

SECTION **DLN**
DRIVELINE

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DLN

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PRECAUTION

PRECAUTIONS

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

INFOID:000000008487441

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 dual stage front air bag modules. The SRS system may only deploy one front air bag, depending on the severity of a collision and whether the front passenger seat is occupied. Information necessary to service the system safely is included in the SR and SB section of this Service Manual.

WARNING:

- To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision which would result in air bag inflation, all maintenance must be performed by an authorized NISSAN/INFINITI dealer.
- Improper maintenance, including incorrect removal and installation of the SRS, can lead to personal injury caused by unintentional activation of the system. For removal of Spiral Cable and Air Bag Module, see the SR section.
- Do not use electrical test equipment on any circuit related to the SRS unless instructed to in this Service Manual. SRS wiring harnesses can be identified by yellow and/or orange harnesses or harness connectors.

PRECAUTIONS WHEN USING POWER TOOLS (AIR OR ELECTRIC) AND HAMMERS

WARNING:

- When working near the Airbag Diagnosis Sensor Unit or other Airbag System sensors with the Ignition ON or engine running, DO NOT use air or electric power tools or strike near the sensor(s) with a hammer. Heavy vibration could activate the sensor(s) and deploy the air bag(s), possibly causing serious injury.
- When using air or electric power tools or hammers, always switch the Ignition OFF, disconnect the battery, and wait at least 3 minutes before performing any service.

Precaution for Battery Service

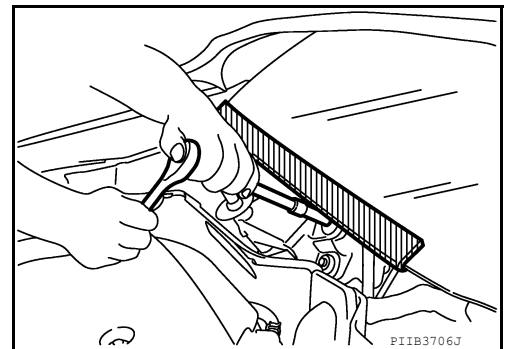
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Before disconnecting the battery, lower both the driver and passenger windows. This will prevent any interference between the window edge and the vehicle when the door is opened/closed. During normal operation, the window slightly raises and lowers automatically to prevent any window to vehicle interference. The automatic window function will not work with the battery disconnected.

Precaution for Procedure without Cowl Top Cover

INFOID:000000007883195

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



Service Notice or Precautions for Transfer

INFOID:000000007883196

- 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.

PRECAUTIONS

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< PRECAUTION >

- 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. A
- 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. B
- 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. C
- Check appearance of the disassembled parts for damage, deformation, and unusual wear. Replace them with a new one if necessary.
- Gaskets, seals, O-rings and lock nuts should be replaced any time when the transfer is disassembled. DLN
- 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. E
- Clean and flush the parts sufficiently and blow-dry them.
- Be careful not to 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. F

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PREPARATION

[TRANSFER: TY20A]

< PREPARATION >

PREPARATION

PREPARATION

Special Service Tool

INFOID:000000007883197

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

Tool number (Kent-Moore No.) Tool name	Description
KV38101700 (—) Drift a: 82 mm (3.23 in) dia. b: 78 mm (3.07 in) dia.	Installing side oil seal (installing adapter case oil seal)
ST30720000 (J-25405) Drift a: 77 mm (3.03 in) dia. b: 55.5 mm (2.185 in) dia.	<ul style="list-style-type: none"> Installing gear ring bearing outer race (transfer case side) Installing gear ring bearing inner race (transfer case side) Installing gear ring bearing inner race (adapter case side) Installing gear ring bearing outer race (adapter case side) Installing transfer case oil seal
ST33200000 (J-26082) Drift a: 60 mm (2.36 in) dia. b: 44.5 mm (1.752 in) dia.	<ul style="list-style-type: none"> Removing gear ring bearing inner race (adapter case side) Installing companion flange
ST33061000 (J-8107-2) Drift a: 38 mm (1.50 in) dia. b: 28.5 mm (1.122 in) dia.	Removing gear ring bearing inner race (transfer case side)
KV381054S0 (J-34286) Puller	<ul style="list-style-type: none"> Removing pinion rear bearing outer race Removing pinion front bearing outer race Removing gear ring 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.	Installing gear ring oil seal

PREPARATION

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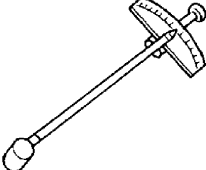
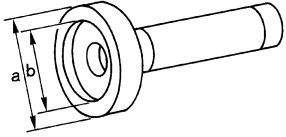
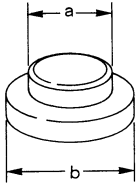
< PREPARATION >

Tool number (Kent-Moore No.) Tool name	Description	A
ST27863000 (—) Drift a: 74.5 mm (2.933 in) dia. b: 62.5 mm (2.461 in) dia.	Installing gear ring bearing inner race (transfer case side)	B
KV40101630 (J-35870) Drift a: 68 mm (2.68 in) dia. b: 60 mm (2.36 in) dia.	Installing gear ring bearing inner race (transfer case side)	DLN
KV38102510 (—) Drift a: 71 mm (2.80 in) dia. b: 65 mm (2.56 in) dia.	Installing gear ring bearing inner race (adapter case side)	E
ST33220000 (J-25804-01) Drift a: 37 mm (1.46 in) dia. b: 31 mm (1.22 in) dia. c: 22 mm (0.87 in) dia.	Removing drive pinion	F
KV38100300 (J-25523) Drift a: 54 mm (2.13 in) dia. b: 46 mm (1.81 in) dia. c: 32 mm (1.26 in) dia.	Installing pinion rear bearing outer race	G
ST33400001 (J-26082) Drift a: 60 mm (2.36 in) dia. b: 47 mm (1.85 in) dia.	<ul style="list-style-type: none"> • Installing pinion front bearing outer race • Installing pinion sleeve oil seal 	H
ST30901000 (J-26010-01) Drift a: 79 mm (3.11 in) dia. b: 45 mm (1.77 in) dia. c: 35.2 mm (1.386 in) dia.	<ul style="list-style-type: none"> • Installing pinion front bearing outer race • Installing pinion front bearing inner race 	I

PREPARATION

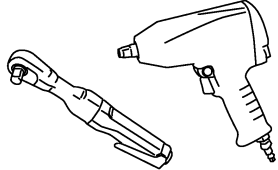
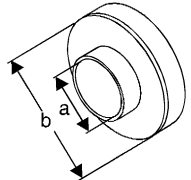
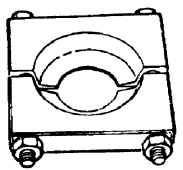
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< PREPARATION >

Tool number (Kent-Moore No.) Tool name	Description
ST3127S000 (J-25765-A) Preload gauge  <small>ZZA0503D</small>	Measuring preload torque
KV38100200 (—) Drift a: 65 mm (2.56 in) dia. b: 49 mm (1.93 in) dia.  <small>ZZA1143D</small>	Removing transfer case oil seal
KV40101840 (—) Drift a: 77 mm (3.03 in) dia. b: 85 mm (3.35 in) dia.  <small>ZZA0881D</small>	Installing gear ring bearing outer race (transfer case side)

Commercial Service Tool

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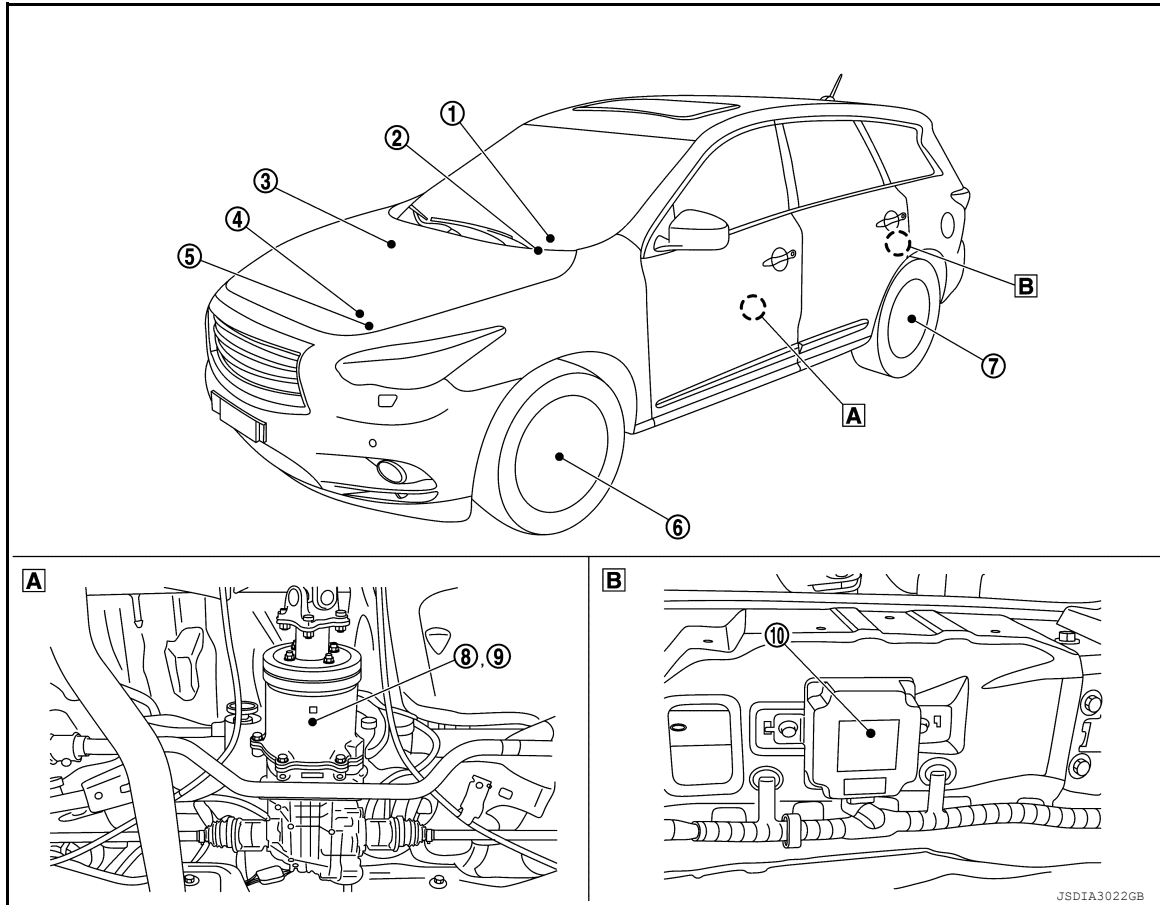
Tool name	Description
Power tool  <small>PBIC0190E</small>	Loosening nuts and bolts and nuts
Drift a: 72 mm (2.83 in) dia. b: 89 mm (3.50 in) dia.  <small>NT660</small>	Installing gear ring bearing outer race (adapter case side)
Replacer  <small>ZZA0700D</small>	Removing pinion front bearing inner race

SYSTEM DESCRIPTION

COMPONENT PARTS

Component Parts Location

INFOID:000000007883199



A. Rear final drive assembly

B. Inside storage room

No.	Component parts	Reference/Function
1	Combination meter (AWD warning icon/display)	Transmits/receives the signals for control of AWD system via CAN communication line to/from AWD control unit. For transmitting/receiving mainly signals, refer to DLN-14, "AWD SYSTEM : System Description" Refer to MWI-6, "METER SYSTEM : Component Parts Location" for detailed installation location.
2	Steering angle sensor	Transmits/receives the signals for control of AWD system via CAN communication line to/from AWD control unit. For transmitting/receiving mainly signals, refer to DLN-14, "AWD SYSTEM : System Description" Refer to BRC-8, "Component Parts Location" for detailed installation location.
3	ABS actuator and electric unit (control unit)	Transmits/receives the signals for control of AWD system via CAN communication line to/from AWD control unit. For transmitting/receiving mainly signals, refer to DLN-14, "AWD SYSTEM : System Description" Refer to BRC-8, "Component Parts Location" for detailed installation location.
4	TCM	Transmits/receives the signals for control of AWD system via CAN communication line to/from AWD control unit. For transmitting/receiving mainly signals, refer to DLN-14, "AWD SYSTEM : System Description" Refer to TM-11, "CVT CONTROL SYSTEM : Component Parts Location" for detailed installation location.

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COMPONENT PARTS

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< SYSTEM DESCRIPTION >

No.	Component parts	Reference/Function
5	ECM	Transmits/receives the signals for control of AWD system via CAN communication line to/from AWD control unit. For transmitting/receiving mainly signals, refer to DLN-14. "AWD SYSTEM : System Description" . Refer to EC-16. "ENGINE CONTROL SYSTEM : Component Parts Location" for detailed installation location.
6	Front wheel sensor	BRC-10. "Wheel Sensor and Sensor Rotor"
7	Rear wheel sensor	
8	AWD solenoid	DLN-10. "AWD Solenoid"
9	Electric controlled coupling	DLN-10. "Electric Controlled Coupling"
10	AWD control unit	DLN-10. "AWD Control Unit"

AWD Control Unit

INFOID:000000007883201

- Controls driving force distribution by signals from each sensor from front wheel driving mode (100:0) to 4-wheel driving mode (50:50).
- Front wheel driving conditions is available by fail-safe function if malfunction is detected in AWD system.
- AWD actuator relay is integrated with AWD control unit, and supplies AWD solenoid with voltage.

AWD Solenoid

INFOID:000000007883202

Controls electric controlled coupling by command current from AWD control unit.

Electric Controlled Coupling

INFOID:000000007883203



Electric controlled coupling is integrated with rear final drive and transmits driving force to rear final drive. For operation, refer to [DLN-12. "Operation Description"](#).

AWD Warning Icon/Display

INFOID:000000007883205

AWD warning icon/display is displayed when there is a malfunction in AWD system. AWD warning icon/display indicates the vehicle is in fail-safe mode and shifting to front-wheel drive or 4-wheel drive (rear-wheels still have some driving torque).


AWD WARNING ICON/DISPLAY INDICATION

Condition	AWD warning icon/display
AWD system malfunction	 <p style="text-align: right; font-size: small;">JSDIA3103GB</p>
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.) When this message is displayed, refer to DLN-62. "Description" .	 <p style="text-align: right; font-size: small;">JSDIA3104GB</p> <p>(Displaying for approximately 1 minute and then turned OFF)</p>

COMPONENT PARTS

< SYSTEM DESCRIPTION >

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Condition	AWD warning icon/display
Large difference in diameter of front/rear tires When this message is displayed, refer to DLN-63. "Diagnosis Procedure" .	 <p style="font-size: small; margin-top: 10px;">JSDIA3105GB (Continuing to display until ignition switch is turned OFF)</p>
Other than above (system normal)	OFF

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CAUTION:

- **AWD warning icon/display is displayed due to data reception error, CAN communication error etc.**

STRUCTURE AND OPERATION

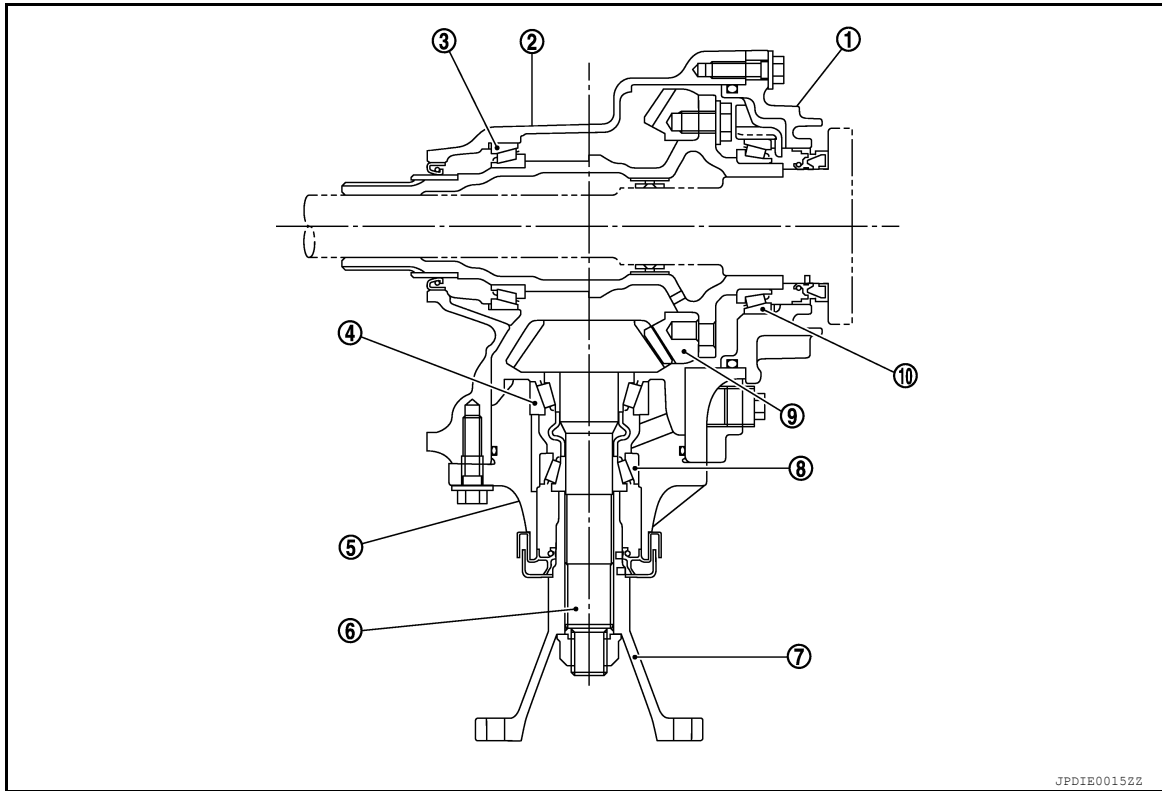
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STRUCTURE AND OPERATION

Sectional View

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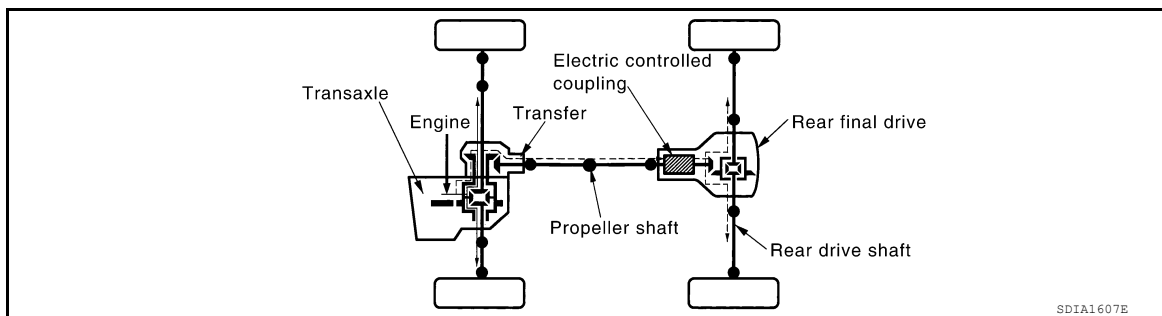


- | | | |
|---|------------------------|---|
| 1. Adapter case | 2. Transfer case | 3. Gear ring bearing (Transfer case side) |
| 4. Pinion front bearing | 5. Pinion sleeve | 6. Drive pinion |
| 7. Companion flange | 8. Pinion rear bearing | 9. Drive gear |
| 10. Gear ring bearing (Adapter case side) | | |

Operation Description

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POWER TRANSFER DIAGRAM



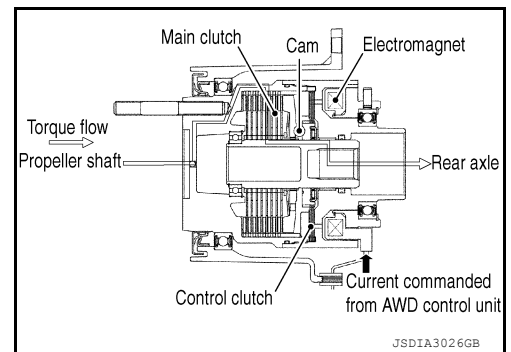
ELECTRIC CONTROLLED COUPLING

STRUCTURE AND OPERATION

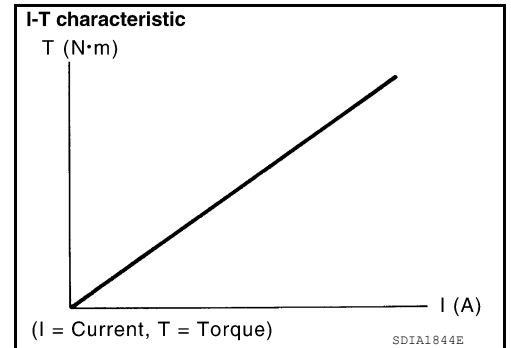
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< SYSTEM DESCRIPTION >

1. The AWD control unit supplies command current to electric controlled coupling (AWD solenoid).
2. The 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. The main clutch transmits torque to front wheels according to pressing power.



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



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SYSTEM

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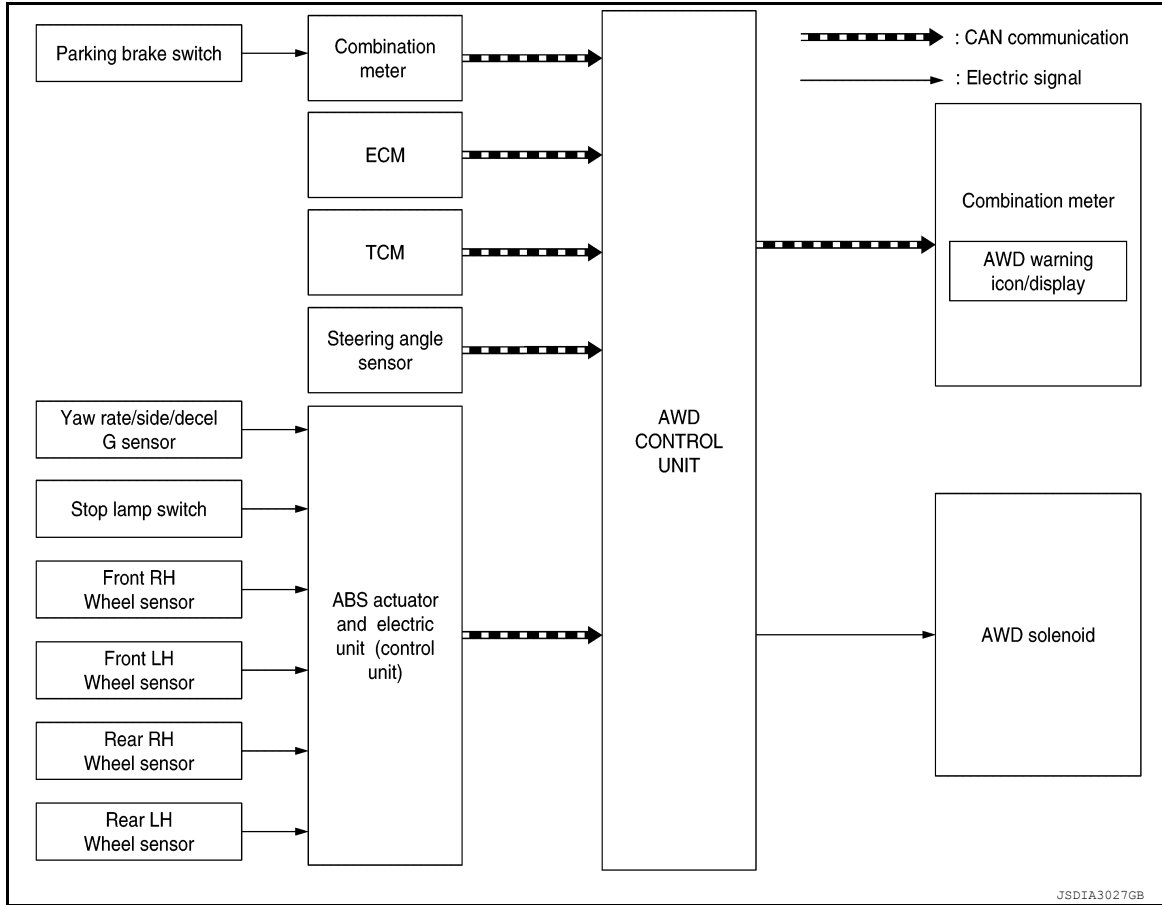
SYSTEM

AWD SYSTEM

AWD SYSTEM : System Description

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SYSTEM DIAGRAM



INPUT/OUTPUT SIGNAL

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

Component parts	Function
ABS actuator and electric unit (control unit)	Transmits the following signals via CAN communication to AWD control unit. <ul style="list-style-type: none"> • Vehicle speed signal • Stop lamp switch signal (brake signal) • Yaw rate sensor signal • Side G sensor signal • Decel G sensor signal
ECM	Transmits the following signals via CAN communication to AWD control unit. <ul style="list-style-type: none"> • Accelerator pedal position signal • Engine speed signal
TCM	Transmits the following signals via CAN communication to AWD control unit. <ul style="list-style-type: none"> • Input shaft revolutionary signal • CVT ratio signal
Combination meter	Transmits conditions of parking brake switch signal via CAN communication to AWD control unit.
	Receives the following signals via CAN communication from AWD control unit. <ul style="list-style-type: none"> • AWD warning icon/display signal
Steering angle sensor	Transmits conditions of steering angle sensor signal via CAN communication to AWD control unit.

SYSTEM

[TRANSFER: TY20A]

< SYSTEM DESCRIPTION >

DESCRIPTION

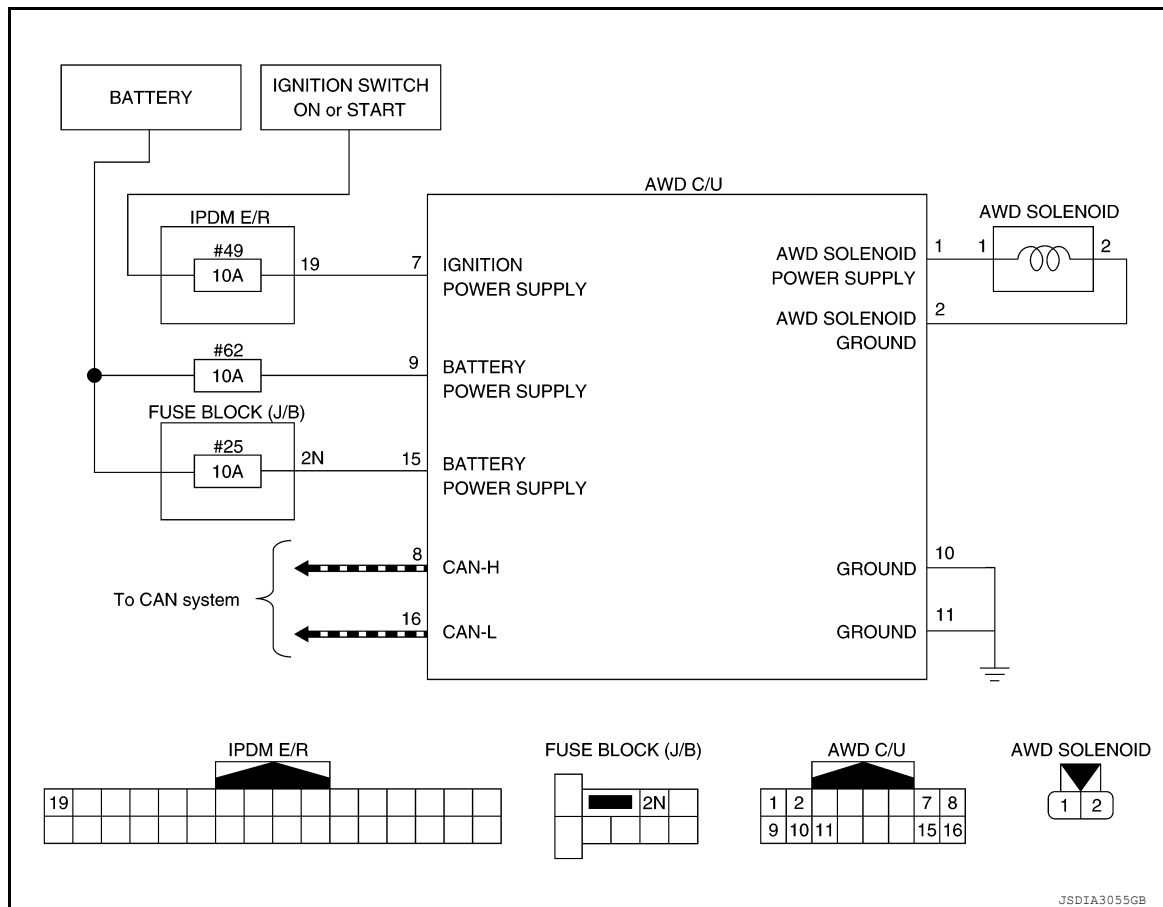
- AWD controls distribution of drive power between front-wheel drive (100:0) and 4-wheel drive (50:50) conditions according to signals from sensors.
- By receiving the steering angle sensor signal, yaw rate sensor signal, side G sensor signal and decel G sensor signal, vehicle with VDC corrects a torque distribution for front and rear wheels according to a driving operation and a behavior of the vehicle during cornering and improves drivability and safety on a slippery road surface.
- Electronic control allows optimal distribution of torque to front/rear wheels to match road conditions.
- AWD mode makes possible stable driving possible with no wheel spin, on snowy roads or other slippery surfaces.
- On roads which do not require 4-wheel drive, it contributes to improved fuel economy by driving in conditions close to front-wheel drive.
- Sensor inputs determine the vehicle's turning condition, and tight cornering/braking are controlled by distributing optimum torque to rear wheels.

NOTE:

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

AWD SYSTEM : Circuit Diagram

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AWD SYSTEM : Fail-Safe

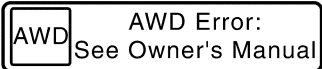
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- If any malfunction occurs in AWD electrical system, and control unit detects the malfunction, AWD warning icon/display on information display is displayed to indicate system malfunction.
- When AWD warning icon/display is displayed, vehicle changes to front-wheel drive or shifts to 4-wheel drive (rear-wheels still have some driving torque).

SYSTEM

< SYSTEM DESCRIPTION >



[TRANSFER: TY20A]

DTC	AWD warning icon/display	Possible cause	Vehicle condition	
C1201		Internal malfunction of AWD control unit	Front-wheel drive or shifts to 4-wheel drive (Rear-wheels still have some driving torque)	
C1203		ABS malfunction • Vehicle speed signal error		
C1204		• Internal malfunction of electronic controlled coupling • Malfunction of AWD solenoid power supply circuit (open or short) • Malfunction of AWD solenoid command current		
C1205		• Internal malfunction of AWD control unit • Malfunction of AWD solenoid power supply circuit (ground short)		
C1210		Malfunction of engine control system		
P1804		<small>JSDIA3103GB</small>		Internal malfunction of AWD control unit
P181F		Writing unit characteristics is incomplete.		
U1000		• CAN communication error • Malfunction of AWD control unit		
U1010		Malfunction of AWD control unit		

AWD SYSTEM : Protection Function

INFOID:000000008180341

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

AWD warning icon/display	Possible cause	Vehicle condition
 <p style="text-align: center;"><small>JSDIA3104GB</small></p> (Displaying for approximately 1 minute and then turned OFF)	Drive train parts in protection mode. It is not malfunction. (Internal temperature rise of electronic controlled coupling) When this message is displayed, refer to DLN-62, "Description" .	Shuts down AWD system temporarily (Front wheel drive)
 <p style="text-align: center;"><small>JSDIA3105GB</small></p> (Continuing to display until ignition switch is turned OFF)	Malfunction in each tire or different tire diameter When this message is displayed, refer to DLN-63, "Diagnosis Procedure" .	

DIAGNOSIS SYSTEM (AWD CONTROL UNIT)

< SYSTEM DESCRIPTION >

[TRANSFER: TY20A]

DIAGNOSIS SYSTEM (AWD CONTROL UNIT)

CONSULT Function

INFOID:000000007883213

APPLICATION ITEMS

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

Diagnostic test mode	Function
ECU Identification	AWD control unit 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 unit can be read.
Active Test	Diagnostic Test Mode in which CONSULT drives some actuators apart from the AWD control unit and also shifts some parameters in a specified range.
Work support	This mode enable a technician 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 unit part number can be read.

SELF DIAGNOSTIC RESULT

Refer to [DLN-22. "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
IGN COUNTER [0 - 39]	<p>The number of times that ignition switch is turned ON after the DTC is detected is displayed.</p> <ul style="list-style-type: none"> • 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. <p>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.</p>

DATA MONITOR

Monitor item (Unit)	Remarks
STOP LAMP SW [On/Off]	Stop lamp switch signal status via CAN communication line is displayed.
ENG SPEED SIG [Run/Stop]	Engine status is displayed.
ETS ACTUATOR [On/Off]	Operating condition of AWD actuator relay (integrated in AWD control unit) is displayed.
4WD WARN LAMP [On/Off]	Control status of AWD warning icon/display is displayed.
4WD MODE SW [AUTO/LOCK]	Mode switch is not equipped, but displayed.
4WD MODE MON [AUTO/LOCK]	Control status of AWD is displayed.
DIS-TIRE MONI [mm]	Improper size tire installed condition is displayed.
P BRAKE SW [On/Off]	Parking switch signal status via CAN communication line is displayed.
BATTERY VOLT [V]	Power supply voltage for AWD control unit

DIAGNOSIS SYSTEM (AWD CONTROL UNIT)

< SYSTEM DESCRIPTION >

[TRANSFER: TY20A]

Monitor item (Unit)	Remarks
THRTL POS SEN [%]	Throttle opening status is displayed.
ETS SOLENOID [A]	Monitored value of current at AWD solenoid
FR RH SENSOR [km/h] or [mph]	Wheel speed calculated by front RH wheel sensor signal is displayed.
FR LH SENSOR [km/h] or [mph]	Wheel speed calculated by front LH wheel sensor signal is displayed.
RR RH SENSOR [km/h] or [mph]	Wheel speed calculated by rear RH wheel sensor signal is displayed.
RR LH SENSOR [km/h] or [mph]	Wheel speed calculated by rear LH wheel sensor signal 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 unit gives drive signal to actuator with receiving command from CONSULT to check operation of actuator.

Test item	Condition	Description
ETS S/V (Detects AWD solenoid)	<ul style="list-style-type: none"> • Vehicle stopped • Engine running • No DTC detected 	Change command current value to AWD solenoid, and then change driving mode. (Monitor value is normal if it is within approx. $\pm 10\%$ of command value.) <ul style="list-style-type: none"> • 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 unit.
UNIT CHARACTERISTICS WRITE	Writes the unit characteristics of electric controlled coupling to AWD control unit.

AWD CONTROL UNIT

< ECU DIAGNOSIS INFORMATION >

[TRANSFER: TY20A]

ECU DIAGNOSIS INFORMATION

AWD CONTROL UNIT

Reference Value

INFOID:000000007883214

VALUES ON THE DIAGNOSIS TOOL

Monitor item	Condition	Value/Status
STOP LAMP SW	Brake pedal: Depressed	On
	Brake pedal: Released	Off
ENG SPEED SIG	Engine stopped (Engine speed: Less than 400 rpm)	Stop
	Engine running (Engine speed: 400 rpm or more)	Run
ETS ACTUATOR	Engine stopped (Ignition switch: ON)	Off
	Engine running	On
4WD WARN LAMP	AWD warning icon/display: ON	On
	AWD warning icon/display: OFF	Off
4WD MODE SW	Always	AUTO
4WD MODE MON	Always	AUTO
DIS-TIRE MONI	Vehicle running with normal size tire installed	0 – 4 mm
	Vehicle running with improper size tire installed (Front/rear tire size difference, wear condition)	4 – 8 mm, 8 – mm
P BRAKE SW	Parking brake operated	On
	Parking brake not operated	Off
BATTERY VOLT	Always	Battery voltage
THRTL POS SEN	When depressing accelerator pedal (Value rises gradually in response to throttle position.)	0 – 100%
ETS SOLENOID	Engine running • At idle speed	Approx. 0.000 A
	Engine running • 3,000 rpm or more constant	Approx. 0.000 – 1.800 A*
FR RH SENSOR	Vehicle stopped	0.00 km/h (0.00 mph)
	Vehicle running CAUTION: Check air pressure of tire under standard condition.	Nearly matches the speed meter display (±10% or less)
FR LH SENSOR	Vehicle stopped	0.00 km/h (0.00 mph)
	Vehicle running CAUTION: Check air pressure of tire under standard condition.	Nearly matches the speed meter display (±10% or less)
RR RH SENSOR	Vehicle stopped	0.00 km/h (0.00 mph)
	Vehicle running CAUTION: Check air pressure of tire under standard condition.	Nearly matches the speed meter display (±10% or less)
RR LH SENSOR	Vehicle stopped	0.00 km/h (0.00 mph)
	Vehicle running CAUTION: Check air pressure of tire under standard condition.	Nearly matches the speed meter display (±10%)

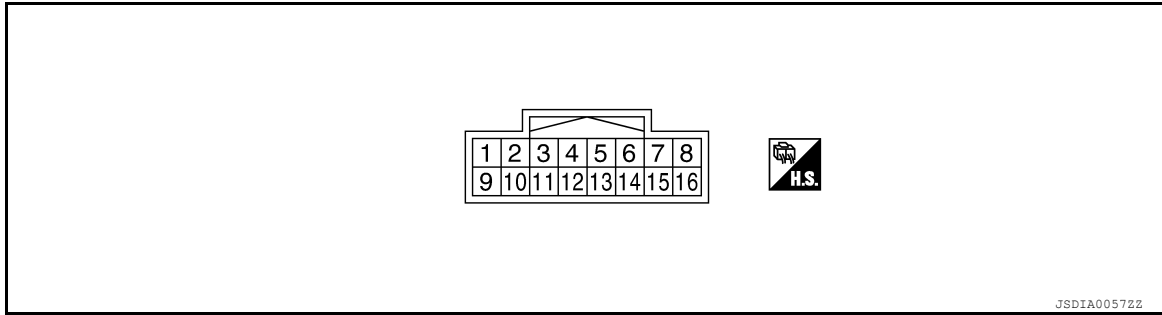
*: The values are changed by throttle opening and engine speed.

TERMINAL LAYOUT

AWD CONTROL UNIT

< ECU DIAGNOSIS INFORMATION >

[TRANSFER: TY20A]



PHYSICAL VALUES

Terminal No. (Wire color)		Description		Condition	Value (Approx.)
+	-	Signal name	Input/ Output		
1 (LG)	Ground	AWD solenoid power supply	Output	Engine speed: At idle	0 V
				Engine speed: 3,000 rpm or more constant	2.5 V*
2 (V)	Ground	AWD solenoid ground	—	Always	0 V
7 (W)	Ground	Ignition switch	Input	Ignition switch: ON	Battery voltage
				Ignition switch: OFF	0 V
8 (L)	—	CAN-H	Input/ Output	—	—
9 (SB)	Ground	Power supply (AWD solenoid)	Input	Always	Battery voltage
10 (GR)	Ground	Ground	—	Always	0 V
11 (GR)	Ground	Ground	—	Always	0 V
15 (Y)	Ground	Power supply (AWD control unit)	Input	Always	Battery voltage
16 (P)	—	CAN-L	Input/ Output	—	—

*: 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:000000007883215

- If any malfunction occurs in AWD electrical system, and control unit detects the malfunction, AWD warning icon/display on information display is displayed to indicate system malfunction.
- When AWD warning icon/display is displayed, vehicle changes to front-wheel drive or shifts to 4-wheel drive (rear-wheels still have some driving torque).

AWD CONTROL UNIT

< ECU DIAGNOSIS INFORMATION >

[TRANSFER: TY20A]

DTC	AWD warning icon/display	Possible cause	Vehicle condition
C1201	<div style="border: 1px solid black; padding: 5px; display: inline-block;"> AWD Error: See Owner's Manual </div>	Internal malfunction of AWD control unit	Front-wheel drive or shifts to 4-wheel drive (Rear-wheels still have some driving torque)
C1203		ABS malfunction • Vehicle speed signal error	
C1204		• Internal malfunction of electronic controlled coupling • Malfunction of AWD solenoid power supply circuit (open or short) • Malfunction of AWD solenoid command current	
C1205		• Internal malfunction of AWD control unit • Malfunction of AWD solenoid power supply circuit (ground short)	
C1210		Malfunction of engine control system	
P1804		Internal malfunction of AWD control unit	
P181F		Writing unit characteristics is incomplete.	
U1000		• CAN communication error • Malfunction of AWD control unit	
U1010		Malfunction of AWD control unit	

Protection Function

INFOID:000000007883216

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

AWD warning icon/display	Possible cause	Vehicle condition
<div style="border: 1px solid black; padding: 5px; display: inline-block;"> AWD High Temp. Stop Vehicle </div> <p style="text-align: center; font-size: x-small; margin-top: 5px;">JSDIA3104GB</p> <p>(Displaying for approximately 1 minute and then turned OFF)</p>	Drive train parts in protection mode. It is not malfunction. (Internal temperature rise of electronic controlled coupling) When this message is displayed, refer to DLN-62, "Description" .	Shuts down AWD system temporarily (Front wheel drive)
<div style="border: 1px solid black; padding: 5px; display: inline-block;"> AWD Tire Size Incorrect: See Owner's Manual </div> <p style="text-align: center; font-size: x-small; margin-top: 5px;">JSDIA3105GB</p> <p>(Continuing to display until ignition switch is turned OFF)</p>	Malfunction in each tire or different tire diameter When this message is displayed, refer to DLN-63, "Diagnosis Procedure" .	

DTC Inspection Priority Chart

INFOID:000000007883217

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	<ul style="list-style-type: none"> • U1000 CAN COMM CIRCUIT • U1010 CONTROL UNIT (CAN)
2	<ul style="list-style-type: none"> • C1201 CONTROLLER FAILURE • C1205 4WD ACTUATOR RLY

AWD CONTROL UNIT

< ECU DIAGNOSIS INFORMATION >

[TRANSFER: TY20A]

Priority	Detected items (DTC)
3	<ul style="list-style-type: none">• C1204 4WD SOLENOID
4	<ul style="list-style-type: none">• C1203 ABS SYSTEM• C1210 ENGINE SIGNAL 1
5	<ul style="list-style-type: none">• P1804 CONTROL UNIT 3
6	<ul style="list-style-type: none">• P181F INCOMP CALIBRATION

DTC Index

INFOID:000000007883218

DTC	Display Item	Reference
C1201	CONTROLLER FAILURE	DLN-43, "DTC Logic"
C1203	ABS SYSTEM	DLN-44, "DTC Logic"
C1204	4WD SOLENOID	DLN-45, "DTC Logic"
C1205	4WD ACTUATOR RLY	DLN-48, "DTC Logic"
C1210	ENGINE SIGNAL 1	DLN-50, "DTC Logic"
P1804	CONTROL UNIT 3	DLN-51, "DTC Logic"
P181F	INCOMP CALIBRATION	DLN-52, "DTC Logic"
U1000	CAN COMM CIRCUIT	DLN-53, "DTC Logic"
U1010	CONTROL UNIT (CAN)	DLN-54, "DTC Logic"

< WIRING DIAGRAM >

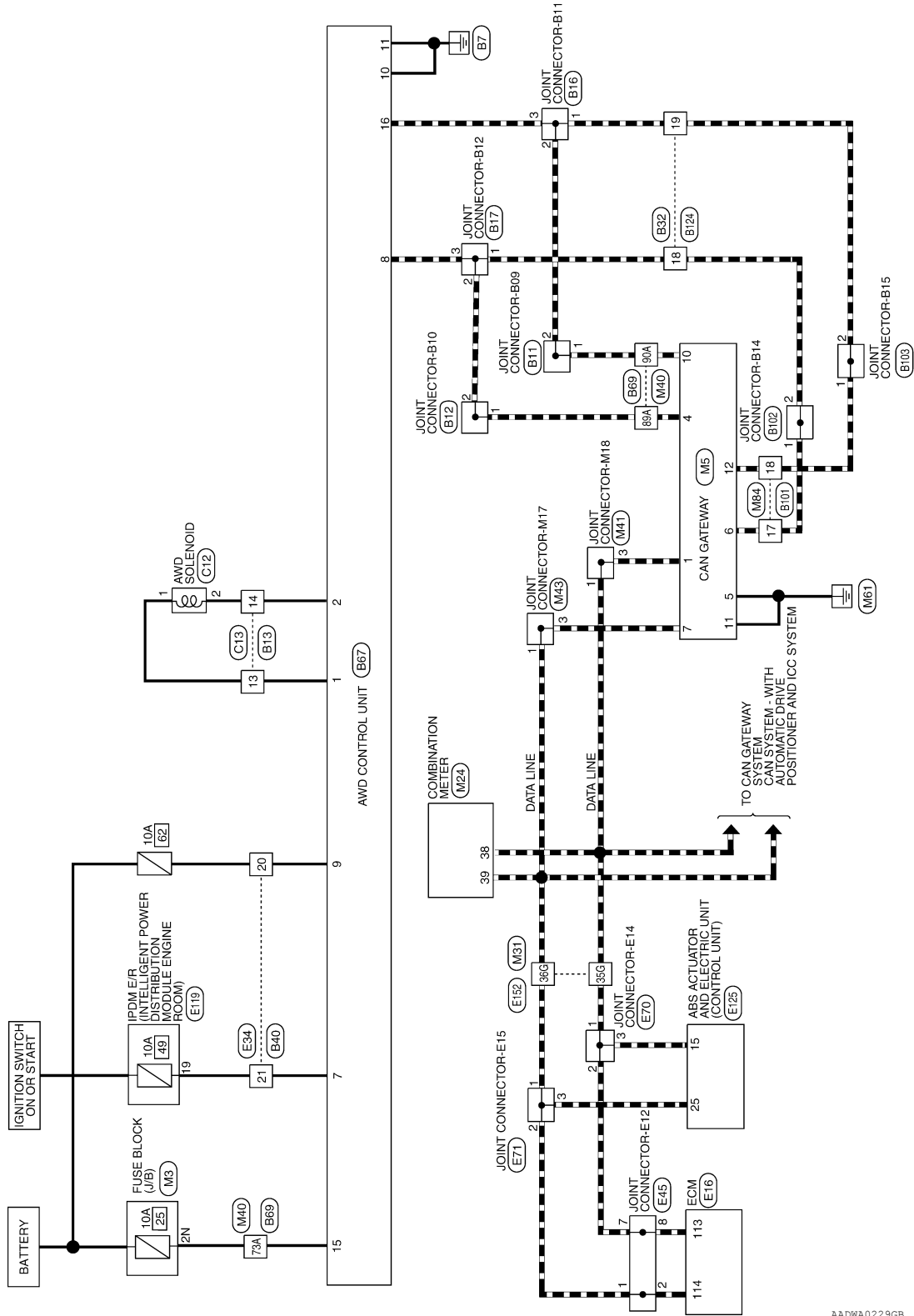
WIRING DIAGRAM

AWD SYSTEM

Wiring Diagram -With Bose Audio System-

INFOID:000000007883219

AWD SYSTEM - WITH ICC SYSTEM

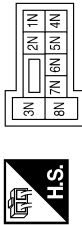


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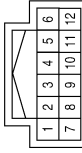
AWD SYSTEM CONNECTORS - WITH ICC SYSTEM

Connector No.	M3
Connector Name	FUSE BLOCK (J/B)
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
2N	BG	-

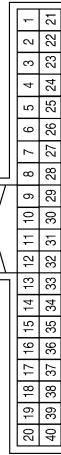
Connector No.	M5
Connector Name	CAN GATEWAY
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
1	L	-
4	L	-
5	B	-

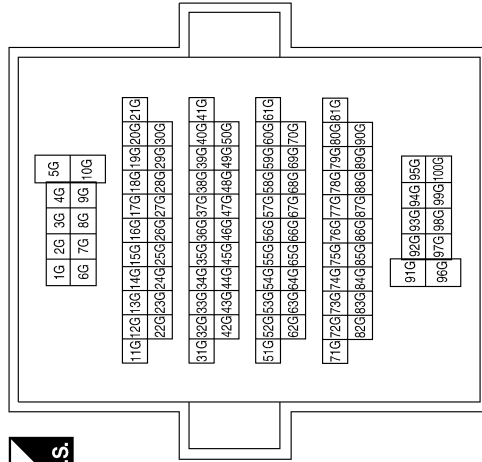
Terminal No.	Color of Wire	Signal Name
6	L	-
7	P	-
10	P	-
11	B	-
12	P	-

Connector No.	M24
Connector Name	COMBINATION METER
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
38	P	CAN-L
39	L	CAN-H

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



Terminal No.	Color of Wire	Signal Name
35G	P	-
36G	L	-

AWD SYSTEM

< WIRING DIAGRAM >

[TRANSFER: TY20A]

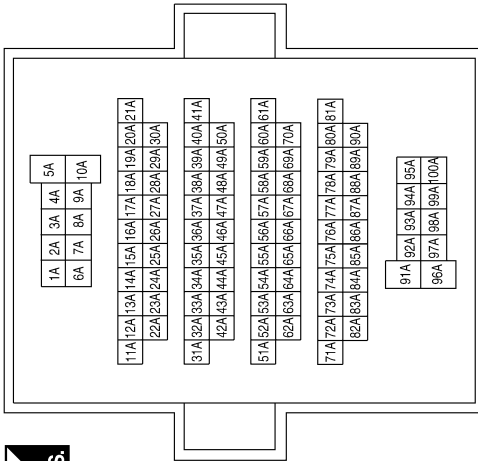
Connector No.	M41
Connector Name	JOINT CONNECTOR-M18
Connector Color	WHITE



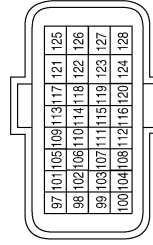
Terminal No.	Color of Wire	Signal Name
1	P	-
3	P	-

Terminal No.	Color of Wire	Signal Name
73A	BG	-
89A	L	-
90A	P	-

Connector No.	M40
Connector Name	WIRE TO WIRE
Connector Color	WHITE

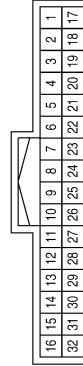


Connector No.	E16
Connector Name	ECM
Connector Color	GRAY



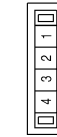
Terminal No.	Color of Wire	Signal Name
113	P	CAN-L
114	L	CAN-H

Connector No.	M84
Connector Name	WIRE TO WIRE
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
17	L	-
18	P	-

Connector No.	M43
Connector Name	JOINT CONNECTOR-M17
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
1	L	-
3	L	-

AADIA0311GB

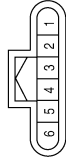
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AWD SYSTEM

< WIRING DIAGRAM >

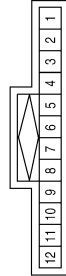
[TRANSFER: TY20A]

Connector No.	E70
Connector Name	JOINT CONNECTOR-E14
Connector Color	BLACK



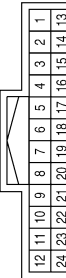
Terminal No.	Color of Wire	Signal Name
1	P	-
2	P	-
3	P	-

Connector No.	E45
Connector Name	JOINT CONNECTOR-E12
Connector Color	BLUE



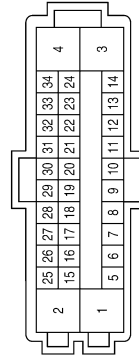
Terminal No.	Color of Wire	Signal Name
1	L	-
2	L	-
7	P	-
8	P	-

Connector No.	E34
Connector Name	WIRE TO WIRE
Connector Color	WHITE



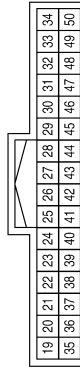
Terminal No.	Color of Wire	Signal Name
20	LG	-
21	SB	-

Connector No.	E125
Connector Name	ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)
Connector Color	BLACK



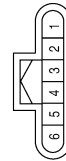
Terminal No.	Color of Wire	Signal Name
15	P	CAN-L
25	L	CAN-H

Connector No.	E119
Connector Name	IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
19	SB	SUB ECU

Connector No.	E71
Connector Name	JOINT CONNECTOR-E15
Connector Color	BLACK



Terminal No.	Color of Wire	Signal Name
1	L	-
2	L	-
3	L	-

AADIA0312GB

AWD SYSTEM

< WIRING DIAGRAM >

[TRANSFER: TY20A]

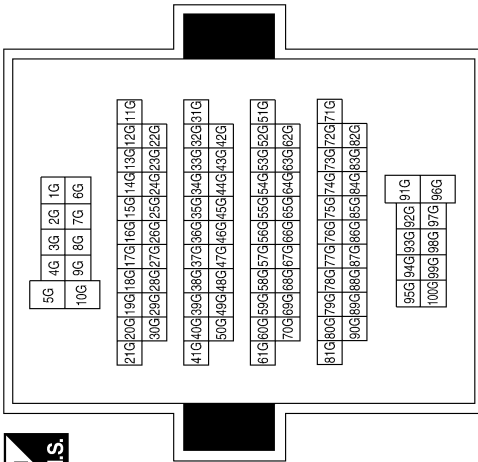
Connector No.	C12
Connector Name	AWD SOLENOID
Connector Color	GRAY



Terminal No.	Color of Wire	Signal Name
1	SB	-
2	Y	-

Terminal No.	Color of Wire	Signal Name
35G	P	-
36G	L	-

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

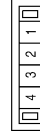


Connector No.	B12
Connector Name	JOINT CONNECTOR-B10
Connector Color	WHITE



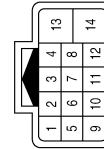
Terminal No.	Color of Wire	Signal Name
1	L	-
2	L	-

Connector No.	B11
Connector Name	JOINT CONNECTOR-B09
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
1	P	-
2	P	-

Connector No.	C13
Connector Name	WIRE TO WIRE
Connector Color	BLACK

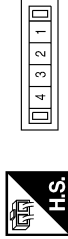


Terminal No.	Color of Wire	Signal Name
13	SB	-
14	Y	-

AADIA0313GB

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DLN
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P

Connector No.	B17
Connector Name	JOINT CONNECTOR-B12
Connector Color	WHITE



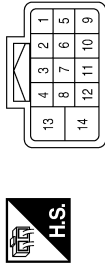
Terminal No.	Color of Wire	Signal Name
1	L	-
2	L	-
3	L	-

Connector No.	B16
Connector Name	JOINT CONNECTOR-B11
Connector Color	WHITE



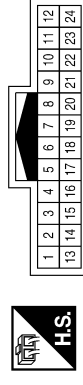
Terminal No.	Color of Wire	Signal Name
1	P	-
2	P	-
3	P	-

Connector No.	B13
Connector Name	WIRE TO WIRE
Connector Color	BLACK



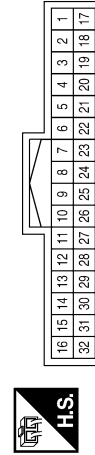
Terminal No.	Color of Wire	Signal Name
13	LG	-
14	V	-

Connector No.	B40
Connector Name	WIRE TO WIRE
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
20	SB	-
21	W	-

Connector No.	B32
Connector Name	WIRE TO WIRE
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
18	L	-
19	P	-

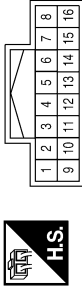
AADIA0314GB

AWD SYSTEM

< WIRING DIAGRAM >

[TRANSFER: TY20A]

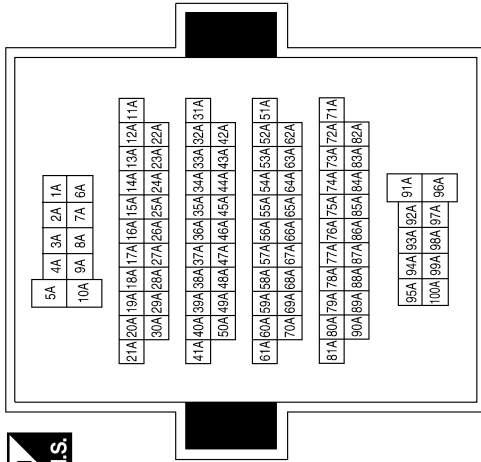
Connector No.	B67
Connector Name	AWD CONTROL UNIT
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
1	LG	AWD SOLENOID (+)
2	V	AWD SOLENOID (-)
3	-	-
4	-	-
5	-	-

Terminal No.	Color of Wire	Signal Name
6	-	-
7	W	IGNITION SWITCH
8	L	CAN-H
9	SB	BATTERY (AWD SOLENOID)
10	GR	GROUND
11	GR	GROUND
12	-	-
13	-	-
14	-	-
15	Y	BATTERY (CONTROL UNIT)
16	P	CAN-L

Connector No.	B69
Connector Name	WIRE TO WIRE
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
73A	Y	-
89A	L	-
90A	P	-

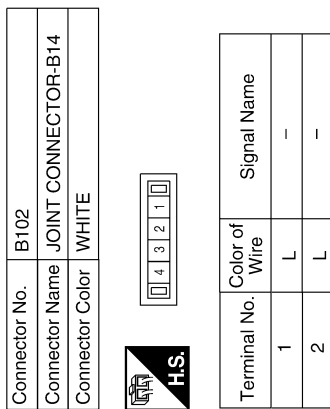
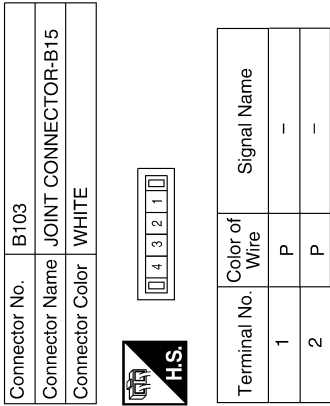
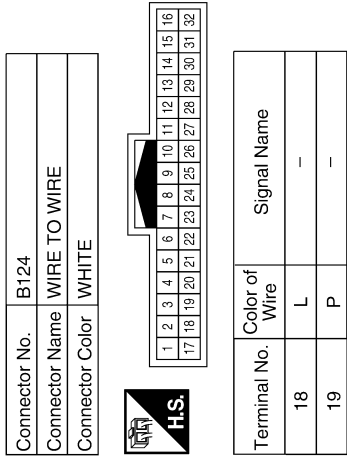
Connector No.	B101
Connector Name	WIRE TO WIRE
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
17	L	-
18	P	-

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AWD SYSTEM

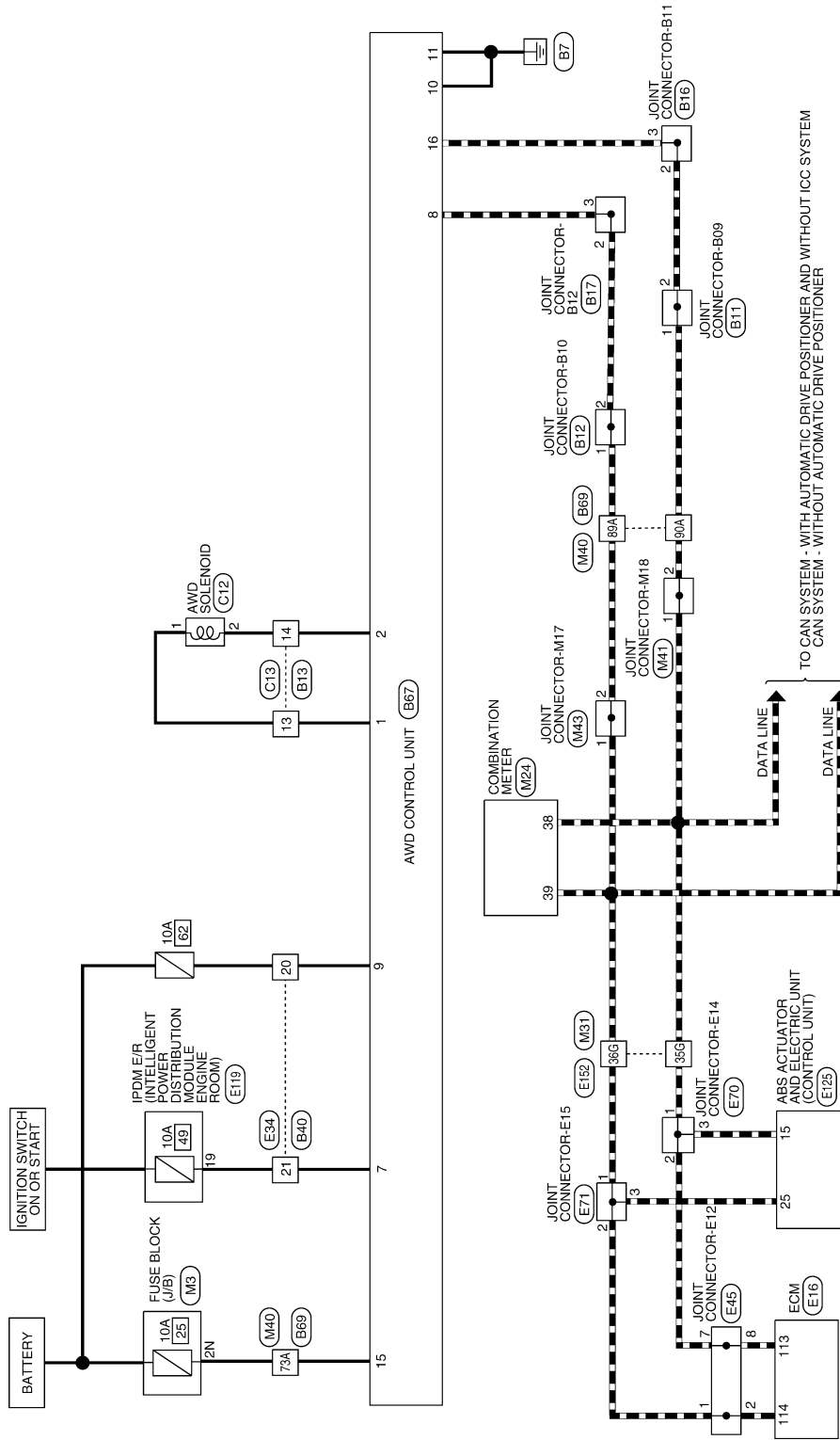
[TRANSFER: TY20A]

< WIRING DIAGRAM >

Wiring Diagram -Without Bose Audio System-

INFOID:000000008377727

AWD SYSTEM - WITHOUT ICC SYSTEM

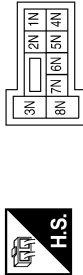


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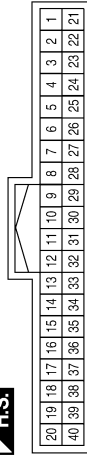
AWD SYSTEM CONNECTORS - WITHOUT ICC SYSTEM

Connector No.	M3
Connector Name	FUSE BLOCK (J/B)
Connector Color	WHITE



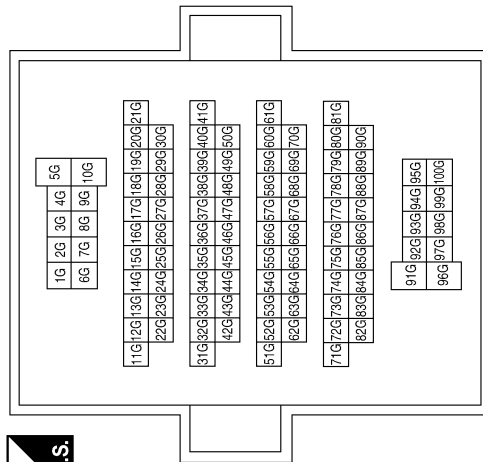
Terminal No.	Color of Wire	Signal Name
2N	BG	-

Connector No.	M24
Connector Name	COMBINATION METER
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
38	P	CAN-L
39	L	CAN-H

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



Terminal No.	Color of Wire	Signal Name
35G	P	-
36G	L	-

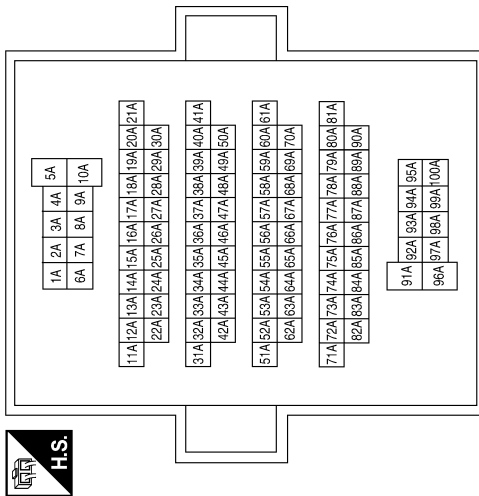
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Connector No.	M41
Connector Name	JOINT CONNECTOR-M18
Connector Color	WHITE

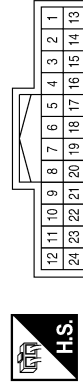


Terminal No.	Color of Wire	Signal Name
1	P	-
2	P	-

Terminal No.	Color of Wire	Signal Name
73A	BG	-
89A	L	-
90A	P	-

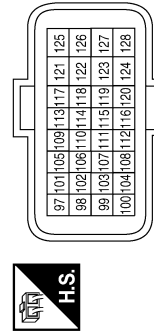


Connector No.	E34
Connector Name	WIRE TO WIRE
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
20	LG	-
21	SB	-

Connector No.	E16
Connector Name	ECM
Connector Color	GRAY



Terminal No.	Color of Wire	Signal Name
113	P	CAN-L
114	L	CAN-H

Connector No.	M43
Connector Name	JOINT CONNECTOR-M17
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
1	L	-
2	L	-

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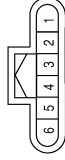
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AWD SYSTEM

< WIRING DIAGRAM >

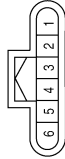
[TRANSFER: TY20A]

Connector No.	E71
Connector Name	JOINT CONNECTOR-E15
Connector Color	BLACK



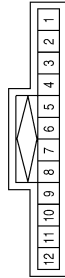
Terminal No.	Color of Wire	Signal Name
1	L	-
2	L	-
3	L	-

Connector No.	E70
Connector Name	JOINT CONNECTOR-E14
Connector Color	BLACK



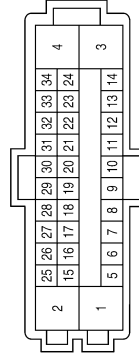
Terminal No.	Color of Wire	Signal Name
1	P	-
2	P	-
3	P	-

Connector No.	E45
Connector Name	JOINT CONNECTOR-E12
Connector Color	BLUE



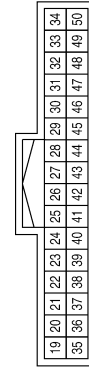
Terminal No.	Color of Wire	Signal Name
1	L	-
2	L	-
7	P	-
8	P	-

Connector No.	E125
Connector Name	ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)
Connector Color	BLACK



Terminal No.	Color of Wire	Signal Name
15	P	CAN-L
25	L	CAN-H

Connector No.	E119
Connector Name	IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
19	SB	SUB ECU

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AWD SYSTEM

< WIRING DIAGRAM >

[TRANSFER: TY20A]

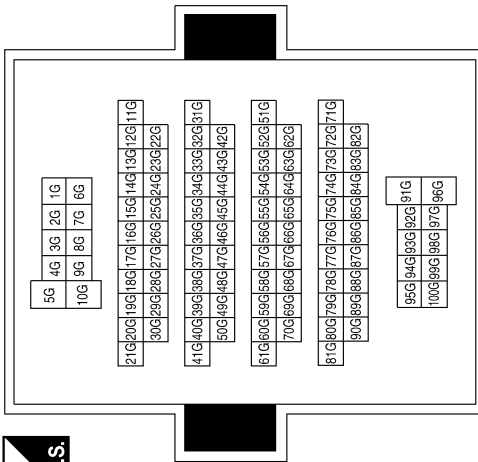
Connector No.	C12
Connector Name	AWD SOLENOID
Connector Color	GRAY



Terminal No.	Color of Wire	Signal Name
1	SB	-
2	Y	-

Terminal No.	Color of Wire	Signal Name
35G	P	-
36G	L	-

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



Connector No.	B12
Connector Name	JOINT CONNECTOR-B10
Connector Color	WHITE



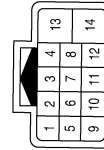
Terminal No.	Color of Wire	Signal Name
1	L	-
2	L	-

Connector No.	B11
Connector Name	JOINT CONNECTOR-B09
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
1	P	-
2	P	-

Connector No.	C13
Connector Name	WIRE TO WIRE
Connector Color	BLACK



Terminal No.	Color of Wire	Signal Name
13	SB	-
14	Y	-

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AWD SYSTEM

< WIRING DIAGRAM >

[TRANSFER: TY20A]

Connector No.	B17
Connector Name	JOINT CONNECTOR-B12
Connector Color	WHITE



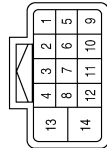
Terminal No.	Color of Wire	Signal Name
2	L	-
3	L	-

Connector No.	B16
Connector Name	JOINT CONNECTOR-B11
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
2	P	-
3	P	-

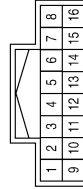
Connector No.	B13
Connector Name	WIRE TO WIRE
Connector Color	BLACK



Terminal No.	Color of Wire	Signal Name
13	LG	-
14	V	-

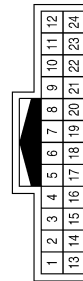
Terminal No.	Color of Wire	Signal Name
6	-	-
7	W	IGNITION SWITCH
8	L	CAN-H
9	SB	BATTERY (AWD SOLENOID)
10	GR	GROUND
11	GR	GROUND
12	-	-
13	-	-
14	-	-
15	Y	BATTERY (CONTROL UNIT)
16	P	CAN-L

Connector No.	B67
Connector Name	AWD CONTROL UNIT
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
1	LG	AWD SOLENOID (+)
2	V	AWD SOLENOID (-)
3	-	-
4	-	-
5	-	-

Connector No.	B40
Connector Name	WIRE TO WIRE
Connector Color	WHITE



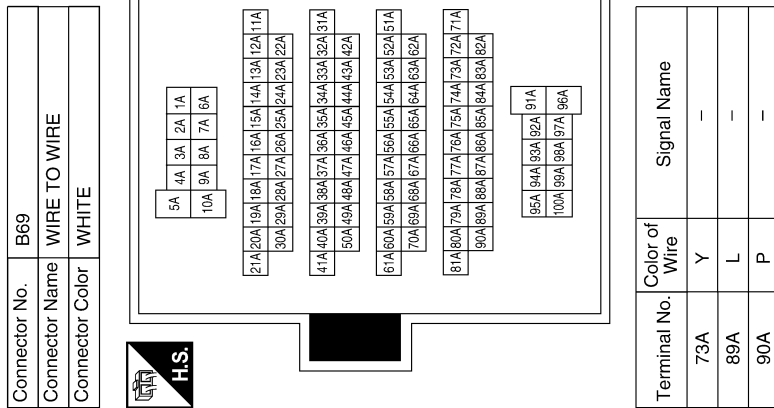
Terminal No.	Color of Wire	Signal Name
20	SB	-
21	W	-

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AWD SYSTEM

< WIRING DIAGRAM >

[TRANSFER: TY20A]



AADIA0322GB

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BASIC INSPECTION

DIAGNOSIS AND REPAIR WORK FLOW

Work Flow

INFOID:000000008180403

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-21, "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 [LAN-22, "Trouble Diagnosis Flow Chart"](#).

Is any DTC detected?

YES >> GO TO 5.

NO >> Check harness and connectors based on the information obtained by interview. Refer to [GI-53, "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?

DIAGNOSIS AND REPAIR WORK FLOW

< BASIC INSPECTION >

[TRANSFER: TY20A]

YES >> GO TO 7.

NO >> Check harness and connectors based on the information obtained by interview. Refer to [GI-53](#), "[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:000000008180404

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

DIAGNOSIS AND REPAIR WORK FLOW

< BASIC INSPECTION >

[TRANSFER: TY20A]

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 UNIT

< BASIC INSPECTION >

[TRANSFER: TY20A]

ADDITIONAL SERVICE WHEN REPLACING AWD CONTROL UNIT

Description

INFOID:000000008180342

When replacing AWD control unit, unit characteristics writing is required.

Work Procedure

INFOID:000000008180343

1.PERFORM WRITING UNIT CHARACTERISTICS

Perform writing unit characteristics of electric controlled coupling.

>> Refer to [DLN-42. "Work Procedure"](#).

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UNIT CHARACTERISTICS WRITING

Description

INFOID:000000008180344

When replacing AWD control unit, rear final drive assembly and/or electric controlled coupling, unit characteristics of electric controlled coupling writing is required.

Work Procedure

INFOID:000000008180345

1. UNIT CHARACTERISTICS WRITING

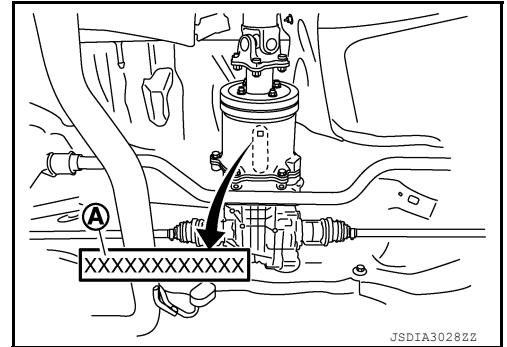
With CONSULT

1. Confirm the unit characteristics (A) of electric controlled coupling.

NOTE:

Unit characteristics is 12-digit alphanumeric.

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

C1201 AWD CONTROL UNIT

< DTC/CIRCUIT DIAGNOSIS >

[TRANSFER: TY20A]

DTC/CIRCUIT DIAGNOSIS

C1201 AWD CONTROL UNIT

DTC Logic

INFOID:000000007883221

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
C1201	CONTROLLER FAILURE	Malfunction has occurred inside AWD control unit.	Internal malfunction of AWD control unit

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 "C1201" detected?

- YES >> Proceed to [DLN-43, "Diagnosis Procedure"](#).
NO >> INSPECTION END

Diagnosis Procedure

INFOID:000000007883222

1. PERFORM SELF-DIAGNOSIS

With CONSULT

1. Erase self-diagnostic results for "ALL MODE AWD/4WD".
2. Turn the ignition switch OFF, and then wait 10 seconds or more.
3. Perform self-diagnosis for "ALL MODE AWD/4WD".

Is DTC "C1201" detected?

- YES >> Replace AWD control unit. Refer to [DLN-67, "Removal and Installation"](#).
NO >> Check AWD control unit pin terminals for damage or loose connection with harness connector. If any items are damaged, repair or replace error-detected parts.

C1203 ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

< DTC/CIRCUIT DIAGNOSIS >

[TRANSFER: TY20A]

C1203 ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

DTC Logic

INFOID:000000007883223

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
C1203	ABS SYSTEM	Malfunction related to wheel sensor has been detected by ABS actuator and electric unit (control unit).	ABS malfunction • Vehicle speed signal error

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

Is DTC "C1203" detected?

- YES >> Proceed to [DLN-44, "Diagnosis Procedure"](#).
NO >> INSPECTION END

Diagnosis Procedure

INFOID:000000007883224

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

With CONSULT

Perform self-diagnosis for "ABS".

Is any DTC detected?

- YES >> Check the DTC. Refer to [BRC-45, "DTC Index"](#).
NO >> GO TO 2.

2. PERFORM SELF-DIAGNOSIS

With CONSULT

1. Erase self-diagnostic results for "ALL MODE AWD/4WD".
2. Start the engine and drive vehicle 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-110, "Component Function Check"](#).

3. CHECK TERMINALS AND HARNESS CONNECTORS

Check AWD control unit 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 "C1203" is detected, Replace AWD control unit. Refer to [DLN-67, "Removal and Installation"](#).
NO >> Repair or replace error-detected parts.

C1204 AWD SOLENOID

< DTC/CIRCUIT DIAGNOSIS >

[TRANSFER: TY20A]

C1204 AWD SOLENOID

DTC Logic

INFOID:000000007883225

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
C1204	4WD SOLENOID	Malfunction related to AWD solenoid has been detected.	<ul style="list-style-type: none">Internal malfunction of electronic controlled couplingMalfunction of AWD solenoid power supply circuit (open or short)Malfunction of AWD solenoid command current

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

- Turn the ignition switch OFF to ON.
- Perform self-diagnosis for "ALL MODE AWD/4WD".

Is DTC "C1204" detected?

- YES >> Proceed to [DLN-45, "Diagnosis Procedure"](#).
NO >> INSPECTION END

Diagnosis Procedure

INFOID:000000007883226

1. CHECK AWD SOLENOID POWER SUPPLY (1)

- Turn the ignition switch OFF.
- Disconnect AWD control unit harness connector.
- Check the voltage between AWD control unit harness connector and ground.

AWD control unit		—	Voltage
Connector	Terminal		
B67	9	Ground	Battery voltage

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

AWD control unit		—	Voltage
Connector	Terminal		
B67	9	Ground	Battery voltage

Is the inspection result normal?

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

2. CHECK AWD SOLENOID POWER SUPPLY (2)

- Turn the ignition switch OFF.
- Check the 10A fuse (#62)

C1204 AWD SOLENOID

[TRANSFER: TY20A]

< DTC/CIRCUIT DIAGNOSIS >

3. Check the harness for open or short between AWD control unit harness connector No.9 terminal and 10A fuse (#62).

Is the inspection result normal?

YES >> Perform the trouble diagnosis for power supply circuit. Refer to [PG-10. "Wiring Diagram - BATTERY POWER SUPPLY -"](#).

NO >> Repair or replace error-detected parts.

3.CHECK AWD SOLENOID GROUND

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

AWD control unit		—	Continuity
Connector	Terminal		
B67	10	Ground	Existed
	11		

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair or replace error-detected parts.

4.CHECK AWD SOLENOID CIRCUIT (1)

Check the resistance between AWD control unit harness connector.

AWD control unit			Resistance (Approx.)
Connector	Terminal		
B67	1	2	2.45 Ω

Is the inspection result normal?

YES >> GO TO 7.

NO >> GO TO 5.

5.CHECK AWD SOLENOID CIRCUIT (2)

1. Remove AWD solenoid harness connector.
2. Check the continuity between AWD control unit harness connector and AWD solenoid harness connector.

AWD control unit		AWD solenoid		Continuity
Connector	Terminal	Connector	Terminal	
B67	1	C12	1	Existed
	2		2	

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

AWD control unit		—	Continuity
Connector	Terminal		
B67	1	Ground	Not existed
	2		

Is the inspection result normal?

YES >> GO TO 6.

NO >> Repair or replace error-detected parts.

6.CHECK AWD SOLENOID

Check AWD solenoid. Refer to [DLN-47. "Component Inspection"](#).

Is the inspection result normal?

YES >> GO TO 7.

NO >> AWD solenoid is malfunctioning. Replace electric controlled coupling. Refer to [DLN-116. "Removal and Installation"](#).

C1204 AWD SOLENOID

< DTC/CIRCUIT DIAGNOSIS >

[TRANSFER: TY20A]

7. CHECK TERMINALS AND HARNESS CONNECTORS

- Check AWD control unit pin terminals for damage or loose connection with harness connector.
- Check AWD solenoid pin terminals for damage or loose connection with harness connector.

Is the inspection result normal?

- YES >> Replace AWD control unit. Refer to [DLN-67, "Removal and Installation"](#).
NO >> Repair or replace error-detected parts.

Component Inspection

INFOID:000000007883227

1. CHECK AWD SOLENOID

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

AWD solenoid		Resistance (Approx.)
Terminal		
1	2	2.45 Ω

Is the inspection result normal?

- YES >> INSPECTION END
NO >> AWD solenoid is malfunctioning. Replace electric controlled coupling. Refer to [DLN-116, "Removal and Installation"](#).

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C1205 AWD ACTUATOR RELAY

< DTC/CIRCUIT DIAGNOSIS >

[TRANSFER: TY20A]

C1205 AWD ACTUATOR RELAY

DTC Logic

INFOID:000000007883228

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
C1205	4WD ACTUATOR RLY	Malfunction has been detected from AWD actuator relay integrated with AWD control unit, or malfunction related to AWD solenoid has been detected.	<ul style="list-style-type: none">Internal malfunction of AWD control unitMalfunction of AWD solenoid power supply circuit (ground short)

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

- Turn the ignition switch OFF to ON.
- Perform self-diagnosis for "ALL MODE AWD/4WD".

Is DTC "C1205" detected?

- YES >> Proceed to [DLN-48, "Diagnosis Procedure"](#).
NO >> INSPECTION END

Diagnosis Procedure

INFOID:000000007883229

1. CHECK AWD SOLENOID CIRCUIT (1)

- Turn the ignition switch OFF.
- Disconnect AWD control unit harness connector.
- Check the continuity between AWD control unit harness connector and the ground.

AWD control unit		—	Continuity
Connector	Terminal		
B67	1	Ground	Not existed
	2		

Is the inspection result normal?

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

2. CHECK AWD SOLENOID

- Disconnect AWD solenoid harness connector.
- Check the continuity between AWD solenoid connector and the ground.

AWD solenoid	—	Continuity
Terminal		
1	Ground	Not existed
2		

Is the inspection result normal?

- YES >> GO TO 3.

C1205 AWD ACTUATOR RELAY

[TRANSFER: TY20A]

< DTC/CIRCUIT DIAGNOSIS >

NO >> AWD solenoid is malfunctioning. Replace electric controlled coupling. Refer to [DLN-116](#), "[Removal and Installation](#)".

3. CHECK AWD SOLENOID CIRCUIT

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

AWD control unit		—	Continuity
Connector	Terminal		
B67	1	Ground	Not existed
	2		

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair or replace damaged parts.

4. CHECK TERMINALS AND HARNESS CONNECTORS

1. Check AWD control unit 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 >> After connecting each harness connector, perform DTC confirmation procedure again. When DTC "C1205" is detected, replace AWD control unit. Refer to [DLN-67](#), "[Removal and Installation](#)".

NO >> Repair or replace damaged parts.

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C1210 ECM

DTC Logic

INFOID:000000007883230

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
C1210	ENGINE SIGNAL 1	Malfunction related to engine signal has been detected.	Malfunction of engine control system

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

Is DTC "C1210" detected?

- YES >> Proceed to diagnosis procedure. Refer to [DLN-50, "Diagnosis Procedure"](#).
 NO >> INSPECTION END

Diagnosis Procedure

INFOID:000000007883231

1. PERFORM ECM SELF-DIAGNOSIS

 **With CONSULT**

Perform self-diagnosis for "ENGINE".

Is any DTC detected?

- YES >> Check the DTC. Refer to [EC-108, "DTC Index"](#).
 NO >> GO TO 2.

2. PERFORM SELF-DIAGNOSIS

 **With CONSULT**

1. Erase self-diagnostic results for "ALL MODE AWD/4WD".
2. Turn the ignition switch OFF.
3. Start the engine and drive vehicle at 30 km/h (19 MPH) or more for approximately 1 minute.
4. Stop the vehicle.
5. Check that malfunction indicator lamp (MIL) turns OFF.

Does malfunction indicator lamp (MIL) turn OFF?

- YES >> GO TO 3.
 NO >> Refer to [EC-75, "DIAGNOSIS DESCRIPTION : Malfunction Indicator Lamp \(MIL\)"](#).

3. CHECK TERMINALS AND HARNESS CONNECTORS

Check AWD control unit 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 "C1210" is detected, Replace AWD control unit. Refer to [DLN-67, "Removal and Installation"](#).
 NO >> Repair or replace error-detected parts.

P1804 AWD CONTROL UNIT

< DTC/CIRCUIT DIAGNOSIS >

[TRANSFER: TY20A]

P1804 AWD CONTROL UNIT

DTC Logic

INFOID:000000008272453

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
P1804	CONTROL UNIT 3	Malfunction is detected in the memory (EEOROM) system of AWD control unit.	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 "P1804" detected?

- YES >> Proceed to [DLN-51, "Diagnosis Procedure"](#).
NO >> INSPECTION END

Diagnosis Procedure

INFOID:000000008272454

1. PERFORM SELF-DIAGNOSIS AGAIN

With CONSULT

Perform "DTC CONFIRMATION PROCEDURE" (self-diagnosis) again. Refer to [DLN-51, "DTC Logic"](#).

Is DTC "P1804" detected?

- YES >> Replace AWD control unit. Refer to [DLN-67, "Removal and Installation"](#).
NO >> Check AWD control unit pin terminals for damage or loose connection with harness connector. If any items are damaged, repair or replace error-detected parts.

P181F INCOMPLETE CALIBRATION

[TRANSFER: TY20A]

< DTC/CIRCUIT DIAGNOSIS >

P181F INCOMPLETE CALIBRATION

DTC Logic

INFOID:000000008180347

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-52, "Diagnosis Procedure"](#).
NO >> INSPECTION END

Diagnosis Procedure

INFOID:000000008180348

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. Turn the ignition switch OFF to ON.
4. Perform self-diagnosis for "ALL MODE AWD/4WD".

Is any DTC except "P181F" detected?

- YES >> Perform trouble diagnosis for detected DTC. Refer to [DLN-22, "DTC Index"](#).
NO >> GO TO 2.

2. PERFORM SELF-DIAGNOSIS AGAIN

With CONSULT

Perform "DTC CONFIRMATION PROCEDURE" (self-diagnosis) again. Refer to [DLN-22, "DTC Index"](#).

Is DTC "P181F" detected?

- YES >> Replace AWD control unit. Refer to [DLN-67, "Removal and Installation"](#).
NO >> Check AWD control unit pin terminals for damage or loose connection with harness connector. If any items are damaged, repair or replace error-detected parts.

U1000 CAN COMM CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

[TRANSFER: TY20A]

U1000 CAN COMM CIRCUIT

Description

INFOID:000000007883232

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:000000007883233

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
U1000	CAN COMM CIRCUIT	AWD control unit is not transmitting/receiving CAN communication signal for 2 seconds or more.	<ul style="list-style-type: none">• CAN communication error• Malfunction of AWD control unit

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-53, "Diagnosis Procedure"](#).

NO >> INSPECTION END

Diagnosis Procedure

INFOID:000000007883234

Proceed to [LAN-22, "Trouble Diagnosis Flow Chart"](#).

U1010 CONTROL UNIT (CAN)

[TRANSFER: TY20A]

< DTC/CIRCUIT DIAGNOSIS >

U1010 CONTROL UNIT (CAN)

Description

INFOID:000000007883235

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:000000007883236

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 unit.	Malfunction of AWD control unit

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-54, "Diagnosis Procedure"](#).

NO >> INSPECTION END

Diagnosis Procedure

INFOID:000000007883237

1. CHECK AWD CONTROL UNIT

Check AWD control unit harness connector for disconnection and deformation.

Is the inspection result normal?

YES >> Replace AWD control unit. Refer to [DLN-67, "Removal and Installation"](#).

NO >> Repair or replace error-detected parts.

POWER SUPPLY AND GROUND CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

[TRANSFER: TY20A]

POWER SUPPLY AND GROUND CIRCUIT

Diagnosis Procedure

INFOID:000000007883238

1. CHECK AWD CONTROL UNIT POWER SUPPLY (1)

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

AWD control unit		—	Voltage (Approx.)
Connector	Terminal		
B67	7	Ground	0 V

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

AWD control unit		—	Voltage
Connector	Terminal		
B67	7	Ground	Battery voltage

Is the inspection result normal?

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

2. CHECK AWD CONTROL UNIT POWER SUPPLY (2)

1. Turn the ignition switch OFF.
2. Check the 10A fuse (#49).
3. Disconnect IPDM E/R harness connector.
4. Check the continuity between AWD control unit harness connector and IPDM E/R harness connector.

AWD control unit		IPDM E/R		Continuity
Connector	Terminal	Connector	Terminal	
B67	7	E119	19	Existed

5. Check the continuity between AWD control unit harness connector and the ground.

AWD control unit		—	Continuity
Connector	Terminal		
B67	7	Ground	Not existed

Is the inspection result normal?

- YES >> Perform the trouble diagnosis for ignition power supply circuit. Refer to [PG-22, "Wiring Diagram - IGNITION POWER SUPPLY -"](#).
- NO >> Repair or replace error-detected parts.

3. CHECK AWD CONTROL UNIT POWER SUPPLY (3)

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

AWD control unit		—	Voltage
Connector	Terminal		
B67	15	Ground	Battery voltage

3. Turn the ignition switch ON.
CAUTION:

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POWER SUPPLY AND GROUND CIRCUIT

[TRANSFER: TY20A]

< DTC/CIRCUIT DIAGNOSIS >

Never start the engine.

4. Check the voltage between AWD control unit harness connector and ground.

AWD control unit		—	Voltage
Connector	Terminal		
B67	15	Ground	Battery voltage

Is the inspection result normal?

YES >> GO TO 5.

NO >> GO TO 4.

4. CHECK AWD CONTROL UNIT POWER SUPPLY (4)

1. Turn the ignition switch OFF.
2. Check the 10A fuse (#25).
3. Disconnect fuse block (J/B) harness connector.
4. Check the continuity between AWD control unit harness connector and fuse block (J/B) harness connector.

AWD control unit		Fuse block (J/B)		Continuity
Connector	Terminal	Connector	Terminal	
B67	15	M3	2N	Existed

5. Check the continuity between AWD control unit harness connector and the ground.

AWD control unit		—	Continuity
Connector	Terminal		
B67	15	Ground	Not existed

Is the inspection result normal?

YES >> Perform the trouble diagnosis for power supply circuit. Refer to [PG-10, "Wiring Diagram - BATTERY 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 solenoid harness connector.
3. Check the voltage between AWD control unit harness connector and ground.

AWD control unit		—	Voltage
Connector	Terminal		
B67	9	Ground	Battery voltage

4. Turn the ignition switch ON.

CAUTION:

Never start the engine.

5. Check the voltage between AWD control unit harness connector and ground.

AWD control unit		—	Voltage
Connector	Terminal		
B67	9	Ground	Battery voltage

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.

POWER SUPPLY AND GROUND CIRCUIT

[TRANSFER: TY20A]

< DTC/CIRCUIT DIAGNOSIS >

2. Check the 10A fuse (#62)
3. Check the harness for open or short between AWD control unit harness connector No.9 terminal and 10A fuse (#62).

Is the inspection result normal?

YES >> Perform the trouble diagnosis for power supply circuit. Refer to [PG-10, "Wiring Diagram - BATTERY POWER SUPPLY -"](#).

NO >> Repair or replace error-detected parts.

7. CHECK AWD CONTROL UNIT GROUND

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

AWD control unit		—	Continuity
Connector	Terminal		
B67	10	Ground	Existed
	11		

Is the inspection result normal?

YES >> INSPECTION END

NO >> Repair or replace error-detected parts.

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AWD WARNING ICON/DISPLAY

Diagnosis Procedure

INFOID:000000007883243

1. CHECK POWER SUPPLY AND GROUND CIRCUIT

Perform the trouble diagnosis for power supply and ground circuit. Refer to [DLN-55, "Diagnosis Procedure"](#).

Is the inspection result normal?

YES >> GO TO 2.

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

2. PERFORM SELF-DIAGNOSIS (AWD CONTROL UNIT)

With CONSULT

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

Is any detected?

YES >> Check the DTC. Refer to [DLN-22, "DTC Index"](#).

NO >> GO TO 3.

3. PERFORM SELF-DIAGNOSIS (COMBINATION METER)

With CONSULT

Perform self-diagnosis for "METER/M&A".

Is any detected?

YES >> Check the DTC. Refer to [MWI-25, "DTC Index"](#).

NO >> Perform the trouble diagnosis for combination meter power supply circuit. Refer to [MWI-73, "COMBINATION METER : Diagnosis Procedure"](#).

AWD ERROR IS DISPLAYED ON INFORMATION DISPLAY

< SYMPTOM DIAGNOSIS >

[TRANSFER: TY20A]

SYMPTOM DIAGNOSIS

AWD ERROR IS DISPLAYED ON INFORMATION DISPLAY

Description

INFOID:000000007883248

AWD warning icon/display (AWD Error: See Owner's Manual) is displayed on information display after the engine started.

Diagnosis Procedure

INFOID:000000007883249

1. PERFORM SELF-DIAGNOSIS

With CONSULT

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

Is any DTC detected?

- YES >> Check the DTC. Refer to [DLN-22, "DTC Index"](#).
- NO >> GO TO 2.

2. CHECK AWD WARNING ICON/DISPLAY

Perform the trouble diagnosis of the AWD warning icon/display. Refer to [DLN-58, "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.

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HEAVY TIGHT-CORNER BRAKING SYMPTOM OCCURS

< SYMPTOM DIAGNOSIS >

[TRANSFER: TY20A]

HEAVY TIGHT-CORNER BRAKING SYMPTOM OCCURS

Description

INFOID:000000007883250

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:000000007883251

1. PERFORM ECM SELF-DIAGNOSIS

With CONSULT

Perform self-diagnosis for "ENGINE".

Is any DTC detected?

- YES >> Check the DTC. Refer to [EC-108, "DTC Index"](#).
- NO >> GO TO 2.

2. PERFORM SELF-DIAGNOSIS

With CONSULT

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

Is DTC "U1000" detected?

- YES >> Proceed to [LAN-22, "Trouble Diagnosis Flow Chart"](#).
- NO >> GO TO 3.

3. CHECK AWD SOLENOID

Perform the trouble diagnosis of the AWD solenoid. Refer to [DLN-45, "Diagnosis Procedure"](#).

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-116, "Removal and Installation"](#).
- NO >> Check each harness connector pin terminal for disconnection.

VEHICLE DOES NOT ENTER AWD MODE

< SYMPTOM DIAGNOSIS >

[TRANSFER: TY20A]

VEHICLE DOES NOT ENTER AWD MODE

Description

INFOID:000000007883252

Vehicle does not enter 4-wheel drive mode even though AWD warning icon/display is not displayed.

Diagnosis Procedure

INFOID:000000007883253

1. CHECK AWD WARNING ICON/DISPLAY

Perform the trouble diagnosis of the AWD warning icon/display. Refer to [DLN-58, "Diagnosis Procedure"](#).

Is the inspection result normal?

YES >> GO TO 2.

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

2. CHECK PARKING BRAKE SWITCH SIGNAL

With CONSULT

Check "P BRAKE SW" of CONSULT "DATA MONITOR" for "ALL MODE AWD/4WD".

Monitor Item	Condition	Status
P BRAKE SW	When the parking brake pedal is operation.	On
	When the parking brake pedal is not operation.	Off

Is the inspection result normal?

YES >> GO TO 3.

NO >> Proceed to [BRC-107, "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-116, "Removal and Installation"](#).

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

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AWD HIGH TEMP IS DISPLAYED ON INFORMATION DISPLAY

< SYMPTOM DIAGNOSIS >

[TRANSFER: TY20A]

AWD HIGH TEMP IS DISPLAYED ON INFORMATION DISPLAY

Description

INFOID:000000007883254

While driving, AWD warning icon/display (AWD High Temp. Stop vehicle) is displayed on information display and it turns OFF after 1 minute.

- 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 icon/display is displayed. Both cases are not malfunction. Refer to [DLN-21. "Protection Function"](#).
- When this symptom occurs, stop vehicle and allow it to idle for some times. Displays will stop and system will be restored.

TIRE SIZE INCORRECT IS DISPLAYED ON INFORMATION DISPLAY

< SYMPTOM DIAGNOSIS >

[TRANSFER: TY20A]

TIRE SIZE INCORRECT IS DISPLAYED ON INFORMATION DISPLAY

Description

INFOID:000000007883255

While driving, AWD warning icon/display (Tire Size Incorrect: See Owner's Manual) is displayed on information display.

Diagnosis Procedure

INFOID:000000007883256

1. CHECK TIRE

Check the following.

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

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace error-detected parts. And then, drive the vehicle at speed of 20 km/h (12 MPH) or more for 5 seconds or more. Improper size information is initialized accordingly.

2. CHECK INPUT SIGNAL OF TIRE DIAMETER

 **With CONSULT**

1. Start the engine.
2. Drive at 20 km/h (12 MPH) or more for approximately 4 minutes continually.
3. Check "DIS-TIRE MONI" of CONSULT "DATA MONITOR" for "ALL MODE AWD/4WD".

Does the item on "DATA MONITOR" indicate "0 - 4 mm"?

YES >> INSPECTION END

NO >> GO TO 3.

3. TERMINAL INSPECTION

Check AWD control unit harness connector for disconnection.

Is the inspection result normal?

YES >> Replace AWD control unit. Refer to [DLN-67, "Removal and Installation"](#).

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

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NOISE, VIBRATION AND HARSHNESS (NVH) TROUBLESHOOTING

< SYMPTOM DIAGNOSIS >

[TRANSFER: TY20A]

NOISE, VIBRATION AND HARSHNESS (NVH) TROUBLESHOOTING

NVH Troubleshooting Chart

INFOID:000000007883257

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.

Symptom		TRANSFER OIL (Level low)			LIQUID GASKET (Damaged)			GEAR (Worn or damaged)	
		TRANSFER OIL (Level low)	TRANSFER OIL (Wrong)	TRANSFER OIL (Level too high)	O-RING (Worn or damaged)	OIL SEAL (Worn or damaged)	BEARING (Worn or damaged)		
Reference	Noise	1	2				3	3	3
	Transfer oil leakage		3	1	2	2	2		
SUSPECTED PARTS (Possible cause)		TRANSFER OIL (Level low)	TRANSFER OIL (Wrong)	TRANSFER OIL (Level too high)	LIQUID GASKET (Damaged)	O-RING (Worn or damaged)	OIL SEAL (Worn or damaged)	GEAR (Worn or damaged)	BEARING (Worn or damaged)
Reference			DLN-65, "Inspection"		DLN-71, "Exploded View"	DLN-71, "Exploded View"	DLN-71, "Exploded View"	DLN-78, "Inspection"	DLN-78, "Inspection"

PERIODIC MAINTENANCE

TRANSFER OIL

Inspection

INFOID:000000007883258

OIL LEAKS

Check that oil is not leaking from transfer assembly or around it.

OIL LEVEL

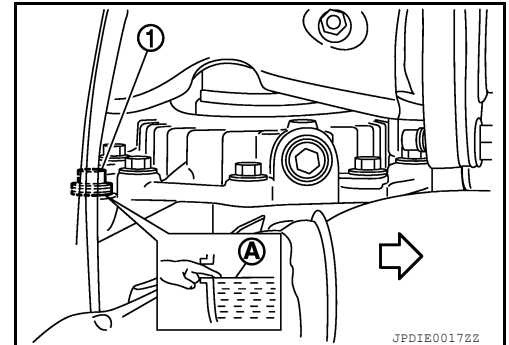
CAUTION:

Do not start engine while checking oil level.

1. Remove filler plug (1).

← : Front

2. Oil level (A) should be level with bottom of filler plug hole. Add oil if necessary. Refer to [MA-11, "Fluids and Lubricants"](#).
3. Clean threads of filler plug (1) and transfer case.
4. Apply sealant to the threads of the filler plug (1) and install it. Tighten to specified torque. Refer to [DLN-71, "Exploded View"](#).
Use Genuine Silicone RTV Sealant or equivalent. Refer to [GI-22, "Recommended Chemical Products and Sealants"](#).



JPD1E00172Z

Draining

INFOID:000000007883259

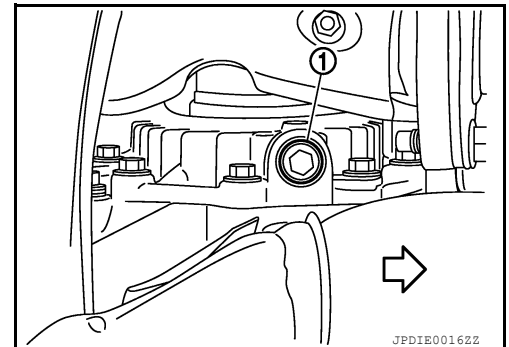
CAUTION:

Do not start engine while checking oil level.

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

← : Front

3. Clean threads of drain plug (1) and transfer case.
4. Apply sealant to the threads of the drain plug (1) and install it. Tighten to specified torque. Refer to [DLN-71, "Exploded View"](#).
Use Genuine Silicone RTV Sealant or equivalent. Refer to [GI-22, "Recommended Chemical Products and Sealants"](#).



JPD1E00162Z

Refilling

INFOID:000000007883260

CAUTION:

Do not start engine while checking oil level.

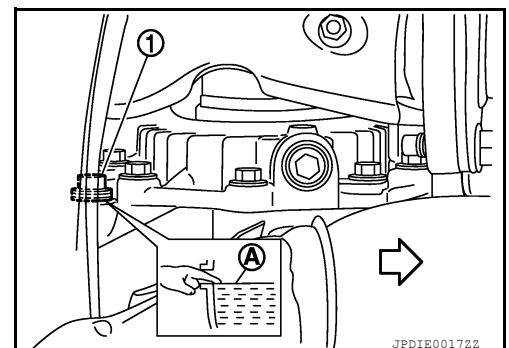
1. Remove filler plug (1).
2. Fill with new oil to the specified level near the filler plug hole.

← : Front

Oil grade and viscosity : Refer to [MA-11, "Fluids and Lubricants"](#).

Oil capacity : Refer to [DLN-94, "General Specifications"](#).

3. Clean threads of filler plug (1) and transfer case.
4. Apply sealant to the threads of the filler plug (1), and install it. Tighten to specified torque. Refer to [DLN-71, "Exploded View"](#).



JPD1E00172Z

TRANSFER OIL

< PERIODIC MAINTENANCE >

[TRANSFER: TY20A]

Use Genuine Silicone RTV Sealant or equivalent. Refer to [GI-22. "Recommended Chemical Products and Sealants"](#).

REMOVAL AND INSTALLATION**AWD CONTROL UNIT****Removal and Installation**

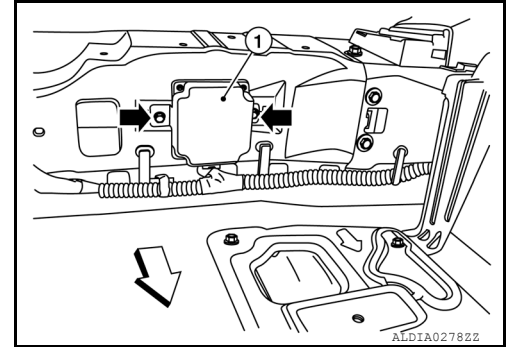
INFOID:000000007883261

REMOVAL

1. Disconnect the negative battery terminal. Refer to [PG-92, "Exploded View"](#).
2. Remove storage box. Refer to [INT-28, "Exploded View"](#).

↔ : Front

3. Remove AWD control unit bolts (↔).
4. Disconnect AWD control unit harness connector.
5. Remove AWD control unit (1).

**INSTALLATION**

Installation is in the reverse order of removal.

- Tighten AWD control unit bolts to specified torque.

AWD control unit bolts : 10.1 N·m (1.0 kg-m, 7 ft-lb)

CAUTION:

Do not drop or shock AWD control unit.

Reset electronic systems as necessary. Refer to [PG-88, "How to Handle Battery"](#).

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ADAPTER CASE OIL SEAL

< REMOVAL AND INSTALLATION >

[TRANSFER: TY20A]

ADAPTER CASE OIL SEAL

Removal and Installation

INFOID:000000008202374

NOTE:

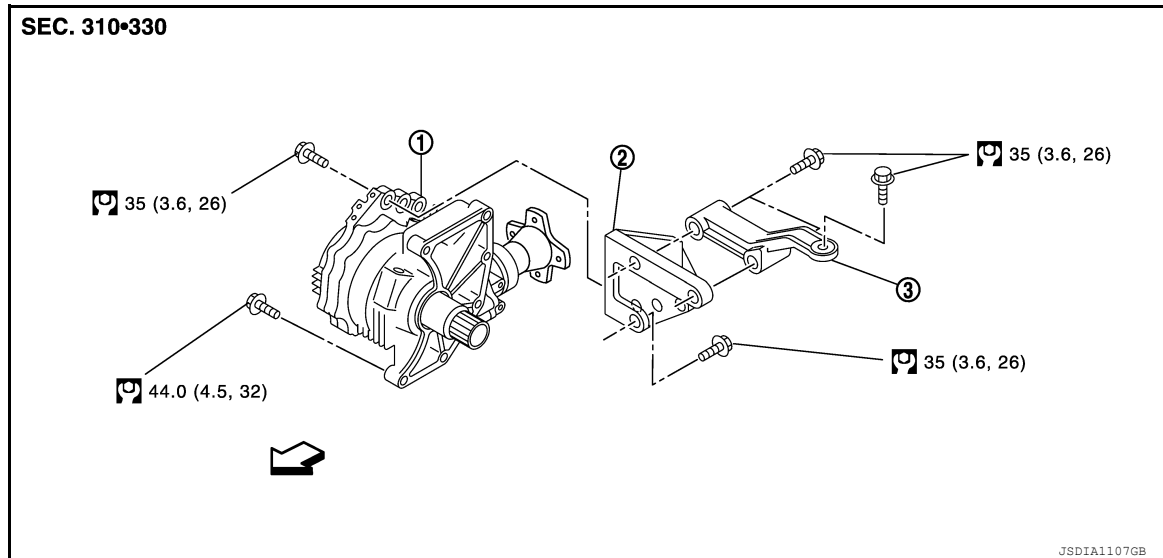
- Replacement on vehicle may cause damage to adapter case, and may cause a transfer oil leak.
- If adaptor case oil seal requires replacement, remove the transfer assembly from the vehicle before replacing adaptor case oil seal. Refer to [DLN-72. "Disassembly"](#).

UNIT REMOVAL AND INSTALLATION

TRANSFER ASSEMBLY

Exploded View

INFOID:000000007883263



1. Transfer assembly

2. Transfer gusset

3. Rear gusset

Vehicle front

: N·m (kg·m, ft·lb)

Removal and Installation

INFOID:000000007883264

NOTE:

When removing components such as hoses, tubes/lines, etc., cap or plug openings to prevent fluid from spilling.

REMOVAL

1. Drain the transfer oil. Refer to [DLN-65, "Draining"](#).
2. Remove rear propeller shaft. Refer to [DLN-99, "Removal and Installation"](#).
3. Remove front drive shaft (RH). Refer to [FAX-17, "Removal and Installation \(Right Side\)"](#).
CAUTION:
Be careful not to damage gear ring oil seal inside of transfer.
4. Remove exhaust manifold (RH). Refer to [EM-33, "Removal and Installation \(RH\)"](#).
CAUTION:
Handle carefully to avoid any shock to three way catalyst.
5. Support transaxle with a suitable jack.
6. Remove the steering gear. Refer to [ST-50, "Removal and Installation - AWD"](#).
7. Remove rear gusset and transfer gusset.
8. Remove transaxle assembly to transfer assembly bolts.
CAUTION:

TRANSFER ASSEMBLY

[TRANSFER: TY20A]

< UNIT REMOVAL AND INSTALLATION >

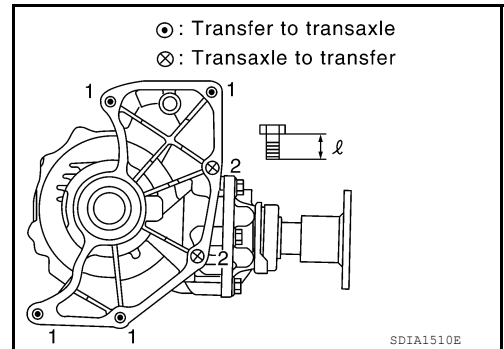
Be careful not to damage gear ring oil seal inside of CVT.

Bolt No.	1	2
Quantity	4	2
Bolt length "ℓ" mm (in)	65 (2.56)	40 (1.57)

9. Remove transfer assembly from the vehicle.

CAUTION:

- Do not damage air breather hose.
- After removing transfer from transaxle, always replace differential side oil seal of the transaxle side with new one. Refer to [TM-180, "Removal and Installation"](#).



INSTALLATION

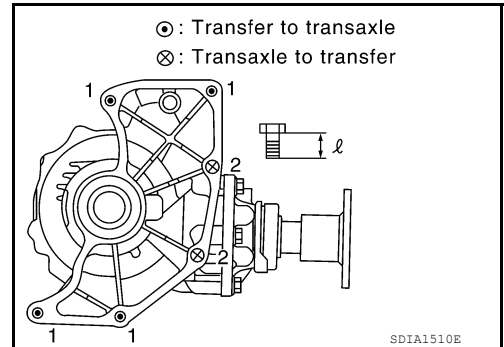
Installation is in the reverse order of removal.

- When installing the transfer to the transaxle, install the bolts following the standard below.

Bolt No.	1	2
Quantity	4	2
Bolt length "ℓ" mm (in)	65 (2.56)	40 (1.57)

CAUTION:

- When installing transfer to transaxle, be careful not to damage oil seal of transaxle.
- Do not reuse differential side oil seal.
- Check oil level and check for oil leaks after installation. Refer to [DLN-65, "Refilling"](#).



ADAPTER CASE

< UNIT DISASSEMBLY AND ASSEMBLY >

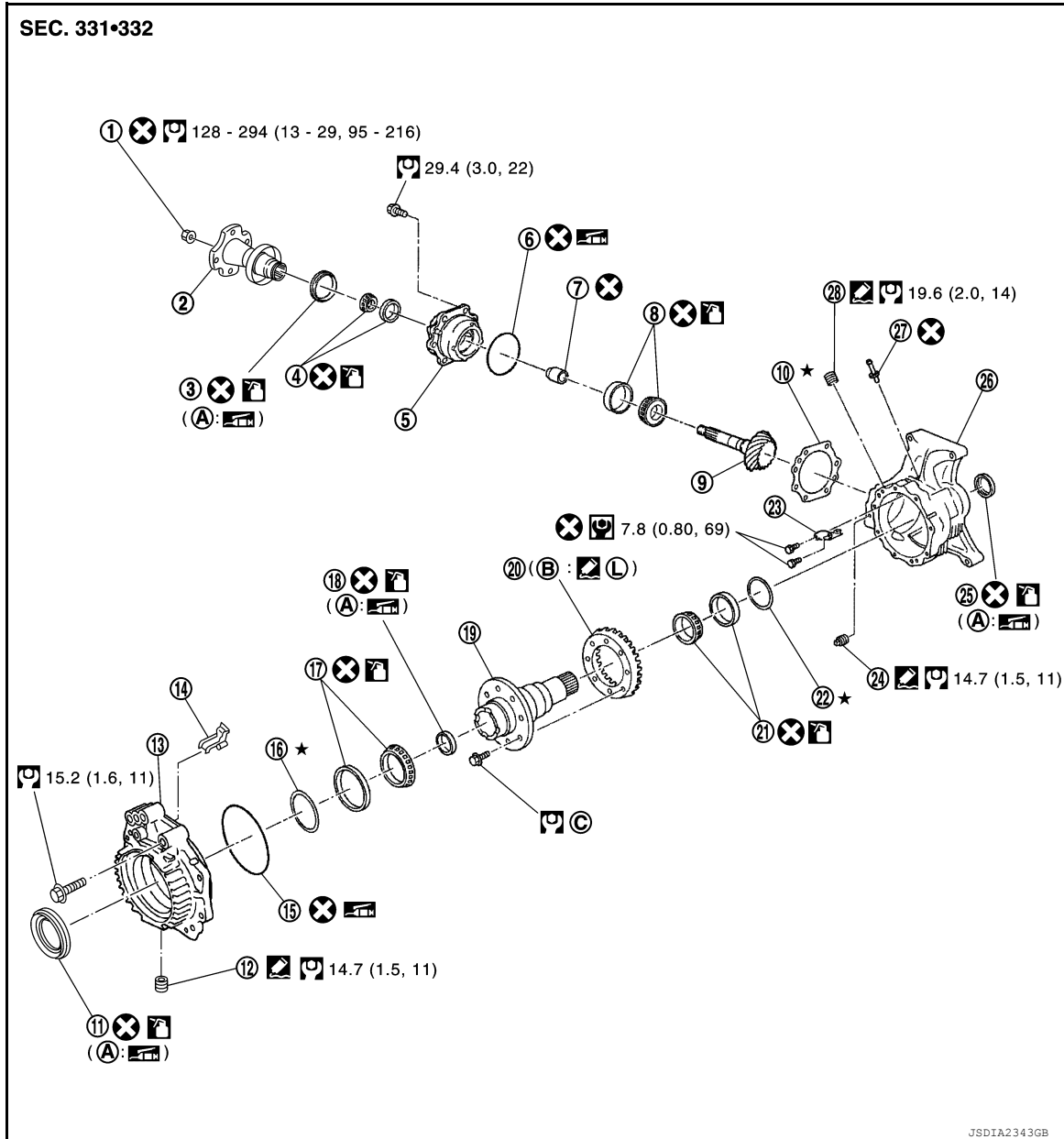
[TRANSFER: TY20A]

UNIT DISASSEMBLY AND ASSEMBLY

ADAPTER CASE

Exploded View

INFOID:000000007883265



- | | | |
|---|---|--|
| 1. Pinion lock nut | 2. Companion flange | 3. Pinion sleeve oil seal |
| 4. Pinion rear bearing | 5. Pinion sleeve | 6. O-ring |
| 7. Collapsible spacer | 8. Pinion front bearing | 9. Drive pinion |
| 10. Pinion sleeve shim | 11. Adapter case oil seal | 12. Drain plug |
| 13. Adapter case | 14. Oil gutter | 15. O-ring |
| 16. Gear ring bearing adjusting shim (adapter case side) | 17. Gear ring bearing (adapter case side) | 18. Gear ring oil seal |
| 19. Gear ring | 20. Drive gear | 21. Gear ring bearing (transfer case side) |
| 22. Gear ring bearing adjusting shim (transfer case side) | 23. Oil defense | 24. Filler plug |

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ADAPTER CASE

< UNIT DISASSEMBLY AND ASSEMBLY >

[TRANSFER: TY20A]

25. Transfer case oil seal

26. Transfer case

27. Breather tube

28. Plug


A. Oil seal lip


B. Screw hole


C. For the tightening torque, refer to [DLN-77](#). "Assembly".


✘: Always replace after every disassembly.

★: Select with proper thickness.


: N·m (kg-m, ft-lb)

: N·m (kg-m, in-lb)

: Apply gear oil.

: Apply multi-purpose grease.

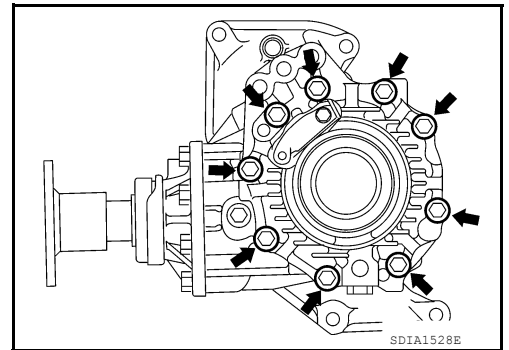
: Apply Genuine Silicone RTV or equivalent. Refer to [GI-22](#). "Recommended Chemical Products and Sealants".

: Apply Genuine High Strength Thread Locking Sealant or equivalent. Refer to [GI-22](#). "Recommended Chemical Products and Sealants".

Disassembly

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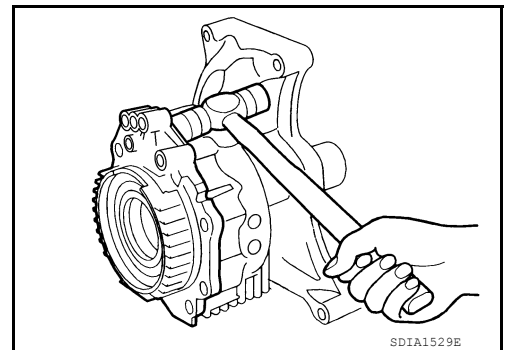
1. Remove adapter case mounting bolts (←).



2. Lightly tap adapter case with a plastic hammer to remove adapter case.
3. Remove O-ring from adapter case.

CAUTION:

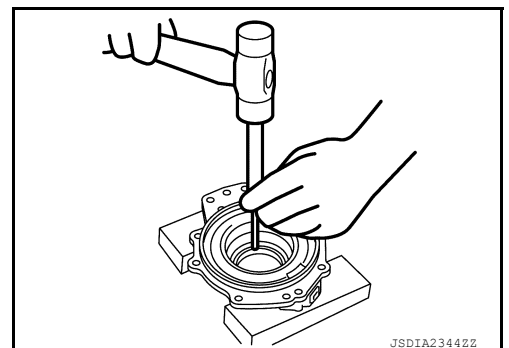
- Never use a tool.
- Never damage adapter case.



4. Lightly tap the metal part of adapter case oil seal with punch from back side of adapter case to remove adapter case oil seal.

CAUTION:

When removing, never damage the adapter case by scooping it out with a tool.

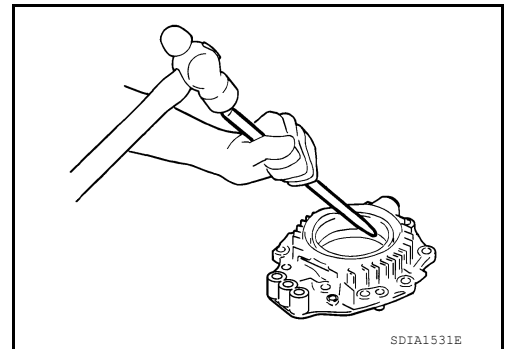


ADAPTER CASE

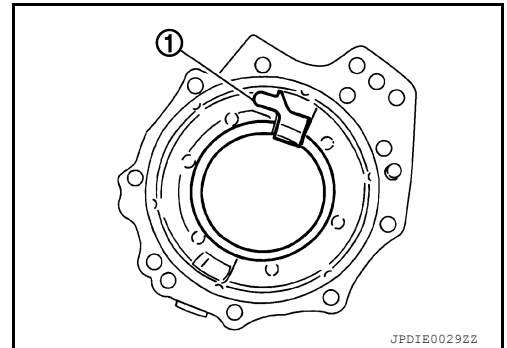
[TRANSFER: TY20A]

< UNIT DISASSEMBLY AND ASSEMBLY >

- Using a brass rod, tap the gear ring bearing adjusting shim at the cutout on the adapter case to remove the gear ring bearing adjusting shim (adapter case side) and gear ring bearing outer race (adapter case side).



- Remove the oil gutter (1).
- Remove the drain plug.
- Perform inspection after disassembly. Refer to [DLN-74, "Inspection"](#).

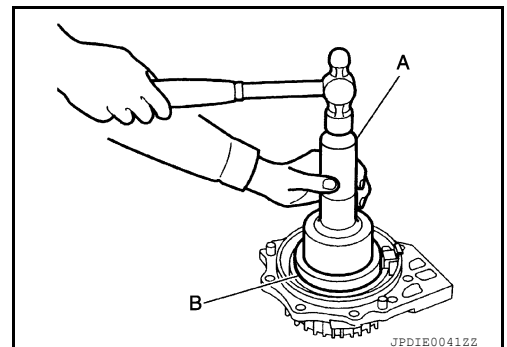


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Assembly

- Select the gear ring bearing adjusting shim (adapter case side). Refer to [DLN-83, "Adjustment"](#).
- Install the oil gutter.
- Using the drifts (A and B), install the selected gear ring bearing adjusting shim (adapter case side) and gear ring bearing outer race (adapter case side).

- A : Drift [SST: ST30720000 (J-25405)]
B : Drift (Commercial Service Tool)



- Using the drift (A) [SST: KV38101700 (—)], drive the adapter case oil seal until it becomes flush with the case end.

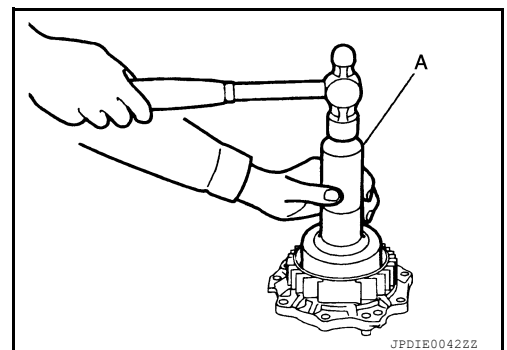
CAUTION:

- When checking the total preload torque, measure it without the oil seal, then install the oil seal.
- Never reuse the oil seal.
- Apply multi-purpose grease onto oil seal lips, and gear oil onto the circumference of the oil seal.
- Use the drift with larger diameter than outer diameter of oil seal.

- Apply sealant on drain plug and install it to the adapter case. Use Genuine Silicone RTV or equivalent. Refer to [GI-22, "Recommended Chemical Products and Sealants"](#).
- Apply multi-purpose grease lightly and evenly onto an O-ring, and install it to the adapter case.

CAUTION:

- Never reuse the O-ring.
- When installing the O-ring, never use a tool.
- Never damage adapter case.



ADAPTER CASE

[TRANSFER: TY20A]

< UNIT DISASSEMBLY AND ASSEMBLY >

7. Install the adapter case to the transfer case, and apply anti-corrosive oil onto threads and seats on the mounting bolts. Tighten to the specified torque.

Bolt symbol	Bolt length "ℓ" mm (in)	Tightening torque N·m (kg-m, ft-lb)
A	45 (1.77)	15.2 (1.6, 11)
B	30 (1.18)	

8. Check backlash, tooth contact, total preload and companion flange runout. Refer to [DLN-83, "Adjustment"](#).

CAUTION:

Measure the total preload without the adapter case oil seal.

Inspection

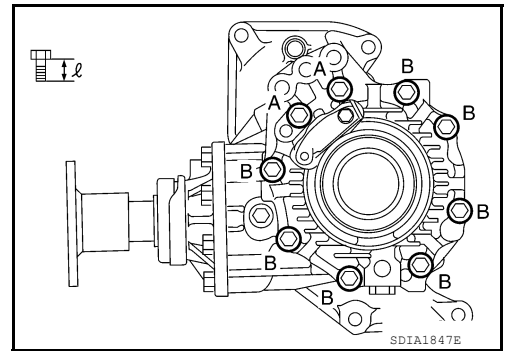
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INSPECTION AFTER DISASSEMBLY

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

Case

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



GEAR RING

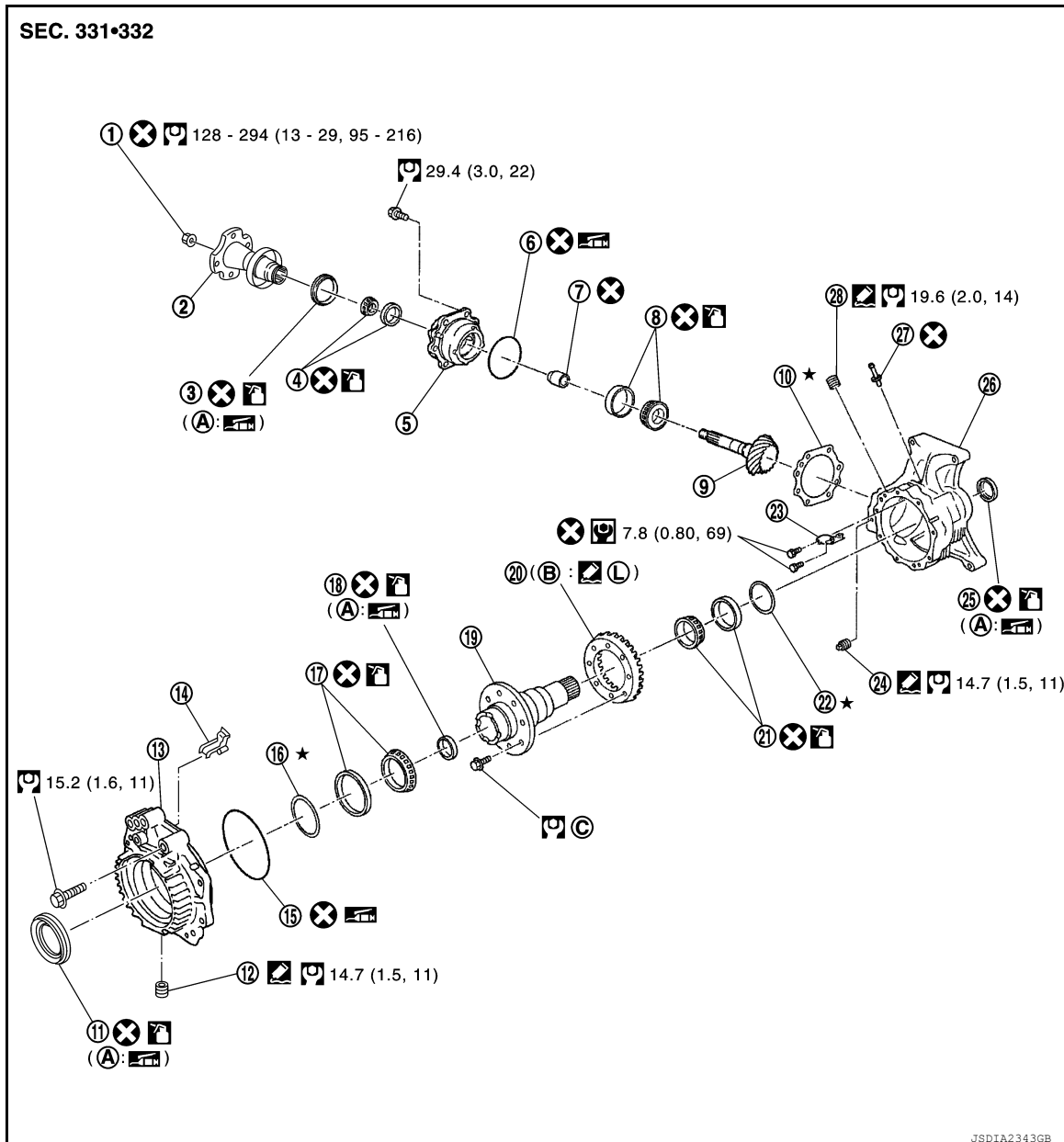
< UNIT DISASSEMBLY AND ASSEMBLY >

[TRANSFER: TY20A]

GEAR RING

Exploded View

INFOID:000000007883269



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|---|---|--|
| 1. Pinion lock nut | 2. Companion flange | 3. Pinion sleeve oil seal |
| 4. Pinion rear bearing | 5. Pinion sleeve | 6. O-ring |
| 7. Collapsible spacer | 8. Pinion front bearing | 9. Drive pinion |
| 10. Pinion sleeve shim | 11. Adapter case oil seal | 12. Drain plug |
| 13. Adapter case | 14. Oil gutter | 15. O-ring |
| 16. Gear ring bearing adjusting shim (adapter case side) | 17. Gear ring bearing (adapter case side) | 18. Gear ring oil seal |
| 19. Gear ring | 20. Drive gear | 21. Gear ring bearing (transfer case side) |
| 22. Gear ring bearing adjusting shim (transfer case side) | 23. Oil defense | 24. Filler plug |
| 25. Transfer case oil seal | 26. Transfer case | 27. Breather tube |

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GEAR RING

< UNIT DISASSEMBLY AND ASSEMBLY >

[TRANSFER: TY20A]

28. Plug


A. Oil seal lip


B. Screw hole


C. For the tightening torque, refer to [DLN-77, "Assembly"](#).


⊗: Always replace after every disassembly.

★: Select with proper thickness.


: N·m (kg-m, ft-lb)

: N·m (kg-m, in-lb)

: Apply gear oil.

: Apply multi-purpose grease.

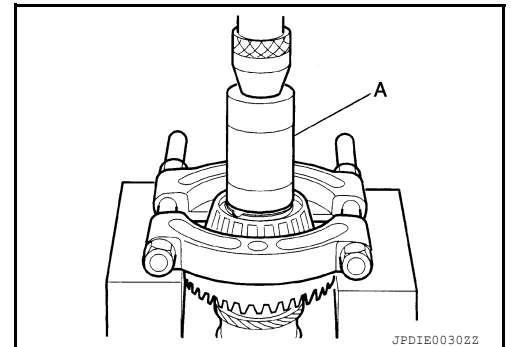
: Apply Genuine Silicone RTV or equivalent. Refer to [GI-22, "Recommended Chemical Products and Sealants"](#).

: Apply Genuine High Strength Thread Locking Sealant or equivalent. Refer to [GI-22, "Recommended Chemical Products and Sealants"](#).

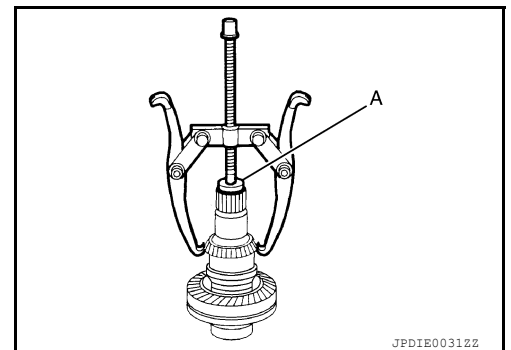
Disassembly

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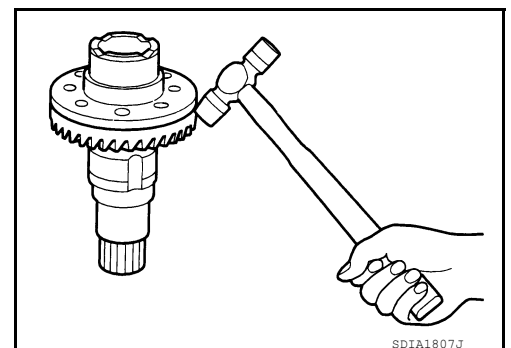
1. Remove adapter case. Refer to [DLN-72, "Disassembly"](#).
2. Remove drive gear assembly from the transfer case.
3. Remove gear ring bearing outer race (transfer case side) and gear ring bearing adjusting shim (transfer case side) from the transfer case. Refer to [DLN-91, "Disassembly"](#).
4. Remove gear ring bearing inner race (adapter case side) from ring gear shaft with the drift (A) [SST: ST33200000 (J-26082)] and a replacer.



5. Remove gear ring bearing inner race (transfer case side) from gear ring with the drift (A) [SST: ST33061000 (J-8107-2)] and a puller.
6. Remove the drive gear mounting bolts.



7. Lightly tap adapter case with a plastic hammer to remove drive gear from the gear ring.

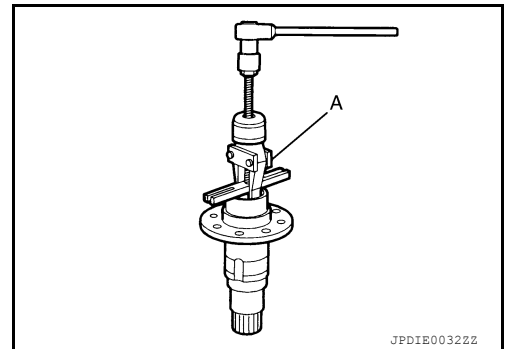


GEAR RING

< UNIT DISASSEMBLY AND ASSEMBLY >

[TRANSFER: TY20A]

- Remove gear ring oil seal from the gear ring with a puller (A) [SST: KV381054S0 (J-34286)].
- Perform inspection after disassembly. Refer to [DLN-78, "Inspection"](#).



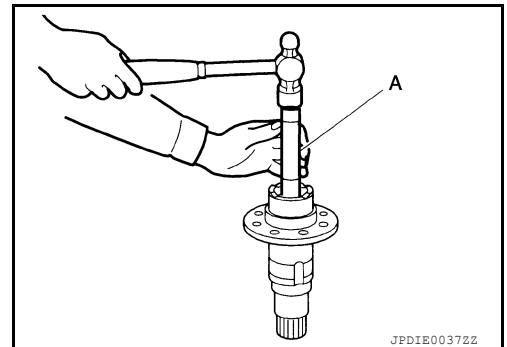
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Assembly

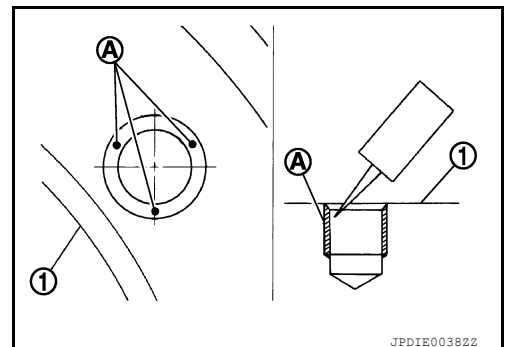
- Install gear ring oil seal to the gear ring with the drift (A) [SST: ST33230000 (J-25805-01)].
CAUTION:
 - Never reuse the oil seal.
 - The oil seal back position after the installation shall be 56.5 mm (2.224 in) from the gear ring end.
 - Apply multi-purpose grease onto oil seal lips, and gear oil onto the circumference of the oil seal.
- Select gear ring bearing adjusting shim (transfer case side). Refer to [DLN-83, "Adjustment"](#).
- Assemble the selected gear ring adjusting shim (transfer case side) and gear ring bearing outer race (transfer case side) to the transfer case. Refer to [DLN-92, "Assembly"](#).



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- CAUTION:**
 - Apply gear oil to the gear ring bearing (transfer case side).
 - Never reuse gear ring bearing (transfer case side).

- Apply thread locking sealant the point (A) into the thread hole for the drive gear (1).
Use Genuine High Strength Thread Locking Sealant or equivalent. Refer to [GI-22, "Recommended Chemical Products and Sealants"](#).



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- CAUTION:**
 - Completely clean and degrease the drive gear back face, thread holes, and drive gear mounting bolts.
 - Apply thread locking sealant onto the first and second threads under the thread hole chamfering of the drive gear on 3 or more different points.
Use Genuine High Strength Thread Locking Sealant or equivalent. Refer to [GI-22, "Recommended Chemical Products and Sealants"](#).
- Install the drive gear to gear ring, and apply anti-corrosive oil onto threads and seats on the mounting bolts.

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- CAUTION:**
If the thread locking sealant is applied aside, quickly wipe it off.
- The drive gear mounting bolts are tightened according to the following torque.

1st step : 27 N·m (2.8 kg-m, 20 ft-lb)
2nd step : 98.5 N·m (10 kg-m, 73 ft-lb)

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CAUTION:

Temporary installation before tightening the bolts through to the completion of the tightening should be within 90 seconds.

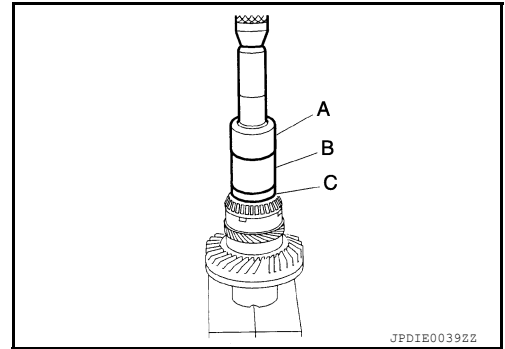
GEAR RING

[TRANSFER: TY20A]

< UNIT DISASSEMBLY AND ASSEMBLY >

7. Apply gear oil to gear ring bearing inner race (transfer case side). Install the gear ring bearing inner race (transfer case side) to gear ring with the drifts (A, B and C).

- A : Drift [SST: ST30720000 (J-25405)]
- B : Drift [SST: ST27863000 (—)]
- C : Drift [SST: KV40101630 (J-35870)]



8. Install gear ring bearing inner race (adaptor case side) with the drifts (A and B).

- A : Drift [SST: ST30720000 (J-25405)]
- B : Drift [SST: KV38102510 (—)]

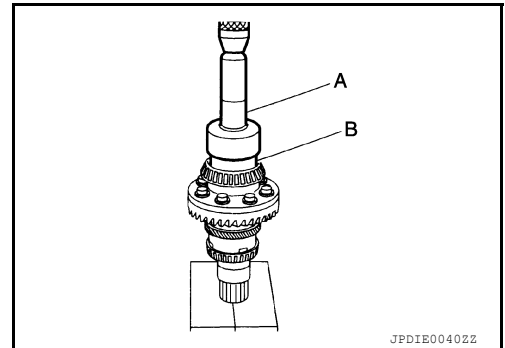
CAUTION:

- Apply gear oil to the gear ring bearing (adaptor case side).
- Never reuse gear ring bearing (adaptor case side).

9. Install the drive gear assembly to the transfer case.
10. Install adapter case. Refer to [DLN-73, "Assembly"](#).
11. Check backlash, tooth contact, total preload and companion flange runout. Refer to [DLN-83, "Adjustment"](#).

CAUTION:

Measure the total preload without the adapter case oil seal.



Inspection

INFOID:000000007883272

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:

If malfunction is detected on the drive gear or drive pinion, replace the drive gear and drive pinion as a set.

Bearing

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

CAUTION:

When replacing the bearing, always replace the inner race and outer race as a pair.

Shim

Check for seizure, damage, and unusual wear.

Case

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

DRIVE PINION

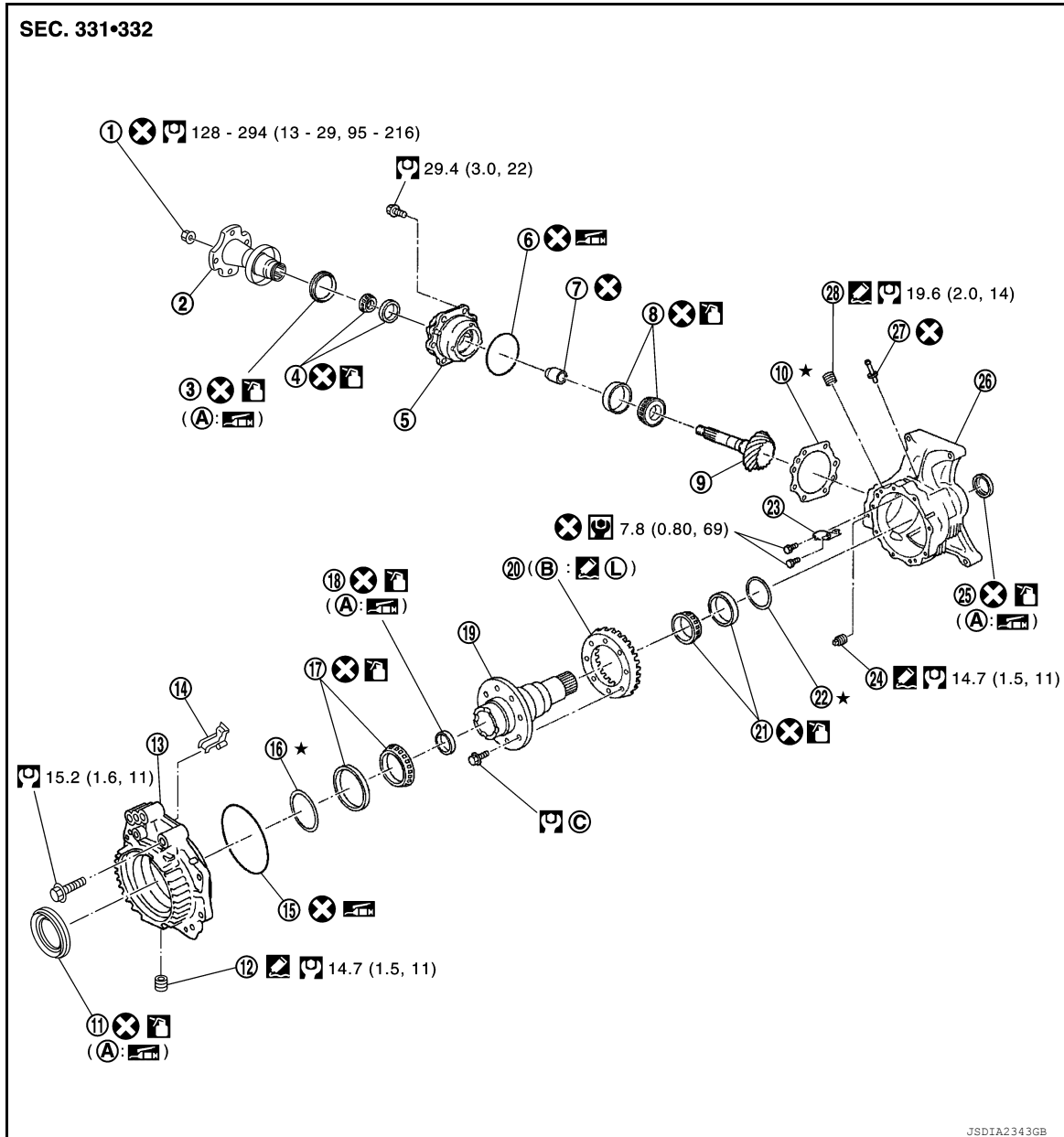
< UNIT DISASSEMBLY AND ASSEMBLY >

[TRANSFER: TY20A]

DRIVE PINION

Exploded View

INFOID:000000007883273



- | | | |
|---|---|--|
| 1. Pinion lock nut | 2. Companion flange | 3. Pinion sleeve oil seal |
| 4. Pinion rear bearing | 5. Pinion sleeve | 6. O-ring |
| 7. Collapsible spacer | 8. Pinion front bearing | 9. Drive pinion |
| 10. Pinion sleeve shim | 11. Adapter case oil seal | 12. Drain plug |
| 13. Adapter case | 14. Oil gutter | 15. O-ring |
| 16. Gear ring bearing adjusting shim (adapter case side) | 17. Gear ring bearing (adapter case side) | 18. Gear ring oil seal |
| 19. Gear ring | 20. Drive gear | 21. Gear ring bearing (transfer case side) |
| 22. Gear ring bearing adjusting shim (transfer case side) | 23. Oil defense | 24. Filler plug |
| 25. Transfer case oil seal | 26. Transfer case | 27. Breather tube |

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DRIVE PINION

< UNIT DISASSEMBLY AND ASSEMBLY >

[TRANSFER: TY20A]

28. Plug


A. Oil seal lip


B. Screw hole


C. For the tightening torque, refer to [DLN-77, "Assembly"](#).


⊗: Always replace after every disassembly.

★: Select with proper thickness.


: N·m (kg-m, ft-lb)

: N·m (kg-m, in-lb)

: Apply gear oil.

: Apply multi-purpose grease.

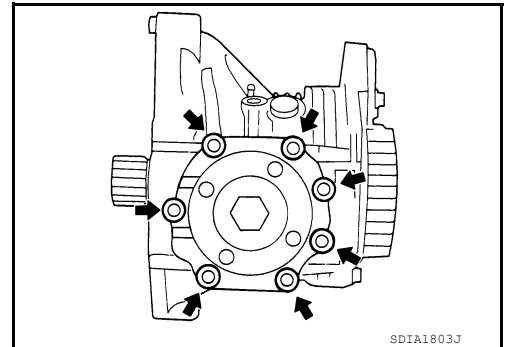
: Apply Genuine Silicone RTV or equivalent. Refer to [GI-22, "Recommended Chemical Products and Sealants"](#).

: Apply Genuine High Strength Thread Locking Sealant or equivalent. Refer to [GI-22, "Recommended Chemical Products and Sealants"](#).

Disassembly

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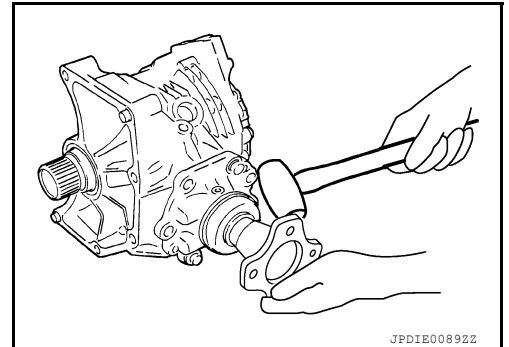
1. Remove pinion sleeve mounting bolts.



2. Lightly tap adapter case with a plastic hammer to remove pinion sleeve assembly.

3. Remove the pinion sleeve shim.

4. Remove the pinion lock nut.



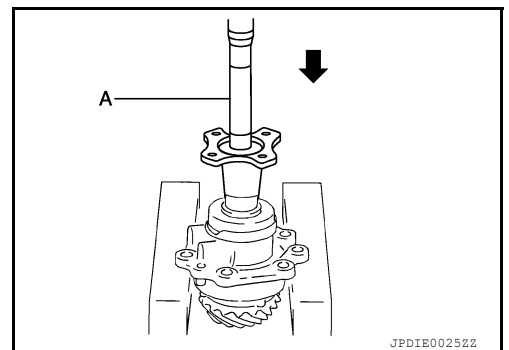
5. Remove drive pinion assembly from pinion sleeve with the drift (A) [SST: ST33220000 (J-25804-01)].

6. Remove companion flange.

7. Remove the O-ring from pinion sleeve.

CAUTION:

- Never use a tool.
- Never damage the pinion sleeve.



DRIVE PINION

[TRANSFER: TY20A]

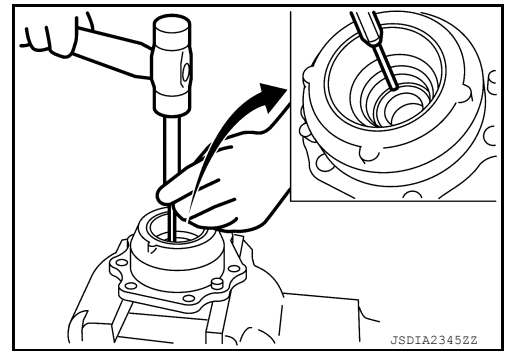
< UNIT DISASSEMBLY AND ASSEMBLY >

8. Put out the circumference of pinion sleeve oil seal from back side of pinion sleeve with punch to remove pinion sleeve oil seal.

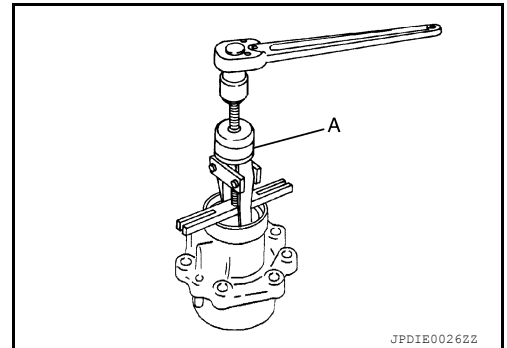
CAUTION:

When removing oil seal, never damage the pinion sleeve by scooping it out with a tool.

9. Remove pinion rear bearing inner race.

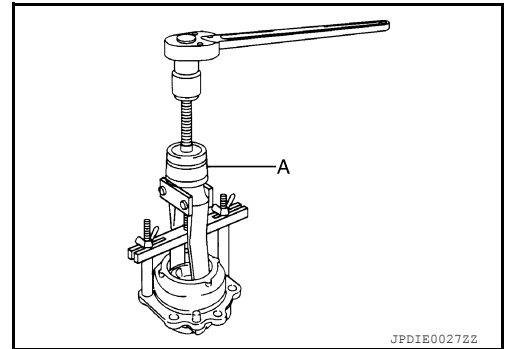


10. Remove the pinion rear bearing outer race with the puller (A) [SST: KV381054S0 (J-34286)].



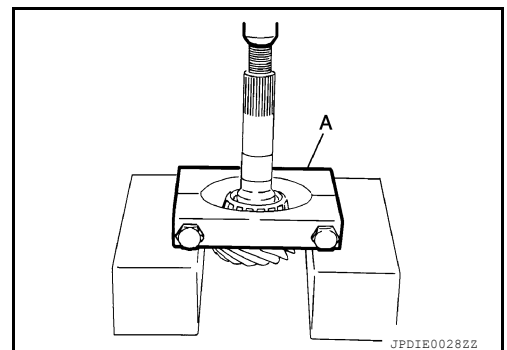
11. Remove the pinion front bearing outer race with the puller (A) [SST: KV381054S0 (J-34286)].

12. Remove the collapsible spacer from the drive pinion.



13. Using the replacer (A) (commercial service tool), press the pinion front bearing inner race out of the drive pinion.

14. Perform inspection after disassembly. Refer to [DLN-88, "Inspection"](#).



INFOID:000000007883275

Assembly

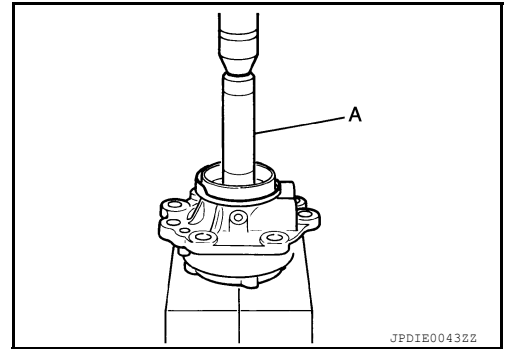
1. Select the pinion sleeve shim. Refer to [DLN-83, "Adjustment"](#).

DRIVE PINION

[TRANSFER: TY20A]

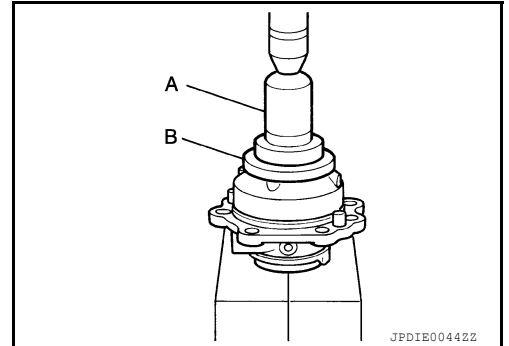
< UNIT DISASSEMBLY AND ASSEMBLY >

2. Install the pinion rear bearing outer race with the drift (A) [SST: KV38100300 (J-25523)].



3. Install the pinion front bearing outer race with the drifts (A and B).

- A : Drift [SST: ST33400001 (J-26082)]
B : Drift [SST: ST30901000 (J-26010-01)]



4. Install the pinion front bearing inner race to drive pinion with the drift (A) [SST: ST30901000 (J-26010-01)].

CAUTION:

- Apply gear oil to the pinion front bearing.
- Never reuse pinion front bearing.

5. Install a collapsible spacer to the drive pinion.

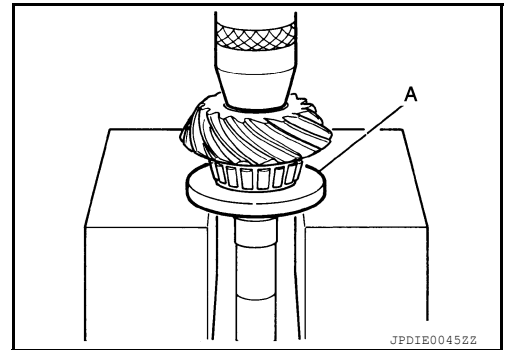
CAUTION:

Never reuse collapsible spacer.

6. Install the pinion rear bearing inner race to pinion sleeve.

CAUTION:

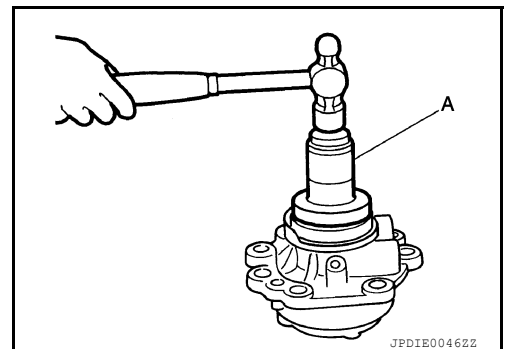
- Apply gear oil to the pinion rear bearing.
- Never reuse pinion rear bearing.



7. Install pinion sleeve oil seal to pinion sleeve with the drift (A) [SST: ST33400001 (J-26082)].

CAUTION:

- Apply multi-purpose grease onto oil seal lips, and gear oil onto the circumference.
- Never reuse oil seal.
- Use the drift with larger diameter than outer diameter of oil seal.

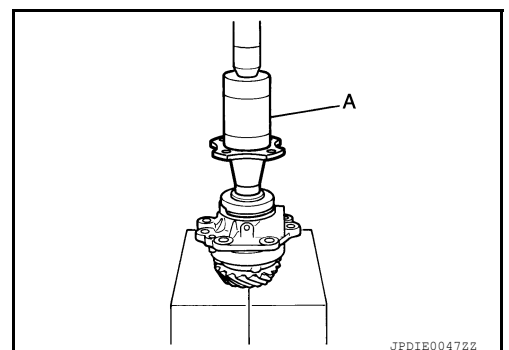


8. Install companion flange to pinion sleeve assembly with the drift (A) [SST: ST33200000 (J-26082)].

9. Apply anti-corrosive oil to the thread and seat of the lock nut, and adjust the pinion lock nut tightening torque and pinion bearing preload torque, using a preload gauge.

Standard

Drive pinion lock nut tighten torque : 128 – 294 N·m (13 – 29 kg·m, 95 – 216 ft·lb)



DRIVE PINION

< UNIT DISASSEMBLY AND ASSEMBLY >

[TRANSFER: TY20A]

Drive pinion bearing preload : Refer to [DLN-94, "Pre-load Torque"](#).

CAUTION:

- Never reuse lock nut.
- If specified preload torque is exceeded, replace the collapsible spacer and tighten again. Never loosen the pinion lock nut for further preload torque adjustment.

10. Apply multi-purpose grease lightly and evenly onto an O-ring, and install it to the pinion sleeve.

CAUTION:

- Never reuse O-ring.
- When installing O-ring, never use a tool.
- Never damage the pinion sleeve.

11. Assemble the selected pinion sleeve shim.
12. Install the pinion sleeve assembly, and apply anti-corrosive oil onto thread and seats on the mounting bolts. Tighten to the specified torque. Refer to [DLN-79, "Exploded View"](#).
13. Check backlash, tooth contact, total preload and companion flange runout. Refer to [DLN-83, "Adjustment"](#).

CAUTION:

Measure the total preload without the adapter case oil seal.

Adjustment

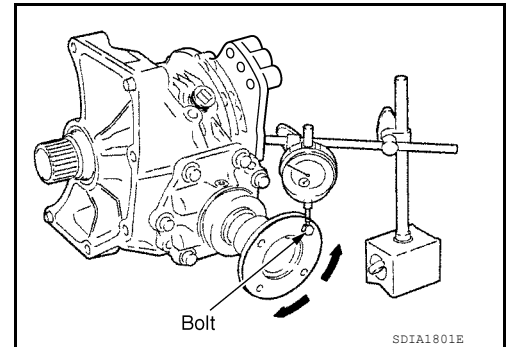
INFOID:000000007883276

BACKLASH

1. Install a bolt to the companion flange.
2. Fit a dial indicator onto the bolt.
3. Measure the circumference backlash of the companion flange, and Check that it satisfies the standard below.

Backlash : Refer to [DLN-94, "Backlash"](#).

- If measured value is out of the specification, disassemble it to check and adjust each part.



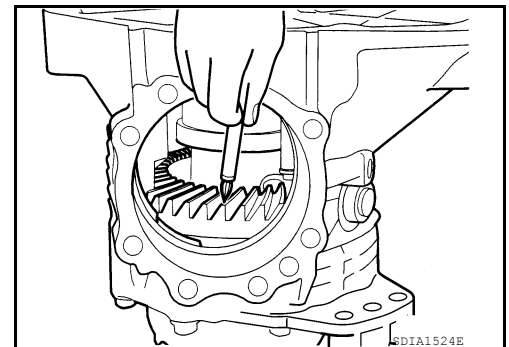
TOOTH CONTACT

1. Remove the pinion sleeve assembly. Refer to [DLN-80, "Disassembly"](#).
2. Apply red lead to the drive gear.

CAUTION:

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

3. Install the pinion sleeve shims and pinion sleeve assembly. Refer to [DLN-81, "Assembly"](#).
4. Remove the plug on the upper side of the transfer case. When installing plug, apply sealant on screw part, and tighten it at the specified torque. Refer to [DLN-79, "Exploded View"](#). Use Genuine Silicone RTV or equivalent. Refer to [GI-22, "Recommended Chemical Products and Sealants"](#).

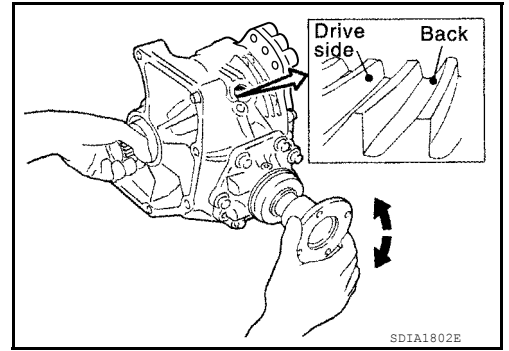


DRIVE PINION

[TRANSFER: TY20A]

< UNIT DISASSEMBLY AND ASSEMBLY >

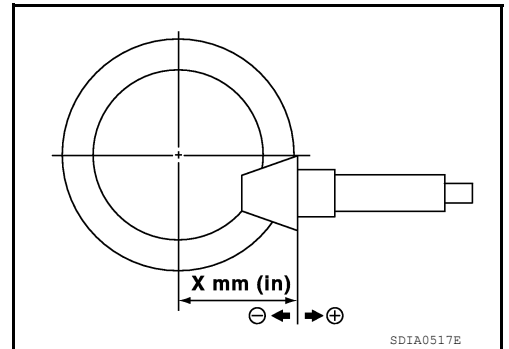
- Rotate the companion flange back and forth several times, and check the drive pinion gear to drive gear tooth contact by viewing from the plug hole.



Pinion sleeve shim selection value mm (in)		Tooth contact condition				Need for adjustment
		Drive side		Back		
↑ Thicker	+0.12 (+0.0047)	Heel side		Toe side		Yes
	+0.09 (+0.0035)					
	+0.06 (+0.0024)					
	+0.03 (+0.0012)					
	0 (0.0)					
↓ Thinner	-0.03 (-0.0012)					No
	-0.06 (-0.0024)					
	-0.09 (-0.0035)					
	-0.12 (-0.0047)					

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- If tooth contact is poorly adjusted, adjust pinion height (dimension X) in the following manner. For selecting adjusting shims, refer to the latest parts information.

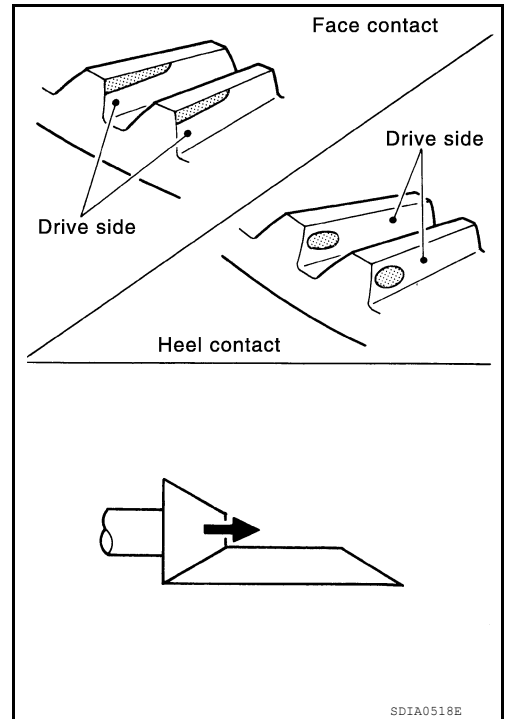


DRIVE PINION

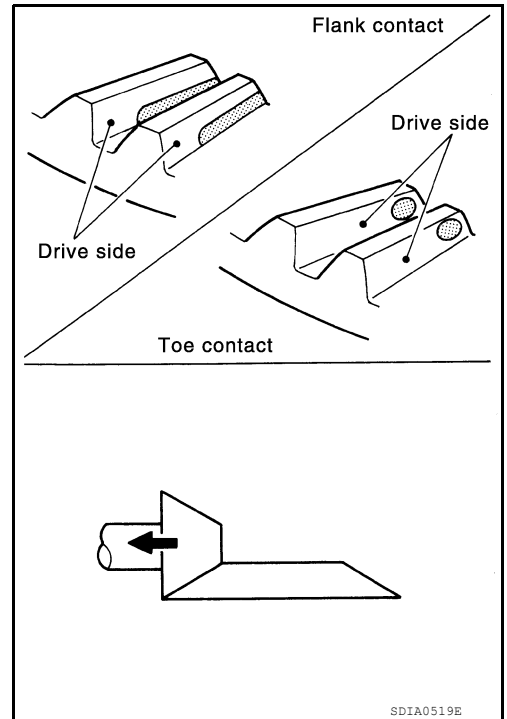
[TRANSFER: TY20A]

< UNIT DISASSEMBLY AND ASSEMBLY >

- If the tooth contact is near the face (face contact), or near the heel (heel contact), thin the pinion sleeve shims to move the drive pinion closer to the drive gear.



- If the tooth contact is near the flank (flank contact), or near the toe (toe contact), thicken the pinion sleeve shims to move the drive pinion farther from the drive gear.



PINION BEARING PRELOAD

1. Remove the pinion sleeve assembly. Refer to [DLN-80. "Disassembly"](#).
2. Rotate the companion flange back and forth 2 to 3 times. Check for unusual noise, rotation malfunction, and other malfunctions.
3. Rotate the companion flange at least 20 times to check for smooth operation of the bearing.

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DRIVE PINION

[TRANSFER: TY20A]

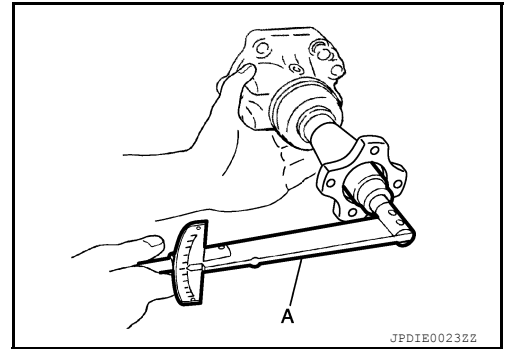
< UNIT DISASSEMBLY AND ASSEMBLY >

4. Measure the drive pinion bearing preload with the preload gauge (A) [SST: ST3127S000 (J-25765-A)].

Preload torque : Refer to [DLN-94, "Preload Torque"](#).

CAUTION:

- Every rotational part shall rotate smoothly with the specified gear oil.
 - Preload torque differs before disassembly and after reassembly.
- If measured value is out of the specification, disassemble the pinion sleeve assembly to check and adjust each part.



TOTAL PRELOAD

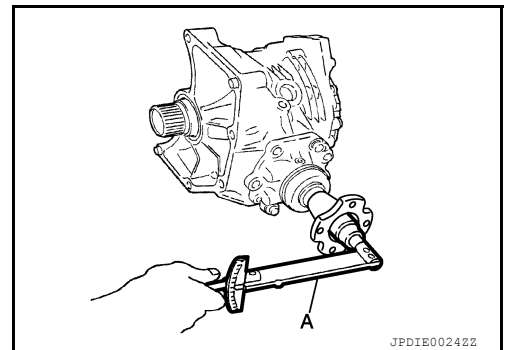
1. Measure pinion bearing preload torque (P1). Refer to [DLN-94, "Preload Torque"](#).
2. Install the pinion sleeve shims and pinion sleeve assembly.
3. Rotate the companion flange at least 20 times to check for smooth operation of the bearing.
4. Measure the total preload with the preload gauge (A) [SST: ST3127S000 (J-25765-A)].

Total Preload torque : Refer to [DLN-94, "Preload Torque"](#).

CAUTION:

Preload torque differs before disassembly and after reassembly.

- If measured value is out of the specification, disassemble it to check and adjust each part. When measuring the total preload torque after the disassembly, measure it with the transfer case oil seals and gear ring oil seals removed, then install the oil seals.

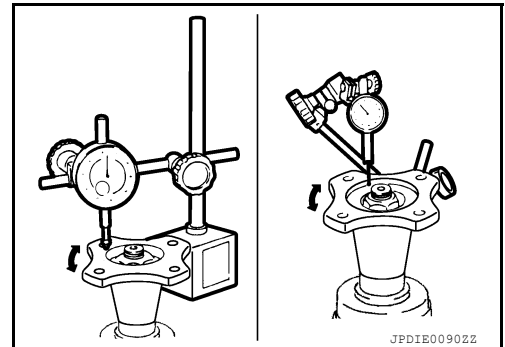


COMPANION FLANGE RUNOUT

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

Companion flange runout : Refer to [DLN-94, "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-94, "Companion Flange Runout"](#).

5. If the runout value is outside the repair limit, follow the procedure below to adjust.
 - a. While changing the phase between companion flange and drive pinion gear by 90° at a time, check runout and determine which phase angle minimizes the runout.
 - b. If the runout value is still outside of the limit after the phase has been changed, replace the companion flange.
 - c. If the runout is out of the specification after replacement of companion flange, adjust the assembly status of the pinion bearings and drive pinion gear, or replace the pinion bearings.

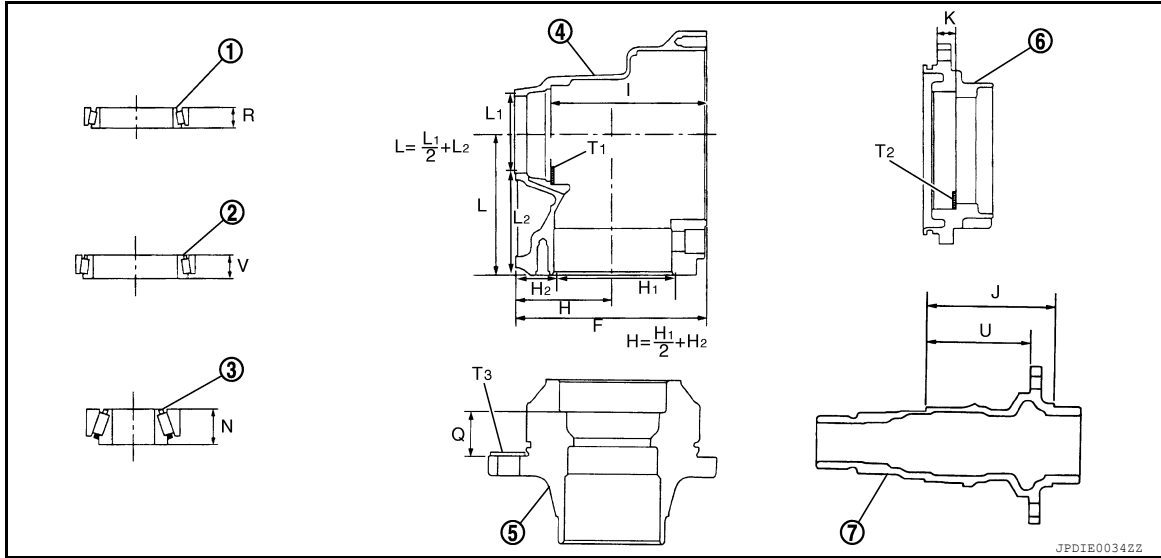
SELECTING ADJUSTING SHIM

DRIVE PINION

< UNIT DISASSEMBLY AND ASSEMBLY >

[TRANSFER: TY20A]

Measurement point



- | | | |
|---|--|-------------------------|
| 1. Gear ring bearing (transfer case side) | 2. Gear ring bearing (adapter case side) | 3. Pinion front bearing |
| 4. Transfer case | 5. Pinion sleeve | 6. Adapter case |
| 7. Gear ring | | |

Gear Ring Bearing Adjusting Shim (Transfer Case Side)

1. Measure F, H, I, R and U shown in the measurement points.
2. Convert the values F, H, I, R and U according to the standards below.

F: Value obtained by subtracting 163.00 mm (6.42 in) from the reading [in increments of 0.01 mm (0.0004 in)].

H: Value obtained by subtracting 83.00 mm (3.268 in) from the reading [in increments of 0.01 mm (0.0004 in)].

I: Value obtained by subtracting 131.90 mm (5.19 in) from the reading [in increments of 0.01 mm (0.0004 in)].

R: Value obtained by subtracting 17.00 mm (0.6693 in) from the reading [in increments of 0.01 mm (0.0004 in)].

U: Value obtained by subtracting 89.50 mm (3.5236 in) from the reading [in increments of 0.01 mm (0.0004 in)].

3. Check dimension Z on the drive gear side face.

NOTE:

Dimension Z indicates the difference between the optimum engagement and the standard dimensions in increments of 0.01 mm (0.0004 in) written on the drive gear side face.

4. Use the formula below to calculate gear ring bearing adjusting shim (transfer case side) thickness T₁.

$$T_1 = (I - F + H + Z - U - R) \times 0.01 \text{ mm (0.0004 in)} + 1.49 \text{ mm (0.0587 in)}$$

5. Select the gear ring bearing adjusting shim (transfer case side). For selecting adjusting shim, refer to the latest parts information.

CAUTION:

- Only one adjusting shim can be selected.
- If no adjusting shim with the calculated value is available, select the thicker and closest one.

Gear Ring Bearing Adjusting Shim (Adapter Case Side)

1. Measure F, H, J, K, U and V shown in the measurement points.
2. Convert the values F, H, J, K, U and V according to the standards below.

DRIVE PINION

< UNIT DISASSEMBLY AND ASSEMBLY >

[TRANSFER: TY20A]

- F: Value obtained by subtracting 163.00 mm (6.42 in) from the reading [in increments of 0.01 mm (0.0004 in)].
- H: Value obtained by subtracting 83.00 mm (3.268 in) from the reading [in increments of 0.01 mm (0.0004 in)].
- J: Value obtained by subtracting 109.50 mm (4.31 in) from the reading [in increments of 0.01 mm (0.0004 in)].
- K: Value obtained by subtracting 14.40 mm (0.5669 in) from the reading [in increments of 0.01 mm (0.0004 in)].
- U: Value obtained by subtracting 89.50 mm (3.5236 in) from the reading [in increments of 0.01 mm (0.0004 in)].
- V: Value obtained by subtracting 17.00 mm (0.6693 in) from the reading [in increments of 0.01 mm (0.0004 in)].

3. Check dimension Z on the drive gear side face.

NOTE:

Dimension Z indicates the difference between the optimum engagement and the standard dimensions in increments of 0.01 mm (0.0004 in) written on the drive gear side face.

4. Use the formula below to calculate gear ring bearing adjusting shim (adapter case side) thickness T₂.

$$T_2 = (K + F - H - Z + U - J - V) \times 0.01 \text{ mm (0.0004 in)} + 1.49 \text{ mm (0.0587 in)}$$

5. Select the gear ring bearing adjusting shim (adapter case side). For selecting adjusting shim, refer to the latest parts information.

CAUTION:

- Only one adjusting shim can be selected.
- If no adjusting shim with the calculated value is available, select the thicker and closest one.

Pinion Sleeve Shim

1. Measure L, N and Q shown in the measurement points.
2. Check the dimension S written on the gear end of the drive pinion.

NOTE:

The dimension S 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 the drive pinion.

3. Use the formula below to calculate pinion sleeve shim thickness T₃.

$$T_3 = [74.6 \text{ mm (2.937 in)} + S] + N + Q - L$$

4. Select the pinion sleeve shim. For selecting shim, refer to the latest parts information.

CAUTION:

- Only one pinion sleeve shim can be selected.

Inspection

INFOID:000000007883277

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

DRIVE PINION

[TRANSFER: TY20A]

< UNIT DISASSEMBLY AND ASSEMBLY >

Check for seizure, damage, and unusual wear.

Case

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

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TRANSFER CASE

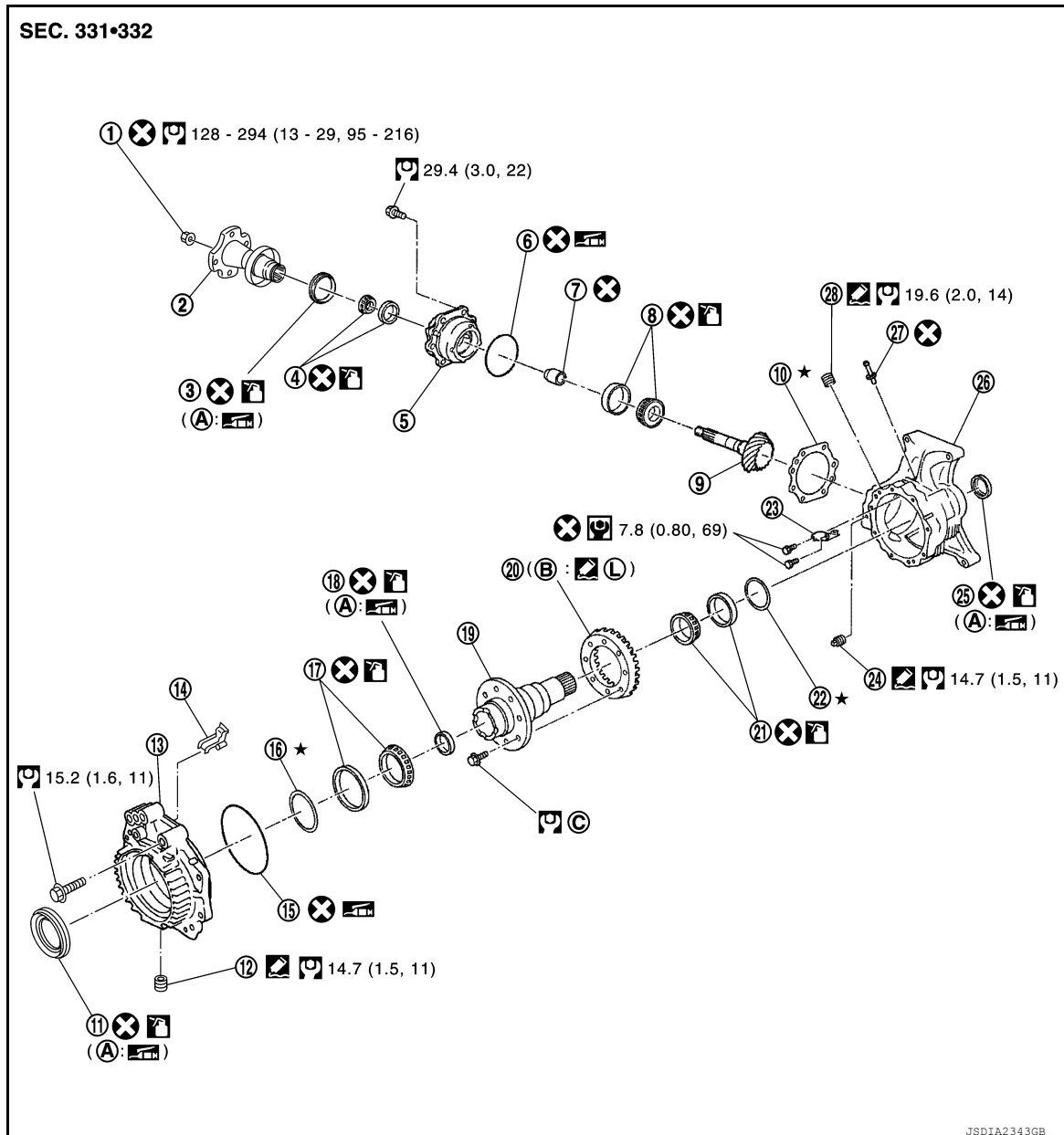
< UNIT DISASSEMBLY AND ASSEMBLY >

[TRANSFER: TY20A]

TRANSFER CASE

Exploded View

INFOID:000000007883278



- | | | |
|---|---|--|
| 1. Pinion lock nut | 2. Companion flange | 3. Pinion sleeve oil seal |
| 4. Pinion rear bearing | 5. Pinion sleeve | 6. O-ring |
| 7. Collapsible spacer | 8. Pinion front bearing | 9. Drive pinion |
| 10. Pinion sleeve shim | 11. Adapter case oil seal | 12. Drain plug |
| 13. Adapter case | 14. Oil gutter | 15. O-ring |
| 16. Gear ring bearing adjusting shim (adapter case side) | 17. Gear ring bearing (adapter case side) | 18. Gear ring oil seal |
| 19. Gear ring | 20. Drive gear | 21. Gear ring bearing (transfer case side) |
| 22. Gear ring bearing adjusting shim (transfer case side) | 23. Oil defense | 24. Filler plug |
| 25. Transfer case oil seal | 26. Transfer case | 27. Breather tube |

TRANSFER CASE

[TRANSFER: TY20A]

< UNIT DISASSEMBLY AND ASSEMBLY >

28. Plug


A. Oil seal lip


B. Screw hole


C. For the tightening torque, refer to [DLN-77, "Assembly"](#).


⊗: Always replace after every disassembly.

★: Select with proper thickness.


: N·m (kg-m, ft-lb)

: N·m (kg-m, in-lb)

: Apply gear oil.

: Apply multi-purpose grease.

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

 (L): Apply Genuine High Strength Thread Locking Sealant or equivalent. Refer to [GI-22, "Recommended Chemical Products and Sealants"](#).

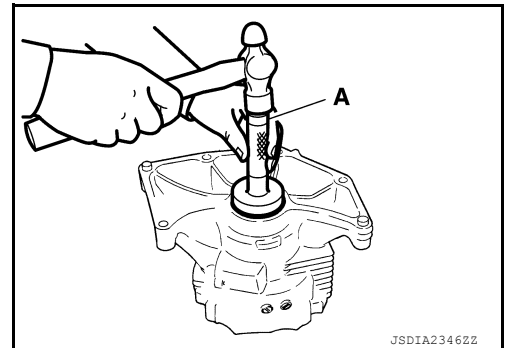
Disassembly

INFOID:000000007883279

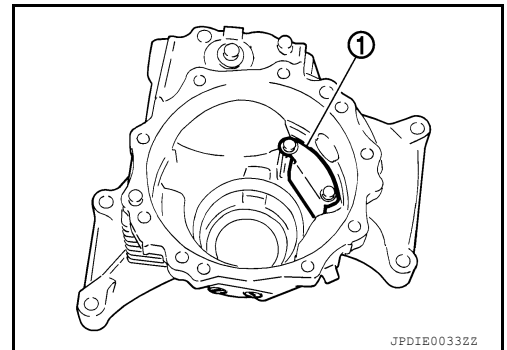
1. Remove adapter case. Refer to [DLN-72, "Disassembly"](#).
2. Remove gear ring assembly. Refer to [DLN-76, "Disassembly"](#).
3. Remove drive pinion assembly. Refer to [DLN-80, "Disassembly"](#).
4. Using the drift (A) [SST: KV38100200 (—)], push out circumference of transfer case oil seal from front side and drop it to back side, to remove transfer case oil seal.

CAUTION:

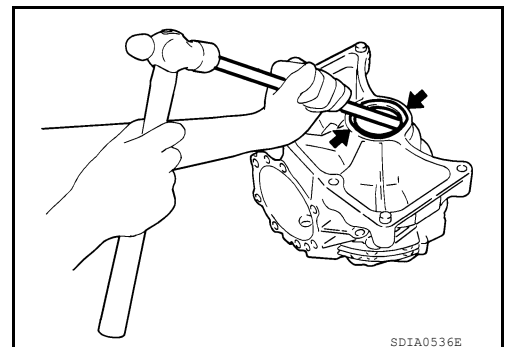
Never damage transfer case.



5. Remove the oil defense (1).



6. Using a brass rod, tap the gear ring bearing adjusting shim (transfer case side) evenly from the 2 cutouts on the transfer case to remove the gear ring bearing adjusting shim (transfer case side) and gear ring bearing outer race (transfer case side).
 7. Remove air breather hose from transfer case.
- CAUTION:**
Never damage air breather hose.
8. Remove air breather tube from transfer case.
 9. Remove the filler plug from the transfer case, and then remove each gasket.
 10. Remove plug from transfer case.



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TRANSFER CASE

< UNIT DISASSEMBLY AND ASSEMBLY >

[TRANSFER: TY20A]

11. Perform inspection after disassembly. Refer to [DLN-93, "Inspection"](#).

Assembly

INFOID:000000007883280

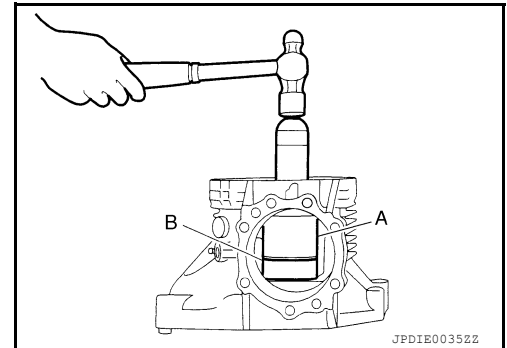
1. Select the gear ring bearing adjusting shim (transfer case side). Refer to [DLN-83, "Adjustment"](#).
2. Install the selected gear ring bearing adjusting shim (transfer side) and gear ring bearing outer race (transfer side) to the transfer case with drifts (A and B).

A : Drift [SST: ST30720000 (J-25405)]

B : Drift [SST: KV40101840 (—)]

CAUTION:

- Apply gear oil to the drive pinion bearing (transfer side).
- Never reuse drive pinion bearing (transfer side).



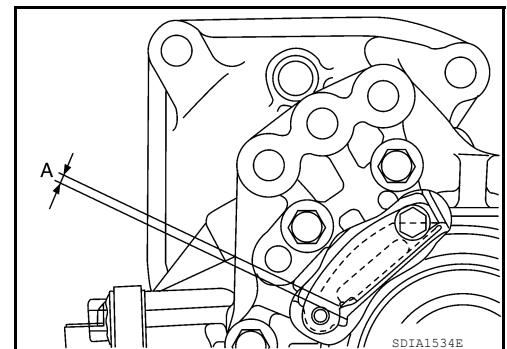
3. Install the oil defense, and tighten the mounting bolts to the specified torque. Refer to [DLN-90, "Exploded View"](#). The clearance (A) between the oil defense and transfer case should be the following.

Clearance between oil defense and transfer case

A : 1.0 - 3.5 mm (0.04 - 0.138 in)

CAUTION:

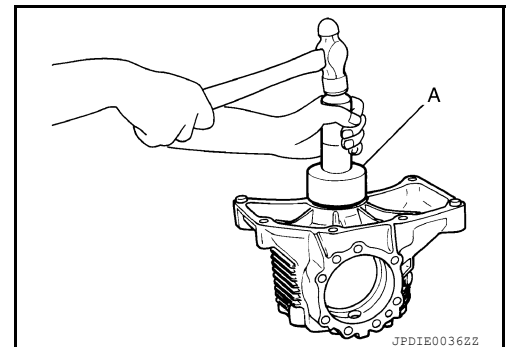
Never reuse mounting bolts.



4. Install the transfer case oil seal until it becomes flush with the case end with drift (A) [SST: ST30720000 (J-25405)].

CAUTION:

- When checking the total preload torque, measure it without the oil seal, then install the oil seal.
- Never reuse oil seal.
- Apply multi-purpose grease onto oil seal lips, and gear oil onto the circumference of the oil seal.
- Use the drift with larger diameter than outer diameter of oil seal.



5. Apply sealant to filler plug and plug before installing them to the transfer case. Refer to [DLN-90, "Exploded View"](#).

Use Genuine Silicone RTV or equivalent. Refer to [GI-22, "Recommended Chemical Products and Sealants"](#).

6. Install breather tube to the transfer case.

CAUTION:

Never reuse breather tube.

7. Install drive gear assembly. Refer to [DLN-77, "Assembly"](#).
8. Install adapter case. Refer to [DLN-73, "Assembly"](#).
9. Install drive pinion assembly. Refer to [DLN-81, "Assembly"](#).
10. Install air breather hose.

CAUTION:

- Check that there are no pinched or restricted areas on the breather hose caused by bending or winding when installing it.

TRANSFER CASE

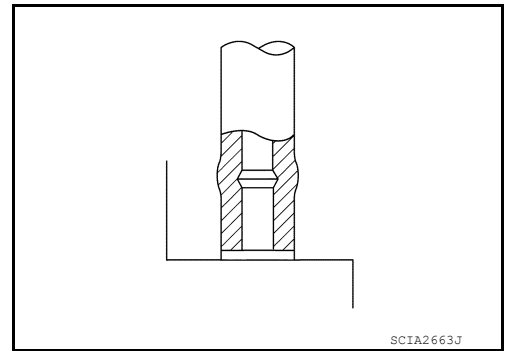
[TRANSFER: TY20A]

< UNIT DISASSEMBLY AND ASSEMBLY >

- Be sure to insert air breather hose into breather tube (metal connector) until hose end reaches the tube's base.
 - Be sure to insert air breather hose in the hole of the transfer case.
11. Check backlash, tooth contact, total preload and companion flange runout. Refer to [DLN-83, "Adjustment"](#).

CAUTION:

Measure the total preload without the adapter case oil seals.



INFOID:000000007883281

Inspection

INSPECTION AFTER DISASSEMBLY

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

Case

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

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SERVICE DATA AND SPECIFICATIONS (SDS)

< SERVICE DATA AND SPECIFICATIONS (SDS)

[TRANSFER: TY20A]

SERVICE DATA AND SPECIFICATIONS (SDS)

SERVICE DATA AND SPECIFICATIONS (SDS)

General Specifications

INFOID:000000007883282

Applied model		AWD
		VQ35DE
		CVT
Transfer model		TY20A
Oil capacity (Approx.)	ℓ (US pt, Imp pt)	0.31 (5/8, 1/2)
Gear ratio		0.404
Number of teeth	Ring gear	42
	Drive pinion	17

Preload Torque

INFOID:000000007883283

BEFORE DISASSEMBLY

Unit: N·m (kg-m, in-lb)

Item		Standard
Drive pinion bearing preload (P1)		0.10 – 0.39 (0.01 – 0.03, 1.0 – 3.0)
Total preload	With all oil seals	$P1 + 0.16 - 0.22$ (0.017 – 0.022, 1.5 – 1.9)
	Without transfer oil seal and adapter case oil seal	$P1 + 0.06 - 0.12$ (0.007 – 0.012, 0.6 – 1.0)

AFTER DISASSEMBLY AND REASSEMBLY

Unit: N·m (kg-m, in-lb)

Item		Standard
Drive pinion bearing preload (P1)		0.50 – 0.99 (0.06 – 0.10, 5 – 8)
Total preload	With all oil seals	$P1 + 0.49 - 0.63$ (0.05 – 0.06, 4.4 – 5.5)
	Without transfer oil seal and adapter case oil seal	$P1 + 0.27 - 0.41$ (0.03 – 0.04, 2.4 – 3.6)

Backlash

INFOID:000000007883284

Unit: mm (in)

Item	Standard
Ring gear to drive pinion	0.17 – 0.24 (0.0067 – 0.0094)

Companion Flange Runout

INFOID:000000007883285

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

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

INFOID:000000008487447

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 dual stage front air bag modules. The SRS system may only deploy one front air bag, depending on the severity of a collision and whether the front passenger seat is occupied. Information necessary to service the system safely is included in the SR and SB section of this Service Manual.

WARNING:

- To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision which would result in air bag inflation, all maintenance must be performed by an authorized NISSAN/INFINITI dealer.
- Improper maintenance, including incorrect removal and installation of the SRS, can lead to personal injury caused by unintentional activation of the system. For removal of Spiral Cable and Air Bag Module, see the SR section.
- Do not use electrical test equipment on any circuit related to the SRS unless instructed to in this Service Manual. SRS wiring harnesses can be identified by yellow and/or orange harnesses or harness connectors.

PRECAUTIONS WHEN USING POWER TOOLS (AIR OR ELECTRIC) AND HAMMERS

WARNING:

- When working near the Airbag Diagnosis Sensor Unit or other Airbag System sensors with the Ignition ON or engine running, DO NOT use air or electric power tools or strike near the sensor(s) with a hammer. Heavy vibration could activate the sensor(s) and deploy the air bag(s), possibly causing serious injury.
- When using air or electric power tools or hammers, always switch the Ignition OFF, disconnect the battery, and wait at least 3 minutes before performing any service.

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PREPARATION

[REAR PROPELLER SHAFT: 3F63A-EDJ75]

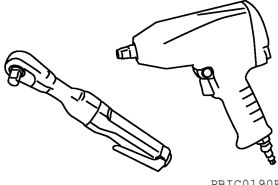
< PREPARATION >

PREPARATION

PREPARATION

Commercial Service Tool

INFOID:000000007883286

Tool name	Description
<p>Power tool</p>  <p>FBIC0190E</p>	<p>Loosening bolts and nuts</p>

NOISE, VIBRATION AND HARSHNESS (NVH) TROUBLESHOOTING

< SYMPTOM DIAGNOSIS >

[REAR PROPELLER SHAFT: 3F63A-EDJ75]

SYMPTOM DIAGNOSIS

NOISE, VIBRATION AND HARSHNESS (NVH) TROUBLESHOOTING

NVH Troubleshooting Chart

INFOID:000000007883287

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

Symptom	Possible cause and SUSPECTED PARTS													
	Reference													
	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
	DLN-98, "Inspection"	DLN-101, "Inspection"	—	DLN-101, "Inspection"	—	DLN-101, "Inspection"	DLN-98, "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
Noise	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Shake		x			x				x	x	x	x		x
Vibration	x	x	x	x	x	x	x		x	x		x		x

x: Applicable

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BASIC INSPECTION

PROPELLER SHAFT ASSEMBLY

Inspection

INFOID:000000007883288

APPEARANCE AND NOISE INSPECTION

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

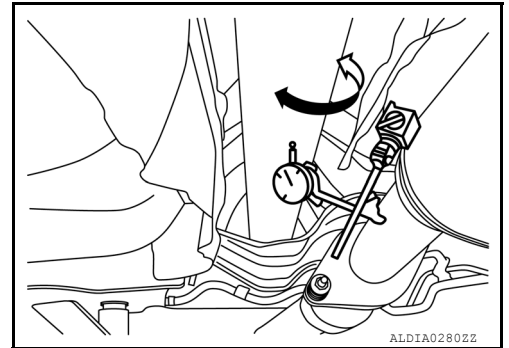
PROPELLER SHAFT VIBRATION

NOTE:

If vibration is present at high speed, check propeller shaft runout first, then check mounting between propeller shaft and companion flange.

1. Measure the runout of the propeller shaft tube at several points by rotating the final drive companion flange with your hands.

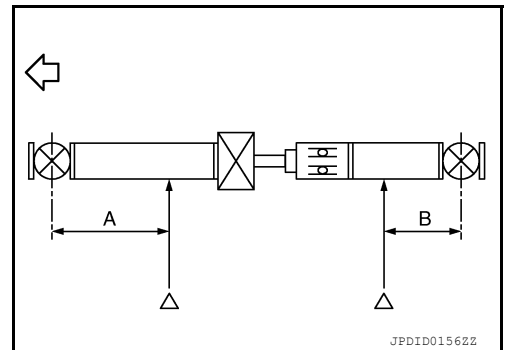
Propeller shaft runout : Refer to [DLN-103, "Propeller Shaft Runout"](#).



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

Dimension (A): 538.0 mm (21.18 in)
(B): 475.5 mm (18.72 in)

← : Front



2. If the runout still exceeds specifications, disconnect the propeller shaft at the final drive companion flange; then rotate the companion flange 90°, 180°, 270° and reconnect propeller shaft.
3. Check the runout again. If the runout still exceeds specifications, replace the propeller shaft assembly.
4. After installation, check for vibration by driving the vehicle.

REAR PROPELLER SHAFT

< REMOVAL AND INSTALLATION >

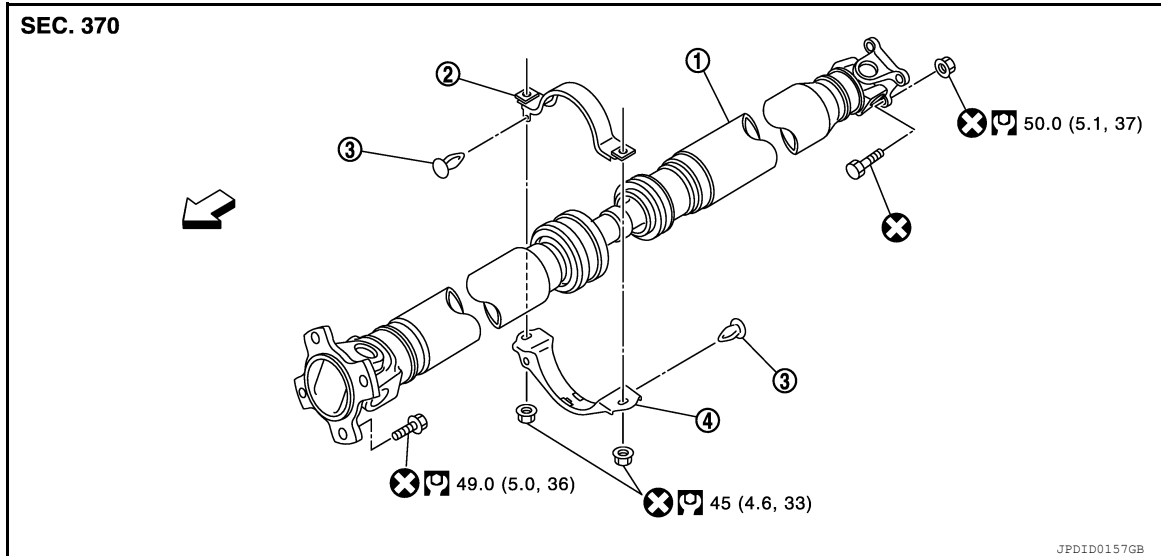
[REAR PROPELLER SHAFT: 3F63A-EDJ75]

REMOVAL AND INSTALLATION

REAR PROPELLER SHAFT

Exploded View

INFOID:000000007883289



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- 1. Propeller shaft assembly
- 2. Center bearing mounting bracket (upper)
- 3. Clip
- 4. Center bearing mounting bracket (lower)

←: Vehicle front

⊗: Always replace after every disassembly.

Ⓜ: N·m (kg·m, ft·lb)

Removal and Installation

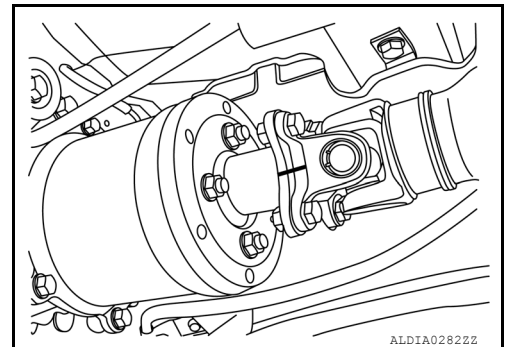
INFOID:000000007883290

REMOVAL

1. Move the CVT shift selector to the neutral position, and then release the parking brake.
2. Put matching marks onto propeller shaft flange yokes, final drive torsional damper, and transfer companion flange.

CAUTION:

For matching marks, use paint. Do not damage propeller shaft flange yokes, final drive torsional damper or transfer companion flange.



3. Remove front heat insulator.

REAR PROPELLER SHAFT

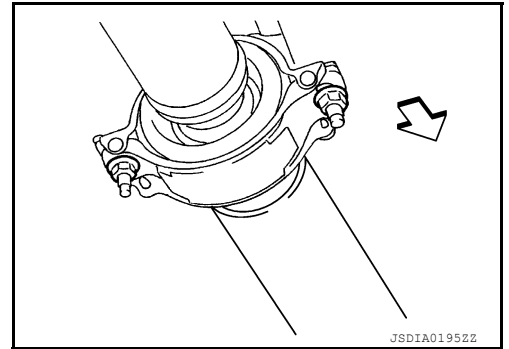
< REMOVAL AND INSTALLATION >

[REAR PROPELLER SHAFT: 3F63A-EDJ75]

4. Loosen nuts of center bearing mounting brackets (upper/lower).

↩ : Front

CAUTION:
Tighten nuts temporarily.



5. Remove propeller shaft assembly bolts and nuts. Refer to [DLN-99, "Exploded View"](#).

6. Remove center bearing mounting bracket nuts.

7. Remove propeller shaft assembly.

CAUTION:
If constant velocity joint was bent during propeller shaft assembly removal, installation, or transportation, its boot may be damaged. Wrap boot with shop cloth or rubber to protect boot from damage.

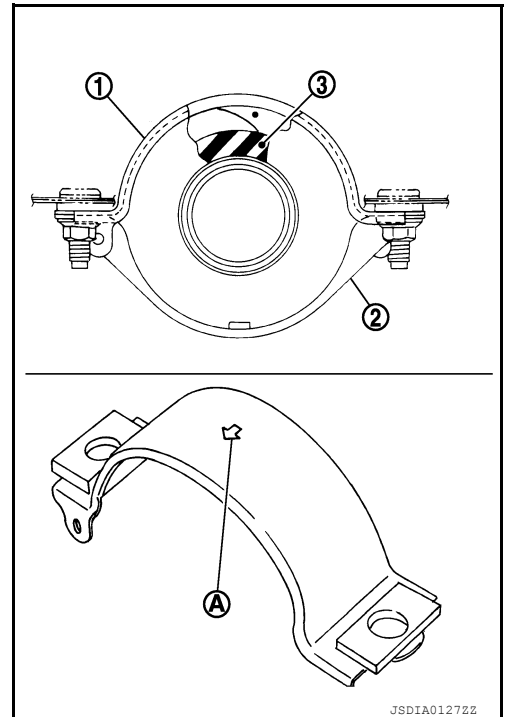
8. Remove clips in center bearing mounting bracket (upper/lower).

9. Perform inspection after removal. Refer to [DLN-101, "Inspection"](#).

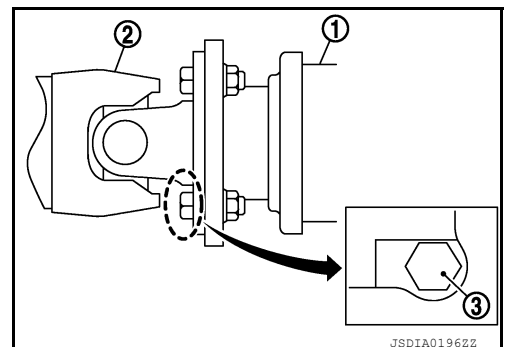
INSTALLATION

Installation is in the reverse order of removal.

- Install center bearing mounting bracket (upper) (1) with its arrow mark (A) facing forward.
- Adjust position of center bearing mounting bracket (upper), center bearing mounting bracket (lower) (2) sliding back and forth to prevent play in thrust direction of center bearing insulator (3). Install center bearing mounting bracket (upper/lower) to vehicle.
- Align matching marks to install propeller shaft assembly to final drive and transfer companion flanges.
- Perform inspection after installation. Refer to [DLN-101, "Inspection"](#).



- After tightening the bolts and nuts to the specified torque, check that the bolts (3) on the flange side are tightened as shown.
- Final drive assembly (1)
- Propeller shaft assembly (2)

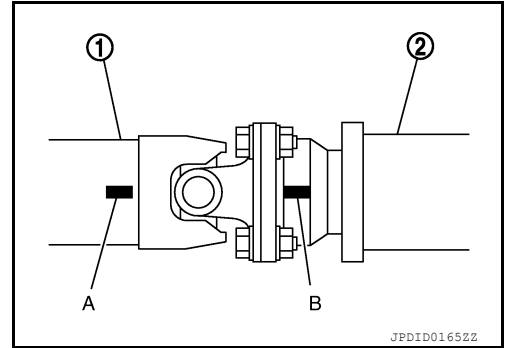


REAR PROPELLER SHAFT

< REMOVAL AND INSTALLATION >

[REAR PROPELLER SHAFT: 3F63A-EDJ75]

- If propeller shaft assembly or final drive assembly has been replaced, connect them as follows:
 - Install propeller shaft (1) while aligning its matching mark (A) with the matching mark (B) of the final drive (2) on the joint as close as possible.
 - Tighten bolts and nuts of propeller shaft and final drive to the specified torque.



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Inspection

INFOID:000000007883291

INSPECTION AFTER REMOVAL

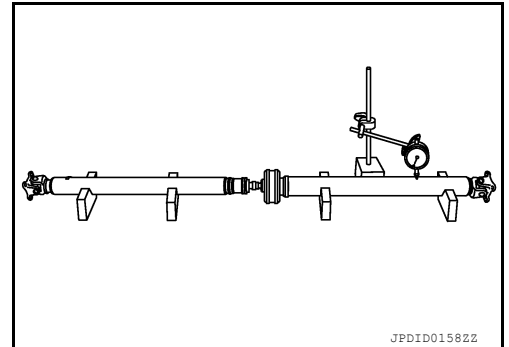
Appearance

Check 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-103, "Propeller Shaft Runout"](#).

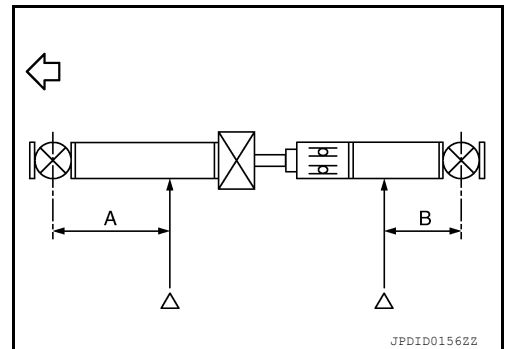


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- Propeller shaft runout measuring point (Point "Δ").

← : Vehicle front

Dimension (A) 506.5 mm (19.94 in)
(B) 497.5 mm (19.59 in)



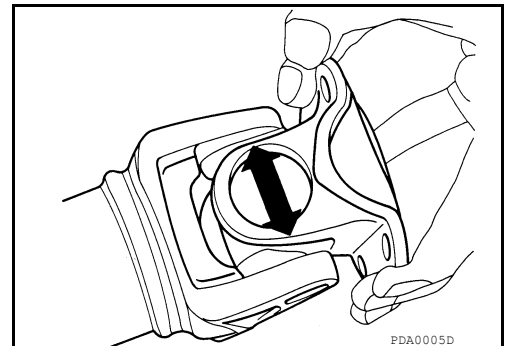
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Journal Axial Play

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-103, "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.

REAR PROPELLER SHAFT

< REMOVAL AND INSTALLATION >

[REAR PROPELLER SHAFT: 3F63A-EDJ75]

CAUTION:

Never disassemble center bearing.

INSPECTION AFTER INSTALLATION

After assembly, perform a driving test to check propeller shaft vibration. If vibration occurs refer to [DLN-98](#), "[Inspection](#)".

SERVICE DATA AND SPECIFICATIONS (SDS)

< SERVICE DATA AND SPECIFICATIONS (SDS)

[REAR PROPELLER SHAFT: 3F63A-EDJ75]

SERVICE DATA AND SPECIFICATIONS (SDS)

SERVICE DATA AND SPECIFICATIONS (SDS)

General Specifications

INFOID:0000000007883292

Applied model		AWD
		VQ35DE
		CVT
Propeller shaft model		3F63A-EDJ75
Number of joints		3
Type of journal bearings (Non-disassembly type)	1st joint	Shell type
	2nd joint	EDJ type
	3rd joint	Shell type
Coupling method with transfer		Flange type
Coupling method with rear final drive		Flange type
Shaft length	1st (Spider to EDJ joint center)	1205 mm (47.44 in)
	2nd (EDJ joint center to spider)	943 mm (37.13 in)
Shaft outer diameter	1st	75 mm (2.95 in)
	2nd	75 mm (2.95 in)

Propeller Shaft Runout

INFOID:0000000007883293

Unit: mm (in)

Item	Limit
Propeller shaft runout	0.8 (0.031)

Journal Axial Play

INFOID:0000000007883294

Unit: mm (in)

Item	Standard
Journal axial play	0 (0)

PRECAUTION

PRECAUTIONS

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

INFOID:000000008487443

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 dual stage front air bag modules. The SRS system may only deploy one front air bag, depending on the severity of a collision and whether the front passenger seat is occupied. Information necessary to service the system safely is included in the SR and SB section of this Service Manual.

WARNING:

- To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision which would result in air bag inflation, all maintenance must be performed by an authorized NISSAN/INFINITI dealer.
- Improper maintenance, including incorrect removal and installation of the SRS, can lead to personal injury caused by unintentional activation of the system. For removal of Spiral Cable and Air Bag Module, see the SR section.
- Do not use electrical test equipment on any circuit related to the SRS unless instructed to in this Service Manual. SRS wiring harnesses can be identified by yellow and/or orange harnesses or harness connectors.

PRECAUTIONS WHEN USING POWER TOOLS (AIR OR ELECTRIC) AND HAMMERS

WARNING:

- When working near the Airbag Diagnosis Sensor Unit or other Airbag System sensors with the Ignition ON or engine running, DO NOT use air or electric power tools or strike near the sensor(s) with a hammer. Heavy vibration could activate the sensor(s) and deploy the air bag(s), possibly causing serious injury.
- When using air or electric power tools or hammers, always switch the Ignition OFF, disconnect the battery, and wait at least 3 minutes before performing any service.

Service Notice or Precautions for Rear Final Drive

INFOID:000000007883295

- Check for the correct installation status prior to removal or disassembly. If matching marks are required, be certain they never 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.
- 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.
- Be careful not to 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.

PREPARATION

[REAR FINAL DRIVE: R145K1]

< PREPARATION >

PREPARATION

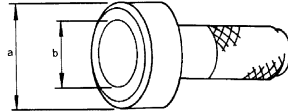
PREPARATION

Special Service Tools

INFOID:000000007883296

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

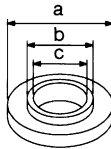
Tool number (Kent-More No.) Tool name	Description
ST30720000 (J-25405) Drift a: 77 mm (3.03 in) dia. b: 55 mm (2.185 in) dia.	Installing front oil seal
KV40105740 (—) Drift a: 57 mm (2.24 in) dia. b: 48 mm (1.89 in) dia.	Installing side oil seal (cover side)
KV31103000 (J-38982) Drift a: 70 mm (2.76 in) dia. b: 59 mm (2.32 in) dia. c: 49 mm (1.93 in) dia.	Installing side oil seal (carrier side)
ST35325000 (—) Drift bar	Installing side oil seal (carrier side)



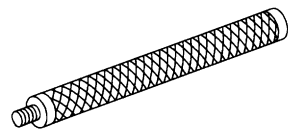
ZZA0811D



ZZA0832D



S-NT107



S-NT090

Commercial Service Tools

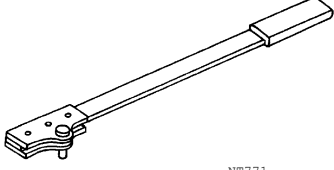
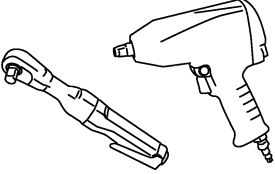
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PREPARATION

< PREPARATION >

[REAR FINAL DRIVE: R145K1]

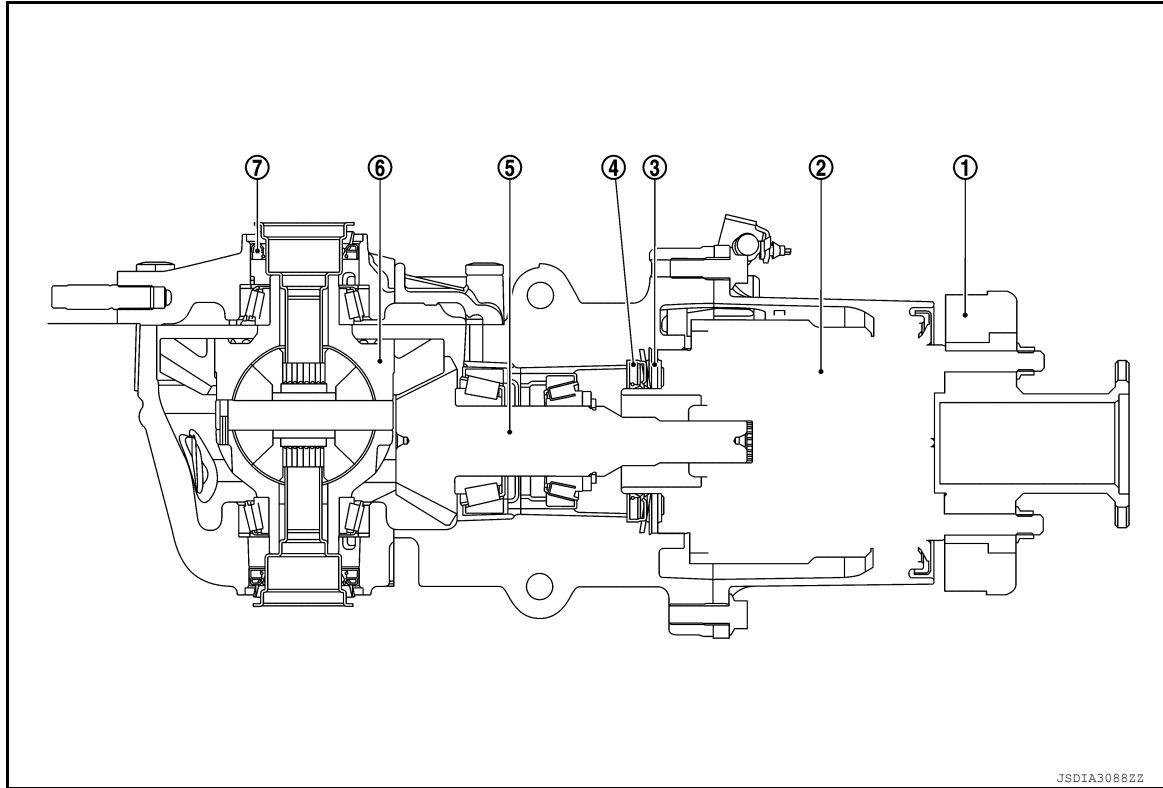
Tool name	Description
Flange wrench  NT771	Removing and installing torsional damper mounting nut
Power tool  PBIC0190E	Loosening bolts and nuts

SYSTEM DESCRIPTION

STRUCTURE AND OPERATION

Sectional View

INFOID:000000007883298



- | | | |
|---------------------|---------------------------------|----------------------|
| 1. Torsional damper | 2. Electric controlled coupling | 3. Wave washer |
| 4. Front oil seal | 5. Drive pinion | 6. Differential case |
| 7. Side oil seal | | |

Electric Controlled Coupling

INFOID:000000007883299

The electric controlled coupling operates as the AWD system. For the operation, refer to [DLN-12. "Operation Description"](#).

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BASIC INSPECTION

ADDITIONAL SERVICE WHEN REPLACING REAR FINAL DRIVE ASSEMBLY

Description

INFOID:000000008465597

When replacing rear final drive assembly, unit characteristics writing is required.

Work Procedure

INFOID:000000008465598

1. PERFORM WRITING UNIT CHARACTERISTICS

Perform writing unit characteristics of electric controlled coupling.

>> Refer to [DLN-42. "Work Procedure"](#).

ADDITIONAL SERVICE WHEN REPLACING ELECTRIC CONTROLLED COUPLING

< BASIC INSPECTION >

[REAR FINAL DRIVE: R145K1]

ADDITIONAL SERVICE WHEN REPLACING ELECTRIC CONTROLLED COUPLING

Description

INFOID:000000008478233

When replacing electric controlled coupling, unit characteristics writing is required.

Work Procedure

INFOID:000000008478234

1.PERFORM WRITING UNIT CHARACTERISTICS

Perform writing unit characteristics of electric controlled coupling.

>> Refer to [DLN-42. "Work Procedure"](#).

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NOISE, VIBRATION AND HARSHNESS (NVH) TROUBLESHOOTING

< SYMPTOM DIAGNOSIS >

[REAR FINAL DRIVE: R145K1]

SYMPTOM DIAGNOSIS

NOISE, VIBRATION AND HARSHNESS (NVH) TROUBLESHOOTING

NVH Troubleshooting Chart

INFOID:000000007883300

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

Symptom	Noise	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
Reference		—	—	—	—	DLN-123, "Adjustment"	DLN-111, "Inspection"	NVH of REAR 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														
		x	x	x	x	x	x	x	x	x	x	x	x	x

x: Applicable

REAR DIFFERENTIAL GEAR OIL

[REAR FINAL DRIVE: R145K1]

< PERIODIC MAINTENANCE >

PERIODIC MAINTENANCE

REAR DIFFERENTIAL GEAR OIL

Inspection

INFOID:000000007883301

OIL LEAKS

Check that oil is not leaking from final drive assembly or around it.

OIL LEVEL

CAUTION:

Do not start engine while checking oil level.

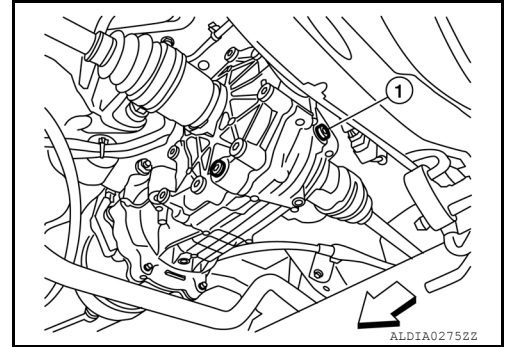
1. Remove and discard filler plug (1).

CAUTION:

Never reuse filler plug.

⇐ : Front

2. Oil level should be level with the bottom of filler plug hole. Add oil if necessary. Refer to [MA-11, "Fluids and Lubricants"](#).
3. Install filler plug (1) and tighten to specified torque. Refer to [DLN-120, "Exploded View"](#).



INFOID:000000007883302

Draining

CAUTION:

Do not start engine while checking oil level.

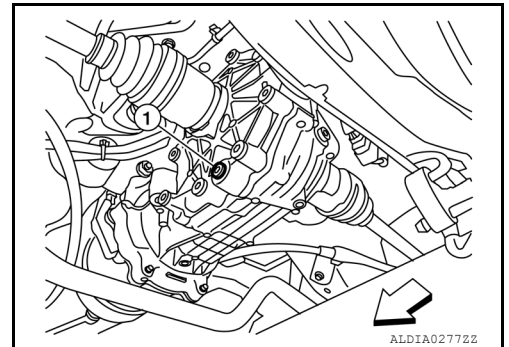
1. Remove and discard drain plug (1), and drain gear oil.

CAUTION:

Never reuse drain plug.

⇐ : Front

2. Install drain plug (1) and tighten to specified torque. Refer to [DLN-120, "Exploded View"](#).



INFOID:000000007883303

Refilling

CAUTION:

Do not start engine while checking oil level.

1. Remove and discard filler plug (1).

CAUTION:

Never reuse filler plug.

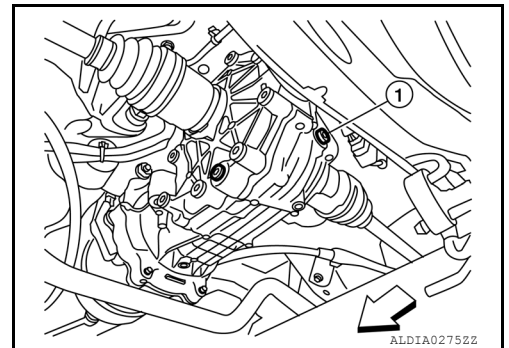
⇐ : Front

2. Fill with new oil to the specified level near the filler plug hole.

Oil grade and viscosity : Refer to [MA-11, "Fluids and Lubricants"](#).

Oil capacity : Refer to [DLN-125, "General Specification"](#).

3. Install filler plug (1) and tighten to specified torque. Refer to [DLN-120, "Exploded View"](#).



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TORSIONAL DAMPER

< REMOVAL AND INSTALLATION >

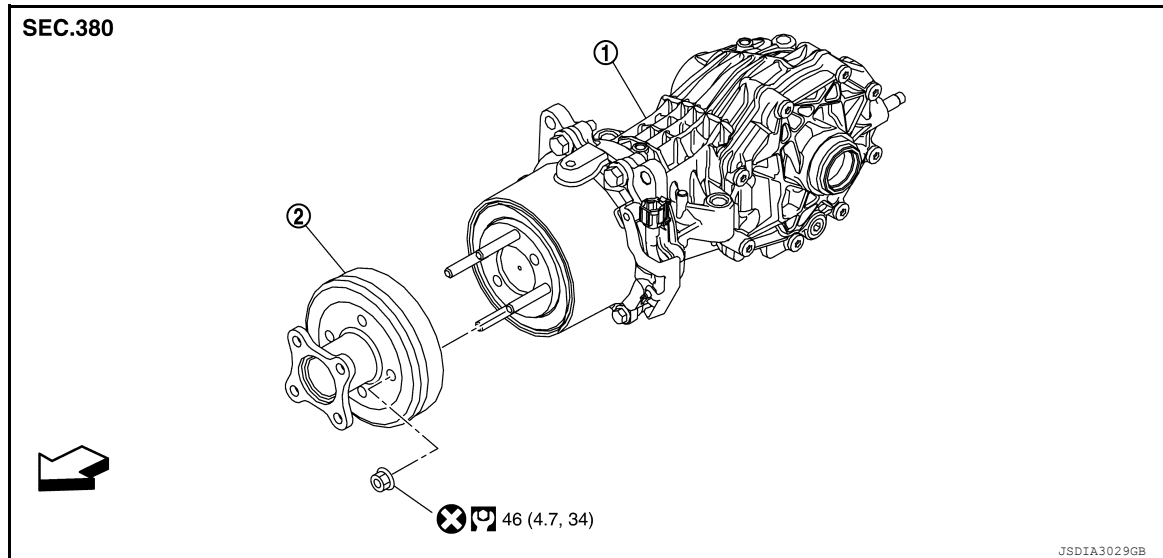
[REAR FINAL DRIVE: R145K1]

REMOVAL AND INSTALLATION

TORSIONAL DAMPER

Exploded View

INFOID:000000007883304



1. Final drive assembly
2. Torsional damper

↔: Vehicle front

⊗: Always replace after every disassembly.

Ⓜ: N·m (kg·m, ft·lb)

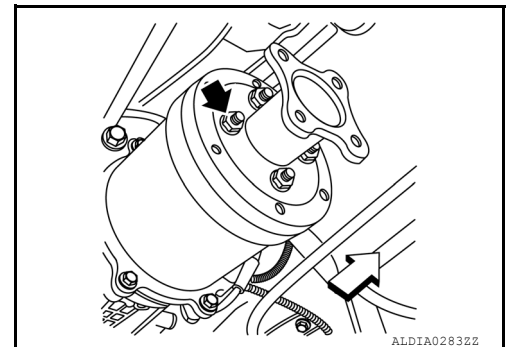
Removal and Installation

INFOID:000000007883305

REMOVAL

1. Remove rear propeller shaft from the torsional damper, and support the end of the propeller shaft. Refer to [DLN-99, "Exploded View"](#).
2. Remove torsional damper lock nuts (↔), using suitable tool.

↔ : Front



3. Remove torsional damper.

INSTALLATION

1. Install torsional damper. (When torsional damper has been reused.)

CAUTION:
Clean the mounting surface.

2. Install torsional damper. (When torsional damper has been replaced.)
Degrease the mounting surface of electric controlled coupling, according to the following instruction.

TORSIONAL DAMPER

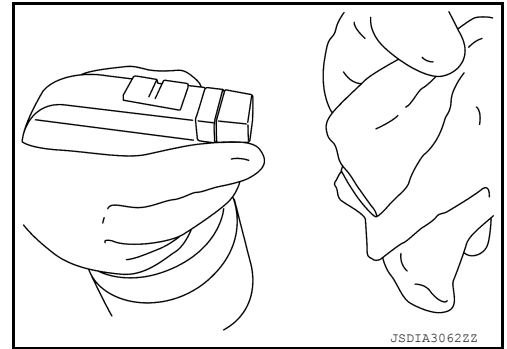
[REAR FINAL DRIVE: R145K1]

< REMOVAL AND INSTALLATION >

1. Spray alcohol on a cotton cloth four times per part.

CAUTION:

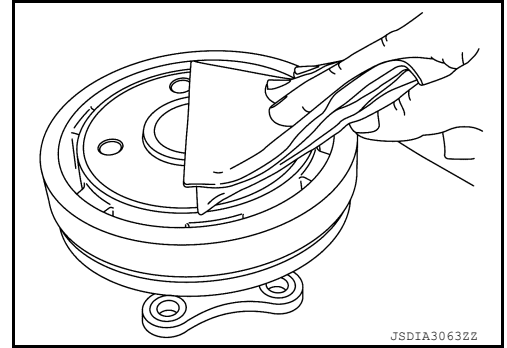
Always use a new cotton cloth.



2. Wipe the mounting surface of electric controlled coupling five times.

CAUTION:

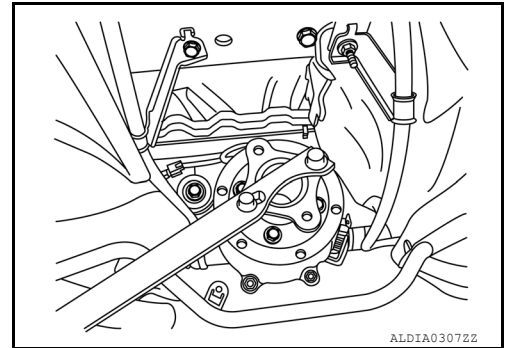
Complete the work within 180 seconds to prevent alcohol from evaporating.



3. Install torsional damper lock nuts, using suitable tool, and tighten to the specified torque.

CAUTION:

Never reuse torsional damper lock nuts.



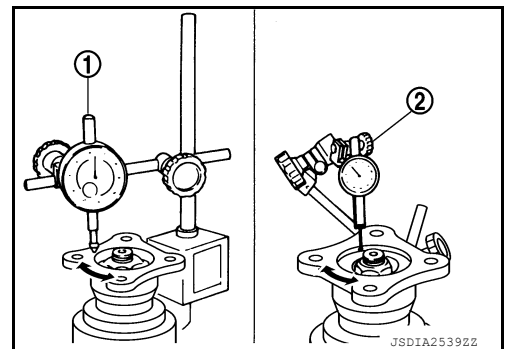
4. Check torsional damper runout as follows:

- Rotate torsional damper and check for runout on the torsional damper face (inner side of the bolt holes) using a dial indicator (1). Also check for runout on the inner side of the torsional damper using a test indicator (2).

Torsional damper runout : Refer to [DLN-125, "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 the torsional damper and electric controlled coupling by 90° step, and search for the position where the runout value is the minimum.
- If the runout value is still outside of the runout limit after the phase has been changed, replace the torsional damper.
- If the runout value is still outside of the runout limit after torsional damper has been replaced, possible cause will be a damaged electric controlled coupling. Repair as necessary. Refer to [DLN-116, "Removal and Installation"](#).

5. Install rear propeller shaft. Refer to [DLN-99, "Exploded View"](#).



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SIDE OIL SEAL

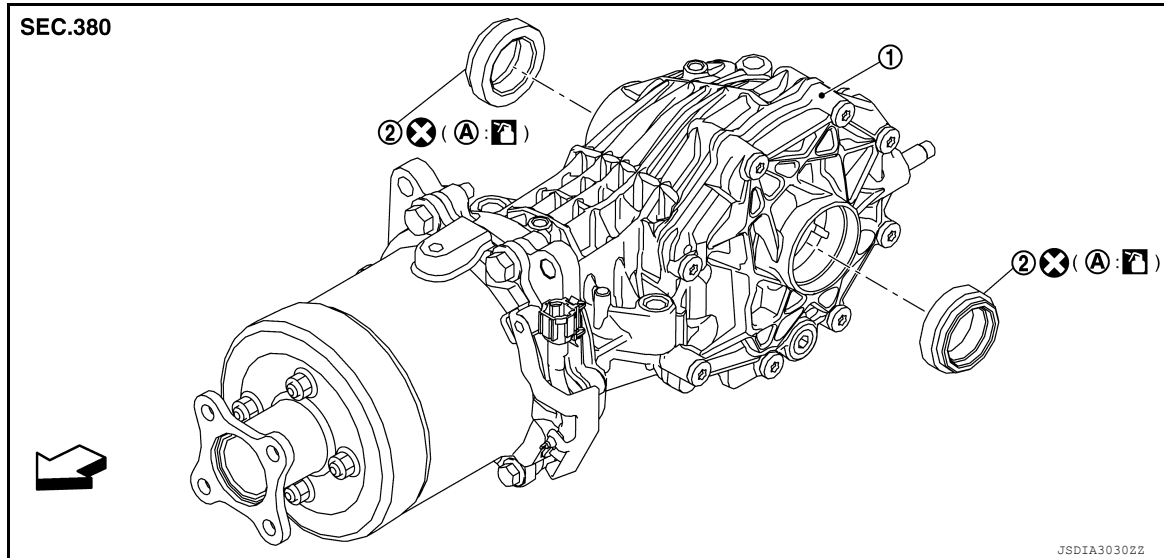
< REMOVAL AND INSTALLATION >

[REAR FINAL DRIVE: R145K1]

SIDE OIL SEAL

Exploded View

INFOID:000000007883306



- 1. Final drive assembly
- 2. Side oil seal
- A. Oil seal lip

←: Vehicle front

⊗: Always replace after every disassembly.

☑: Apply gear oil.

Removal and Installation

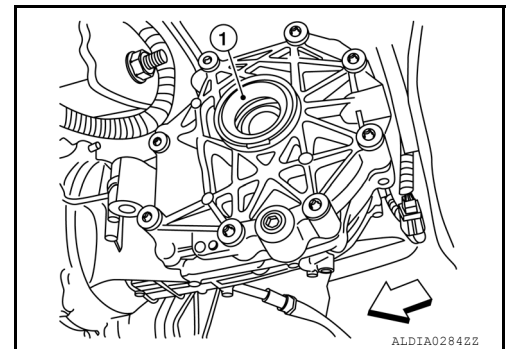
INFOID:000000007883307

REMOVAL

1. Remove rear drive shaft (LH or RH) as necessary. Refer to [RAX-9, "Removal and Installation"](#).
2. Remove side oil seal (1), using suitable tool.

CAUTION:
Be careful not to damage gear carrier and side cover.

← : Front



INSTALLATION

SIDE OIL SEAL

< REMOVAL AND INSTALLATION >

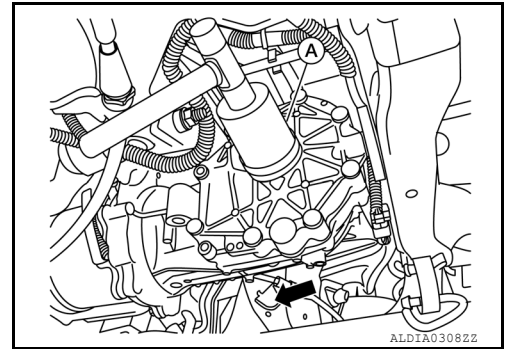
[REAR FINAL DRIVE: R145K1]

1. Install side oil seal (cover side) until it becomes flush with the carrier end, using tool (A).

Tool number (A): KV40105740 (—)

CAUTION:

- Do not reuse oil seal.
- When installing, do not incline oil seals.
- Apply gear oil onto side oil seal lip.

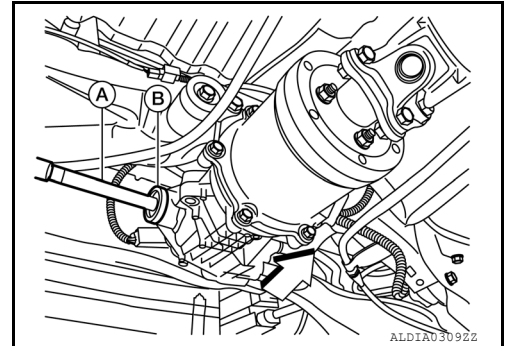


2. Install side oil seal (carrier side) until it becomes flush with the carrier end, using tool (A) and tool (B).

Tool number (A): ST35325000 (—)
(B): KV31103000 (J-38982)

CAUTION:

- Do not reuse oil seal.
- When installing, do not incline oil seals.
- Apply gear oil onto side oil seal lip.



3. Install rear drive shaft (LH or RH) as necessary. Refer to [RAX-9, "Removal and Installation"](#).
4. Check oil level and check for oil leaks. Refer to [DLN-111, "Inspection"](#).

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ELECTRIC CONTROLLED COUPLING

< REMOVAL AND INSTALLATION >

[REAR FINAL DRIVE: R145K1]

ELECTRIC CONTROLLED COUPLING

Removal and Installation

INFOID:000000008179016

NOTE:

- There is not enough room to remove electric controlled coupling on vehicle.
- If electric controlled coupling requires replacement, remove the rear final drive assembly from the vehicle before replacing electric controlled coupling. Refer to [DLN-120, "Disassembly"](#).

REAR FINAL DRIVE ASSEMBLY

< UNIT REMOVAL AND INSTALLATION >

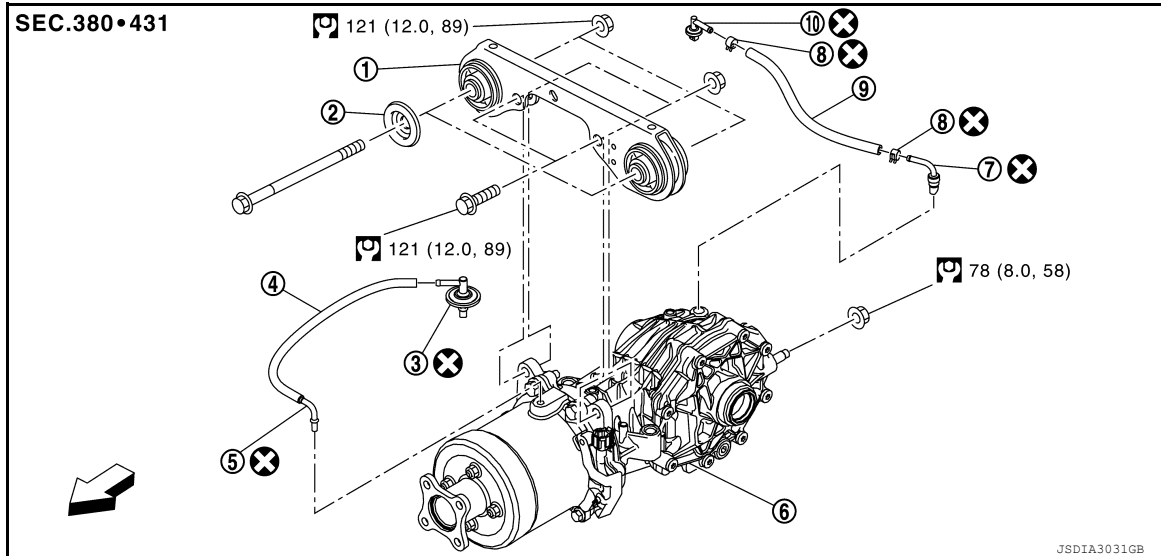
[REAR FINAL DRIVE: R145K1]

UNIT REMOVAL AND INSTALLATION

REAR FINAL DRIVE ASSEMBLY

Exploded View

INFOID:000000007883310



- | | | |
|---------------------------------|------------------|-------------------------|
| 1. Final drive mounting bracket | 2. Washer | 3. Breather |
| 4. Breather hose | 5. Breather tube | 6. Final drive assembly |
| 7. Breather tube | 8. Hose clamp | 9. Breather hose |
| 10. Breather | | |

←: Vehicle front

⊗: Always replace after every disassembly.

Ⓜ: N·m (kg·m, ft·lb)

Removal and Installation

INFOID:000000007883311

NOTE:

When removing components such as hoses, tubes/lines, etc., cap or plug openings to prevent fluid from spilling.

REMOVAL

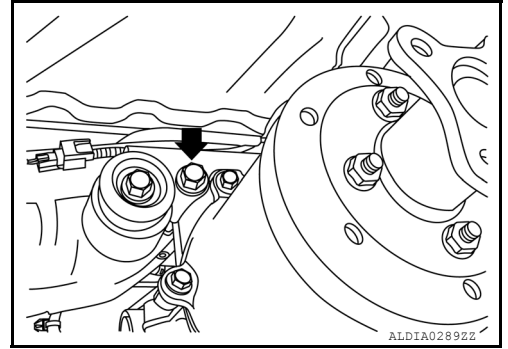
1. Drain rear final drive oil. Refer to [DLN-111, "Draining"](#).
2. Remove the rear propeller shaft from the rear final drive and support the rear propeller shaft with suitable wire. Refer to [DLN-99, "Removal and Installation"](#).
3. Remove the vehicle spare tire.
4. Remove the rear drive shafts. Refer to [RAX-9, "Removal and Installation"](#).
5. Remove rear stabilizer bar. Refer to [RSU-18, "Removal and Installation"](#).
6. Remove AWD harness bracket.
7. Disconnect AWD harness connector and unclip harness from the final drive mounting bracket.
8. Remove rear final drive breather hose and electric controlled coupling breather hose.
9. Support final drive assembly with a suitable jack.

REAR FINAL DRIVE ASSEMBLY

< UNIT REMOVAL AND INSTALLATION >

[REAR FINAL DRIVE: R145K1]

10. Remove final drive bolts (←).



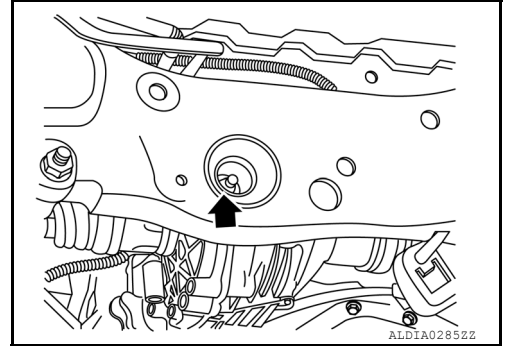
11. Remove rear final drive nut (←) at rear suspension member, and remove final drive from vehicle.

NOTE:

If it is necessary to remove the final drive mounting bracket, the fuel tank must be removed first. Refer to [FL-11. "Removal and Installation"](#).

CAUTION:

Secure final drive assembly to a suitable jack while removing it.



INSTALLATION

Installation is in the reverse order of removal.

- Install the breather hose (1) to breather connector until dimension (A) shown as follows.

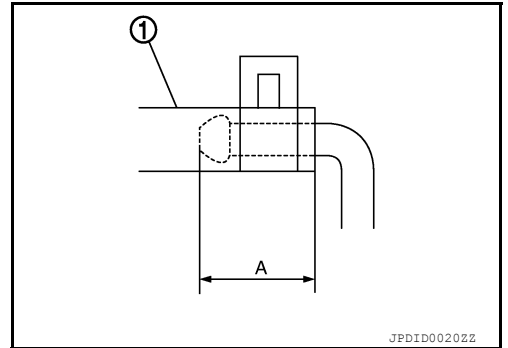
A:

Final drive side : 20 mm (0.79 in)

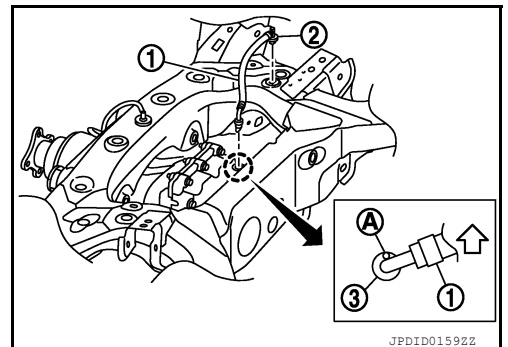
Suspension member side : 20.7 mm (0.815 in)

CAUTION:

- Do not reuse hose clamp and breather connector.
- Make sure there are no pinched or restricted areas on the breather hose caused by bending or winding when installing it.
- Install the hose clamp at the final drive side, with the tab facing to the vehicle front.
- Install the hose clamp at the suspension member side, with the tab facing downward.
- If remove resin connector (2) and metal connector (3), install breather hose (1), resin connector and metal connector as shown in the figure.
- For installation, insert resin connector into the square hole of rear suspension. Install metal connector to rear cover with aiming painted mark (A) to the front of vehicle.



← : Vehicle front



REAR FINAL DRIVE ASSEMBLY

[REAR FINAL DRIVE: R145K1]

< UNIT REMOVAL AND INSTALLATION >

- Install the electric controlled coupling breather hose (1) as shown in the figure.
- Install electric controlled coupling breather hose at the coupling side to the metal connector (3) of the coupling (2) all the way to the point shown by the solid arrow (←).

← : Vehicle front

- Install electric controlled coupling breather hose at the suspension member side until dimension (A) shown as follows.

A : 15 mm (0.59 in)

- If remove resin connector of the electric controlled coupling (1) and metal connector (2), install them as shown in the figure.
- Install the resin connector at the insertion side to the suspension member, facing to the vehicle front.
- Install the metal connector to the coupling cover, facing to the vehicle front.

CAUTION:

Do not reuse breather connector and hose clip.

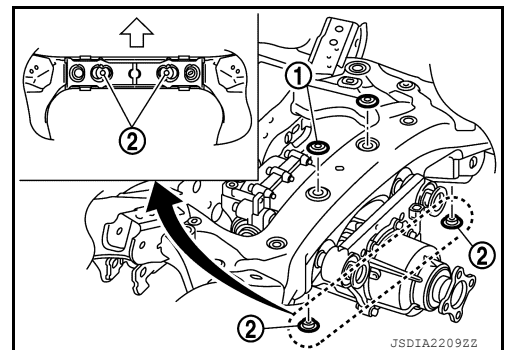
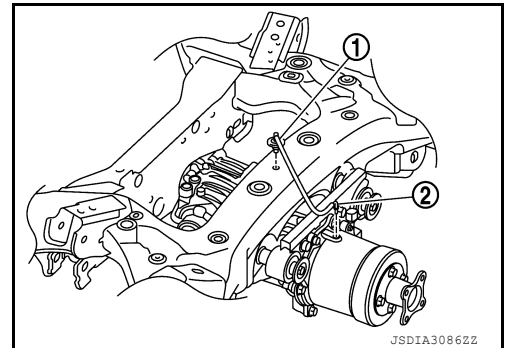
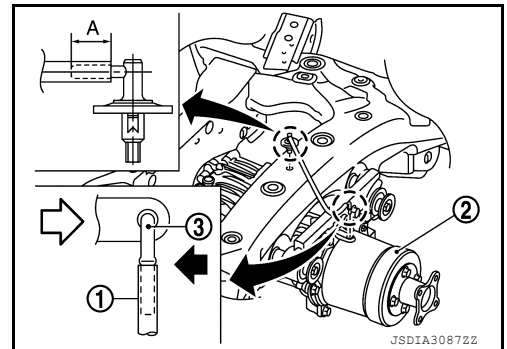
- If remove plug (1) and (2), install them as shown in the figure.

← : Vehicle front

CAUTION:

Do not reuse breather connector and hose clip.

- When oil leaks while removing final drive assembly, check oil level after the installation. Refer to [DLN-111, "Inspection"](#).
- When replacing rear final drive assembly, perform writing unit characteristics. Refer to [DLN-108, "Work Procedure"](#).



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REAR FINAL DRIVE ASSEMBLY

< UNIT DISASSEMBLY AND ASSEMBLY >

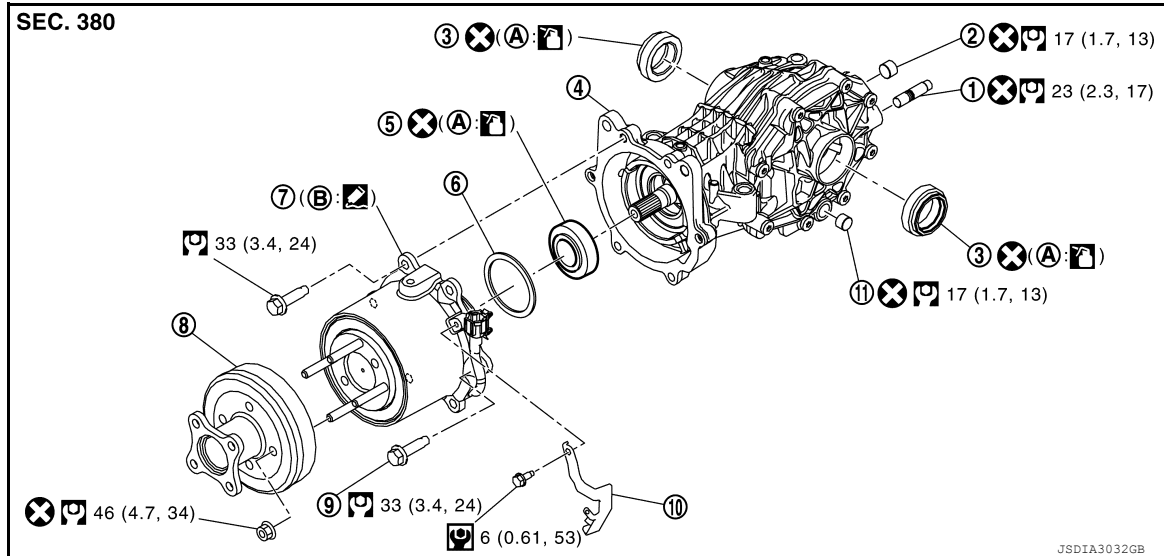
[REAR FINAL DRIVE: R145K1]

UNIT DISASSEMBLY AND ASSEMBLY

REAR FINAL DRIVE ASSEMBLY

Exploded View

INFOID:000000007883312



- | | | |
|---------------------------------|------------------------------|------------------|
| 1. Stud bolt | 2. Filler plug | 3. Side oil seal |
| 4. Final drive assembly | 5. Front oil seal | 6. Wave washer |
| 7. Electric controlled coupling | 8. Torsional damper | 9. Reamer bolt |
| 10. Harness bracket | 11. Drain plug | |
| A. Oil seal lip | B. Final drive mounting face | |

⊗: Always replace after every disassembly.

⊕: N-m (kg-m, ft-lb)

⊖: N-m (kg-m, in-lb)

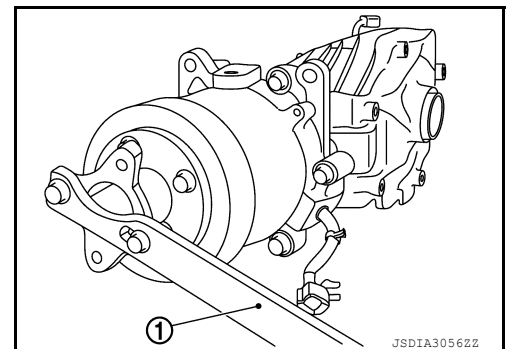
⊙: Apply gear oil.

⊚: Apply Genuine Silicone RTV or equivalent. Refer to [GI-22. "Recommended Chemical Products and Sealants"](#).

Disassembly

INFOID:000000007883313

1. Remove torsional damper mounting nut, using a flange wrench (1) (commercial service tool).
2. Remove torsional damper.
3. Remove harness bracket.
4. Remove electric controlled coupling.
5. Remove wave washer.



REAR FINAL DRIVE ASSEMBLY

[REAR FINAL DRIVE: R145K1]

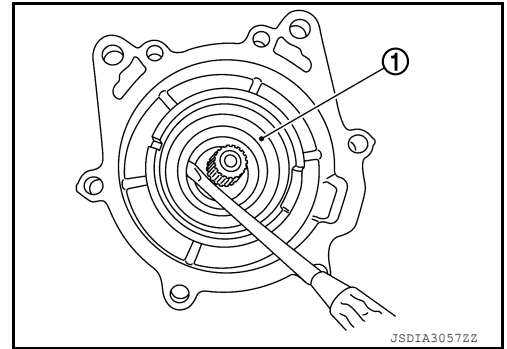
< UNIT DISASSEMBLY AND ASSEMBLY >

6. Remove front oil seal (1) from final drive assembly, using a oil seal remover.

CAUTION:

Never damage final drive assembly.

7. Remove drain plug and filler plug, if necessary.

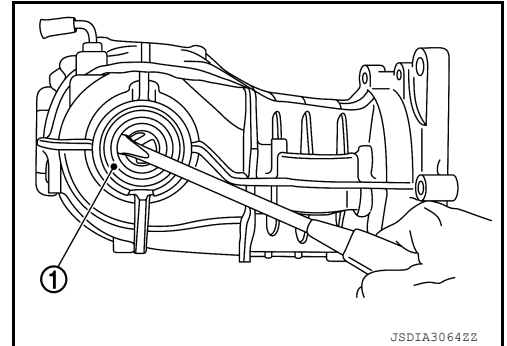


8. Remove side oil seal (1), using a oil seal remover.

CAUTION:

Never damage final drive assembly and side cover.

9. Remove stud bolt from side cover, if necessary.



Assembly

1. Install stud bolt to side cover.

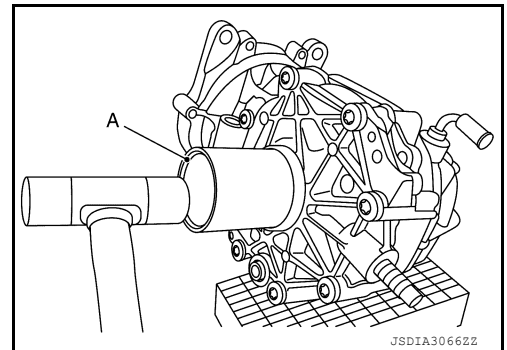
CAUTION:

Never reuse stud bolt.

2. Install side oil seal (cover side) until it becomes flush with the carrier end, using the drift (A) [SST: KV40105740 (—)].

CAUTION:

- Never reuse oil seal.
- When installing, do not incline oil seals.
- Apply gear oil onto side oil seal lip.



3. Install side oil seal (carrier side) until it becomes flush with the carrier end, using the drift (A) and drift bar (B).

A : Drift [SST: KV31103000 (J-38982)]

B : Drift bar [SST: ST35325000 (—)]

CAUTION:

- Never reuse oil seal.
- When installing, do not incline oil seals.
- Apply gear oil onto side oil seal lip.

4. Install drain plug.

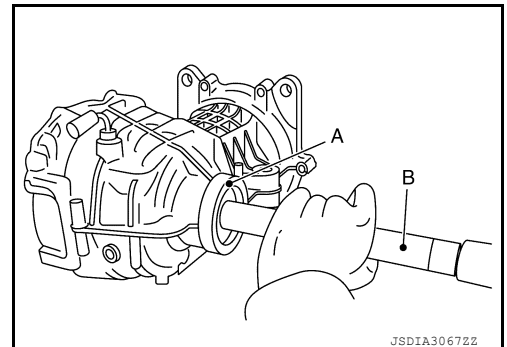
CAUTION:

Never reuse drain plug.

5. Install filler plug.

CAUTION:

Never reuse filler plug.



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REAR FINAL DRIVE ASSEMBLY

[REAR FINAL DRIVE: R145K1]

< UNIT DISASSEMBLY AND ASSEMBLY >

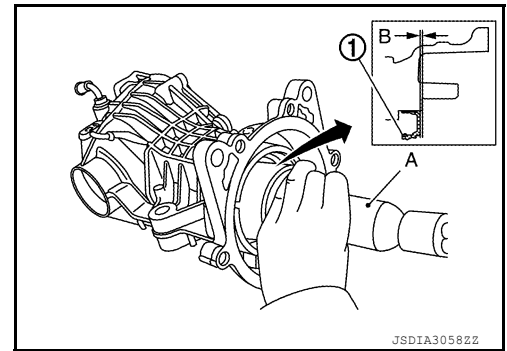
6. Using the drift (A) [SST: ST30720000 (J-25405)], install front oil seal (1) as shown in the figure.

B : 0.5 – 1.2 mm (0.020 – 0.047 in)

CAUTION:

- Never reuse oil seal.
- When installing, never incline oil seal.
- Apply gear oil onto side oil seal lip.

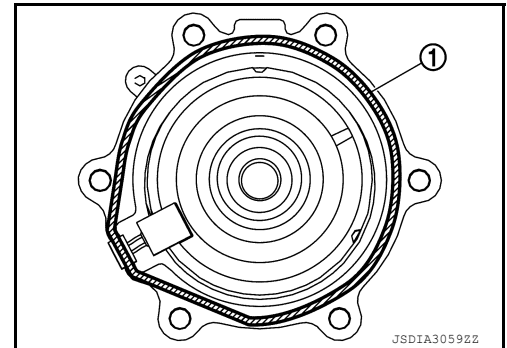
7. Install wave washer to electric controlled coupling.



8. 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:

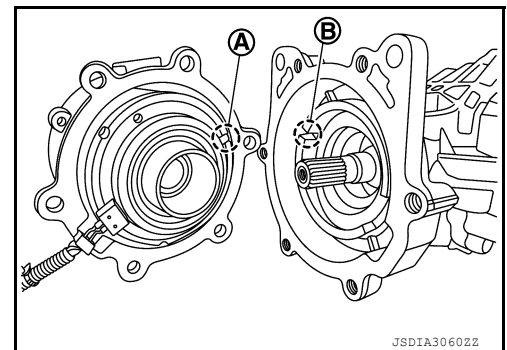
- Remove old gasket adhering to the mounting surfaces. Also remove any moisture, oil, or foreign material adhering to the mounting surfaces.
- The width of sealant bend is approximately 3 mm (0.012 in).



9. Install electric controlled coupling to spline of drive pinion inside final drive assembly.

CAUTION:

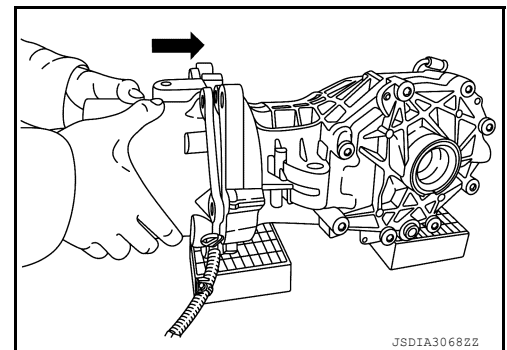
- Align the pin (A) on electric controlled coupling with the groove (B) of final drive assembly.
- Be careful not to damage center oil seal.



10. Press the electric controlled coupling pin to check that it is positioned in the groove of the final drive assembly as shown in the figure.

NOTE:

If the pin is properly positioned in the groove, then the electric controlled coupling can be pressed by the same amount of flexion of the wave washer.



REAR FINAL DRIVE ASSEMBLY

[REAR FINAL DRIVE: R145K1]

< UNIT DISASSEMBLY AND ASSEMBLY >

11. Temporarily tighten reamer bolts (1) to the positions shown in the figure.

CAUTION:

- Never use tools. Always tighten by hand.
- If reamer bolts cannot be tightened all the way by hand, the electric controlled coupling pin may not be positioned in the groove of the final drive assembly. In this case, remove electric controlled coupling and reinstall it.

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

13. Install harness bracket, and tighten bolts to the specified torque.

14. Install torsional damper. (When torsional damper has been reused.)

CAUTION:

Clean the mounting surface.

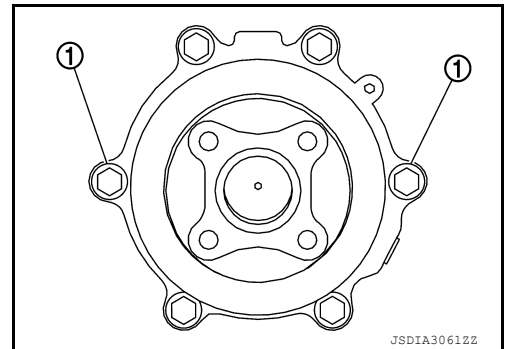
15. Install torsional damper. (When torsional damper has been replaced.)

Degrease the mounting surface of electric controlled coupling, according to the following instruction.

1. Spray alcohol on a cotton cloth four times per part.

CAUTION:

Always use a new cotton cloth.



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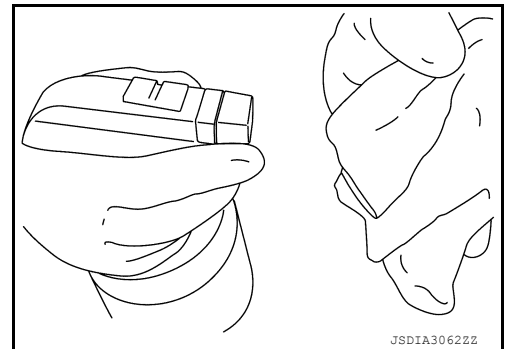
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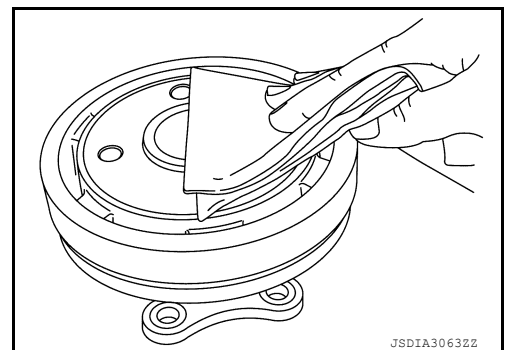
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2. Wipe the mounting surface of electric controlled coupling five times.

CAUTION:

Complete the work within 180 seconds to prevent alcohol from evaporating.



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16. Install torsional damper mounting nut, using flange wrench (1) (commercial service tool) and tighten to the specified torque.

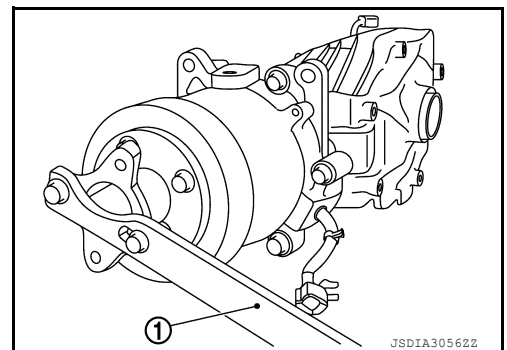
CAUTION:

Never reuse torsional damper mounting nut.

17. Check companion flange runout. Refer to [DLN-123, "Adjustment"](#).

18. When oil leaks while removing, check oil level after installation. Refer to [DLN-111, "Inspection"](#).

19. When replacing electric controlled coupling, perform writing unit characteristics after installing final drive assembly to the vehicle. Refer to [DLN-109, "Work Procedure"](#).



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Adjustment

INFOID:000000007883315

COMPANION FLANGE RUNOUT

REAR FINAL DRIVE ASSEMBLY

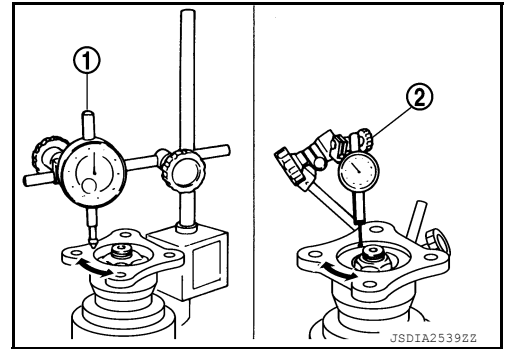
< UNIT DISASSEMBLY AND ASSEMBLY >

[REAR FINAL DRIVE: R145K1]

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-125, "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 electric controlled coupling.

Inspection

INFOID:000000007883316

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)

[REAR FINAL DRIVE: R145K1]

SERVICE DATA AND SPECIFICATIONS (SDS)

SERVICE DATA AND SPECIFICATIONS (SDS)

General Specification

INFOID:000000007883326

Applied model	AWD
	VQ35DE
	CVT
Final drive model	R145K1
Gear ratio	2.466
Number of teeth (Drive gear/Drive pinion)	37/15
Oil capacity (Approx.) <i>ℓ</i> (US pt, Imp pt)	0.5 (1, 7/8)
Number of pinion gears	2

Companion Flange Runout

INFOID:000000007883331

Unit: mm (in)

Item	Limit
Companion flange face	0.12 (0.0047)
Inner side of the companion flange	0.27 (0.0106)