

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:000000010292457

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. 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

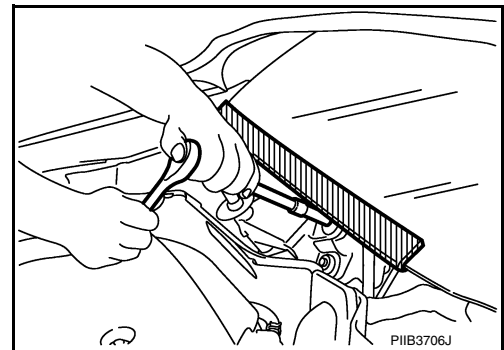
WARNING:

- 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 three minutes before performing any service.

Precaution for Procedure without Cowl Top Cover

INFOID:000000009991718

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



Precaution for Battery Service

INFOID:000000009991719

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.

Service Notice or Precautions for Transfer

INFOID:000000010335787

- After overhaul refill the transfer with new transfer oil.
- Check the oil level or replace the oil only with the vehicle parked on level surface.
- During removal or installation, keep inside of transfer clear of dust or dirt.
- Replace all tires at the same time. Always use tires of the proper size and the same brand and pattern. Fitting improper size and unusual wear tires applies excessive force to vehicle mechanism and can cause longitudinal vibration.
- Disassembly should be done in a clean work area.

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PRECAUTIONS

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< PRECAUTION >

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

PREPARATION

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PREPARATION

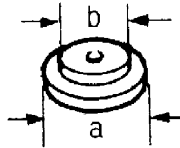
PREPARATION

Special Service Tool

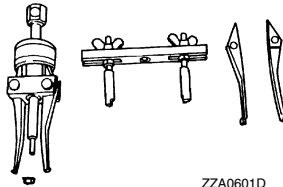
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The actual shapes of TechMate tools may differ from those of special service tools illustrated here.

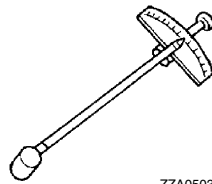
Tool number (TechMate No.) Tool name	Description
ST33061000 (J-8107-2) Drift a: 38 mm (1.50 in) dia. b: 28.5 mm (1.122 in) dia.	Removing gear ring bearing inner race (transfer case side)
KV381054S0 (J-34286) Puller	Removing ring gear shaft oil seal
ST3127S000 (J-25765-A) Preload gauge	Measuring preload torque



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ZZA0601D



ZZA0503D

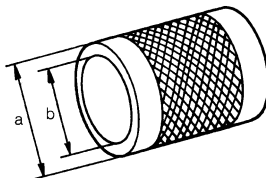
Commercial Service Tool

INFOID:0000000010337464

Tool name	Description
Power tool	Loosening nuts, screws and bolts
Drift a: 52 mm (2.05 in) dia. b: 44 mm (1.73 in) dia.	Removing gear ring bearing inner race (transfer cover side)



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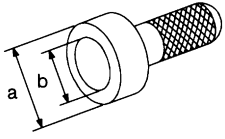
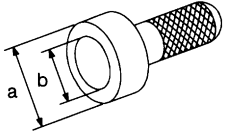
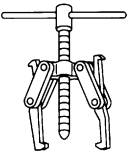
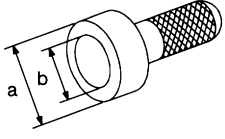
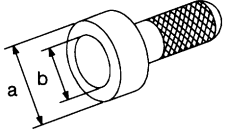
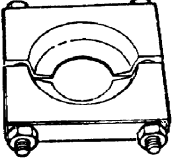
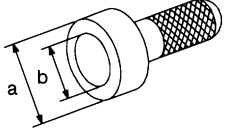


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PREPARATION

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Tool name	Description
<p>Drift a: 56.5 mm (2.224 in) dia. b: 48 mm (1.89 in) dia.</p>  <p style="text-align: center;">NT115</p>	<p>Installing side oil seal (installing transfer case oil seal)</p>
<p>Drift a: 44 mm (1.73 in) dia. b: 33 mm (1.3 in) dia.</p>  <p style="text-align: center;">NT115</p>	<p>Installing ring gear shaft oil seal</p>
<p>Puller</p>  <p style="text-align: center;">NT077</p>	<p>Removing ring gear bearing (left) inner race (transfer case side)</p>
<p>Drift a: 70 mm (2.76 in) dia. b: 60 mm (2.36 in) dia.</p>  <p style="text-align: center;">NT115</p>	<p>Installing oil seal (installing pinion bearing seal)</p>
<p>Drift a: 78 mm (3.07 in) dia. b: 68 mm (2.68 in) dia.</p>  <p style="text-align: center;">NT115</p>	<p>Installing side oil seal (installing transfer cover oil seal)</p>
<p>Replacer</p>  <p style="text-align: center;">ZZA0700D</p>	<ul style="list-style-type: none"> • Removing drive pinion • Removing ring gear bearing (left) inner race (transfer cover side)
<p>Drift a: 58 mm (2.28 in) dia. b: 55 mm (2.17 in) dia.</p>  <p style="text-align: center;">NT115</p>	<p>Installing ring gear bearing (left) inner race (transfer case side)</p>

PREPARATION

< PREPARATION >

[TRANSFER: TY21C]

Tool name	Description
Drift a: 62 mm (2.44 in) dia. b: 58 mm (2.28 in) dia.	Installing ring gear bearing (right) inner race (transfer cover side)
Drift a: 73.5 mm (2.894 in) dia.	Installing ring gear bearing (left) outer race (transfer case side)
Drift a: 87 mm (3.43 in) dia.	Installing ring gear bearing (right) outer race (transfer cover side)
Drift a: 20 mm (0.79 in) dia.	Removing drive pinion
Drift a: 50 mm (1.97 in) dia. b: 41 mm (1.61 in) dia.	Installing pinion bearing assembly
Drift a: 40 mm (1.57 in) dia. b: 25 mm (0.98 in) dia.	Installing companion flange

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COMPONENT PARTS

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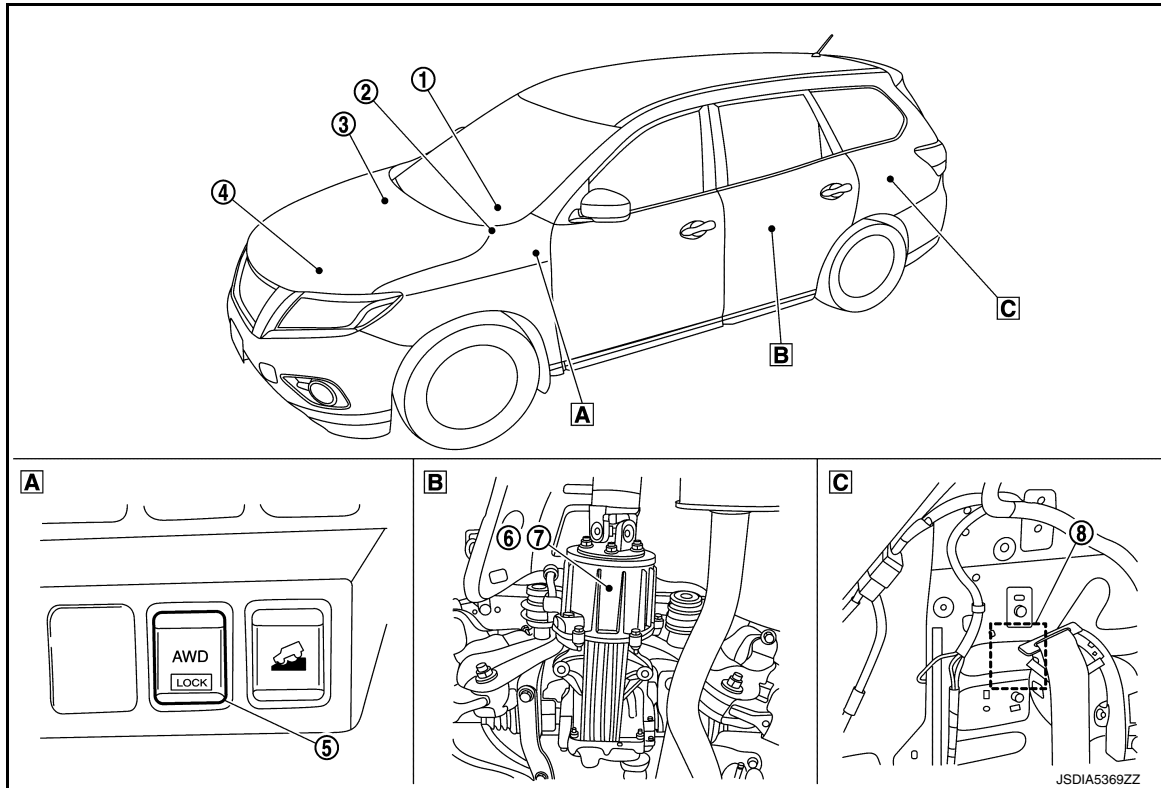
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SYSTEM DESCRIPTION

COMPONENT PARTS

Component Parts Location

INFOID:000000009991723



A Instrument lower panel LH

B Rear final drive assembly

C Rear wheel house outer panel in luggage room of left side

No.	Component	Function
①	Combination meter	<p>Mainly transmits the following signals to AWD control unit via CAN communication.</p> <ul style="list-style-type: none"> • Parking brake switch signal <p>Mainly receives the following signals from AWD control unit via CAN communication.</p> <ul style="list-style-type: none"> • AWD warning lamp signal • AWD LOCK indicator lamp signal <p>For detailed installation location, refer to MWI-6. "METER SYSTEM : Component Parts Location".</p>
②	Steering angle sensor	<p>Mainly transmits the following signals to AWD control unit via CAN communication.</p> <ul style="list-style-type: none"> • steering angle sensor signal <p>For detailed installation location, refer to BRC-8. "Component Parts Location".</p>
③	ABS actuator and electric unit (control unit)	<p>Mainly transmits the following signals to AWD control unit via CAN communication.</p> <ul style="list-style-type: none"> • Each wheel speed signal • Stop lamp switch signal (brake signal) • Yaw rate sensor signal • Side G sensor signal • Decel G sensor signal <p>For detailed installation location, refer to BRC-8. "Component Parts Location".</p>

COMPONENT PARTS

< SYSTEM DESCRIPTION >

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No.	Component	Function
④	ECM	Mainly transmits the following signals to AWD control unit via CAN communication. <ul style="list-style-type: none"> • Accelerator pedal position signal • Engine speed signal For detailed installation location, refer to EC-14 , " Component Parts Location ".
⑤	AWD lock switch	Refer to DLN-11 , " AWD Lock Switch ".
⑥	Electric controlled coupling	Refer to DLN-11 , " Electric Controlled Coupling ".
⑦	AWD solenoid	Refer to DLN-11 , " AWD Solenoid ".
⑧	AWD control unit • AWD actuator relay	Refer to DLN-11 , " AWD Control Unit ".

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AWD Control Unit

INFOID:000000009991724

- 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.

Electric Controlled Coupling

INFOID:000000009991726

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 Solenoid

INFOID:000000009991725

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

AWD Lock Switch

INFOID:000000009995319

Every time AWD lock switch is pressed, AUTO mode and LOCK mode switch each other.

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STRUCTURE AND OPERATION

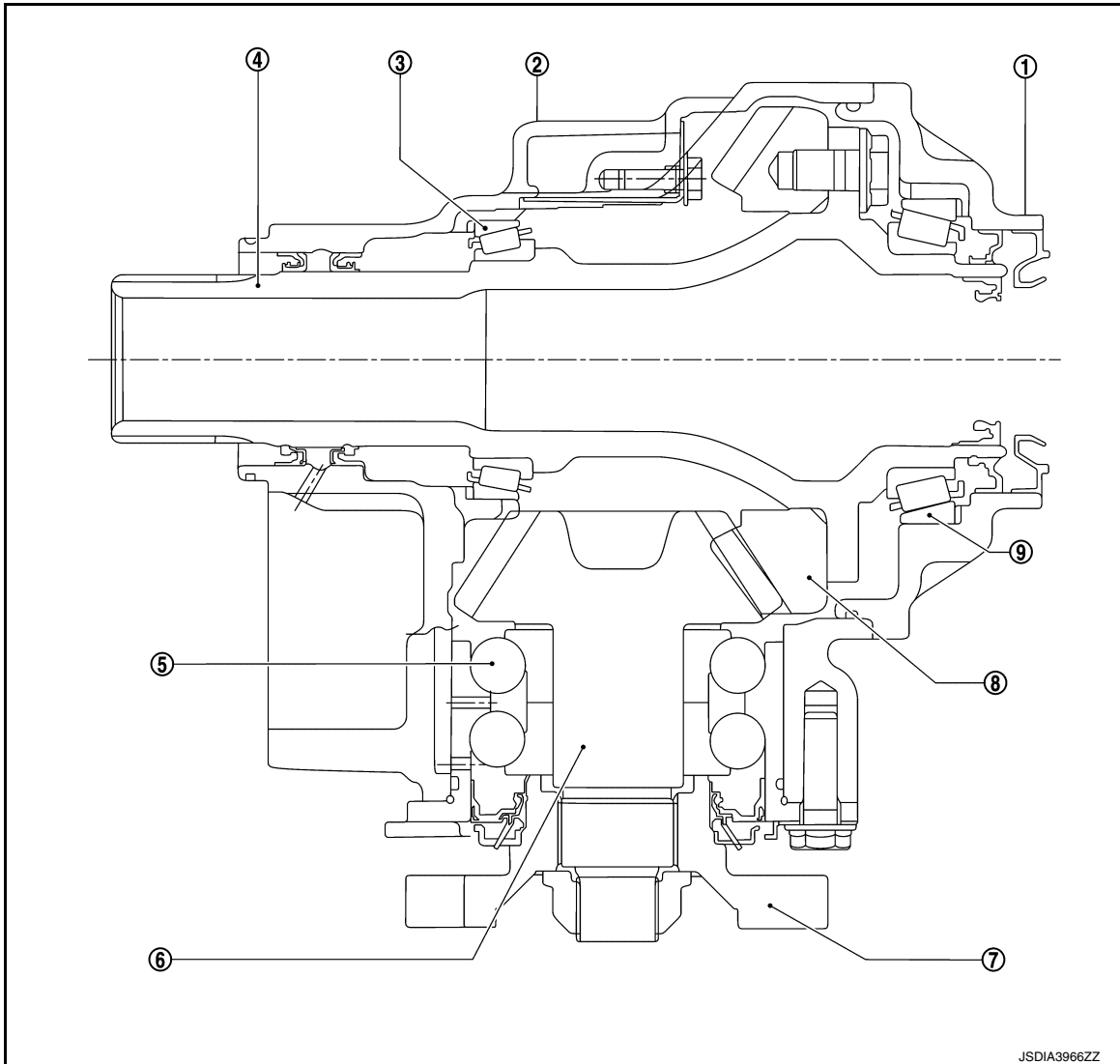
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STRUCTURE AND OPERATION

Sectional View

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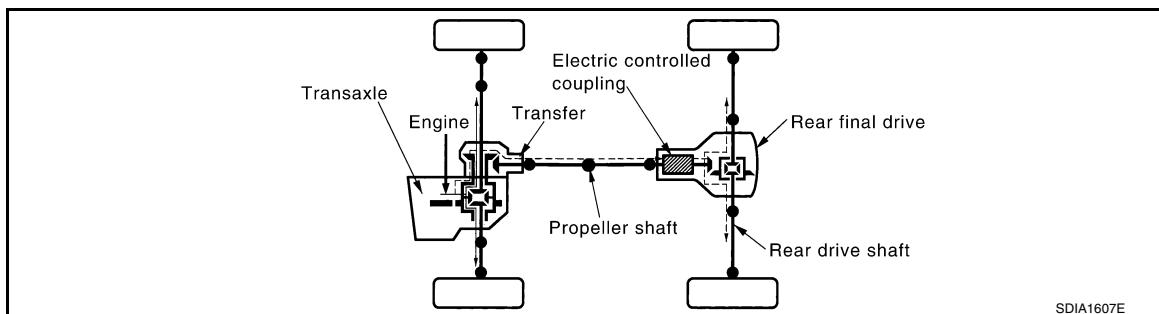


- | | | |
|---------------------|-------------------|--|
| 1. Transfer cover | 2. Transfer case | 3. Ring gear bearing (transfer case side) |
| 4. Ring gear shaft | 5. Pinion bearing | 6. Drive pinion |
| 7. Companion flange | 8. Ring gear | 9. Ring gear bearing (transfer cover side) |

Operation Description

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POWER TRANSFER DIAGRAM



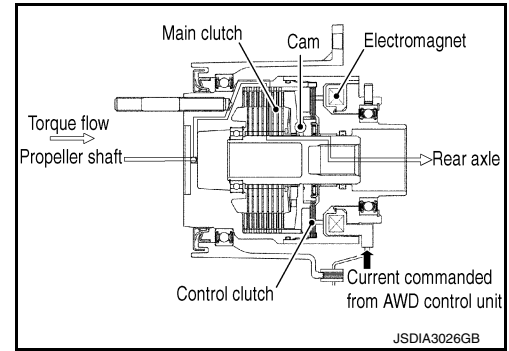
STRUCTURE AND OPERATION

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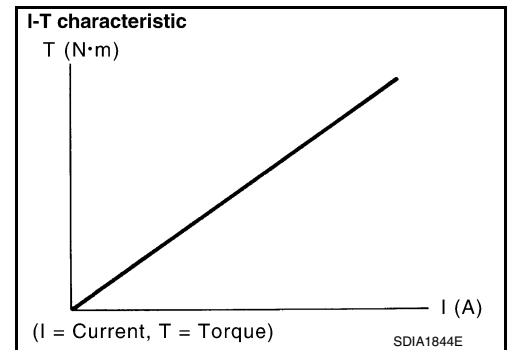
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ELECTRIC CONTROLLED COUPLING

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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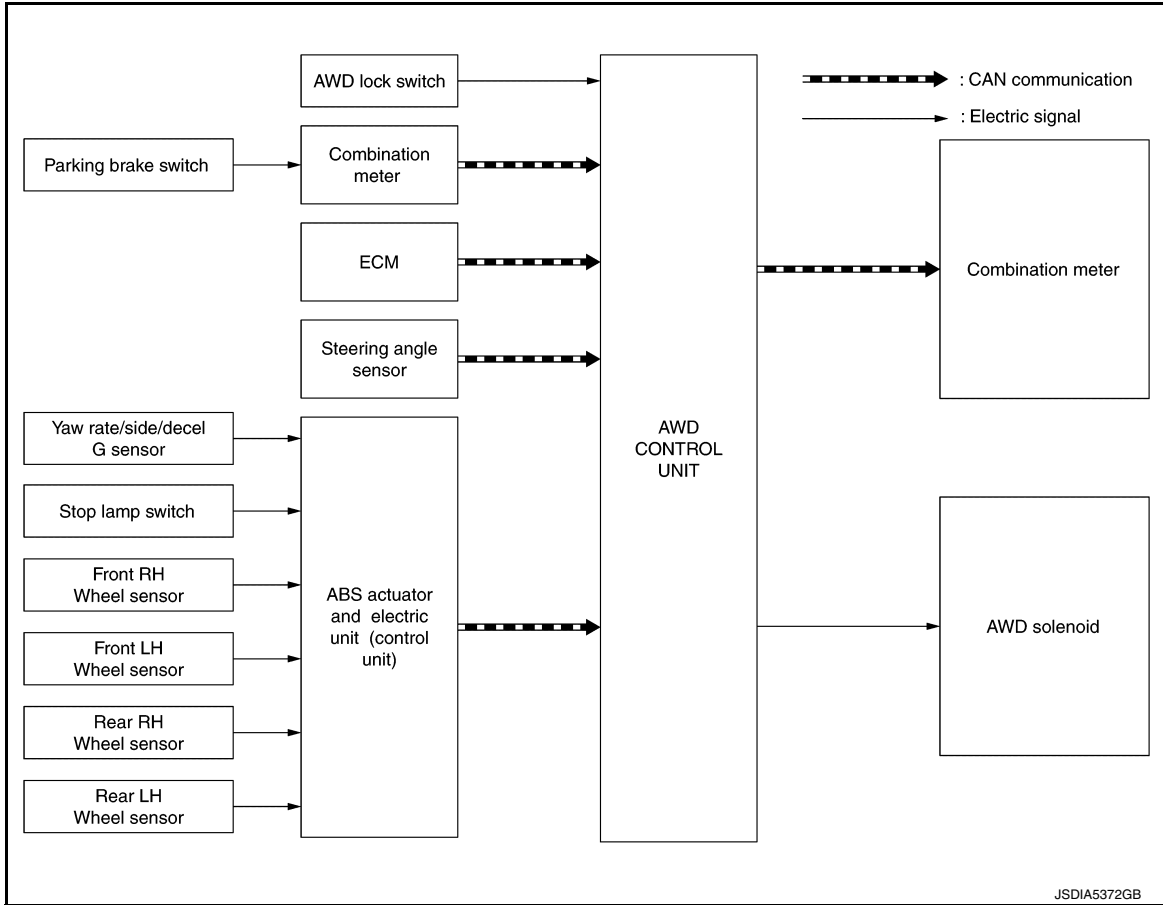
SYSTEM

AWD SYSTEM

AWD SYSTEM : System Description

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SYSTEM DIAGRAM



Signal with Communication Line

Major signal transmission between each unit via CAN communication lines are shown in the following table.

Component parts	Signal item
Combination meter	Mainly transmits the following signals to AWD control unit via CAN communication. <ul style="list-style-type: none"> • Parking brake switch signal Mainly receives the following signals from AWD control unit via CAN communication. <ul style="list-style-type: none"> • AWD warning lamp signal • AWD LOCK indicator lamp signal
Steering angle sensor	Mainly transmits the following signals to AWD control unit via CAN communication. <ul style="list-style-type: none"> • steering angle sensor signal

SYSTEM

< SYSTEM DESCRIPTION >

[TRANSFER: TY21C]

Component parts	Signal item
ABS actuator and electric unit (control unit)	Mainly transmits the following signals to AWD control unit via CAN communication. <ul style="list-style-type: none"> • Each wheel speed signal • Stop lamp switch signal (brake signal) • Yaw rate sensor signal • Side G sensor signal • Decel G sensor signal
ECM	Mainly transmits the following signals to AWD control unit via CAN communication. <ul style="list-style-type: none"> • Accelerator pedal position signal • Engine speed signal

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 : Fail-Safe

INFOID:000000009991732

If any malfunction occurs in AWD electrical system, and control unit detects the malfunction, AWD warning on information display (combination meter) is displayed to indicate system malfunction. And then AWD control unit controls becomes the fail-safe mode depending on DTC.

DTC	Vehicle condition
<ul style="list-style-type: none"> •C1201 •C1204 •C1209 •P1804 •P1809 •P1811 •P181F 	AWD control changes to front-wheel drive immediately, then AWD control stops, and the vehicle becomes front-wheel drive.
<ul style="list-style-type: none"> •C1203 •C1210 •P1808 •P181D •U1000 •U1010 	AWD control changes to front-wheel drive gradually (rear-wheels still have some driving torque), then AWD control stops, and the vehicle becomes front-wheel drive.
<ul style="list-style-type: none"> •P181B 	No impact to vehicle behavior.

AWD SYSTEM : Protection Function

INFOID:000000009991733

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.)

SYSTEM

< SYSTEM DESCRIPTION >

[TRANSFER: TY21C]

DTC	AWD warning (on information display)	Error area and root cause	Contents of protection function
—	Refer to DLN-16, "INFORMATION DISPLAY (COMBINATION METER) : AWD Warning" .	Rear final drive assembly in protection mode. It is not malfunction. (Internal temperature rise of electronic controlled coupling)	Shuts down AWD system temporarily (Front wheel drive)
—		Malfunction in each tire or different tire diameter	

NOTE:

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

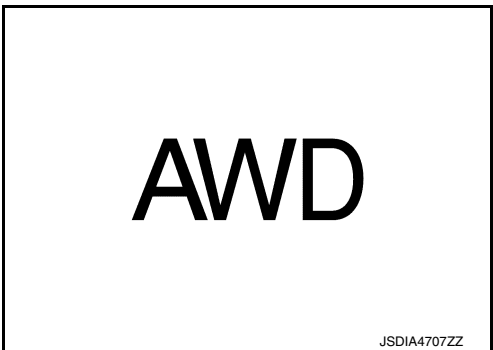
INFORMATION DISPLAY (COMBINATION METER)

INFORMATION DISPLAY (COMBINATION METER) : AWD Warning

INFOID:000000009992081

DESIGN/PURPOSE

AWD warning is displayed when the AWD system has a malfunction. AWD warning indicates that the vehicle is in fail-safe mode or protection function mode.

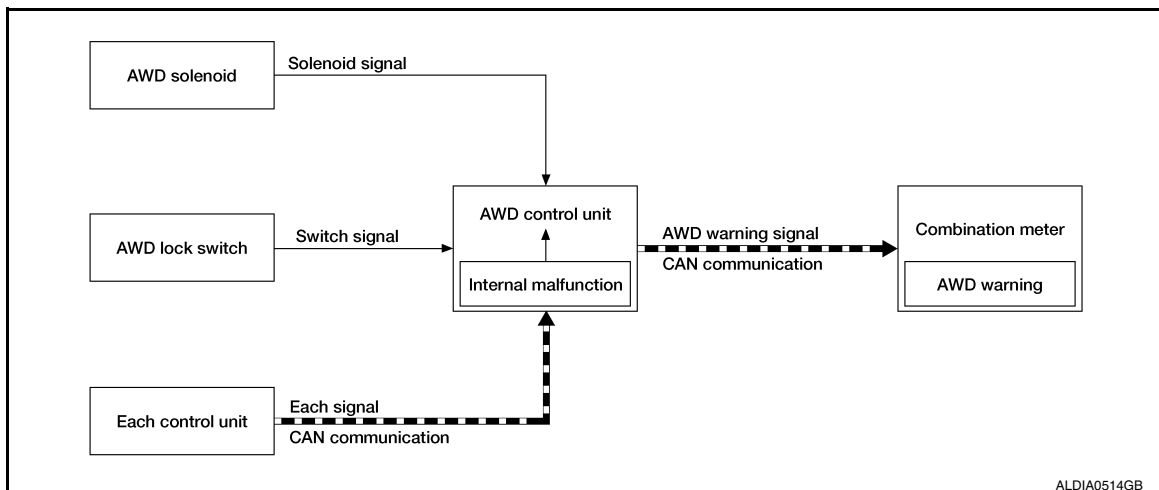
Symbol	Message	Condition
	AWD Error See Owner's Manual	AWD system malfunction.
	AWD High Temp. Stop vehicle	Protection function is activated due to heavy load to electric controlled coupling. (AWD system is not malfunctioning and AWD system changes to rear wheel drive.)
	Tire Size Incorrect See Owner's Manual	Large difference in diameter of front/rear tires.

SYNCHRONIZATION WITH MASTER WARNING LAMP

Applicable

For master warning lamp, refer to [DLN-17, "WARNING/INDICATOR/CHIME LIST : Warning/Indicator \(On Information Display\)"](#).

SYSTEM DIAGRAM



SIGNAL PATH

- The AWD control unit judges and decides a mode from among normal mode, fail-safe mode, and protection function mode, according to signals received from each switch, sensor, and control unit.

SYSTEM

< SYSTEM DESCRIPTION >

[TRANSFER: TY21C]

- The AWD control unit transmits AWD warning signal to the combination meter via CAN communication when judging fail-safe mode or protection function mode.
- The combination meter displays AWD warning on the information display when receiving AWD warning signal transmitted from the AWD control unit.

WARNING CONDITION

AWD warning is displayed when the AWD system goes into fail-safe mode or protection function mode.

WARNING CANCEL CONDITION

When any of the conditions listed below is satisfied:

- Ignition switch is in a position other than ON.
- AWD warning becomes invisible when the AWD system returns to normal.

WARNING/INDICATOR/CHIME LIST

WARNING/INDICATOR/CHIME LIST : Warning/Indicator (On Information Display)

INFOID:000000009992082

Name	Function
AWD warning	Refer to DLN-16, "INFORMATION DISPLAY (COMBINATION METER) : AWD Warning" .

DIAGNOSIS SYSTEM (AWD CONTROL UNIT)

< SYSTEM DESCRIPTION >

[TRANSFER: TY21C]

DIAGNOSIS SYSTEM (AWD CONTROL UNIT)

CONSULT Function

INFOID:000000009991734

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-23. "DTC Index"](#).

When "PRCNT" 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.

Monitor item (Unit)	Remarks
ODO/TRIP METER [km/h] or [mph]	Odometer value via CAN communication line is displayed.
ABS OPERATION SIG [On/Off]	ABS operation status via CAN communication line is displayed.
VDC OPERATION SIG [On/Off]	VDC operation status via CAN communication line is displayed.
TCS OPERATION SIG [On/Off]	TCS operation status via CAN communication line is displayed.
HI COEF FRIC FLG 1 [LOW/HIGH]	Measured friction of load is displayed when vehicle starts.
HI COEF FRIC FLG 2 [LOW/HIGH]	Measured friction of load is displayed when vehicle during deceleration.
IGN VOLT [V]	Ignition voltage supplied to AWD control unit is displayed.
TARGET SOL CRNT [A]	AWD solenoid target current is displayed.
SOLENOID CRNT [A]	AWD solenoid control current is displayed.
QUASI VEHICLE SPEED [km/h] or [mph]	Vehicle speed calculated by AWD control unit is displayed.
FRONT WHEEL SPEED [km/h] or [mph]	Front wheel speed average calculated by AWD control unit is displayed.
REAR WHEEL SPEED [km/h] or [mph]	Rear wheel speed average calculated by AWD control unit is displayed.
SLCT LVR POSI	Current transmission gear via CAN communication line is displayed.
OPERATION MODE	Control status of AWD mode is displayed.
FRONT RH WHEEL SPEED [km/h] or [mph]	Wheel speed calculated by front RH wheel sensor signal is displayed.
FRONT LH WHEEL SPEED [km/h] or [mph]	Wheel speed calculated by front LH wheel sensor signal is displayed.
REAR RH WHEEL SPEED [km/h] or [mph]	Wheel speed calculated by rear RH wheel sensor signal is displayed.
REAR LH WHEEL SPEED [km/h] or [mph]	Wheel speed calculated by rear LH wheel sensor signal is displayed.

DIAGNOSIS SYSTEM (AWD CONTROL UNIT)

< SYSTEM DESCRIPTION >

[TRANSFER: TY21C]

DATA MONITOR

NOTE:

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

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 (on information display) is displayed.
4WD MODE SW [AUTO/LOCK]	AWD lock switch status is displayed.
4WD MODE MON [AUTO/LOCK]	Control status of AWD is displayed.
DIS-TIRE MONI [mm]	Improper size tire installed condition is displayed.
PARKING BRAKE SW SIG [On/Off]	Parking switch signal status via CAN communication line is displayed.
4WD MODE SW (2WD) [On/Off]	This item is not equipped, but displayed.
4WD MODE SW (AUTO) [On/Off]	This item is not equipped, but displayed.
4WD MODE SW (LOCK) [On/Off]	AWD lock switch signal is displayed.
READY [Off/Running]	This item is not equipped, but displayed.
BATTERY VOLT [V]	Power supply voltage value of AWD control unit is displayed.
THRTL POS SEN [%]	Throttle opening status is displayed.
ETS SOLENOID [A]	Monitored value of current at AWD solenoid is displayed.
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
SOLENOID (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: TY21C]

ECU DIAGNOSIS INFORMATION

AWD CONTROL UNIT

Reference Value

INFOID:000000009991735

VALUES ON THE DIAGNOSIS TOOL

NOTE:

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

Monitor item	Condition	Value/Status	
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 (on information display): Displayed	On	
	AWD warning (on information display): Not displayed	Off	
4WD MODE SW	Releasing AWD lock switch	AUTO	
	AWD lock switch is hold pressed	LOCK	
4WD MODE MON	AWD LOCK indicator lamp: OFF	AUTO	
	AWD LOCK indicator lamp: ON	Vehicle speed below 10 km/h (6 mph)	LOCK
		Vehicle speed above 10 km/h (6 mph)	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	
PARKING BRAKE SW SIG	Parking brake operated	On	
	Parking brake not operated	Off	
4WD MODE SW (2WD)	Always	Off	
4WD MODE SW (AUTO)	Always	Off	
4WD MODE SW (LOCK)	Releasing AWD lock switch	Off	
	AWD lock switch is hold pressed	On	
READY	Always	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	AUTO mode	Approx. 0.000 A
		LOCK mode	Approx. 0.000 A
	Engine running • 3,000 rpm or more constant	AUTO mode	Approx. 0.000 – 2.000 A*
		LOCK mode	Approx. 2.000 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)	

AWD CONTROL UNIT

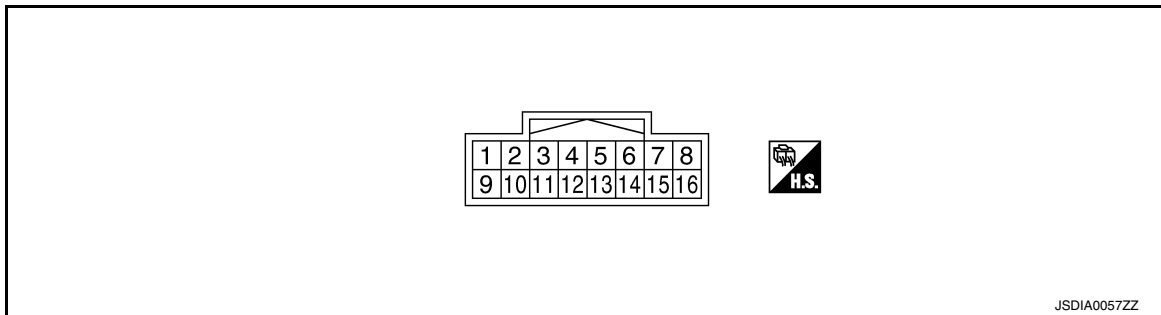
< ECU DIAGNOSIS INFORMATION >

[TRANSFER: TY21C]

Monitor item	Condition	Value/Status
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



PHYSICAL VALUES

Terminal No. (Wire color)		Description		Condition	Value (Approx.)	
+	-	Signal name	Input/ Output			
1 (SB)	Ground	AWD solenoid power supply	Output	Engine speed: At idle	0 V	
				Engine speed: 3,000 rpm or more constant	AUTO mode	2.5 V*
					LOCK mode	8 V
2 (Y)	Ground	AWD solenoid ground	Input	Engine speed: At idle	0 V	
				Engine speed: 3,000 rpm or more constant	0 V	
7 (LA/R)	Ground	Ignition switch	Input	Ignition switch: ON	Battery voltage	
				Ignition switch: OFF	0 V	
8 (L)	—	CAN-H	Input/ Output	—	—	
9 (LA/G)	Ground	Power supply (AWD solenoid)	Input	Always	Battery voltage	
10 (B)	Ground	Ground	—	Always	0 V	
11 (B)	Ground	Ground	—	Always	0 V	
14 (Y)	Ground	AWD lock switch	Input	Ignition switch: ON	Releasing AWD lock switch	Battery voltage
					AWD lock switch is hold pressed	0 V

AWD CONTROL UNIT

< ECU DIAGNOSIS INFORMATION >

[TRANSFER: TY21C]

Terminal No. (Wire color)		Description		Condition	Value (Approx.)
+	-	Signal name	Input/ Output		
15 (LA/L)	Ground	Power supply (AWD control unit)	Input	Always	Battery voltage
16 (P)	—	CAN-L	Input/ Output	—	—

*: The values are changed by depressed accelerator pedal 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:000000010336553

If any malfunction occurs in AWD electrical system, and control unit detects the malfunction, AWD warning on information display (combination meter) is displayed to indicate system malfunction. And then AWD control unit controls becomes the fail-safe mode depending on DTC.

DTC	Vehicle condition
<ul style="list-style-type: none"> •C1201 •C1204 •C1209 •P1804 •P1809 •P1811 •P181F 	AWD control changes to front-wheel drive immediately, then AWD control stops, and the vehicle becomes front-wheel drive.
<ul style="list-style-type: none"> •C1203 •C1210 •P1808 •P181D •U1000 •U1010 	AWD control changes to front-wheel drive gradually (rear-wheels still have some driving torque), then AWD control stops, and the vehicle becomes front-wheel drive.
•P181B	No impact to vehicle behavior.

Protection Function

INFOID:000000010336554

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.)

DTC	AWD warning (on information display)	Error area and root cause	Contents of protection function
—	Refer to DLN-16, "INFORMATION DISPLAY (COMBINATION METER) : AWD Warning" .	Rear final drive assembly in protection mode. It is not malfunction. (Internal temperature rise of electronic controlled coupling)	Shuts down AWD system temporarily (Front wheel drive)
—		Malfunction in each tire or different tire diameter	

NOTE:

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

DTC Inspection Priority Chart

INFOID:000000009991738

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

AWD CONTROL UNIT

< ECU DIAGNOSIS INFORMATION >

[TRANSFER: TY21C]

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"> • P1809 CONTROL UNIT
3	<ul style="list-style-type: none"> • C1201 CONTROLLER FAILURE • P1804 CONTROL UNIT
4	<ul style="list-style-type: none"> • C1204 4WD SOLENOID
5	<ul style="list-style-type: none"> • P1811 BATTERY VOLTAGE
6	<ul style="list-style-type: none"> • C1203 ABS SYSTEM • P1808 VHCL SPEED SEN-ABS
7	<ul style="list-style-type: none"> • C1210 ENGINE SIGNAL 1 • P181D ENGINE SYSTEM
8	<ul style="list-style-type: none"> • C1209 MODE SW
9	<ul style="list-style-type: none"> • P181F INCOMP CALIBRATION
10	<ul style="list-style-type: none"> • P181B INCOMP SELF SHUT

DTC Index

INFOID:000000009991739

DTC	Display Item	Reference
C1201	CONTROLLER FAILURE	DLN-36, "DTC Description"
C1203	ABS SYSTEM	DLN-37, "DTC Description"
C1204	4WD SOLENOID	DLN-38, "DTC Description"
C1209	MODE SW	DLN-41, "DTC Description"
C1210	ENGINE SIGNAL 1	DLN-43, "DTC Description"
P1804	CONTROL UNIT	DLN-44, "DTC Description"
P1808	VHCL SPEED SEN-ABS	DLN-45, "DTC Description"
P1809	CONTROL UNIT	DLN-46, "DTC Description"
P1811	BATTERY VOLTAGE	DLN-47, "DTC Description"
P181B	INCOMP SELF SHUT	DLN-50, "DTC Description"
P181D	ENGINE SYSTEM	DLN-53, "DTC Description"
P181F	INCOMP CALIBRATION	DLN-54, "DTC Description"
U1000	CAN COMM CIRCUIT	DLN-55, "DTC Description"
U1010	CONTROL UNIT (CAN)	DLN-56, "DTC Description"

NOTE:

If some DTCs are displayed at the same time, refer to [DLN-22, "DTC Inspection Priority Chart"](#).

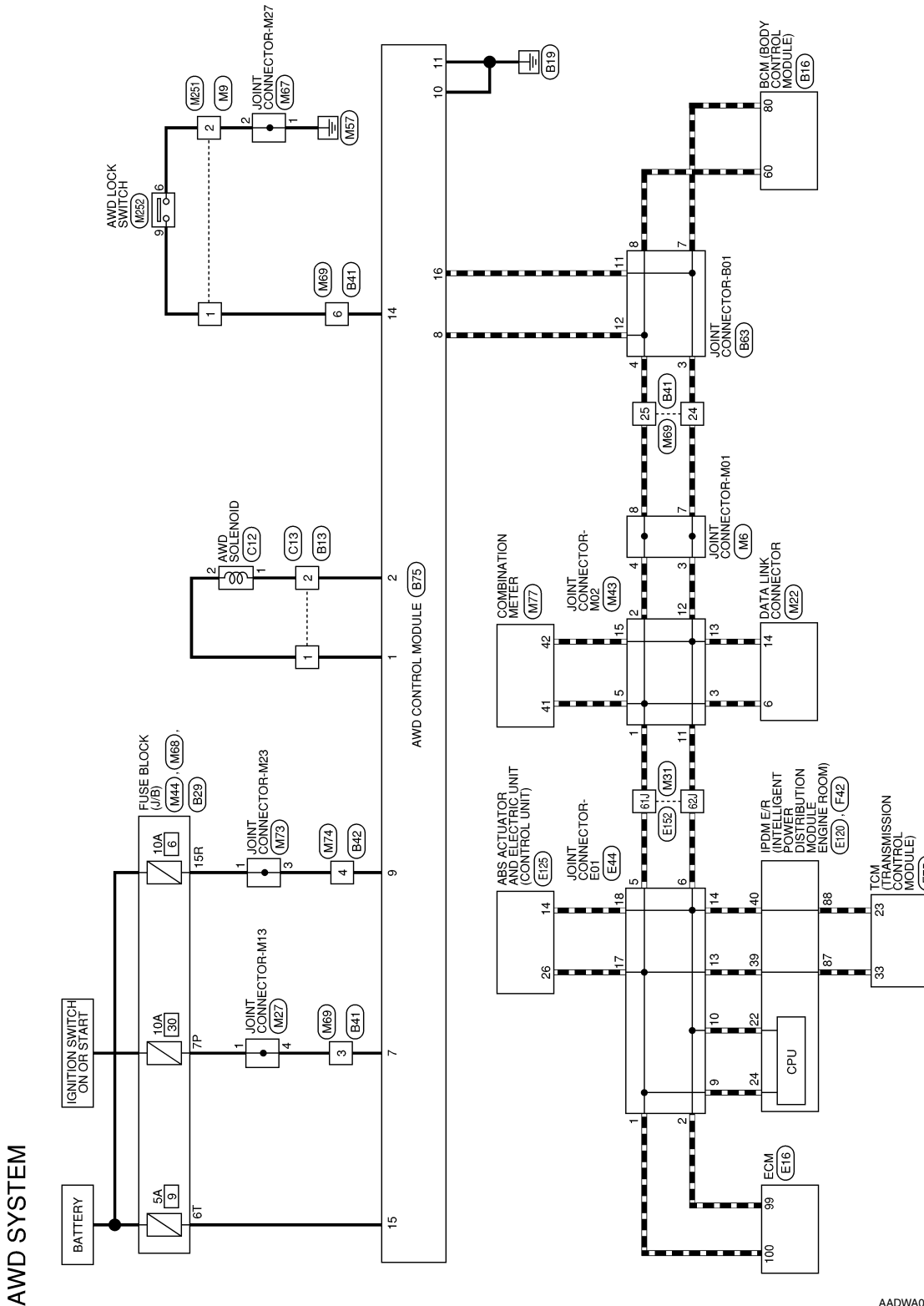
< WIRING DIAGRAM >

WIRING DIAGRAM

AWD SYSTEM

Wiring Diagram

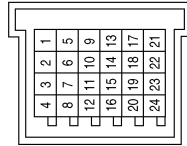
INFOID:000000009991740



AADWA0312GB

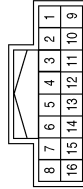
AWD SYSTEM CONNECTORS

Connector No.	M6
Connector Name	JOINT CONNECTOR-M01
Connector Color	GRAY



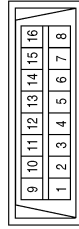
Terminal No.	Color of Wire	Signal Name
3	P	-
4	L	-
7	P	-
8	L	-

Connector No.	M9
Connector Name	WIRE TO WIRE
Connector Color	WHITE



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

Connector No.	M22
Connector Name	DATA LINK CONNECTOR
Connector Color	WHITE



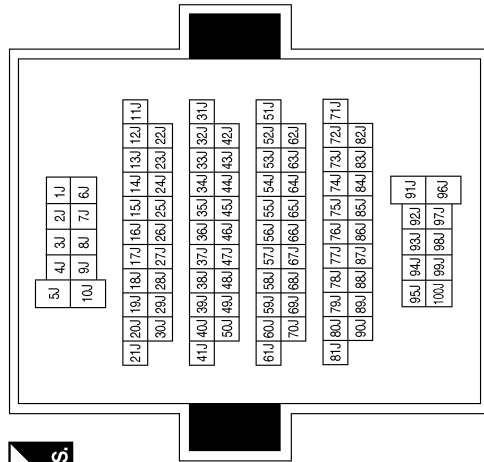
Terminal No.	Color of Wire	Signal Name
6	L	-
14	P	-

Connector No.	M27
Connector Name	JOINT CONNECTOR-M13
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
1	SB	-
4	SB	-

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



Terminal No.	Color of Wire	Signal Name
61J	L	-
62J	P	-

A
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DLN
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AWD SYSTEM

< WIRING DIAGRAM >

[TRANSFER: TY21C]

Connector No.	M67
Connector Name	JOINT CONNECTOR-M27
Connector Color	WHITE



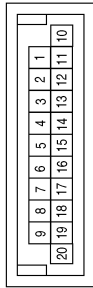
Terminal No.	Color of Wire	Signal Name
1	B	-
2	B	-

Connector No.	M44
Connector Name	FUSE BLOCK (J/B)
Connector Color	WHITE



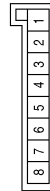
Terminal No.	Color of Wire	Signal Name
7P	Y	-

Connector No.	M43
Connector Name	JOINT CONNECTOR-M02
Connector Color	BLUE



Terminal No.	Color of Wire	Signal Name
1	L	-
2	L	-
3	L	-
5	L	-
11	P	-
12	P	-
13	P	-
15	P	-

Connector No.	M73
Connector Name	JOINT CONNECTOR-M23
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
1	W	-
3	Y	-

Connector No.	M69
Connector Name	WIRE TO WIRE
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
3	SB	-
6	Y	-
24	P	-
25	L	-

Connector No.	M68
Connector Name	FUSE BLOCK (J/B)
Connector Color	BROWN



Terminal No.	Color of Wire	Signal Name
15R	W	-

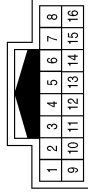
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AWD SYSTEM

< WIRING DIAGRAM >

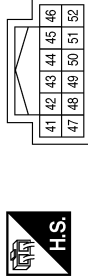
[TRANSFER: TY21C]

Connector No.	M251
Connector Name	WIRE TO WIRE
Connector Color	WHITE



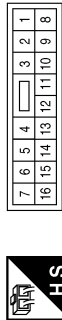
Terminal No.	Color of Wire	Signal Name
1	Y	-
2	B	-

Connector No.	M77
Connector Name	COMBINATION METER
Connector Color	WHITE



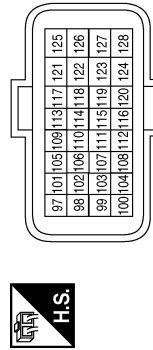
Terminal No.	Color of Wire	Signal Name
41	SB	CAN-H
42	LG	CAN-L

Connector No.	M74
Connector Name	WIRE TO WIRE
Connector Color	WHITE



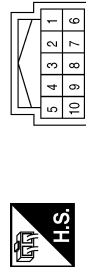
Terminal No.	Color of Wire	Signal Name
4	Y	-

Connector No.	E16
Connector Name	ECM
Connector Color	BLACK



Terminal No.	Color of Wire	Signal Name
99	P	CAN-L
100	L	CAN-H

Connector No.	M252
Connector Name	AWD LOCK SWITCH
Connector Color	WHITE

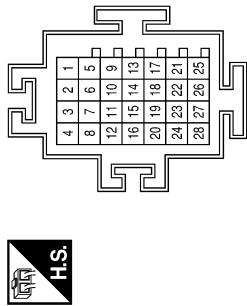


Terminal No.	Color of Wire	Signal Name
6	B	-
9	Y	-

AADIA0644GB

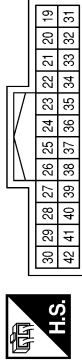
A
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O
P

Connector No.	E44
Connector Name	JOINT CONNECTOR-E01
Connector Color	WHITE



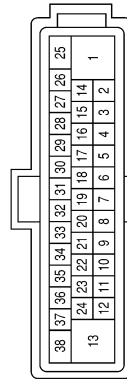
Terminal No.	Color of Wire	Signal Name
1	L	-
2	P	-
5	L	-
6	P	-
9	L	-
10	P	-
13	L	-
14	P	-
17	L	-
18	P	-

Connector No.	E120
Connector Name	IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)
Connector Color	GRAY



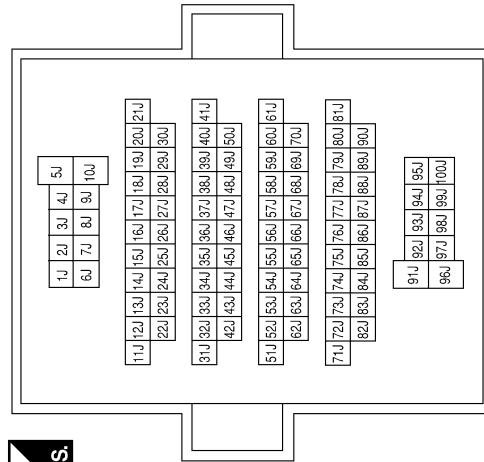
Terminal No.	Color of Wire	Signal Name
22	P	CAN-L
24	L	CAN-H
39	L	CAN-H
40	P	CAN-L

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



Terminal No.	Color of Wire	Signal Name
14	P	CAN-L
26	L	CAN-H

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



Terminal No.	Color of Wire	Signal Name
61J	L	-
62J	L	-

AWD SYSTEM

< WIRING DIAGRAM >

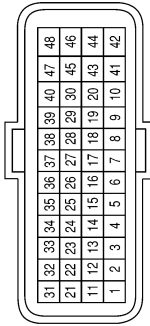
[TRANSFER: TY21C]

Connector No.	C12
Connector Name	AWD SOLENOID
Connector Color	BLACK



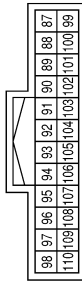
Terminal No.	Color of Wire	Signal Name
1	Y	-
2	SB	-

Connector No.	F75
Connector Name	TCM (TRANSMISSION CONTROL MODULE)
Connector Color	BLACK



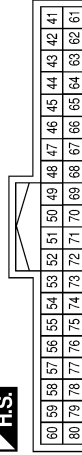
Terminal No.	Color of Wire	Signal Name
23	P	CAN-L
33	L	CAN-H

Connector No.	F42
Connector Name	IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)
Connector Color	BLACK



Terminal No.	Color of Wire	Signal Name
87	L	CAN-H
88	P	CAN-L

Connector No.	B16
Connector Name	BCM (BODY CONTROL MODULE)
Connector Color	GREEN



Terminal No.	Color of Wire	Signal Name
60	L	CAN-H
80	P	CAN-L

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



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

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



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

AADIA0646GB

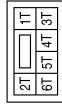
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AWD SYSTEM

< WIRING DIAGRAM >

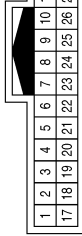
[TRANSFER: TY21C]

Connector No.	B29
Connector Name	FUSE BLOCK (J/B)
Connector Color	WHITE



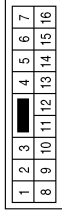
Terminal No.	Color of Wire	Signal Name
6T	LAVL	-

Connector No.	B41
Connector Name	WIRE TO WIRE
Connector Color	WHITE



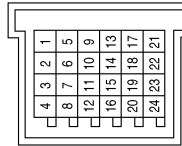
Terminal No.	Color of Wire	Signal Name
3	LA/R	-
6	Y	-
24	P	-
25	L	-

Connector No.	B42
Connector Name	WIRE TO WIRE
Connector Color	WHITE



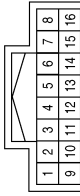
Terminal No.	Color of Wire	Signal Name
4	LA/G	-

Connector No.	B63
Connector Name	JOINT CONNECTOR-B01
Connector Color	GRAY



Terminal No.	Color of Wire	Signal Name
3	P	-
4	L	-
7	P	-
8	L	-
11	P	-
12	L	-

Connector No.	B75
Connector Name	AWD CONTROL MODULE
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
1	SB	AWD SOL (+)
2	Y	AWD SOL (-)
3	-	-
4	-	-
5	V	AUTO

Terminal No.	Color of Wire	Signal Name
6	-	-
7	LA/R	IGN
8	L	CAN-H
9	LA/G	SOL BATT
10	B	GND
11	B	GND
12	GR	2WD
13	-	-
14	Y	LOCK SWITCH
15	LA/L	VB
16	P	CAN-L

BASIC INSPECTION

DIAGNOSIS AND REPAIR WORK FLOW

Work Flow

INFOID:000000009991741

DETAILED FLOW

1. INTERVIEW FROM THE CUSTOMER

Clarify customer complaints before inspection. First of all, perform an interview utilizing [DLN-32, "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-22, "Protection Function"](#).

CAUTION:

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

>> GO TO 3.

3. PERFORM SELF-DIAGNOSIS

 **With CONSULT**

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

Is any DTC detected?

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

4. RECHECK SYMPTOM

 **With CONSULT**

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

NOTE:

If some DTCs are detected at the same time, determine the order for performing the diagnosis based on [DLN-22, "DTC Inspection Priority Chart"](#).

Is any DTC detected?

- YES >> GO TO 5.
- NO >> Check harness and connectors based on the information obtained by interview. Refer to [GI-41, "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?

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DIAGNOSIS AND REPAIR WORK FLOW

< BASIC INSPECTION >

[TRANSFER: TY21C]

YES >> GO TO 7.

NO >> Check harness and connectors based on the information obtained by interview. Refer to [GI-41](#), "[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:000000009991742

Description

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

Interview sheet sample

Interview sheet								
Customer name		MR/MS	Registration number		Initial year registration			
			Vehicle type		VIN			
Storage date			Engine		Mileage km (Mile)			
Symptom			<input type="checkbox"/> Vehicle does not enter AWD mode.					
			<input type="checkbox"/> AWD warning (AWD Error) 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: TY21C]

Interview sheet

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

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ADDITIONAL SERVICE WHEN REPLACING AWD CONTROL UNIT

< BASIC INSPECTION >

[TRANSFER: TY21C]

ADDITIONAL SERVICE WHEN REPLACING AWD CONTROL UNIT

Description

INFOID:000000009991743

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

Work Procedure

INFOID:000000009991744

1. PERFORM WRITING UNIT CHARACTERISTICS

Perform writing unit characteristics of electric controlled coupling.

>> Refer to [DLN-35. "Work Procedure"](#).

UNIT CHARACTERISTICS WRITING

Description

INFOID:000000009991745

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:000000009991746

1. UNIT CHARACTERISTICS WRITING

Ⓜ With CONSULT

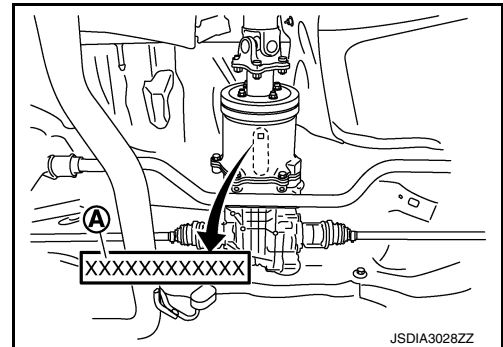
1. Confirm the unit characteristics Ⓐ of electric controlled coupling.

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



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DTC/CIRCUIT DIAGNOSIS

C1201 AWD CONTROL UNIT

DTC Description

INFOID:000000009991747

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition
C1201	CONTROLLER FAILURE (Control unit failure)	Malfunction has occurred inside AWD control unit.

POSSIBLE CAUSE

Internal malfunction of AWD control unit

FAIL-SAFE

AWD control changes to front-wheel drive immediately, then AWD control stops, and the vehicle becomes front-wheel drive.

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. DTC REPRODUCTION PROCEDURE

Ⓟ 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 diagnosis procedure. Refer to [DLN-36, "Diagnosis Procedure"](#).
- NO-1 >> To check malfunction symptom before repair: Refer to [GI-41, "Intermittent Incident"](#).
- NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:000000009991748

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: TY21C]

C1203 ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

DTC Description

INFOID:000000009991749

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition
C1203	ABS SYSTEM (ABS system)	Malfunction related to wheel sensor has been detected by ABS actuator and electric unit (control unit).

POSSIBLE CAUSE

ABS malfunction

- Vehicle speed signal error

FAIL-SAFE

AWD control changes to front-wheel drive gradually (rear-wheels still have some driving torque), then AWD control stops, and the vehicle becomes front-wheel drive.

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. DTC REPRODUCTION PROCEDURE

With CONSULT

1. 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 diagnosis procedure. Refer to [DLN-37, "Diagnosis Procedure"](#).
- NO-1 >> To check malfunction symptom before repair: Refer to [GI-41, "Intermittent Incident"](#).
- NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:000000009991750

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-55, "DTC Index"](#).
- NO >> GO TO 2.

2. 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: TY21C]

C1204 AWD SOLENOID

DTC Description

INFOID:000000009991751

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition
C1204	4WD SOLENOID (4WD solenoid)	Malfunction related to AWD solenoid has been detected.

POSSIBLE CAUSE

- Internal malfunction of electronic controlled coupling
- Malfunction of AWD solenoid power supply circuit (open or short)
- Malfunction of AWD solenoid command current

FAIL-SAFE

AWD control changes to front-wheel drive immediately, then AWD control stops, and the vehicle becomes front-wheel drive.

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. DTC REPRODUCTION PROCEDURE

Ⓟ With CONSULT

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

Is DTC "C1204" detected?

- YES >> Proceed to diagnosis procedure. Refer to [DLN-38, "Diagnosis Procedure"](#).
 NO-1 >> To check malfunction symptom before repair: Refer to [GI-41, "Intermittent Incident"](#).
 NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:000000009991752

1. CHECK AWD SOLENOID 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
Connector	Terminal		
B75	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		
B75	9	Ground	Battery voltage

Is the inspection result normal?

C1204 AWD SOLENOID

[TRANSFER: TY21C]

< DTC/CIRCUIT DIAGNOSIS >

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

2.CHECK AWD SOLENOID POWER SUPPLY (2)

1. Turn the ignition switch OFF.
2. Check the 10A fuse (#16).
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	
B75	9	M68	15R	Existed

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

AWD control unit		—	Continuity
Connector	Terminal		
B75	9	Ground	Not existed

Is the inspection result normal?

- YES >> Perform the trouble diagnosis for power supply circuit. Refer to [PG-4, "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		
B75	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		
B75	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	
B75	1	C12	2	Existed
	2		1	

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C1204 AWD SOLENOID

< DTC/CIRCUIT DIAGNOSIS >

[TRANSFER: TY21C]

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

AWD control unit		—	Continuity
Connector	Terminal		
B75	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-40, "Component Inspection"](#).

Is the inspection result normal?

YES >> GO TO 7.

NO >> AWD solenoid is malfunctioning. Replace electric controlled coupling. Refer to [DLN-114, "Removal and Installation"](#).

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:000000009991753

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-114, "Removal and Installation"](#).

C1209 MODE SW

DTC Description

INFOID:000000010336730

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition
C1209	MODE SW (Mode switch)	More than two switch inputs are simultaneously detected due to short circuit of AWD lock switch.

POSSIBLE CAUSE

Malfunction of AWD lock switch or AWD lock switch circuit.

FAIL-SAFE

AWD control changes to front-wheel drive immediately, then AWD control stops, and the vehicle becomes front-wheel drive.

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. DTC REPRODUCTION PROCEDURE

 With CONSULT

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

Is DTC "C1209" detected?

- YES >> Proceed to diagnosis procedure. Refer to [DLN-41, "Diagnosis Procedure"](#).
- NO-1 >> To check malfunction symptom before repair: Refer to [GI-41, "Intermittent Incident"](#).
- NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:000000010336731

1. CHECK AWD LOCK SWITCH

Check AWD lock switch. Refer to [DLN-42, "Component Inspection"](#).

Is the inspection result normal?

- YES >> GO TO 2.
- NO >> Replace AWD lock switch. Refer to [DLN-68, "Removal and Installation"](#).

2. CHECK AWD LOCK SWITCH CIRCUIT (1)

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

AWD lock switch		—	Continuity
Connector	Terminal		
M252	6	Ground	Existed

Is the inspection result normal?

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

3. CHECK AWD LOCK SWITCH CIRCUIT (2)

- Disconnect AWD control unit harness connector.
- Check the continuity between AWD control unit harness connector and AWD lock switch harness connector.

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AWD control unit		AWD lock switch		Continuity
Connector	Terminal	Connector	Terminal	
B75	14	M252	9	Existed

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

AWD control unit		—	Continuity
Connector	Terminal		
B75	14	Ground	Not existed

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair or replace damaged parts.

4. CHECK AWD CONTROL UNIT OUTPUT SIGNAL

1. Connect AWD control unit harness connector.

2. Turn the ignition switch ON.

CAUTION:

Never start the engine.

3. Check the voltage between AWD lock switch harness connector and ground.

AWD lock switch		—	Voltage (Approx.)
Connector	Terminal		
M252	9	Ground	Battery voltage

Is the inspection result normal?

YES >> Check each harness connector pin terminal for disconnection.

NO >> Replace AWD control unit. Refer to [DLN-67, "Removal and Installation"](#).

Component Inspection

INFOID:000000010336732

1. CHECK AWD LOCK SWITCH

1. Turn the ignition switch OFF.

2. Remove AWD lock switch.

3. Check the continuity between AWD lock switch connector terminals.

AWD lock switch		Condition	Continuity
Terminal			
6	9	When releasing AWD lock switch.	Not existed
		When AWD lock switch is hold pressed.	Existed

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace AWD lock switch. Refer to [DLN-68, "Removal and Installation"](#).

C1210 ECM

DTC Description

INFOID:000000009991756

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition
C1210	ENGINE SIGNAL 1 (Engine signal 1)	Malfunction related to engine signal has been detected.

POSSIBLE CAUSE

Malfunction of engine control system

FAIL-SAFE

AWD control changes to front-wheel drive gradually (rear-wheels still have some driving torque), then AWD control stops, and the vehicle becomes front-wheel drive.

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. DTC REPRODUCTION PROCEDURE

 With CONSULT

1. Drive the vehicle for a while.
2. Perform self-diagnosis for "ALL MODE AWD/4WD".

Is DTC "C1210" detected?

- YES >> Proceed to diagnosis procedure. Refer to [DLN-43, "Diagnosis Procedure"](#).
- NO-1 >> To check malfunction symptom before repair: Refer to [GI-41, "Intermittent Incident"](#).
- NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:000000009991757

1. PERFORM ECM SELF-DIAGNOSIS

 With CONSULT

Perform self-diagnosis for "ENGINE".

Is any DTC detected?

- YES >> Check the DTC. Refer to [EC-93, "DTC Index"](#).
- NO >> GO TO 2.

2. 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.

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P1804 AWD CONTROL UNIT

< DTC/CIRCUIT DIAGNOSIS >

[TRANSFER: TY21C]

P1804 AWD CONTROL UNIT

DTC Description

INFOID:000000009991758

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition
P1804	CONTROL UNIT (Control unit)	Malfunction is detected in the memory (EEPROM) system of AWD control unit.

POSSIBLE CAUSE

Internal malfunction of AWD control unit.

FAIL-SAFE

AWD control changes to front-wheel drive immediately, then AWD control stops, and the vehicle becomes front-wheel drive.

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. DTC REPRODUCTION PROCEDURE

With CONSULT

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

Is DTC "P1804" detected?

- YES >> Proceed to diagnosis procedure. Refer to [DLN-44, "Diagnosis Procedure"](#).
NO-1 >> To check malfunction symptom before repair: Refer to [GI-41, "Intermittent Incident"](#).
NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:000000009991759

1. REPLACE AWD CONTROL UNIT

CAUTION:

Replace AWD control unit when DTC "P1804" is detected simultaneously with other items.

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

P1808 WHEEL SPEED SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[TRANSFER: TY21C]

P1808 WHEEL SPEED SENSOR

DTC Description

INFOID:000000010336733

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition
P1808	VHCL SPEED SEN-ABS (Vehicle speed sensor-ABS)	<ul style="list-style-type: none">Malfunction is detected in vehicle speed signal that is output from ABS actuator and electric unit (control unit) through CAN communication.Improper signal is input while driving.

POSSIBLE CAUSE

- ABS malfunction
- Internal malfunction of AWD control unit

FAIL-SAFE

AWD control changes to front-wheel drive gradually (rear-wheels still have some driving torque), then AWD control stops, and the vehicle becomes front-wheel drive.

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. DTC REPRODUCTION PROCEDURE

With CONSULT

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

Is DTC "P1808" detected?

- YES >> Proceed to diagnosis procedure. Refer to [DLN-45. "Diagnosis Procedure"](#).
NO-1 >> To check malfunction symptom before repair: Refer to [Gl-41. "Intermittent Incident"](#).
NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:000000010336734

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-55. "DTC Index"](#).
NO >> GO TO 2.

2. 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 "P1808" is detected, Replace AWD control unit. Refer to [DLN-67. "Removal and Installation"](#).
NO >> Repair or replace error-detected parts.

P1809 AWD CONTROL UNIT

< DTC/CIRCUIT DIAGNOSIS >

[TRANSFER: TY21C]

P1809 AWD CONTROL UNIT

DTC Description

INFOID:000000010337095

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition
P1809	CONTROL UNIT (Control unit)	AD converter system of AWD control unit is malfunctioning.

POSSIBLE CAUSE

Internal malfunction of AWD control unit

FAIL-SAFE

AWD control changes to front-wheel drive immediately, then AWD control stops, and the vehicle becomes front-wheel drive.

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. DTC REPRODUCTION PROCEDURE

With CONSULT

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

Is DTC "P1809" detected?

- YES >> Proceed to diagnosis procedure. Refer to [DLN-46, "Diagnosis Procedure"](#).
NO-1 >> To check malfunction symptom before repair: Refer to [GI-41, "Intermittent Incident"](#).
NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:000000010337096

1. REPLACE AWD CONTROL UNIT

CAUTION:

Replace AWD control unit when DTC "P1809" is detected simultaneously with other items.

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

P1811 BATTERY VOLTAGE

< DTC/CIRCUIT DIAGNOSIS >

[TRANSFER: TY21C]

P1811 BATTERY VOLTAGE

DTC Description

INFOID:000000010336735

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition
P1811	BATTERY VOLTAGE (Battery voltage)	When engine is running and AWD control unit power supply is less than 9 V or higher than 16 V.

POSSIBLE CAUSE

- Malfunction of AWD control unit power supply circuit (open or short)
- Battery power supply
- Ignition power supply
- Internal malfunction of AWD control unit

FAIL-SAFE

AWD control changes to front-wheel drive immediately, then AWD control stops, and the vehicle becomes front-wheel drive.

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. DTC REPRODUCTION PROCEDURE

With CONSULT

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

Is DTC "P1811" detected?

- YES >> Proceed to diagnosis procedure. Refer to [DLN-47, "Diagnosis Procedure"](#).
- NO-1 >> To check malfunction symptom before repair: Refer to [GI-41, "Intermittent Incident"](#).
- NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:000000010336736

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		
B75	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		
B75	7	Ground	Battery voltage

P1811 BATTERY VOLTAGE

[TRANSFER: TY21C]

< DTC/CIRCUIT DIAGNOSIS >

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 (#30).
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	
B75	7	M44	7P	Existed

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

AWD control unit		—	Continuity
Connector	Terminal		
B75	7	Ground	Not existed

Is the inspection result normal?

- YES >> Perform the trouble diagnosis for ignition power supply circuit. Refer to [PG-15, "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 (Approx.)
Connector	Terminal		
B75	15	Ground	Battery voltage

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

AWD control unit		—	Voltage
Connector	Terminal		
B75	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 5A fuse (#9).
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	
B75	15	B29	6T	Existed

P1811 BATTERY VOLTAGE

< DTC/CIRCUIT DIAGNOSIS >

[TRANSFER: TY21C]

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

AWD control unit		—	Continuity
Connector	Terminal		
B75	15	Ground	Not existed

Is the inspection result normal?

YES >> Perform the trouble diagnosis for power supply circuit. Refer to [PG-4, "Wiring Diagram — Battery Power Supply —"](#).

NO >> Repair or replace error-detected parts.

5.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		
B75	10	Ground	Existed
	11		

Is the inspection result normal?

YES >> GO TO 6.

NO >> Repair or replace error-detected parts.

6.CHECK TERMINALS AND HARNESS CONNECTORS

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

Is the inspection result normal?

YES >> After turning the ignition switch OFF, perform DTC confirmation procedure again. When DTC "P1811" is detected, Replace AWD control unit. Refer to [DLN-67, "Removal and Installation"](#).

NO >> Repair or replace error-detected parts.

P181B INCOMPLETE SELF SHUT

< DTC/CIRCUIT DIAGNOSIS >

[TRANSFER: TY21C]

P181B INCOMPLETE SELF SHUT

DTC Description

INFOID:000000010336737

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition
P181B	INCOMP SELF SHUT (Incomplete self shut)	When ignition switch is ON, self-shut of AWD control unit was incomplete.

POSSIBLE CAUSE

- Malfunction of AWD control unit power supply circuit (open or short)
- Battery power supply
- Ignition power supply
- Internal malfunction of AWD control unit

FAIL-SAFE

No impact to vehicle behavior.

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. DTC REPRODUCTION PROCEDURE

Ⓟ With CONSULT

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

Is DTC "P181B" detected?

- YES >> Proceed to diagnosis procedure. Refer to [DLN-50, "Diagnosis Procedure"](#).
NO-1 >> To check malfunction symptom before repair: Refer to [GI-41, "Intermittent Incident"](#).
NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:000000010336738

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		
B75	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		
B75	7	Ground	Battery voltage

Is the inspection result normal?

P181B INCOMPLETE SELF SHUT

< DTC/CIRCUIT DIAGNOSIS >

[TRANSFER: TY21C]

- 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 (#30).
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	
B75	7	M44	7P	Existed

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

AWD control unit		—	Continuity
Connector	Terminal		
B75	7	Ground	Not existed

Is the inspection result normal?

- YES >> Perform the trouble diagnosis for ignition power supply circuit. Refer to [PG-15, "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 (Approx.)
Connector	Terminal		
B75	15	Ground	Battery voltage

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

AWD control unit		—	Voltage
Connector	Terminal		
B75	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 5A fuse (#9).
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	
B75	15	B29	6T	Existed

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

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P181B INCOMPLETE SELF SHUT

< DTC/CIRCUIT DIAGNOSIS >

[TRANSFER: TY21C]

AWD control unit		—	Continuity
Connector	Terminal		
B75	15	Ground	Not existed

Is the inspection result normal?

YES >> Perform the trouble diagnosis for power supply circuit. Refer to [PG-4, "Wiring Diagram — Battery Power Supply —"](#).

NO >> Repair or replace error-detected parts.

5. 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		
B75	10	Ground	Existed
	11		

Is the inspection result normal?

YES >> GO TO 6.

NO >> Repair or replace error-detected parts.

6. CHECK TERMINALS AND HARNESS CONNECTORS

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

Is the inspection result normal?

YES >> After turning the ignition switch OFF, perform DTC confirmation procedure again. When DTC "P181B" is detected, Replace AWD control unit. Refer to [DLN-67, "Removal and Installation"](#).

NO >> Repair or replace error-detected parts.

P181D ENGINE TORQUE SIGNAL

< DTC/CIRCUIT DIAGNOSIS >

[TRANSFER: TY21C]

P181D ENGINE TORQUE SIGNAL

DTC Description

INFOID:000000010336739

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition
P181D	ENGINE SYSTEM (Engine system)	Malfunction related to engine signal has been detected.

POSSIBLE CAUSE

- Malfunction of engine control system
- Internal malfunction of AWD control unit

FAIL-SAFE

AWD control changes to front-wheel drive gradually (rear-wheels still have some driving torque), then AWD control stops, and the vehicle becomes front-wheel drive.

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. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Drive the vehicle for a while.
2. Stop the vehicle.
3. Perform self-diagnosis for "ALL MODE AWD/4WD".

Is DTC "P181D" detected?

- YES >> Proceed to diagnosis procedure. Refer to [DLN-53, "Diagnosis Procedure"](#).
NO-1 >> To check malfunction symptom before repair: Refer to [GI-41, "Intermittent Incident"](#).
NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:000000010336740

1. PERFORM ECM SELF-DIAGNOSIS

With CONSULT

Perform self-diagnosis for "ENGINE".

Is any DTC detected?

- YES >> Check the DTC. Refer to [EC-93, "DTC Index"](#).
NO >> GO TO 2.

2. 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 "P181D" is detected, Replace AWD control unit. Refer to [DLN-67, "Removal and Installation"](#).
NO >> Repair or replace error-detected parts.

P181F INCOMPLETE CALIBRATION

< DTC/CIRCUIT DIAGNOSIS >

[TRANSFER: TY21C]

P181F INCOMPLETE CALIBRATION

DTC Description

INFOID:000000009991760

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition
P181F	INCOMP CALIBRATION (incomplete calibration)	When incomplete writing unit characteristics of electric controlled coupling are detected.

POSSIBLE CAUSE

Writing unit characteristics are incomplete.

FAIL-SAFE

AWD control changes to front-wheel drive immediately, then AWD control stops, and the vehicle becomes front-wheel drive.

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. DTC REPRODUCTION PROCEDURE

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 diagnosis procedure. Refer to [DLN-54, "Diagnosis Procedure"](#).
NO-1 >> To check malfunction symptom before repair: Refer to [GI-41, "Intermittent Incident"](#).
NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:000000009991761

1. PERFORM WRITING UNIT CHARACTERISTICS

1. Erase self-diagnostic result for "ALL MODE AWD/4WD".
2. Perform writing unit characteristics. Refer to [DLN-35, "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-23, "DTC Index"](#).
NO >> GO TO 2.

2. PERFORM SELF-DIAGNOSIS AGAIN

With CONSULT

Perform "DTC CONFIRMATION PROCEDURE" (self-diagnosis) again. Refer to [DLN-54, "DTC Description"](#).

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: TY21C]

U1000 CAN COMM CIRCUIT

DTC Description

INFOID:000000010336782

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 DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition
U1000	CAN COMM CIRCUIT (CAN communication circuit)	AWD control unit is not transmitting/receiving CAN communication signal for 2 seconds or more.

POSSIBLE CAUSE

- CAN communication error
- Internal malfunction of AWD control unit

FAIL-SAFE

AWD control changes to front-wheel drive gradually (rear-wheels still have some driving torque), then AWD control stops, and the vehicle becomes front-wheel drive.

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. DTC REPRODUCTION PROCEDURE

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 diagnosis procedure. Refer to [DLN-55, "Diagnosis Procedure"](#).
- NO-1 >> To check malfunction symptom before repair: Refer to [GI-41, "Intermittent Incident"](#).
- NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:000000010336783

Proceed to [LAN-17, "Trouble Diagnosis Flow Chart"](#).

U1010 CONTROL UNIT (CAN)

< DTC/CIRCUIT DIAGNOSIS >

[TRANSFER: TY21C]

U1010 CONTROL UNIT (CAN)

DTC Description

INFOID:000000010336784

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 DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition
U1010	CONTROL UNIT (CAN) [Control unit (CAN)]	Detecting error during the initial diagnosis of CAN controller of AWD control unit.

POSSIBLE CAUSE

Internal malfunction of AWD control unit

FAIL-SAFE

AWD control changes to front-wheel drive gradually (rear-wheels still have some driving torque), then AWD control stops, and the vehicle becomes front-wheel drive.

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. DTC REPRODUCTION PROCEDURE

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 diagnosis procedure. Refer to [DLN-56, "Diagnosis Procedure"](#).
NO-1 >> To check malfunction symptom before repair: Refer to [GI-41, "Intermittent Incident"](#).
NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:000000010336785

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: TY21C]

POWER SUPPLY AND GROUND CIRCUIT

Diagnosis Procedure

INFOID:000000009991768

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		
B75	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		
B75	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 (#30).
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	
B75	7	M44	7P	Existed

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

AWD control unit		—	Continuity
Connector	Terminal		
B75	7	Ground	Not existed

Is the inspection result normal?

- YES >> Perform the trouble diagnosis for ignition power supply circuit. Refer to [PG-15, "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 (Approx.)
Connector	Terminal		
B75	15	Ground	Battery voltage

3. Turn the ignition switch ON.

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POWER SUPPLY AND GROUND CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

[TRANSFER: TY21C]

CAUTION:

Never start the engine.

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

AWD control unit		—	Voltage
Connector	Terminal		
B75	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 5A fuse (#9).
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	
B75	15	B29	6T	Existed

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

AWD control unit		—	Continuity
Connector	Terminal		
B75	15	Ground	Not existed

Is the inspection result normal?

YES >> Perform the trouble diagnosis for power supply circuit. Refer to [PG-4. "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. Check the voltage between AWD control unit harness connector and ground.

AWD control unit		—	Voltage
Connector	Terminal		
B75	9	Ground	Battery voltage

3. Turn the ignition switch ON.

CAUTION:

Never start the engine.

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

AWD control unit		—	Voltage
Connector	Terminal		
B75	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

< DTC/CIRCUIT DIAGNOSIS >

[TRANSFER: TY21C]

2. Check the 10A fuse (#16).
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	
B75	9	M68	15R	Existed

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

AWD control unit		—	Continuity
Connector	Terminal		
B75	9	Ground	Not existed

Is the inspection result normal?

YES >> Perform the trouble diagnosis for power supply circuit. Refer to [PG-4, "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		
B75	10	Ground	Existed
	11		

Is the inspection result normal?

YES >> INSPECTION END

NO >> Repair or replace error-detected parts.

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HEAVY TIGHT-CORNER BRAKING SYMPTOM OCCURS

< SYMPTOM DIAGNOSIS >

[TRANSFER: TY21C]

SYMPTOM DIAGNOSIS

HEAVY TIGHT-CORNER BRAKING SYMPTOM OCCURS

Description

INFOID:000000009991772

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:000000009991773

1. PERFORM ECM SELF-DIAGNOSIS

With CONSULT

Perform self-diagnosis for "ENGINE".

Is any DTC detected?

- YES >> Check the DTC. Refer to [EC-93, "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 [DLN-55, "Diagnosis Procedure"](#).
- NO >> GO TO 3.

3. CHECK AWD SOLENOID

Perform the trouble diagnosis of the AWD solenoid. Refer to [DLN-38, "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-114, "Removal and Installation"](#).
- NO >> Check each harness connector pin terminal for disconnection.

VEHICLE DOES NOT ENTER AWD MODE

< SYMPTOM DIAGNOSIS >

[TRANSFER: TY21C]

VEHICLE DOES NOT ENTER AWD MODE

Description

INFOID:000000009991774

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

Diagnosis Procedure

INFOID:000000009991775

1. CHECK INFORMATION DISPLAY (COMBINATION METER)

Perform the trouble diagnosis of combination meter. Refer to [MWI-52, "Work flow"](#).

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 "PARKING BRAKE SW SIG" of CONSULT "DATA MONITOR" for "ALL MODE AWD/4WD".

Monitor Item	Condition	Status
PARKING BRAKE SW SIG	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-115, "Component Function Check"](#).

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-114, "Removal and Installation"](#).

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

AWD HIGH TEMP IS DISPLAYED ON INFORMATION DISPLAY

< SYMPTOM DIAGNOSIS >

[TRANSFER: TY21C]

AWD HIGH TEMP IS DISPLAYED ON INFORMATION DISPLAY

Description

INFOID:000000009991776

While driving, AWD warning (AWD High Temp. Stop vehicle) is displayed on information display (combination meter).

- 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 AWD warning (AWD High Temp. Stop vehicle) is displayed. Both cases are not malfunction. Refer to [DLN-22, "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: TY21C]

TIRE SIZE INCORRECT IS DISPLAYED ON INFORMATION DISPLAY

Description

INFOID:000000009991777

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

Diagnosis Procedure

INFOID:000000009991778

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: TY21C]

NOISE, VIBRATION AND HARSHNESS (NVH) TROUBLESHOOTING

NVH Troubleshooting Chart

INFOID:000000009991779

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

Reference		DLN-65, "Inspection"		—		DLN-72, "Exploded View"		DLN-72, "Exploded View"		DLN-79, "Inspection", DLN-88, "Inspection"		DLN-79, "Inspection", DLN-88, "Inspection"
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)				
Symptom	Noise	1	2				3	3				3
	Transfer oil leakage		3	1	2	2	2					

PERIODIC MAINTENANCE

TRANSFER OIL

Inspection

INFOID:000000009991780

TRANSFER OIL LEAKS

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

TRANSFER OIL LEVEL

CAUTION:

Do not start engine while checking transfer oil level.

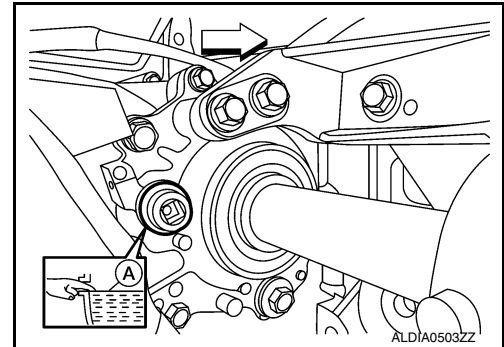
1. Remove filler plug (1) and gasket.

← : Front

2. Transfer oil level (A) should be level with bottom of filler plug hole. Add transfer oil if necessary. Refer to [MA-11, "Fluids and Lubricants"](#).
3. Set a new gasket onto filler plug, and install it in the transfer and tighten to specified torque. Refer to [DLN-89, "Exploded View"](#).

CAUTION:

Do not reuse gasket.



INFOID:000000009991781

Draining

CAUTION:

Do not start engine while working.

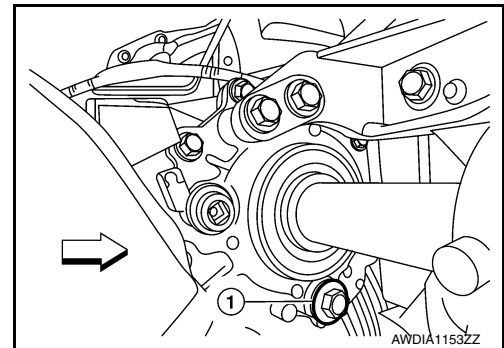
1. Run the vehicle to warm up the transfer unit sufficiently.
2. Stop the engine and remove drain plug (1) and gasket and drain the transfer oil.

← : Front

3. Set a new gasket onto drain plug, and install it in the transfer and tighten to specified torque. Refer to [DLN-89, "Exploded View"](#).

CAUTION:

Do not reuse gasket.



INFOID:000000009991782

Refilling

CAUTION:

Do not start engine while checking transfer oil level.

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

← : Front

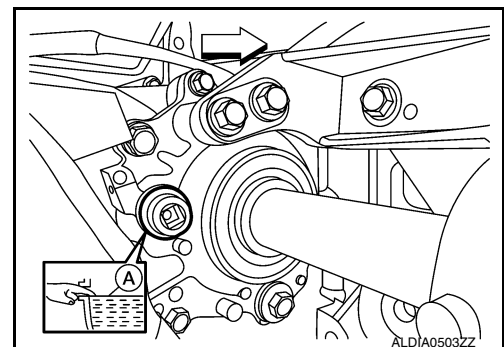
Transfer oil grade and viscosity

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

Transfer oil capacity

: Refer to [DLN-93, "General Specifications"](#).

3. Set a new gasket onto filler plug, and install it in the transfer and tighten to specified torque. Refer to [DLN-89, "Exploded View"](#).



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TRANSFER OIL

< PERIODIC MAINTENANCE >

[TRANSFER: TY21C]

CAUTION:
Do not reuse gasket.

AWD CONTROL UNIT

< REMOVAL AND INSTALLATION >

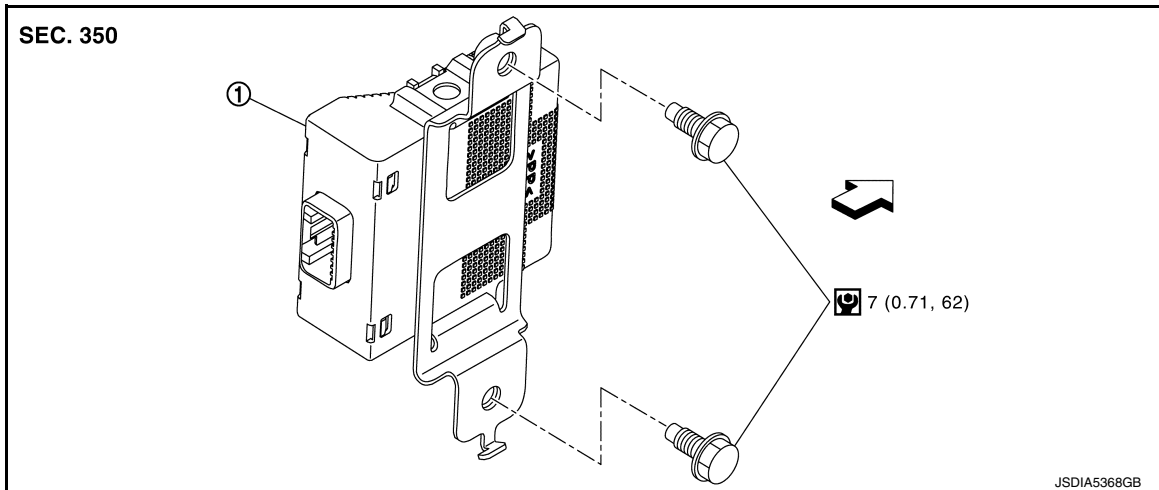
[TRANSFER: TY21C]

REMOVAL AND INSTALLATION

AWD CONTROL UNIT

Exploded View

INFOID:000000009995320



① AWD control unit

↔ : Vehicle front

🔩 : N·m (kg-m, in-lb)

Removal and Installation

INFOID:000000009991783

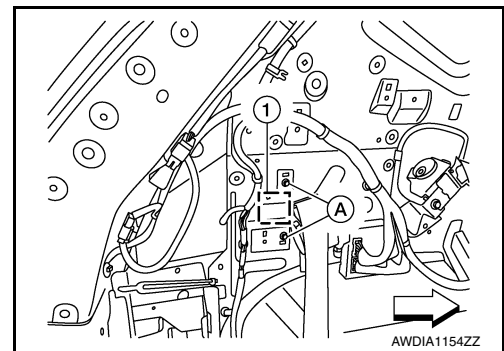
REMOVAL

1. Remove luggage side lower finisher (LH). Refer to [INT-33, "Exploded View"](#).
2. Disconnect AWD control unit harness connector.
3. Remove AWD control unit bolts (↔).

NOTE:

AWD control unit is located on the back side of body panel.

↔ : Front



4. Remove AWD control unit.

INSTALLATION

Installation is in the reverse order of removal.

CAUTION:

- Do not drop or shock AWD control unit.
- When replacing AWD control unit, perform writing unit characteristic. Refer to [DLN-35, "Work Procedure"](#).

AWD LOCK SWITCH

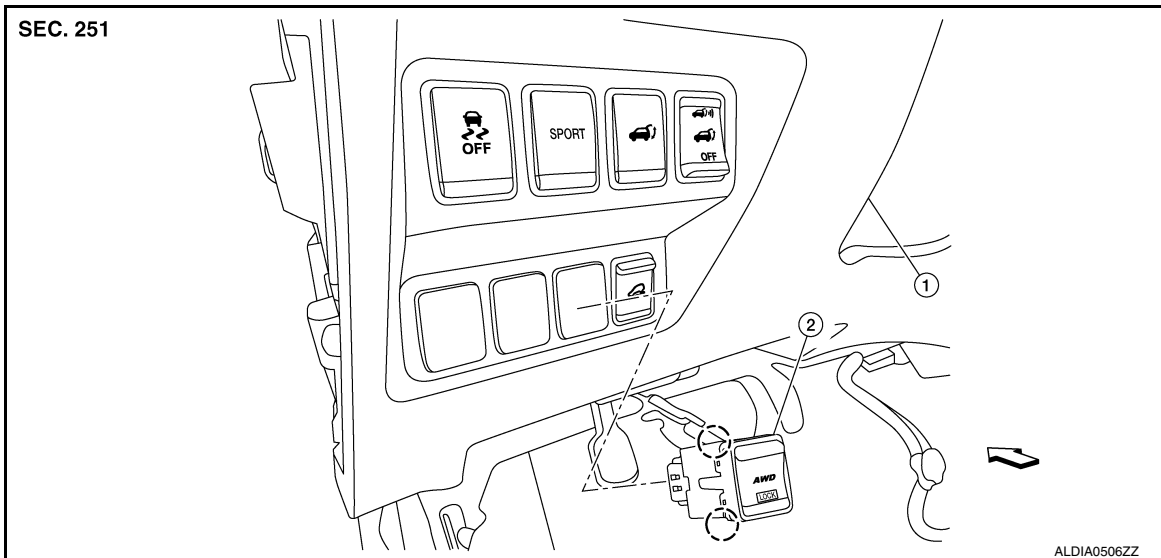
< REMOVAL AND INSTALLATION >

[TRANSFER: TY21C]

AWD LOCK SWITCH

Exploded View

INFOID:000000010297884



1. Instrument lower panel LH

2. AWD lock switch

← Front

○ : Pawl

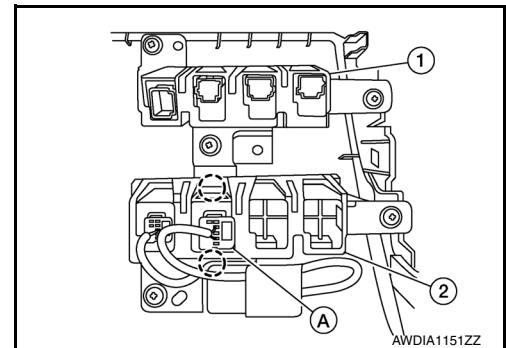
Removal and Installation

INFOID:000000010297885

REMOVAL

1. Remove instrument lower panel LH. Refer to [IP-22. "Removal and Installation"](#).
2. Disconnect AWD lock switch harness connector (A).
3. Remove AWD lock switch from lower switch bracket (2).

○ : Pawls



INSTALLATION

Install in the reverse order of removal.

TRANSFER COVER OIL SEAL

< REMOVAL AND INSTALLATION >

[TRANSFER: TY21C]

TRANSFER COVER OIL SEAL

Removal and Installation

INFOID:000000009991784

NOTE:

- Replacement on vehicle may cause damage to transfer cover, and may cause a transfer oil leak.
- If transfer cover oil seal requires replacement, remove the transfer assembly from the vehicle before replacing transfer cover oil seal. Refer to [DLN-73. "Disassembly"](#).

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TRANSFER ASSEMBLY

< UNIT REMOVAL AND INSTALLATION >

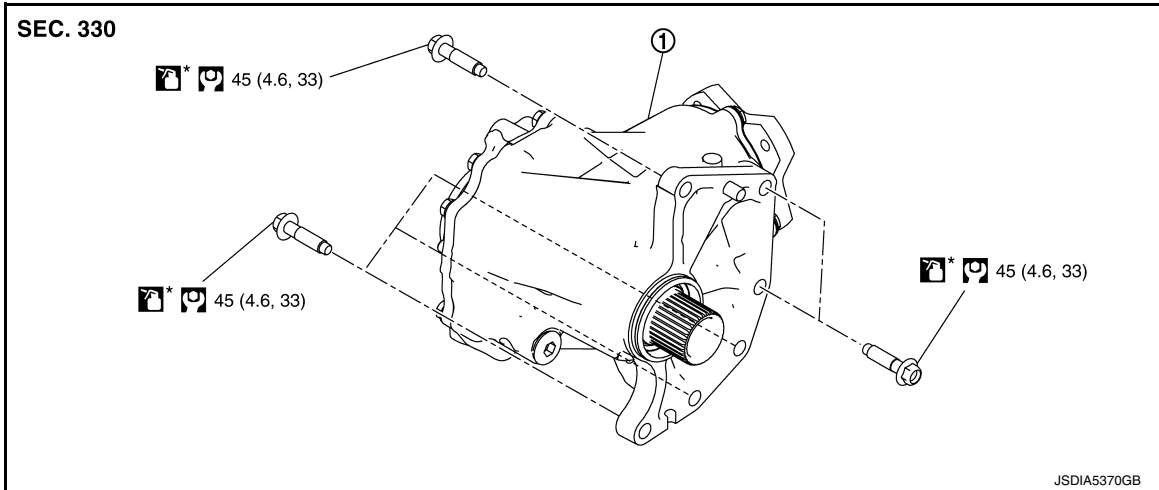
[TRANSFER: TY21C]

UNIT REMOVAL AND INSTALLATION

TRANSFER ASSEMBLY

Exploded View

INFOID:000000009991785



① Transfer assembly

: N·m (kg-m, ft-lb)

*: Apply anti-corrosion oil.

Removal and Installation

INFOID:000000009991786

NOTE:

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

REMOVAL

1. Remove front drive shaft (RH). Refer to [FAX-20, "Removal and Installation \(RH\)"](#).
2. Remove front suspension member. Refer to [FSU-20, "Removal and Installation"](#).
3. Remove front exhaust tube. Refer to [EX-5, "Exploded View"](#).
4. Remove rear propeller shaft. Refer to [DLN-99, "Removal and Installation"](#).
5. Remove transaxle assembly to transfer assembly bolts.

CAUTION:

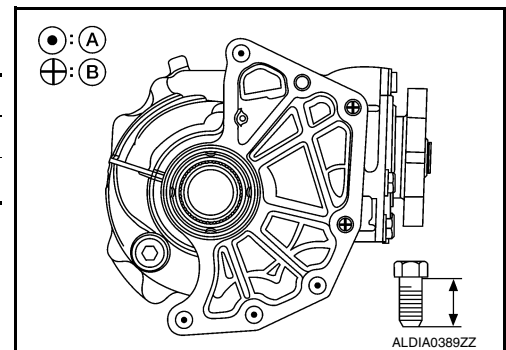
Be careful not to damage gear ring oil seal inside of CVT.

Bolt No.	(A)	(B)
Quantity	4	2
Bolt length "ℓ" mm (in)	40 (1.57)	40 (1.57)

6. 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-210, "Removal and Installation"](#).



INSTALLATION

Installation is in the reverse order of removal.

TRANSFER ASSEMBLY

< UNIT REMOVAL AND INSTALLATION >

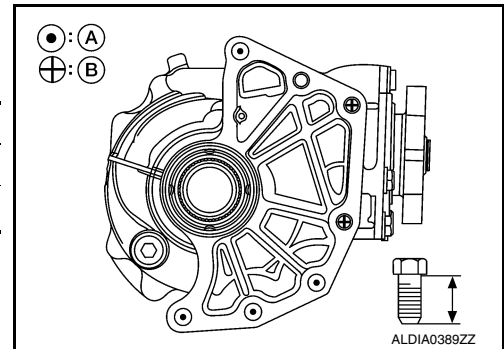
[TRANSFER: TY21C]

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

Bolt No.	(A)	(B)
Quantity	4	2
Bolt length "ℓ" mm (in)	40 (1.57)	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 transfer oil level and check for transfer oil leaks after installation. Refer to [DLN-65, "Refilling"](#).



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TRANSFER COVER

< UNIT DISASSEMBLY AND ASSEMBLY >

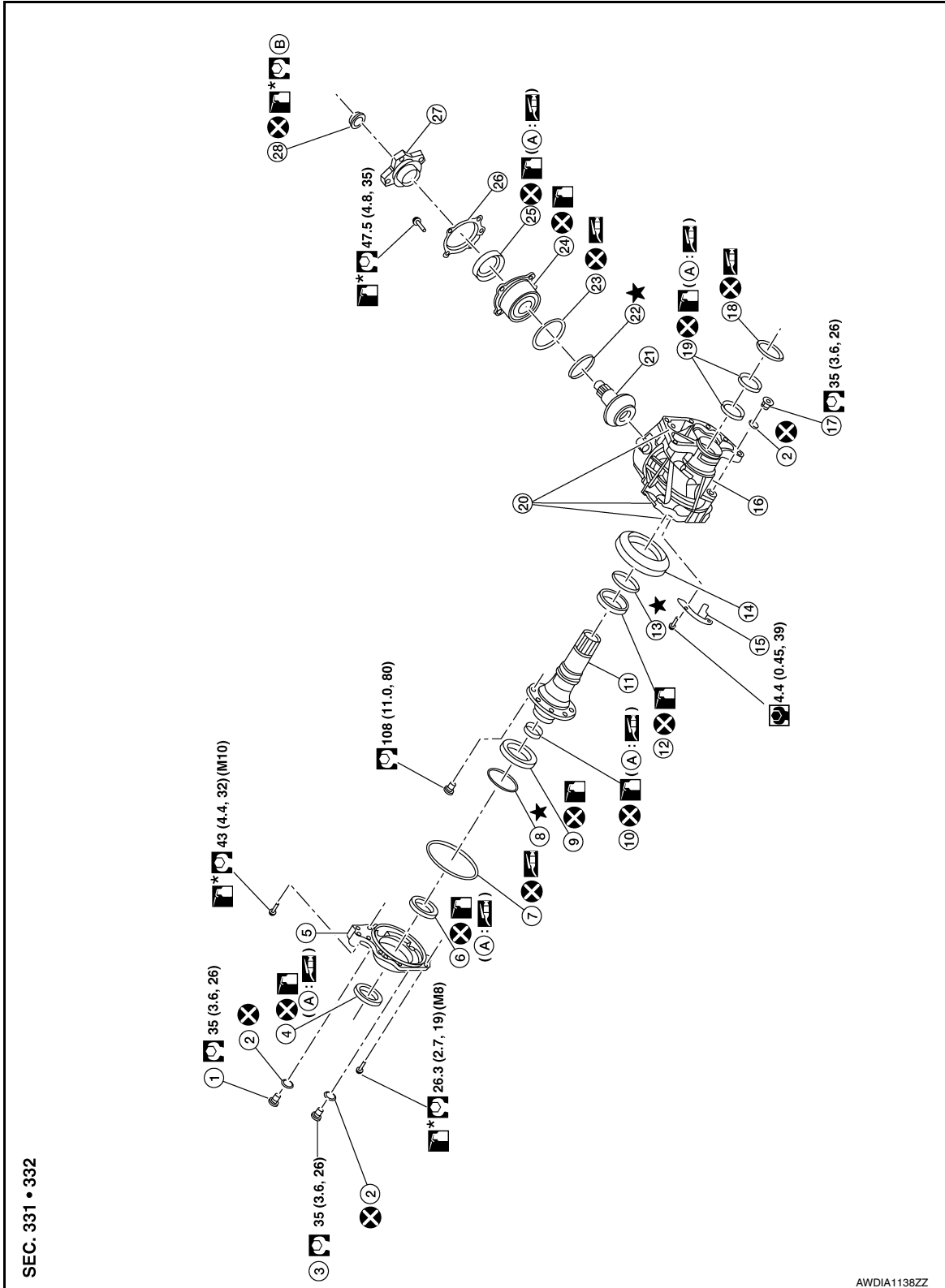
[TRANSFER: TY21C]

UNIT DISASSEMBLY AND ASSEMBLY

TRANSFER COVER

Exploded View

INFOID:000000010337336



TRANSFER COVER

< UNIT DISASSEMBLY AND ASSEMBLY >

[TRANSFER: TY21C]

- | | | | |
|---|--|--|-----|
| 1. Filler plug | 2. Gasket | 3. Drain plug | A |
| 4. Oil seal | 5. Transfer cover | 6. Oil seal | B |
| 7. O-ring | 8. Ring gear bearing adjusting shim (transfer cover side) | 9. Ring gear bearing (transfer cover side) | B |
| 10. Ring gear shaft oil seal | 11. Ring gear shaft | 12. Ring gear bearing (transfer case side) | C |
| 13. Ring gear bearing adjusting shim (transfer case side) | 14. Ring gear | 15. Baffle plate | C |
| 16. Transfer case | 17. Plug | 18. O-ring | |
| 19. Oil seal | 20. Dowel pin | 21. Drive pinion | |
| 22. Drive pinion adjusting shim | 23. O-ring | 24. Pinion bearing assembly | DLN |
| 25. Oil seal | 26. Dust cover | 27. Companion flange | |
| 28. Pinion lock nut | | | |
| A. Oil seal lip | B. Comply with the assembly procedure when tightening. Refer to DLN-83. "Assembly" . | | E |

: N·m (kg-m, in-lb)

: N·m (kg-m, ft-lb)

: Always replace after every disassembly.

: Apply gear oil.

: Apply anti-corrosive oil.

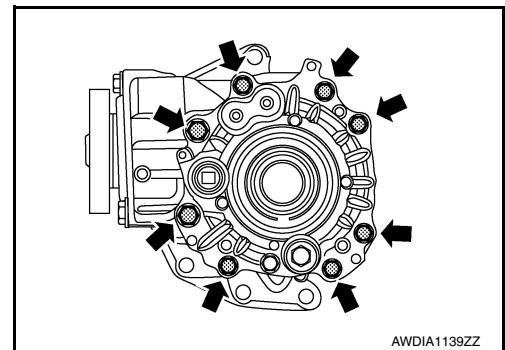
: Apply multi-purpose grease.

★: Select with proper thickness.

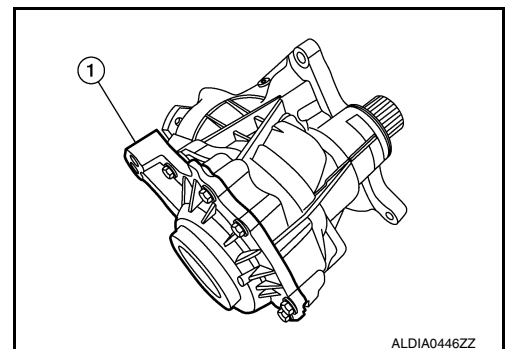
Disassembly

INFOID:000000010337337

1. Remove transfer cover mounting bolts (←).



2. Lightly tap transfer cover (1) with a plastic hammer to remove transfer cover.
3. Remove O-ring from transfer cover.
 - CAUTION:**
 - Do not use a suitable tool.
 - Do not damage transfer cover.



TRANSFER COVER

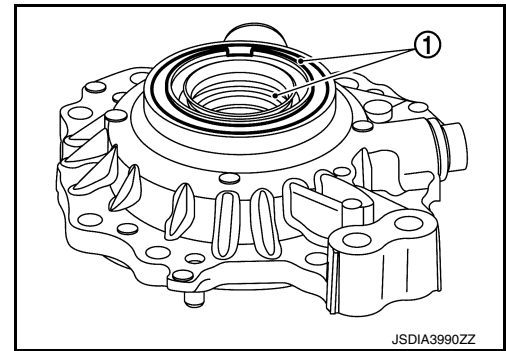
< UNIT DISASSEMBLY AND ASSEMBLY >

[TRANSFER: TY21C]

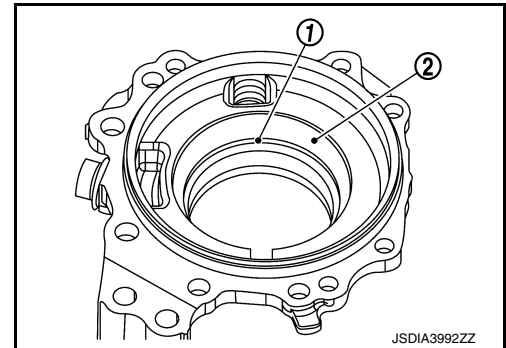
4. Lightly tap the metal part of oil seals (1) with punch from back side of transfer cover to remove oil seals.

CAUTION:

When removing, Do not damage the transfer cover by scooping it out with a suitable tool.



5. Remove the ring gear bearing adjusting shim (transfer cover side) (1) and ring gear bearing outer race (transfer cover side) (2) using suitable tool.
6. Remove drain plug and gasket.
7. Remove filler plug and gasket.
8. Perform inspection after disassembly. Refer to [DLN-75. "Inspection"](#).



INFOID:000000010337338

Assembly

1. Select the ring gear bearing adjusting shim (transfer cover side). Refer to [DLN-84. "Adjustment"](#).
2. Install the selected ring gear bearing adjusting shim (transfer cover side) (1) and ring gear bearing outer race (transfer cover side) (2) using suitable tool.

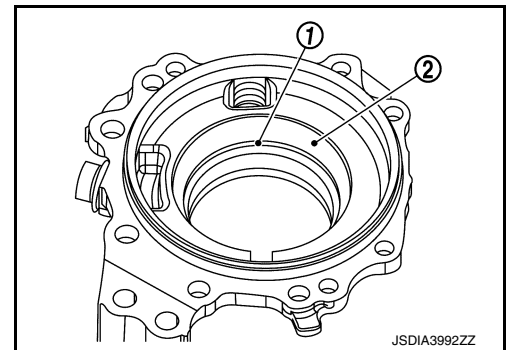
CAUTION:

- Do not reuse ring gear bearing.
- Apply gear oil to the ring gear bearing.

3. Install gasket onto drain plug and install them to transfer cover.

CAUTION:

Do not reuse gasket.



4. Install the transfer cover to the transfer case, and apply anti-corrosive oil onto thread and seats on the mounting bolts. Then tighten mounting bolts to the specified torque.

(A) : M10 bolt

(B) : M8 bolt

NOTE:

At this timing, O-ring installing to transfer cover is not necessary. Install O-ring after tooth contact is checked.

5. Check backlash, tooth contact, total preload and companion flange runout. Refer to [DLN-84. "Adjustment"](#).

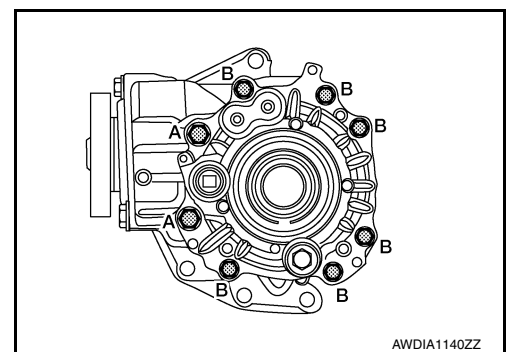
CAUTION:

Measure the total preload without oil seals of transfer cover and transfer case.

6. Remove transfer cover to install O-ring.
7. Apply multi-purpose grease lightly and evenly onto an O-ring, and install it to the transfer cover.

CAUTION:

- Do not reuse O-ring.
- When installing O-ring, do not use a suitable tool.
- Do not damage O-ring.



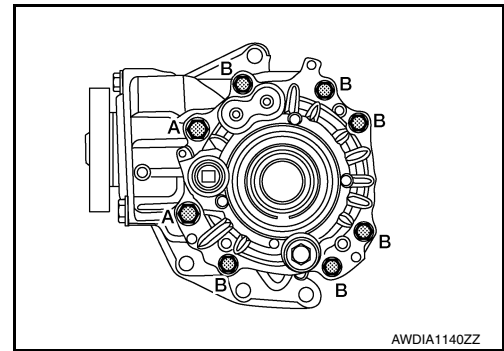
TRANSFER COVER

< UNIT DISASSEMBLY AND ASSEMBLY >

[TRANSFER: TY21C]

8. Install the transfer cover to the transfer case, and apply anti-corrosive oil onto thread and seats on the mounting bolts. Then tighten mounting bolts to the specified torque.

- (A) : M10 bolt
(B) : M8 bolt



9. Using suitable tool drive the transfer cover oil seals.

- (A) : $10.3 +0.6/-0$ mm ($0.406 +0.024/-0$ in)
(B) : $0 +0.6/-0$ mm ($0 +0.024/-0$ in)

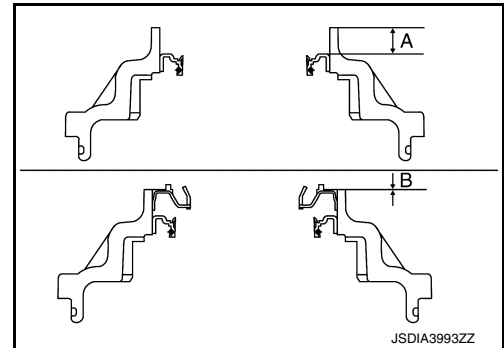
CAUTION:

- When checking the total preload torque, measure it without the oil seal, then install the oil seal.
- Do not reuse the oil seal.
- When installing, do not incline oil seal.
- Apply multi-purpose grease onto oil seal lips, and gear oil onto the circumference of the oil seal.

10. Install gasket onto filler plug and install them to transfer cover.

CAUTION:

- Do not reuse gasket.
- Install filler plug after oil is filled.



Inspection

INFOID:0000000010337339

INSPECTION AFTER DISASSEMBLY

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

Transfer cover

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

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RING GEAR SHAFT

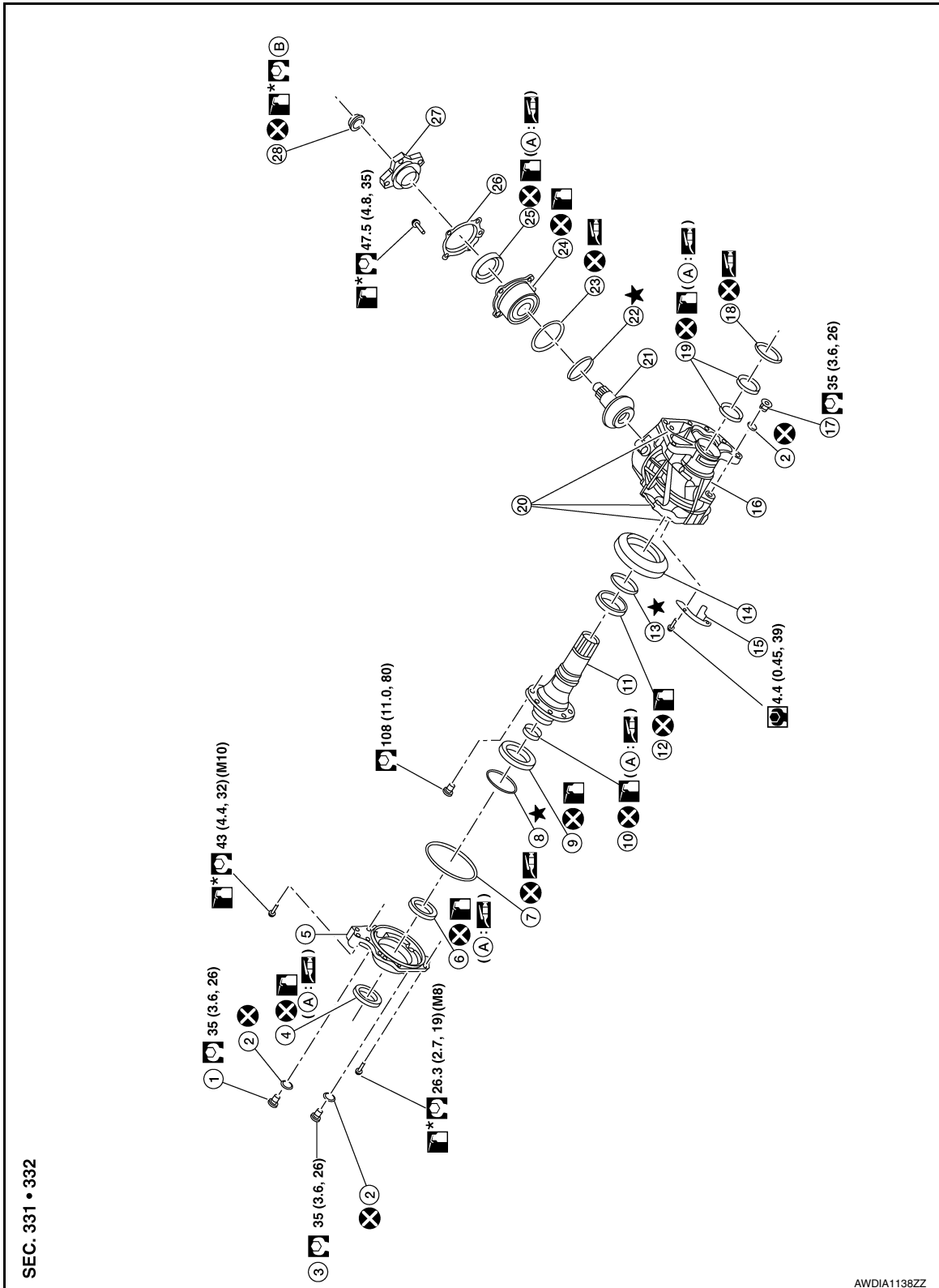
< UNIT DISASSEMBLY AND ASSEMBLY >

[TRANSFER: TY21C]

RING GEAR SHAFT

Exploded View

INFOID:000000010337357



SEC. 331 • 332

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- | | | |
|----------------|-------------------|---------------|
| 1. Filler plug | 2. Gasket | 3. Drain plug |
| 4. Oil seal | 5. Transfer cover | 6. Oil seal |

RING GEAR SHAFT

< UNIT DISASSEMBLY AND ASSEMBLY >

[TRANSFER: TY21C]

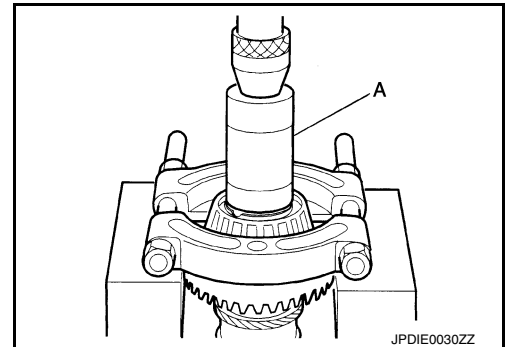
- | | | |
|---|--|--|
| 7. O-ring | 8. Ring gear bearing adjusting shim (transfer cover side) | 9. Ring gear bearing (transfer cover side) |
| 10. Ring gear shaft oil seal | 11. Ring gear shaft | 12. Ring gear bearing (transfer case side) |
| 13. Ring gear bearing adjusting shim (transfer case side) | 14. Ring gear | 15. Baffle plate |
| 16. Transfer case | 17. Plug | 18. O-ring |
| 19. Oil seal | 20. Dowel pin | 21. Drive pinion |
| 22. Drive pinion adjusting shim | 23. O-ring | 24. Pinion bearing assembly |
| 25. Oil seal | 26. Dust cover | 27. Companion flange |
| 28. Pinion lock nut | | |
| A. Oil seal lip | B. Comply with the assembly procedure when tightening. Refer to DLN-83 , "Assembly". | |

- : N·m (kg-m, in-lb)
- : N·m (kg-m, ft-lb)
- : Always replace after every disassembly.
- : Apply gear oil.
- : Apply anti-corrosive oil.
- : Apply multi-purpose grease.
- ★: Select with proper thickness.

Disassembly

INFOID:000000010337341

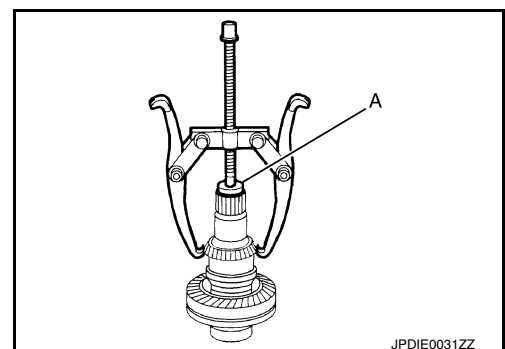
1. Remove transfer cover assembly. Refer to [DLN-73](#), "Disassembly".
2. Remove ring gear bearing outer race (transfer cover side) and ring gear bearing adjusting shim (transfer cover side) from the transfer cover. Refer to [DLN-73](#), "Disassembly".
3. Remove ring gear shaft assembly from the transfer case.
4. Remove ring gear bearing outer race (transfer case side) and ring gear bearing adjusting shim (transfer case side) from the transfer case. Refer to [DLN-90](#), "Disassembly".
5. Remove ring gear bearing inner race (transfer cover side) from ring gear shaft using suitable tool (A) and suitable tool.



6. Remove ring gear bearing inner race (transfer case side) from ring gear shaft with suitable tool (A) and Tool.

Tool number : (KV381054S0) J-34286

7. Remove the ring gear mounting bolts.



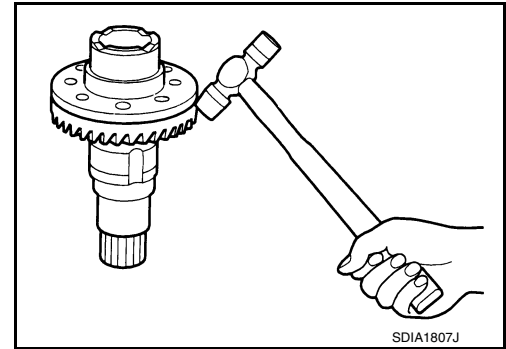
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RING GEAR SHAFT

< UNIT DISASSEMBLY AND ASSEMBLY >

[TRANSFER: TY21C]

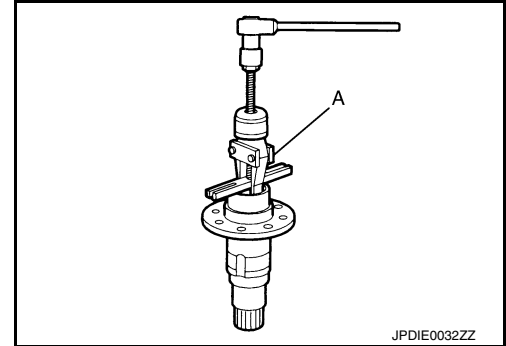
8. Lightly tap ring gear with a plastic hammer to remove ring gear from the ring gear shaft.



9. Remove ring gear shaft oil seal from the ring gear shaft with the Tool (A).

Tool number : (KV381054S0) J-34286

10. Perform inspection after disassembly. Refer to [DLN-79, "Inspection"](#).



INFOID:000000010337342

Assembly

1. Using suitable tool (A), install ring gear shaft oil seal (1) within the dimension (L) shown as follows.

(L) : 2.0 +0.6/-0 mm (0.079 +0.024/-0 in)

CAUTION:

- Do not reuse the oil seal.
- When installing, do not incline oil seal.
- Apply multi-purpose grease onto oil seal lips, and gear oil onto the circumference of the oil seal.

2. Select ring gear bearing adjusting shim (transfer case side) and ring gear bearing adjusting shim (transfer cover side). Refer to [DLN-84, "Adjustment"](#).
3. Assemble the selected ring gear bearing adjusting shim (transfer case side) and ring gear bearing outer race (transfer case side) to transfer case. Refer to [DLN-91, "Assembly"](#).

CAUTION:

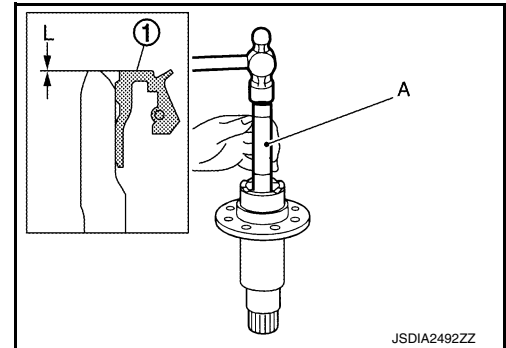
- Do not reuse ring gear bearing.
- Apply gear oil to the ring gear bearing.

4. Assemble the selected ring gear bearing adjusting shim (transfer cover side) and ring gear bearing outer race (transfer cover side) to transfer cover. Refer to [DLN-74, "Assembly"](#).

CAUTION:

- Do not reuse ring gear bearing.
- Apply gear oil to the ring gear bearing.

5. Install the ring gear to ring gear shaft, and tighten mounting bolts to the specified torque.



RING GEAR SHAFT

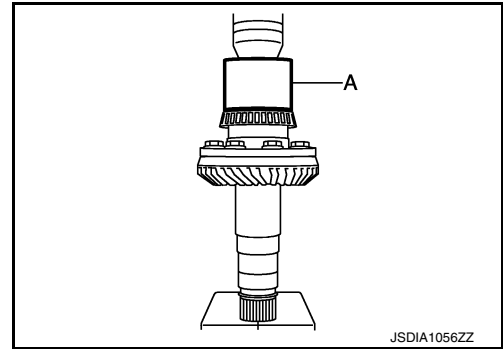
< UNIT DISASSEMBLY AND ASSEMBLY >

[TRANSFER: TY21C]

6. Install ring gear bearing inner race (transfer cover side) with drift (A) (commercial service tool).

CAUTION:

- Do not reuse ring gear bearing.
- Apply gear oil to the ring gear bearing.



7. Install the ring gear bearing inner race (transfer case side) to ring gear shaft with suitable tool (A).

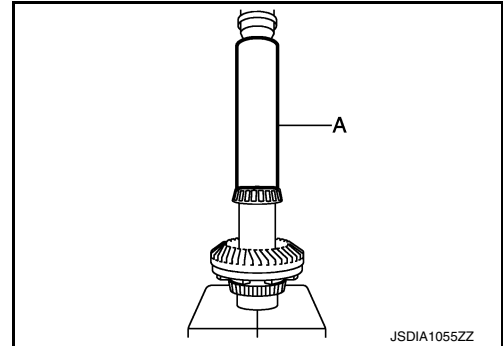
CAUTION:

- Do not reuse ring gear bearing.
- Apply gear oil to the ring gear bearing.

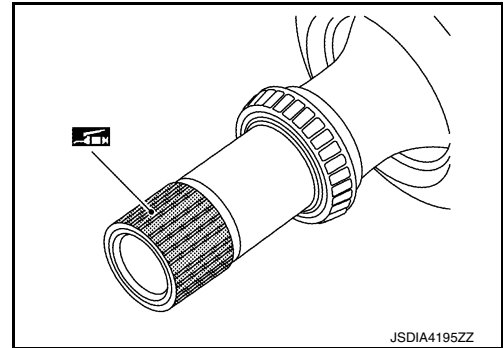
8. Install the ring gear shaft assembly to the transfer case.

CAUTION:

Protect transfer case oil seals beforehand from being damaged by the spline of ring gear shaft below method following.



- a. Apply multi-purpose grease to spline part indicated in the figure.



- b. Wrap piece of vinyl to spline part only indicated in the figure. [(A): limit line]

CAUTION:

Do not wrap sliding surfaces on oil seal.

9. Install transfer cover to check and adjust each part. Refer to [DLN-74, "Assembly"](#).

NOTE:

At this timing, O-ring installing to transfer cover is not necessary. Install O-ring after backlash and tooth contact are checked.

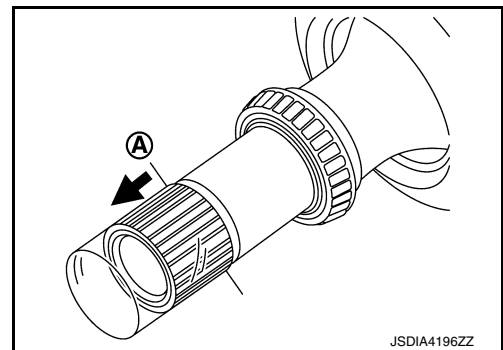
10. Check backlash, tooth contact, total preload and companion flange runout. Refer to [DLN-84, "Adjustment"](#).

CAUTION:

Measure the total preload without oil seals of transfer cover and transfer case.

11. Reinstall transfer cover for installing O-ring. Refer to [DLN-74, "Assembly"](#).

12. After installing transfer case oil seals, remove wrapped vinyl from the spline of ring gear shaft.



Inspection

INFOID:000000010337343

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.

RING GEAR SHAFT

< UNIT DISASSEMBLY AND ASSEMBLY >

[TRANSFER: TY21C]

CAUTION:

If malfunction is detected on the ring gear or drive pinion, replace the ring 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.

DRIVE PINION

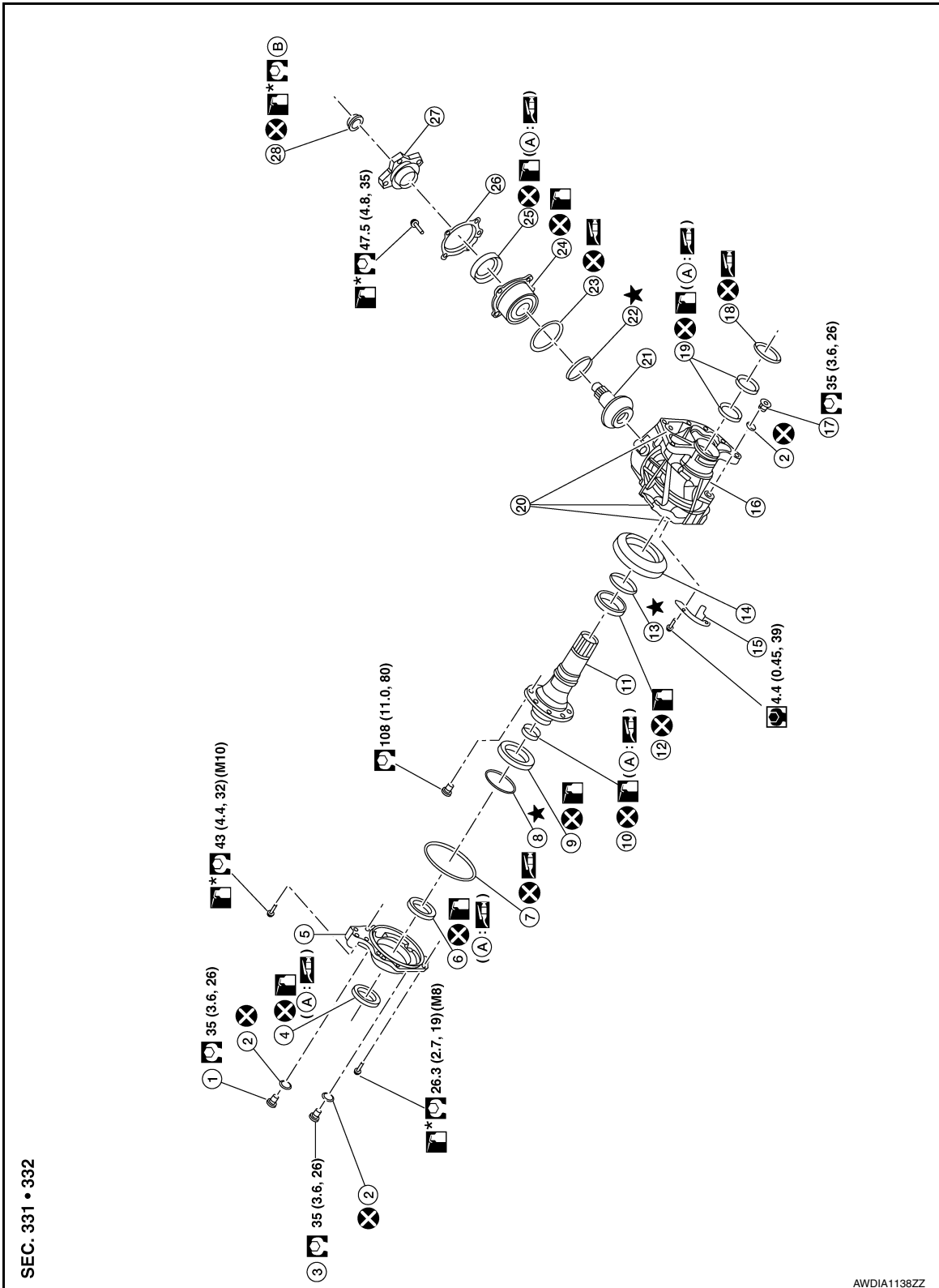
< UNIT DISASSEMBLY AND ASSEMBLY >

[TRANSFER: TY21C]

DRIVE PINION

Exploded View

INFOID:000000010337358



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|----------------|-------------------|---------------|
| 1. Filler plug | 2. Gasket | 3. Drain plug |
| 4. Oil seal | 5. Transfer cover | 6. Oil seal |

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DRIVE PINION


< UNIT DISASSEMBLY AND ASSEMBLY >

[TRANSFER: TY21C]


- | | | |
|---|---|--|
| 7. O-ring | 8. Ring gear bearing adjusting shim (transfer cover side) | 9. Ring gear bearing (transfer cover side) |
| 10. Ring gear shaft oil seal | 11. Ring gear shaft | 12. Ring gear bearing (transfer case side) |
| 13. Ring gear bearing adjusting shim (transfer case side) | 14. Ring gear | 15. Baffle plate |
| 16. Transfer case | 17. Plug | 18. O-ring |
| 19. Oil seal | 20. Dowel pin | 21. Drive pinion |
| 22. Drive pinion adjusting shim | 23. O-ring | 24. Pinion bearing assembly |
| 25. Oil seal | 26. Dust cover | 27. Companion flange |
| 28. Pinion lock nut | | |


- A. Oil seal lip
- B. Comply with the assembly procedure when tightening. Refer to [DLN-83. "Assembly"](#).


: N·m (kg-m, in-lb)

: N·m (kg-m, ft-lb)

: Always replace after every disassembly.

: Apply gear oil.

: Apply anti-corrosive oil.

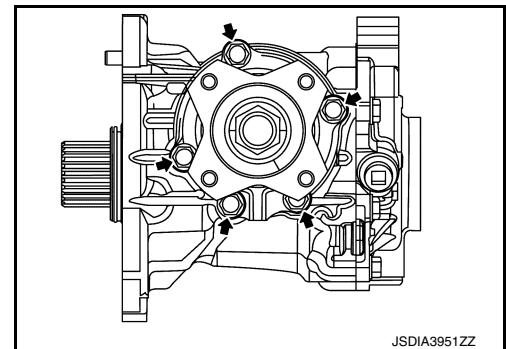
: Apply multi-purpose grease.

★: Select with proper thickness.

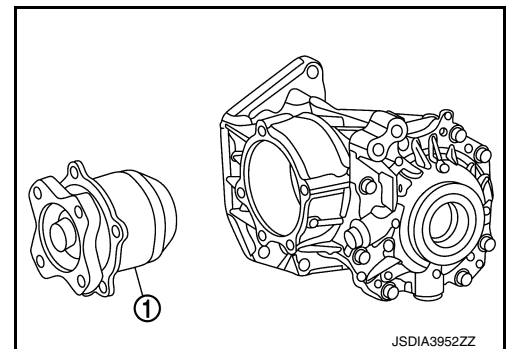
Disassembly

INFOID:000000010337345

1. Remove pinion bearing assembly mounting bolts.



2. Lightly tap companion flange with a plastic hammer to remove drive pinion assembly (1).
3. Remove the O-ring from pinion bearing.
4. Remove the pinion lock nut.

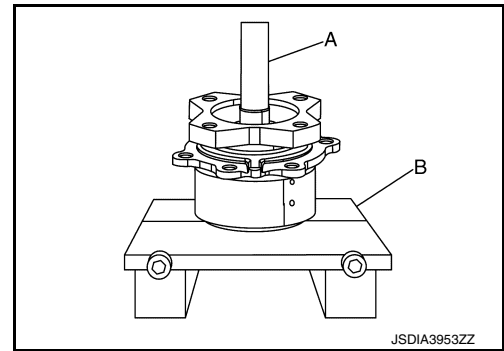


DRIVE PINION

< UNIT DISASSEMBLY AND ASSEMBLY >

[TRANSFER: TY21C]

- Remove drive pinion from pinion bearing assembly using suitable tool (A) and suitable tool (B).
- Remove adjusting shim.
- Remove companion flange.
- Remove the dust cover.
- Remove the oil seal.
- Perform inspection after disassembly. Refer to [DLN-88, "Inspection"](#).



Assembly

INFOID:000000010337346

- Select drive pinion adjusting shim. Refer to [DLN-84, "Adjustment"](#).
- Assemble the selected drive pinion adjusting shim to drive pinion.
- Install the drive pinion to pinion bearing assembly using suitable tool.

CAUTION:

- Do not reuse pinion bearing assembly.
- Apply gear oil to pinion bearing part.

- Install oil seal to pinion bearing assembly using suitable tool (A).

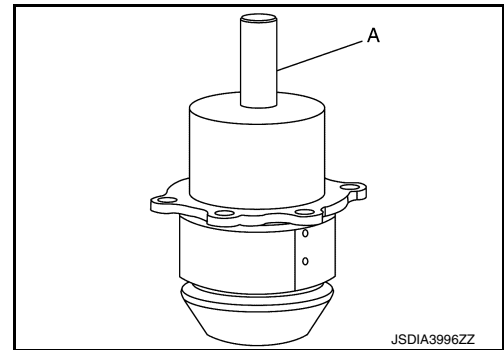
CAUTION:

- Do not reuse the oil seal.
- When installing, do not incline oil seal.
- Apply multi-purpose grease onto oil seal lips, and gear oil onto the circumference of the oil seal.

- Install dust cover.

NOTE:

Tighten dust cover together with pinion bearing assembly.



- Install companion flange (1) to pinion bearing using suitable tool (A).
- 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.
- Install pinion lock nut, and then tighten to the specified torque.

Pinion lock nut tightening torque : 90 ± 9 N·m (9.2 ± 0.92 kg·m, 66 ± 7 ft·lb)

CAUTION:

- Do not reuse pinion lock nut.
- Check that pinion lock nut is seated on the companion flange.

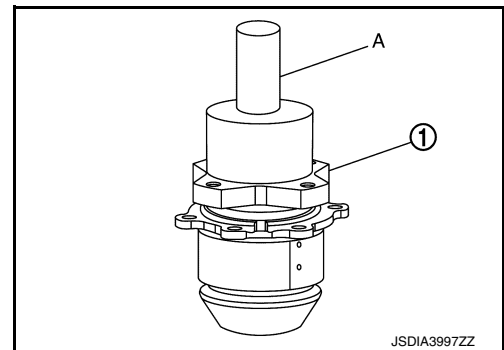
- After tightening pinion lock nut to the specified torque, retighten the pinion lock nut by 25 degrees.
- Measure the pinion bearing preload.

Pinion bearing preload : Refer to [DLN-93, "Preload Torque"](#).

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

CAUTION:

- Do not reuse O-ring.
- When installing O-ring, do not use a suitable tool.
- Do not damage O-ring.



DRIVE PINION

< UNIT DISASSEMBLY AND ASSEMBLY >

[TRANSFER: TY21C]

- Install drive pinion assembly, and apply anti-corrosive oil onto thread and seats on the mounting bolts. Tighten to the specified torque.

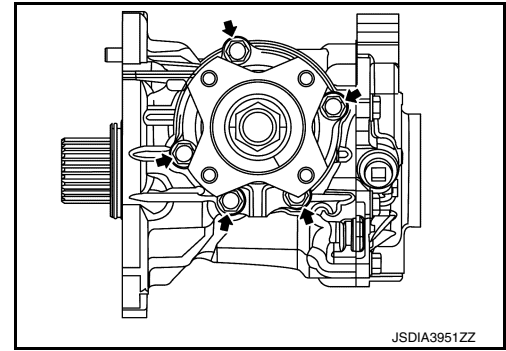
NOTE:

Tighten dust cover together with pinion bearing assembly.

- Check backlash, tooth contact, total preload and companion flange runout. Refer to [DLN-84, "Adjustment"](#).

CAUTION:

Measure the total preload without oil seals of transfer cover and transfer case.



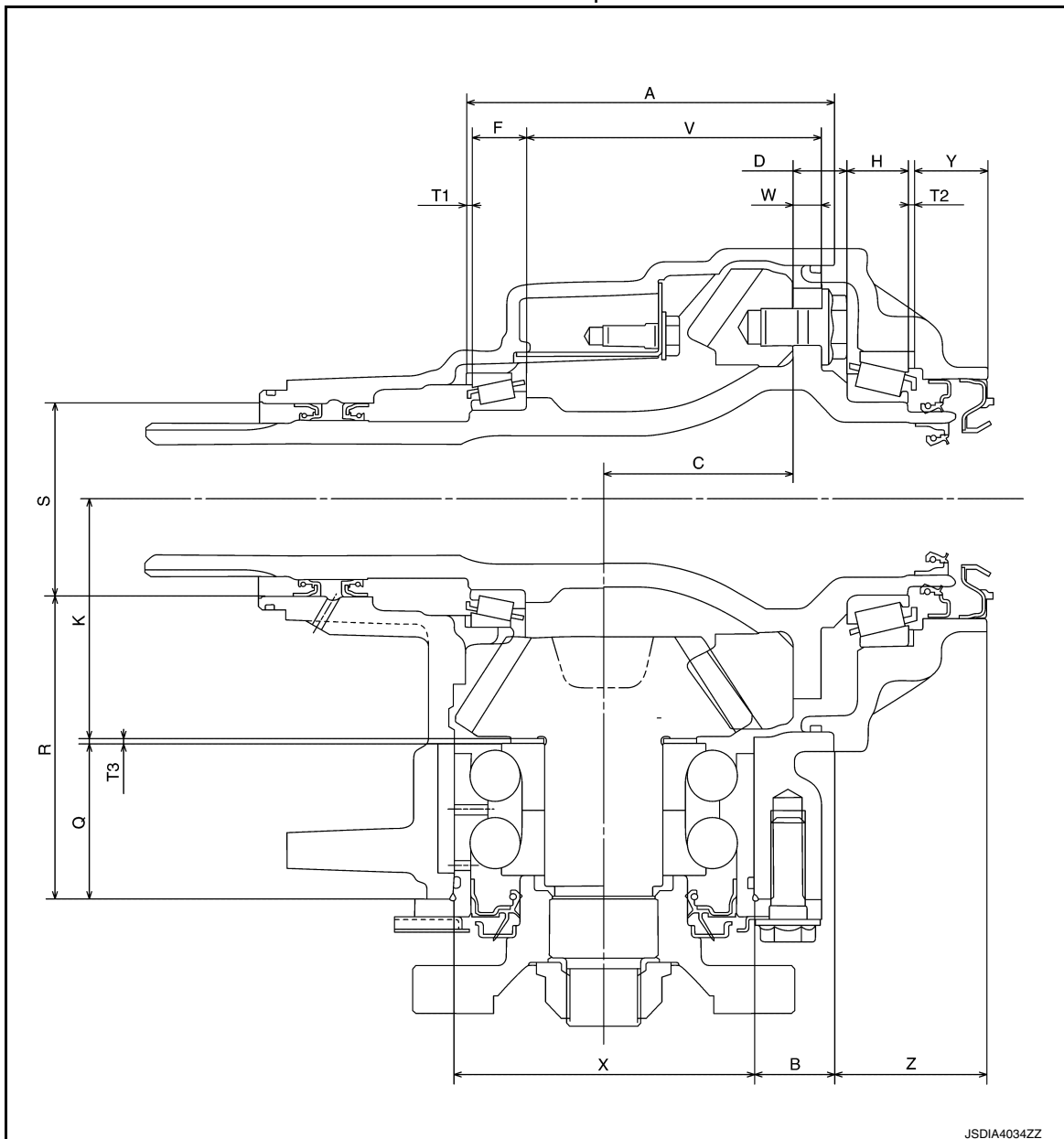
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Adjustment

ADJUSTING SHIM SELECTION

Measurement point



JSDIA4034ZZ

Select adjusting shim of T1, T2, and T3, respectively, by using the following equation.

T1 [Ring gear bearing adjusting shim (transfer case side)]

• $T1 = A - (B + X/2) + C + W - V - F - (M/100) + 0.071$ mm (0.0028 in)

DRIVE PINION

< UNIT DISASSEMBLY AND ASSEMBLY >

[TRANSFER: TY21C]

T2 [Ring gear bearing adjusting shim (transfer cover side)]

$$T2 = -Y + Z + (B + X/2) - C - D - H + (M/100) + 0.071 \text{ mm (0.0028 in)}$$

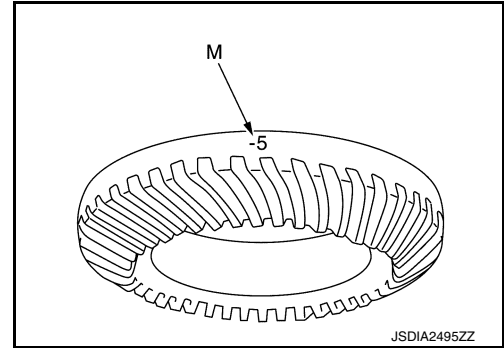
T3 (Drive pinion adjusting shim)

$$T3 = -Q + (R + S/2) - K + (O/100)$$

- Check dimension (M) on the ring gear side face.

NOTE:

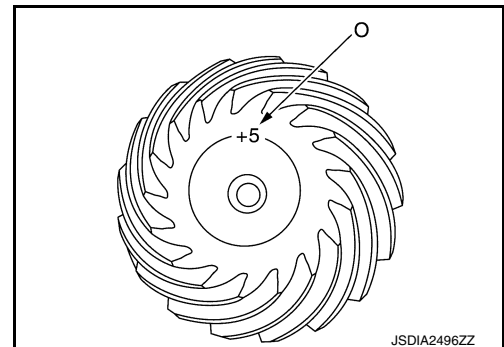
Dimension "M" indicates the difference between the optimum engagement and standard dimensions in increments of 0.01 mm (0.0004 in) written on the ring gear side face.



- Check dimension (O) on the gear end of drive pinion.

NOTE:

Dimension "O" indicates the difference between the optimum engagement and the standard dimensions in increments of 0.01 mm (0.0004 in) written on the gear end of drive pinion.



PINION BEARING PRELOAD

CAUTION:

When measuring preload, the rotating speed must be set to 30 rpm.

1. Remove ring gear shaft assembly from the transfer case. Refer to [DLN-77, "Disassembly"](#).
2. Rotate the companion flange back and forth from 2 to 3 times to check for unusual noise, binding, sticking, and so on.
3. Rotate the companion flange at least 20 times to check for smooth operation of the bearing.
4. Measure the pinion bearing preload using Tool A).

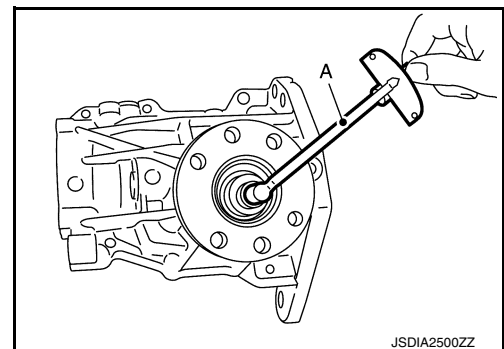
Pinion bearing preload : Refer to [DLN-93, "Preload Torque"](#).

Tool number : [ST3127S000 \(J-25765-A\)](#)

CAUTION:

Each rotational part should rotate smoothly with the specified gear oil.

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



TOTAL PRELOAD

CAUTION:

When measuring preload, the rotating speed must be set to 30 rpm.

1. Measure pinion bearing preload.

CAUTION:

Check that the pinion bearing preload is within the standard.

2. Assemble the ring gear shaft assembly to the transfer case. Refer to [DLN-78, "Assembly"](#)
3. Install transfer cover to check and adjust each part. Refer to [DLN-74, "Assembly"](#).
4. Rotate the companion flange at least 20 times to check for smooth operation of the bearing.

DRIVE PINION

< UNIT DISASSEMBLY AND ASSEMBLY >

[TRANSFER: TY21C]

5. Measure the total preload using Tool (A).

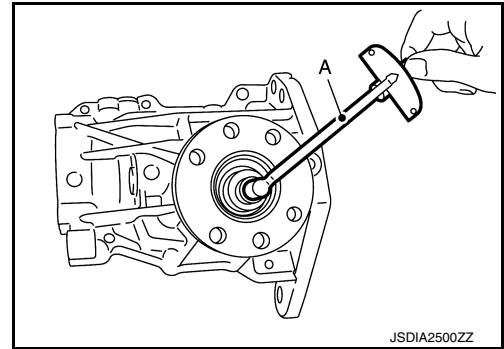
Total preload : Refer to [DLN-93, "Preload Torque"](#).

Tool number : ST3127S000 (J-25765-A)

CAUTION:

Each rotational part should rotate smoothly with the specified gear oil.

- If outside the standard, disassemble the transfer assembly to check and adjust each part. Measure it with the transfer case oil seal and transfer cover oil seal removed when measuring total preload after disassembly. Then install transfer case oil seals and transfer cover oil seal.

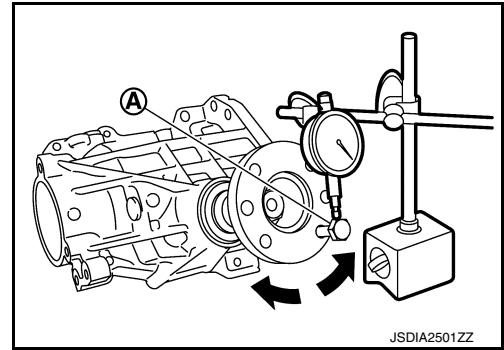


BACKLASH

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

Backlash : Refer to [DLN-93, "Backlash"](#).

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



TOOTH CONTACT

1. Remove transfer cover. Refer to [DLN-73, "Disassembly"](#).
2. Remove ring gear shaft assembly from transfer case. Refer to [DLN-77, "Disassembly"](#).
3. Apply red lead onto the ring gear.

CAUTION:

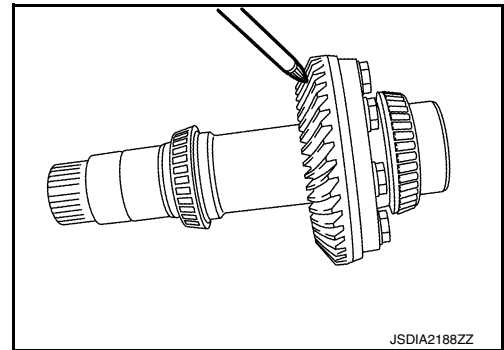
Apply red lead to both faces of 3 to 4 gears at 4 locations evenly spaced on the ring gear.

4. Assemble the ring gear shaft assembly to the transfer case. Refer to [DLN-78, "Assembly"](#).
5. Install transfer cover to check and adjust each part. Refer to [DLN-74, "Assembly"](#).

NOTE:

At this timing, O-ring installing to transfer cover is not necessary. Install O-ring after backlash and tooth contact are checked.

6. Remove the plug from the transfer case.
7. Rotate the companion flange back and forth several times, and check the drive pinion gear to ring gear tooth contact by viewing from the plug hole.



DRIVE PINION

< UNIT DISASSEMBLY AND ASSEMBLY >

[TRANSFER: TY21C]

Tooth Contact Judgment Guide

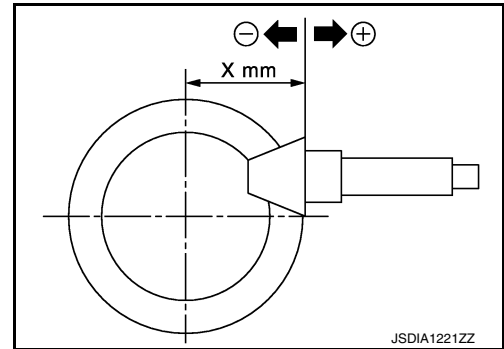
Drive pinion adjusting shim selection value mm(in)		Tooth contact condition				Need for adjustment
		Drive side		Back side		
↑ Thinner	-0.09 (-0.0035)	Heel side 	Toe side 	Toe side 	Heel side 	YES
	-0.06 (-0.0024)					
	-0.03 (-0.0012)					NO
	0					
↓ Thicker	+0.03 (+0.0012)					YES
	+0.06 (+0.0024)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

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8. Follow the procedure below to adjust pinion height (dimension X) if tooth contact is improper. For selecting adjusting shim, refer to the latest parts information.

CAUTION:

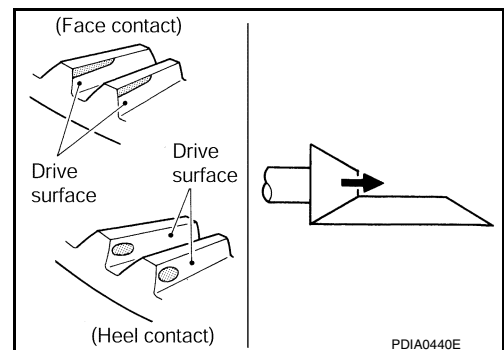
If no adjusting shim with the calculated value is available, select the thicker and closest one.



- Thicken the drive pinion adjusting shim to move the drive pinion closer to the ring gear in case of face contact or heel contact.

CAUTION:

Only one adjusting shim can be selected.



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DRIVE PINION

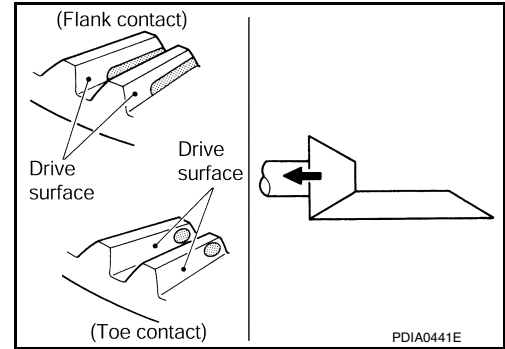
< UNIT DISASSEMBLY AND ASSEMBLY >

[TRANSFER: TY21C]

- Thin the drive pinion adjusting shim to move the drive pinion farther from the ring gear in case of flank contact or toe contact.

CAUTION:

Only one adjusting shim can be selected.



COMPANION FLANGE RUNOUT

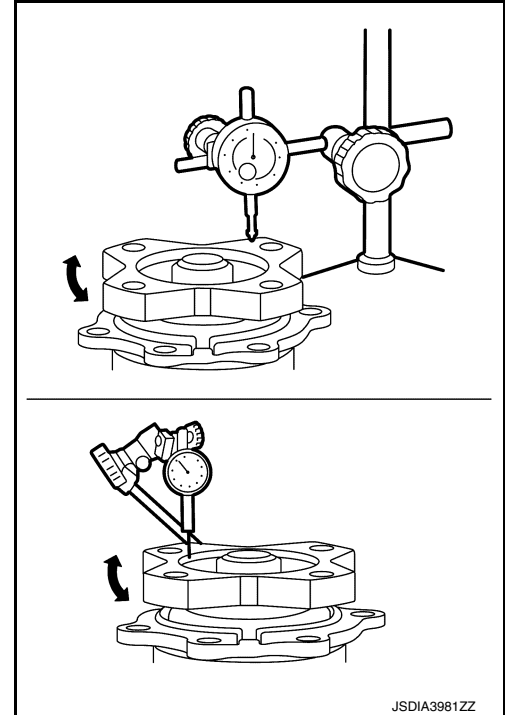
1. Fit a dial indicator onto the companion flange face (inner side of the propeller shaft mounting bolt holes).
2. Rotate the companion flange to check for runout.

Companion flange runout : Refer to [DLN-93, "Companion Flange Runout"](#).

3. Fit suitable tool 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-93, "Companion Flange Runout"](#).

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



Inspection

INFOID:000000010337348

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.

Shim

Check for seizure, damage, and unusual wear.

TRANSFER CASE

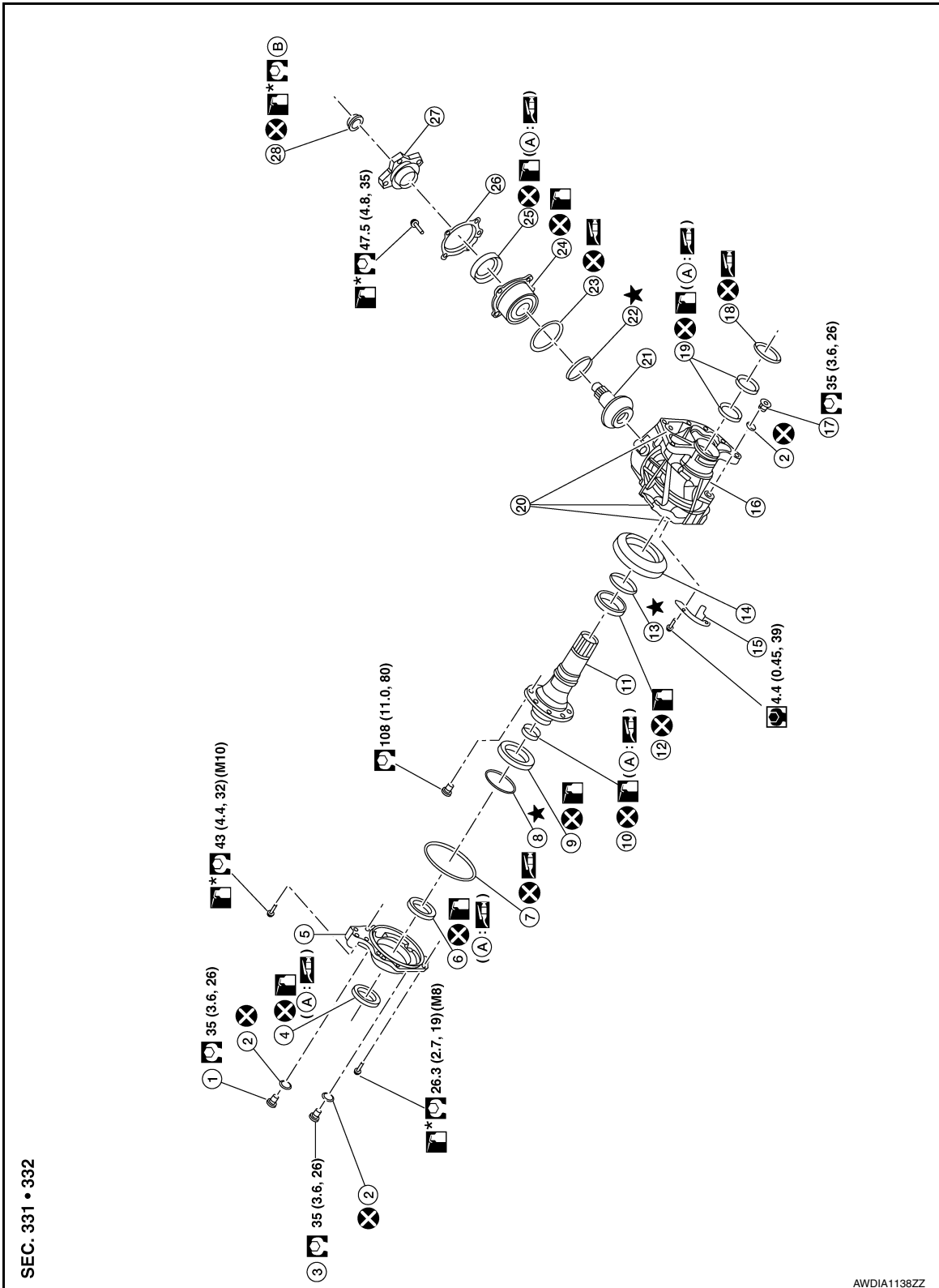
< UNIT DISASSEMBLY AND ASSEMBLY >

[TRANSFER: TY21C]

TRANSFER CASE

Exploded View

INFOID:000000010337359



SEC. 331 • 332

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|----------------|-------------------|---------------|
| 1. Filler plug | 2. Gasket | 3. Drain plug |
| 4. Oil seal | 5. Transfer cover | 6. Oil seal |


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TRANSFER CASE

< UNIT DISASSEMBLY AND ASSEMBLY >


[TRANSFER: TY21C]


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|---|--|--|
| 7. O-ring | 8. Ring gear bearing adjusting shim (transfer cover side) | 9. Ring gear bearing (transfer cover side) |
| 10. Ring gear shaft oil seal | 11. Ring gear shaft | 12. Ring gear bearing (transfer case side) |
| 13. Ring gear bearing adjusting shim (transfer case side) | 14. Ring gear | 15. Baffle plate |
| 16. Transfer case | 17. Plug | 18. O-ring |
| 19. Oil seal | 20. Dowel pin | 21. Drive pinion |
| 22. Drive pinion adjusting shim | 23. O-ring | 24. Pinion bearing assembly |
| 25. Oil seal | 26. Dust cover | 27. Companion flange |
| 28. Pinion lock nut | | |
| A. Oil seal lip | B. Comply with the assembly procedure when tightening. Refer to DLN-83, "Assembly" . | |


: N·m (kg-m, in-lb)

: N·m (kg-m, ft-lb)

: Always replace after every disassembly.

: Apply gear oil.

: Apply anti-corrosive oil.

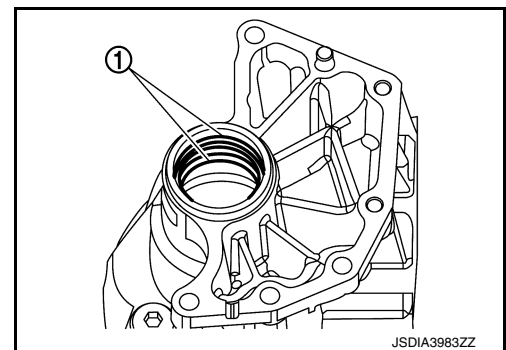
: Apply multi-purpose grease.

★: Select with proper thickness.

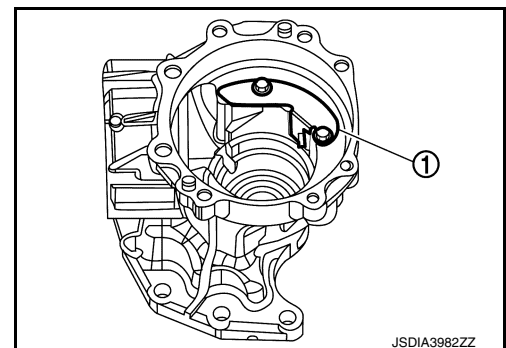
Disassembly

INFOID:000000010337350

1. Remove transfer cover. Refer to [DLN-73, "Disassembly"](#).
2. Remove ring gear shaft assembly. Refer to [DLN-77, "Disassembly"](#).
3. Remove drive pinion assembly. Refer to [DLN-82, "Disassembly"](#).
4. Remove O-ring from transfer case.
CAUTION:
 - Do not use a suitable tool.
 - Do not damage transfer case.
5. Remove oil seals (1).
CAUTION:
Do not damage transfer case.



6. Remove baffle plate (1).



TRANSFER CASE

< UNIT DISASSEMBLY AND ASSEMBLY >

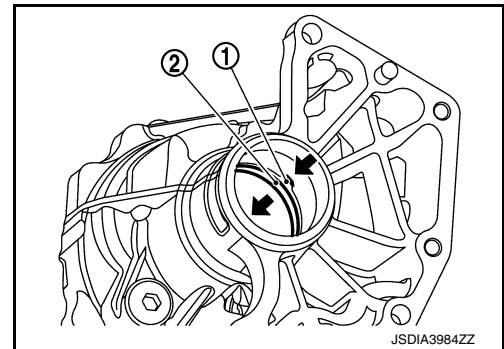
[TRANSFER: TY21C]

- Remove the ring gear bearing adjusting shim (transfer case side) (1) and ring gear bearing outer race (transfer case side) (2) by tapping from the 2 cutouts (←) on the transfer case.

CAUTION:

Do not damage transfer case.

- Remove plug and gasket.
- Perform inspection after disassembly. Refer to [DLN-92, "Inspection"](#).



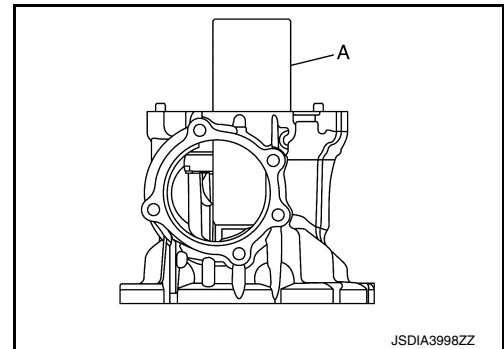
Assembly

INFOID:000000010337351

- Select the ring gear bearing adjusting shim (transfer case side). Refer to [DLN-84, "Adjustment"](#).
- Install the selected ring gear bearing adjusting shim (transfer case side) and ring gear bearing outer race (transfer case side) using suitable tool (A).

CAUTION:

- Do not reuse ring gear bearing.
- Apply gear oil to the ring gear bearing.



- Install baffle plate (1).
- Install ring gear shaft assembly. Refer to [DLN-78, "Assembly"](#).
- Install drive pinion assembly. Refer to [DLN-83, "Assembly"](#).
- Install transfer cover to check and adjust each part. Refer to [DLN-74, "Assembly"](#).

NOTE:

At this timing, O-ring installing to transfer cover is not necessary. Install O-ring after backlash and tooth contact are checked.

- Check backlash, tooth contact, total preload and companion flange runout. Refer to [DLN-84, "Adjustment"](#).

CAUTION:

Measure the total preload without oil seals of transfer cover and transfer case.

- Reinstall transfer cover for installing O-ring. Refer to [DLN-74, "Assembly"](#).
- Install oil seals using suitable tool.

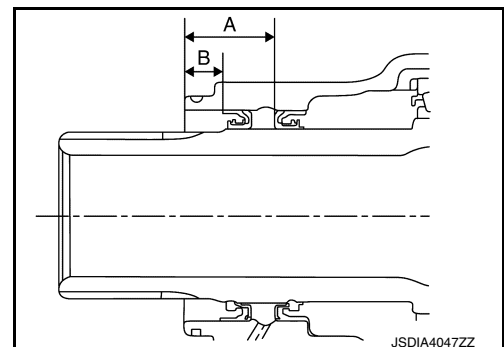
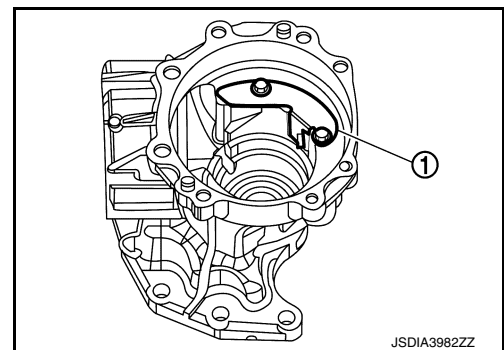
(A) : 24.8 mm (0.976 in)

(B) : 10.3 mm (0.406 in)

CAUTION:

- When checking the total preload torque, measure it without the oil seal, then install the oil seal.
- Do not reuse the oil seal.
- When installing, do not incline oil seal.
- Apply multi-purpose grease onto oil seal lips, and gear oil onto the circumference of the oil seal.
- Do not damage oil seals by spline of ring gear shaft.

- After installing oil seals to transfer case, remove wrapped vinyl from the spline of ring gear shaft.
- Apply multi-purpose grease lightly and evenly onto an O-ring, and install it to the transfer case.



TRANSFER CASE

< UNIT DISASSEMBLY AND ASSEMBLY >

[TRANSFER: TY21C]

CAUTION:

- Do not reuse O-ring.
- When installing O-ring, do not use a suitable tool.
- Do not damage O-ring.

Inspection

INFOID:0000000010337352

INSPECTION AFTER DISASSEMBLY

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

Case

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

SERVICE DATA AND SPECIFICATIONS (SDS)

< SERVICE DATA AND SPECIFICATIONS (SDS)

[TRANSFER: TY21C]

SERVICE DATA AND SPECIFICATIONS (SDS)

SERVICE DATA AND SPECIFICATIONS (SDS)

General Specifications

INFOID:000000009991804

ℓ (US pt, Imp pt)

Applied model	AWD	
	QR25DE	
	CVT	
Transfer model	TY21C	
Oil Type	MA-11, "Fluids and Lubricants"	
Oil capacity (Approx.)	0.31 (5/8 pt, 1/2 pt)	
Gear ratio	0.404	
Number of teeth	Ring gear	42
	Drive pinion	17

Preload Torque

INFOID:0000000010337353

Unit: N·m (kg·m, in·lb)

Item	Standard	
Pinion bearing preload	0.25 – 1.15 (0.03 – 0.11, 3.0 – 10.0)	
Total preload	With all oil seals	P1 + 0.7 – 1.0 (0.08 – 0.1, 7.0 – 8.0)
	Without oil seals (for transfer cover and transfer case)	P1 + 0.5 – 0.8 (0.06 – 0.08, 5.0 – 7.0)

Backlash

INFOID:0000000010337354

Unit: mm (in)

Item	Standard
Ring gear to drive pinion	0.16 – 0.21 (0.0063 – 0.0083)

Companion Flange Runout

INFOID:0000000010337355

Unit: mm (in)

Item	Limit
Companion flange face (inner side of the propeller shaft mounting bolt holes)	0.15 (0.0059)
Inside of companion flange (socket diameter)	0.1 (0.004)

PRECAUTIONS

< PRECAUTION >

[REAR PROPELLER SHAFT: C-CVJ-C]

PRECAUTION

PRECAUTIONS

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

INFOID:000000010292458

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. 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 three minutes before performing any service.

Precaution for Propeller Shaft

INFOID:000000010315567

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

PREPARATION

< PREPARATION >

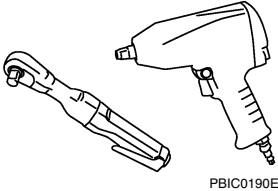
[REAR PROPELLER SHAFT: C-CVJ-C]

PREPARATION

PREPARATION

Commercial Service Tools

INFOID:000000009995323

Tool name	Description
<p>Power tool</p>  <p>PBIC0190E</p>	<p>Loosening bolts and nuts</p>

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STRUCTURE AND OPERATION

< SYSTEM DESCRIPTION >

[REAR PROPELLER SHAFT: C-CVJ-C]

SYSTEM DESCRIPTION

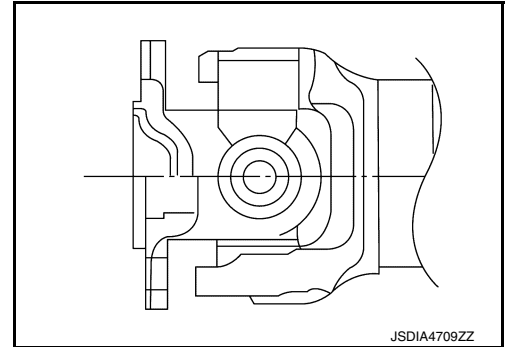
STRUCTURE AND OPERATION

Sectional View

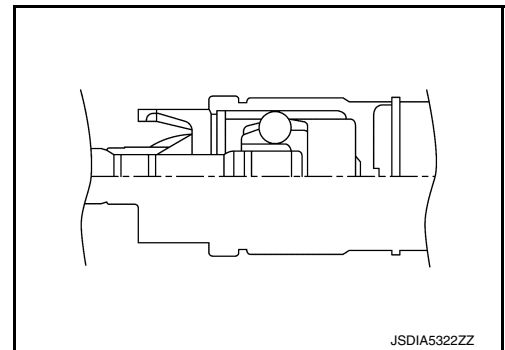
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PART OF JOINT

Universal Type (Shell Type)



CVJ Type



NOISE, VIBRATION AND HARSHNESS (NVH) TROUBLESHOOTING

< SYMPTOM DIAGNOSIS >

[REAR PROPELLER SHAFT: C-CVJ-C]

SYMPTOM DIAGNOSIS

NOISE, VIBRATION AND HARSHNESS (NVH) TROUBLESHOOTING

NVH Troubleshooting Chart

INFOID:000000009797671

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

Symptom		Possible cause and SUSPECTED PARTS													
		Uneven rotating torque	Center bearing improper installation	Excessive center bearing axial end play	Center bearing mounting (insulator) cracks, damage or deterioration	Excessive joint angle	Rotation imbalance	Excessive runout	DIFFERENTIAL	AXLE AND SUSPENSION	TIRE	ROAD WHEEL	DRIVE SHAFT	BRAKE	STEERING
Noise	Noise	x	x	x	x	x	x	x	x	x	x	x	x	x	x
	Shake		x			x				x	x	x	x	x	x
	Vibration	x	x	x	x	x	x	x		x	x	x	x		x
Reference		DLN-98, "Inspection"	DLN-99, "Exploded View"	—	DLN-101, "Inspection"	—	DLN-98, "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.

x: Applicable

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PERIODIC MAINTENANCE

REAR PROPELLER SHAFT

Inspection

INFOID:000000009797673

APPEARANCE AND NOISE

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

VIBRATION

If vibration is present at high speed, adjust the propeller shaft phase first.

1. Check the propeller shaft for bend and damage. If damaged, replace propeller shaft assembly.
2. Perform a cruise test drive to check the propeller shaft for runout. If vibration occurs, separate propeller shaft at electric controlled coupling of final drive; then change the phase between electric controlled coupling stud bolt and propeller shaft by the one bolt hole at a time and install propeller shaft.
3. If vibration is still detected, measure propeller shaft runout after removing it. Refer to [DLN-101, "Inspection"](#).

REAR PROPELLER SHAFT

< REMOVAL AND INSTALLATION >

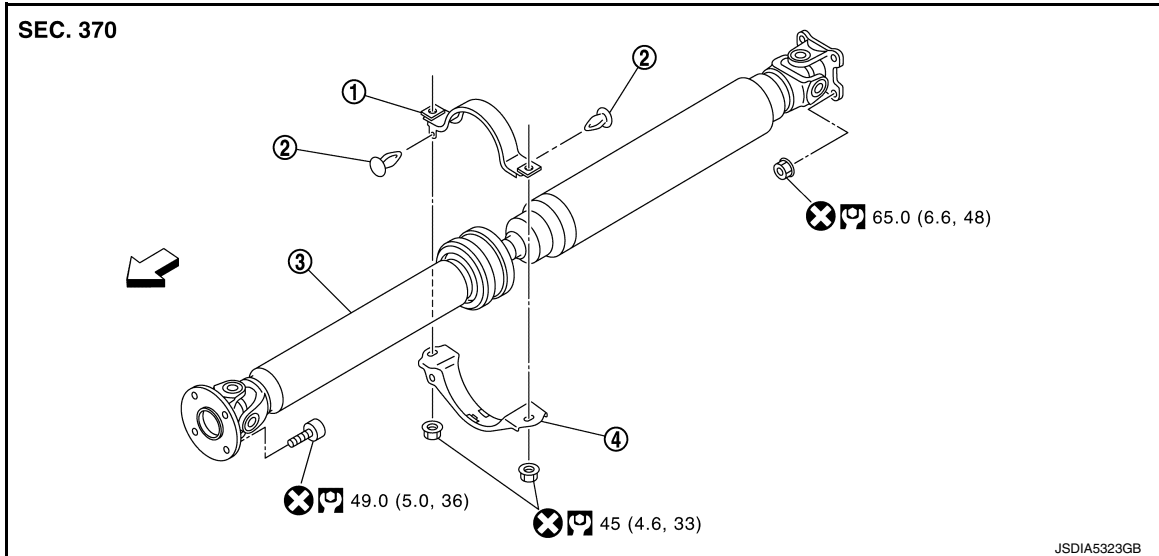
[REAR PROPELLER SHAFT: C-CVJ-C]

REMOVAL AND INSTALLATION

REAR PROPELLER SHAFT

Exploded View

INFOID:000000009797674



- ① Center bearing mounting bracket (upper)
 - ② Clip
 - ③ Propeller shaft assembly
 - ④ Center bearing mounting bracket (lower)
- ⇐: Vehicle front
- : N·m (kg-m, ft-lb)
- : Always replace after every disassembly.

Removal and Installation

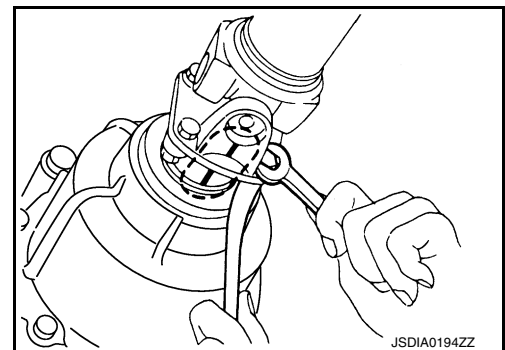
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REMOVAL

1. Shift the transaxle to the neutral position, and then release the parking brake.
2. Remove muffler assembly. Refer to [EX-5, "Removal and Installation"](#).
3. Put matching marks onto propeller shaft flange yoke and final drive and transfer companion flanges.

CAUTION:

For matching marks, use paint. Do not damage propeller shaft flange yoke and transfer companion flange.



REAR PROPELLER SHAFT

< REMOVAL AND INSTALLATION >

[REAR PROPELLER SHAFT: C-CVJ-C]

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

↔ : Front

CAUTION:

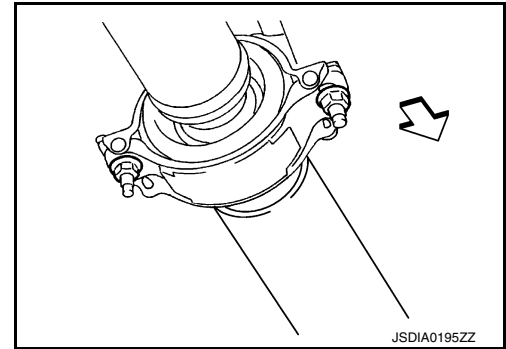
Tighten nuts temporarily.

5. Remove propeller shaft assembly bolts and nuts.
6. Remove center bearing 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 interference area to metal part with shop cloth or rubber to protect boot from breakage.

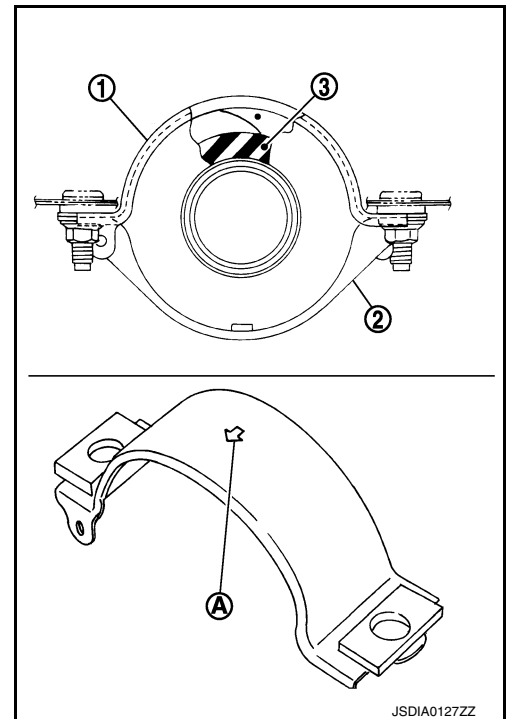
8. Remove clips and center bearing bracket (upper/lower).



INSTALLATION

Installation is in the reverse order of removal.

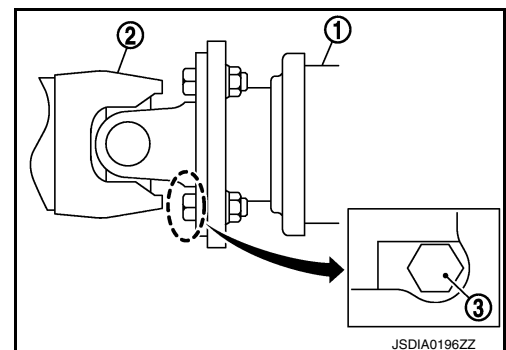
- When removing propeller shaft from final drive assembly (electric controlled coupling), replace stud bolts of electric controlled coupling.
- Install center bearing bracket (upper) (1) with its arrow mark (A) facing forward.
- Adjust position of center bearing bracket (upper), center bearing bracket (lower) (2) sliding back and forth to prevent play in thrust direction of center bearing insulator (3). Install center bearing 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, make sure that the bolts (3) on the flange side is tightened as shown in the figure.

(1) : Final drive assembly

(2) : Propeller shaft assembly



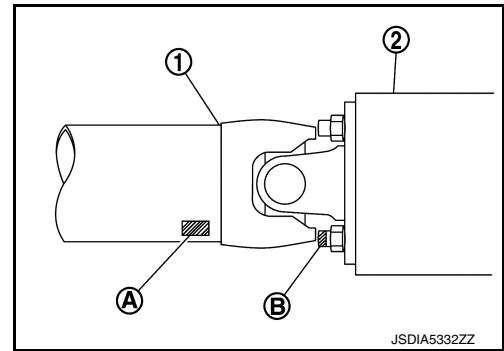
- If propeller shaft assembly or final drive assembly (electric controlled coupling) has been replaced, connect them as follows:

REAR PROPELLER SHAFT

< REMOVAL AND INSTALLATION >

[REAR PROPELLER SHAFT: C-CVJ-C]

- Install propeller shaft (1) while aligning its matching marks (A) on propeller shaft with matching mark (B) on electric controlled coupling and join them as close as possible.



Inspection

INFOID:000000009797676

INSPECTION AFTER REMOVAL

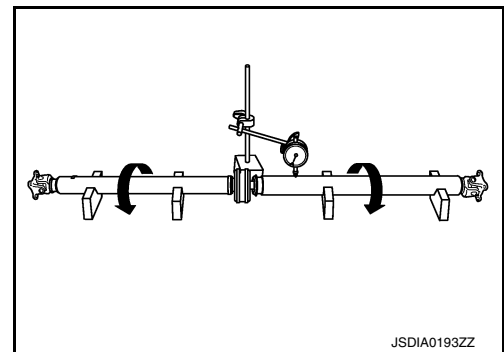
Appearance

Check propeller shaft tube surface for dents or cracks. If malfunction 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"](#).

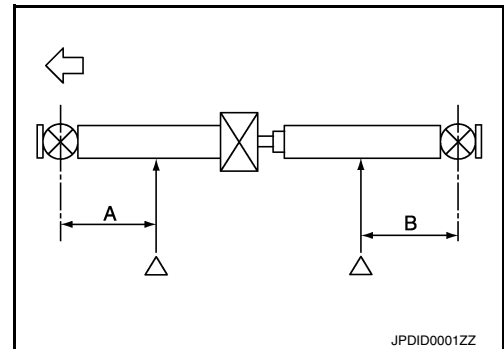


- Propeller shaft runout measuring point (Point "△").

← : Front side

Dimension

A : 541.5 mm (21.32 in)
B : 488.7 mm (19.24 in)

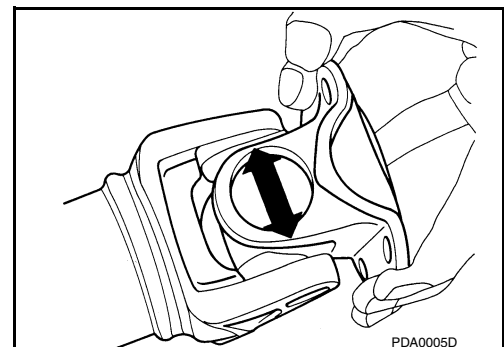


Journal Axial Play

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

Journal axial play : Refer to [DLN-103, "Journal Axial Play"](#).

CAUTION:
Never disassemble joints.



Center Bearing

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

CAUTION:

REAR PROPELLER SHAFT

< REMOVAL AND INSTALLATION >

[REAR PROPELLER SHAFT: C-CVJ-C]

Never disassemble center bearing.

INSPECTION AFTER INSTALLATION

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

SERVICE DATA AND SPECIFICATIONS (SDS)

< SERVICE DATA AND SPECIFICATIONS (SDS)

[REAR PROPELLER SHAFT: C-CVJ-C]

SERVICE DATA AND SPECIFICATIONS (SDS)

SERVICE DATA AND SPECIFICATIONS (SDS)

General Specifications

INFOID:000000009797677

Applied model		AWD
		QR25DE
		CVT
Propeller shaft model		C-CVJ-C
Number of joints		3
Joint type	1st joint	Universal (Shell type)
	2nd joint	CVJ type
	3rd joint	Universal (Shell type)
Coupling method	Transfer side	Flange type
	Rear final drive side	Flange type
Shaft length	1st (Spider to CVJ joint center)	1196 mm (47.09 in)
	2nd (CVJ joint center to spider)	983 mm (38.70 in)
Shaft outer diameter	1st	63.5 mm (2.500 in)
	2nd	70.0 mm (2.756 in)

Propeller Shaft Runout

INFOID:000000009797678

Unit: mm (in)

Item	Standard
Propeller shaft runout	0.6 (0.024) or less

Journal Axial Play

INFOID:000000009797679

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:000000010292459

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. 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 three minutes before performing any service.

Service Notice or Precautions for Rear Final Drive

INFOID:000000010337807

- 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 ones if necessary.
- Gaskets, seals and O-rings 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.
- Never use 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

< PREPARATION >

[REAR FINAL DRIVE: R145]

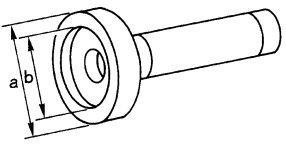
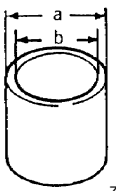
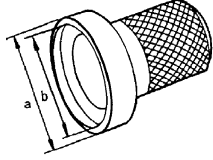
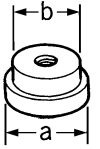
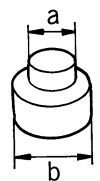
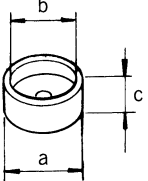
PREPARATION

PREPARATION

Special Service Tools

INFOID:000000010339798

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

Tool number (TechMate No.) Tool name	Description
KV38100200 (J-26233) Drift a: 65 mm (2.56 in) dia. b: 49 mm (1.93 in) dia.	 <p style="text-align: center;">ZZA1143D</p> <ul style="list-style-type: none"> Installing drive pinion oil seal Installing side oil seal
ST27861000 (—) Drift a: 62 mm (2.44 in) dia. b: 52 mm (2.05 in) dia.	 <p style="text-align: center;">ZZA0832D</p> <p>Installing drive pinion oil seal</p>
ST35271000 (J-26091) Drift a: 72 mm (2.83 in) dia. b: 63 mm (2.48 in) dia.	 <p style="text-align: center;">ZZA0814D</p> <p>Installing drive pinion oil seal</p>
KV40100610 (J-26089) Drift a: 63 mm (2.48 in) dia. b: 54.3 mm (2.138 in) dia.	 <p style="text-align: center;">ZZA1000D</p> <ul style="list-style-type: none"> Removing and installing gear carrier and rear cover (2 pieces are used) Installing pinion front bearing inner race
ST33052000 (—) Adaptor a: 22 mm (0.87 in) dia. b: 28 mm (1.10 in) dia.	 <p style="text-align: center;">ZZA1023D</p> <p>Removing side bearing inner race</p>
KV40105020 (—) Drift a: 39.7 mm (1.563 in) dia. b: 35 mm (1.38 in) dia. c: 15 mm (0.59 in)	 <p style="text-align: center;">ZZA1133D</p> <p>Installing side bearing inner race</p>

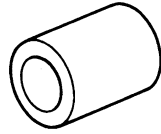
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PREPARATION

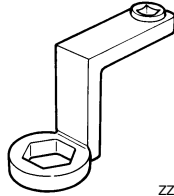
< PREPARATION >

[REAR FINAL DRIVE: R145]

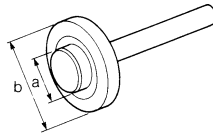
Tool number (TechMate No.) Tool name	Description
KV38109500 (—) Drive pinion socket	<ul style="list-style-type: none"> • Removing and installing drive pinion lock nut • Measuring preload torque
KV38109400 (—) Pinion nut wrench	Removing and installing drive pinion lock nut
ST17130000 (—) Drift a: 31.8 mm (1.252 in) dia. b: 58 mm (2.28 in) dia.	Installing pinion rear bearing outer race
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 pinion front bearing outer race
ST23860000 (—) Drift a: 38 mm (1.50 in) dia. b: 33 mm (1.30 in) dia.	<ul style="list-style-type: none"> • Installing pinion rear bearing inner race • Installing pinion front bearing inner race
ST38220000 (—) Press stand a: 63 mm (2.48 in) dia. b: 65 mm (2.56 in)	Installing pinion front bearing inner race



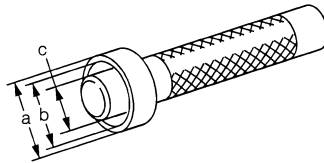
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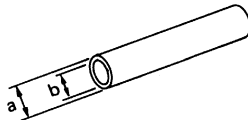
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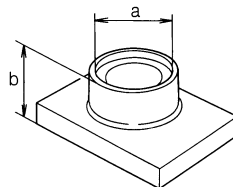
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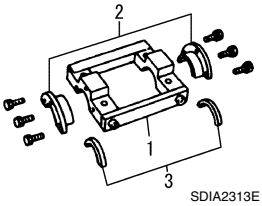


ZZA1058D

PREPARATION

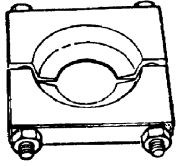
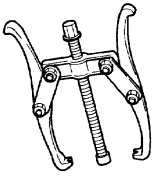
< PREPARATION >

[REAR FINAL DRIVE: R145]

Tool number (TechMate No.) Tool name	Description	
ST3127S000 (J-25765-A) Preload gauge	Measuring preload torque	A B C
KV381086S1 (—) Dummy cover set 1. KV38108610 (—) Dummy cover 2. KV38108621 (—) Dummy cover spacer 3. KV38108630 (—) Dummy cover shim	 <ul style="list-style-type: none"> • Checking backlash • Checking drive gear runout • Checking tooth contact 	DLN E F G

Commercial Service Tools

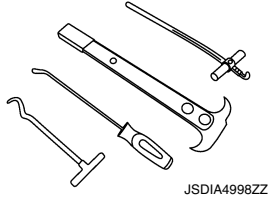
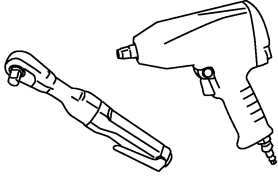
INFOID:000000010339799

Tool name	Description	
Separator	 <ul style="list-style-type: none"> • Removing side bearing inner race • Removing pinion rear bearing inner race 	H I J
Puller	 <ul style="list-style-type: none"> • Removing side bearing inner race • Removing pinion rear bearing inner race 	K L M
Pin punch a: 4.5 mm (0.177 in) dia.	Removing and installing lock pin	N O P

PREPARATION

< PREPARATION >

[REAR FINAL DRIVE: R145]

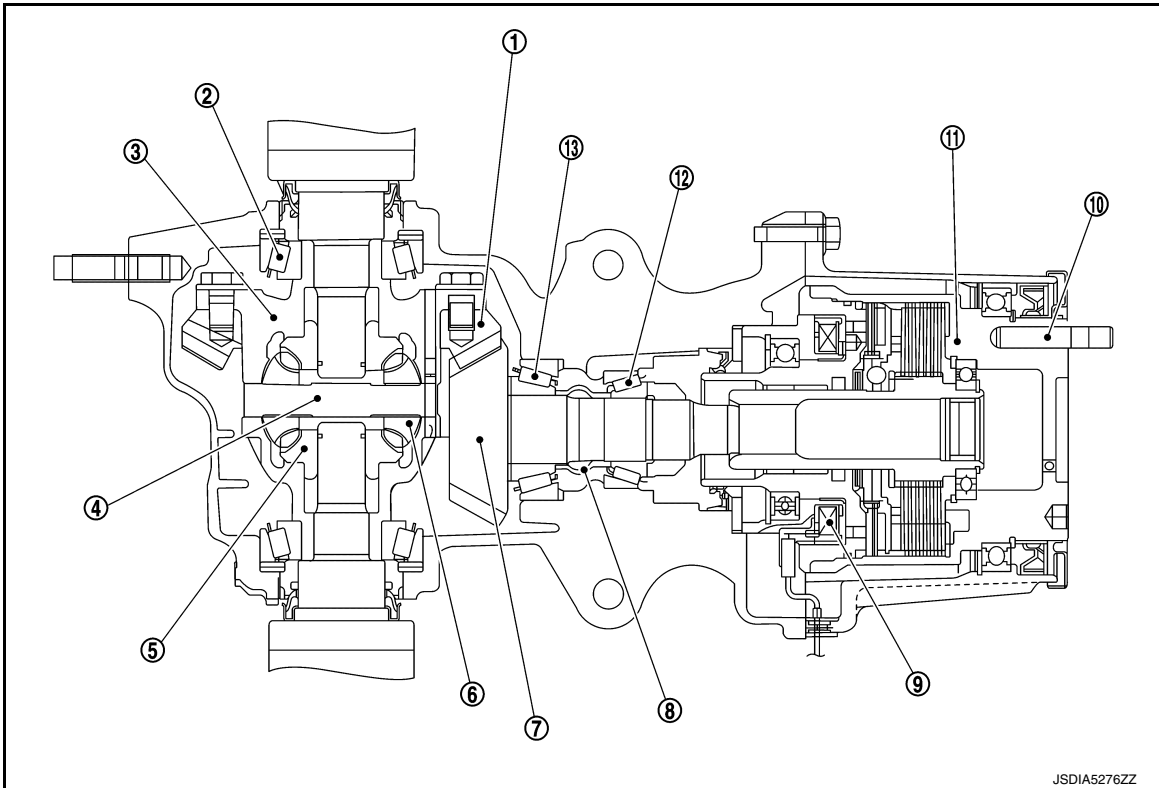
Tool name	Description
<p>Oil seal remover</p>  <p>JSDIA4998ZZ</p>	<p>Removing drive pinion oil seal</p>
<p>Power tool</p>  <p>PBIC0190E</p>	<p>Loosening bolts and nuts</p>

SYSTEM DESCRIPTION

STRUCTURE AND OPERATION

Sectional View

INFOID:000000009995344



- | | | |
|-----------------------|--------------------------------|------------------------|
| ① Drive gear | ② Side bearing | ③ Differential case |
| ④ Pinion mate shaft | ⑤ Side gear | ⑥ Pinion mate gear |
| ⑦ Drive pinion | ⑧ Collapsible spacer | ⑨ AWD solenoid |
| ⑩ Stud bolt | ⑪ Electric controlled coupling | ⑫ Pinion front bearing |
| ⑬ Pinion rear bearing | | |

Electric Controlled Coupling

INFOID:000000009995345

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

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NOISE, VIBRATION AND HARSHNESS (NVH) TROUBLESHOOTING

< SYMPTOM DIAGNOSIS >

[REAR FINAL DRIVE: R145]

SYMPTOM DIAGNOSIS

NOISE, VIBRATION AND HARSHNESS (NVH) TROUBLESHOOTING

NVH Troubleshooting Chart

INFOID:000000009797681

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

Symptom	Noise	Possible cause and SUSPECTED PARTS	Reference
	x	Gear tooth rough	DLN-134, "Inspection"
	x	Gear contact improper	DLN-130, "Adjustment"
	x	Tooth surfaces worn	DLN-134, "Inspection"
	x	Backlash incorrect	DLN-130, "Adjustment"
	x	Companion flange excessive runout	—
	x	Gear oil improper	DLN-111, "Inspection"
	x	PROPELLER SHAFT	NVH of REAR PROPELLER SHAFT in this section.
	x	AXLE AND SUSPENSION	NVH in FAX, RAX, FSU and RSU sections
	x	TIRE	NVH in WT section
	x	ROAD WHEEL	NVH in WT section
	x	DRIVE SHAFT	NVH in FAX and RAX section
	x	BRAKE	NVH in BR section
	x	STEERING	NVH in ST section

x: Applicable

REAR DIFFERENTIAL GEAR OIL

< PERIODIC MAINTENANCE >

[REAR FINAL DRIVE: R145]

PERIODIC MAINTENANCE

REAR DIFFERENTIAL GEAR OIL

Inspection

INFOID:000000009797685

OIL LEAKS

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

OIL LEVEL

- Remove filler plug (1) and check oil level from filler plug mounting hole as shown.

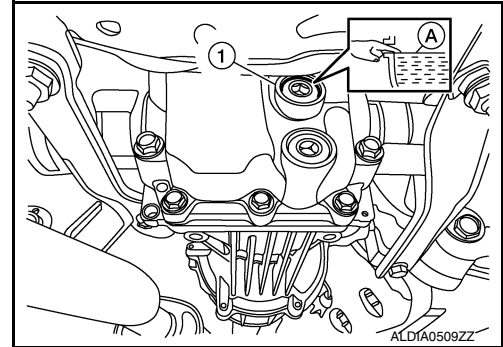
CAUTION:

Do not start engine while checking oil level.

- Set a new gasket on filler plug and install it on final drive assembly. Refer to [DLN-124, "Exploded View"](#).

CAUTION:

Do not reuse gasket.



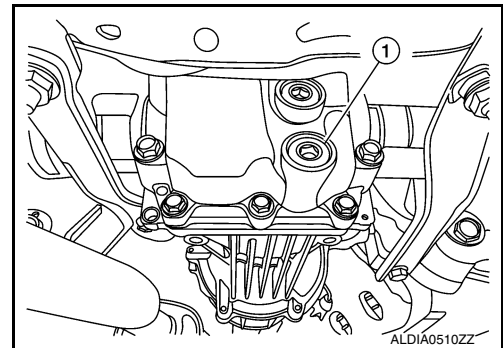
Draining

INFOID:000000009797686

- Stop engine.
- Remove drain plug (1) and drain gear oil.
- Set a new gasket on drain plug and install it to final drive assembly and tighten to the specified torque. Refer to [DLN-124, "Exploded View"](#).

CAUTION:

Do not reuse gasket.



Refilling

INFOID:000000009797687

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

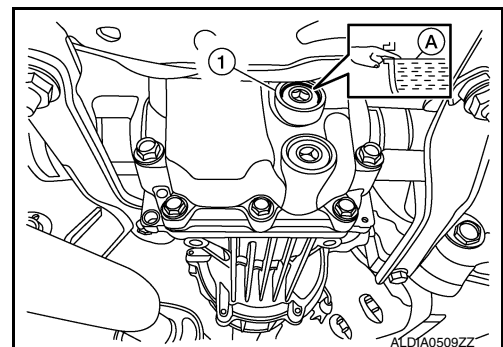
Oil grade and viscosity : Refer to [MA-11, "Fluids and Lubricants"](#).

Oil capacity : Refer to [DLN-141, "General Specifications"](#).

- After refilling oil, check oil level. Set a new gasket to filler plug, then install it to final drive assembly. Refer to [DLN-124, "Exploded View"](#).

CAUTION:

Do not reuse gasket.



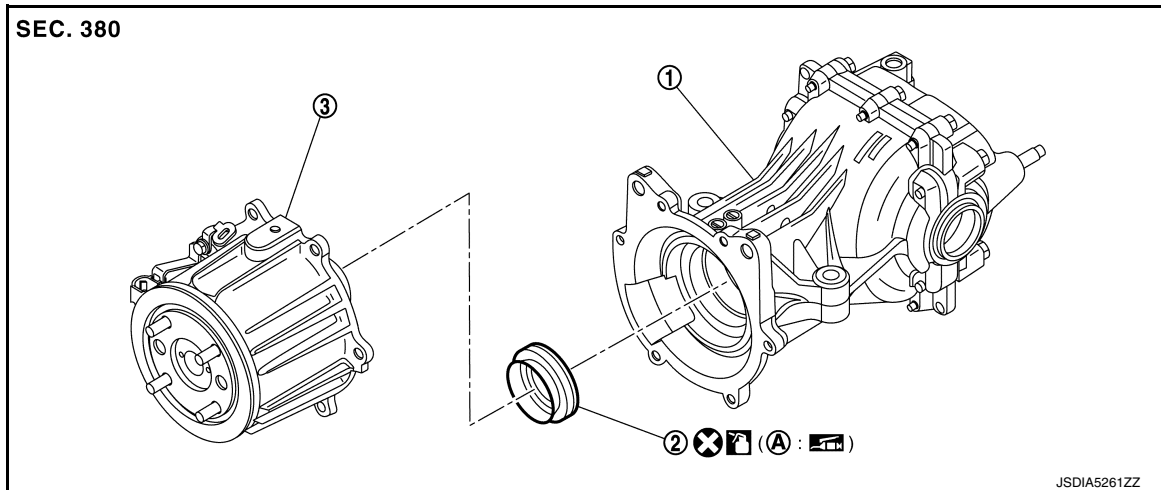
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REMOVAL AND INSTALLATION

DRIVE PINION OIL SEAL

Exploded View

INFOID:000000009797688



- ① Rear final drive assembly
- ② Drive pinion oil seal
- ③ Electric controlled coupling assembly
- (A) Oil seal lip
- ⊗: Always replace after every disassembly.
- 🔧: Apply gear oil.
- 🛠️: Apply multi-purpose grease.

Removal and Installation

INFOID:000000009797689

REMOVAL

1. Remove electric controlled coupling. Refer to [DLN-114, "Removal and Installation"](#).
2. Using a suitable tool remove drive pinion oil seal.

CAUTION:

Do not damage rear final drive assembly.

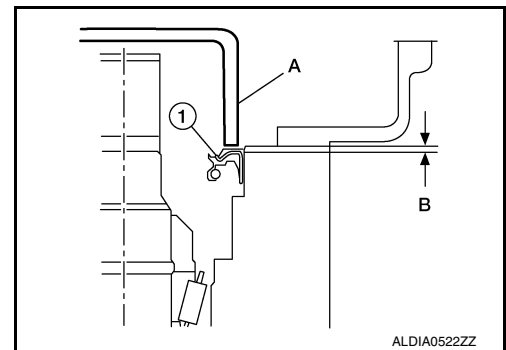
INSTALLATION

1. Install drive pinion oil seal (1) using Tool (A).

Oil seal installation length (B) : 0.8 - 1.2 mm (0.031 - 0.047 in)
Tool number : KV38100200 (J-26233)
: ST27861000 (—)

CAUTION:

- Do not reuse oil seal.
- When installing, do not incline oil seal.
- Apply multi-purpose grease onto oil seal lips, and gear oil onto the circumference of oil seal.



2. Install rear propeller shaft. Refer to [DLN-99, "Exploded View"](#).
3. When oil leaks while removing, check oil level after the installation. Refer to [DLN-111, "Inspection"](#).

SIDE OIL SEAL

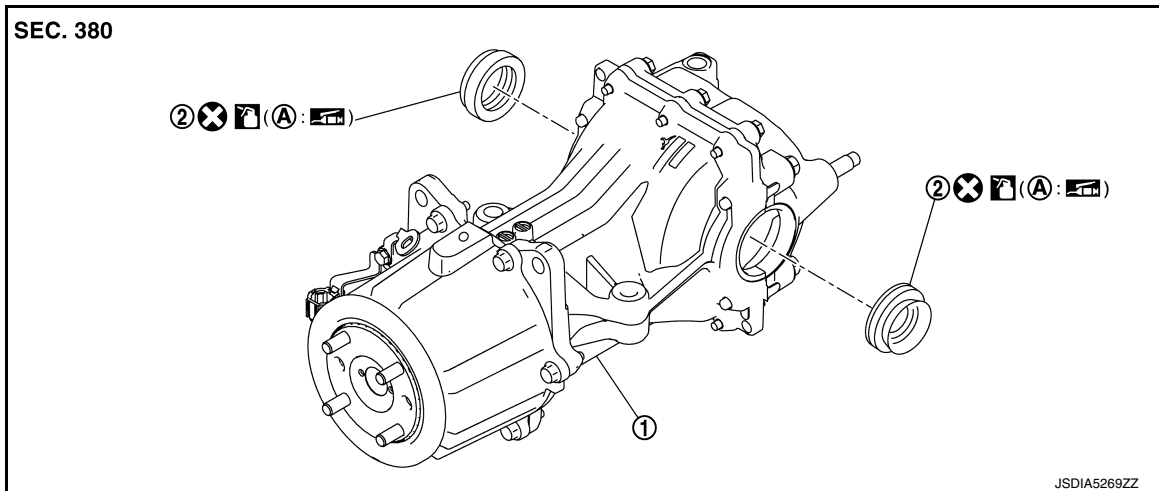
< REMOVAL AND INSTALLATION >

[REAR FINAL DRIVE: R145]

SIDE OIL SEAL

Exploded View

INFOID:000000009797690



- ① Rear final drive assembly ② Side oil seal

(A) Oil seal lip

⊗: Always replace after every disassembly.

🛢️: Apply gear oil.

🛠️: Apply multi-purpose grease.

Removal and Installation

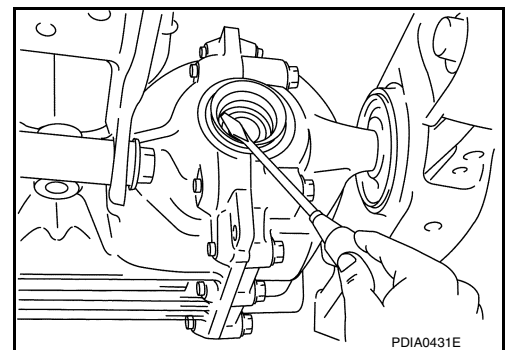
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REMOVAL

1. Remove rear drive shaft (LH/RH) with power tool. Refer to [RAX-19. "Exploded View"](#).
2. Remove side oil seal (LH/RH), using a suitable tool.

CAUTION:

Do not damage gear carrier and rear cover.



INSTALLATION

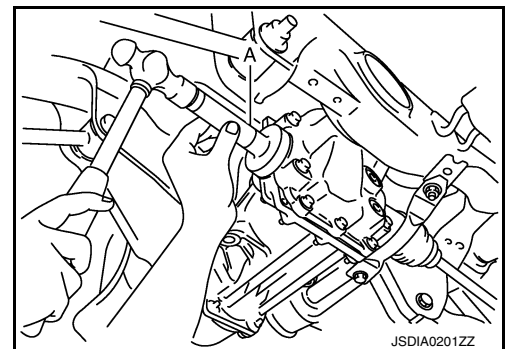
1. Install side oil seals until it becomes flush with the carrier end, using Tool (A).

Tool number : KV38100200 (J-26233)

CAUTION:

- Do not reuse oil seals.
- When installing, do not incline oil seals.
- Apply multi-purpose grease onto oil seal lips, and gear oil onto the circumference of oil seal.

2. Install rear drive shafts. Refer to [RAX-19. "Exploded View"](#).
3. When oil leaks while removing, check oil level after the installation. Refer to [DLN-111. "Inspection"](#).



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ELECTRIC CONTROLLED COUPLING

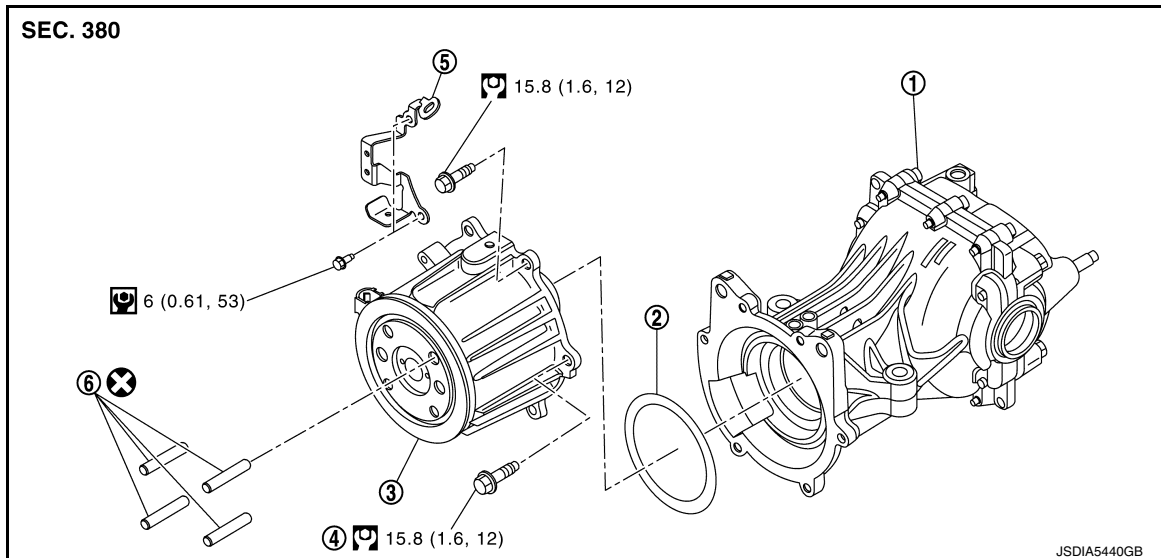
< REMOVAL AND INSTALLATION >

[REAR FINAL DRIVE: R145]

ELECTRIC CONTROLLED COUPLING

Exploded View

INFOID:000000009797692



- ① Rear final drive assembly
- ② Wave spring
- ③ Electric controlled coupling assembly
- ④ Reamer bolt
- ⑤ Connector bracket
- ⑥ Stud bolt

: N·m (kg-m, in-lb)

: N·m (kg-m, ft-lb)

: Always replace after every disassembly.

Removal and Installation

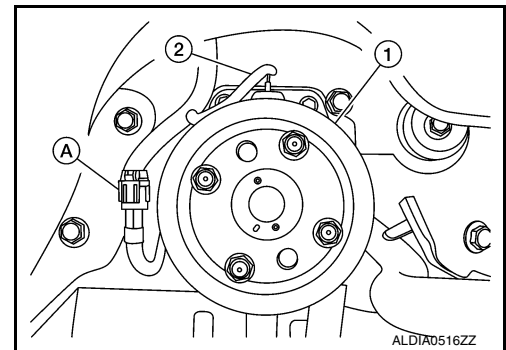
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NOTE:

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

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 electric controlled coupling breather hose (2) from electric controlled coupling (1).
3. Disconnect the electric controlled coupling harness connector (A).



4. Remove harness connector bracket.
5. Remove bolts from electric controlled coupling.
6. Remove the electric controlled coupling.

CAUTION:

Be careful that the wave washer does not fall out or get damaged when removing the electric controlled coupling.

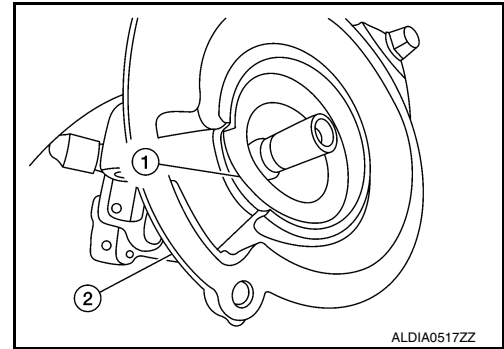
ELECTRIC CONTROLLED COUPLING

< REMOVAL AND INSTALLATION >

[REAR FINAL DRIVE: R145]

7. Remove wave washer (1).

(2) : Rear final drive assembly



INSTALLATION

Installation is in the reverse order of removal.

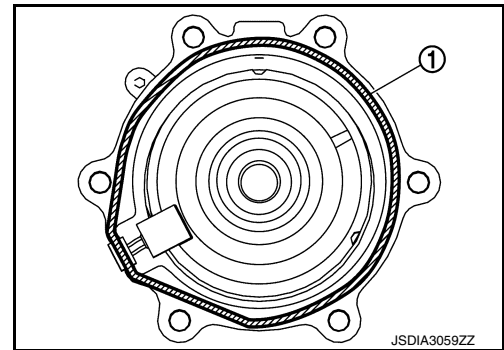
CAUTION:

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

- Remove the old sealant from mating surfaces using a suitable tool before installing.
- 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:

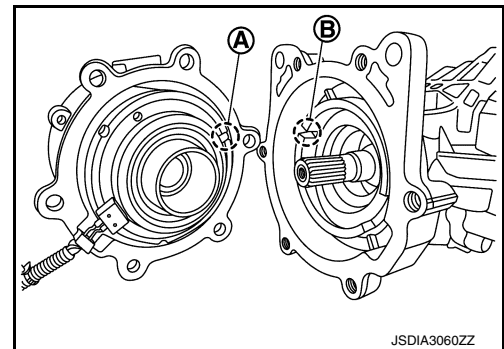
- The width of sealant bend is approximately 3 mm (0.012 in).
- Installation should be done within 5 minutes after applying liquid gasket.
- Do not fill the engine within engine oil for at least 30 minutes after the components are installed to allow the sealant to cure.



- 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.



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ELECTRIC CONTROLLED COUPLING

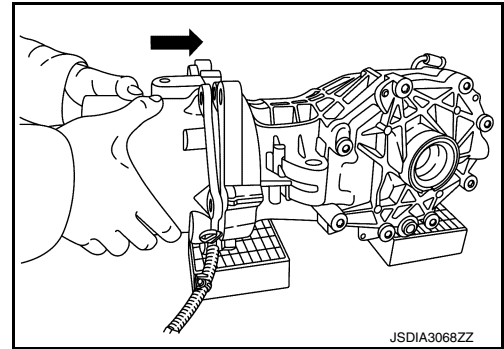
< REMOVAL AND INSTALLATION >

[REAR FINAL DRIVE: R145]

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

NOTE:

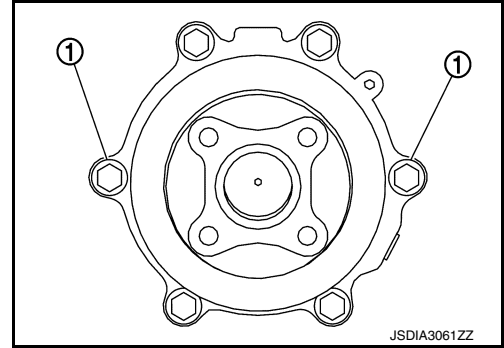
If the pin is properly positioned in the groove, then the electric controlled coupling can be pressed into position by the same amount of flexion of the wave washer.



- Temporarily tighten reamer bolts (1) to the positions shown.

CAUTION:

- Do not 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.



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

AIR BREATHER

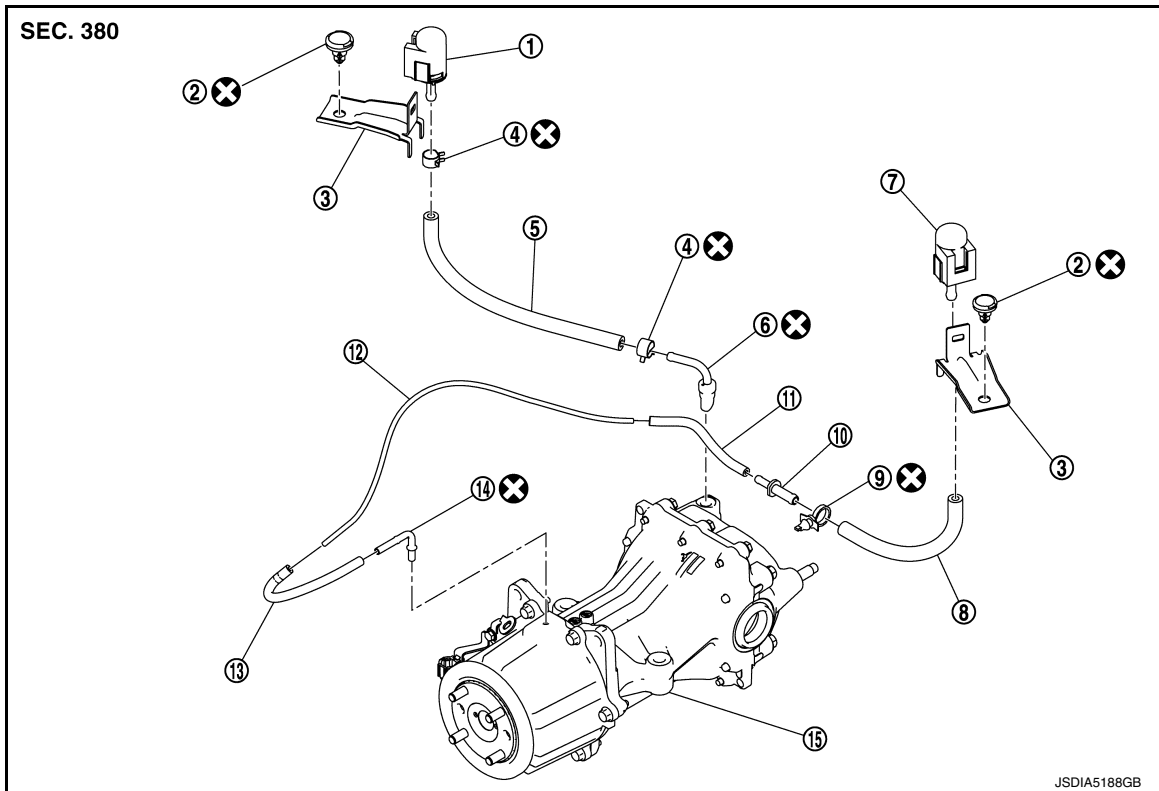
< REMOVAL AND INSTALLATION >

[REAR FINAL DRIVE: R145]

AIR BREATHER

Exploded View

INFOID:000000009995328



- | | | |
|------------------------------|------------------------------|------------------------------|
| ① Breather connector (resin) | ② Trim clip | ③ Bracket |
| ④ Hose clamp | ⑤ Air breather hose | ⑥ Breather connector (metal) |
| ⑦ Breather connector (resin) | ⑧ Air breather hose | ⑨ Clip |
| ⑩ Hose connector | ⑪ Air breather hose* | ⑫ Air breather tube* |
| ⑬ Air breather hose* | ⑭ Breather connector (metal) | ⑮ Rear final drive assembly |

⊗: Always replace after every disassembly.

*: These parts are adhered to each other. Therefore they are assembled parts.

Removal and Installation

INFOID:000000009995329

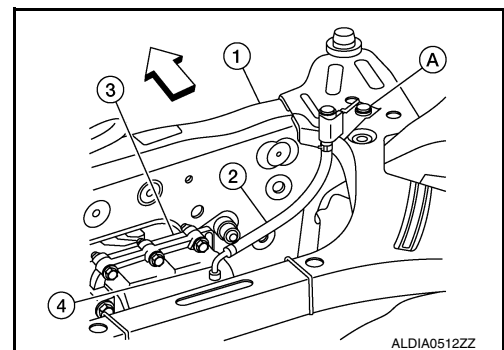
REMOVAL

1. Remove clip (A) from rear suspension member (1).

(3) : Rear final drive assembly

← : Front

2. Remove air breather hose (2) and breather tube (4) together.



3. Loosen hose clamp and remove breather tube from air breather hose.

AIR BREATHER

< REMOVAL AND INSTALLATION >

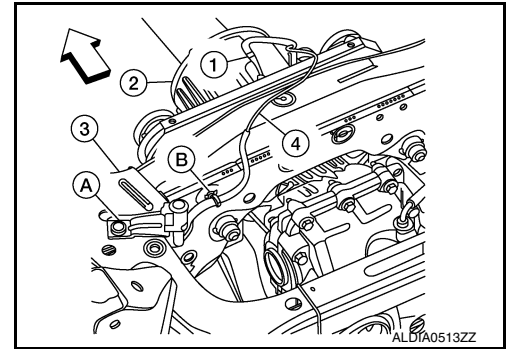
[REAR FINAL DRIVE: R145]

4. Remove clips (A) from rear suspension member (3).

(2) : Rear final drive assembly

⇐ : Front

5. Remove hose clamp (1) and clip (B) from air breather hose (4).



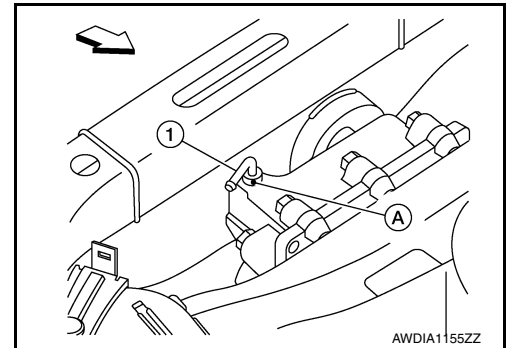
INSTALLATION

Installation is in the reverse order of removal.

- For non-reusable parts, refer to [DLN-117, "Exploded View"](#).
- Set breather connector (1) to rear final drive with the paint mark (A) facing front as shown.

⇐ : Front

- When installing air breather hose, make sure there are no pinched or restricted areas on air breather hose caused by bending or winding.



REAR FINAL DRIVE ASSEMBLY

< UNIT REMOVAL AND INSTALLATION >

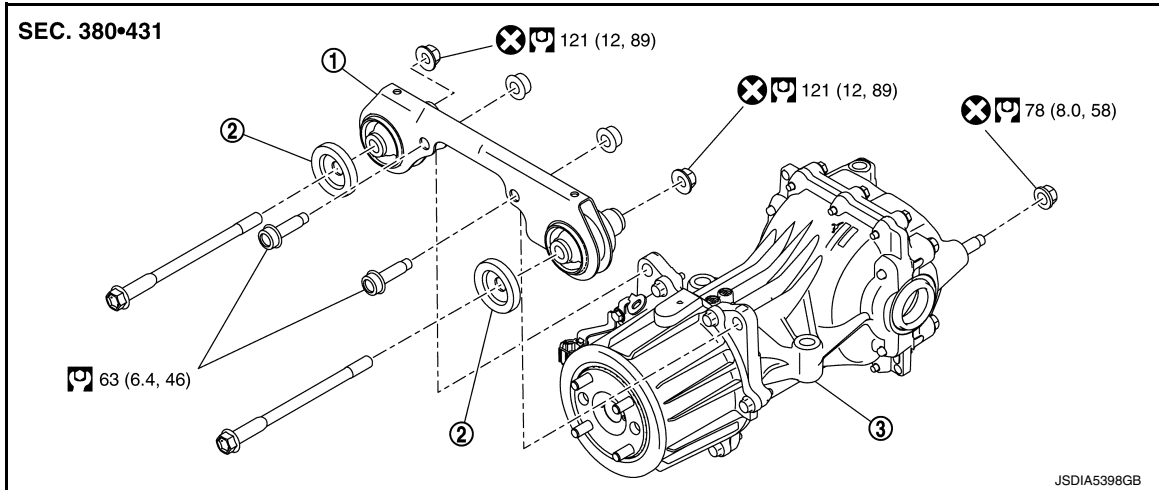
[REAR FINAL DRIVE: R145]

UNIT REMOVAL AND INSTALLATION

REAR FINAL DRIVE ASSEMBLY

Exploded View

INFOID:000000009797694



- ① Final drive mounting bracket ② Mounting stopper ③ Rear final drive assembly

: N·m (kg-m, ft-lb)

: Always replace after every disassembly.

Removal and Installation

INFOID:000000009797695

REMOVAL

1. Remove rear propeller shaft. Refer to [DLN-99, "Exploded View"](#).
2. Remove rear drive shafts. Refer to [RAX-19, "Exploded View"](#).
3. Disconnect AWD solenoid harness connector.
4. Remove rear final drive breather hose and electric controlled coupling breather hose.
5. Support final drive assembly with a suitable jack.
6. Remove final drive nuts and final drive bolts with power tool.
If necessary, remove final drive bracket and washer with power tool.

CAUTION:

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

INSTALLATION

Installation is in the reverse order of removal.

- 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-35, "Work Procedure"](#).

ELECTRIC CONTROLLED COUPLING

< UNIT DISASSEMBLY AND ASSEMBLY >

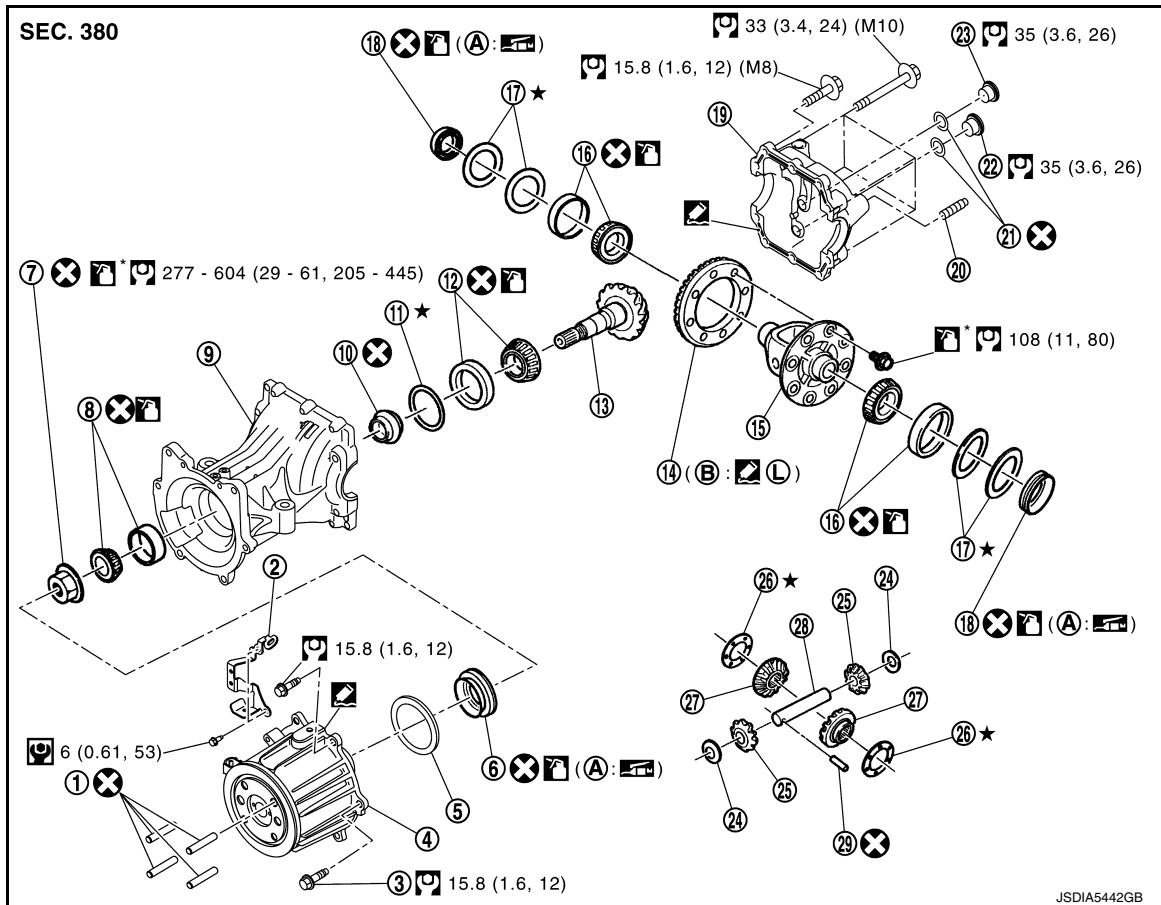
[REAR FINAL DRIVE: R145]

UNIT DISASSEMBLY AND ASSEMBLY

ELECTRIC CONTROLLED COUPLING

Exploded View

INFOID:000000010339803



- | | | |
|---|-------------------------------|-----------------------------|
| ① Stud bolt | ② Connector bracket | ③ Reamer bolt |
| ④ Electric controlled coupling assembly | ⑤ Wave spring | ⑥ Drive pinion oil seal |
| ⑦ Drive pinion lock nut | ⑧ Pinion front bearing | ⑨ Gear carrier |
| ⑩ Collapsible spacer | ⑪ Drive pinion adjusting shim | ⑫ Pinion rear bearing |
| ⑬ Drive pinion | ⑭ Drive gear | ⑮ Differential case |
| ⑯ Side bearing | ⑰ Side bearing adjusting shim | ⑱ Side oil seal |
| ⑲ Rear cover | ⑳ Stud bolt | ㉑ Gasket |
| ㉒ Drain plug | ㉓ Filler plug | ㉔ Pinion mate thrust washer |
| ㉕ Pinion mate gear | ㉖ Side gear thrust washer | ㉗ Side gear |
| ㉘ Pinion mate shaft | ㉙ Lock pin | |
| Ⓐ Oil seal lip | Ⓑ Screw hole | |

☐: N·m (kg-m, in-lb)

☐: N·m (kg-m, ft-lb)

⊗: Always replace after every disassembly.


★: Select with proper thickness.


☑: Apply gear oil.

ELECTRIC CONTROLLED COUPLING


< UNIT DISASSEMBLY AND ASSEMBLY >

[REAR FINAL DRIVE: R145]

: Apply anti-corrosion oil.

: Apply multi purpose grease.

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

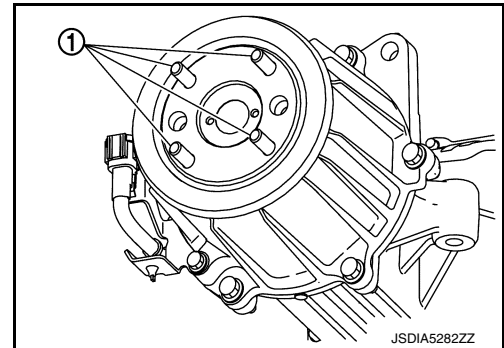
: Apply Genuine High Strength Thread Locking Sealant or equivalent. Refer to [GI-22, "Recommended Chemical Products and Sealants"](#).

Disassembly and Assembly

INFOID:000000010339785

DISASSEMBLY

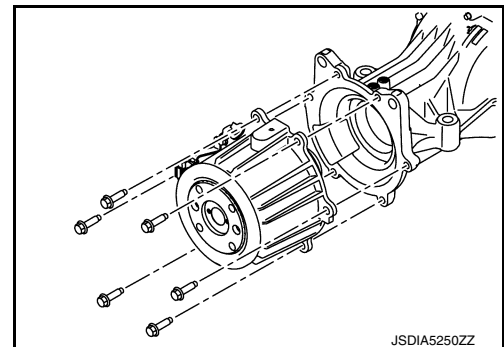
1. Remove stud bolts ①.



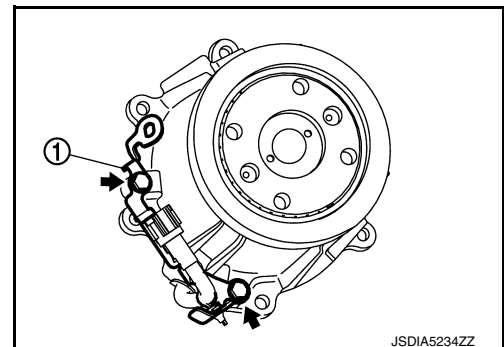
2. Remove electric controlled coupling assembly from final drive assembly.
3. Remove wave spring.
4. Remove drive pinion oil seal from the inside of gear carrier. Refer to [DLN-136, "Disassembly and Assembly"](#).

CAUTION:

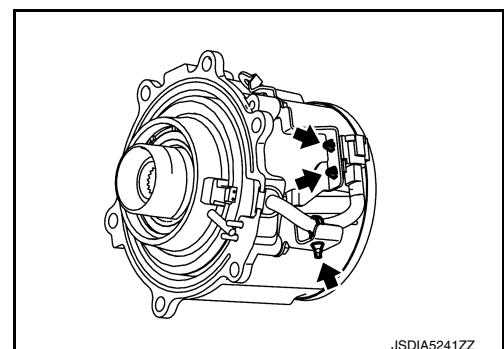
When removing electric controlled coupling, replace drive pinion oil seal.



5. Remove connector bracket ① from electric controlled coupling.



6. Separate band clip and connector clip from connector bracket.



ASSEMBLY

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ELECTRIC CONTROLLED COUPLING

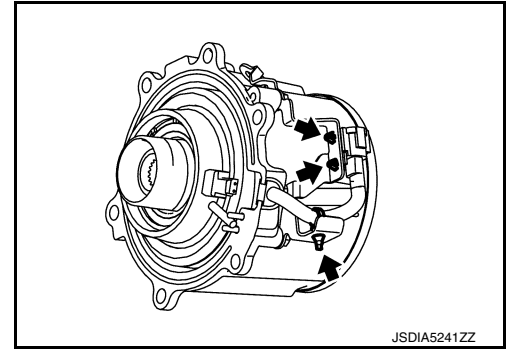
< UNIT DISASSEMBLY AND ASSEMBLY >

[REAR FINAL DRIVE: R145]

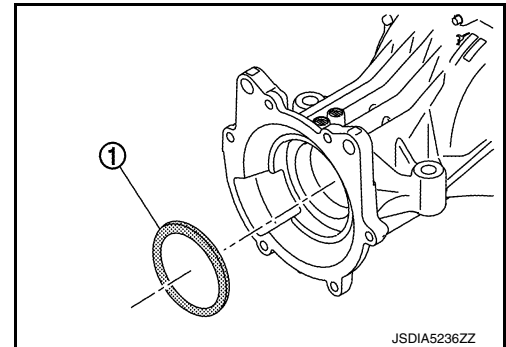
1. Install connector bracket to electric controlled coupling.
 - For tightening torque, refer to [DLN-120, "Exploded View"](#).
2. Fix AWD solenoid harness with band clip and connector clip.
3. Install drive pinion oil seal to the inside of gear carrier. Refer to [DLN-136, "Disassembly and Assembly"](#).

CAUTION:

When removing electric controlled coupling, replace drive pinion oil seal.



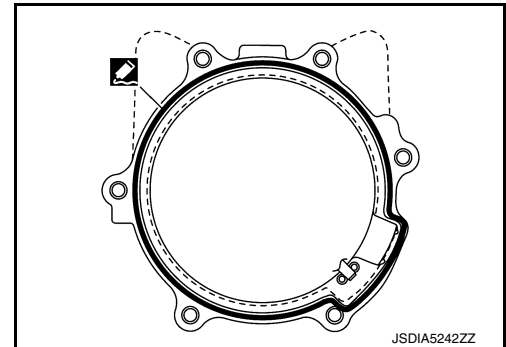
4. Install wave spring ① to the inside of gear carrier.



5. Apply liquid gasket to mating surface of electric controlled coupling assembly.

CAUTION:

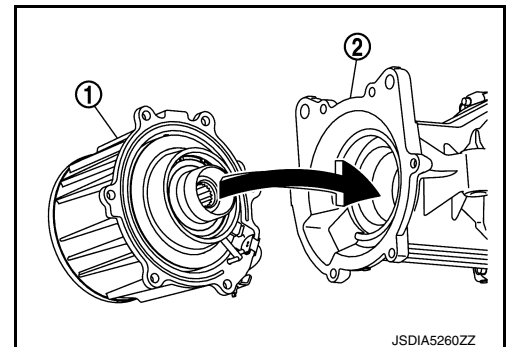
- Remove old gasket adhering to the mounting surfaces. Also remove any moisture, oil, or foreign material adhering to the mounting surfaces.
- The width of sealant bead is approximately 3 mm (0.12 in). Apply sealant evenly.



6. Match electric controlled coupling assembly ① to spline of drive pinion, then install it to final drive assembly ②.

CAUTION:

Be careful not to damage drive pinion oil seal.

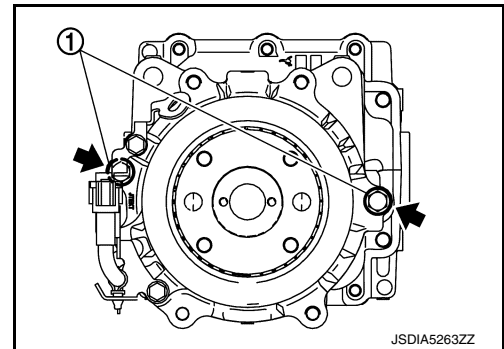


ELECTRIC CONTROLLED COUPLING

< UNIT DISASSEMBLY AND ASSEMBLY >

[REAR FINAL DRIVE: R145]

7. Temporarily tighten reamer bolts ① to the positions shown in the figure.
8. Tighten reamer bolts and electric controlled coupling assembly mounting bolts to the specified torque.
 - For tightening torque, refer to [DLN-120. "Exploded View"](#).



9. Install stud bolts ①.

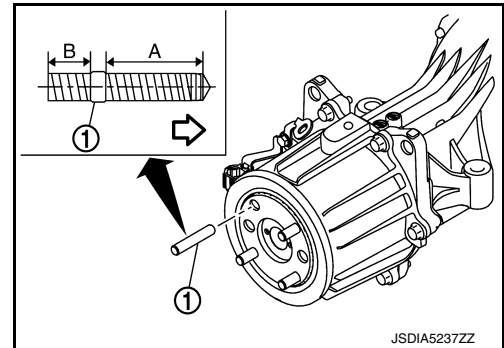
← : Electric controlled coupling side

Thread length

A : Long
B : Short

CAUTION:

- Never reuse stud bolt.
- Screw long thread side of stud bolt to electric controlled coupling.
- Screw the stud bolt until the stop by applying a torque of 15 N·m (1.5 kg-m, 11 ft-lb) $\pm 20\%$.
- After installing stud bolt, the length of the protrusion from electric controlled coupling must be 19.8 mm (0.780 in) ± 1.4 mm (0.055 in).



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DIFFERENTIAL ASSEMBLY

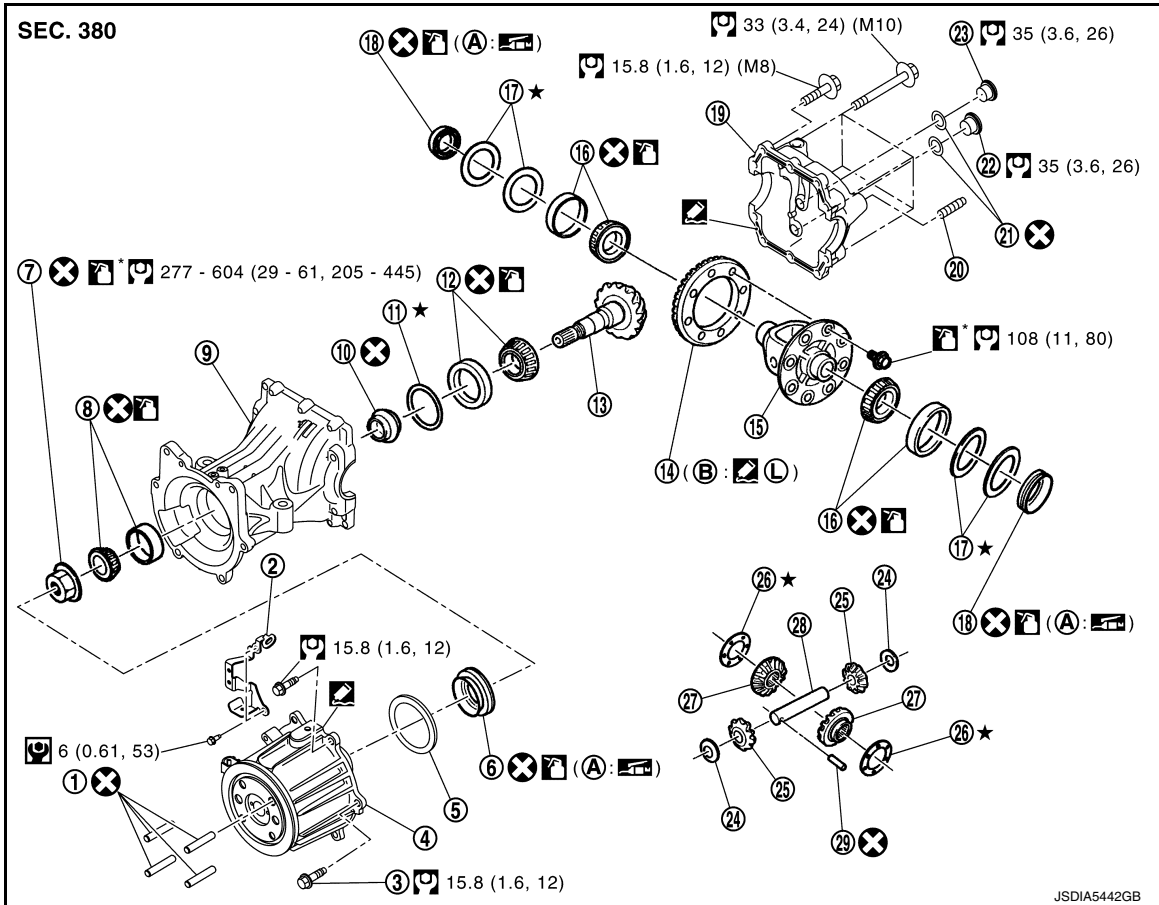
< UNIT DISASSEMBLY AND ASSEMBLY >

[REAR FINAL DRIVE: R145]

DIFFERENTIAL ASSEMBLY

Exploded View

INFOID:000000010339789



- | | | |
|---|-------------------------------|-----------------------------|
| ① Stud bolt | ② Connector bracket | ③ Reamer bolt |
| ④ Electric controlled coupling assembly | ⑤ Wave spring | ⑥ Drive pinion oil seal |
| ⑦ Drive pinion lock nut | ⑧ Pinion front bearing | ⑨ Gear carrier |
| ⑩ Collapsible spacer | ⑪ Drive pinion adjusting shim | ⑫ Pinion rear bearing |
| ⑬ Drive pinion | ⑭ Drive gear | ⑮ Differential case |
| ⑯ Side bearing | ⑰ Side bearing adjusting shim | ⑱ Side oil seal |
| ⑲ Rear cover | ⑳ Stud bolt | ㉑ Gasket |
| ㉒ Drain plug | ㉓ Filler plug | ㉔ Pinion mate thrust washer |
| ㉕ Pinion mate gear | ㉖ Side gear thrust washer | ㉗ Side gear |
| ㉘ Pinion mate shaft | ㉙ Lock pin | |

☞: N·m (kg-m, in-lb)

☞: N·m (kg-m, ft-lb)

⊗: Always replace after every disassembly.

★: Select with proper thickness.

☞: Apply gear oil.

☞*: Apply anti-corrosion oil.


☞: Apply multi purpose grease.

DIFFERENTIAL ASSEMBLY

< UNIT DISASSEMBLY AND ASSEMBLY >

[REAR FINAL DRIVE: R145]

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

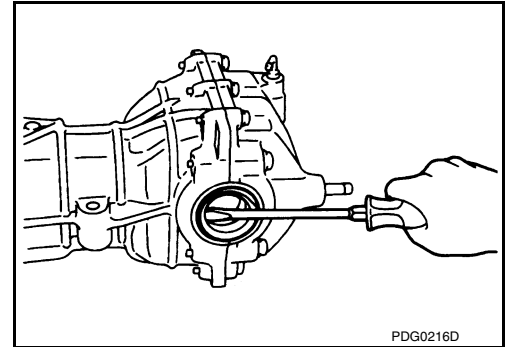
 Apply Genuine High Strength Thread Locking Sealant or equivalent. Refer to [GI-22. "Recommended Chemical Products and Sealants"](#).

Disassembly and Assembly

INFOID:000000010339790

DISASSEMBLY

1. Remove drain plug, filler plug and gaskets.
2. Remove the side oil seal, using oil seal remover (commercial service tool).
CAUTION:
Never damage gear carrier and rear cover.
3. Remove rear cover mounting bolts.



4. Set drifts (A and B) to the right and left side bearing adjusting shims individually. Press differential assembly with side bearing to remove gear carrier assembly and rear cover assembly.

A : Drift [SST: KV40100610 (J-26089)]

B : Drift [SST: KV40100610 (J-26089)]

CAUTION:

The pressure shall be as low as possible to remove gear carrier assembly and rear cover assembly. The maximum pressure shall be 10 kN (1 ton, 1.0 Imp ton).

NOTE:

Differential assembly, side bearings, and adjusting washers are compressed and integrated in gear carrier and rear cover.

5. Remove stud bolt from rear cover.
NOTE:
It is not necessary to remove stud bolt except when it is replaced.
6. Remove side bearing adjusting shims and side bearing outer races.

CAUTION:

Mark the side bearing adjusting shims so that the original mounting positions (right/left) can be identified later.

7. Remove side bearing inner races, using adaptor (A), separator (B) and puller (C).

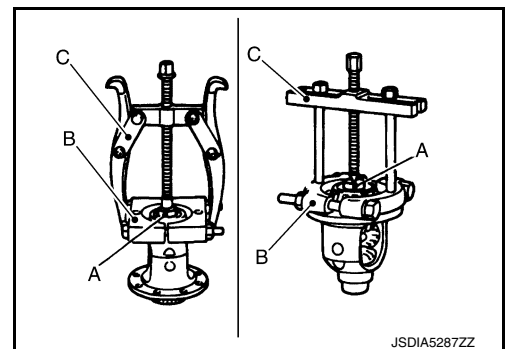
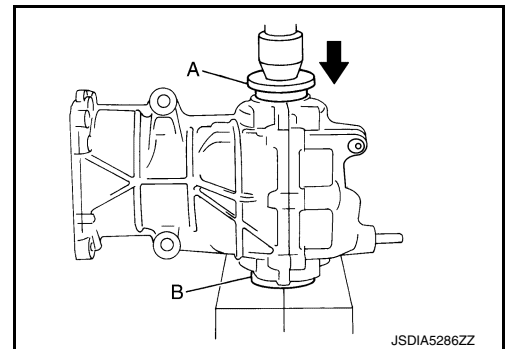
A : Adaptor [ST33052000 (—)]

B : Separator (commercial service tool)

C : Puller (commercial service tool)

CAUTION:

- To prevent damage to the side bearing and drive gear, place copper plates between these parts and vise.
- It is not necessary to remove side bearing inner race except when it is replaced.



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DIFFERENTIAL ASSEMBLY

< UNIT DISASSEMBLY AND ASSEMBLY >

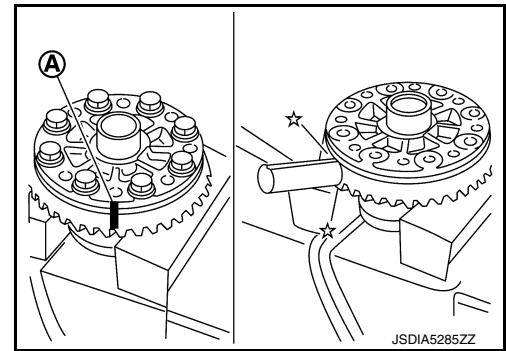
[REAR FINAL DRIVE: R145]

8. For proper reinstallation, paint matching marks (A) on one differential assembly and drive gear.

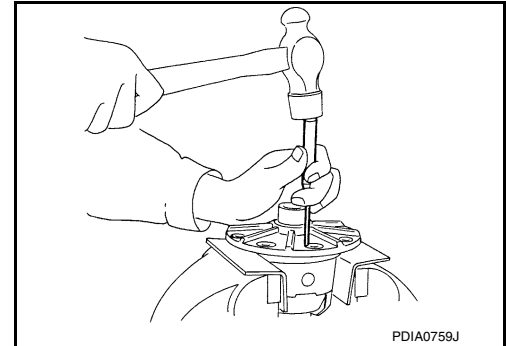
CAUTION:

For matching marks, use paint. Never damage differential assembly and drive gear.

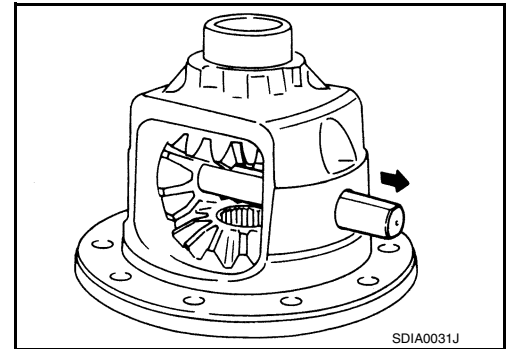
9. Remove drive gear mounting bolts and then remove drive gear from differential assembly.



10. Remove lock pin of pinion mate shaft, using the pin punch (commercial service tool).

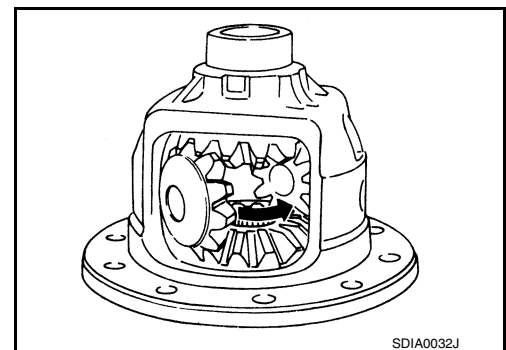


11. Remove pinion mate shaft.



12. Remove pinion mate gears, pinion mate thrust washers, side gears, side gear thrust washers from differential case.

13. Perform inspection after disassembly. Refer to [DLN-134, "Inspection"](#).



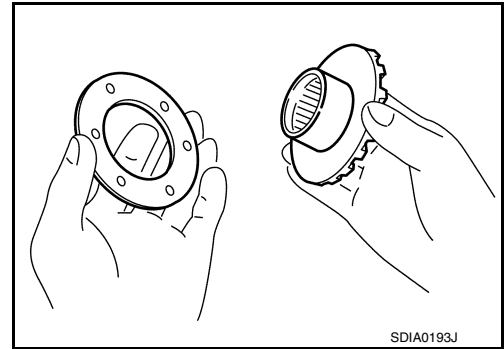
ASSEMBLY

DIFFERENTIAL ASSEMBLY

< UNIT DISASSEMBLY AND ASSEMBLY >

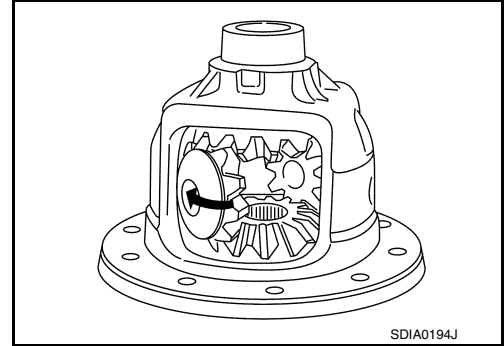
[REAR FINAL DRIVE: R145]

1. Install side gear thrust washers with the same thickness as the ones installed prior to disassembly or reinstall the old ones on the side gears.
2. Install side gears and side gear thrust washers into differential case.



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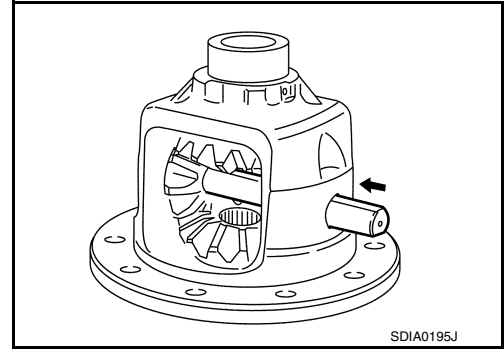
3. Align 2 pinion mate gears in diagonally opposite positions, then rotate and install them into differential case after installing thrust washer to pinion mate gear.



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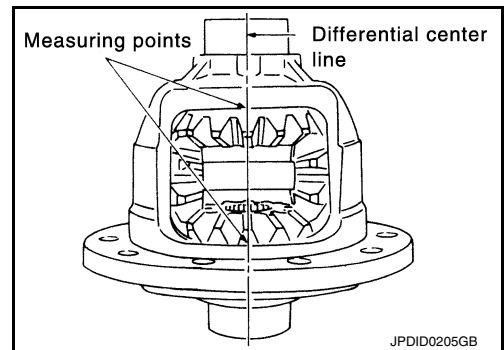
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4. Align the lock pin holes on differential case with pinion mate shaft, and install pinion mate shaft.



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5. Measure side gear end play. If necessary, select the appropriate side gear thrust washers.
 - a. Place differential assembly straight up so that side gear to be measured comes upward.



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DIFFERENTIAL ASSEMBLY

< UNIT DISASSEMBLY AND ASSEMBLY >

[REAR FINAL DRIVE: R145]

- b. Using feeler gauge, measure the clearance between side gear back and differential case at 3 different points, while rotating side gear. Average the 3 readings, and then measure the clearance of the other side as well.

Side gear back clearance : Refer to [DLN-141, "Differential Side Gear Clearance"](#).

CAUTION:

To prevent side gear from tilting, insert feeler gauges with the same thickness from both sides.

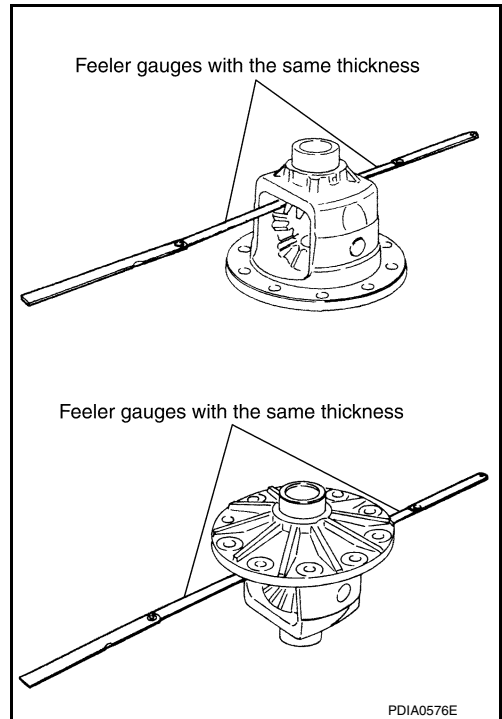
- If the back clearance is outside the specification, use a thicker/thinner side gear thrust washer to adjust. For selecting thrust washer, refer to the latest parts information.

When the back clearance is large : Use a thicker thrust washer.

When the back clearance is small : Use a thinner thrust washer.

CAUTION:

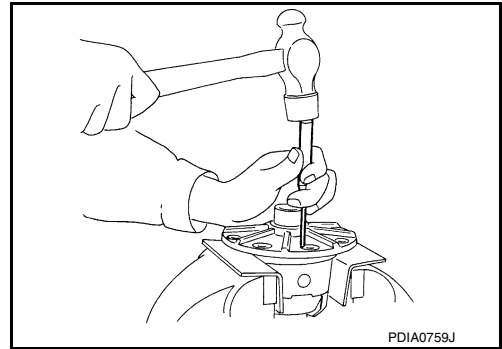
Select a side gear thrust washer for right and left individually.



6. Drive a lock pin into pinion mate shaft, using the pin punch (commercial service tool).

CAUTION:

Never reuse lock pin.

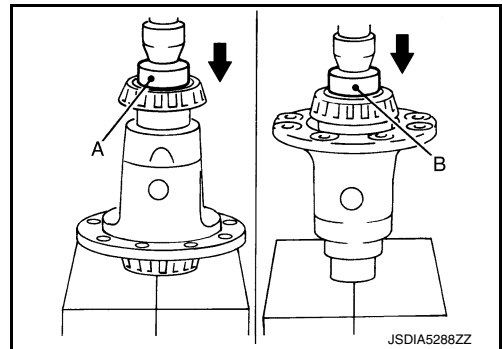


7. Press side bearing inner races to differential assembly, using the drifts (A and B).

- A : Drift [SST: KV40105020 (—)]
- B : Drift [SST: KV40105020 (—)]

CAUTION:

- Never reuse side bearing inner race.
- Apply gear oil to side bearing.



8. Apply thread locking sealant into the thread hole of drive gear.

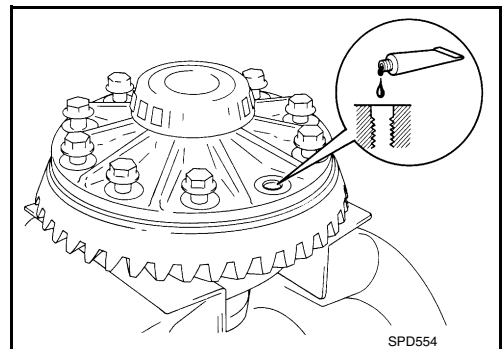
CAUTION:

Clean and degrease drive gear back and threaded holes sufficiently.

9. Install the drive gear to differential assembly.

CAUTION:

Align the matching mark of differential assembly and drive gear.



DIFFERENTIAL ASSEMBLY

< UNIT DISASSEMBLY AND ASSEMBLY >

[REAR FINAL DRIVE: R145]

10. Tighten the bolts in a crisscross fashion to the specified torque.
- For tightening torque, refer to [DLN-124, "Exploded View"](#).

CAUTION:

Apply anti-corrosion oil to the thread and seat of mounting bolts.

11. Assemble side bearing outer races to inner races.

CAUTION:

- **Never reuse side bearing outer race.**
- **Apply gear oil to side bearing.**

12. Install new side bearing adjusting shims (2 pieces for one side) with the same thickness as the ones installed prior to disassembly or re-install the old ones, on side bearing outer race of differential assembly.

If side bearing adjusting shims have been already selected, use them.

13. Set the drifts (A and B) to the right and left side bearing adjusting shims individually. Compress differential assembly and side bearing to gear carrier assembly to install differential assembly.

A : Drift [KV40100610 (J-26089)]

B : Drift [KV40100610 (J-26089)]

CAUTION:

- **The drift shall be placed on the center of the adjusting shims.**
- **The pressure shall be as low as possible to install differential assembly into gear carrier assembly. The maximum pressure shall be 10 kN (1 ton, 1.1 US ton, 1.0 Imp ton).**
- **If the adjusting shims are installed by tapping, the gear carrier may be damaged. Avoid tapping.**

14. Install dummy cover set [SST: KV381086S1 (—)], check and adjust drive gear runout, tooth contact, backlash, and total preload torque. Refer to [DLN-130, "Adjustment"](#).

15. Remove dummy cover set.

16. Install stud bolt to rear cover.

CAUTION:

Screw the stud bolt until the thread becomes invisible by applying a torque of 20 N·m (2.0 kg-m, 15 ft-lb) or less.

17. Apply liquid gasket to mating surface of rear cover.

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 bead is approximately 3 mm (0.12 in). Apply sealant evenly.**

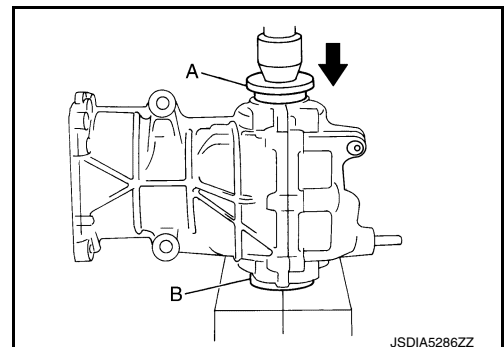
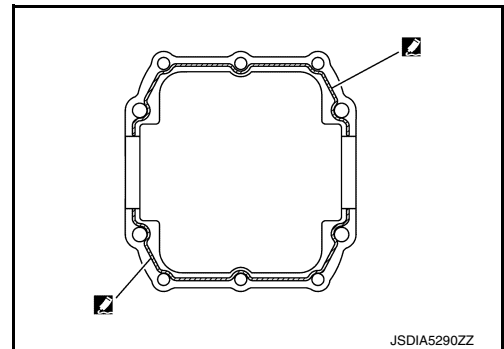
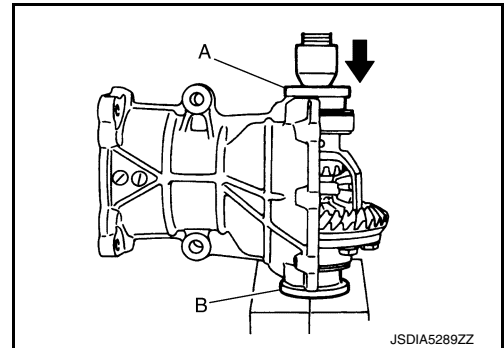
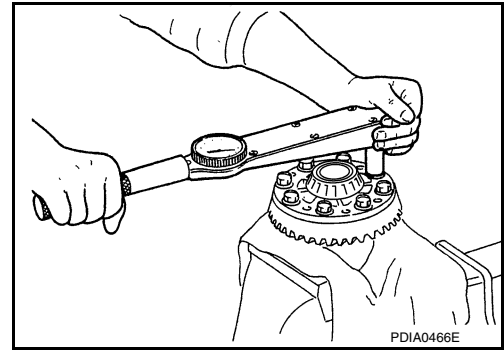
18. Set the drifts (A and B) to the right and left side bearing adjusting shims individually. Compress differential assembly and side bearing to install rear cover.

A : Drift [KV40100610 (J-26089)]

B : Drift [KV40100610 (J-26089)]

CAUTION:

- **The drift shall be placed on the center of the adjusting shims.**



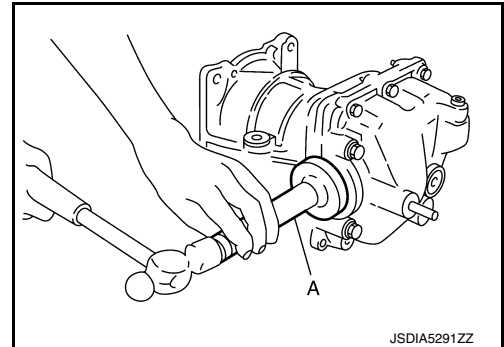
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DIFFERENTIAL ASSEMBLY

< UNIT DISASSEMBLY AND ASSEMBLY >

[REAR FINAL DRIVE: R145]

- The pressure shall be as low as possible to install differential assembly into gear carrier assembly. The maximum pressure shall be 10 kN (1 ton, 1.1 US ton, 1.0 Imp ton).
 - If the adjusting shims are installed by tapping, the gear carrier may be damaged. Avoid tapping.
19. Tighten rear cover mounting bolts to the specified torque.
 - For tightening torque, refer to [DLN-124, "Exploded View"](#).
 20. Using the drift (A) [SST: KV38100200 (J-26233)], drive side oil seals until it becomes flush with the gear carrier end.
CAUTION:
 - Never reuse oil seals.
 - When installing, do not incline oil seals.
 - Apply multi-purpose grease onto oil seal lips, and gear oil onto the circumference of oil seal.
 21. Check total preload torque. Refer to [DLN-130, "Adjustment"](#).



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Adjustment

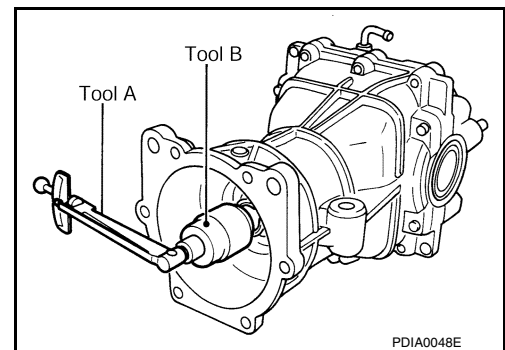
TOTAL PRELOAD TORQUE

1. Remove electric controlled coupling assembly. Refer to [DLN-121, "Disassembly and Assembly"](#).
2. Rotate drive pinion back and forth 2 to 3 times to check for unusual noise and rotation malfunction.
3. Rotate drive pinion at least 20 times to check for smooth operation of the bearing.
4. Fit drive pinion socket onto drive pinion spline. Measure the total preload, using the preload gauge and drive pinion socket.

- A : Preload gauge [SST: ST3127S000 (J-25765-A)]
B : Drive pinion socket [SST: KV38109500 (—)]

Standard

Total preload torque : Refer to [DLN-141, "Preload Torque"](#).



NOTE:

Total preload torque = Pinion bearing torque + Side bearing torque

- If measured value is out of the specification, disassemble it to check and adjust each part. Adjust the pinion bearing preload and side bearing preload.
Adjust the pinion bearing preload first, then adjust the side bearing preload.

When the preload torque is large

On pinion bearings: Replace the collapsible spacer.

On side bearings: Use thinner side bearing adjusting shims. For selecting adjusting shim, refer to the latest parts information.

When the preload is small

On pinion bearings: Tighten the drive pinion nut.

On side bearings: Use thicker side bearing adjusting shims. For selecting adjusting shim, refer to the latest parts information.

DRIVE GEAR RUNOUT

1. Remove rear cover. Refer to [DLN-125, "Disassembly and Assembly"](#).
2. Following the procedure below, install a dummy cover set [SST: KV381086S1 (—)] to gear carrier.

DIFFERENTIAL ASSEMBLY

< UNIT DISASSEMBLY AND ASSEMBLY >

[REAR FINAL DRIVE: R145]

- a. Set dummy cover shims [SST: KV38108630 (—)] to the right and left side bearing adjusting shims.
- b. Temporarily tighten dummy cover [SST: KV38108610 (—)] to gear carrier.
- c. Position dummy cover spacers [SST: KV38108621 (—)] to dummy cover [SST: KV38108610 (—)].
- d. Tighten rear cover mounting bolts to the specified torque. Refer to [DLN-124, "Exploded View"](#).
- e. Tighten dummy cover spacer mounting bolts evenly to the specified torque.

 : 5.9 N·m (0.6 kg-m, 52 in-lb)

3. Fit a dial indicator to the drive gear back face.
4. Rotate the drive gear to measure runout.

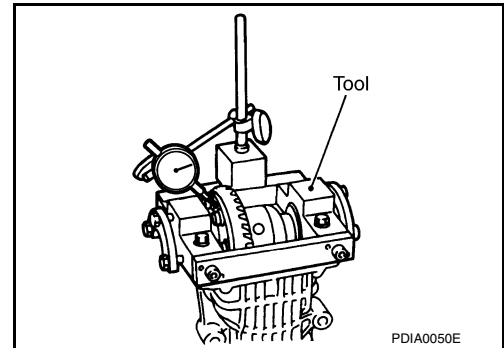
Limit

Drive gear back face runout : Refer to [DLN-141, "Drive Gear Runout"](#).

- If the runout is outside of the repair limit, check drive gear assembly condition; foreign material may be caught between drive gear and differential case, or differential case or drive gear may be deformed, etc.

CAUTION:

Replace drive gear and drive pinion as a set.



TOOTH CONTACT

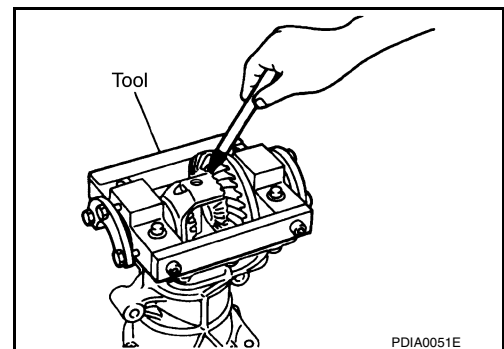
1. Remove rear cover. Refer to [DLN-125, "Disassembly and Assembly"](#).
2. Following the procedure below, install a dummy cover set [SST: KV381086S1 (—)] to gear carrier.
 - a. Set dummy cover shims [SST: KV38108630 (—)] to the right and left side bearing adjusting shims.
 - b. Temporarily tighten dummy cover [SST: KV38108610 (—)] to gear carrier.
 - c. Position dummy cover spacers [SST: KV38108621 (—)] to dummy cover [SST: KV38108610 (—)].
 - d. Tighten rear cover mounting bolts to the specified torque. Refer to [DLN-124, "Exploded View"](#).
 - e. Tighten dummy cover spacer mounting bolts evenly to the specified torque.

 : 5.9 N·m (0.6 kg-m, 52 in-lb)

3. Apply red lead to drive gear.

CAUTION:

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



DIFFERENTIAL ASSEMBLY

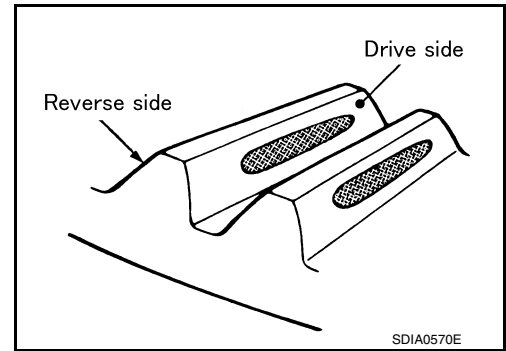
< UNIT DISASSEMBLY AND ASSEMBLY >

[REAR FINAL DRIVE: R145]

4. Rotate drive gear back and forth several times, check drive pinion gear to drive gear tooth contact.

CAUTION:

Check tooth contact on drive side and reverse side.



Tooth Contact Judgment Guide

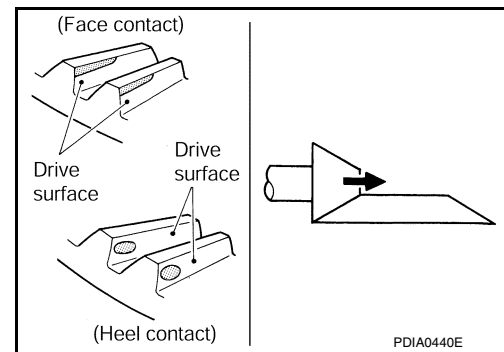
Tooth contact condition		Drive pinion adjusting shim selection value [mm (in)]	Adjustment (Yes/No)	Possible cause	
Drive side	Back side				
Heel side 	Toe side 	↑ Thicker	Yes	Occurrence of noise and scoring sound in all speed ranges.	
					+0.09 (+0.0035)
					+0.06 (+0.0024)
		↓ Thinner	No	-	
					+0.03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

DIFFERENTIAL ASSEMBLY

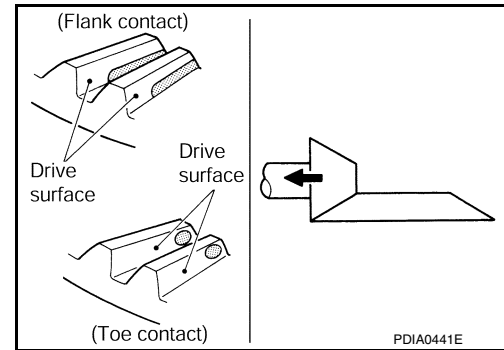
< UNIT DISASSEMBLY AND ASSEMBLY >

[REAR FINAL DRIVE: R145]

- If the tooth contact is near the face (face contact), or near the heel (heel contact), thicken drive pinion gear adjusting shim to move drive pinion closer to drive gear. For selecting adjusting shim, refer to the latest parts information.



- If the tooth contact is near the flank (flank contact), or near the toe (toe contact), thin drive pinion gear adjusting shim to move drive pinion farther from drive gear. For selecting adjusting shim, refer to the latest parts information.



BACKLASH

1. Remove rear cover. Refer to [DLN-125, "Disassembly and Assembly"](#).
2. Following the procedure below, install a dummy cover set [SST: KV381086S1 (—)] to gear carrier.
 - a. Set dummy cover shims [SST: KV38108630 (—)] to the right and left side bearing adjusting shims.
 - b. Temporarily tighten dummy cover [SST: KV38108610 (—)] to gear carrier.
 - c. Position dummy cover spacers [SST: KV38108621 (—)] to dummy cover [SST: KV38108610 (—)].
 - d. Tighten rear cover mounting bolts to the specified torque. Refer to [DLN-124, "Exploded View"](#).
 - e. Tighten dummy cover spacer mounting bolts evenly to the specified torque.

 : 5.9 N·m (0.6 kg-m, 52 in-lb)

3. Fit a dial indicator to the drive gear face to measure the backlash.

Standard

Backlash : Refer to [DLN-141, "Backlash"](#).

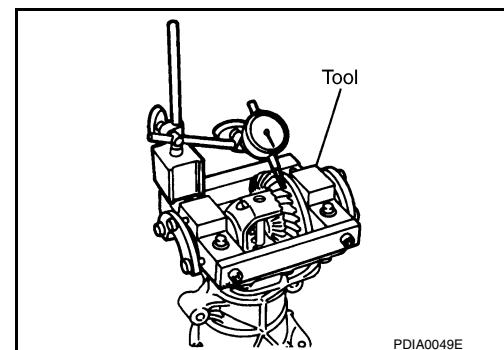
- If the backlash is outside of the specified value, change the thickness of side bearing adjusting shims.

When the backlash is large:

Make drive gear back adjusting shims thicker, and drive gear front adjusting shims thinner. For selecting adjusting shim, refer to the latest parts information.

When the backlash is small:

Make drive gear back adjusting shims thinner, and drive gear front adjusting shims thicker. For selecting adjusting shim, refer to the latest parts information.



DIFFERENTIAL ASSEMBLY

< UNIT DISASSEMBLY AND ASSEMBLY >

[REAR FINAL DRIVE: R145]

Inspection

INFOID:000000010339792

INSPECTION AFTER DISASSEMBLY

Drive Gear and Drive Pinion

- Clean up the disassembled parts.
- If the gear teeth never mesh or line-up correctly, determine the cause and adjust or replace as necessary.
- If the gears are worn, cracked, damaged, pitted or chipped (by friction) noticeably, replace with new drive gear and drive pinion as a set.

Bearing

- Clean up the disassembled parts.
- If any chipped (by friction), pitted, worn, rusted or scratched marks, or unusual noise from the bearing is observed, replace as a bearing assembly (as a new set).

Oil Seal

- Whenever disassembled, replace.
- If wear, deterioration of adherence (sealing force lips), or damage is detected on the lips, replace them.

Differential Assembly

DIFFERENTIAL CASE

- Clean up the disassembled parts.
- If any wear or crack on the contact sides of the differential case is found, replace.

SIDE GEAR AND PINION MATE GEAR

- Clean up the disassembled parts.
- If any cracks or damage on the surface of the tooth is found, replace.
- If any worn or chipped mark on the contact sides of the thrust washer is found, replace.

SIDE GEAR THRUST WASHER AND PINION MATE THRUST WASHER

- Clean up the disassembled parts.
- If it is chipped (by friction), damaged, or unusually worn, replace.

DRIVE PINION

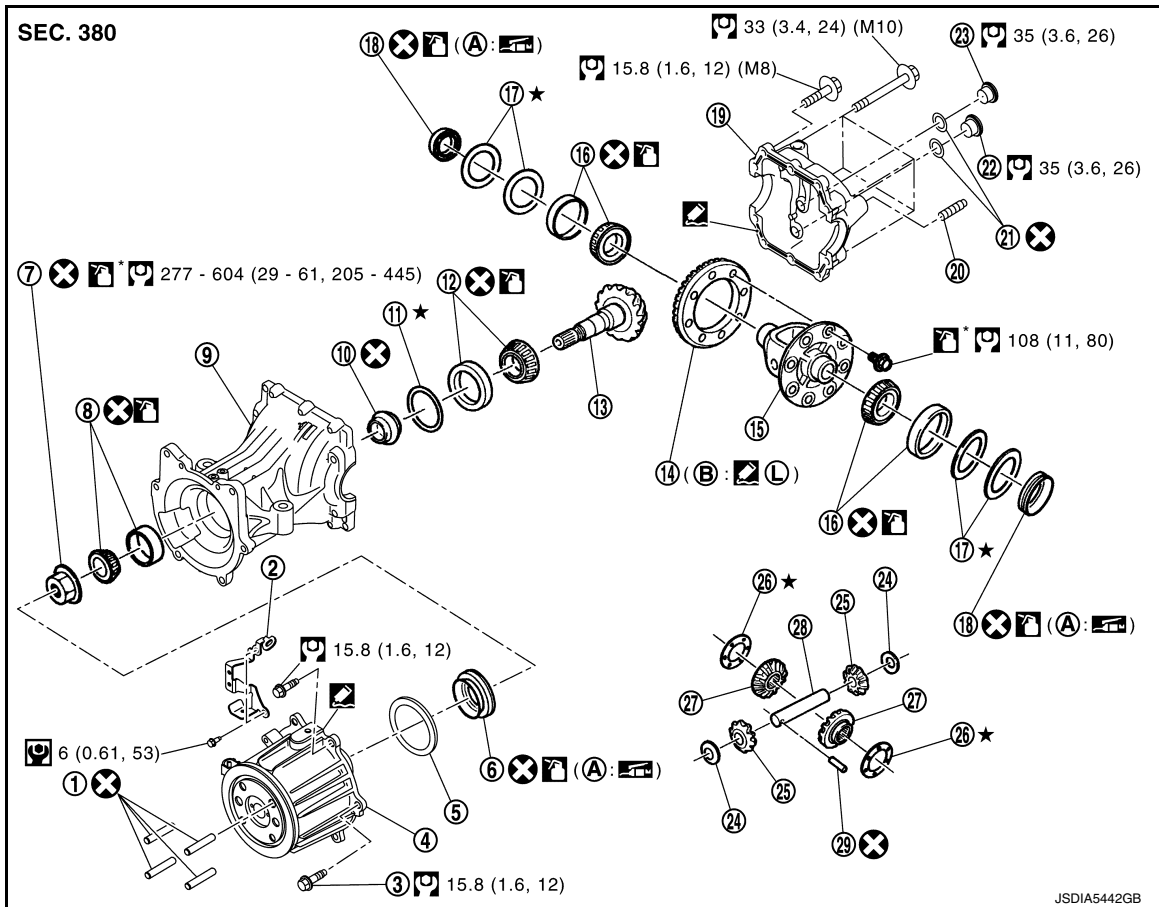
< UNIT DISASSEMBLY AND ASSEMBLY >

[REAR FINAL DRIVE: R145]

DRIVE PINION

Exploded View

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- | | | |
|---|-------------------------------|-----------------------------|
| ① Stud bolt | ② Connector bracket | ③ Reamer bolt |
| ④ Electric controlled coupling assembly | ⑤ Wave spring | ⑥ Drive pinion oil seal |
| ⑦ Drive pinion lock nut | ⑧ Pinion front bearing | ⑨ Gear carrier |
| ⑩ Collapsible spacer | ⑪ Drive pinion adjusting shim | ⑫ Pinion rear bearing |
| ⑬ Drive pinion | ⑭ Drive gear | ⑮ Differential case |
| ⑯ Side bearing | ⑰ Side bearing adjusting shim | ⑱ Side oil seal |
| ⑲ Rear cover | ⑳ Stud bolt | ㉑ Gasket |
| ㉒ Drain plug | ㉓ Filler plug | ㉔ Pinion mate thrust washer |
| ㉕ Pinion mate gear | ㉖ Side gear thrust washer | ㉗ Side gear |
| ㉘ Pinion mate shaft | ㉙ Lock pin | |
| (A) Oil seal lip | (B) Screw hole | |

: N·m (kg-m, in-lb)

: N·m (kg-m, ft-lb)

: Always replace after every disassembly.

★: Select with proper thickness.

: Apply gear oil.

: Apply anti-corrosion oil.

: Apply multi purpose grease.


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DRIVE PINION

< UNIT DISASSEMBLY AND ASSEMBLY >

[REAR FINAL DRIVE: R145]

: 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 and Assembly

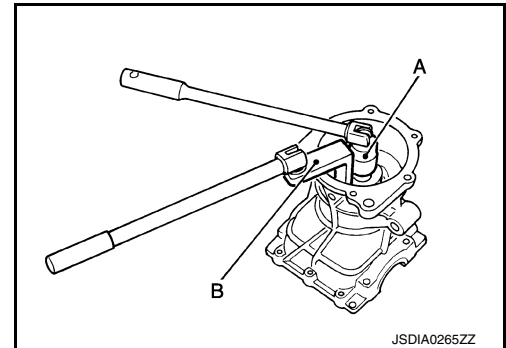
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DISASSEMBLY

1. Remove electric controlled coupling assembly. Refer to [DLN-121, "Disassembly and Assembly"](#).
2. Remove differential assembly. Refer to [DLN-125, "Disassembly and Assembly"](#).
3. Remove drive pinion oil seal, using oil seal remover (commercial service tool).
4. Fit drive pinion socket (A) onto drive pinion spline. Remove drive pinion lock nut, using the pinion nut wrench (B).

A : Drive pinion socket [SST: KV38109500 (—)]

B : Pinion nut wrench [SST: KV38109400 (—)]

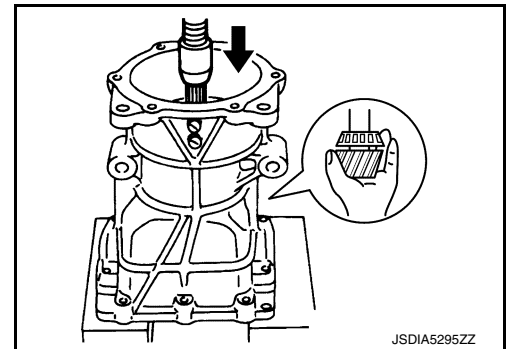


5. Press drive pinion assembly out of gear carrier.

CAUTION:

Never drop drive pinion assembly.

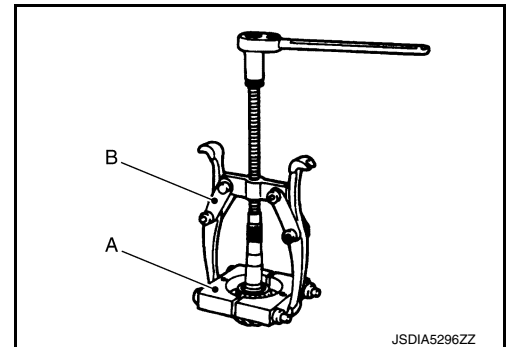
6. Remove pinion front bearing inner race.
7. Remove collapsible spacer.



8. Remove pinion rear bearing inner race from drive pinion, using the separator (A) and the puller (B).

A : Separator (commercial service tool)

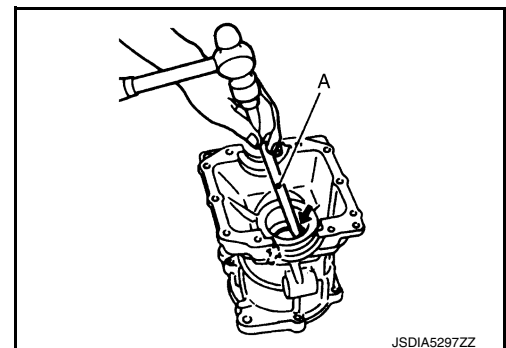
B : Puller (commercial service tool)



9. Using a brass rod or equivalent (A), tap pinion front bearing outer race evenly from the 2 cutouts on gear carrier and remove pinion front bearing outer race.

CAUTION:

Be careful not to damage gear carrier.



DRIVE PINION

< UNIT DISASSEMBLY AND ASSEMBLY >

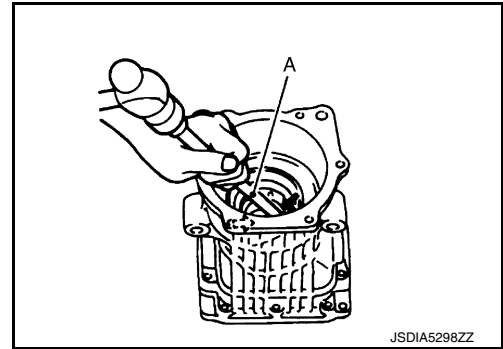
[REAR FINAL DRIVE: R145]

10. Using a brass rod or equivalent (A), tap drive pinion adjusting shim evenly from the 2 cutouts on gear carrier and remove drive pinion adjusting shim and pinion rear bearing outer race.

CAUTION:

Be careful not to damage gear carrier.

11. Perform inspection after disassembly. Refer to [DLN-140](#), "[Inspection](#)".

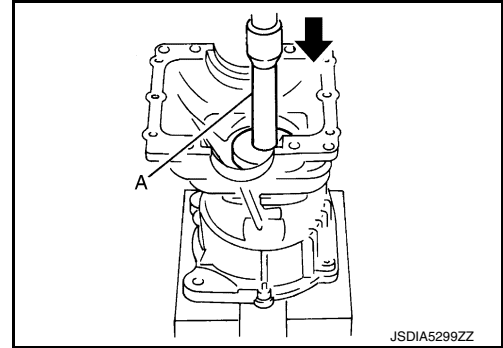


ASSEMBLY

1. Install a drive pinion adjusting shim of the same thickness as was installed prior to disassembly. Press pinion rear bearing outer race into gear carrier, using the drift (A) [SST: ST17130000 (—)].

CAUTION:

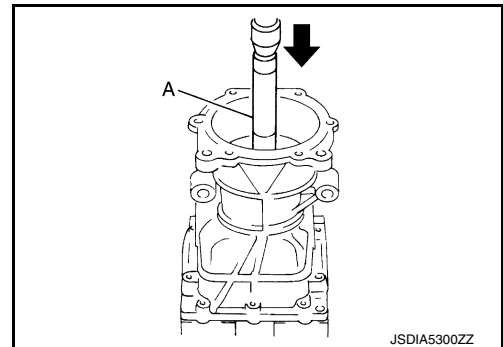
- At first, using a hammer, tap bearing outer race until it becomes flush to gear carrier.
- Never reuse pinion rear bearing outer race.



2. Press pinion front bearing outer race into gear carrier, using the drift (A) [SST: ST33230000 (J-25805-01)].

CAUTION:

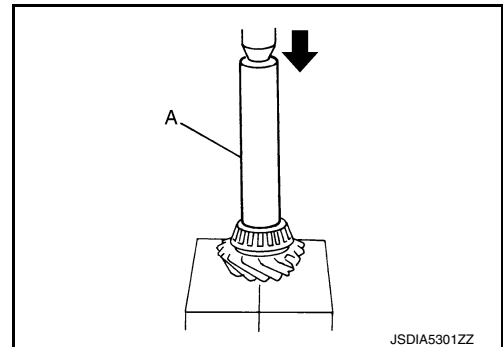
- At first, using a hammer, tap bearing outer race until it becomes flush to gear carrier.
- Never reuse pinion front bearing outer race.



3. Press pinion rear bearing inner race to drive pinion, using the drift (A) [SST: ST23860000 (—)].

CAUTION:

Never reuse pinion rear bearing inner race.



4. Check and adjust the tooth contact and back lash of drive gear and drive pinion following the procedure below.

- a. Assemble drive pinion into gear carrier.

CAUTION:

- Never assemble collapsible spacer.
- Apply gear oil to pinion rear bearing.

- b. Assemble pinion front bearing inner race to drive pinion assembly.

CAUTION:

- Never reuse pinion front bearing inner race.
- Apply gear oil to pinion front bearing.

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< UNIT DISASSEMBLY AND ASSEMBLY >

[REAR FINAL DRIVE: R145]

- c. Using the drifts (A and C) and press stand (B), press pinion front bearing inner race to drive pinion as far as drive pinion lock nut can be tightened.

- A : Drift [SST: KV40100610 (J-26089)]
- B : Press stand [SST: ST38220000 (—)]
- C : Drift [SST: ST23860000 (—)]

- d. Temporarily tighten removed drive pinion lock nut to drive pinion.

NOTE:

Use removed drive pinion lock nut only for the preload measurement.

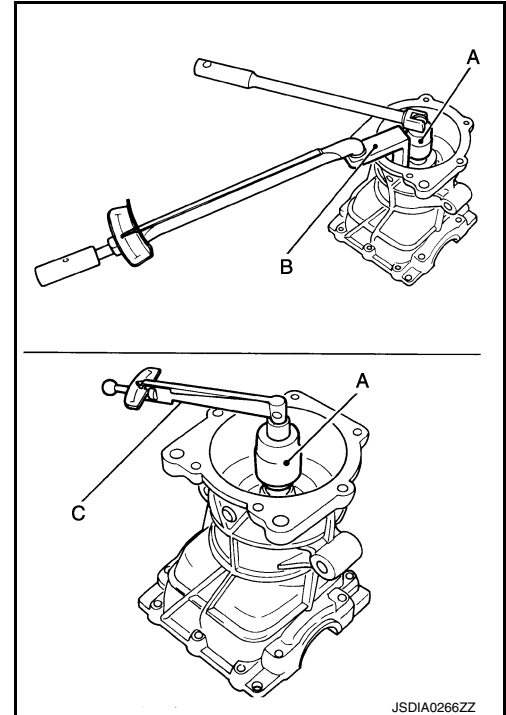
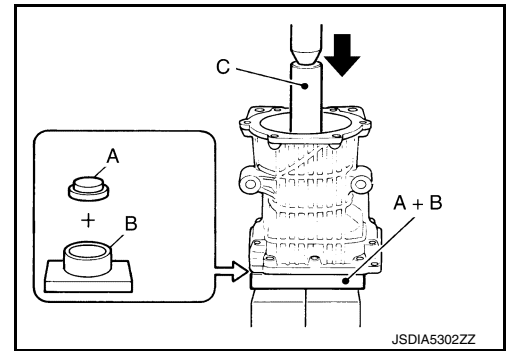
- e. Rotate drive pinion more than 20 times to adjust bearing.
- f. Fit the drive pinion socket (A) onto the drive pinion. Using the pinion nut wrench (B), tighten drive pinion lock nut holding drive pinion, while adjusting pinion bearing preload torque using preload gauge (C).

- A : Drive pinion socket [SST: KV38109500 (—)]
- B : Pinion nut wrench [SST: KV38109400 (—)]
- C : Preload gauge [SST: ST3127S000 (J-25765-A)]

Pinion bearing preload : Refer to [DLN-141, "Preload Torque"](#).

CAUTION:

Drive pinion lock nut is tightened with no collapsible spacer. Be careful not to overtighten it. While measuring the preload, tighten it by 5° to 10°.



- g. Install new side bearing adjusting shims (2 pieces for one side) with the same thickness or re-install the old ones to the same mounting position they were in prior to disassembly. Install differential assembly to gear carrier. Refer to [DLN-125, "Disassembly and Assembly"](#).

CAUTION:

Apply differential gear oil to the side bearings.

- h. Check and adjust tooth contact, drive gear to drive pinion backlash. Refer to [DLN-130, "Adjustment"](#).
- i. Remove differential assembly.
- j. Remove drive pinion assembly from gear carrier
- k. Remove drive pinion nut and press drive pinion assembly out of gear carrier.
- l. Remove pinion front bearing inner race.

DRIVE PINION

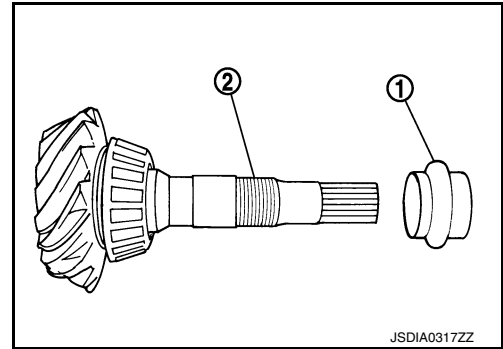
< UNIT DISASSEMBLY AND ASSEMBLY >

[REAR FINAL DRIVE: R145]

5. Assemble collapsible spacer ① to drive pinion ②.

CAUTION:

- Be careful of the mounting direction of collapsible spacer.
- Never reuse collapsible spacer.



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6. Assemble drive pinion into gear carrier.

CAUTION:

Apply gear oil to pinion rear bearing.

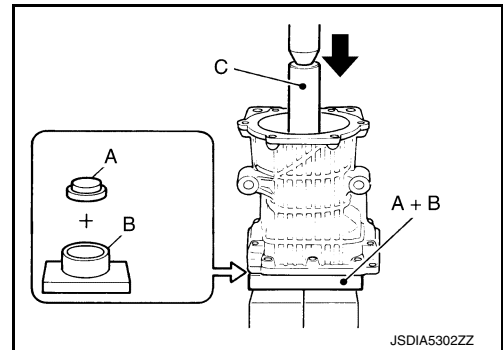
7. Assemble pinion front bearing inner race to drive pinion assembly.

CAUTION:

- Never reuse pinion front bearing inner race.
- Apply gear oil to pinion front bearing.

8. Using the drifts (A and C) and press stand (B), press pinion front bearing inner race to drive pinion as far as drive pinion lock nut can be tightened.

- A : Drift [SST: KV40100610 (J-26089)]
- B : Press stand [SST: ST38220000 (—)]
- C : Drift [SST: ST23860000 (—)]



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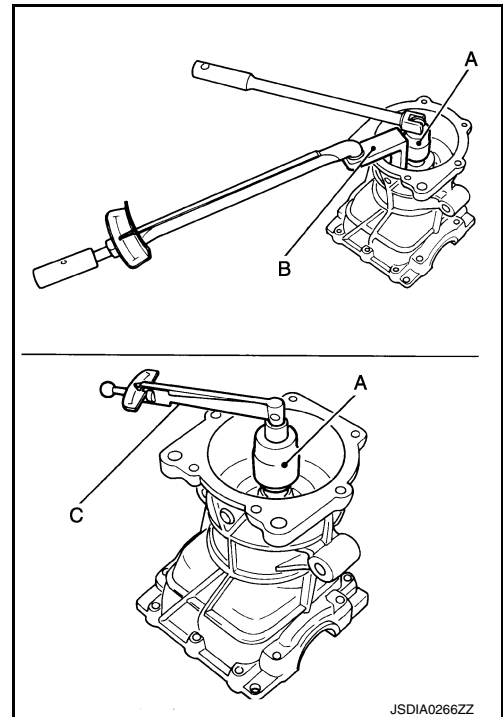
9. Apply anti-corrosion oil to the thread and seat of drive pinion lock nut, and temporarily tighten drive pinion lock nut to drive pinion.

CAUTION:

Never reuse drive pinion lock nut.

10. Fit the drive pinion socket (A) onto the drive pinion. While holding drive pinion, tighten drive pinion lock nut within the limits of specified torque so as to keep the pinion bearing preload within a standard values, using the pinion nut wrench (B) and the preload gauge (C).

- A : Drive pinion socket [SST: KV38109500 (—)]
- B : Pinion nut wrench [SST: KV38109400 (—)]
- C : Preload gauge [SST: ST3127S000 (J-25765-A)]



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Drive pinion lock nut tightening torque : Refer to [DLN-135, "Exploded View"](#).

Pinion bearing preload : Refer to [DLN-141, "Preload Torque"](#).

CAUTION:

- Adjust the lower limit of the drive pinion lock nut tightening torque first.
- If the preload torque exceeds the specified value, replace collapsible spacer and tighten it again to adjust. Never loose n drive pinion lock nut to adjust the preload torque.
- After adjustment, rotate drive pinion back and forth 2 to 3 times to check for unusual noise, rotation malfunction, and other malfunctions.

11. Install differential assembly. Refer to [DLN-125, "Disassembly and Assembly"](#).

CAUTION:

Never install rear cover at this timing.

DRIVE PINION

< UNIT DISASSEMBLY AND ASSEMBLY >

[REAR FINAL DRIVE: R145]

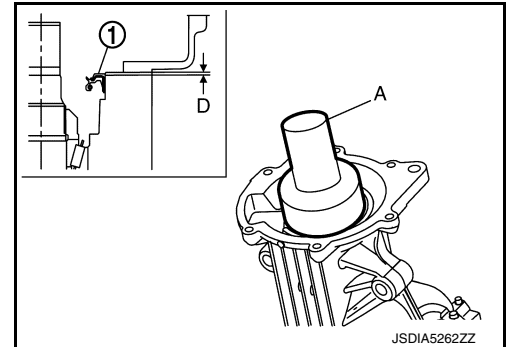
12. Check and adjust drive gear runout, tooth contact, and drive gear to drive pinion backlash. Refer to [DLN-130, "Adjustment"](#).
13. Remove dummy cover set [SST: KV381086S1 (—)], then install rear cover, and side oil seal. Refer to [DLN-125, "Disassembly and Assembly"](#).
14. Check total preload torque. Refer to [DLN-130, "Adjustment"](#).
15. Using the drift (A) [SST: ST35271000 (J-26091)], install drive pinion oil seal ① within the dimension (D) shown as follows.

D : 0.8 – 1.2 mm (0.031 – 0.047 in)

CAUTION:

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

16. Install electric controlled coupling assembly. Refer to [DLN-121, "Disassembly and Assembly"](#).



Inspection

INFOID:000000010339797

INSPECTION AFTER DISASSEMBLY

Drive Gear and Drive Pinion

- Clean up the disassembled parts.
- If the gear teeth never mesh or line-up correctly, determine the cause and adjust or replace as necessary.
- If the gears are worn, cracked, damaged, pitted or chipped (by friction) noticeably, replace with new drive gear and drive pinion as a set.

Bearing

- Clean up the disassembled parts.
- If any chipped (by friction), pitted, worn, rusted or scratched marks, or unusual noise from the bearing is observed, replace as a bearing assembly (as a new set).

Oil Seal

- Whenever disassembled, replace.
- If wear, deterioration of adherence (sealing force lips), or damage is detected on the lips, replace them.

SERVICE DATA AND SPECIFICATIONS (SDS)

< SERVICE DATA AND SPECIFICATIONS (SDS)

[REAR FINAL DRIVE: R145]

SERVICE DATA AND SPECIFICATIONS (SDS)

SERVICE DATA AND SPECIFICATIONS (SDS)

General Specifications

INFOID:0000000010339737

Applied model	AWD	
	QR25DE	
	CVT	
Final drive model	R145	
Gear ratio	2.466	
Number of teeth (Drive gear/Drive pinion)	37/15	
Number of pinion gears	2	
Drive pinion adjustment spacer type	Collapsible	
Oil	Recommended oil	Refer to MA-11. "Fluids and Lubricants" .
	Oil capacity (Approx.) ℓ (US pt, Imp pt)	0.55 (1-1/8, 1)

Preload Torque

INFOID:0000000010339738

Unit: N·m (kg-m, in-lb)

Item	Standard
Pinion bearing (P1)	0.69 – 1.18 (0.07 – 0.12, 7 – 10)
Side bearing (P2)	0.66 – 1.00 (0.07 – 0.10, 6 – 8)
Side bearing to pinion bearing (Total preload) (Total preload = P1 + P2)	1.35 – 2.18 (0.14 – 0.22, 12 – 19)

Drive Gear Runout

INFOID:0000000010339739

Unit: mm (in)

Item	Standard
Drive gear back face runout	0.05 (0.0020) or less

Backlash

INFOID:0000000010339740

Unit: mm (in)

Item	Standard
Drive gear to drive pinion gear	0.10 – 0.15 (0.0039 – 0.0059)

Differential Side Gear Clearance

INFOID:0000000010339741

Unit: mm (in)

Item	Standard
Side gear backlash (Clearance between side gear and differential case)	0.10 (0.004) or less (Each gear should rotate smoothly without excessive resistance during differential motion.)