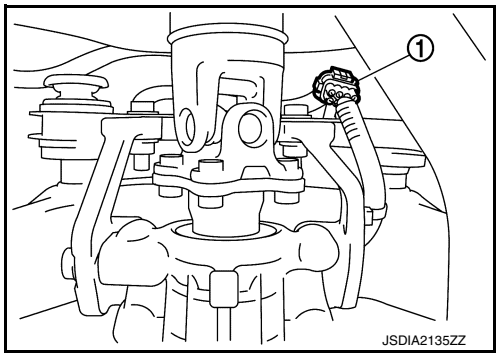
: Apply Genuine Liquid Gasket, Three Bond 1217 or equivalent.

Removal and Installation

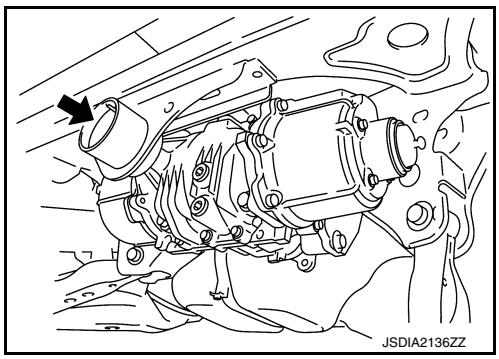
INFOID:0000000012199508

REMOVAL

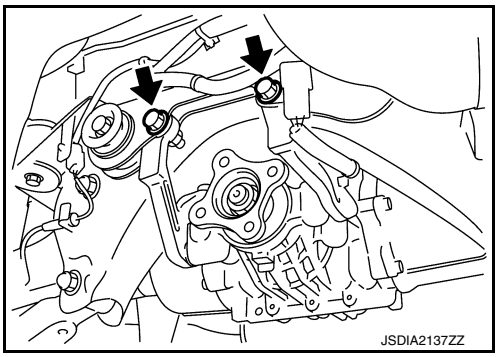
1. Remove rear drive shaft. Refer to RAX-19, "Removal and Installation".
2. Disconnect sub-harness connector (1).
3. Remove propeller shaft assembly. Refer to DLN-124, "Removal and Installation".
4. Support rear final drive assembly with a suitable jack.



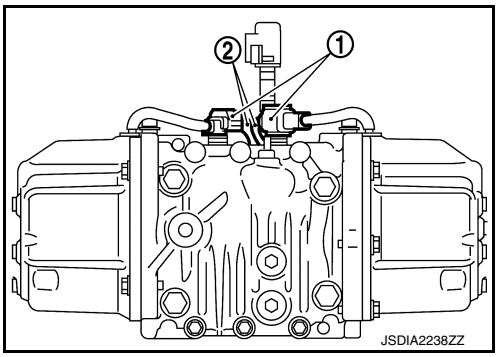
5. Remove rear final drive mounting bolt (⬅) at rear suspension member.



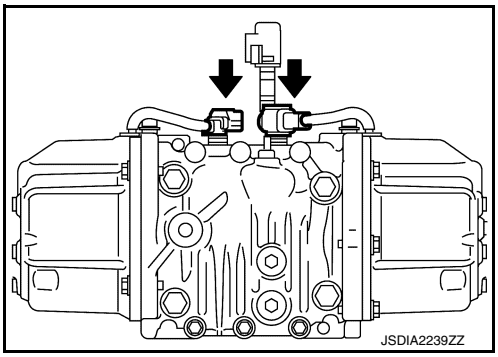
6. Remove final drive mounting bolts and nuts (⬅) with power tool.
7. Lower rear final drive assembly to the position where electric controlled coupling connector can be disconnect.
   CAUTION:
   Secure final drive assembly to a suitable jack while removing it.



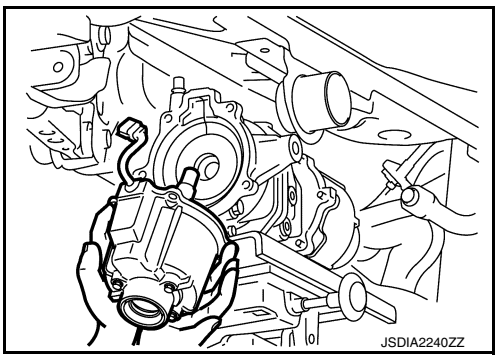
8. Disconnect electric controlled coupling connector (1) from sub-harness (2).



9. Remove electric controlled coupling connector from final drive assembly.



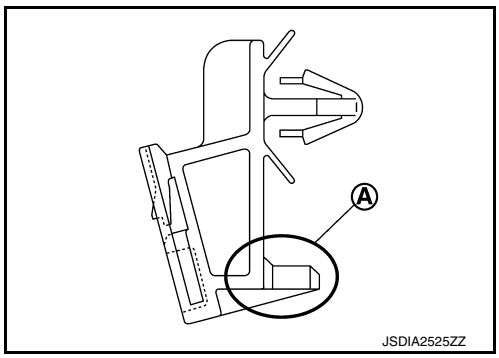
10. Remove electric controlled coupling from final drive assembly.
11. Remove sub-harness from final drive assembly.
    CAUTION:
    - **Remove sub-harness only when necessary.**
    - **Never damage side oil seal.**



INSTALLATION

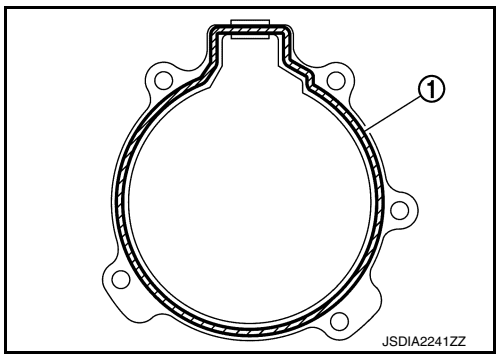
1. If remove sub–harness, replace band clip to sub-harness, and then install sub–harness to rear final drive assembly.
   CAUTION:
   - **Never reuse band clip.**
   - **Check original mounting dimensions to install clip to the original position.**

- **Pin (A) of sub–harness connector clip must be functioning certainly as baffle pin.**
- **Check the area around the rotating object to see that there is no interference.**

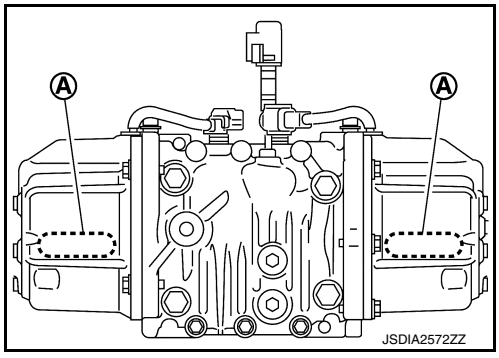


2. Apply liquid gasket (1) to mating surface of coupling cover.
   - Use Genuine Silicone RTV or equivalent. Refer to GI-22, "Recommended Chemical Products and Sealants".

CAUTION:
- **Remove old gasket adhering to the mounting surfaces. Also remove any moisture, oil, or foreign material adhering to the mounting surfaces.**
- **Overlap both ends of the bead for at least 3 mm (0.12 in).**
- **Apply liquid gasket to grommet as well.**
- **The width of sealant bend is approximately 3 mm (0.012 in).**



- **Never allow liquid gasket to contact the unit characteristics (A) of the coupling cover.**



3. Install electric controlled coupling (1) to spline of center stem with grommet of harness facing upward, temporarily tighten reamer bolts (2) to the positions shown in the figure.

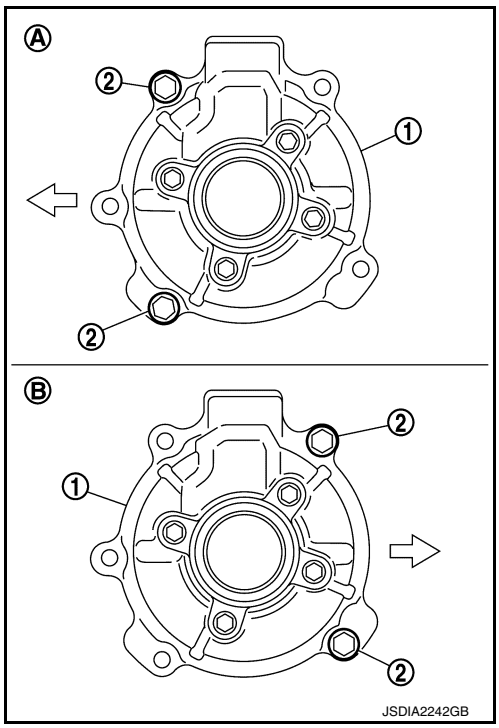
A: Left side
B: Right side

⇦: Vehicle front

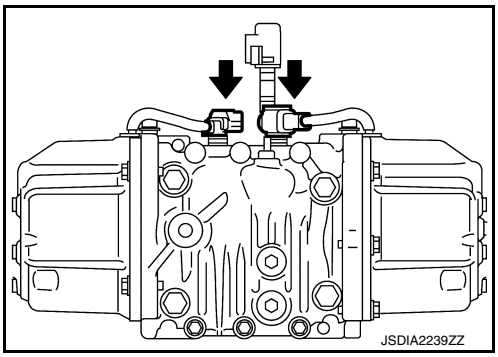
CAUTION:
Never damage side oil seal.

4. Tighten reamer bolts and coupling cover mounting bolts to the specified torque.

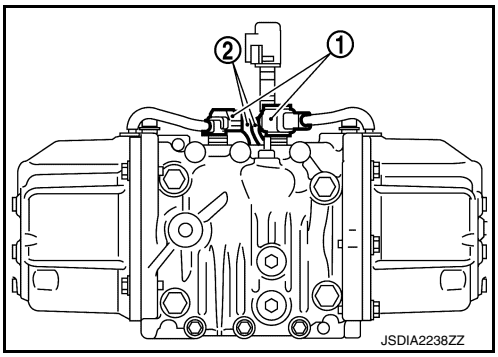
CAUTION:
Never allow harness to get caught in the bolt.



5. Replace connector clip from electric controlled coupling connector, and then insert it to final drive assembly.
   CAUTION:
   - **Never reuse connector clip.**
   - **When inserting connector clip to final drive assembly, never tug harness.**



6. Connect electric controlled coupling connector (1) to sub-harness (2).
7. Install rear drive shaft. Refer to RAX-19, "Removal and Installation".
   CAUTION:
   Never damage electric controlled coupling oil seal.
8. Install propeller shaft assembly. Refer to DLN-124, "Removal and Installation".
9. When oil leaks while removing, check oil level after the installation. Refer to DLN-137, "Inspection".



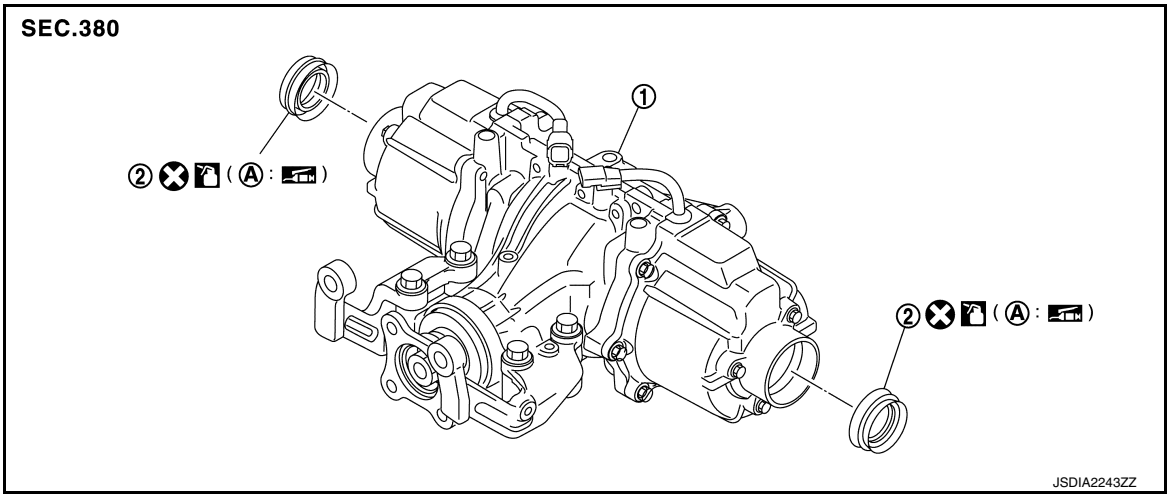
10. When replacing electric controlled coupling, perform writing unit characteristics after installing rear final drive assembly to the vehicle. Refer to DLN-42, "Work Procedure".
    CAUTION:
    Always writing unit characteristics of both side electric controlled couplings.

ELECTRIC CONTROLLED COUPLING OIL SEAL

Exploded View

INFOID:0000000012199509

SEC.380



1. Rear final drive assembly
2. Electric controlled coupling oil seal

A. Oil seal lip

: Always replace after every disassembly.

: Apply multi purpose grease

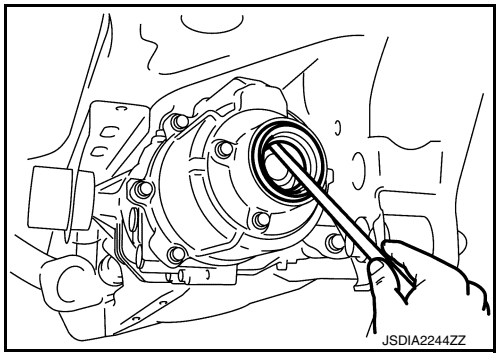
: Apply gear oil.

Removal and Installation

INFOID:0000000012199510

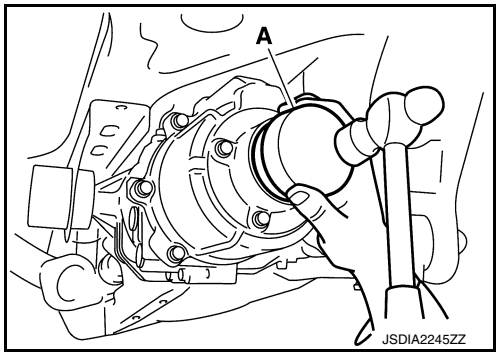
REMOVAL

1. Remove rear drive shafts. Refer to RAX-19, "Removal and Installation".
2. Remove electric controlled coupling oil seal from electric controlled coupling, using the suitable oil seal remover.
   CAUTION:
   Never damage electric controlled coupling.



INSTALLATION

1. Using the drift (A) [SST: KV38109700 (—)], install electric controlled coupling oil seal to electric controlled coupling to electric controlled coupling all the way until SST contact the end.
   NOTE:
   The use of SST satisfies the mounting dimensions.
   CAUTION:
   - **Always use SST [KV38109700 (—)].**
   - **Never reuse oil seal.**
   - **When installing, never incline oil seal.**
   - **Apply multi-purpose grease onto oil seal lips, and gear oil onto the circumference of oil seal.**



2. Install rear drive shafts. Refer to RAX-19, "Removal and Installation".

CAUTION:

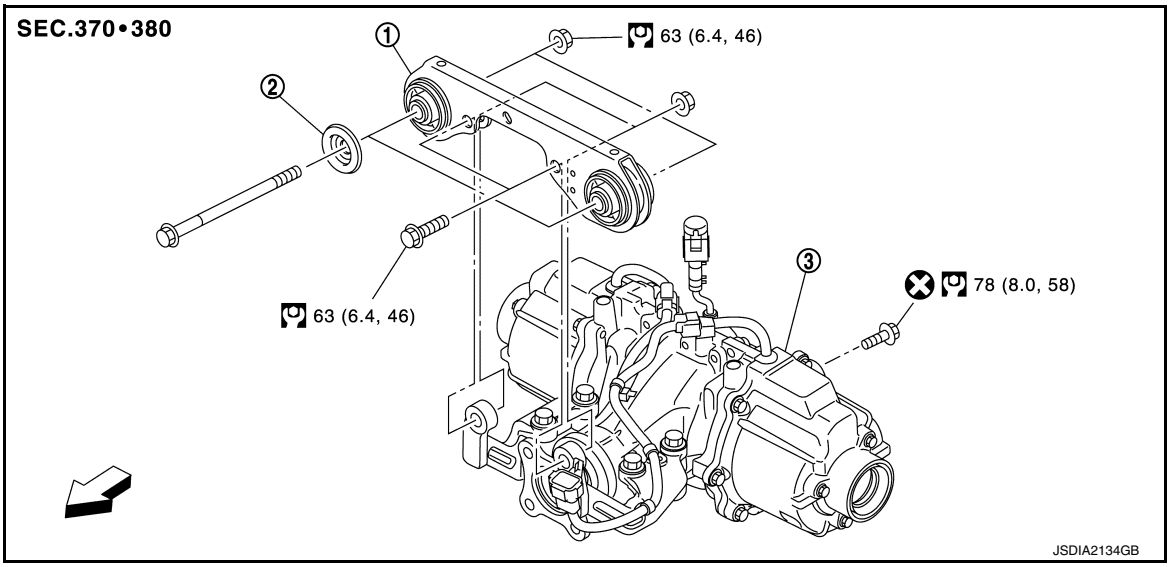
Never damage electric controlled coupling oil seal.

UNIT REMOVAL AND INSTALLATION

REAR FINAL DRIVE ASSEMBLY

Exploded View

INFOID:0000000012199511



1. Final drive mounting bracket
2. Washer
3. Rear final drive assembly

⇦: Vehicle front

: Always replace after every disassembly

: N·m (kg-m, ft-lb)

: Apply multi purpose grease

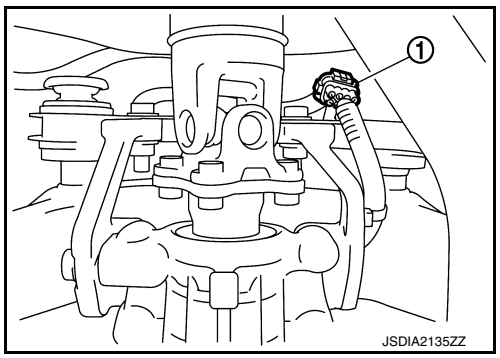
: Apply gear oil.

Removal and Installation

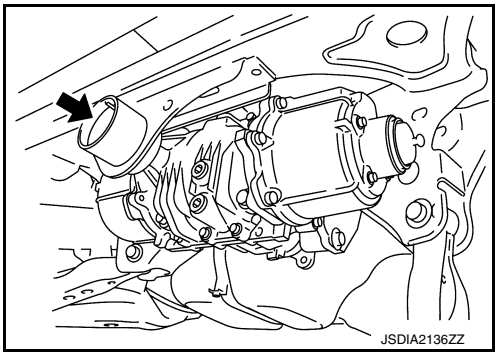
INFOID:0000000012199512

REMOVAL

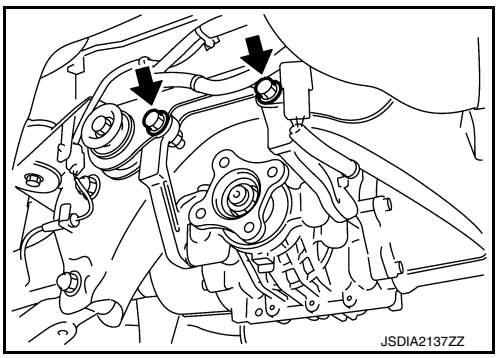
1. Remove rear drive shaft. Refer to RAX-19, "Removal and Installation".
2. Disconnect sub-harness connector (1).
3. Remove propeller shaft assembly. Refer to DLN-124, "Removal and Installation".
4. Support rear final drive assembly with a suitable jack.



5. Remove rear final drive mounting bolt (⬅) at rear suspension member.



6. Remove final drive mounting bolts and nuts (⬅) with power tool, and then remove rear final drive assembly from final drive mounting bracket.
CAUTION:
Secure final drive assembly to a suitable jack while removing it.
7. Remove rear final drive breather hose.
8. Remove fuel tank. Refer to FL-23, "AWD : Removal and Installation".
9. Remove final drive mounting bracket.



INSTALLATION

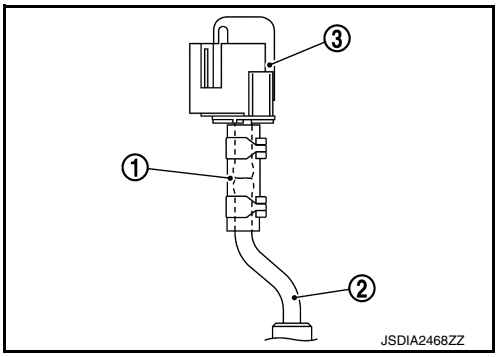
Note the following, and install in the reverse order of removal.

- If remove breather hose, install breather hose as following.

- Insert breather hose (1) of final drive side to breather tube (2) until hose end reaches the tube bent R portion.

(3): Breather

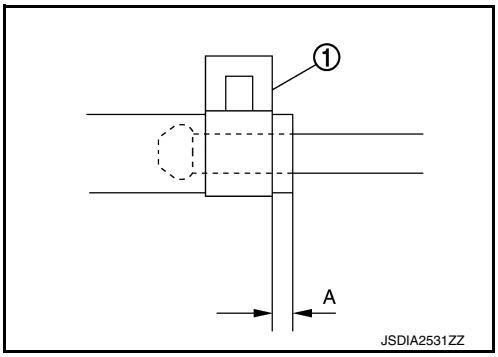
- Install the breather to breather hose until hose end reaches the breather.



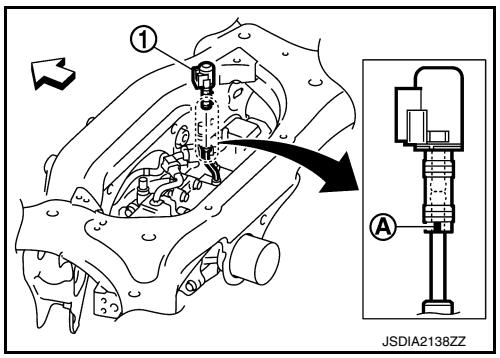
- Install hose clamp (1) until dimension (A) shown as follows.

Dimension A : 5 mm (0.20 in)

CAUTION:
- **Never reuse hose clamps.**
- **Install the hose clamps, with the tab facing vehicle rear.**



- Install breather assembly (1) to final drive as shown in the figure.



(A): Paint mark

⇦: Vehicle front

- Install breather hose with paint mark (A) facing vehicle rear.

- When installing rear drive shaft, never damage electric controlled coupling oil seal.
- When oil leaks while removing final drive assembly, check oil level after the installation. Refer to DLN-137, "Inspection".
- When replacing rear final drive assembly or electric controlled coupling, perform writing unit characteristics after installing rear final drive assembly to the vehicle. Refer to DLN-42, "Work Procedure".

CAUTION:

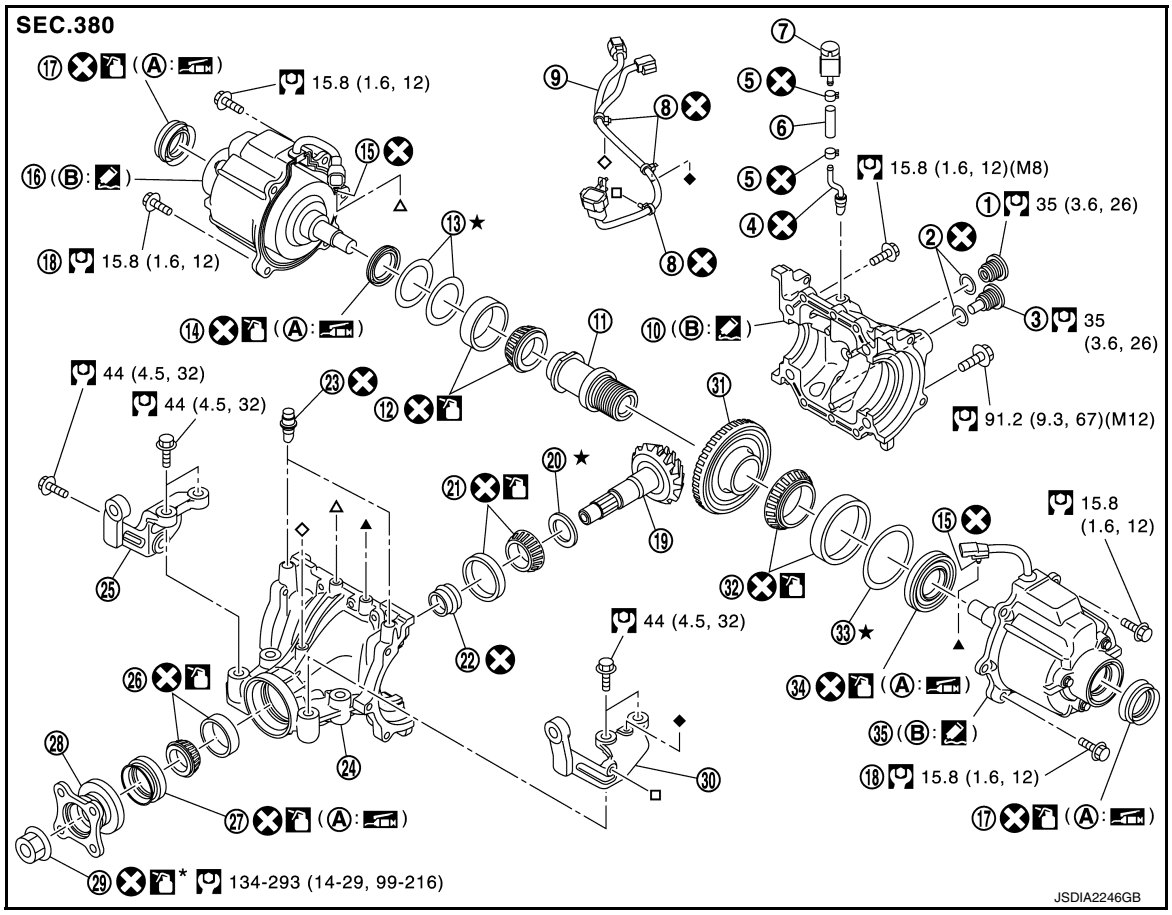
Always writing unit characteristics of both side electric controlled couplings.

UNIT DISASSEMBLY AND ASSEMBLY

ELECTRIC CONTROLLED COUPLING

Exploded View

INFOID:0000000012199513



1. Filler plug
2. Gasket
3. Drain plug
4. Breather tube
5. Hose clamp
6. Breather hose
7. Breather
8. Band clip
9. Sub-harness
10. Rear cover
11. Center stem
12. Side bearing (right)
13. Side bearing adjusting shim (right)
14. Side oil seal (right)
15. Connector clip
16. Electric controlled coupling (right)
17. Electric controlled coupling oil seal
18. Reamer bolt
19. Drive pinion
20. Drive pinion adjusting shim
21. Pinion bearing (rear)
22. Collapsible spacer
23. Breather
24. Gear carrier
25. Carrier bracket (right)
26. Pinion bearing (front)
27. Front oil seal
28. Companion flange
29. Drive pinion lock nut
30. Carrier bracket (left)
31. Drive gear
32. Side bearing (left)
33. Side bearing adjusting shim (left)
34. Side oil seal (left)
35. Electric controlled coupling (left)
A. Oil seal lip
B. Gear carrier mounting face

: Always replace after every disassembly.

★: Select with proper thickness.

: N·m (kg-m, ft-lb)

: Apply multi purpose grease

: Apply gear oil.

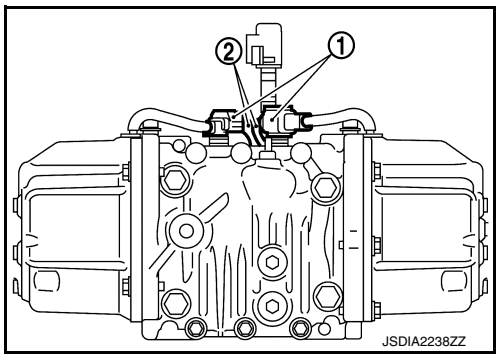
: Apply anti-corrosive oil.

: Apply Genuine Silicone RTV or equivalent. Refer to GI-22, "Recommended Chemical Products and Sealants".

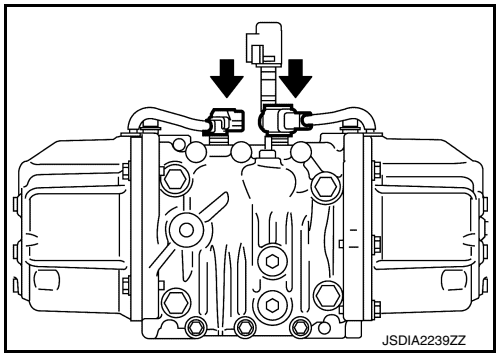
Disassembly

INFOID:0000000012199514

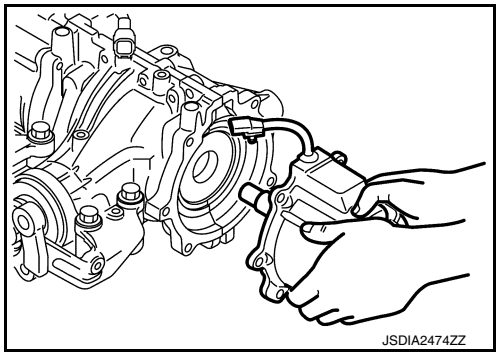
1. Disconnect electric controlled coupling connector (1) from sub-harness (2).



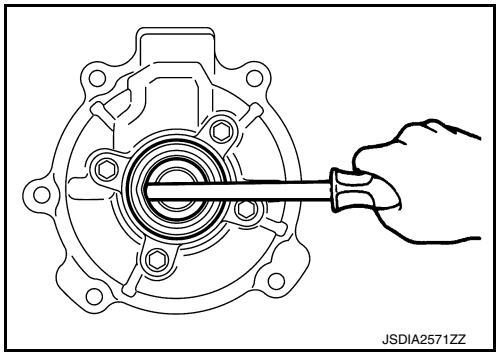
2. Remove electric controlled coupling connector from final drive assembly.



3. Remove electric controlled coupling from final drive assembly.
CAUTION:
Never damage side oil seal.
4. Remove sub-harness from final drive assembly.
CAUTION:
Remove sub-harness only when necessary.



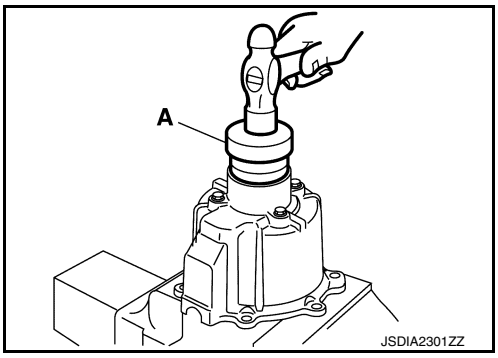
5. Remove electric controlled coupling oil seal from electric controlled coupling, using the suitable oil seal remover.
CAUTION:
Never damage electric controlled coupling.



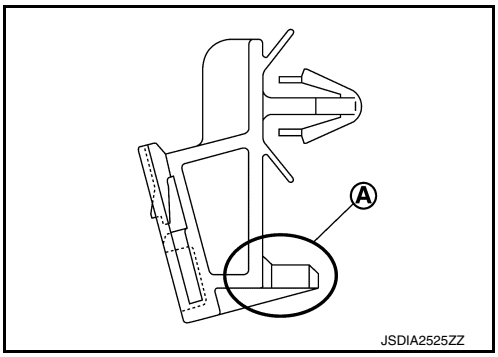
Assembly

INFOID:0000000012199515

1. Using the drift (A) [SST: KV38109700 (—)], install electric controlled coupling oil seal to electric controlled coupling to electric controlled coupling all the way until SST contact the end.
NOTE:
The use of SST satisfies the mounting dimensions.
CAUTION:
- **Always use SST [KV38109700 (—)].**
- **Never reuse oil seal.**
- **When installing, never incline oil seal.**
- **Apply multi-purpose grease onto oil seal lips, and gear oil onto the circumference of oil seal.**

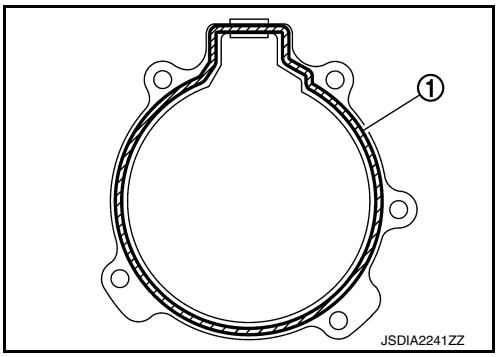


2. If remove sub–harness, replace band clip to sub-harness, and then install sub–harness to rear final drive assembly.
CAUTION:
- **Never reuse band clip.**
- **Check original mounting dimensions to install clip to the original position.**
- **Pin (A) of sub–harness connector clip must be functioning certainly as baffle pin.**
- **Check the area around the rotating object to see that there is no interference.**

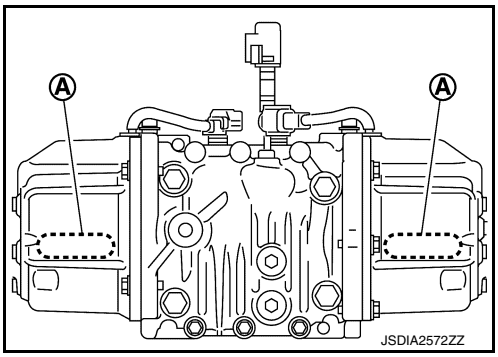


3. Apply liquid gasket (1) to mating surface of coupling cover.
- Use Genuine Silicone RTV or equivalent. Refer to GI-22, "Recommended Chemical Products and Sealants".

CAUTION:
- **Remove old gasket adhering to the mounting surfaces. Also remove any moisture, oil, or foreign material adhering to the mounting surfaces.**
- **Overlap both ends of the bead for at least 3 mm (0.12 in).**
- **Apply liquid gasket to grommet as well.**
- **The width of sealant bend is approximately 3 mm (0.012 in).**



- **Never allow liquid gasket to contact the unit characteristics (A or B) of the coupling cover.**



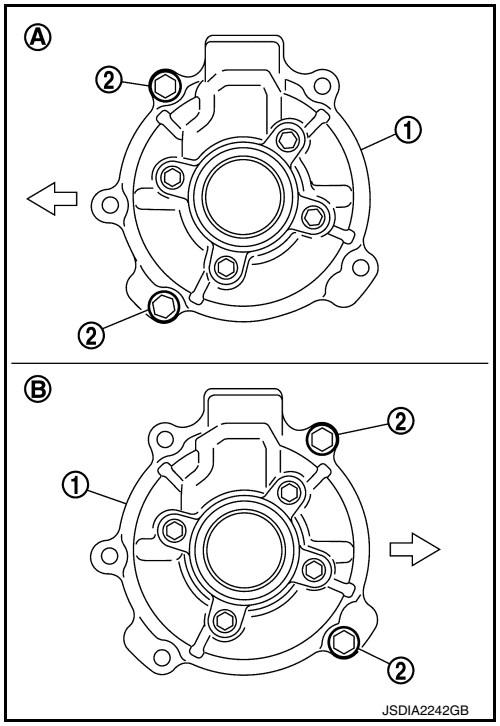
4. Install electric controlled coupling (1) to spline of center stem with grommet of harness facing upward, temporarily tighten reamer bolts (2) to the positions shown in the figure.

A: Left side
B: Right side

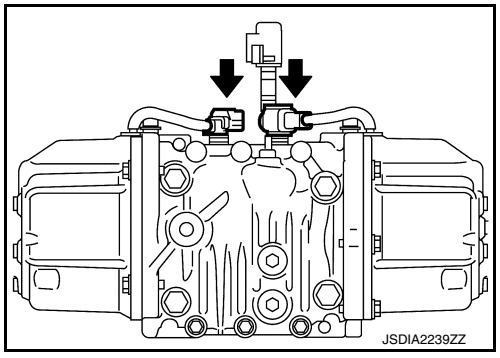
⇦: Vehicle front

CAUTION:
Never damage side oil seal.

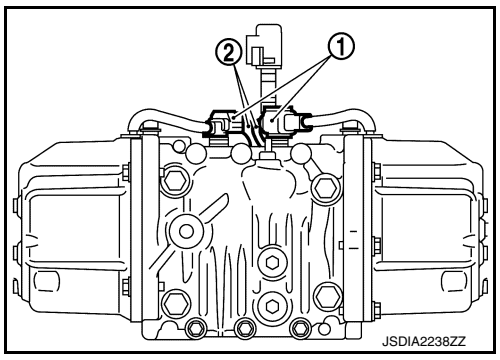
5. Tighten reamer bolts and coupling cover mounting bolts to the specified torque.
CAUTION:
Never allow harness to get caught in the bolt.



6. Replace connector clip from electric controlled coupling connector, and then insert it to final drive assembly.
CAUTION:
- **Never reuse connector clip.**
- **When inserting connector clip to final drive assembly, never tug harness.**



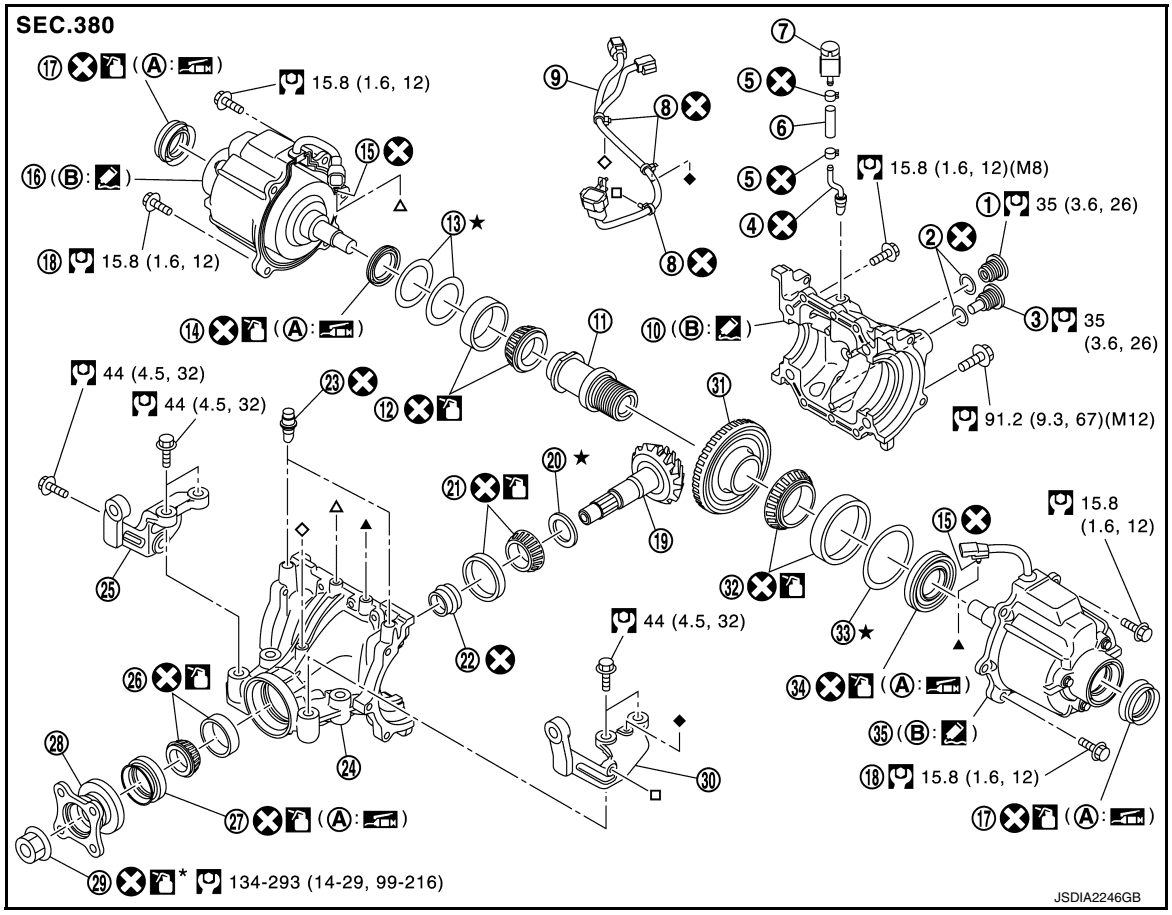
7. Connect electric controlled coupling connector (1) to sub-harness (2).
8. When oil leaks while removing, check oil level after the installation. Refer to DLN-137, "Inspection".
9. When replacing electric controlled coupling, perform writing unit characteristics after installing rear final drive assembly to the vehicle. Refer to DLN-42, "Work Procedure".
CAUTION:
Always perform writing unit characteristics of both side electric controlled couplings.



CENTER STEM ASSEMBLY

Exploded View

INFOID:0000000012199516



1. Filler plug
2. Gasket
3. Drain plug
4. Breather tube
5. Hose clamp
6. Breather hose
7. Breather
8. Band clip
9. Sub-harness
10. Rear cover
11. Center stem
12. Side bearing (right)
13. Side bearing adjusting shim (right)
14. Side oil seal (right)
15. Connector clip
16. Electric controlled coupling (right)
17. Electric controlled coupling oil seal
18. Reamer bolt
19. Drive pinion
20. Drive pinion adjusting shim
21. Pinion bearing (rear)
22. Collapsible spacer
23. Breather
24. Gear carrier
25. Carrier bracket (right)
26. Pinion bearing (front)
27. Front oil seal
28. Companion flange
29. Drive pinion lock nut
30. Carrier bracket (left)
31. Drive gear
32. Side bearing (left)
33. Side bearing adjusting shim (left)
34. Side oil seal (left)
35. Electric controlled coupling (left)
A. Oil seal lip
B. Gear carrier mounting face

: Always replace after every disassembly.

★: Select with proper thickness.

: N·m (kg-m, ft-lb)

: Apply multi purpose grease

: Apply gear oil.

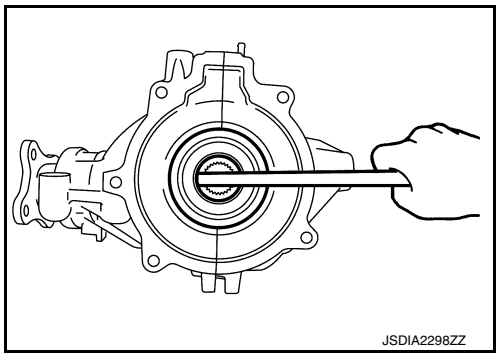
: Apply anti-corrosive oil.

: Apply Genuine Silicone RTV or equivalent. Refer to GI-22, "Recommended Chemical Products and Sealants".

Disassembly

INFOID:0000000012199517

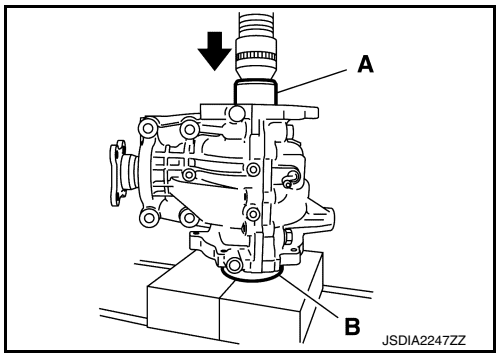
1. Remove carrier brackets.
2. Remove electric controlled couplings. Refer to DLN-155, "Disassembly".
3. Remove breather tube and breathers.
   CAUTION:
   Remove breather tube and breathers only when necessary.
4. Remove side oil seal with the suitable oil seal remover.
   CAUTION:
   Never damage gear carrier and rear cover.
5. Remove rear cover mounting bolts.


JSDIA2298ZZ

6. Set the drifts (A and B) to the right and left side bearing adjusting shims individually. Press center stem assembly with side bearing to remove gear carrier assembly and rear cover assembly.

   A : Drift [SST: KV38109820 (—)]
   B : Drift [SST: KV38109810 (—)]

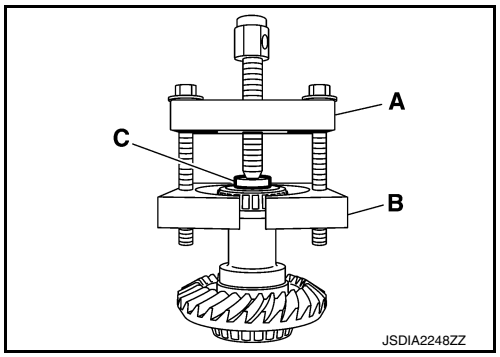
   CAUTION:
   The pressure shall be as low as possible to remove gear carrier assembly and rear cover assembly. The maximum pressure shall be 10 kN (1 ton, 1.0 lmp ton).
   NOTE:
   Center stem assembly, side bearings, and adjusting shims are compressed and integrated in gear carrier and rear cover.



JSDIA2247ZZ

7. Remove drain plug and filler plug, if necessary.
8. Remove side bearing adjusting shims and outer races of side bearing .
   CAUTION:
   Mark the side bearing adjusting shims so that the original mounting positions (right/left) can be identified later.
9. Remove inner race of side bearing (right), using the puller (A), the replacer (B) and the drift (C).

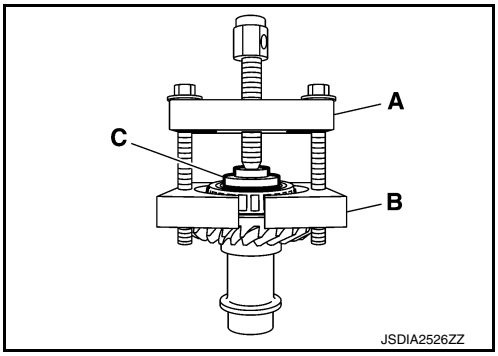
   A : Puller (Commercial service tool)
   B : Replacer (Commercial service tool)
   C : Drift [SST: ST33052000 (—)]



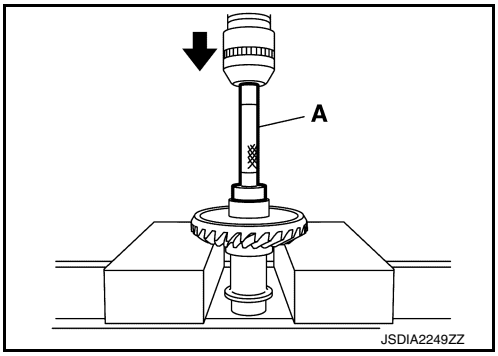
JSDIA2248ZZ

10. Remove inner race of side bearing (left), using the puller (A), the replacer (B) and the drift (C).

    A : Puller (Commercial service tool)
    B : Replacer (Commercial service tool)
    C : Drift [SST: ST02371000 (—)]



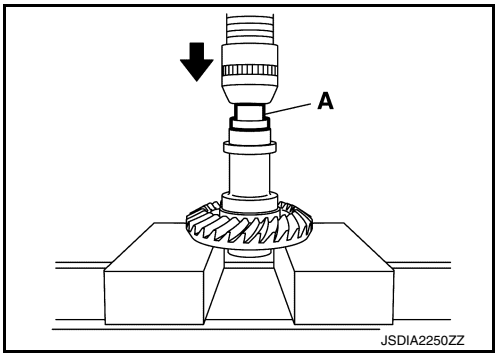
11. Remove center stem from drive gear, using the drift (A) [SST: ST33220000 (J-25804-01)].
12. Perform inspection after disassembly. Refer to DLN-166, "Inspection".



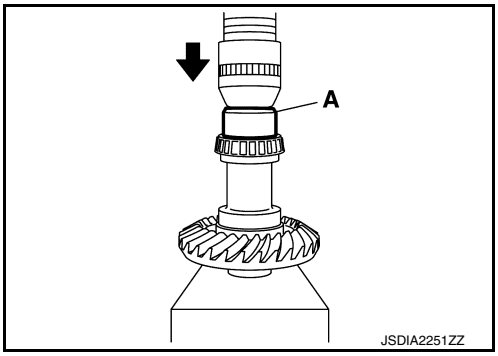
Assembly

INFOID:0000000012199518

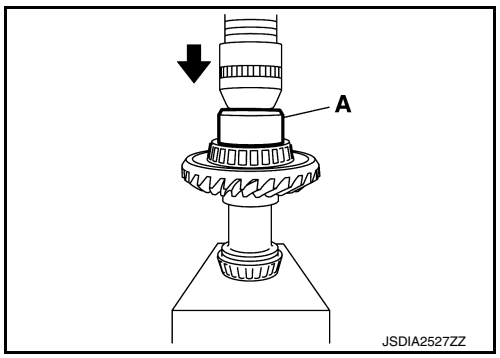
1. Press center stem to drive gear, using the drift (A) [SST: ST33052000 (—)].



2. Press inner race of side bearing (right) to center stem assembly, using the drift (A) (Commercial service tool).
   CAUTION:
   - **Never reuse side bearing.**
   - **Apply gear oil to side bearing.**



3. Press inner race of side bearing (left) to center stem assembly, using the drift (A) (Commercial service tool).

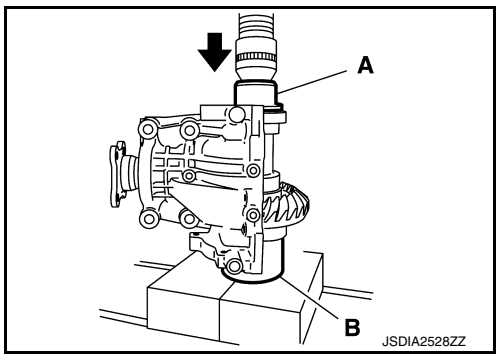


CAUTION:
- **Never reuse side bearing.**
- **Apply gear oil to side bearing.**

4. Install side bearing adjusting shims (2 pieces for right side) with the same thickness as the ones installed prior to disassembly or re-install the old ones, with outer race of side bearing to center stem assembly.
If side bearing adjusting shims have been already selected, use them.

CAUTION:
- **Never reuse side bearing.**
- **Apply gear oil to side bearing.**

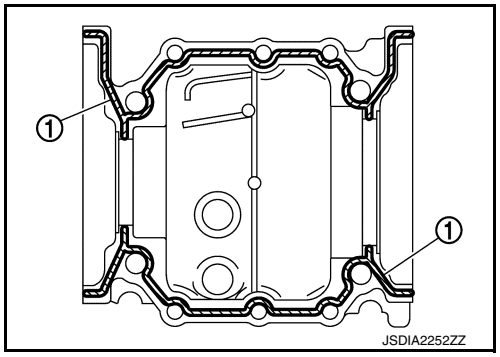
5. Set the drifts (A and B) to the right and left side bearing adjusting shims individually. Press center stem assembly with side bearing to install gear carrier assembly to center stem assembly.



A : Drift [SST: KV38109820 (—)]
B : Drift [SST: KV38109810 (—)]

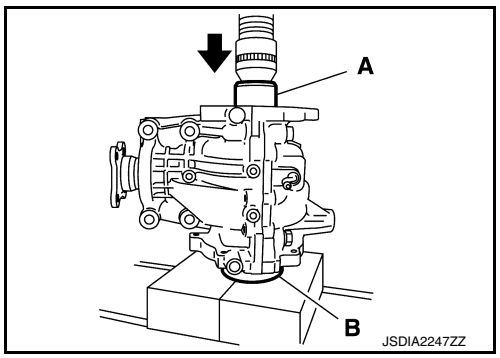
CAUTION:
- **The drift shall be placed on the center of the adjusting shims.**
- **The pressure shall be as low as possible to install differential assembly into gear carrier assembly. The maximum pressure shall be 10 kN (1 ton, 1.0 lmp ton).**
- **If the adjusting shims are installed by tapping, the gear carrier may be damaged. Avoid tapping.**

6. Install dummy cover set, check and adjust drive gear runout, tooth contact, backlash, and total preload torque. Refer to DLN-162, "Adjustment".
7. Remove dummy cover set.
8. Apply liquid gasket (1) to mating surface of rear cover.
   - Use Genuine Silicone RTV or equivalent. Refer to GI-22, "Recommended Chemical Products and Sealants".



CAUTION:
- **Remove old gasket adhering to the mounting surfaces. Also remove any moisture, oil, or foreign material adhering to the mounting surfaces.**
- **The width of sealant bend is approximately 3 mm (0.012 in). Apply sealant evenly.**

9. Set the drifts (A and B) to the right and left side bearing adjusting shims individually. Compress center stem assembly with side bearing to install rear cover.

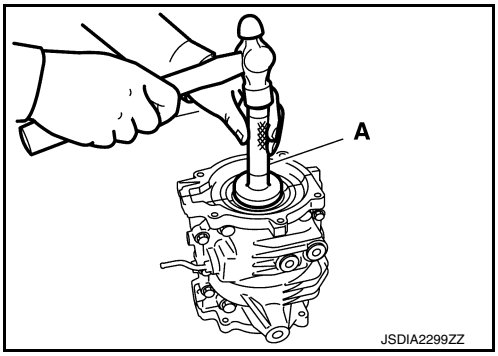


A : Drift [SST: KV38109820 (—)]
B : Drift [SST: KV38109810 (—)]

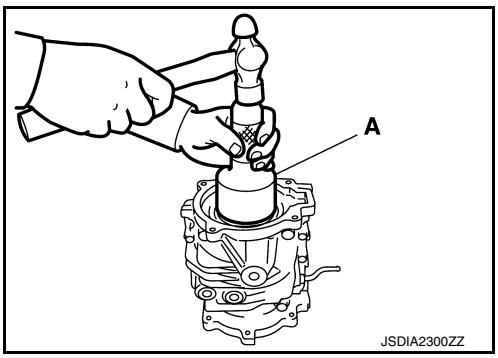
CAUTION:
- **The drift shall be placed on the center of the adjusting shims.**
- **The pressure shall be as low as possible to install the rear cover. The maximum pressure shall be 10 kN (1 ton, 1.0 lmp ton).**
- **If rear cover is forced in by tapping, rear cover may be damaged by adjusting shims. Avoid tapping.**

10. Tighten rear cover mounting bolts to the specified torque.

11. Install side oil seal (right) until it becomes flush with the gear carrier end, using the drift (A) [SST: ST33400001 (J-26082)].
CAUTION:
- **Never reuse oil seal.**
- **When installing, never incline oil seal.**
- **Apply multi-purpose grease onto oil seal lips, and gear oil onto the circumference of oil seal.**



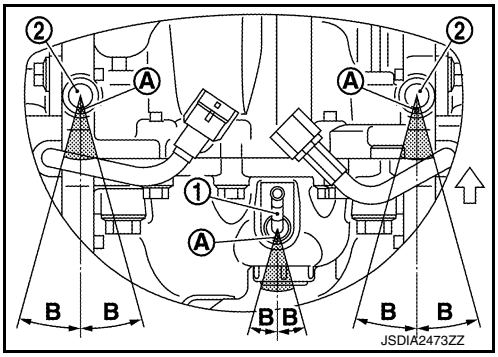
12. Install side oil seal (left) until it becomes flush with the gear carrier end, using the drift (A) [SST: KV38100500 (—)].
CAUTION:
- **Never reuse oil seal.**
- **When installing, never incline oil seal.**
- **Apply multi-purpose grease onto oil seal lips, and gear oil onto the circumference of oil seal.**



13. Set gasket to drain plug. Install it to gear carrier.
CAUTION:
Never reuse oil gasket.
14. Set gasket to filler plug. Install it to gear carrier.
CAUTION:
- **Never reuse oil gasket.**
- **After oil is refilled, tighten filler plug to specified torque.**
15. Install carrier brackets.
16. Install electric controlled coupling. Refer to DLN-156, "Assembly".
17. Check total preload torque. Refer to DLN-162, "Adjustment".

18. Install breather tube (1) and breathers (2) with the paint mark (A) facing vehicle rear within the angle (B) shown as follows.

Angle (B) : 0 – 15°



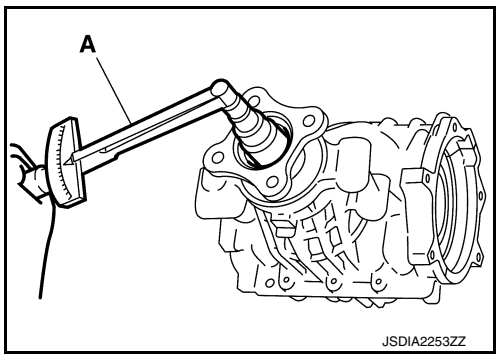
Adjustment

INFOID:0000000012199519

TOTAL PRELOAD TORQUE

1. Before inspection and adjustment, drain gear oil.
2. Remove electric controlled couplings. Refer to DLN-155, "Disassembly".
3. Rotate drive pinion back and forth 2 to 3 times to check for unusual noise and rotation malfunction.

4. Rotate drive pinion at least 20 times to check for smooth operation of the bearing.
5. Measure the total preload, using the preload gauge (A) [SST: ST3127S000 (J-25765-A)].



Total preload torque : Refer to DLN-175, "Preload Torque".

NOTE:
Total preload torque = Pinion bearing torque + Side bearing torque

- If measured value is out of the specification, disassemble it to check and adjust each part. Adjust the pinion bearing preload and side bearing preload. Adjust the pinion bearing preload first, then adjust the side bearing preload.

When the preload torque is large

On pinion bearings: **Replace the collapsible spacer.**

On side bearings: **Use thinner side bearing adjusting shims. For selecting adjusting shim, refer to the latest parts information.**

When the preload is small

On pinion bearings: **Tighten the drive pinion nut.**

On side bearings: **Use thicker side bearing adjusting shims. For selecting adjusting shim, refer to the latest parts information.**

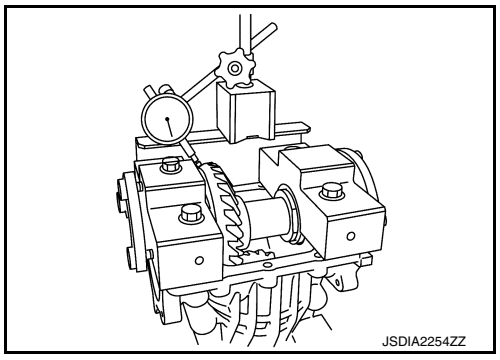
DRIVE GEAR RUNOUT

1. Remove rear cover. Refer to DLN-159, "Disassembly".
2. Following the procedure below, install the dummy cover set [SST: KV381096S0 (—)] to gear carrier.

a. Temporarily install the bearing guides [SST: KV38109610 (—), KV38109620 (—)] to gear carrier.
b. Position the dummy cap spacers [SST: KV38109630 (—), KV38109640 (—)] and the angle [SST: KV38109650 (—)] to bearing guide.
c. Use rear cover mounting bolts, tighten bolts to the specified torque. Refer to DLN-158, "Exploded View".
d. Tighten dummy cap spacer mounting bolts evenly to the specified torque.

Tightening torque : 5.9 N·m (0.6 kg-m, 52 in-lb)

3. Fit a dial indicator to the drive gear back face.
4. Rotate the drive gear to measure runout.



Drive gear back face runout : Refer to DLN-175, "Drive Gear Runout".

- If the runout is outside of the repair limit, check drive gear assembly condition; foreign material may be caught between drive gear and center stem, or center stem or drive gear may be deformed, etc.

CAUTION:
Replace drive gear and drive pinion as a set.

TOOTH CONTACT

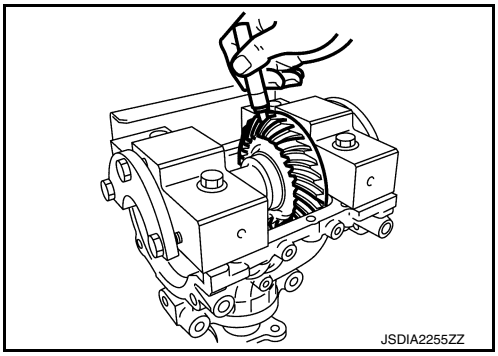
1. Remove rear cover. Refer to DLN-159, "Disassembly".
2. Following the procedure below, install the dummy cover set [SST: KV381096S0 (—)] to gear carrier.

a. Temporarily install the bearing guides [SST: KV38109610 (—), KV38109620 (—)] to gear carrier.

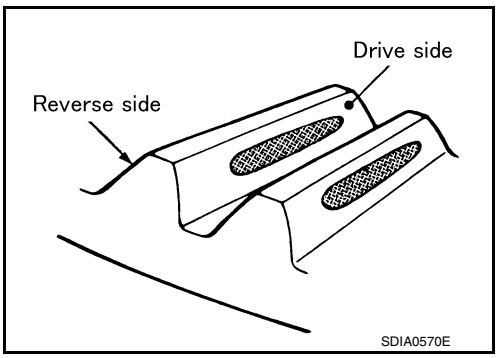
b. Position the dummy cap spacers [SST: KV38109630 (—), KV38109640 (—)] and the angle [SST: KV38109650 (—)] to bearing guide.
c. Use rear cover mounting bolts, tighten bolts to the specified torque. Refer to DLN-158, "Exploded View".
d. Tighten dummy cap spacer mounting bolts evenly to the specified torque.

Tightening torque : 5.9 N·m (0.6 kg-m, 52 in-lb)

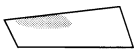
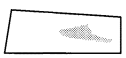
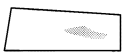
3. Apply red lead to drive gear.
CAUTION:
Apply red lead to both the faces of 3 to 4 gears at 4 locations evenly spaced on drive gear.



4. Rotate drive gear back and forth several times, check drive pinion gear to drive gear tooth contact.
CAUTION:
Check tooth contact on drive side and reverse side.

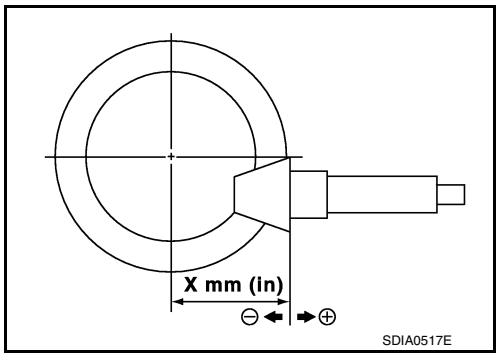


Tooth Contact Judgment Guide

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

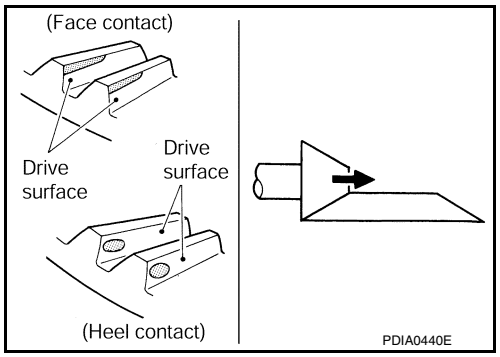
SDIA2549E

5. If tooth contact is improperly adjusted, follow the procedure below to adjust the pinion height (dimension X). For selecting adjusting shim, refer to the latest parts information.



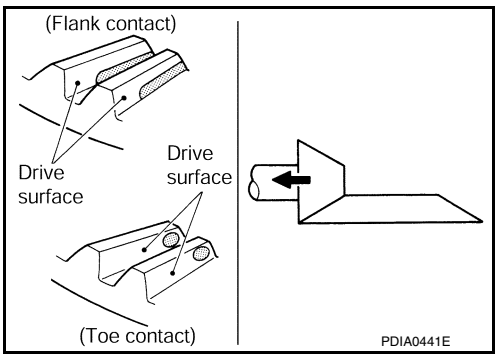
SDIA0517E

- If the tooth contact is near the face (face contact), or near the heel (heel contact), thicken drive pinion gear adjusting shim to move drive pinion closer to drive gear.



PDIA0440E

- If the tooth contact is near the flank (flank contact), or near the toe (toe contact), thin drive pinion gear adjusting shim to move drive pinion farther from drive gear.



BACKLASH

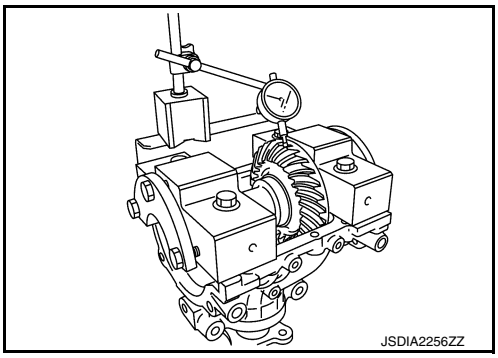
1. Remove rear cover. Refer to DLN-159, "Disassembly".
2. Following the procedure below, install the dummy cover set [SST: KV381096S0 (—)] to gear carrier.

a. Temporarily install the bearing guides [SST: KV38109610 (—), KV38109620 (—)] to gear carrier.
b. Position the dummy cap spacers [SST: KV38109630 (—), KV38109640 (—)] and the angle [SST: KV38109650 (—)] to bearing guide.
c. Use rear cover mounting bolts, and tighten bolts to the specified torque. Refer to DLN-158, "Exploded View".
d. Tighten dummy cap spacer mounting bolts evenly to the specified torque.

Tightening torque : 5.9 N·m (0.6 kg-m, 52 in-lb)

3. Fit a dial indicator to the drive gear face to measure the backlash.

Backlash : Refer to DLN-175, "Backlash".



- If the backlash is outside of the specified value, change the thickness of side bearing adjusting shims.

When the backlash is large:

Make drive gear back adjusting shims thicker, and drive gear front adjusting shims thinner. For selecting adjusting shim, refer to the latest parts information.

When the backlash is small:

Make drive gear back adjusting shims thinner, and drive gear front adjusting shims thicker. For selecting adjusting shim, refer to the latest parts information.

Inspection

INFOID:0000000012199520

INSPECTION AFTER DISASSEMBLY

Drive Gear and Drive Pinion

- Clean up the disassembled parts.
- If the gear teeth never mesh or line-up correctly, determine the cause and adjust or replace as necessary.
- If the gears are worn, cracked, damaged, pitted or chipped (by friction) noticeably, replace with new drive gear and drive pinion as a set.

Bearing

- Whenever disassembled, replace.
- Clean up the disassembled parts.
- If any chipped (by friction), pitted, worn, rusted or scratched marks, or unusual noise from the bearing is observed, replace as a bearing assembly (as a new set).

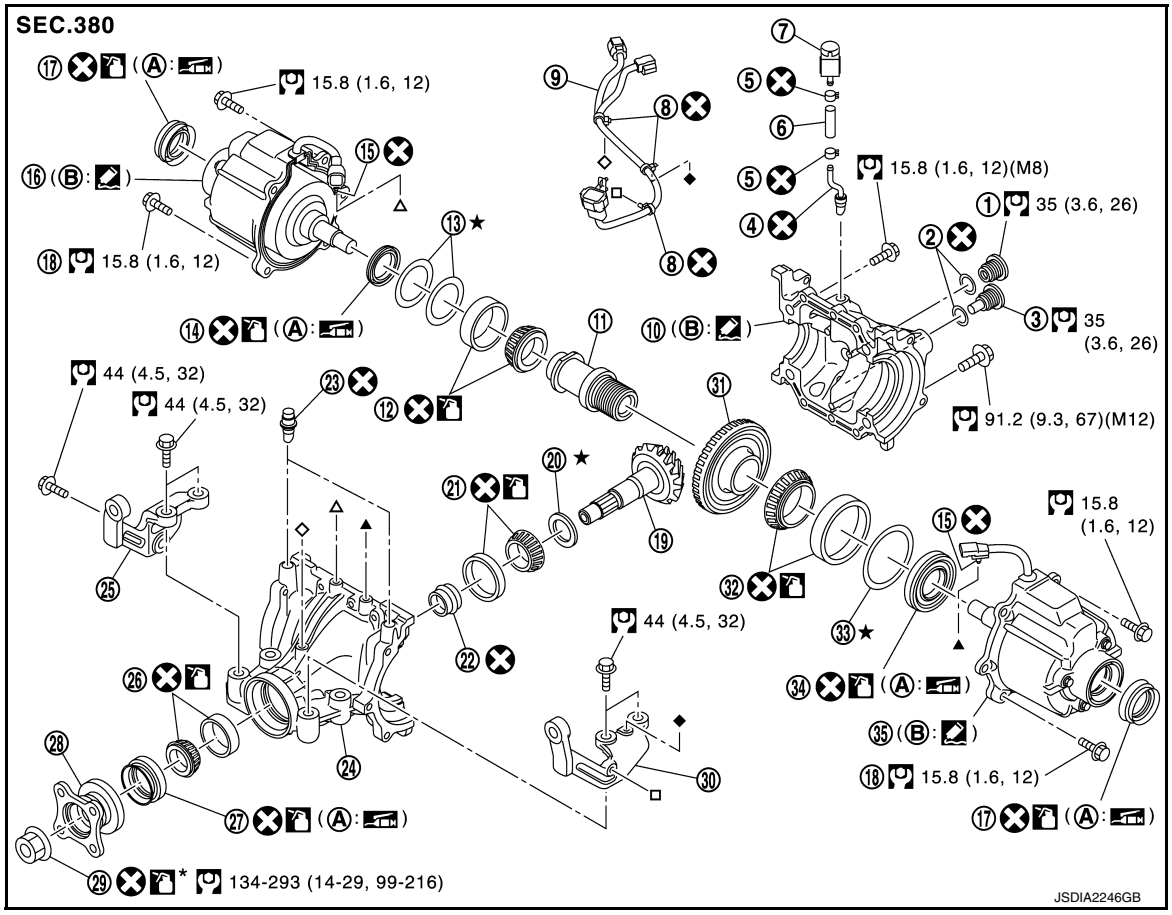
Oil Seal
- Whenever disassembled, replace.
- If wear, deterioration of adherence (sealing force lips), or damage is detected on the lips, replace them.

Gear Carrier and Rear Cover
- Check damage and cracks of gear carrier and rear cover.

DRIVE PINION

Exploded View

INFOID:0000000012199521



1. Filler plug
2. Gasket
3. Drain plug
4. Breather tube
5. Hose clamp
6. Breather hose
7. Breather
8. Band clip
9. Sub-harness
10. Rear cover
11. Center stem
12. Side bearing (right)
13. Side bearing adjusting shim (right)
14. Side oil seal (right)
15. Connector clip
16. Electric controlled coupling (right)
17. Electric controlled coupling oil seal
18. Reamer bolt
19. Drive pinion
20. Drive pinion adjusting shim
21. Pinion bearing (rear)
22. Collapsible spacer
23. Breather
24. Gear carrier
25. Carrier bracket (right)
26. Pinion bearing (front)
27. Front oil seal
28. Companion flange
29. Drive pinion lock nut
30. Carrier bracket (left)
31. Drive gear
32. Side bearing (left)
33. Side bearing adjusting shim (left)
34. Side oil seal (left)
35. Electric controlled coupling (left)
A. Oil seal lip
B. Gear carrier mounting face

: Always replace after every disassembly.

★: Select with proper thickness.

: N·m (kg-m, ft-lb)

: Apply multi purpose grease

: Apply gear oil.

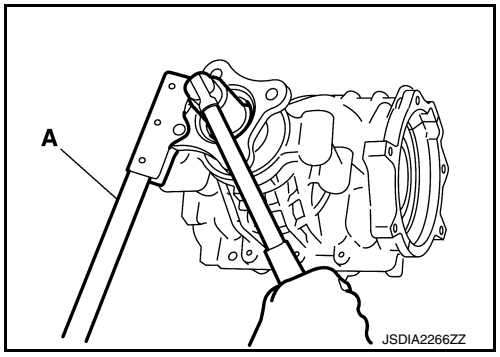
: Apply anti-corrosive oil.

: Apply Genuine Silicone RTV or equivalent. Refer to GI-22, "Recommended Chemical Products and Sealants".

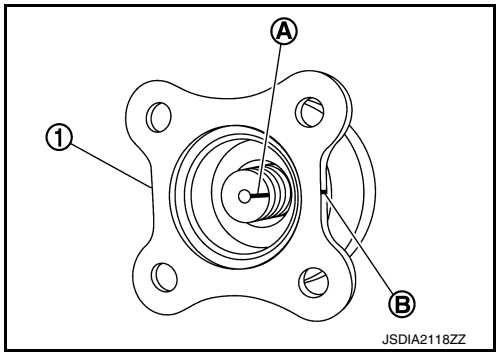
Disassembly

INFOID:0000000012199522

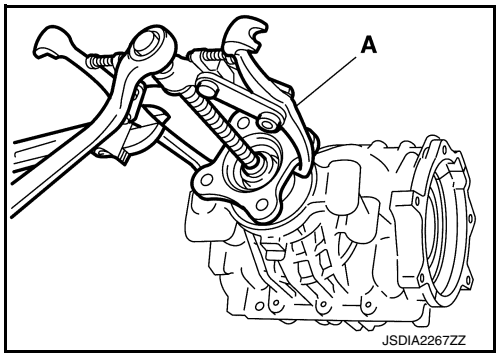
1. Remove electric controlled couplings. Refer to DLN-155, "Disassembly".
2. Remove center stem assembly. Refer to DLN-159, "Disassembly".
3. Remove drive pinion lock nut with the flange wrench (A) (Commercial service tool).



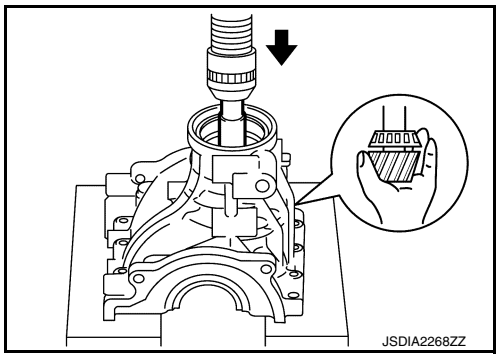
4. Put matching mark (A) on the end of drive pinion. The matching mark should be in line with the matching mark (B) on companion flange (1).
CAUTION:
For matching mark, use paint. Never damage companion flange and drive pinion.
NOTE:
The matching mark on the final drive companion flange indicates the maximum vertical runout position.
When replacing companion flange, matching mark is not necessary.



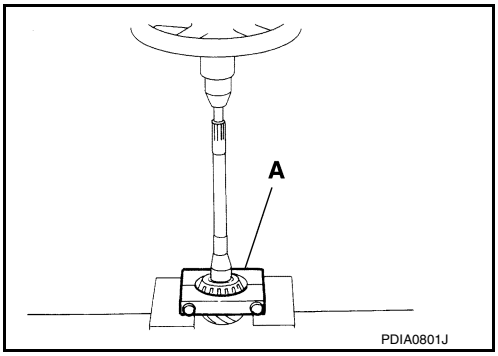
5. Remove companion flange using the puller (A) (Commercial service tool).



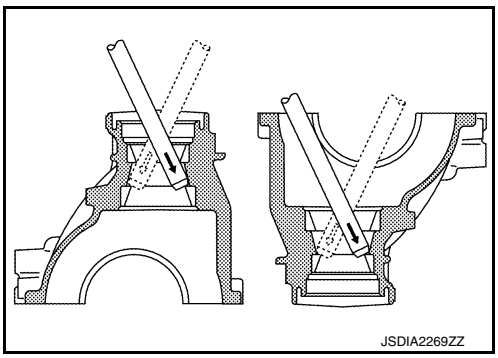
6. Press drive pinion assembly out of gear carrier.
CAUTION:
Never drop drive pinion assembly.
7. Remove front oil seal.
8. Remove inner race of pinion bearing (front).
9. Remove collapsible spacer.



10. Remove inner race of pinion bearing (rear) and drive pinion adjusting shim with the replacer (A) (Commercial service tool).
11. Remove drive pinion adjusting shim.



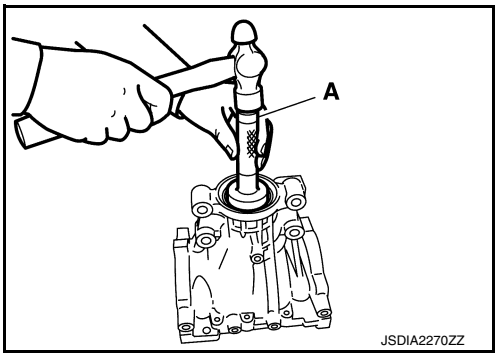
12. Tap the outer races of pinion bearing (front and rear) uniformly using the brass rod or equivalent to remove them.
CAUTION:
Never damage gear carrier.
13. Perform inspection after disassembly. Refer to DLN-173, "Inspection".



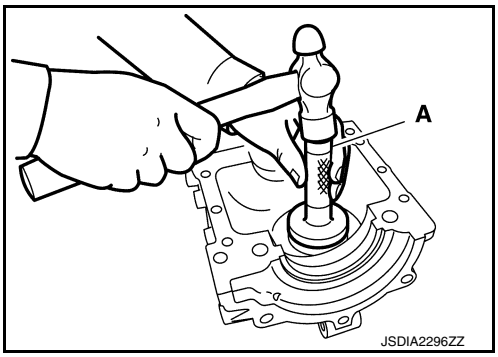
Assembly

INFOID:0000000012199523

1. Install outer race of pinion bearing (front) to the gear carrier with the drift (A) [SST: ST33190000 (—)].
CAUTION:
- **At first, using the hammer, tap outer race of bearing until it becomes flat to gear carrier.**
- **Never reuse pinion bearing.**



2. Install outer race of pinion bearing (rear) to the gear carrier with the drift (A) [SST: ST37830000 (—)].
CAUTION:
- **At first, using the hammer, tap outer race of bearing until it becomes flat to gear carrier.**
- **Never reuse pinion bearing.**

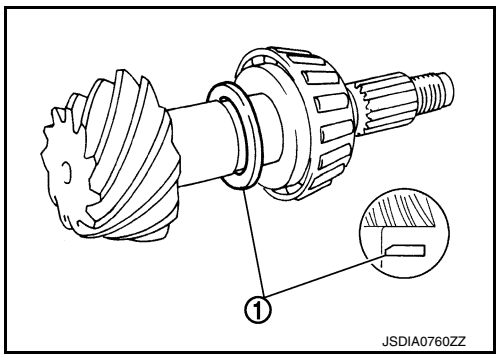


3. Temporarily install drive pinion adjusting shim (1).

When hypoid gear set has been replaced
- Select drive pinion adjusting shim. Refer to DLN-172, "Adjustment".

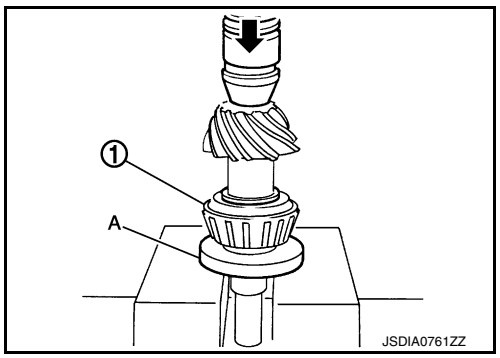
When hypoid gear set has been reused
- Temporarily install the removed drive pinion adjusting shim or same thickness shim to drive pinion.

CAUTION:
Pay attention to the direction of drive pinion adjusting shim. (Assemble as shown in the figure.)



4. Install inner race of pinion bearing (rear) (1) to drive pinion with the drift (A) [SST: ST33032000 (—)].

CAUTION:
Never reuse pinion bearing.



5. Assemble collapsible spacer (1) to drive pinion (2).

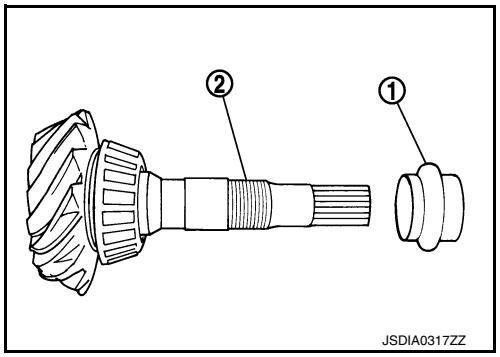
CAUTION:
- **Be careful of the mounting direction of collapsible spacer.**
- **Never reuse collapsible spacer.**

6. Assemble drive pinion into gear carrier.

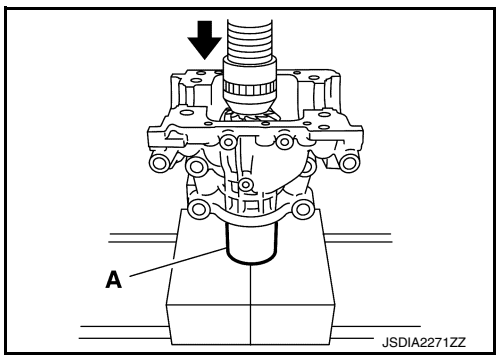
CAUTION:
Apply gear oil to pinion bearing.

7. Assemble inner race of pinion bearing (front) to drive pinion assembly.

CAUTION:
- **Never reuse pinion bearing.**
- **Apply gear oil to pinion bearing.**

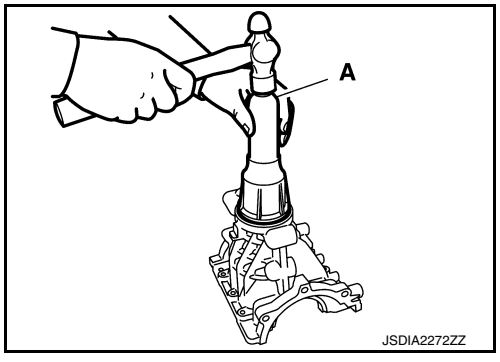


8. Using the drift (A) [SST: KV37710000 (—)], press the inner race of pinion bearing (front) to drive pinion as far as drive pinion nut can be tightened.

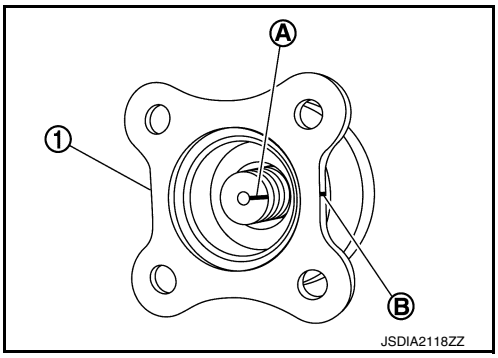


9. Using the drift (A) (Commercial service tool), drive front oil seal until it becomes flush with the gear carrier end.

CAUTION:
- **Never reuse oil seal.**
- **When installing, never incline oil seal.**
- **Apply multi-purpose grease onto oil seal lips, and gear oil onto the circumference of oil seal.**



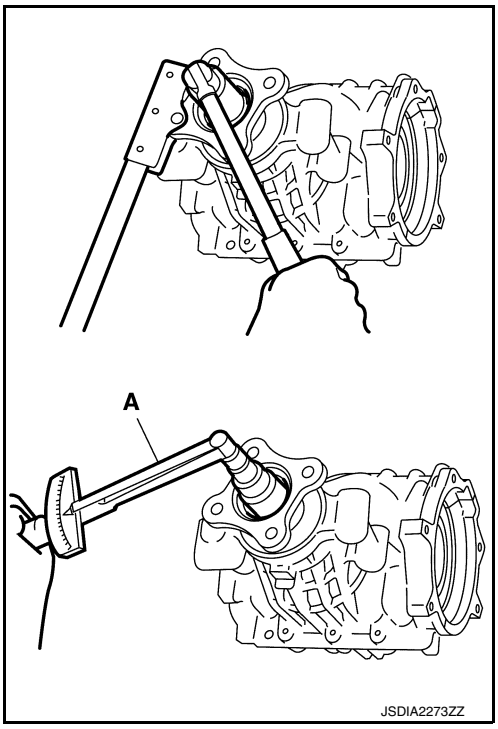
10. Install companion flange.
NOTE:
When reusing drive pinion, align the matching mark (A) of drive pinion with the matching mark (B) of companion flange (1), and then install companion flange.



11. Apply anti-corrosion oil to the thread and seat of drive pinion lock nut, and temporarily tighten drive pinion lock nut to drive pinion, using the flange wrench (Commercial service tool).
CAUTION:
Never reuse drive pinion lock nut.
12. Adjust to the drive pinion lock nut tightening torque and pinion bearing preload torque, using the preload gauge (A) [SST: ST3127S000 (J-25765-A)].

Pinion bearing preload : Refer to DLN-175, "Preload Torque".

CAUTION:
- **Adjust to the lower limit of the drive pinion lock nut tightening torque first.**
- **If the preload torque exceeds the specified value, replace collapsible spacer and tighten it again to adjust. Never loosen drive pinion lock nut to adjust the preload torque.**
- **After adjustment, rotate drive pinion back and forth 2 to 3 times to check for unusual noise, rotation malfunction, and other malfunctions.**



13. Install center stem assembly. Refer to DLN-160, "Assembly".
CAUTION:
Never install rear cover at this timing.
14. Check and adjust drive gear runout, tooth contact, drive gear to drive pinion backlash, and companion flange runout. Refer to DLN-162, "Adjustment" and DLN-172, "Adjustment".
15. Check total preload torque. Refer to DLN-162, "Adjustment".
16. Install rear cover. Refer to DLN-160, "Assembly".
17. Install electric controlled couplings. Refer to DLN-156, "Assembly".

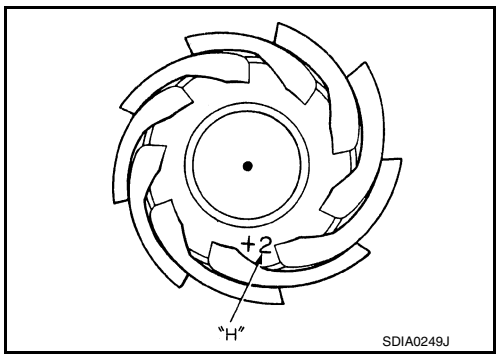
Adjustment

INFOID:0000000012199524

PINION GEAR HEIGHT

If the hypoid gear set has been replaced, select the drive pinion adjusting shim.

1. Use the formula below to calculate drive pinion adjusting shim thickness.



Shim selection equation:

$T = T_0 + (t_1 - t_2)$

T: Correct shim thickness

T_0: Removed shim thickness

t_1: Old drive pinion head letter "H" × 0.01"
("H": machined tolerance 1/100 mm × 100)

t_2: New drive pinion head letter "H" × 0.01"
("H": machined tolerance 1/100 mm × 100)

Example:

$T = 3.21 + [(2 \times 0.01) - (-1 \times 0.01)] = 3.24$

T_0: 3.21

t_1: +2

t_2: −1

2. Select the proper drive pinion adjusting shim. For selecting adjusting shim, refer to the latest parts information.

CAUTION:
If unable to find a shim of desired thickness, use a shim with thickness closest to the calculated value.

Example:

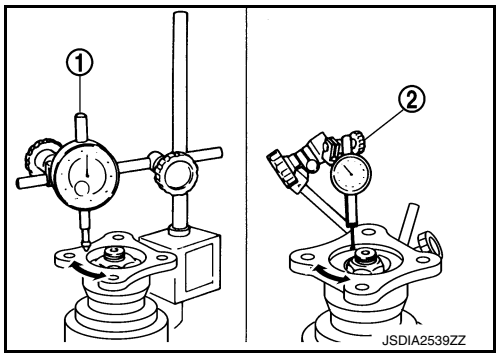
Calculated value... T = 3.22 mm

Used shim... T = 3.21 mm

COMPANION FLANGE RUNOUT

Check for companion flange runout as follows:

- For companion flange face, fit a dial indicator (1) onto the companion flange face (inner side of the propeller shaft mounting bolt holes). For inner side of the companion flange, fit a test indicator (2) to the inner side of companion flange (socket diameter).
- Rotate companion flange to check for runout.



Companion flange runout : Refer to DLN-175, "Companion Flange Runout".

- If the runout value is outside the runout limit, follow the procedure below to adjust.
- Check for runout while changing the phase between companion flange and drive pinion by 90° step, and search for the position where the runout is the minimum.
- If the runout value is still outside of the limit after the phase has been changed, replace companion flange.
- If the runout value is still outside of the limit after companion flange has been replaced, possible cause will be an assembly malfunction of drive pinion.

Inspection

INFOID:0000000012199525

INSPECTION AFTER DISASSEMBLY

Drive Gear and Drive Pinion

- Clean up the disassembled parts.
- If the gear teeth never mesh or line-up correctly, determine the cause and adjust or replace as necessary.
- If the gears are worn, cracked, damaged, pitted or chipped (by friction) noticeably, replace with new drive gear and drive pinion as a set.

Bearing

- Whenever disassembled, replace.
- Clean up the disassembled parts.
- If any chipped (by friction), pitted, worn, rusted or scratched marks, or unusual noise from the bearing is observed, replace as a bearing assembly (as a new set).

Oil Seal

- Whenever disassembled, replace.
- If wear, deterioration of adherence (sealing force lips), or damage is detected on the lips, replace them.

Companion Flange

- Clean up the disassembled parts.
- If any chipped mark [about 0.1 mm, (0.004 in)] or other damage on the contact sides of the lips of the companion flange is found, replace.

SERVICE DATA AND SPECIFICATIONS (SDS)

SERVICE DATA AND SPECIFICATIONS (SDS)

General Specification

INFOID:0000000012199526

Applied model	MR16DDT
Final drive model	RTVS
Gear ratio	2.416
Number of teeth (Drive gear/Drive pinion)	29/12
Oil capacity (Approx.) ℓ (US pt, Imp pt)	0.40 (7/8, 3/4)
Drive pinion adjustment spacer type	Collapsible

Drive Gear Runout

INFOID:0000000012199527

Unit: mm (in)

Item	Limit
Drive gear back face runout	0.05 (0.0020)

Preload Torque

INFOID:0000000012199528

Unit: N·m (kg-m, in-lb)

Item	Standard
Pinion bearing (P_1)	1.06 – 1.76 N·m (0.11 – 0.18 kg-m)
Side bearing (P_2)	0.33 – 0.70 N·m (0.03 – 0.07 kg-m)
Side bearing to pinion bearing (Total preload) (Total preload = P_1 + P_2)	1.39 – 2.46 N·m (0.14 – 0.25 kg-m)

Backlash

INFOID:0000000012199529

Unit: mm (in)

Item	Standard
Drive gear to drive pinion gear	0.13 – 0.18 (0.0051 – 0.0071)

Companion Flange Runout

INFOID:0000000012199530

Unit: mm (in)

Item	Limit
Companion flange face	0.13 (0.0051)
Inner side of the companion flange	0.19 (0.0075)