SECTION DLN
DRIVELINE

CONTENTS

TRANSFER: TY21C

PRECAUTION 5

PRECAUTIONS 5
High Voltage Precautions 5
Precautions Concerning On-board Servicing of Hybrid Systems 6
Precaution for Technicians Using Medical Electric..... 7
Precaution for Supplemental Restraint System (SRS) "AIR BAG" and "SEAT BELT PRE-TENSIONER" 7
Precaution for Procedure without Cowl Top Cover..... 8
Precaution for Battery Service 8
Service Notice or Precautions for Transfer 8

PREPARATION 9

PREPARATION 9
Special Service Tool 9
Commercial Service Tool 9

SYSTEM DESCRIPTION 12

COMPONENT PARTS 12
Component Parts Location 12
AWD Control Unit 13
Electric Controlled Coupling 13
AWD Solenoid 13
AWD Lock Switch 13

STRUCTURE AND OPERATION 14
Sectional View 14
Operation Description 15

SYSTEM 16

AWD SYSTEM 16
AWD SYSTEM : System Description 16
AWD SYSTEM : Fail-Safe 17
AWD SYSTEM : Protection Function 18

INFORMATION DISPLAY (COMBINATION METER) 18
INFORMATION DISPLAY (COMBINATION METER) : AWD Warning 18
INFORMATION DISPLAY (COMBINATION METER) : AWD Torque Distribution Indicator 19

WARNING/INDICATOR/CHIME LIST 19
WARNING/INDICATOR/CHIME LIST : Warning/ Indicator (On Information Display) 20

DIAGNOSIS SYSTEM (AWD CONTROL UNIT) 21
CONSULT Function 21

ECU DIAGNOSIS INFORMATION 23

AWD CONTROL UNIT 23
Reference Value 23
Fail-Safe 25
Protection Function 25
DTC Inspection Priority Chart 26
DTC Index 26

WIRING DIAGRAM 27

AWD SYSTEM 27
Wiring Diagram 27

BASIC INSPECTION 36

DIAGNOSIS AND REPAIR WORK FLOW 36
Work Flow 36
Diagnostic Work Sheet 37

ADDITIONAL SERVICE WHEN REPLACING AWD CONTROL UNIT 39
Description 39
Work Procedure 39

UNIT CHARACTERISTICS WRITING 40
Description 40
Work Procedure 40

DTC/CIRCUIT DIAGNOSIS 41

C1201 AWD CONTROL UNIT 41
DTC Description 41
Diagnosis Procedure 41

C1203 ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) 42
DTC Description 42
Diagnosis Procedure 42

C1204 AWD SOLENOID 43
DTC Description 43
Diagnosis Procedure 43
Component Inspection 45

C1209 MODE SW 46
DTC Description 46
Diagnosis Procedure 46
Component Inspection 47

C1210 ECM 48
DTC Description 48
Diagnosis Procedure 48

P1804 AWD CONTROL UNIT 49
DTC Description 49
Diagnosis Procedure 49

P1808 WHEEL SPEED SENSOR 50
DTC Description 50
Diagnosis Procedure 50

P1809 AWD CONTROL UNIT 51
DTC Description 51
Diagnosis Procedure 51

P1811 BATTERY VOLTAGE 52
DTC Description 52
Diagnosis Procedure 52

P181B INCOMPLETE SELFSHUT 55
DTC Description 55
Diagnosis Procedure 55

P181D ENGINE TORQUE SIGNAL 58
DTC Description 58
Diagnosis Procedure 58

P181F INCOMPLETE CALIBRATION 59
DTC Description 59
Diagnosis Procedure 59

U1000 CAN COMM CIRCUIT 60
DTC Description 60
Diagnosis Procedure 60

U1010 CONTROL UNIT (CAN) 61
DTC Description 61
Diagnosis Procedure 61

POWER SUPPLY AND GROUND CIRCUIT 62
Diagnosis Procedure 62

SYMPTOM DIAGNOSIS 65

HEAVY TIGHT-CORNER BRAKING SYMPTOM OCCURS 65
Description 65
Diagnosis Procedure 65

VEHICLE DOES NOT ENTER AWD MODE 66
Description 66
Diagnosis Procedure 66

AWD HIGH TEMP IS DISPLAYED ON INFORMATION DISPLAY 67
Description 67

TIRE SIZE INCORRECT IS DISPLAYED ON INFORMATION DISPLAY 68
Description 68
Diagnosis Procedure 68

NOISE, VIBRATION AND HARSHNESS (NVH) TROUBLESHOOTING 69
NVH Troubleshooting Chart 69

PERIODIC MAINTENANCE 70

TRANSFER OIL 70
Inspection 70
Draining 70
Refilling 70

REMOVAL AND INSTALLATION 72

AWD CONTROL UNIT 72
Exploded View 72
Removal and Installation 72

AWD LOCK SWITCH 73
Removal and Installation 73

TRANSFER COVER OIL SEAL 74
Removal and Installation 74

UNIT REMOVAL AND INSTALLATION 75

TRANSFER ASSEMBLY 75
Exploded View 75
Removal and Installation 75

UNIT DISASSEMBLY AND ASSEMBLY ... 77

TRANSFER COVER 77
Exploded View 77
Disassembly and Assembly 78
Inspection 80

RING GEAR SHAFT 81
Exploded View 81
Disassembly and Assembly 82
Inspection 84

DRIVE PINION 85
Exploded View 85
Disassembly and Assembly 86
Adjustment 88
Inspection 92

TRANSFER CASE 93
Exploded View 93
Disassembly and Assembly 94
Inspection 96

SERVICE DATA AND SPECIFICATIONS (SDS) 97

SERVICE DATA AND SPECIFICATIONS (SDS) 97
General Specifications 97
Preload Torque 97
Backlash 97
Companion Flange Runout 97

REAR PROPELLER SHAFT: C-CVJ-C

PRECAUTION 98

PRECAUTIONS 98
High Voltage Precautions 98
Precautions Concerning On-board Servicing of Hybrid Systems 99
Precaution for Supplemental Restraint System (SRS) "AIR BAG" and "SEAT BELT PRE-TENSIONER" 100
Precautions for Removing Battery Terminal 100
Precaution for Propeller Shaft 101

PREPARATION 102

PREPARATION 102
Commercial Service Tools 102

SYSTEM DESCRIPTION 103

STRUCTURE AND OPERATION 103
Sectional View 103

SYMPTOM DIAGNOSIS 104

NOISE, VIBRATION AND HARSHNESS (NVH) TROUBLESHOOTING 104
NVH Troubleshooting Chart 104

PERIODIC MAINTENANCE 105

REAR PROPELLER SHAFT 105
Inspection 105

REMOVAL AND INSTALLATION 106

REAR PROPELLER SHAFT 106
Exploded View 106
Removal and Installation 106
Inspection 109

SERVICE DATA AND SPECIFICATIONS (SDS) 111

SERVICE DATA AND SPECIFICATIONS (SDS) 111
General Specifications 111
Propeller Shaft Runout 111
Journal Axial Play 111

REAR FINAL DRIVE: R145

PRECAUTION 112

PRECAUTIONS 112
High Voltage Precautions 112
Precaution for Supplemental Restraint System (SRS) "AIR BAG" and "SEAT BELT PRE-TENSIONER" 113
Service Notice or Precautions for Rear Final Drive 114

PREPARATION 115

PREPARATION 115
Special Service Tools 115
Commercial Service Tools 117

SYSTEM DESCRIPTION 119

STRUCTURE AND OPERATION 119
Sectional View 119
Electric Controlled Coupling 119

SYMPTOM DIAGNOSIS 120

NOISE, VIBRATION AND HARSHNESS (NVH) TROUBLESHOOTING 120
NVH Troubleshooting Chart 120

PERIODIC MAINTENANCE 121

REAR DIFFERENTIAL GEAR OIL 121
Inspection 121
Draining 121
Refilling 121

REMOVAL AND INSTALLATION 122

DRIVE PINION OIL SEAL 122
Exploded View 122
Removal and Installation 122

SIDE OIL SEAL 123
Exploded View 123
Removal and Installation 123

ELECTRIC CONTROLLED COUPLING 124
Exploded View 124
Removal and Installation 124

AIR BREATHER 127
Exploded View 127
Removal and Installation 127

UNIT REMOVAL AND INSTALLATION ... 129

REAR FINAL DRIVE ASSEMBLY 129
Exploded View 129
Removal and Installation 129

UNIT DISASSEMBLY AND ASSEMBLY .. 130

ELECTRIC CONTROLLED COUPLING 130
Exploded View 130
Disassembly and Assembly 130

DIFFERENTIAL ASSEMBLY 134
Exploded View 134
Disassembly and Assembly 134
Adjustment 140
Inspection 144

DRIVE PINION 145
Exploded View 145
Disassembly and Assembly 145
Inspection 150

SERVICE DATA AND SPECIFICATIONS (SDS) 151

SERVICE DATA AND SPECIFICATIONS (SDS) 151
General Specifications 151
Preload Torque 151
Drive Gear Runout 151
Backlash 151
Differential Side Gear Clearance 151

PRECAUTION

PRECAUTIONS

High Voltage Precautions

INFOID:0000000014910233

DANGER:

Since hybrid vehicles and electric vehicles contain a high voltage battery, there is the risk of electric shock, electric leakage, or similar accidents if the high voltage component and vehicle are handled incorrectly. Be sure to follow the correct work procedures when performing inspection and maintenance.

WARNING:

- **Be sure to remove the service plug in order to disconnect the high voltage circuits before performing inspection or maintenance of high voltage system harnesses and parts.**
- **The removed service plug must always be carried in a pocket of the responsible worker or placed in the tool box during the procedure to prevent the plug from being connected by mistake.**
- **Be sure to wear insulating protective equipment consisting of glove, shoes, face shield and glasses before beginning work on the high voltage system.**
- **Never allow workers other than the responsible person to touch the vehicle containing high voltage parts. To keep others from touching the high voltage parts, these parts must be covered with an insulating sheet except when using them.**

CAUTION:

Never bring the vehicle into the READY status with the service plug removed unless otherwise instructed in the Service Manual. A malfunction may occur if this is not observed.

HIGH VOLTAGE HARNESS AND EQUIPMENT IDENTIFICATION

All the high voltage harnesses and connectors are orange. The Li-ion battery and other high voltage devices include an orange high voltage label. Never touch these harnesses and high voltage parts.

HANDLING OF HIGH VOLTAGE HARNESS AND TERMINALS

Immediately insulate disconnected high voltage connectors and terminals with insulating tape.

REGULATIONS ON WORKERS WITH MEDICAL ELECTRONICS

WARNING:

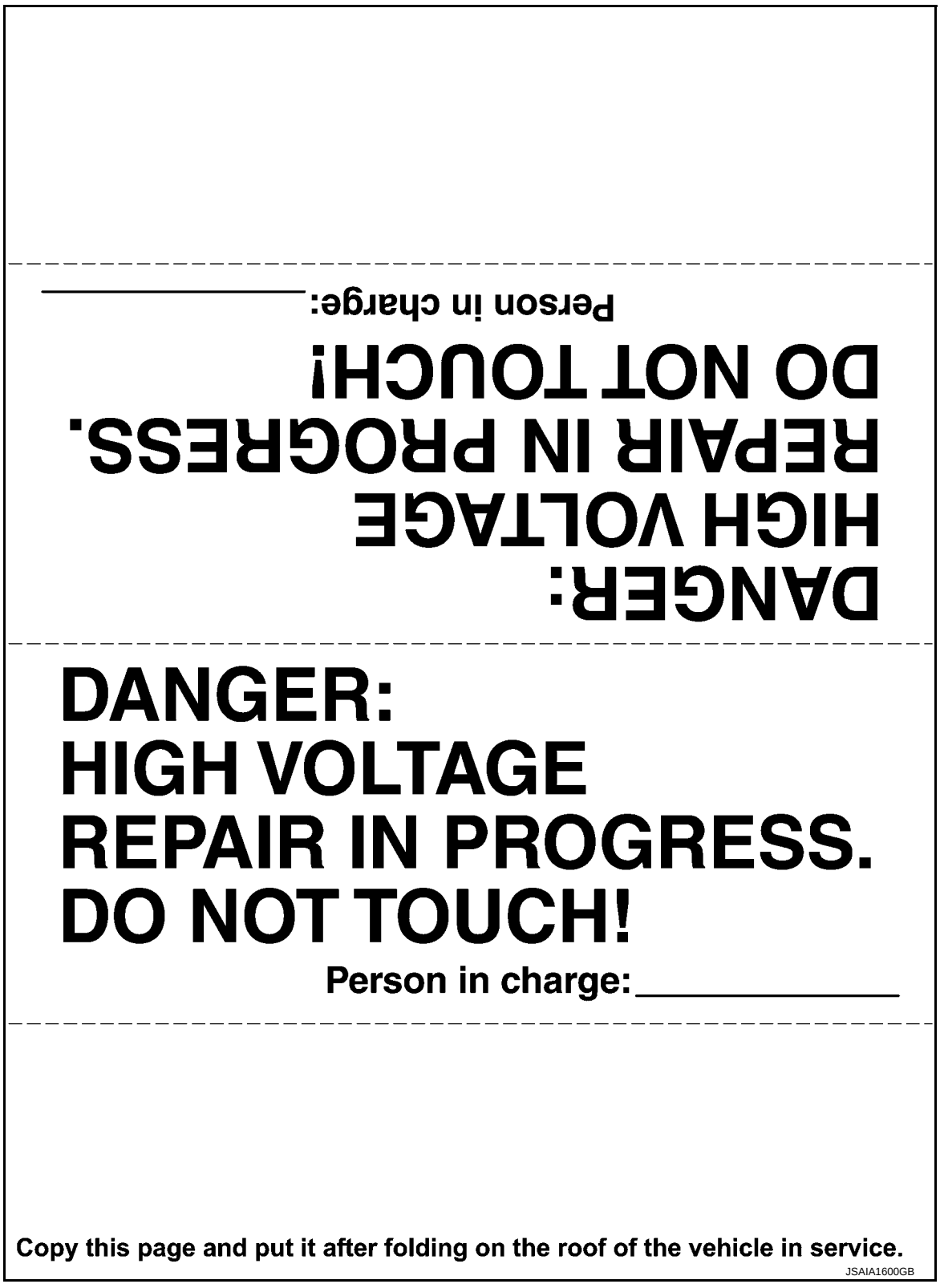
The vehicle contains parts that contain powerful magnets. If a person who is wearing a heart pacemaker or other medical device is close to these parts, the medical device may be affected by the magnets. Such persons must not perform work on the vehicle.

PROHIBITED ITEMS TO CARRY DURING THE WORK

Hybrid vehicles and electric vehicles contain parts with high voltage and intense magnetic force. Never carry metal products and magnetic recording media (e.g. cash card, prepaid card) to repair/inspect high voltage parts. If this is not observed, the metal products may create a risk of short circuit and the magnetic recording media may lose their magnetic recording.

POSTING A SIGN OF “DANGER! HIGH VOLTAGE AREA. KEEP OUT”

Indicate "HIGH VOLTAGE. DO NOT TOUCH" on the vehicle under repair/inspection to call attention to other workers.



Precautions Concerning On-board Servicing of Hybrid Systems

INFOID:0000000014910234

CAUTION:

Be sure to turn the ignition switch OFF before performing inspection and servicing inside the engine compartment or underneath the vehicle. If the ignition switch is ON (vehicle READY state), even if the engine is stopped, the conditions of the vehicle may cause the engine to start automatically.

If it is necessary to continually operate the engine during inspection or servicing, use the designated inspection mode. GI-71, "Description".

Precaution for Technicians Using Medical Electric

INFOID:0000000014910240

OPERATION PROHIBITION

WARNING:

- **Parts with strong magnet is used in this vehicle.**
- **Technicians using a medical electric device such as pacemaker must never perform operation on the vehicle, as magnetic field can affect the device function by approaching to such parts.**

NORMAL CHARGE PRECAUTION

WARNING:

- **If a technician uses a medical electric device such as an implantable cardiac pacemaker or an implantable cardioverter defibrillator, the possible effects on the devices must be checked with the device manufacturer before starting the charge operation.**
- **As radiated electromagnetic wave generated by PDM (Power Delivery Module) at normal charge operation may affect medical electric devices, a technician using a medical electric device such as implantable cardiac pacemaker or an implantable cardioverter defibrillator must not approach motor room [PDM (Power Delivery Module)] at the hood-opened condition during normal charge operation.**

PRECAUTION AT TELEMATICS SYSTEM OPERATION

WARNING:

- **If a technician uses implantable cardiac pacemaker or implantable cardioverter defibrillator (ICD), avoid the device implanted part from approaching within approximately 220 mm (8.66 in) from interior/exterior antenna.**
- **The electromagnetic wave of TCU might affect the function of the implantable cardiac pacemaker or the implantable cardioverter defibrillator (ICD), when using the service, etc.**
- **If a technician uses other medical electric devices than implantable cardiac pacemaker or implantable cardioverter defibrillator (ICD), the electromagnetic wave of TCU might affect the function of the device. The possible effects on the devices must be checked with the device manufacturer before TCU use.**

PRECAUTION AT INTELLIGENT KEY SYSTEM OPERATION

WARNING:

- **If a technician uses implantable cardiac pacemaker or implantable cardioverter defibrillator (ICD), avoid the device implanted part from approaching within approximately 220 mm (8.66 in) from interior/exterior antenna.**
- **The electromagnetic wave of Intelligent Key might affect the function of the implantable cardiac pacemaker or the implantable cardioverter defibrillator (ICD), at door operation, at each request switch operation, or at engine starting.**
- **If a technician uses other medical electric devices than implantable cardiac pacemaker or implantable cardioverter defibrillator (ICD), the electromagnetic wave of Intelligent Key might affect the function of the device. The possible effects on the devices must be checked with the device manufacturer before Intelligent Key use.**

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

INFOID:0000000014808106

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, it is recommended that all maintenance and repair be performed by an authorized NISSAN/INFINITI dealer.**
- **Improper repair, including incorrect removal and installation of the SRS, can lead to personal injury caused by unintentional activation of the system. For removal of Spiral Cable and Air Bag Module, see 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

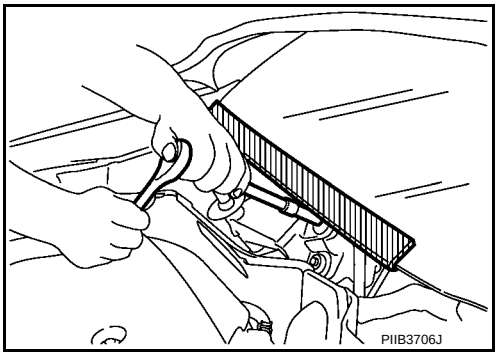
WARNING:

- **When working near the Air Bag Diagnosis Sensor Unit or other Air Bag 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 or batteries, and wait at least three minutes before performing any service.**

Precaution for Procedure without Cowl Top Cover

INFOID:0000000014630149

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:0000000014630150

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:0000000014630151

- After overhaul refill the transfer with new transfer oil.
- Check the oil level or replace the oil only with the vehicle parked on level surface.
- During removal or installation, keep inside of transfer clear of dust or dirt.
- Replace all tires at the same time. Always use tires of the proper size and the same brand and pattern. Fitting improper size and unusual wear tires applies excessive force to vehicle mechanism and can cause longitudinal vibration.
- Disassembly should be done in a clean work area.
- Before proceeding with disassembly, thoroughly clean the transfer. It is important to prevent the internal parts from becoming contaminated by dirt or other foreign matter.
- Check for the correct installation status prior to removal or disassembly. If matching marks are required, be certain they do not interfere with the function of the parts when applied.
- All parts should be carefully cleaned with a general purpose, non-flammable solvent before inspection or reassembly.
- Check appearance of the disassembled parts for damage, deformation, and unusual wear. Replace them with a new one if necessary.
- Gaskets, seals, 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.

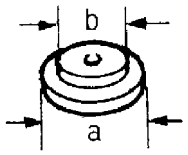
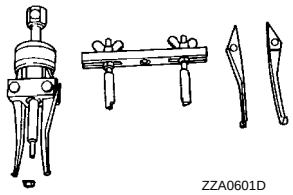
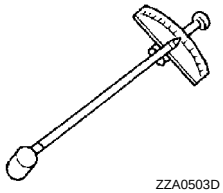
PREPARATION

PREPARATION

Special Service Tool

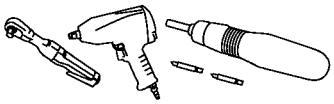
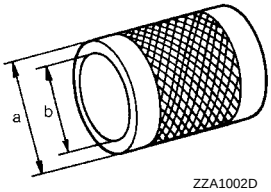
INFOID:0000000014630152

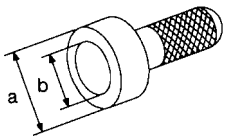
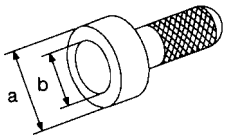
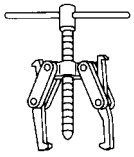
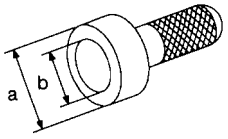
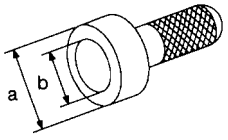
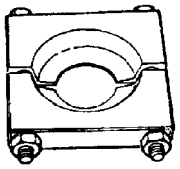
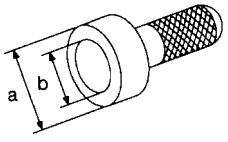
The actual shape of the tools may differ from those illustrated here.

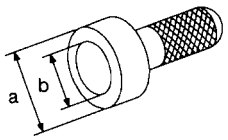
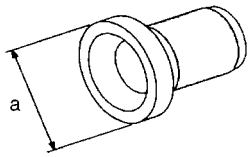
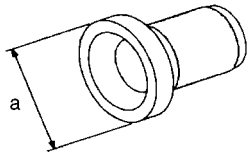
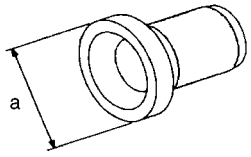
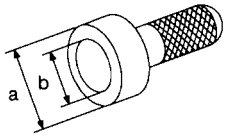
Tool number (TechMate No.) Tool name	Description
ST33061000 (J-8107-2) Drift a: 38 mm (1.50 in) dia. b: 28.5 mm (1.122 in) dia.  ZZA0810D	Removing gear ring bearing inner race (transfer case side)
KV381054S0 (J-34286) Puller  ZZA0601D	Removing ring gear shaft oil seal
ST3127S000 (J-25765-A) Preload gauge  ZZA0503D	Measuring preload torque

Commercial Service Tool

INFOID:0000000014630153

Tool name	Description
Power Tool  PIIB1407E	Loosening nuts, screws and bolts
Drift a: 52 mm (2.05 in) dia. b: 44 mm (1.73 in) dia.  ZZA1002D	Removing gear ring bearing inner race (transfer cover side)

Tool name	Description
Drift a: 56.5 mm (2.224 in) dia. b: 48 mm (1.89 in) dia.  NT115	Installing side oil seal (installing transfer case oil seal)
Drift a: 44 mm (1.73 in) dia. b: 33 mm (1.3 in) dia.  NT115	Installing ring gear shaft oil seal
Puller  NT077	Removing ring gear bearing (left) inner race (transfer case side)
Drift a: 70 mm (2.76 in) dia. b: 60 mm (2.36 in) dia.  NT115	Installing oil seal (installing pinion bearing seal)
Drift a: 78 mm (3.07 in) dia. b: 68 mm (2.68 in) dia.  NT115	Installing side oil seal (installing transfer cover oil seal)
Replacer  ZZA0700D	• Removing drive pinion • Removing ring gear bearing (left) inner race (transfer cover side)
Drift a: 58 mm (2.28 in) dia. b: 55 mm (2.17 in) dia.  NT115	Installing ring gear bearing (left) inner race (transfer case side)

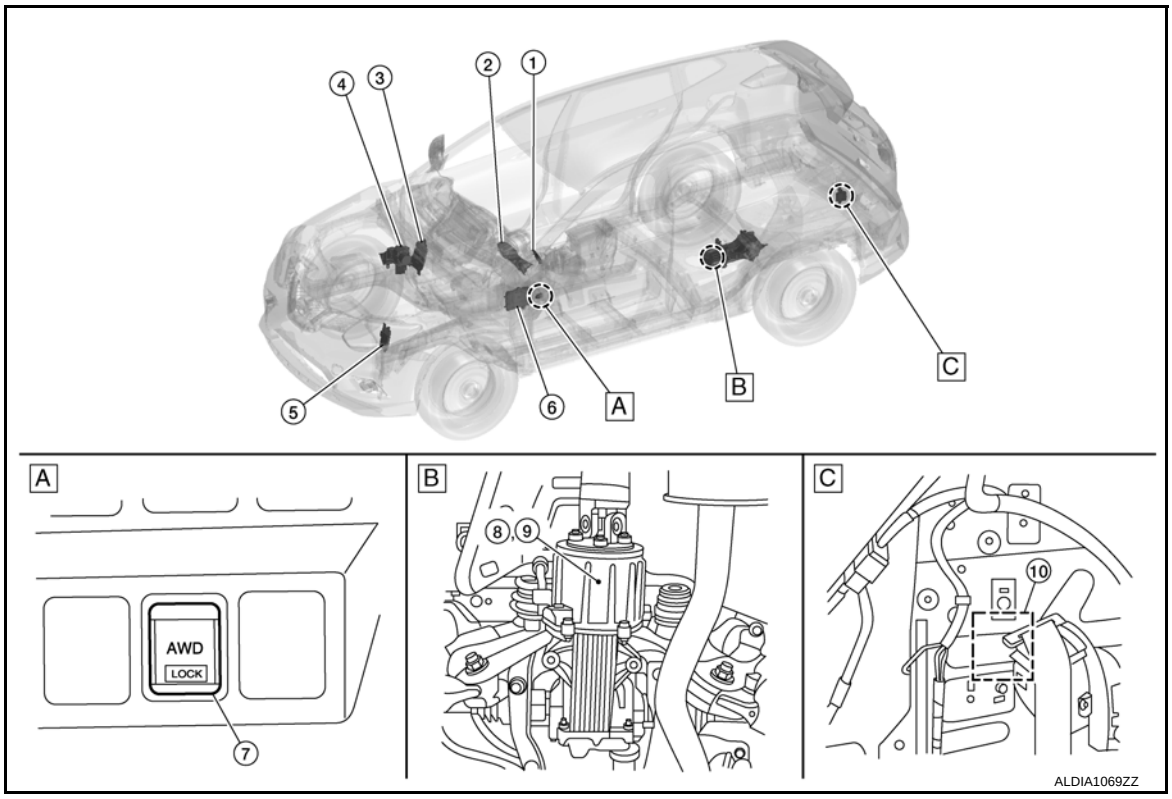
Tool name	Description
Drift a: 62 mm (2.44 in) dia. b: 58 mm (2.28 in) dia.  NT115	Installing ring gear bearing (right) inner race (transfer cover side)
Drift a: 73.5 mm (2.894 in) dia.  SCIA5338E	Installing ring gear bearing (left) outer race (transfer case side)
Drift a: 87 mm (3.43 in) dia.  SCIA5338E	Installing ring gear bearing (right) outer race (transfer cover side)
Drift a: 20 mm (0.79 in) dia.  SCIA5338E	Removing drive pinion
Drift a: 40 mm (1.57 in) dia. b: 25 mm (0.98 in) dia.  NT115	Installing companion flange

SYSTEM DESCRIPTION

COMPONENT PARTS

Component Parts Location

INFOID:0000000014630154



A. Instrument lower panel LH B. Rear final drive assembly C. View with luggage side upper finisher (LH) removed

No.	Component	Function
1.	Steering angle sensor	Mainly transmits the following signal to AWD control unit via CAN communication: • Steering angle sensor signal For detailed installation location, refer to STC-5, "Component Parts Location".
2.	Combination meter	Mainly transmits the following signal to AWD control unit via CAN communication: • Parking brake switch signal • Odometer signal Mainly receives the following signals from AWD control unit via CAN communication: • AWD warning display signal • AWD LOCK signal • Torque distribution indicator signal For detailed installation location, refer to MWI-5, "METER SYSTEM : Component Parts Location".

No.	Component	Function
3.	HPCM	Mainly transmits the following signals to AWD control unit via CAN communication: • Accelerator pedal position signal • Engine speed signal • Engine torque signal • HPCM status signal **NOTE:** Some signals are transmitted to the AWD control unit by HPCM as a substitute for ECM. Refer to TM-213, "Exploded View".
4.	ABS actuator and electric unit (control unit)	Mainly transmits the following signals to AWD control unit via CAN communication: • Each wheel speed signal • Yaw rate sensor signal • Side G sensor signal • Decel G sensor signal • ABS operation signal • TCS operation signal • VDC operation signal For detailed installation location, refer to BRC-10, "Component Parts Location".
5.	TCM	Mainly transmits the following signals to AWD control unit via CAN communication: For detailed installation location, refer to TM-15, "CVT CONTROL SYSTEM : Component Parts Location".
6.	BCM	Mainly transmits the following signals to the AWD control unit via CAN communication. • Stop lamp switch signal For detailed installation location, refer to BCS-73, "Removal and Installation".
7.	AWD lock switch	Refer to DLN-13, "AWD Lock Switch".
8.	Electric controlled coupling	Refer to DLN-13, "Electric Controlled Coupling".
9.	AWD solenoid	Refer to DLN-13, "AWD Solenoid".
10.	AWD control unit • AWD actuator relay	Refer to DLN-13, "AWD Control Unit".

AWD Control Unit

INFOID:0000000014630155

- 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:0000000014630156

Electric controlled coupling is integrated with rear final drive and transmits driving force to rear final drive. For operation, refer to DLN-15, "Operation Description".

AWD Solenoid

INFOID:0000000014630157

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

AWD Lock Switch

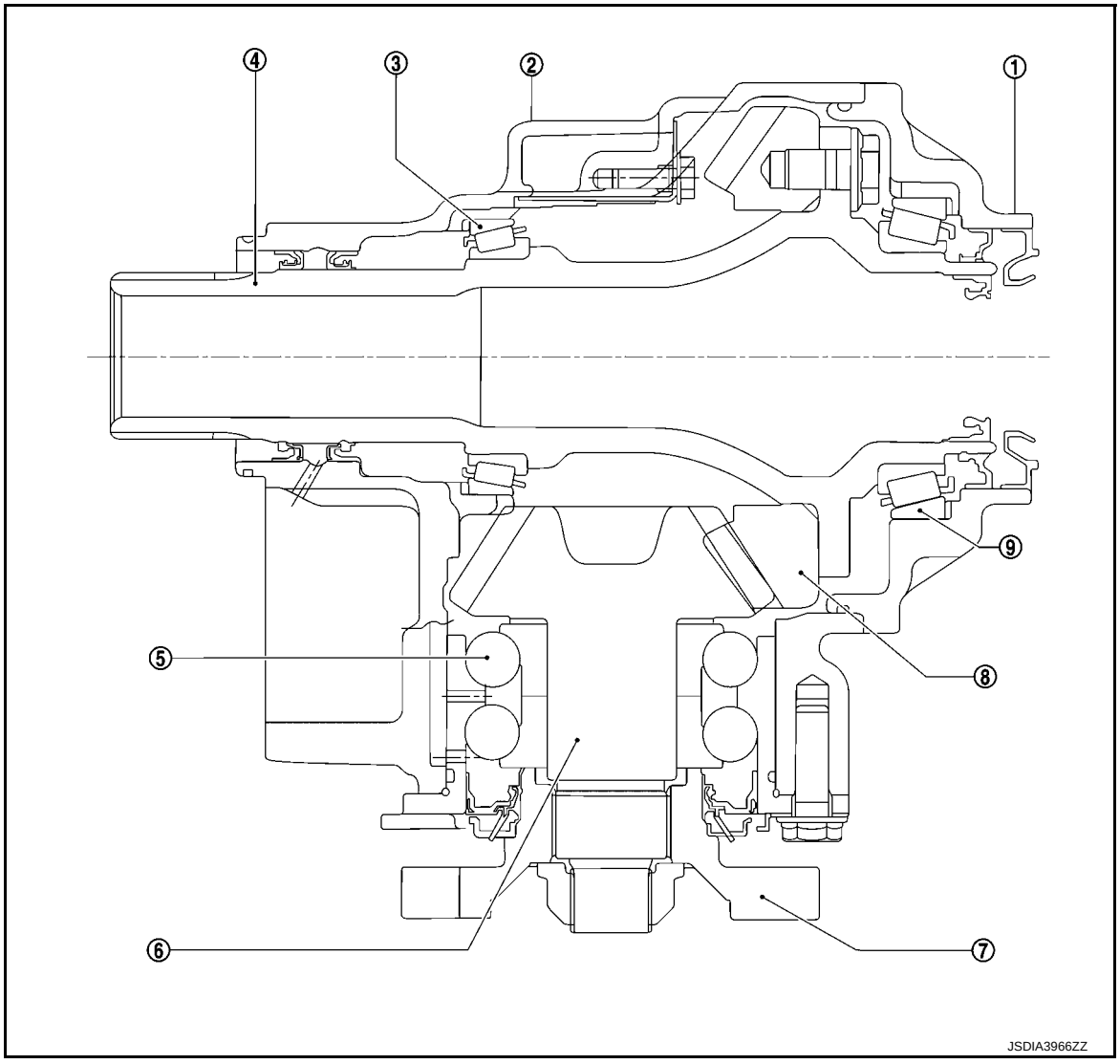
INFOID:0000000014630158

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

STRUCTURE AND OPERATION

Sectional View

INFOID:0000000014630159

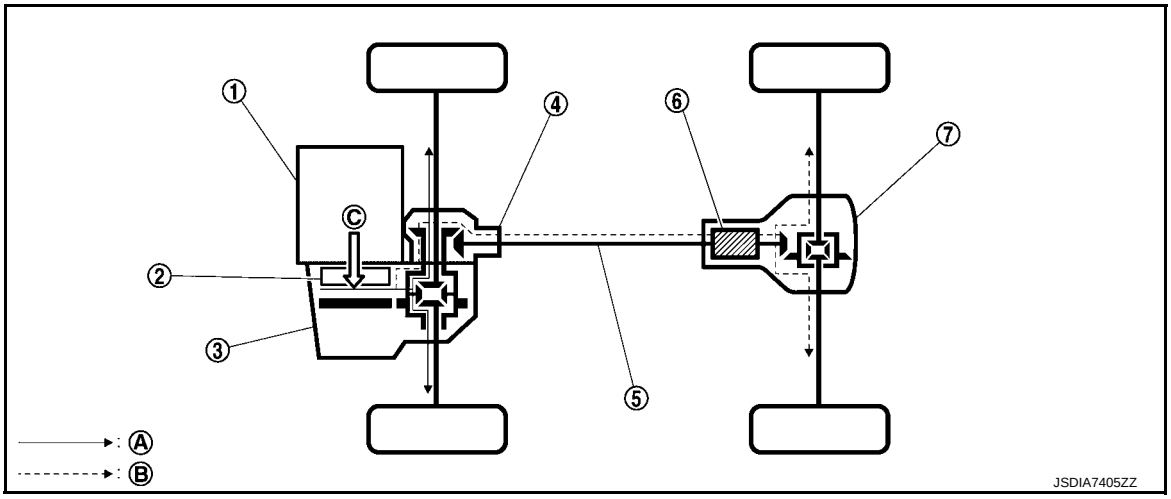


1. Transfer cover
2. Transfer case
3. Ring gear bearing (transfer case side)
4. Ring gear shaft
5. Pinion bearing
6. Drive pinion
7. Companion flange
8. Ring gear
9. Ring gear bearing (transfer cover side)

Operation Description

INFOID:0000000014630160

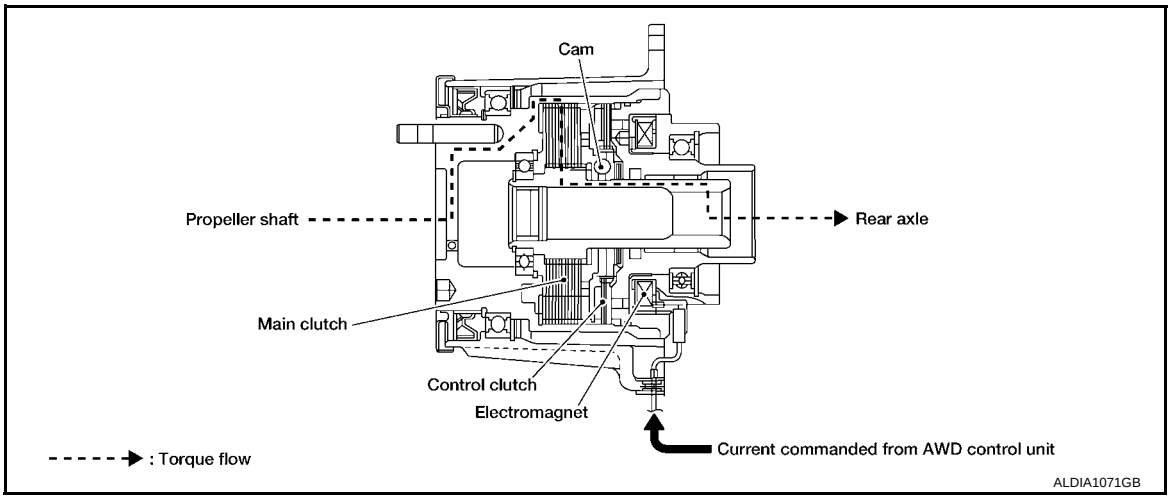
POWER TRANSFER DIAGRAM



1. Engine
2. Traction motor
3. Transaxle
4. Transfer case
5. Driveshaft
6. Electric controlled coupling
7. Rear final drive

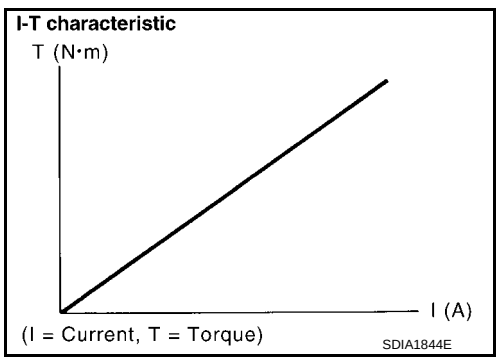
A. Power transmission to front wheels B. Power transmission to rear wheels C. Power from engine to traction motor

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.

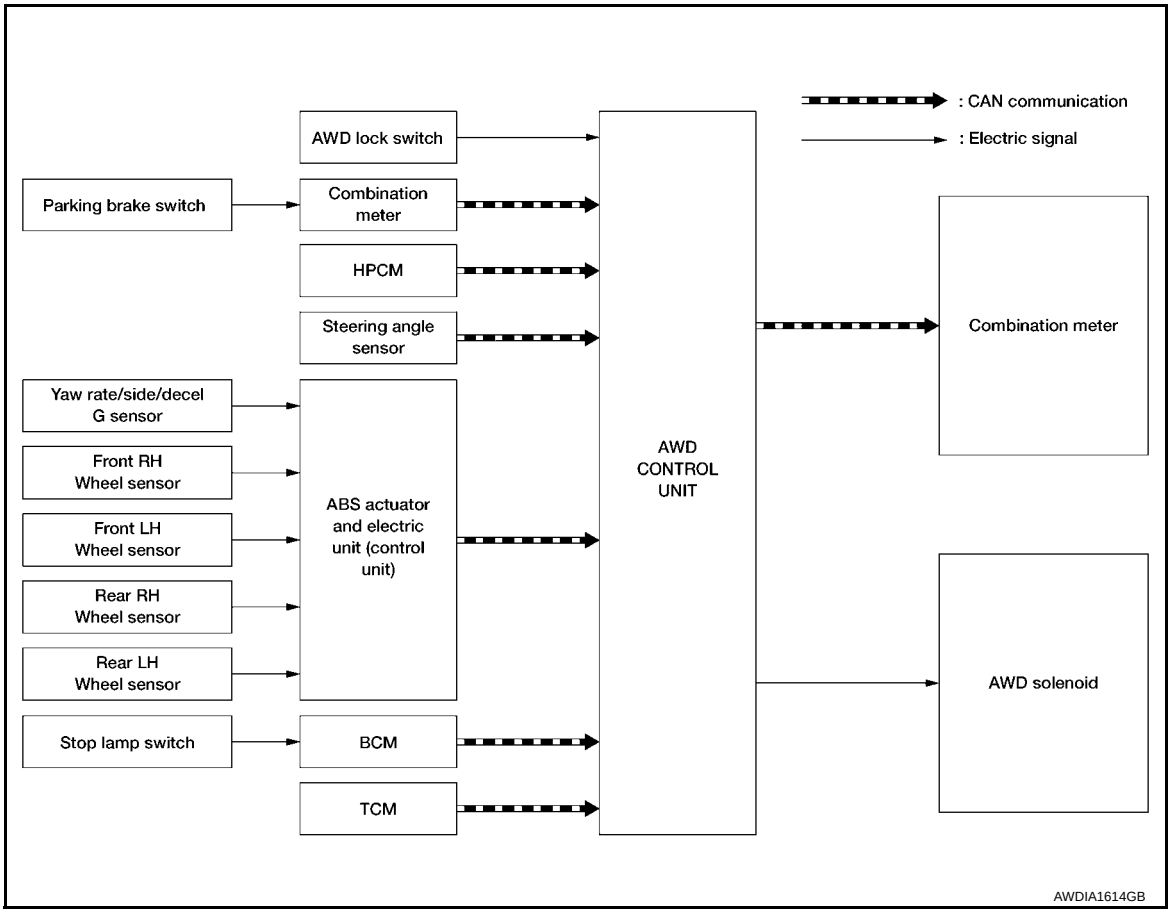
- Transmission torque to the rear wheels is determined according to command current.



SYSTEM
AWD SYSTEM
AWD SYSTEM : System Description

INFOID:0000000014630161

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 signal to AWD control unit via CAN communication: • Parking brake switch signal • Odometer signal Mainly receives the following signals from AWD control unit via CAN communication: • AWD warning display signal • AWD LOCK indicator signal • Torque distribution indicator signal
Steering angle sensor	Mainly transmits the following signal to AWD control unit via CAN communication: • Steering angle signal

Component parts	Signal item
ABS actuator and electric unit (control unit)	Mainly transmits the following signals to AWD control unit via CAN communication: • Each wheel speed signal • Stop lamp switch signal (brake signal) • Yaw rate sensor signal • Side G sensor signal • Decel G sensor signal • ABS operation signal • TCS operation signal • VDC operation signal
HPCM	Mainly transmits the following signals to AWD control unit via CAN communication: • Accelerator pedal position signal • Engine speed signal • Engine torque speed • HPCM status signal **NOTE:** Some signals are transmitted to the AWD control unit by HPCM as a substitute for ECM.
TCM	Mainly transmits the following signals to AWD control unit via CAN communication. • Gear position signal
BCM	Mainly transmits the following signals to AWD control unit via CAN communication: • Stop lamp switch 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:0000000014630162

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
•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.
•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.

AWD SYSTEM : Protection Function

INFOID:0000000014630163

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-18, "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.

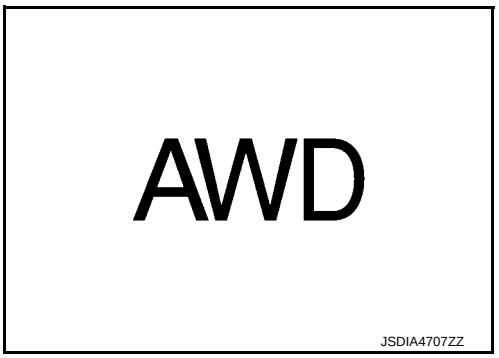
INFORMATION DISPLAY (COMBINATION METER)

INFORMATION DISPLAY (COMBINATION METER) : AWD Warning

INFOID:0000000014630164

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.

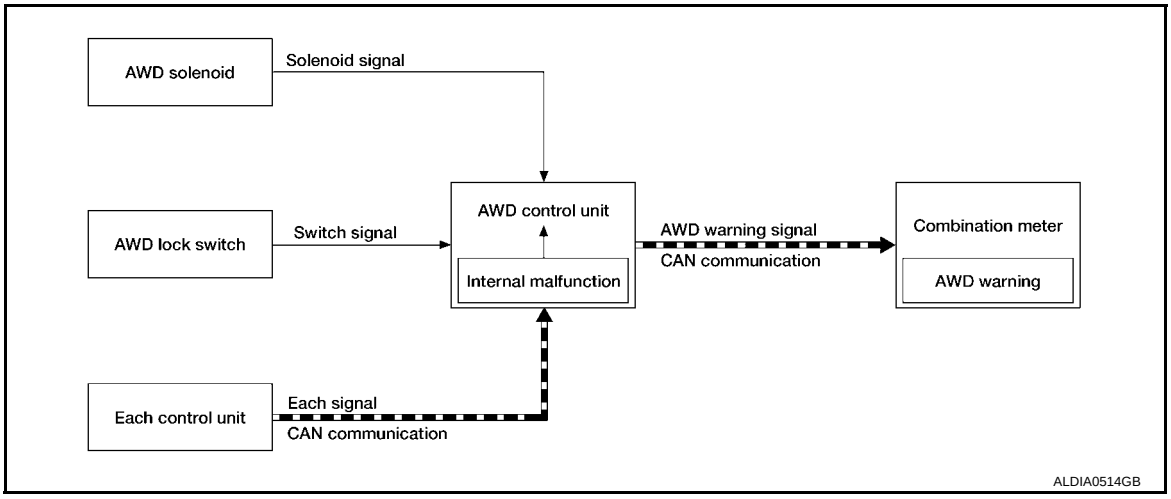
Symbol	Message	Condition
 JSDIA4707ZZ	AWD Error See Owner's Manual	AWD system malfunction.
	AWD High Temp. Stop vehicle	Protection function is activated due to heavy load to electric controlled coupling. (AWD system is not malfunctioning and AWD system changes to rear wheel drive.)
	Tire Size Incorrect 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-20, "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.
- 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

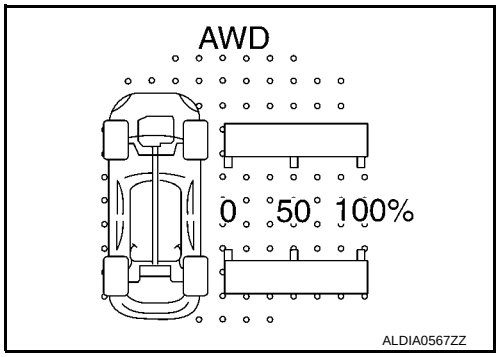
When any of the conditions listed below is satisfied:

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

INFORMATION DISPLAY (COMBINATION METER) : AWD Torque Distribution Indicator

INFOID:0000000014630165

DESIGN/PURPOSE

Symbol	Function
	Displays the drive torque distribution to the front and rear wheels while driving and informs the driver of this. **NOTE:** The driving force distribution may not match actual one. This is not a system malfunction.

WARNING/INDICATOR/CHIME LIST

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

INFOID:0000000014630166

Name	Function
AWD warning	Refer to DLN-18, "INFORMATION DISPLAY (COMBINATION METER) : AWD Warning".

DIAGNOSIS SYSTEM (AWD CONTROL UNIT)

CONSULT Function

INFOID:0000000014630167

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-26, "DTC Index".

When “PRSNT” is displayed on “Self Diagnostic Result”.
- The system is presently malfunctioning.

When “PAST” is displayed on “Self Diagnostic 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.

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]	Operating status of hybrid system is 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)	• Vehicle stopped • Ready status • No DTC detected	Change command current value to AWD solenoid, and then change driving mode. (Monitor value is normal if it is within approx. ±10% of command value.) • Qu: Increase current value in increments of 0.2 A • Qd: Decrease current value in increments of 0.2 A • UP: Increase current value in increments of 0.02 A • DOWN: Decrease current value in increments of 0.02 A

CAUTION:
Never energize continuously for a long time.

WORK SUPPORT

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

ECU DIAGNOSIS INFORMATION

AWD CONTROL UNIT

Reference Value

INFOID:0000000014630168

VALUES ON THE DIAGNOSIS TOOL

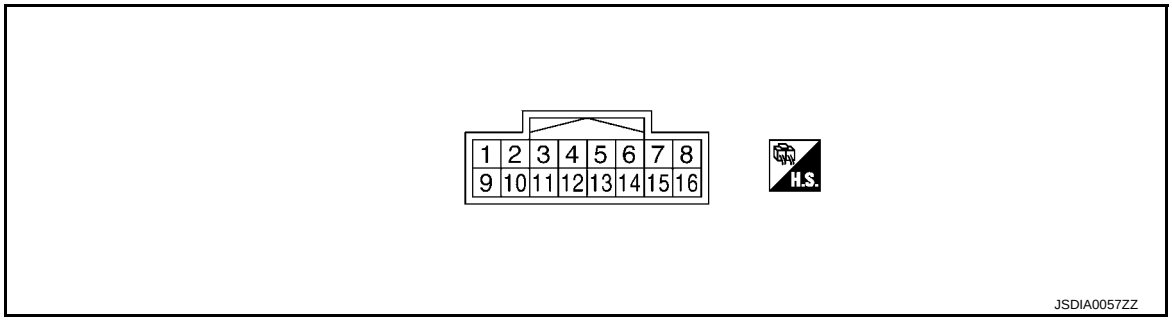
NOTE:
The following table includes information (items) inapplicable to this vehicle. For information (items) applicable to this vehicle, refer to CONSULT display items.

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	Vehicle state: Except ready		Off
	Vehicle state: Ready		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	Hybrid system: Normal		Running
	Hybrid system: Malfunctioning		Off
BATTERY VOLT	Always		Battery voltage
THRTL POS SEN	When depressing accelerator pedal (Value rises gradually in response to throttle position.)		0 – 100% *1
ETS SOLENOID	When accelerator pedal is released with engine or motor running	AUTO mode	Approx. 0.000 A
		LOCK mode	Approx. 0.000 A
	When accelerator pedal is depressed with engine or motor running	AUTO mode	Approx. 0.000 – 2.490 A *2
		LOCK mode	Approx. 2.490 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)

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 virtual. Motor torque is added to it.
*: The values are changed by depressed accelerator pedal and engine/motor 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	When accelerator pedal is released with engine or motor running	AUTO mode	0 V
					LOCK mode	0 V
				When accelerator pedal is depressed with engine or motor running	AUTO mode	2.5 V*
					LOCK mode	8 V
2 (Y)	Ground	AWD solenoid ground	Input	Engine or motor running	Accelerator pedal: released	0 V
					Accelerator pedal: De-pressed	0 V
7 (LA/R)	Ground	Ignition switch	Input	Ignition switch: ON		Battery voltage
				Ignition switch: OFF		0 V
8 (L)	—	CAN-high	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

Terminal No. (Wire color)		Description		Condition		Value (Approx.)
+	-	Signal name	Input/ Output			
14 (Y)	Ground	AWD lock switch	Input	Ignition switch: ON	Releasing AWD lock switch	Battery voltage
					AWD lock switch is hold pressed	0 V
15 (LA/L)	Ground	Power supply (AWD control unit)	Input	Always		Battery voltage
16 (P)	—	CAN-low	Input/ Output	—		—

*: The values are changed by depressed accelerator pedal opening and engine/motor speed.

CAUTION:

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

Fail-Safe

INFOID:0000000014630169

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
•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.
•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:0000000014630170

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-18, "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:0000000014630171

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

Priority	Detected items (DTC)
1	• C1201 CONTROLLER FAILURE
2	• U1000 CAN COMM CIRCUIT • U1010 CONTROL UNIT (CAN)
3	• C1203 ABS SYSTEM • C1210 ENGINE SIGNAL 1 • P1808 VHCL SPEED SEN-ABS • P181D ENGINE SYSTEM
4	• P1809 CONTROL UNIT
5	• C1204 4WD SOLENOID • P1811 BATTERY VOLTAGE
6	• C1209 MODE SW
7	• C1804 CONTROL UNIT
8	• P181B INCOMP SELFSHUT • P181F INCOMP CALIBRATION

DTC Index

INFOID:0000000014630172

DTC	Display Item	Reference
C1201	CONTROLLER FAILURE	DLN-41, "DTC Description"
C1203	ABS SYSTEM	DLN-42, "DTC Description"
C1204	4WD SOLENOID	DLN-43, "DTC Description"
C1209	MODE SW	DLN-46, "DTC Description"
C1210	ENGINE SIGNAL 1	DLN-48, "DTC Description"
P1804	CONTROL UNIT	DLN-49, "DTC Description"
P1808	VHCL SPEED SEN-ABS	DLN-50, "DTC Description"
P1809	CONTROL UNIT	DLN-51, "DTC Description"
P1811	BATTERY VOLTAGE	DLN-52, "DTC Description"
P181B	INCOMP SELF SHUT	DLN-55, "DTC Description"
P181D	ENGINE SYSTEM	DLN-58, "DTC Description"
P181F	INCOMP CALIBRATION	DLN-59, "DTC Description"
U1000	CAN COMM CIRCUIT	DLN-60, "DTC Description"
U1010	CONTROL UNIT (CAN)	DLN-61, "DTC Description"

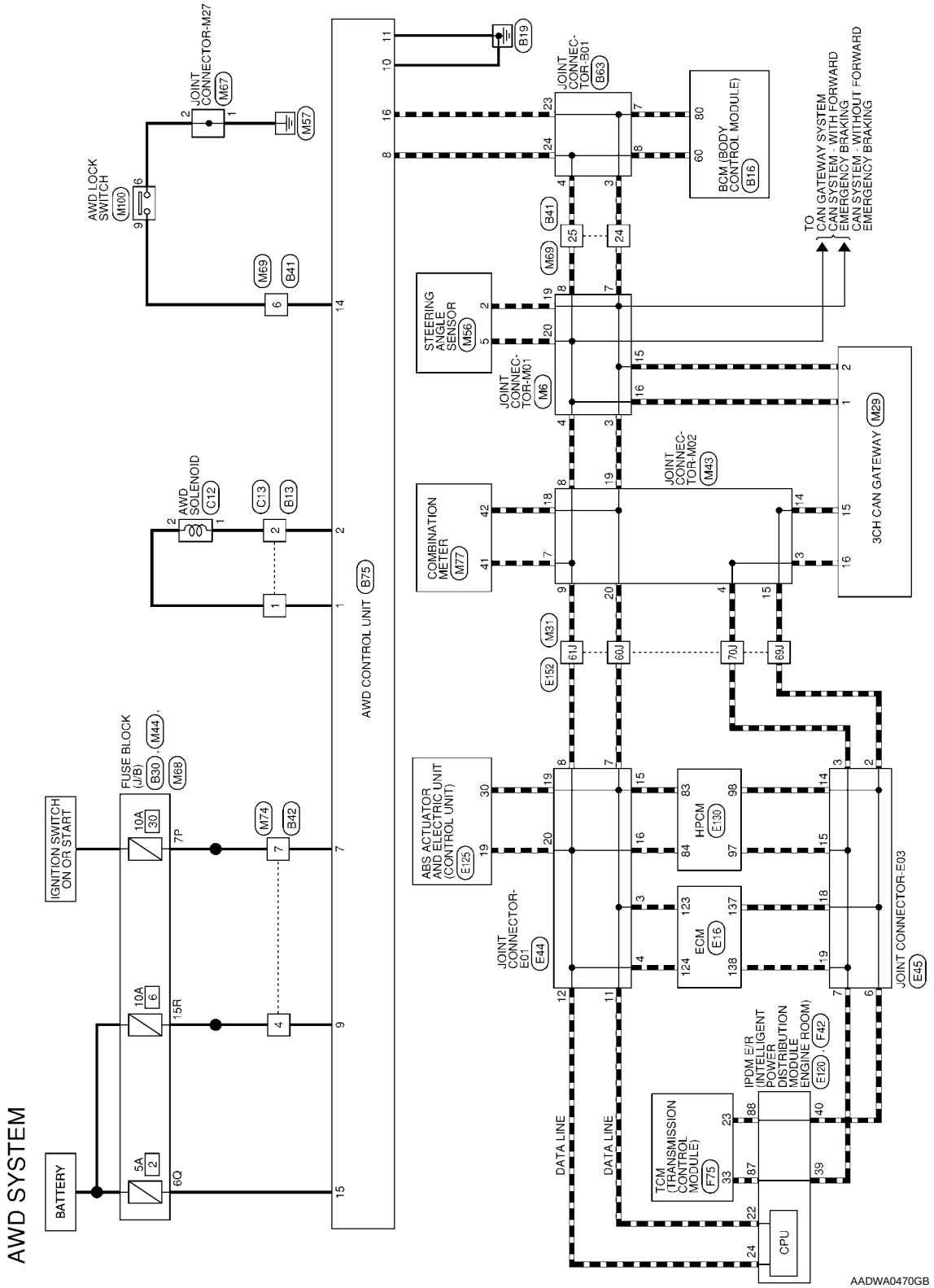
NOTE:
If some DTCs are displayed at the same time, refer to DLN-26, "DTC Inspection Priority Chart".

WIRING DIAGRAM

AWD SYSTEM

Wiring Diagram

INFOID:0000000014630173



AWD SYSTEM CONNECTORS

Connector No.	B13
Connector Name	WIRE TO WIRE
Connector Type	RS02FB
Connector Color	BLACK

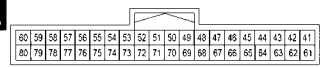
H.S.



Terminal No.	Color of Wire	Signal Name
1	SB	TO CHASSIS HARNESS
2	Y	TO CHASSIS HARNESS

Connector No.	B16
Connector Name	BCM (BODY CONTROL MODULE)
Connector Type	TH40FG-NH
Connector Color	GREEN

H.S.



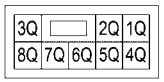
Terminal No.	Color of Wire	Signal Name
41	–	–
42	–	–
43	–	–
44	–	–
45	–	–
46	R	I SES BACKDOOR BUTTON SW
47	–	–
48	–	–
49	G	I NO TOUCH TGATE SENSOR
50	W	I RR DOOR SW
51	LG	I TGATE SW
52	R	I RL DOOR SW
53	SB	I AS DOOR2 SW
54	–	–
55	LA/G	I RR AUTOSTOP SW
56	Y	I TGATE OPENER SW
57	SB	I DR DOOR2 SW
58	–	–
59	–	–
60	L	CAN-H

AADIA1395GB

61	V	SES EXT REAR ANTENNA B
62	Y	SES INT MIDDLE ANTENNA B
63	L	SES INT MIDDLE ANTENNA A
64	LG	SES EXT REAR ANTENNA A
65	–	–
66	–	–
67	–	–
68	–	–
69	–	–
70	–	–
71	–	–
72	–	–
73	–	–
74	–	–
75	–	–
76	–	–
77	V	SHIFT LOCK RLY
78	–	–
79	LA/W	O STOP LAMP3
80	P	CAN-L

Connector No.	B30
Connector Name	FUSE BLOCK (J/B)
Connector Type	NS08FW-CS
Connector Color	WHITE

H.S.



Terminal No.	Color of Wire	Signal Name
1Q	BG	ACCESSORY
2Q	BR	IGNITION
3Q	R	BATTERY
4Q	–	–
5Q	–	–
6Q	LA/L	BATTERY
7Q	–	–
8Q	–	–

Connector No.	B41
Connector Name	WIRE TO WIRE
Connector Type	TH32MW-NH
Connector Color	WHITE

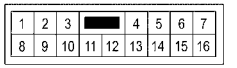
H.S.



Terminal No.	Color of Wire	Signal Name
1	SB	TO MAIN HARNESS
2	SB	TO MAIN HARNESS
3	L	TO MAIN HARNESS
4	L	TO MAIN HARNESS
5	W	TO MAIN HARNESS
6	Y	TO MAIN HARNESS
7	LG	TO MAIN HARNESS
8	BG	TO MAIN HARNESS
9	BR	TO MAIN HARNESS
10	Y	TO MAIN HARNESS
11	G	TO MAIN HARNESS
12	L	TO MAIN HARNESS
13	W	TO MAIN HARNESS
14	GR	TO MAIN HARNESS
15	Y	TO MAIN HARNESS
16	P	TO MAIN HARNESS
17	R	TO MAIN HARNESS
18	W	TO MAIN HARNESS
19	R	TO MAIN HARNESS
20	–	TO MAIN HARNESS
21	–	TO MAIN HARNESS
22	–	TO MAIN HARNESS
23	–	TO MAIN HARNESS
24	P	TO MAIN HARNESS
25	L	TO MAIN HARNESS
26	G	TO MAIN HARNESS
27	R	TO MAIN HARNESS
28	L	TO MAIN HARNESS
29	SHIELD	TO MAIN HARNESS
30	W	TO MAIN HARNESS
31	B	TO MAIN HARNESS
32	R	TO MAIN HARNESS

Connector No.	B42
Connector Name	WIRE TO WIRE
Connector Type	NS16MW-CS
Connector Color	WHITE

H.S.

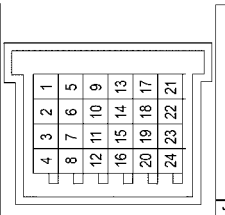


Terminal No.	Color of Wire	Signal Name
1	LG	TO MAIN HARNESS
2	LG	TO MAIN HARNESS
3	V	TO MAIN HARNESS
4	LA/G	TO MAIN HARNESS
5	W	TO MAIN HARNESS
6	BG	TO MAIN HARNESS
7	LA/R	TO MAIN HARNESS
8	LA/G	TO MAIN HARNESS (WITHOUT AUTOMATIC DRIVE POSITIONER)
8	LA/GR	TO MAIN HARNESS (WITH AUTOMATIC DRIVE POSITIONER)
9	LA/P	TO MAIN HARNESS
10	LA/R	TO MAIN HARNESS
11	LA/V	TO MAIN HARNESS
12	LA/Y	TO MAIN HARNESS
13	LA/GR	TO MAIN HARNESS
14	LA/BG	TO MAIN HARNESS
15	LA/BR	TO MAIN HARNESS
16	R	TO MAIN HARNESS

AWD SYSTEM CONNECTORS

Connector No.	B63
Connector Name	JOINT CONNECTOR-B01
Connector Type	NH24FW-J
Connector Color	WHITE

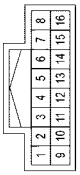
H.S.



Terminal No.	Color of Wire	Signal Name
1	L	CAN-H
2	Y	CAN-L
3	P	CAN-L
4	L	CAN-H
5	L	CAN-H
6	Y	CAN-L
7	P	CAN-L
8	L	CAN-H
9	L	CAN-H
10	Y	CAN-L
11	P	CAN-L
12	L	CAN-H
13	–	–
14	–	–
15	P	CAN-L
16	L	CAN-H
17	–	–
18	–	–
19	–	–
20	–	–
21	L	CAN-H
22	Y	CAN-L
23	P	CAN-L
24	L	CAN-H

Connector No.	B75
Connector Name	AWD CONTROL UNIT
Connector Type	TH16FW-NH
Connector Color	WHITE

H.S.



Terminal No.	Color of Wire	Signal Name
1	SB	AWD SOL (+)
2	Y	AWD SOL (-)
3	–	–
4	–	–
5	–	–
6	–	–
7	LA/R	IGN
8	L	CAN-H
9	LA/G	SOL BATT
10	B	GND
11	B	GND
12	–	–
13	–	–
14	Y	LOCK SWITCH
15	LA/L	VB
16	P	CAN-L

Connector No.	C12
Connector Name	AWD SOLENOID
Connector Type	RS02FGY
Connector Color	GRAY

H.S.



Terminal No.	Color of Wire	Signal Name
1	Y	AWD SOL (-)
2	SB	AWD SOL (+)

Connector No.	C13
Connector Name	WIRE TO WIRE
Connector Type	RS02MB
Connector Color	BLACK

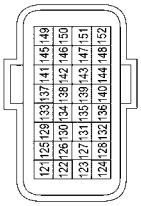
H.S.



Terminal No.	Color of Wire	Signal Name
1	SB	TO BODY HARNESS
2	Y	TO BODY HARNESS

Connector No.	E16
Connector Name	ECM
Connector Type	RH24FB-RZ8-L-LH
Connector Color	BLACK

H.S.



Terminal No.	Color of Wire	Signal Name
121	L	EVAP CONTROL SYSTEM PRESSURE SENSOR
122	–	–
123	P	CAN-L
124	L	CAN-H
125	R	SENSOR POWER SUPPLY
126	–	–
127	–	–
128	BG	FUEL TANK TEMPERATURE SENSOR
129	–	–
130	–	–
131	–	–
132	–	–
133	LG	IGNITION SWITCH
134	–	–
135	–	–
136	–	–
137	G	HEV CAN-L
138	L	HEV CAN-H
139	Y	STOP LAMP SWITCH

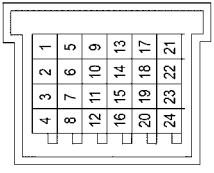
Terminal No.	Color of Wire	Signal Name
140	GR	BRAKE PEDAL POSITION SWITCH
141	Y	EVAP CANISTER VENT CONTROL VALVE
142	–	–
143	–	–
144	–	–
145	G	ECM POWER SUPPLY
146	–	–
147	GR	ECM GROUND
148	B	SENSOR GROUND
149	GR	ECM GROUND
150	–	–
151	–	–
152	GR	ECM GROUND

AADIA1396GB

AWD SYSTEM CONNECTORS

Connector No.	E44
Connector Name	JOINT CONNECTOR-E01
Connector Type	NH24FG-J
Connector Color	GREEN

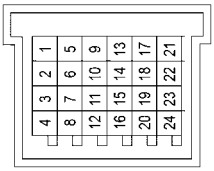
H.S.



Terminal No.	Color of Wire	Signal Name
1	V	SENSOR GROUND
2	LG	I BRAKE SW2
3	P	CAN-L
4	L	CAN-H
5	B	SENSOR GROUND
6	LG	I BRAKE SW2
7	P	CAN-L
8	L	CAN-H
9	W	SENSOR GROUND
10	Y	STOP LAMP SWITCH
11	P	CAN-L
12	L	CAN-H
13	–	–
14	R	STOP LAMP SWITCH
15	P	CAN-L
16	L	CAN-H
17	BR	EVAP CONTROL SYSTEM PRESSURE SENSOR
18	–	–
19	P	CAN-L
20	L	CAN-H
21	L	EVAP CONTROL SYSTEM PRESSURE SENSOR
22	–	–
23	–	–
24	–	–

Connector No.	E45
Connector Name	JOINT CONNECTOR-E03
Connector Type	NH24FW-J
Connector Color	WHITE

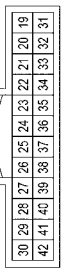
H.S.



Terminal No.	Color of Wire	Signal Name
1	B	GROUND
2	G	CAN-L
3	L	CAN-H
4	–	–
5	B	GROUND
6	G	HEV CAN-L
7	L	HEV CAN-H
8	–	–
9	B	GROUND
10	G	CAN-L
11	L	CAN-H
12	–	–
13	SHIELD	SHIELD
14	G	CAN-L
15	L	CAN-H
16	–	–
17	B	GROUND
18	G	HEV CAN-L
19	L	HEV CAN-H
20	–	–
21	B	GROUND
22	–	–
23	–	–
24	–	–

Connector No.	E120
Connector Name	IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)
Connector Type	TH24FGY-NH
Connector Color	GRAY

H.S.



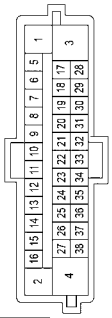
Terminal No.	Color of Wire	Signal Name
19	LG	O IGN ECM
20	–	–
21	–	–
22	P	CAN-L
23	–	–
24	L	CAN-H
25	–	–
26	–	–
27	SB	CABIN MOTOR 5
28	R	CABIN MOTOR 6
29	LG	CABIN MOTOR 7
30	Y	CABIN MOTOR 8
31	B	2ND SIGNAL GROUND
32	GR	LI PUSH SW
33	BR	I AUTO STOP WIPER
34	–	–
35	–	–
36	–	–
37	–	–
38	–	–
39	L	HEV CAN-H
40	G	HEV CAN-L
41	W	CABIN MOTOR 3
42	R	CABIN MOTOR 4

AADIA1397GB

AWD SYSTEM CONNECTORS

Connector No.	E125
Connector Name	ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)
Connector Type	SAZ34FB-HS2-SJZ2-DH
Connector Color	BLACK

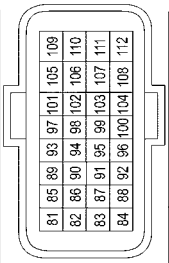
H.S.



Terminal No.	Color of Wire	Signal Name
1	BR	UB VR
2	B	GND MR
3	Y	UB MR
4	B	GND ECU
5	–	–
6	–	–
7	–	–
8	W	SKS1 (S1)
9	BR	VDC OFF
10	G	SKS2 (S2)
11	V	WSP FR
12	SB	WSS FR
13	BR	WSP RL
14	G	WSS RL
15	–	–
16	–	–
17	–	–
18	–	–
19	L	CAN- H
20	–	–
21	–	–
22	–	–
23	W	WSP FL
24	P	WSS FL
25	BG	WSP RR
26	LG	WSS RR
27	–	–
28	GR	WAU
29	–	–
30	P	CAN- L
31	B	VSSG (GND)
32	–	–
33	R	ASSM (VCC)
35	–	–
36	–	–
37	–	–
38	–	–

Connector No.	E130
Connector Name	HPCM
Connector Type	RH24FB-RZ8-L-RH
Connector Color	BLACK

H.S.



Terminal No.	Color of Wire	Signal Name
81	R	12V BATTERY VOLTAGE
82	–	–
83	P	CAN-L
84	L	CAN-H
85	–	–
86	–	–
87	–	–
88	B	DC/DC CONVERTER VOLTAGE STABILIZER SIGNAL
89	–	–
90	–	–
91	–	–
92	–	–
93	Y	IGNITION SIGNAL
94	G	ASCD STEERING SWITCH
95	BR	ASCD STEERING SWITCH GROUND
96	–	–
97	L	HEV SYSTEM CAN-H
98	G	HEV SYSTEM CAN-L
99	R	STOP LAMP SWITCH
100	W	BRAKE PEDAL POSITION SWITCH
101	–	–
102	SB	SENSOR POWER SUPPLY
103	BR	ACCELERATOR PEDAL POSITION SENSOR 2
104	LG	SENSOR GROUND
105	BR	POWER SUPPLY FOR HPCM
106	V	SENSOR POWER SUPPLY
107	–	–
108	B	HPCM GND
109	–	–
110	GR	ACCELERATOR PEDAL POSITION SENSOR 1
111	R	SENSOR GROUND
112	GR	HPCM GND

AADIA1398GB

AWD SYSTEM CONNECTORS

Connector No.	E152
Connector Name	WIRE TO WIRE
Connector Type	TH80FW-CS16-TM4
Connector Color	WHITE

H.S.

Terminal No.	Color of Wire	Signal Name
1J	–	TO MAIN HARNESS
2J	Y	TO MAIN HARNESS
3J	–	TO MAIN HARNESS
4J	–	TO MAIN HARNESS
5J	–	TO MAIN HARNESS
6J	–	TO MAIN HARNESS
7J	–	TO MAIN HARNESS
8J	–	TO MAIN HARNESS
9J	BR	TO MAIN HARNESS
10J	–	TO MAIN HARNESS
11J	–	TO MAIN HARNESS
12J	–	TO MAIN HARNESS
13J	–	TO MAIN HARNESS
14J	–	TO MAIN HARNESS
15J	–	TO MAIN HARNESS
16J	–	TO MAIN HARNESS
17J	–	TO MAIN HARNESS
18J	–	TO MAIN HARNESS
19J	–	TO MAIN HARNESS
20J	–	TO MAIN HARNESS
21J	GR	TO MAIN HARNESS
22J	SHIELD	TO MAIN HARNESS
23J	LG	TO MAIN HARNESS
24J	V	TO MAIN HARNESS
25J	L	TO MAIN HARNESS
26J	BR	TO MAIN HARNESS
27J	G	TO MAIN HARNESS

28J	R	TO MAIN HARNESS
29J	L	TO MAIN HARNESS
30J	V	TO MAIN HARNESS
31J	–	TO MAIN HARNESS
32J	–	TO MAIN HARNESS
33J	R	TO MAIN HARNESS
34J	L	TO MAIN HARNESS
35J	BG	TO MAIN HARNESS
36J	LG	TO MAIN HARNESS
37J	GR	TO MAIN HARNESS
38J	BR	TO MAIN HARNESS
39J	–	TO MAIN HARNESS
40J	–	TO MAIN HARNESS
41J	G	TO MAIN HARNESS
42J	W	TO MAIN HARNESS
43J	L	TO MAIN HARNESS
44J	B	TO MAIN HARNESS
45J	SB	TO MAIN HARNESS
46J	BR	TO MAIN HARNESS
47J	W	TO MAIN HARNESS
48J	W	TO MAIN HARNESS
49J	L	TO MAIN HARNESS
50J	P	TO MAIN HARNESS
51J	W	TO MAIN HARNESS
52J	R	TO MAIN HARNESS
53J	SB	TO MAIN HARNESS
54J	LG	TO MAIN HARNESS
55J	W	TO MAIN HARNESS
56J	BG	TO MAIN HARNESS
57J	R	TO MAIN HARNESS
58J	V	TO MAIN HARNESS
59J	BR	TO MAIN HARNESS
60J	P	TO MAIN HARNESS
61J	L	TO MAIN HARNESS
62J	P	TO MAIN HARNESS
63J	L	TO MAIN HARNESS
64J	R	TO MAIN HARNESS
65J	L	TO MAIN HARNESS
66J	BG	TO MAIN HARNESS
67J	–	TO MAIN HARNESS
68J	–	TO MAIN HARNESS
69J	G	TO MAIN HARNESS
70J	L	TO MAIN HARNESS
71J	–	TO MAIN HARNESS
72J	–	TO MAIN HARNESS
73J	–	TO MAIN HARNESS
74J	–	TO MAIN HARNESS
75J	–	TO MAIN HARNESS
76J	–	TO MAIN HARNESS
77J	–	TO MAIN HARNESS
78J	–	TO MAIN HARNESS
79J	SHIELD	TO MAIN HARNESS
80J	B	TO MAIN HARNESS

81J	W	TO MAIN HARNESS
82J	–	TO MAIN HARNESS
83J	–	TO MAIN HARNESS
84J	–	TO MAIN HARNESS
85J	–	TO MAIN HARNESS
86J	–	TO MAIN HARNESS
87J	–	TO MAIN HARNESS
88J	–	TO MAIN HARNESS
89J	–	TO MAIN HARNESS
90J	–	TO MAIN HARNESS
91J	–	TO MAIN HARNESS
92J	LG	TO MAIN HARNESS
93J	L	TO MAIN HARNESS
94J	L	TO MAIN HARNESS
95J	BR	TO MAIN HARNESS
96J	–	TO MAIN HARNESS
97J	GR	TO MAIN HARNESS
98J	P	TO MAIN HARNESS
99J	W	TO MAIN HARNESS
100J	Y	TO MAIN HARNESS

Connector No.	F42
Connector Name	IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)
Connector Type	TH24FB-NH
Connector Color	BLACK

H.S.

96	97	96	95	94	93	92	91	90	89	88	87
110	109	108	107	106	105	104	103	102	101	100	99

Terminal No.	Color of Wire	Signal Name
87	L	HEV CAN-H
88	G	HEV CAN-L
89	W	MOTOR CABIN 3
90	R	MOTOR CABIN 4
91	–	–
92	BG	LI NP SW
93	P	LI ECM DRIVER
94	–	–
95	–	–
96	–	–
97	–	–
98	–	–
99	BG	MOTOR CABIN 5
100	GR	MOTOR CABIN 6
101	LG	MOTOR CABIN 7

102	Y	MOTOR CABIN 8
103	W	HOOD SW2
104	–	–
105	–	–
106	BR	LO FAN RELAY2(PWM)
107	–	–
108	–	–
109	–	–
110	–	–

AADIA1399GB

AWD SYSTEM CONNECTORS

Connector No.	F75
Connector Name	TCM (TRANSMISSION CONTROL MODULE)
Connector Type	RH40FB-RZ8-L-LH
Connector Color	BLACK

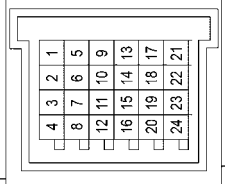
H.S.



Terminal No.	Color of Wire	Signal Name
1	–	–
2	SB	L RANGE SW
3	LG	CLUTCH 2 TEMP SENSOR
4	Y	D RANGE SW
5	R	N RANGE SW
6	G	R RANGE SW
7	V	P RANGE SW
8	–	–
9	–	–
10	–	–
11	W	SENSOR GND
12	LG	CVT FLUID TEMP SENS
13	–	–
14	–	–
15	B	SENSOR GND
16	R	SEC PRESS SENS
17	L	PRI PRESS SENS
18	–	–
19	–	–
20	–	–
21	–	–
22	–	–
23	G	HEV CAN-L
24	–	–
25	W	EOP SIG
26	P	SENS PWR SUPPLY
27	–	–
28	–	–
29	–	–
30	BR	LINE PRESS SOL VALVE
31	–	–
32	P	EOP STATE
33	L	HEV CAN-H
34	R	OUTPUT SPEED SENS
35	LG	PRI SPEED SENS
36	–	–
37	BG	SELECT SOL VALVE
38	GR	TCC SOL VALVE
39	SB	SEC PRESS SOL VALVE
40	V	PRI PRESS SOL VALVE
41	B	GND
42	B	GND
43	–	–
44	–	–
45	LG	BATT
46	LG	BATT
47	R	VIGN
48	R	VIGN

Connector No.	M6
Connector Name	JOINT CONNECTOR-M01
Connector Type	NH24FGY-J
Connector Color	GRAY

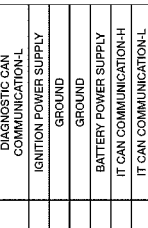
H.S.



Terminal No.	Color of Wire	Signal Name
1	GR	K-LINE
2	R	IGNITION
3	P	CAN-L
4	L	CAN-H
5	–	–
6	–	–
7	P	CAN-L
8	L	CAN-H
9	GR	K-LINE
10	R	IGNITION
11	P	CAN-L
12	L	CAN-H
13	P	CAN-L
14	L	CAN-H
15	P	CAN-L
16	L	CAN-H
17	P	CAN-L
18	L	CAN-H
19	P	CAN-H
20	L	CAN-H
21	P	CAN-L
22	L	CAN-H
23	P	CAN-L
24	L	CAN-H

Connector No.	M29
Connector Name	3CH CAN GATEWAY
Connector Type	TH16FW-NH
Connector Color	WHITE

H.S.



Terminal No.	Color of Wire	Signal Name
1	L	VEHICLE CAN COMMUNICATION 1-H
2	P	VEHICLE CAN COMMUNICATION 1-L
3	L	DIAGNOSTIC CAN COMMUNICATION-H
4	P	DIAGNOSTIC CAN COMMUNICATION-L
5	Y	IGNITION POWER SUPPLY
6	B	GROUND
7	B	GROUND
8	W	BATTERY POWER SUPPLY
9	L	IT CAN COMMUNICATION-H
10	V	IT CAN COMMUNICATION-L
11	L	DIAGNOSTIC CAN COMMUNICATION-H
12	P	DIAGNOSTIC CAN COMMUNICATION-L
13	L	IT CAN COMMUNICATION-H
14	V	IT CAN COMMUNICATION-L
15	L	HEV CAN COMMUNICATION-L
16	G	HEV CAN COMMUNICATION-H

AADIA1400GB

AWD SYSTEM CONNECTORS

Connector No.	M31
Connector Name	WIRE TO WIRE
Connector Type	TH80MW-CS16-TM4
Connector Color	WHITE

H.S.

Terminal No.	Color of Wire	Signal Name
1J	–	TO ENGINE ROOM HARNESS
2J	R	TO ENGINE ROOM HARNESS
3J	–	TO ENGINE ROOM HARNESS
4J	–	TO ENGINE ROOM HARNESS
5J	–	TO ENGINE ROOM HARNESS
6J	–	TO ENGINE ROOM HARNESS
7J	–	TO ENGINE ROOM HARNESS
8J	–	TO ENGINE ROOM HARNESS
9J	W	TO ENGINE ROOM HARNESS
10J	–	TO ENGINE ROOM HARNESS
11J	–	TO ENGINE ROOM HARNESS
12J	–	TO ENGINE ROOM HARNESS
13J	–	TO ENGINE ROOM HARNESS
14J	–	TO ENGINE ROOM HARNESS
15J	–	TO ENGINE ROOM HARNESS
16J	–	TO ENGINE ROOM HARNESS
17J	–	TO ENGINE ROOM HARNESS
18J	–	TO ENGINE ROOM HARNESS
19J	–	TO ENGINE ROOM HARNESS
20J	–	TO ENGINE ROOM HARNESS
21J	LA/L	TO ENGINE ROOM HARNESS
22J	SHIELD	TO ENGINE ROOM HARNESS
23J	LG	TO ENGINE ROOM HARNESS
24J	V	TO ENGINE ROOM HARNESS
25J	L	TO ENGINE ROOM HARNESS
26J	BR	TO ENGINE ROOM HARNESS
27J	G	TO ENGINE ROOM HARNESS
28J	Y	TO ENGINE ROOM HARNESS
29J	L	TO ENGINE ROOM HARNESS
30J	V	TO ENGINE ROOM HARNESS
31J	–	TO ENGINE ROOM HARNESS
32J	–	TO ENGINE ROOM HARNESS
33J	R	TO ENGINE ROOM HARNESS
33J	Y	TO ENGINE ROOM HARNESS - (WITH DRIVER ASSISTNACE SYSTEM)
34J	L	TO ENGINE ROOM HARNESS
35J	BG	TO ENGINE ROOM HARNESS
36J	GR	TO ENGINE ROOM HARNESS
37J	Y	TO ENGINE ROOM HARNESS
38J	LA/BR	TO ENGINE ROOM HARNESS
39J	–	TO ENGINE ROOM HARNESS
40J	–	TO ENGINE ROOM HARNESS
41J	LA/R	TO ENGINE ROOM HARNESS
42J	W	TO ENGINE ROOM HARNESS
43J	L	TO ENGINE ROOM HARNESS
44J	B	TO ENGINE ROOM HARNESS
45J	SB	TO ENGINE ROOM HARNESS
46J	BR	TO ENGINE ROOM HARNESS
47J	W	TO ENGINE ROOM HARNESS
48J	R	TO ENGINE ROOM HARNESS
49J	SB	TO ENGINE ROOM HARNESS
50J	GR	TO ENGINE ROOM HARNESS
51J	W	TO ENGINE ROOM HARNESS
52J	R	TO ENGINE ROOM HARNESS
53J	BR	TO ENGINE ROOM HARNESS
54J	LG	TO ENGINE ROOM HARNESS
55J	LA/Y	TO ENGINE ROOM HARNESS
56J	LA/V	TO ENGINE ROOM HARNESS
57J	LA/R	TO ENGINE ROOM HARNESS
58J	W	TO ENGINE ROOM HARNESS
59J	BR	TO ENGINE ROOM HARNESS
60J	P	TO ENGINE ROOM HARNESS
61J	L	TO ENGINE ROOM HARNESS
62J	R	TO ENGINE ROOM HARNESS
63J	L	TO ENGINE ROOM HARNESS
64J	R	TO ENGINE ROOM HARNESS
65J	L	TO ENGINE ROOM HARNESS
66J	BG	TO ENGINE ROOM HARNESS
67J	–	TO ENGINE ROOM HARNESS
68J	–	TO ENGINE ROOM HARNESS
69J	G	TO ENGINE ROOM HARNESS
70J	L	TO ENGINE ROOM HARNESS
71J	–	TO ENGINE ROOM HARNESS
72J	–	TO ENGINE ROOM HARNESS
73J	–	TO ENGINE ROOM HARNESS
74J	–	TO ENGINE ROOM HARNESS
75J	–	TO ENGINE ROOM HARNESS
76J	–	TO ENGINE ROOM HARNESS
77J	–	TO ENGINE ROOM HARNESS
78J	–	TO ENGINE ROOM HARNESS
79J	SHIELD	TO ENGINE ROOM HARNESS
80J	B	TO ENGINE ROOM HARNESS
81J	W	TO ENGINE ROOM HARNESS
82J	–	TO ENGINE ROOM HARNESS
83J	–	TO ENGINE ROOM HARNESS
84J	–	TO ENGINE ROOM HARNESS
85J	–	TO ENGINE ROOM HARNESS
86J	–	TO ENGINE ROOM HARNESS
87J	–	TO ENGINE ROOM HARNESS
88J	–	TO ENGINE ROOM HARNESS
89J	–	TO ENGINE ROOM HARNESS
90J	–	TO ENGINE ROOM HARNESS
91J	–	TO ENGINE ROOM HARNESS
92J	Y	TO ENGINE ROOM HARNESS
93J	G	TO ENGINE ROOM HARNESS
94J	L	TO ENGINE ROOM HARNESS
95J	P	TO ENGINE ROOM HARNESS
96J	–	TO ENGINE ROOM HARNESS
97J	SB	TO ENGINE ROOM HARNESS
98J	P	TO ENGINE ROOM HARNESS
99J	LA/R	TO ENGINE ROOM HARNESS
100J	R	TO ENGINE ROOM HARNESS

Connector No.	M43
Connector Name	JOINT CONNECTOR-M02
Connector Type	NH20FG-DC
Connector Color	GREEN

H.S.

Terminal No.	Color of Wire	Signal Name
1	–	–
2	–	–
3	L	CAN-H
4	L	CAN-H
5	L	CAN-H
6	–	–
7	L	CAN-H
8	L	CAN-H
9	L	CAN-H
10	–	–
11	–	–
12	–	–
13	–	–
14	G	CAN-L
15	G	CAN-L
16	G	CAN-L
17	–	–
18	P	CAN-L
19	P	CAN-L
20	P	CAN-L

Connector No.	M44
Connector Name	FUSE BLOCK (J/B)
Connector Type	NS16FW-CS
Connector Color	WHITE

H.S.

Terminal No.	Color of Wire	Signal Name
1P	R	IGNITION
2P	G	IGNITION
3P	Y	IGNITION RELAY-2 CONTROL
4P	LG	REAR WINDOW DEFOGGER RELAY OUTPUT
5P	GR	REAR WINDOW DEFOGGER RELAY OUTPUT
6P	LA/R	REAR WINDOW DEFOGGER RELAY CONTROL
7P	Y	IGNITION
8P	V	IGNITION
9P	L	BATTERY
10P	LG	IGNITION
11P	–	–
12P	–	–
13P	G	BATTERY
14P	–	–
15P	L	BATTERY
16P	LA/W	FRONT BLOWER MOTOR RELAY CONTROL

AADIA1401GB

AWD SYSTEM CONNECTORS

Connector No.	M56
Connector Name	STEERING ANGLE SENSOR
Connector Type	TH08GY-NH
Connector Color	GRAY

H.S.

1	2	3	4
5	6	7	8

Terminal No.	Color of Wire	Signal Name
1	B	GND
2	P	CAN-L
3	–	–
4	G	IGN
5	L	CAN-H
6	–	–
7	–	–
8	–	–

Connector No.	M67
Connector Name	JOINT CONNECTOR-M27
Connector Type	SAC08JW
Connector Color	WHITE

H.S.

8	7	6	5	4	3	2	1

Terminal No.	Color of Wire	Signal Name
1	B	GROUND
2	B	GROUND
3	B	GROUND
4	B	GROUND
5	B	GROUND
6	B	GROUND
7	B	GROUND
8	B	GROUND

Connector No.	M68
Connector Name	FUSE BLOCK (J/B)
Connector Type	NS16FBR-CS
Connector Color	BROWN

H.S.

7R	6R	5R	4R		3R	2R	1R
16R	15R	14R	13R	12R	11R	10R	9R	8R

Terminal No.	Color of Wire	Signal Name
1R	V	ILLUMINATION +
2R	G	IGNITION
3R	V	BATTERY
4R	–	–
5R	–	–
6R	LA/L	ACCESSORY
7R	LA/V	BATTERY
8R	–	–
9R	–	–
10R	GR	BATTERY
11R	–	–
12R	–	–
13R	–	–
14R	W	BATTERY
15R	W	BATTERY
16R	GR	ACCESSORY

Connector No.	M69
Connector Name	WIRE TO WIRE
Connector Type	TH32FW-NH
Connector Color	WHITE

H.S.

16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17

Terminal No.	Color of Wire	Signal Name
1	SB	TO BODY HARNESS
2	BR	TO BODY HARNESS
3	L	TO BODY HARNESS
4	L	TO BODY HARNESS
5	W	TO BODY HARNESS
6	Y	TO BODY HARNESS
7	LG	TO BODY HARNESS

8	BG	TO BODY HARNESS
9	BR	TO BODY HARNESS
10	Y	TO BODY HARNESS
11	G	TO BODY HARNESS
12	L	TO BODY HARNESS
13	W	TO BODY HARNESS
14	GR	TO BODY HARNESS
15	Y	TO BODY HARNESS
16	P	TO BODY HARNESS
17	R	TO BODY HARNESS
18	W	TO BODY HARNESS
19	R	TO BODY HARNESS
20	–	TO BODY HARNESS
21	–	TO BODY HARNESS
22	–	TO BODY HARNESS
23	–	TO BODY HARNESS
24	P	TO BODY HARNESS
25	L	TO BODY HARNESS
26	BR	TO BODY HARNESS
27	R	TO BODY HARNESS
28	L	TO BODY HARNESS
29	SHIELD	TO BODY HARNESS
30	W	TO BODY HARNESS
31	B	TO BODY HARNESS
32	R	TO BODY HARNESS

Connector No.	M74
Connector Name	WIRE TO WIRE
Connector Type	NS16FW-CS
Connector Color	WHITE

H.S.

7	6	5	4		3	2	1
16	15	14	13	12	11	10	9	8

Terminal No.	Color of Wire	Signal Name
1	LG	TO BODY HARNESS
2	LG	TO BODY HARNESS
3	V	TO BODY HARNESS
4	Y	TO BODY HARNESS
5	W	TO BODY HARNESS
6	BG	TO BODY HARNESS
7	SB	TO BODY HARNESS
8	BR	TO BODY HARNESS
9	LA/G	TO BODY HARNESS
10	LA/R	TO BODY HARNESS
11	LG	TO BODY HARNESS
12	GR	TO BODY HARNESS

13	BR	TO BODY HARNESS
14	LA/L	TO BODY HARNESS
15	LA/BR	TO BODY HARNESS
16	GR	TO BODY HARNESS

Connector No.	M77
Connector Name	COMBINATION METER
Connector Type	TH12FW-NH
Connector Color	WHITE

H.S.

41	42	43	44	45	46
47	48	49	50	51	52

Terminal No.	Color of Wire	Signal Name
41	L	CAN-H
42	P	CAN-L
43	R	ILL CONT OUT
44	LA/B	FUEL SENSOR GND
45	G	BAT
46	V	IGN
47	SB	M-CAN H
48	LG	M-CAN L
49	–	–
50	–	–
51	LA/L	FUEL SENSOR
52	B	G1

AADIA1402GB

BASIC INSPECTION

DIAGNOSIS AND REPAIR WORK FLOW

Work Flow

INFOID:0000000014630174

DETAILED FLOW

1.INTERVIEW FROM THE CUSTOMER

Clarify customer complaints before inspection. First of all, perform an interview utilizing DLN-37, "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-25, "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 DIAGNOSTIC RESULT

With CONSULT

Perform “Self Diagnostic Result” of “ALL MODE AWD/4WD”.

Is any DTC detected?

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

4.RECHECK SYMPTOM

With CONSULT

1. Erase “Self Diagnostic Result” of “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-26, "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-54, "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 Result” of “ALL MODE AWD/4WD”.

>> GO TO 7.

6.IDENTIFY ERROR-DETECTED SYSTEM BY SYMPTOM DIAGNOSIS

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

Can the error-detected system be identified?

YES >> GO TO 7.
NO >> Check harness and connectors based on the information obtained by interview. Refer to GI-54, "Intermittent Incident".

7. FINAL CHECK

With CONSULT
1. Check the reference value for AWD control unit.
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:0000000014630175

Description

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

Interview sheet sample

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

Interview sheet

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

Memo

ADDITIONAL SERVICE WHEN REPLACING AWD CONTROL UNIT

Description

INFOID:0000000014630176

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

Work Procedure

INFOID:0000000014630177

1.PERFORM WRITING UNIT CHARACTERISTICS

Perform writing unit characteristics of electric controlled coupling.

>> Refer to DLN-40, "Work Procedure".

UNIT CHARACTERISTICS WRITING

Description

INFOID:0000000014630178

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

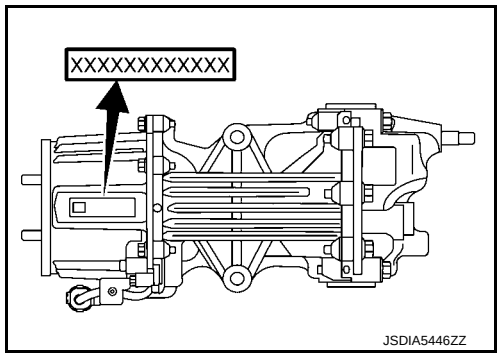
Work Procedure

INFOID:0000000014630179

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” of “ALL MODE AWD/4WD”.
4. Input unit characteristics.
5. Select “Start”.
6. Check that “UNIT CHARACTERISTICS WRITE COMPLETED” is displayed.



>> Work End.

DTC/CIRCUIT DIAGNOSIS

C1201 AWD CONTROL UNIT

DTC Description

INFOID:0000000014630180

DTC DETECTION LOGIC

DTC No.	CONSULT screen items (Trouble diagnosis content)	DTC detecting condition	
C1201	CONTROLLER FAILURE (Control unit failure)	Diagnosis condition	All times
		Signal (terminal)	—
		Threshold	Malfunction has occurred inside AWD control unit.
		Diagnosis delay time	2 seconds

POSSIBLE CAUSE

Internal malfunction of AWD control unit

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

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

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

CONSULT
1. Turn the ignition switch OFF to ON.
2. Select “Self Diagnostic Result” mode of “ALL MODE AWD/4WD”.

Is DTC “C1201” detected?

YES >> Proceed to diagnosis procedure. Refer to DLN-41, "Diagnosis Procedure".
NO-1 >> To check malfunction symptom before repair: Refer to GI-54, "Intermittent Incident".
NO-2 >> Confirmation after repair: Inspection End.

Diagnosis Procedure

INFOID:0000000014630181

1. PERFORM SELF DIAGNOSTIC RESULT

CONSULT
1. Erase “Self Diagnostic Result” of “ALL MODE AWD/4WD”.
2. Turn the ignition switch OFF, and then wait 10 seconds or more.
3. Turn the ignition switch ON.
4. Select “Self Diagnostic Result” mode of “ALL MODE AWD/4WD”.

Is DTC “C1201” detected?

YES >> Replace AWD control unit. Refer to DLN-72, "Removal and Installation".
NO >> Inspection End.

C1203 ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

DTC Description

INFOID:0000000014630182

DTC DETECTION LOGIC

DTC No.	CONSULT screen items (Trouble diagnosis content)	DTC detecting condition	
C1203	ABS SYSTEM (ABS system)	Diagnosis condition	All times
		Signal (terminal)	—
		Threshold	Malfunction related to wheel sensor has been detected by ABS actuator and electric unit (control unit).
		Diagnosis delay time	2 seconds

POSSIBLE CAUSE

ABS malfunction
- Vehicle speed signal error

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

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

>> GO TO 2.

2.DTC REPRODUCTION PROCEDURE

CONSULT
1. Drive at 30 km/h (19 MPH) or more for approximately 1 minute.
2. Stop the vehicle.
3. Select “Self Diagnostic Result” mode of “ALL MODE AWD/4WD”.

Is DTC “C1203” detected?

YES >> Proceed to diagnosis procedure. Refer to DLN-42, "Diagnosis Procedure".
NO-1 >> To check malfunction symptom before repair: Refer to GI-54, "Intermittent Incident".
NO-2 >> Confirmation after repair: Inspection End.

Diagnosis Procedure

INFOID:0000000014630183

1.PERFORM ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) SELF DIAGNOSTIC RESULT

CONSULT
Select “Self Diagnostic Result” mode of “ABS”.

Is any DTC detected?

YES >> Check the DTC. Refer to BRC-61, "DTC Index".
NO >> Inspection End.

C1204 AWD SOLENOID

DTC Description

INFOID:0000000014630184

DTC DETECTION LOGIC

DTC No.	CONSULT screen items (Trouble diagnosis content)	DTC detecting condition	
C1204	4WD SOLENOID (4WD solenoid)	Diagnosis condition	All times
		Signal (terminal)	—
		Threshold	Malfunction related to AWD solenoid has been detected.
		Diagnosis delay time	2 seconds

POSSIBLE CAUSE

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

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

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

>> GO TO 2.

2.DTC REPRODUCTION PROCEDURE

CONSULT

1. Turn the ignition switch ON, then wait 10 seconds or more.
2. Select “Self Diagnostic Result” mode of “ALL MODE AWD/4WD”.

Is DTC “C1204” detected?

YES >> Proceed to diagnosis procedure. Refer to DLN-43, "Diagnosis Procedure".
NO-1 >> To check malfunction symptom before repair: Refer to GI-54, "Intermittent Incident".
NO-2 >> Confirmation after repair: Inspection End.

Diagnosis Procedure

INFOID:0000000014630185

1.CHECK AWD SOLENOID POWER SUPPLY

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	9	Ground	Battery voltage

4. Turn the ignition switch ON.
   CAUTION:
   Do not set the vehicle to READY. Do not start the engine.
5. Check the voltage between AWD control unit harness connector and ground.

AWD control unit		—	Voltage (Approx.)
Connector	Terminal		
B75	9	Ground	Battery voltage

Is the inspection result normal?

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

2.CHECK AWD SOLENOID POWER SUPPLY CIRCUIT

1. Turn the ignition switch OFF.
2. Check the 10A fuse (#6).
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	Yes

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

AWD control unit		—	Continuity
Connector	Terminal		
B75	9	Ground	No

Is the inspection result normal?

YES >> Perform the trouble diagnosis for power supply circuit. Refer to PG-13, "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	Yes
	11		

Is the inspection result normal?

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

4.CHECK AWD SOLENOID CIRCUIT

Check the resistance between AWD control unit harness connector.

AWD control unit			Resistance (Approx.)
Connector	Terminal		
B75	1	2	2.5 Ω

Is the inspection result normal?

YES >> GO TO 7.
NO >> GO TO 5.

5.CHECK HARNESS FOR AWD SOLENOID CIRCUIT

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	Yes
	2		1	

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

AWD control unit		—	Continuity
Connector	Terminal		
B75	1	Ground	No
	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-45, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 7.
NO >> AWD solenoid is malfunctioning. Replace electric controlled coupling. Refer to DLN-124, "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 >> Inspection End.
NO >> Repair or replace error-detected parts.

Component Inspection

INFOID:0000000014630186

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	2.5 Ω

Is the inspection result normal?

YES >> Inspection End.
NO >> AWD solenoid is malfunctioning. Replace electric controlled coupling. Refer to DLN-124, "Removal and Installation".

C1209 MODE SW

DTC Description

INFOID:0000000014630187

DTC DETECTION LOGIC

DTC No.	CONSULT screen items (Trouble diagnosis content)	DTC detecting condition	
C1209	MODE SW (Mode switch)	Diagnosis condition	All times
		Signal (terminal)	—
		Threshold	More than two switch inputs are simultaneously detected due to short circuit of AWD lock switch.
		Diagnosis delay time	2 seconds

POSSIBLE CAUSE

Malfunction of AWD lock switch or AWD lock switch circuit.

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

CONSULT

1. Set the vehicle to READY state.
   CAUTION:
   Stop the vehicle.
2. Operate AWD lock switch.
3. Select “Self Diagnostic Result” of “ALL MODE AWD/4WD”.

Is DTC “C1209” detected?

YES >> Proceed to diagnosis procedure. Refer to DLN-46, "Diagnosis Procedure".
NO-1 >> To check malfunction symptom before repair: Refer to GI-54, "Intermittent Incident".
NO-2 >> Confirmation after repair: Inspection End.

Diagnosis Procedure

INFOID:0000000014630188

1.CHECK AWD LOCK SWITCH

Check AWD lock switch. Refer to DLN-47, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 2.
NO >> Replace AWD lock switch. Refer to DLN-73, "Removal and Installation".

2.CHECK AWD LOCK SWITCH GROUND CIRCUIT

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

AWD lock switch		—	Continuity
Connector	Terminal		
M100	6	Ground	Yes

Is the inspection result normal?

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

3.CHECK AWD LOCK SWITCH SIGNAL CIRCUIT

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

AWD control unit		AWD lock switch		Continuity
Connector	Terminal	Connector	Terminal	
B75	14	M100	9	Yes

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

AWD control unit		—	Continuity
Connector	Terminal		
B75	14	Ground	No

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:
Do not set the vehicle to READY state.

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

AWD lock switch		—	Voltage (Approx.)
Connector	Terminal		
M100	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-72, "Removal and Installation".

Component Inspection

INFOID:0000000014630189

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.	No
		When AWD lock switch is hold pressed.	Yes

Is the inspection result normal?

YES >> Inspection End.
NO >> Replace AWD lock switch. Refer to DLN-73, "Removal and Installation".

C1210 ECM

DTC Description

INFOID:0000000014630190

DTC DETECTION LOGIC

DTC No.	CONSULT screen items (Trouble diagnosis content)	DTC detecting condition	
C1210	ENGINE SIGNAL 1 (Engine signal 1)	Diagnosis condition	All times
		Signal (terminal)	—
		Threshold	Malfunction related to engine signal has been detected. **NOTE:** AWD control unit receives signal of ECM in substitution from HPCM
		Diagnosis delay time	2 seconds

POSSIBLE CAUSE

Malfunction of engine control system or hybrid 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

CONSULT

1. Set the vehicle to READY state.
2. Drive vehicle at 10 km/h (6 MPH) or more for approximately five minutes.
3. Stop the vehicle.
4. Select “Self Diagnostic Result” mode of “ALL MODE AWD/4WD”.

Is DTC “C1210” detected?

YES >> Proceed to diagnosis procedure. Refer to DLN-48, "Diagnosis Procedure".
NO-1 >> To check malfunction symptom before repair: Refer to GI-54, "Intermittent Incident".
NO-2 >> Confirmation after repair: Inspection End.

Diagnosis Procedure

INFOID:0000000014630191

1.PERFORM HPCM SELF DIAGNOSTIC RESULT

CONSULT

Select “Self Diagnostic Result” mode of “EV/HEV”.

Is any DTC detected?

YES >> Check the DTC. Refer to HBC-71, "DTC Index".
NO >> INspection End.

P1804 AWD CONTROL UNIT

DTC Description

INFOID:0000000014630192

DTC DETECTION LOGIC

DTC No.	CONSULT screen items (Trouble diagnosis content)	DTC detecting condition	
P1804	CONTROL UNIT (Control unit)	Diagnosis condition	All times
		Signal (terminal)	—
		Threshold	Malfunction is detected in the memory (EEPROM) system of AWD control unit.
		Diagnosis delay time	2 seconds

POSSIBLE CAUSE

Internal malfunction of AWD control unit.

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

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

>> GO TO 2.

2.DTC REPRODUCTION PROCEDURE

CONSULT

1. Turn the ignition switch ON.
2. Select “Self Diagnostic Result” mode of “ALL MODE AWD/4WD”.

Is DTC “P1804” detected?

YES >> Proceed to diagnosis procedure. Refer to DLN-49, "Diagnosis Procedure".
NO-1 >> To check malfunction symptom before repair: Refer to GI-54, "Intermittent Incident".
NO-2 >> Confirmation after repair: Inspection End.

Diagnosis Procedure

INFOID:0000000014630193

1.PERFORM SELF DIAGNOSTIC RESULT

CONSULT

After erasing the DTC, perform DTC confirmation procedure again. Refer to DLN-49, "DTC Description"

Is DTC P1804 detected?

YES >> Replace AWD control unit. Refer DLN-72, "Removal and Installation".
NO >> Inspection End.

P1808 WHEEL SPEED SENSOR

DTC Description

INFOID:0000000014630194

DTC DETECTION LOGIC

DTC No.	CONSULT screen items (Trouble diagnosis content)	DTC detecting condition	
P1808	VHCL SPEED SEN-ABS (Vehicle speed sensor-ABS)	Diagnosis condition	All times
		Signal (terminal)	—
		Threshold	• 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.
		Diagnosis delay time	2 seconds

POSSIBLE CAUSE

- ABS malfunction
- Internal malfunction of AWD control unit

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

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

>> GO TO 2.

2.DTC REPRODUCTION PROCEDURE

CONSULT

1. Set the vehicle to READY state.
2. Drive vehicle at 10 km/h (6 MPH) or more for approximately 5 minutes.
3. Stop the vehicle.
4. Select “Self Diagnostic Result” mode of “ALL MODE AWD/4WD”.

Is DTC “P1808” detected?

YES >> Proceed to diagnosis procedure. Refer to DLN-50, "Diagnosis Procedure".
NO-1 >> To check malfunction symptom before repair: Refer to GI-54, "Intermittent Incident".
NO-2 >> Confirmation after repair: Inspection End.

Diagnosis Procedure

INFOID:0000000014630195

1.PERFORM ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) SELF DIAGNOSTIC RESULT

CONSULT

Select “Self Diagnostic Result” mode of “ABS”.

Is any DTC detected?

YES >> Check the DTC. Refer to BRC-61, "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-72, "Removal and Installation".
NO >> Repair or replace error-detected parts.

P1809 AWD CONTROL UNIT

DTC Description

INFOID:0000000014630196

DTC DETECTION LOGIC

DTC No.	CONSULT screen items (Trouble diagnosis content)	DTC detecting condition	
P1809	CONTROL UNIT (Control unit)	Diagnosis condition	All times
		Signal (terminal)	—
		Threshold	AWD converter system of AWD control unit is malfunctioning
		Diagnosis delay time	2 seconds

POSSIBLE CAUSE

Internal malfunction of AWD control unit

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

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

>> GO TO 2.

2.DTC REPRODUCTION PROCEDURE

CONSULT

1. Turn the ignition switch ON.
2. Select “Self Diagnostic Result” mode of “ALL MODE AWD/4WD”.

Is DTC “P1809” detected?

YES >> Proceed to diagnosis procedure. Refer to DLN-51, "Diagnosis Procedure".
NO-1 >> To check malfunction symptom before repair: Refer to GI-54, "Intermittent Incident".
NO-2 >> Confirmation after repair: Inspection End.

Diagnosis Procedure

INFOID:0000000014630197

1.PERFORM SELF DIAGNOSTIC RESULT

CONSULT

After erasing the DTC, perform DTC confirmation procedure again. Refer to DLN-51, "DTC Description".

Is DTC P1809 detected?

YES >> Replace AWD control unit. Refer DLN-72, "Removal and Installation".
NO >> Inspection End.

P1811 BATTERY VOLTAGE

DTC Description

INFOID:0000000014630198

DTC DETECTION LOGIC

DTC No.	CONSULT screen items (Trouble diagnosis content)	DTC detecting condition	
P1811	BATTERY VOLTAGE (Battery voltage)	Diagnosis condition	All times
		Signal (terminal)	—
		Threshold	AWD control unit power supply is less than 9V or higher than 26 V when the vehicle is in READY state.
		Diagnosis delay time	2 seconds

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

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

CONSULT

1. Set the vehicle to READY state.
2. Drive the vehicle at 10 km/h (6 MPH) or more for approximately five minutes.
3. Stop the vehicle.
4. Select “Self Diagnostic Result” mode of “ALL MODE AWD/4WD”.

Is DTC “P1811” detected?

YES >> Proceed to diagnosis procedure. Refer to DLN-52, "Diagnosis Procedure".
NO-1 >> To check malfunction symptom before repair: Refer to GI-54, "Intermittent Incident".
NO-2 >> Confirmation after repair: Inspection End.

Diagnosis Procedure

INFOID:0000000014630199

1.CHECK AWD CONTROL UNIT POWER SUPPLY (IGNITION POWER SUPPLY)

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 set the vehicle to READY. Never start the engine.
5. Check the voltage between AWD control unit harness connector and ground.

AWD control unit		—	Voltage (Approx.)
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 CIRCUIT (IGNITION POWER SUPPLY)

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	Yes

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

AWD control unit		—	Continuity
Connector	Terminal		
B75	7	Ground	No

Is the inspection result normal?

YES >> Perform the trouble diagnosis for ignition power supply circuit. Refer to PG-44, "Wiring Diagram - IGNITION POWER SUPPLY -".
NO >> Repair or replace error-detected parts.

3. CHECK AWD CONTROL UNIT POWER SUPPLY (BATTERY POWER SUPPLY)

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 set the vehicle to READY. Never start the engine.
4. Check the voltage between AWD control unit harness connector and ground.

AWD control unit		—	Voltage (Approx.)
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 CIRCUIT (BATTERY POWER SUPPLY)

1. Turn the ignition switch OFF.
2. Check the 5A fuse (#2).
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	B30	6Q	Yes

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

AWD control unit		—	Continuity
Connector	Terminal		
B75	15	Ground	No

Is the inspection result normal?

YES >> Perform the trouble diagnosis for power supply circuit. Refer to PG-13, "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	Yes
	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-72, "Removal and Installation".
NO >> Repair or replace error-detected parts.

P181B INCOMPLETE SELFSHUT

DTC Description

INFOID:0000000014630200

DTC DETECTION LOGIC

DTC No.	CONSULT screen items (Trouble diagnosis content)	DTC detecting condition	
P181B	INCOMP SELF SHUT (Incomplete self shut)	Diagnosis condition	All times
		Signal (terminal)	—
		Threshold	When ignition switch is ON, self-shut of AWD control unit was incomplete.
		Diagnosis delay time	2 seconds

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

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

CONSULT

1. Turn the ignition switch ON.
2. Select “Self Diagnostic Result” mode of “ALL MODE AWD/4WD”.

Is DTC “P181B” detected?

YES >> Proceed to diagnosis procedure. Refer to DLN-55, "Diagnosis Procedure".
NO-1 >> To check malfunction symptom before repair: Refer to GI-54, "Intermittent Incident".
NO-2 >> Confirmation after repair: Inspection End.

Diagnosis Procedure

INFOID:0000000014630201

1.CHECK AWD CONTROL UNIT POWER SUPPLY (IGNITION POWER SUPPLY)

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:
   Do not set the vehicle to READY. Never start the engine.
5. Check the voltage between AWD control unit harness connector and ground.

AWD control unit		—	Voltage (Approx.)
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 CIRCUIT (IGNITION POWER SUPPLY)

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	Yes

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

AWD control unit		—	Continuity
Connector	Terminal		
B75	7	Ground	No

Is the inspection result normal?

YES >> Perform the trouble diagnosis for ignition power supply circuit. Refer to PG-44, "Wiring Diagram - IGNITION POWER SUPPLY -".
NO >> Repair or replace error-detected parts.

3. CHECK AWD CONTROL UNIT POWER SUPPLY (BATTERY POWER SUPPLY)

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:
   Do not set the vehicle to READY. Never start the engine.
4. Check the voltage between AWD control unit harness connector and ground.

AWD control unit		—	Voltage (Approx.)
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 CIRCUIT (BATTERY POWER SUPPLY)

1. Turn the ignition switch OFF.
2. Check the 5A fuse (#2).
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	B30	6Q	Yes

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

AWD control unit		—	Continuity
Connector	Terminal		
B75	15	Ground	No

Is the inspection result normal?

YES >> Perform the trouble diagnosis for power supply circuit. Refer to PG-13, "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	Yes
	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-72, "Removal and Installation".

NO >> Repair or replace error-detected parts.

P181D ENGINE TORQUE SIGNAL

DTC Description

INFOID:0000000014630202

DTC DETECTION LOGIC

DTC No.	CONSULT screen items (Trouble diagnosis content)	DTC detecting condition	
P181D	ENGINE SYSTEM (Engine system)	Diagnosis condition	All times
		Signal (terminal)	—
		Threshold	Malfunction is detected in engine torque signal that is output from HPCM through CAN communication. **NOTE:** AWD control unit receives signal of ECM in substitution from HPCM
		Diagnosis delay time	2 seconds

POSSIBLE CAUSE

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

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

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

>> GO TO 2.

2.DTC REPRODUCTION PROCEDURE

CONSULT

1. Set the vehicle to READY state.
2. Drive the vehicle at 10 km/h (6 MPH) or more for approximately five minutes.
3. Stop the vehicle.
4. Select “Self Diagnostic Result” mode of “ALL MODE AWD/4WD”.

Is DTC “P181D” detected?

YES >> Proceed to diagnosis procedure. Refer to DLN-58, "Diagnosis Procedure".
NO-1 >> To check malfunction symptom before repair: Refer to GI-54, "Intermittent Incident".
NO-2 >> Confirmation after repair: Inspection End.

Diagnosis Procedure

INFOID:0000000014630203

1.PERFORM HPCM SELF DIAGNOSTIC RESULT

CONSULT

Select “Self Diagnostic Result” mode of “EV/HEV”.

Is any DTC detected?

YES >> Check the DTC. Refer to HBC-71, "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-72, "Removal and Installation".
NO >> Repair or replace error-detected parts.

P181F INCOMPLETE CALIBRATION

DTC Description

INFOID:0000000014630204

DTC DETECTION LOGIC

DTC No.	CONSULT screen items (Trouble diagnosis content)	DTC detecting condition	
P181F	INCOMP CALIBRATION (incomplete calibration)	Diagnosis condition	All times
		Signal (terminal)	—
		Threshold	When incomplete writing unit characteristics of electric controlled coupling are detected.
		Diagnosis delay time	2 seconds

POSSIBLE CAUSE

- Writing unit characteristics are incomplete.
- Internal malfunction of AWD control unit.

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

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

>> GO TO 2.

2.DTC REPRODUCTION PROCEDURE

CONSULT

1. Turn the ignition switch OFF to ON.
2. Select “Self Diagnostic Result” of “ALL MODE AWD/4WD”.

Is DTC “P181F” detected?

YES >> Proceed to diagnosis procedure. Refer to DLN-59, "Diagnosis Procedure".
NO-1 >> To check malfunction symptom before repair: Refer to GI-54, "Intermittent Incident".
NO-2 >> Confirmation after repair: Inspection End.

Diagnosis Procedure

INFOID:0000000014630205

1.PERFORM WRITING UNIT CHARACTERISTICS

1. Erase “Self Diagnostic Result” of “ALL MODE AWD/4WD”.
2. Perform writing unit characteristics. Refer to DLN-40, "Work Procedure".
3. Turn the ignition switch OFF to ON.
4. Select “Self Diagnostic Result” mode of “ALL MODE AWD/4WD”.

Is any DTC except “P181F” detected?

YES >> Perform trouble diagnosis for detected DTC. Refer to DLN-26, "DTC Index".
NO >> GO TO 2.

2.PERFORM WRITING UNIT CHARACTERISTICS AGAIN

1. Erase “Self Diagnostic Result” of “ALL MODE AWD/4WD”.
2. Perform writing unit characteristics. Refer to DLN-39, "Work Procedure".
3. Perform DTC confirmation procedure again. Refer to DLN-59, "DTC Description".

Is DTC “P181F” detected?

YES >> Replace AWD control unit. Refer to DLN-72, "Removal and Installation".
NO >> Inspection End.

U1000 CAN COMM CIRCUIT

DTC Description

INFOID:0000000014630206

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 items (Trouble diagnosis content)	DTC detecting condition	
U1000	CAN COMM CIRCUIT (CAN communication circuit)	Diagnosis condition	All times
		Signal (terminal)	—
		Threshold	AWD control unit is not transmitting/receiving CAN communication signal for 2 seconds or more.
		Diagnosis delay time	2 seconds

POSSIBLE CAUSE

- CAN communication error
- Internal malfunction of AWD control unit

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

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

>> GO TO 2.

2.DTC REPRODUCTION PROCEDURE

CONSULT

1. Turn the ignition switch OFF to ON.
2. Select “Self Diagnostic Result” mode of “ALL MODE AWD/4WD”.

Is DTC “U1000” detected?

YES >> Proceed to diagnosis procedure. Refer to DLN-60, "Diagnosis Procedure".
NO-1 >> To check malfunction symptom before repair: Refer to GI-54, "Intermittent Incident".
NO-2 >> Confirmation after repair: Inspection End.

Diagnosis Procedure

INFOID:0000000014630207

Proceed to LAN-26, "Trouble Diagnosis Flow Chart".

U1010 CONTROL UNIT (CAN)

DTC Description

INFOID:0000000014630208

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 items (Trouble diagnosis content)	DTC detecting condition	
U1010	CONTROL UNIT (CAN) [Control unit (CAN)]	Diagnosis condition	All times
		Signal (terminal)	—
		Threshold	Detecting error during the initial diagnosis of CAN controller of AWD control unit.
		Diagnosis delay time	2 seconds

POSSIBLE CAUSE

Internal malfunction of AWD control unit

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

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

>> GO TO 2.

2.DTC REPRODUCTION PROCEDURE

CONSULT

1. Turn the ignition switch OFF to ON.
2. Select “Self Diagnostic Result” mode of “ALL MODE AWD/4WD”.

Is DTC “U1010” detected?

YES >> Proceed to diagnosis procedure. Refer to DLN-61, "Diagnosis Procedure".
NO-1 >> To check malfunction symptom before repair: Refer to GI-54, "Intermittent Incident".
NO-2 >> Confirmation after repair: Inspection End.

Diagnosis Procedure

INFOID:0000000014630209

1.PERFORM SELF DIAGNOSTIC RESULT

CONSULT

After erasing the DTC, perform DTC confirmation procedure again. Refer to DLN-61, "DTC Description".

Is DTC U1010 detected?

YES >> Replace AWD control unit. Refer to DLN-72, "Removal and Installation".
NO >> Inspection End.

POWER SUPPLY AND GROUND CIRCUIT

Diagnosis Procedure

INFOID:0000000014630210

1.CHECK AWD CONTROL UNIT POWER SUPPLY (IGITION POWER SUPPLY)

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:
   Do not set the vehicle to READY state/Never start the engine.
5. Check the voltage between AWD control unit harness connector and ground.

AWD control unit		—	Voltage (Approx.)
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 CITCUIT (IGNITION POWER SUPPLY)

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	Yes

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

AWD control unit		—	Continuity
Connector	Terminal		
B75	7	Ground	No

Is the inspection result normal?

YES >> Perform the trouble diagnosis for ignition power supply circuit. Refer to PG-44, "Wiring Diagram - IGNITION POWER SUPPLY -".
NO >> Repair or replace error-detected parts.

3.CHECK AWD CONTROL UNIT POWER SUPPLY (BATTERY POWER SUPPLY)

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:
Do not set the vehicle to READY state/Never start the engine.

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

AWD control unit		—	Voltage (Approx.)
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 CIRCUIT (BATTERY POWER SUPPLY)

1. Turn the ignition switch OFF.
2. Check the 5A fuse (#2).
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	B30	6Q	Yes

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

AWD control unit		—	Continuity
Connector	Terminal		
B75	15	Ground	No

Is the inspection result normal?

YES >> Perform the trouble diagnosis for power supply circuit. Refer to PG-13, "Wiring Diagram - BATTERY POWER SUPPLY -".
NO >> Repair or replace error-detected parts.

5. CHECK AWD SOLENOID POWER SUPPLY

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	9	Ground	Battery voltage

3. Turn the ignition switch ON.

CAUTION:
Do not set the vehicle to READY state/Never start the engine.

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

AWD control unit		—	Voltage (Approx.)
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 CIRCUIT

1. Turn the ignition switch OFF.

2. Check the 10A fuse (#6).
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	Yes

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

AWD control unit		—	Continuity
Connector	Terminal		
B75	9	Ground	No

Is the inspection result normal?

YES >> Perform the trouble diagnosis for power supply circuit. Refer to PG-13, "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	Yes
	11		

Is the inspection result normal?

YES >> Inspection End.
NO >> Repair or replace error-detected parts.

SYMPTOM DIAGNOSIS

HEAVY TIGHT-CORNER BRAKING SYMPTOM OCCURS

Description

INFOID:0000000014630211

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:0000000014630212

1. PERFORM HPCM SELF DIAGNOSTIC RESULT

CONSULT
Select “Self Diagnostic Result” mode of “EV/HEV”.

Is any DTC detected?

YES >> Check the DTC. Refer to HBC-71, "DTC Index".
NO >> GO TO 2.

2. PERFORM SELF DIAGNOSTIC RESULT

CONSULT
Select “Self Diagnostic Result” mode of “ALL MODE AWD/4WD”.

Is DTC “U1000” detected?

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

3. CHECK AWD SOLENOID

Perform the trouble diagnosis of the AWD solenoid. Refer to DLN-43, "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-124, "Removal and Installation".
NO >> Check each harness connector pin terminal for disconnection.

VEHICLE DOES NOT ENTER AWD MODE

Description

INFOID:0000000014630213

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

Diagnosis Procedure

INFOID:0000000014630214

1.CHECK INFORMATION DISPLAY (COMBINATION METER)

Perform the trouble diagnosis of combination meter. Refer to MWI-53, "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

CONSULT

Check “PARKING BRAKE SW SIG” in “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 MWI-66, "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-124, "Removal and Installation".
NO >> Check each harness connector pin terminal for disconnection.

AWD HIGH TEMP IS DISPLAYED ON INFORMATION DISPLAY

Description

INFOID:0000000014630215

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-25, "Protection Function".
- When this symptom occurs, stop vehicle and allow it to decrease temperature of drivetrain. Displays will stop and system will be restored.

TIRE SIZE INCORRECT IS DISPLAYED ON INFORMATION DISPLAY

Description

INFOID:0000000014630216

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

Diagnosis Procedure

INFOID:0000000014630217

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

CONSULT
1. Set the vehicle to READY state.
2. Drive at 20 km/h (12 MPH) or more for approximately 4 minutes continually.
3. Check "DIS-TIRE MONI" in "Data Monitor" of "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-72, "Removal and Installation".
NO >> Repair or replace the error-detected parts.

NOISE, VIBRATION AND HARSHNESS (NVH) TROUBLESHOOTING

NVH Troubleshooting Chart

INFOID:0000000014630218

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-70, "Inspection"			—	DLN-81, "Exploded View"	DLN-81, "Exploded View"	DLN-81, "Exploded View"	DLN-93, "Exploded View"
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:0000000014630219

TRANSFER OIL LEAKS

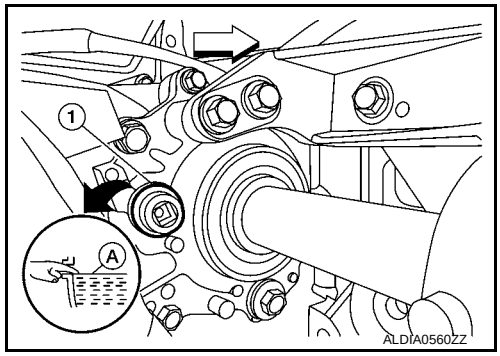
Check that transfer oil is not leaking from transfer assembly or around it.

TRANSFER OIL LEVEL

CAUTION:

Turn the ignition switch OFF 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-93, "Exploded View".
   CAUTION:
   Do not reuse gasket.

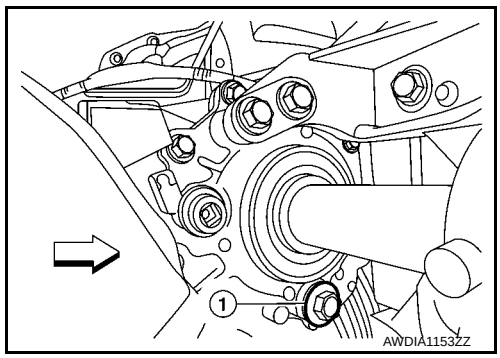
Draining

INFOID:0000000014630220

CAUTION:

Turn the ignition switch OFF before 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-93, "Exploded View".
   CAUTION:
   Do not reuse gasket.

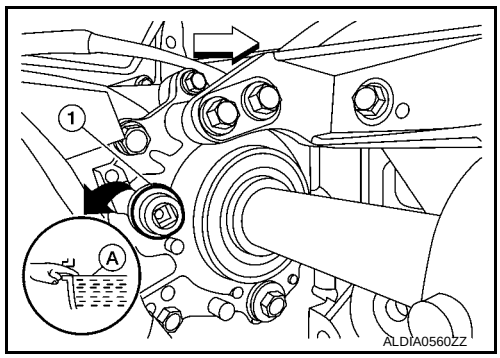
Refilling

INFOID:0000000014630221

CAUTION:

Turn the ignition switch OFF while checking transfer oil level.

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



⇦ : Front

Transfer oil grade and viscosity	**: Refer to MA-11, "Fluids and Lubricants".**
Transfer oil capacity	**: Refer to DLN-97, "General Specifications".**

3. Set a new gasket onto filler plug, and install it in the transfer and tighten to specified torque. Refer to DLN-93, "Exploded View".

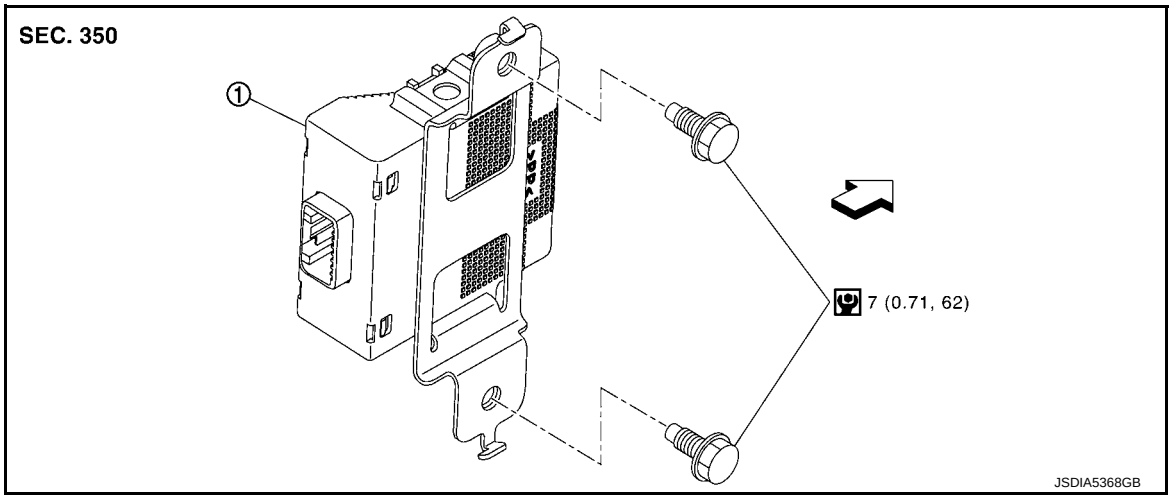
CAUTION:
Do not reuse gasket.

REMOVAL AND INSTALLATION

AWD CONTROL UNIT

Exploded View

INFOID:0000000014630222



1. AWD control unit ⇦ Front

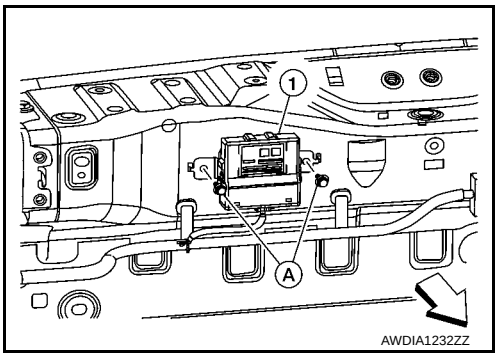
Removal and Installation

INFOID:0000000014630223

REMOVAL

1. Remove luggage side lower finisher (LH). Refer to INT-32, "LUGGAGE SIDE LOWER FINISHER : Removal and Installation".
2. Disconnect harness connector from the AWD control unit.
3. Remove AWD control unit bolts (A).
   NOTE:
   AWD control unit (1) 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-40, "Work Procedure".**

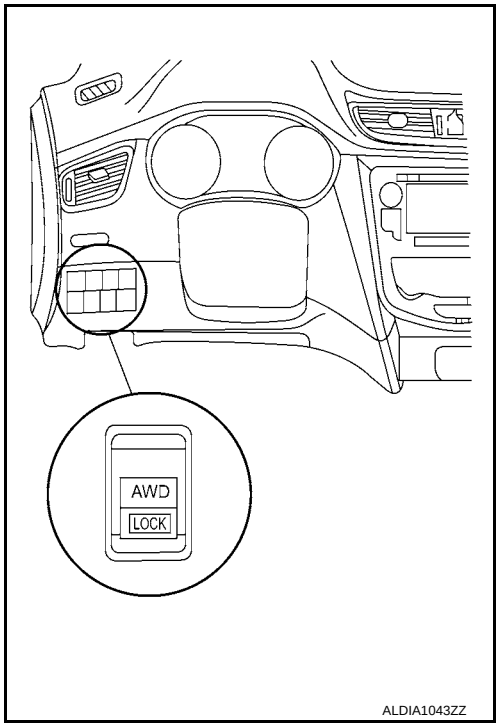
AWD LOCK SWITCH

Removal and Installation

INFOID:0000000014630225

REMOVAL

1. Remove the instrument panel side cover. Refer to IP-14, "Exploded View".
2. Remove instrument lower panel LH. Refer to IP-22, "Removal and Installation".
3. Remove the upper switch carrier.
4. Remove the lower switch carrier.
5. Release pawls using suitable tool and remove AWD lock switch from lower switch carrier.



INSTALLATION

Install in the reverse order of removal.

TRANSFER COVER OIL SEAL

Removal and Installation

INFOID:0000000014630226

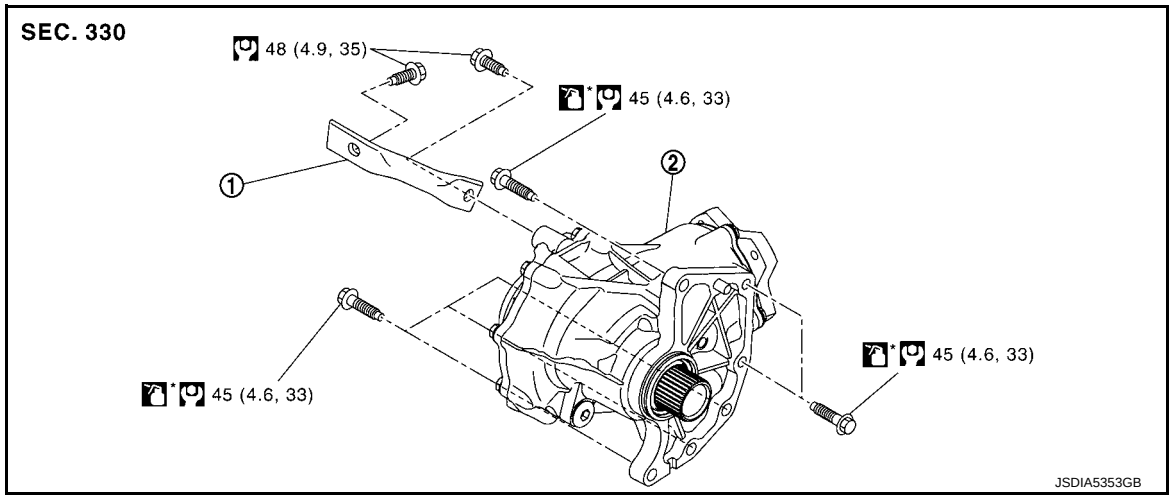
NOTE:
- Replacement on vehicle may cause damage to transfer cover, and may cause a transfer oil leak.
- If transfer cover oil seal requires replacement, remove the transfer assembly from the vehicle before replacing transfer cover oil seal. Refer to DLN-78, "Disassembly and Assembly".

UNIT REMOVAL AND INSTALLATION

TRANSFER ASSEMBLY

Exploded View

INFOID:0000000014630227



1. Transfer assembly bracket
2. Transfer assembly

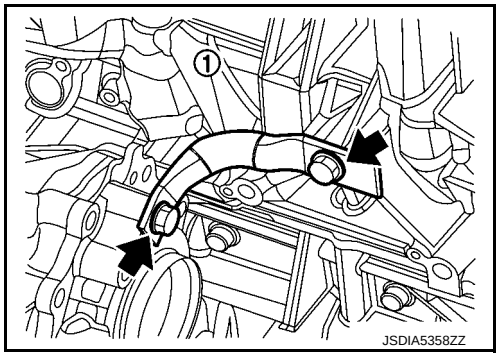
Removal and Installation

INFOID:0000000014630228

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

REMOVAL

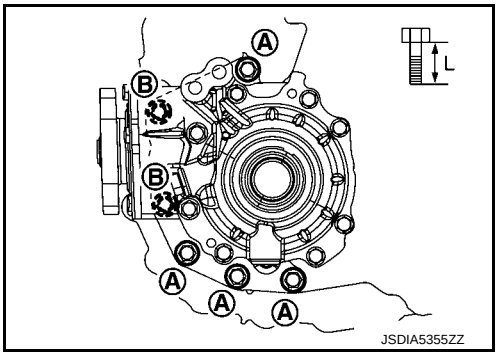
1. Remove front drive shaft (RH). Refer to FAX-22, "Removal and Installation (RH)".
2. Remove front suspension member. Refer to FSU-21, "Removal and Installation".
3. Remove front exhaust tube. Refer to EX-7, "Exploded View".
4. Remove rear propeller shaft. Refer to DLN-106, "Removal and Installation".
5. Remove bolts (⬅) and transfer assembly gusset (1) from engine block and transfer assembly.



6. 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)	44 (1.73)	42 (1.65)



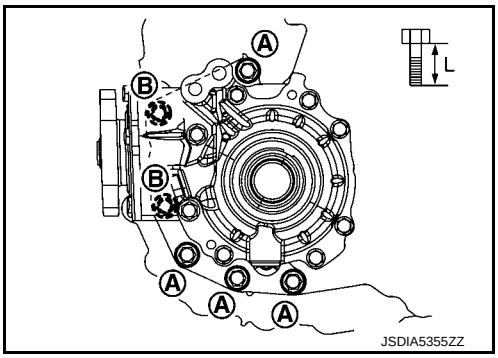
7. Remove transfer assembly from the vehicle.

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 DLN-74, "Removal and Installation".**

INSTALLATION

1. Install the transfer to the transaxle, install the bolts following the standard below.

Bolt No.	(A)	(B)
Quantity	4	2
Bolt length " ℓ " mm (in)	44 (1.73)	42 (1.65)



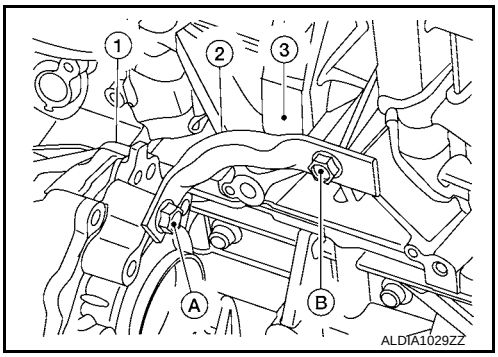
CAUTION:
- **When installing transfer to transaxle, be careful not to damage oil seal of transaxle.**
- **Do not reuse differential side oil seal.**

2. Install brace (2) and bolts (A) and (B) to the engine block (3) and transfer assembly (2).

a. Install bolt (B) to the engine block (3) first, and then bolt (A) to the transfer assembly (1). Temporarily tighten the bolts.

b. Tighten bolt (A) first to specification. Then tighten bolt (B) to specification.

Bolts 48 Nm (4.9 kg-m, 35 ft-lb)



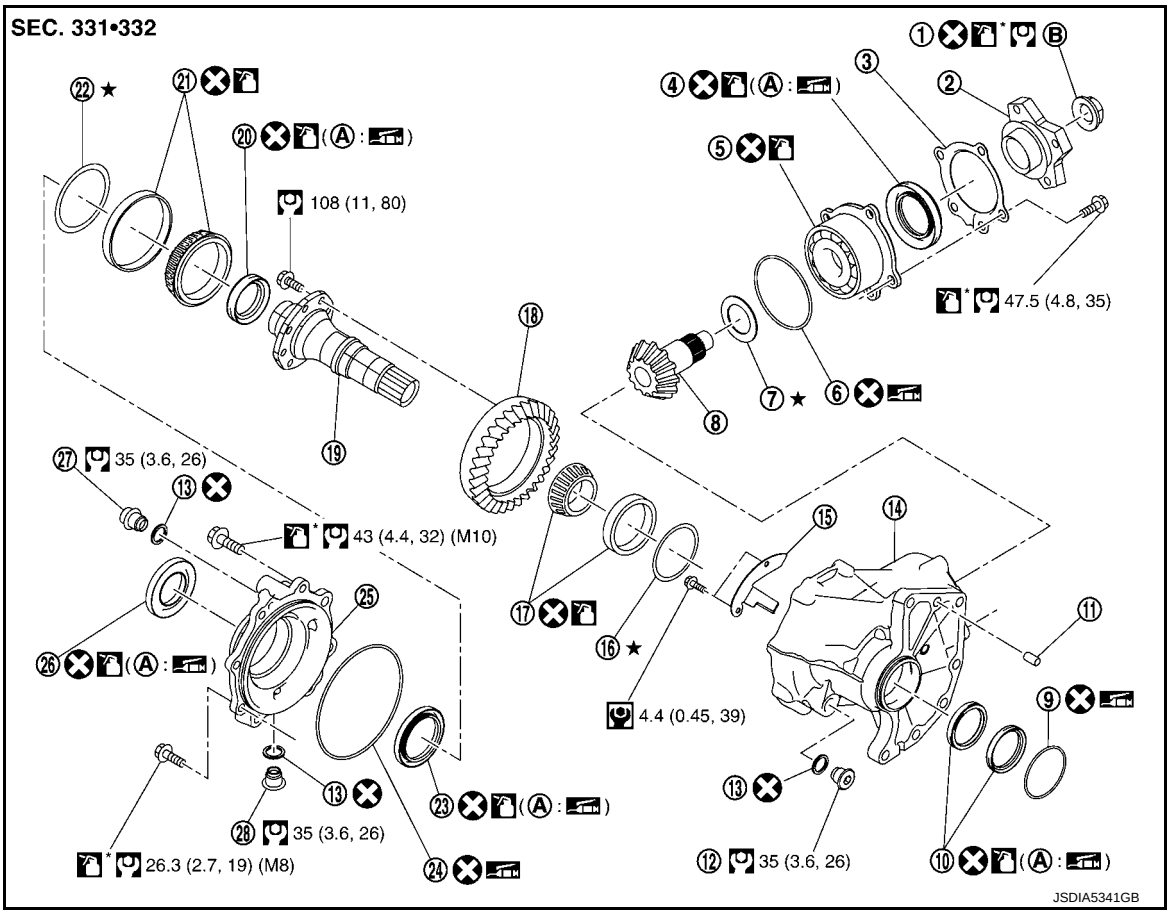
The remaining installation is in the reverse order of removal.
- Check transfer oil level and check for transfer oil leaks after installation. Refer to DLN-70, "Refilling".

UNIT DISASSEMBLY AND ASSEMBLY

TRANSFER COVER

Exploded View

INFOID:0000000014910800



1.	Drive pinion lock nut	2.	Companion flange	3.	Dust shield
4.	Drive pinion oil seal	5.	Pinion bearing assembly	6.	O-ring
7.	Drive pinion adjusting shim	8.	Drive pinion	9.	O-ring
10.	Transfer case oil seal	11.	Dowel pin	12.	Plug
13.	Gasket	14.	Transfer case	15.	Baffle plate
16	Ring gear bearing adjusting shim (transfer case side)	17.	Ring gear bearing (transfer case side)	18.	Ring gear
19.	Ring gear shaft	20.	Ring gear shaft oil seal	21.	Ring gear bearing (transfer cover side)
22.	Ring gear bearing adjusting shim (transfer cover side)	23	Transfer cover oil seal (inner)	24	O-ring
25.	Transfer cover	26.	Transfer cover oil seal (outer)	27.	Filler plug
28.	Drain plug				
Ⓐ	Oil seal lip	Ⓑ	Comply with the assembly procedure when tightening. Refer to DLN-145, "Disassembly and Assembly".		

★: Select with proper thickness.

: Apply transfer oil.

: Apply anti-corrosive oil.

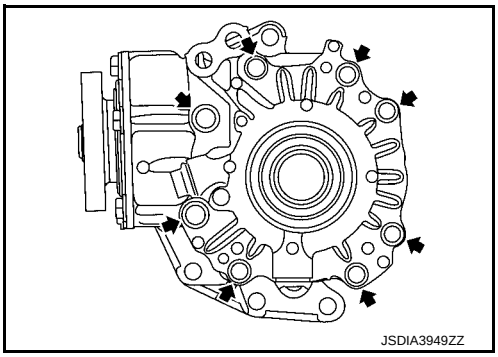
: Apply multi-purpose grease.

Disassembly and Assembly

INFOID:0000000014910801

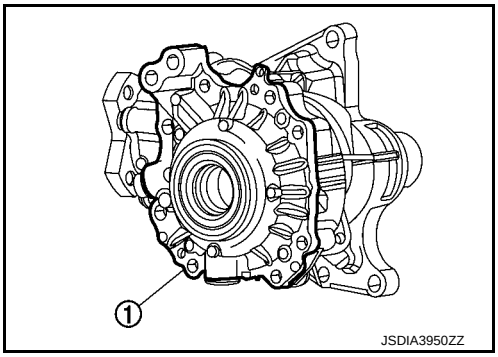
DISASSEMBLY

1. Remove transfer cover bolts (⬅).



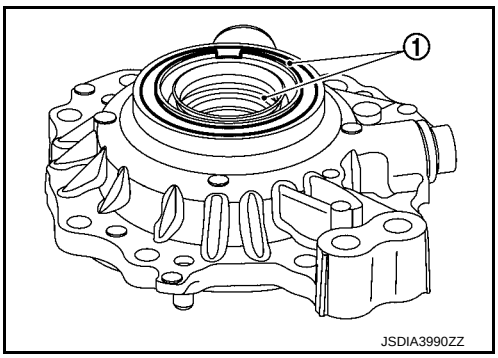
2. Lightly tap transfer cover (1) with a plastic hammer to remove transfer cover.
3. Remove O-ring from transfer cover.

CAUTION:
- **Do not use a tool.**
- **Do not damage transfer cover.**

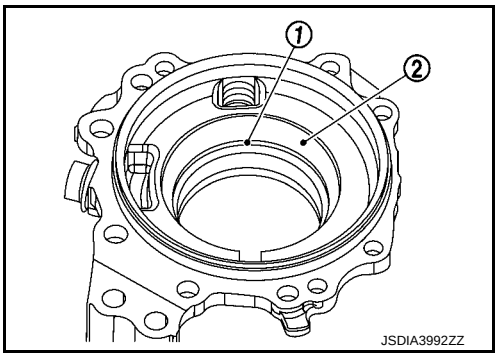


4. Remove the outer and inner transfer cover oil seals.
   - Lightly tap the metal part of oil seals (1) with pin punch from the back side of transfer cover.

CAUTION:
Do not damage the transfer cover by prying out with a tool.



5. Remove ring gear bearing adjusting shim (transfer cover side) (1) and ring gear bearing outer race (transfer cover side) (2).

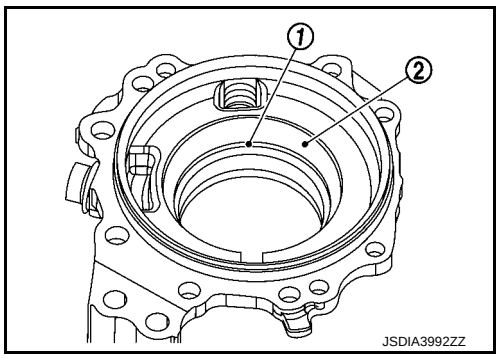


6. Remove drain plug, filler plug and gaskets.
7. Inspect components after disassembly. Refer to DLN-80, "Inspection".

ASSEMBLY

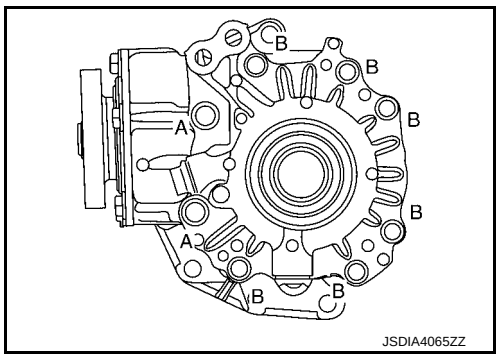
1. Select the ring gear bearing adjusting shim (transfer cover side). Refer to DLN-88, "Adjustment".

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 (transfer cover side).**
- **Apply transfer oil to the ring gear bearing (transfer cover side).**

3. Install the transfer cover to the transfer case, and apply anti-corrosive oil onto thread and seats on the bolts. Tighten bolts to the specified torque.



A : M10 bolt
B : M8 bolt

- For tightening torque, refer to DLN-77, "Exploded View".

NOTE:
Do not install the O-ring to transfer cover. Install O-ring after tooth contact is checked.

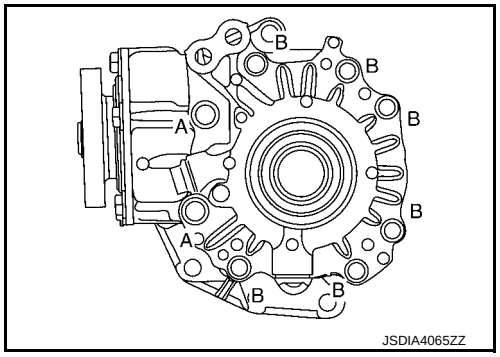
4. Check backlash, tooth contact, total preload and companion flange runout. Refer to DLN-88, "Adjustment".

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

5. Remove transfer cover and install new O-ring.

CAUTION:
- **Always install a new O-ring.**
- **Apply multi-purpose grease lightly and evenly onto O-ring.**
- **Do not use a tool to install O-ring.**

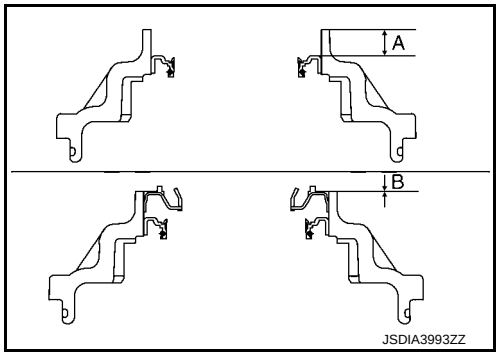
6. Install the transfer cover to the transfer case, and apply anti-corrosive oil onto thread and seats on the bolts. Tighten bolts to the specified torque.



A : M10 bolt
B : M8 bolt

- For tightening torque, refer to DLN-77, "Exploded View".

7. Using a suitable tool, install transfer cover oil seal (outer/inner).



A : Installation dimension for transfer cover oil seal (inner)
B : Installation dimension for transfer cover oil seal (outer)

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:
- **Measure the total preload torque without the oil seal.**
- **Install a new oil seal.**
- **When installing, never incline oil seal.**
- **Apply multi-purpose grease on the inner oil seal and transfer oil onto the outer circumference of oil seal.**

8. Install drain plug and new gasket to transfer cover.

- For tightening torque, refer to DLN-77, "Exploded View".

CAUTION:
Install a new gasket.

9. Install new gasket and filler plug to transfer cover.
   - For tightening torque, refer to DLN-77, "Exploded View".

CAUTION:
- **Install a new gasket.**
- **Install filler plug after oil is filled.**

Inspection

INFOID:0000000014910802

INSPECTION AFTER DISASSEMBLY

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

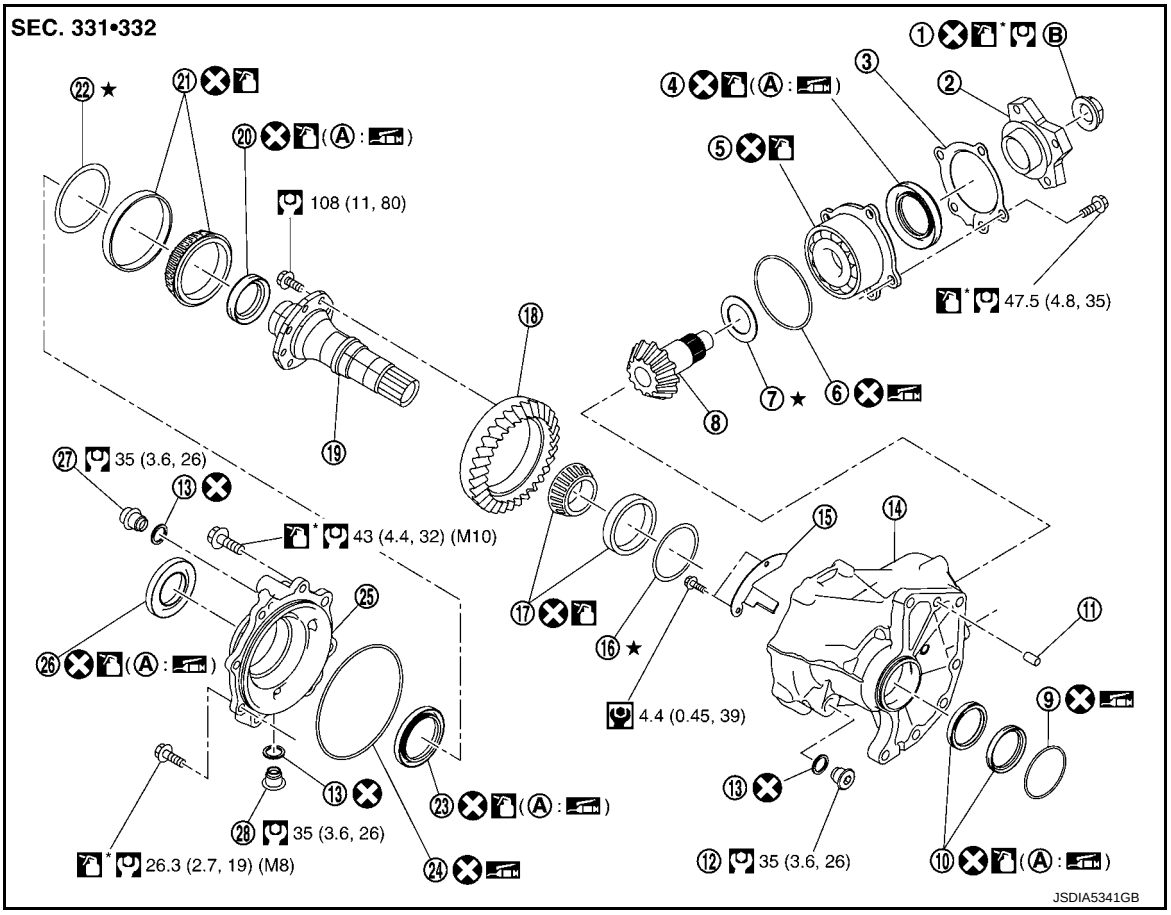
Transfer cover

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

RING GEAR SHAFT

Exploded View

INFOID:0000000014910808



1.	Drive pinion lock nut	2.	Companion flange	3.	Dust shield
4.	Drive pinion oil seal	5.	Pinion bearing assembly	6.	O-ring
7.	Drive pinion adjusting shim	8.	Drive pinion	9.	O-ring
10.	Transfer case oil seal	11.	Dowel pin	12.	Plug
13.	Gasket	14.	Transfer case	15.	Baffle plate
16.	Ring gear bearing adjusting shim (transfer case side)	17.	Ring gear bearing (transfer case side)	18.	Ring gear
19.	Ring gear shaft	20.	Ring gear shaft oil seal	21.	Ring gear bearing (transfer cover side)
22.	Ring gear bearing adjusting shim (transfer cover side)	23.	Transfer cover oil seal (inner)	24.	O-ring
25.	Transfer cover	26.	Transfer cover oil seal (outer)	27.	Filler plug
28.	Drain plug				
(A)	Oil seal lip	(B)	Follow the assembly procedure when tightening. Refer to DLN-145, "Disassembly and Assembly".		

★: Select with proper thickness.

: Apply transfer oil.

*: Apply anti-corrosive oil.

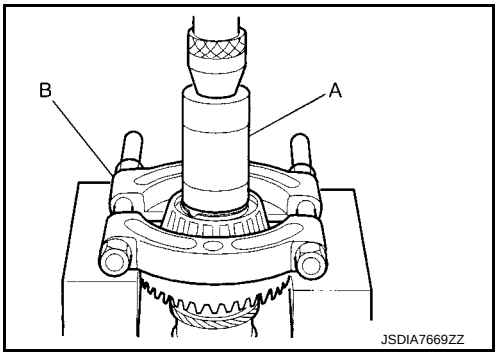
: Apply multi-purpose grease.

Disassembly and Assembly

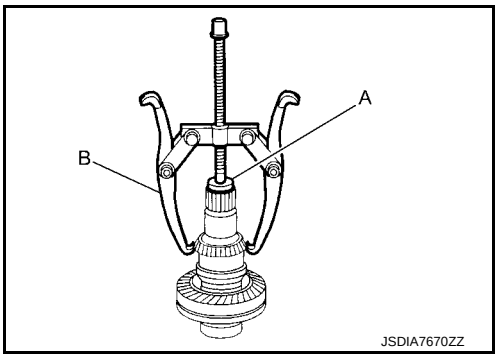
INFOID:0000000014910809

DISASSEMBLY

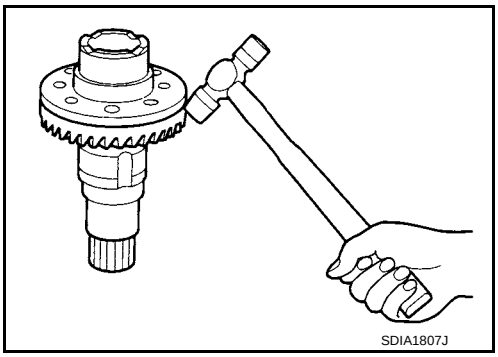
1. Remove transfer cover assembly. Refer to DLN-78, "Disassembly and Assembly".
2. Remove ring gear bearing outer race (transfer cover side) and ring gear bearing adjusting shim (transfer cover side) from the transfer cover. Refer to DLN-78, "Disassembly and Assembly".
3. Remove ring gear shaft assembly 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-94, "Disassembly and Assembly".
5. Remove ring gear bearing inner race (transfer cover side) from ring gear shaft using suitable tools (A) and Replacer (B).



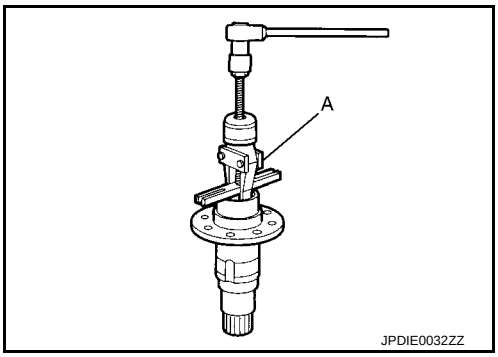
6. Remove ring gear bearing inner race (transfer case side) from ring gear shaft using suitable tool with drift (A) and puller (B).
7. Remove the ring gear mounting bolts.



8. Using a plastic hammer, lightly tap ring gear to remove ring gear from the ring gear shaft.

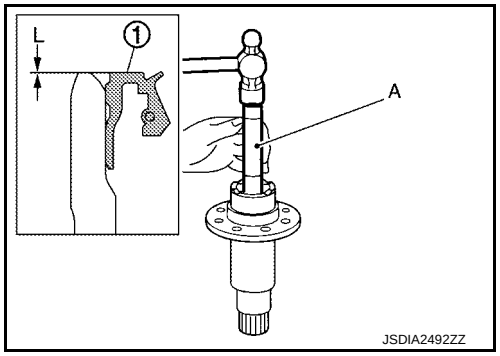


9. Remove ring gear shaft oil seal from the ring gear shaft using a suitable tool and a puller (A).
10. Inspect all components after disassembly. Refer to DLN-84, "Inspection".



ASSEMBLY

1. Using a drift (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:
- **Install a new oil seal.**
- **When installing, never incline oil seal.**
- **Apply multi-purpose grease onto inner seal and transfer oil onto the circumference of the oil seal.**

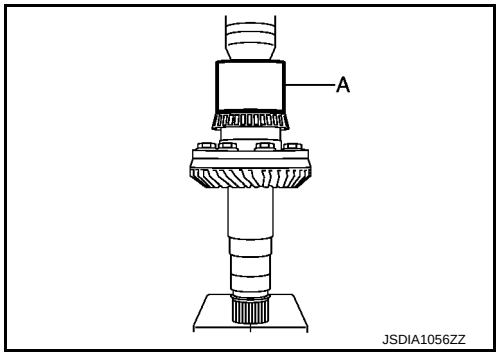
2. Select ring gear bearing adjusting shim (transfer case side) and ring gear bearing adjusting shim (transfer cover side). Refer to DLN-88, "Adjustment".
3. Assemble the selected ring gear bearing adjusting shim (transfer case side) and ring gear bearing outer race (transfer case side) to transfer case. Refer to DLN-94, "Disassembly and Assembly".

CAUTION:
- **Do not reuse ring gear bearing (transfer case side).**
- **Apply transfer oil to the ring gear bearing (transfer case side).**

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-78, "Disassembly and Assembly".

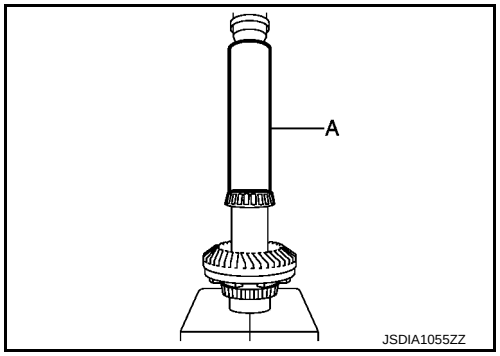
CAUTION:
- **Do not reuse ring gear bearing (transfer cover side).**
- **Apply transfer oil to the ring gear bearing (transfer cover side).**

5. Install the ring gear to ring gear shaft, and tighten bolts to the specified torque.
   - For tightening torque, refer to DLN-81, "Exploded View".
6. Using a suitable tool (A), install ring gear bearing inner race (transfer cover side).



CAUTION:
- **Do not reuse ring gear bearing (transfer cover side).**
- **Apply transfer oil to the ring gear bearing (transfer cover side).**

7. Using a suitable tool (A), install the ring gear bearing inner race (transfer case side) to ring gear shaft.

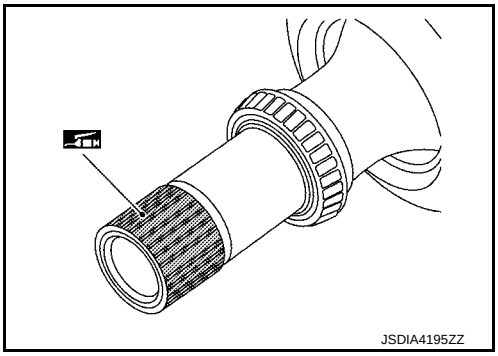


CAUTION:
- **Do not reuse ring gear bearing (transfer case side).**
- **Apply transfer oil to the ring gear bearing (transfer case side).**

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

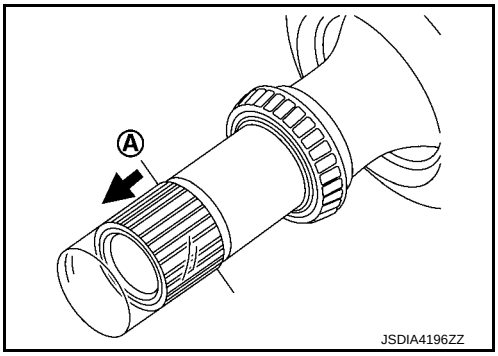
CAUTION:
Protect transfer case oil seals from being damaged by the spline of ring gear shaft using the following steps.

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



b. Wrap piece of a suitable vinyl to spline part only indicated in the figure.

Ⓐ : Limit line of wrapping



CAUTION:
Never wrap sliding surfaces on oil seal.
NOTE:
A plastic bag can be used by cutting it to fit.

9. Install transfer cover to check and adjust each part. Refer to DLN-78, "Disassembly and Assembly".
NOTE:
Installation of O-ring 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-88, "Adjustment".
CAUTION:
Measure the total preload without oil seals of transfer cover and transfer case.
11. Install O-ring to transfer cover and install transfer case. Refer to DLN-78, "Disassembly and Assembly".
12. After installing transfer case oil seals, remove wrapped vinyl from the spline of ring gear shaft.

Inspection

INFOID:0000000014910810

INSPECTION AFTER DISASSEMBLY

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

Gear and Shaft

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

CAUTION:
If malfunction is detected on the 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.

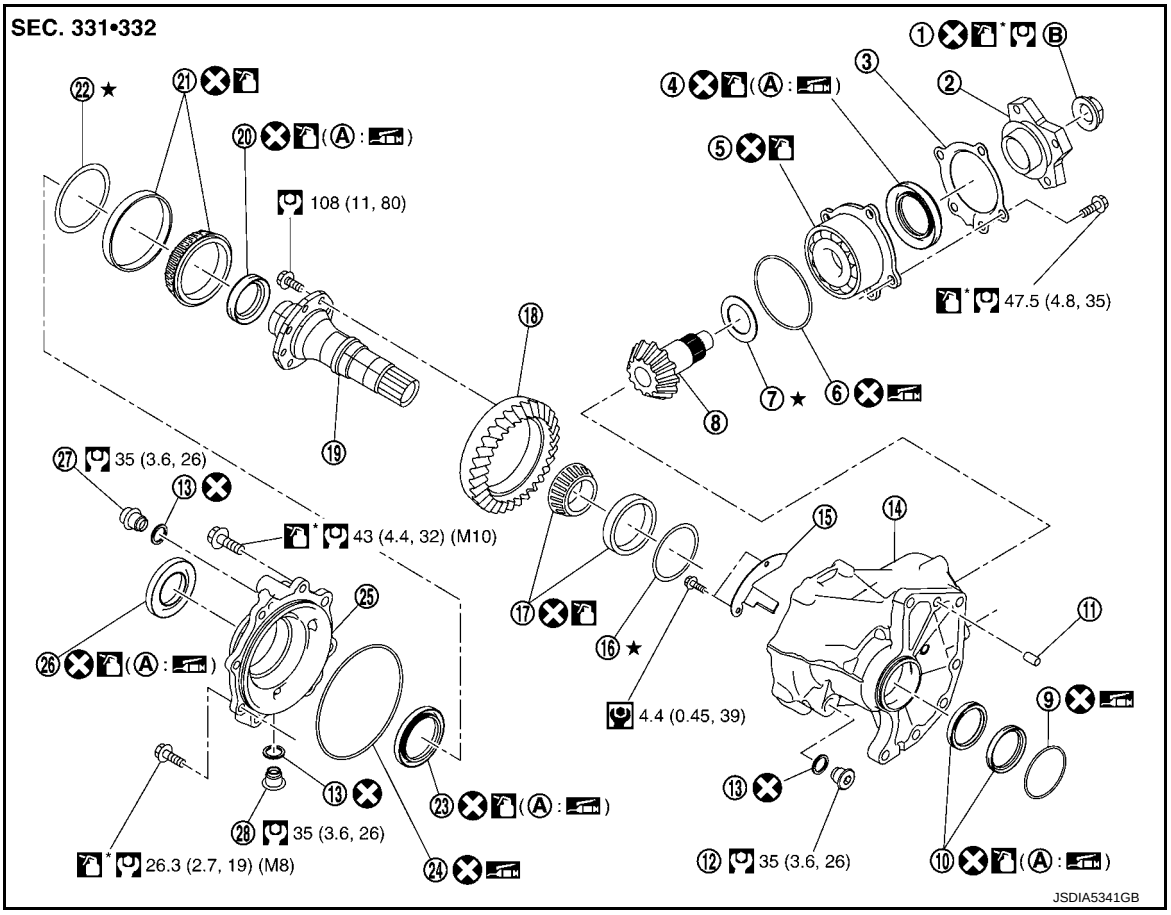
Shim

Check for seizure, damage, and unusual wear.

DRIVE PINION

Exploded View

INFOID:0000000014912599



1.	Drive pinion lock nut	2.	Companion flange	3.	Dust shield
4.	Drive pinion oil seal	5.	Pinion bearing assembly	6.	O-ring
7.	Drive pinion adjusting shim	8.	Drive pinion	9.	O-ring
10.	Transfer case oil seal	11.	Dowel pin	12.	Plug
13.	Gasket	14.	Transfer case	15	Baffle plate
16.	Ring gear bearing adjusting shim (transfer case side)	17.	Ring gear bearing (transfer case side)	18.	Ring gear
19.	Ring gear shaft	20.	Ring gear shaft oil seal	21.	Ring gear bearing (transfer cover side)
22.	Ring gear bearing adjusting shim (transfer cover side)	23.	Transfer cover oil seal (inner)	24.	O-ring
25.	Transfer cover	26.	Transfer cover oil seal (outer)	27.	Filler plug
28.	Drain plug				
(A)	Oil seal lip	(B)	Comply with the assembly procedure when tightening. Refer to DLN-86, "Disassembly and Assembly".		

★: Select with proper thickness.

: Apply transfer oil.

*: Apply anti-corrosive oil.

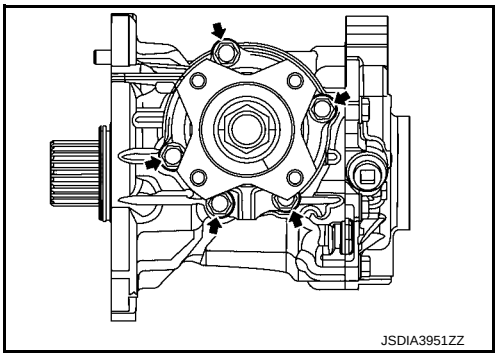
: Apply multi-purpose grease.

Disassembly and Assembly

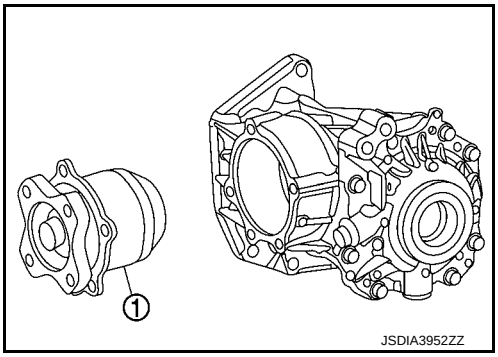
INFOID:0000000014912600

DISASSEMBLY

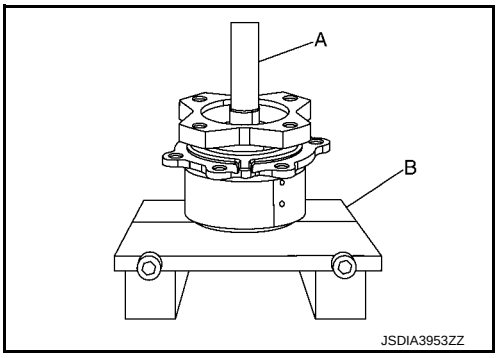
1. Remove pinion bearing assembly bolts (⬅).



2. Using a plastic hammer, lightly tap companion flange to remove pinion bearing assembly (1).



3. Remove the O-ring.
4. Remove the drive pinion lock nut.
5. Using a drift (A) and a suitable tool (B), remove drive pinion from pinion bearing assembly.

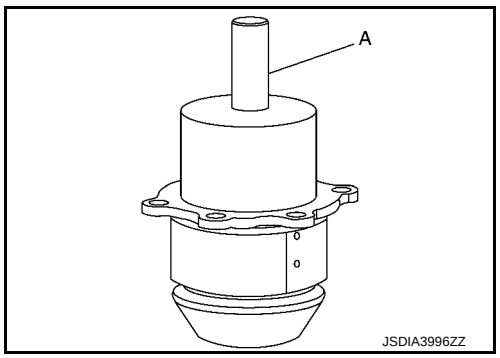


6. Remove drive pinion adjusting shim.
7. Remove companion flange.
8. Remove dust shield.
9. Remove drive pinion oil seal.
10. Perform inspection after disassembly. Refer to DLN-92, "Inspection".

ASSEMBLY

1. Select drive pinion adjusting shim. Refer to DLN-88, "Adjustment".
2. Assemble the selected drive pinion adjusting shim to drive pinion.
3. Using a suitable tool, install the drive pinion to pinion bearing assembly.
   CAUTION:
   - **Do not reuse pinion bearing assembly.**
   - **Apply transfer oil to pinion bearing part.**

4. Using a suitable tool (A), install drive pinion oil seal to the pinion bearing assembly.

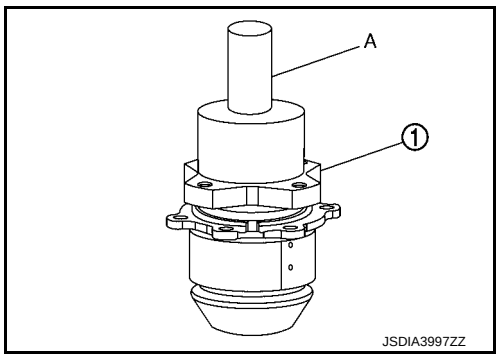


CAUTION:
- **Do not reuse the oil seal.**
- **When installing, never incline oil seal.**
- **Apply multi-purpose grease onto oil seal lips, and transfer oil onto the circumference of the oil seal.**

5. Install dust shield.

NOTE:
Tighten dust shield with the pinion bearing assembly.

6. Using a suitable tool (A), Install companion flange (1) to pinion bearing.



7. Tighten drive pinion lock nut within the limits of specified torque so as to keep the pinion bearing preload within the standard values.

a. Apply anti-corrosive oil to the thread and seat of drive pinion lock nut and install it to drive pinion, and then tighten to the specified torque.

Drive pinion lock nut tightening torque : 90 N·m (9.2 kg-m, 66 ft-lb)

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

b. After tightening drive pinion lock nut to the specified torque, tighten the drive pinion lock nut additionally to the specified angle.

Drive pinion lock nut tightening angle : 25 degrees

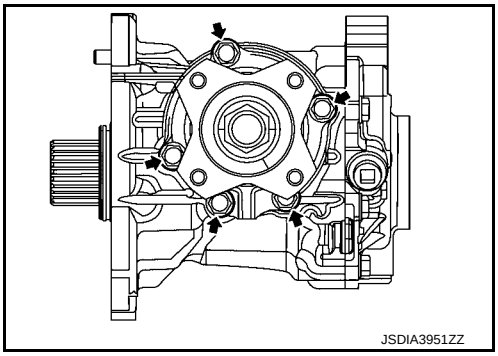
c. Using the preload gauge, measure the pinion bearing preload.

Pinion bearing preload : Refer to DLN-97, "Preload Torque".

8. Install O-ring to pinion bearing assembly.

CAUTION:
- **Do not reuse O-ring.**
- **Apply multi-purpose grease lightly and evenly onto O-ring.**
- **Installing O-ring by hand. Do not use a tool.**

9. Install pinion bearing assembly, and apply anti-corrosive oil onto thread and seats on the mounting bolts. Tighten to the specified torque.
   • For tightening torque, refer to DLN-85, "Exploded View".
   NOTE:
   Tighten dust shield together with pinion bearing assembly.
10. Check backlash, tooth contact, total preload and companion flange runout. Refer to DLN-88, "Adjustment".
    CAUTION:
    Measure the total preload without the transfer case cover oil seal or the transfer case oil seal.

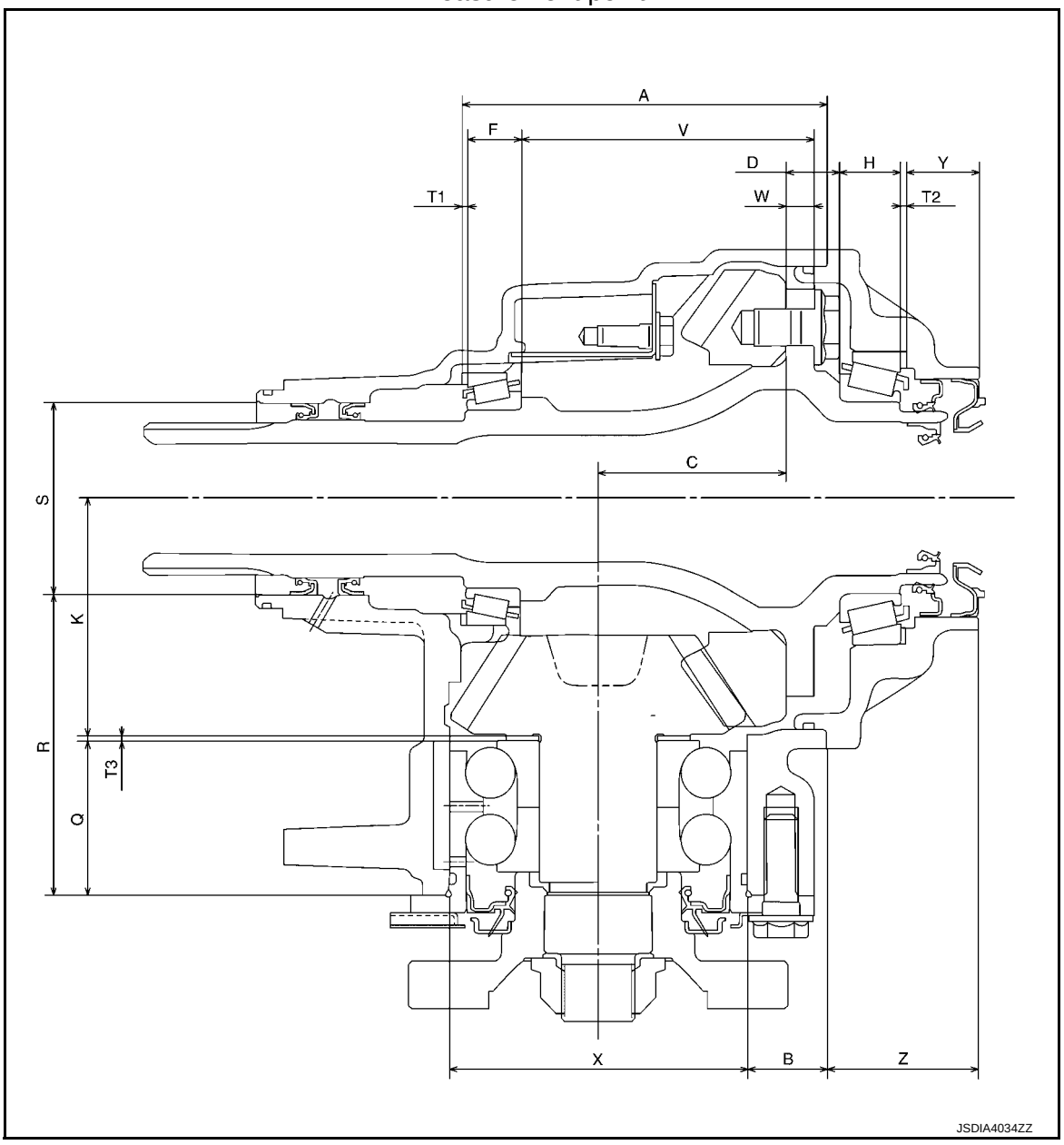

JSDIA3951ZZ

Adjustment

INFOID:0000000014912601

ADJUSTING SHIM SELECTION

Measurement point



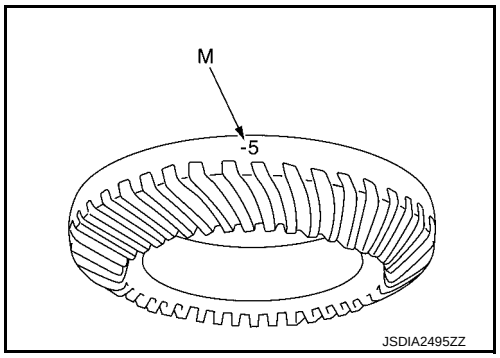
JSDIA4034ZZ

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

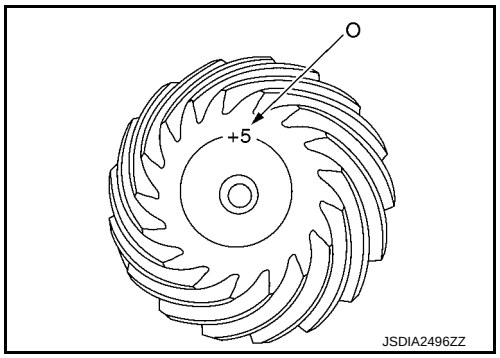
T1 [Ring gear bearing adjusting shim (transfer case side)]
• T1 = A –(B +X/2) +C +W –V –F –(M/100) +0.071 mm (0.0028 in)

T2 [Ring gear bearing adjusting shim (transfer cover side)]
• T2 = –Y +Z +(B +X/2) –C –D –H +(M/100) +0.071 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.

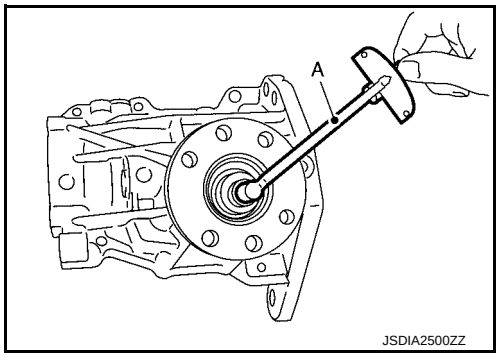


PINION BEARING PRELOAD

1. Remove ring gear shaft assembly from the transfer case. Refer to DLN-82, "Disassembly and Assembly".
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. While rotate drive pinion at 30 rpm, measure the pinion bearing preload with the preload gauge (A) (SST: ST3127S000).

Pinion bearing preload : Refer to DLN-97, "Preload Torque".

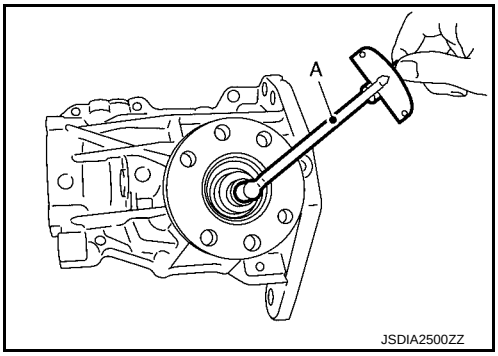
CAUTION:
Each rotational part should rotate smoothly with the specified transfer oil.
• If outside the standard, disassemble pinion bearing assembly to check and adjust each part.



TOTAL PRELOAD

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-82, "Disassembly and Assembly"
3. Install transfer cover to check and adjust each part. Refer to DLN-78, "Disassembly and Assembly".
4. Rotate the companion flange at least 20 times to check for smooth operation of the bearing.

5. While rotate drive pinion at 30 rpm, measure the total preload with the preload gauge (A) (SST: ST3127S000).

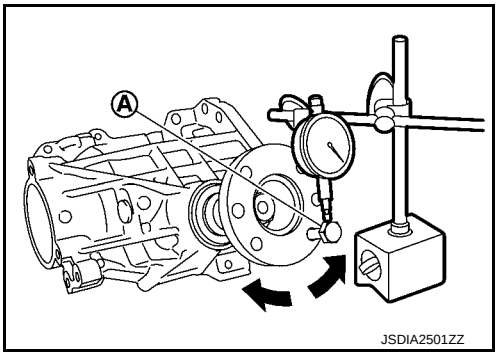


Total preload **: Refer to DLN-97, "Preload Torque".**

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

BACKLASH

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

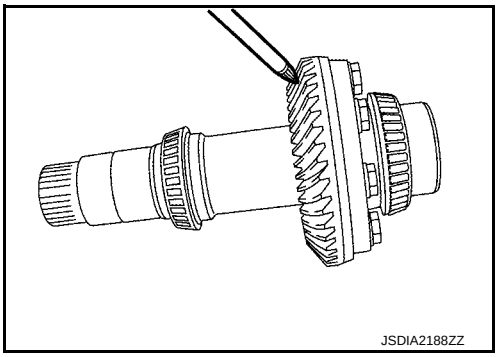


Backlash **: Refer to DLN-97, "Backlash".**

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

TOOTH CONTACT

1. Remove transfer cover. Refer to DLN-78, "Disassembly and Assembly".
2. Remove ring gear shaft assembly from transfer case. Refer to DLN-82, "Disassembly and Assembly".
3. Apply red lead or equivalent onto the ring gear.
   CAUTION:
   Apply red lead or equivalent to both faces of 3 to 4 gears at 4 locations evenly spaced on the ring gear.
4. Assemble ring gear shaft assembly to the transfer case. Refer to DLN-82, "Disassembly and Assembly".
5. Install transfer cover to check and adjust each part. Refer to DLN-78, "Disassembly and 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 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.

Tooth Contact Judgment Guide

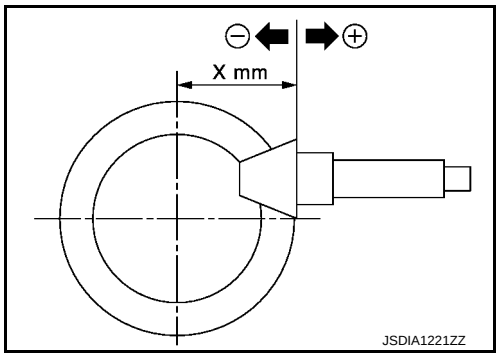
Drive pinion adjusting shim selection value mm(in)		Tooth contact condition		Need for adjustment
		Drive side	Back side	
Thinner ↑	-0.09 (-0.0035)	Heel side / Toe side	Toe side / Heel side	YES
	-0.06 (-0.0024)			
	-0.03 (-0.0012)			NO
	0			
Thicker ↓	+0.03 (+0.0012)			
	+0.06 (+0.0024)			YES
	+0.09 (+0.0035)			

JSDIA4035GB

8. Follow the procedure below to adjust pinion height (dimension X) if tooth contact is improper.

CAUTION:

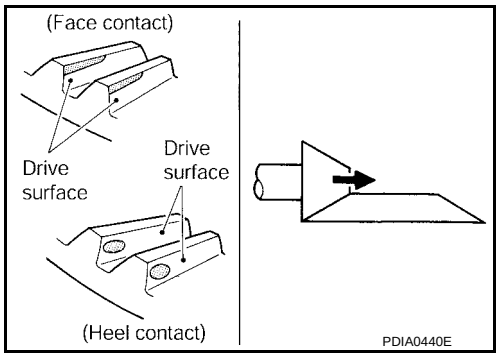
If no adjusting shim with the calculated value is available, select the thicker and closest one.



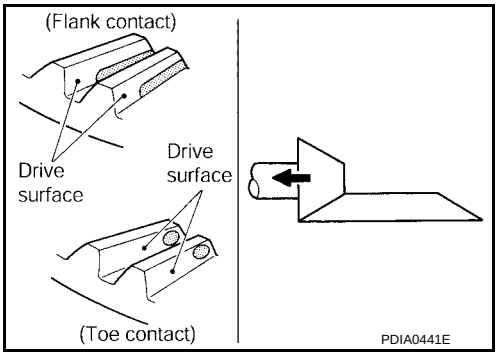
- Thicken the drive pinion adjusting shim to move the drive pinion closer to the ring gear in case of face contact or heel contact.
  For selecting adjusting shim, refer to the latest parts information.

CAUTION:

Only one adjusting shim can be selected.



- Thin the drive pinion adjusting shim to move the drive pinion farther from the ring gear in case of flank contact or toe contact.
  For selecting adjusting shim, refer to the latest parts information.
  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 companion flange to check for runout.

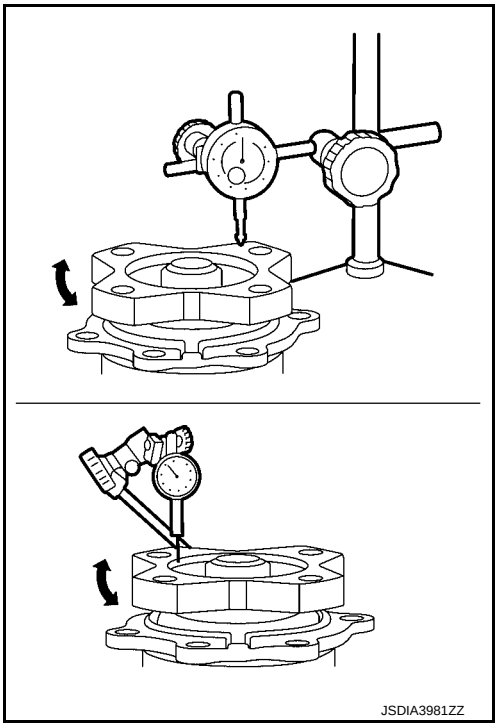
Companion flange face runout	**: Refer to DLN-97, "Companion Flange Runout".**

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

Inner side of the companion flange runout	**: Refer to DLN-97, "Companion Flange Runout".**

5. If the runout value is outside the runout limit, follow the procedure below to adjust.

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 assembly and drive pinion, or replace pinion bearing assembly if runout is outside the standard after the companion flange is replaced.



Inspection

INFOID:0000000014912602

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.

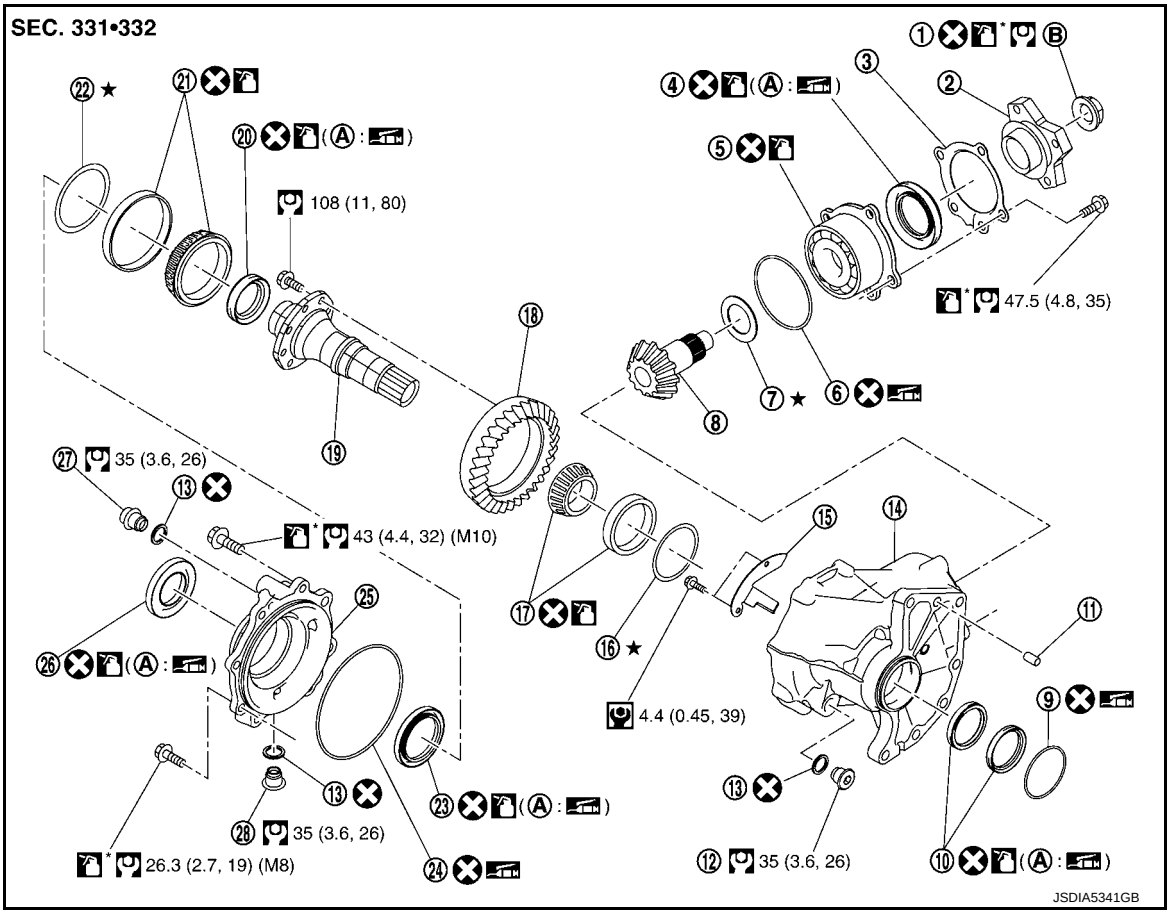
Shim

Check for seizure, damage, and unusual wear.

TRANSFER CASE

Exploded View

INFOID:0000000014912607



1.	Drive pinion lock nut	2.	Companion flange		Dust shield
4.	Drive pinion oil seal	5.	Pinion bearing assembly	6.	O-ring
7.	Drive pinion adjusting shim	8.	Drive pinion	9.	O-ring
10.	Transfer case oil seal	11.	Dowel pin	12.	Plug
13.	Gasket	14.	Transfer case	15.	Baffle plate
16.	Ring gear bearing adjusting shim (transfer case side)	17.	Ring gear bearing (transfer case side)	18.	Ring gear
19.	Ring gear shaft	20.	Ring gear shaft oil seal	21.	Ring gear bearing (transfer cover side)
22.	Ring gear bearing adjusting shim (transfer cover side)	23.	Transfer cover oil seal (inner)	24.	O-ring
25.	Transfer cover	26.	Transfer cover oil seal (outer)	27.	Filler plug
28.	Drain plug				
(A)	Oil seal lip	(B)	Comply with the assembly procedure when tightening. Refer to DLN-94, "Disassembly and Assembly".		

★: Select with proper thickness.

: Apply transfer oil.

*: Apply anti-corrosive oil.

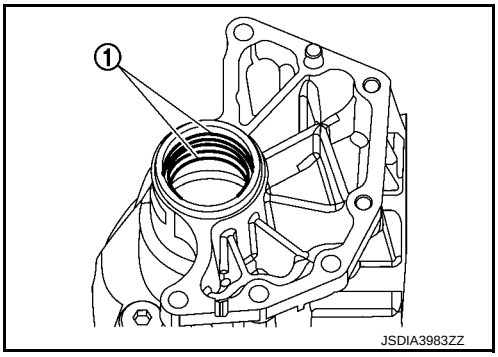
: Apply multi-purpose grease.

Disassembly and Assembly

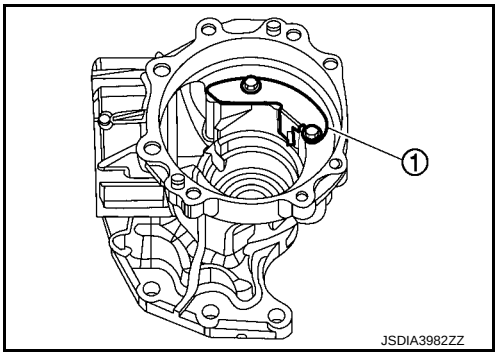
INFOID:0000000014912608

DISASSEMBLY

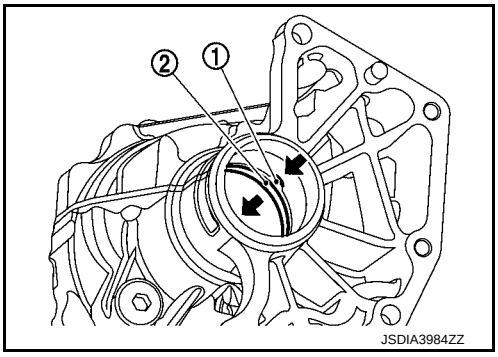
1. Remove transfer cover. Refer to DLN-78, "Disassembly and Assembly".
2. Remove ring gear shaft assembly. Refer to DLN-82, "Disassembly and Assembly".
3. Remove drive pinion assembly. Refer to DLN-86, "Disassembly and Assembly".
4. Remove O-ring from transfer case.
   CAUTION:
   - **Do not use a tool to remove O-ring.**
   - **Do not damage transfer case.**
5. Remove transfer case oil seals (1).
   CAUTION:
   Do not damage transfer case.



6. Remove baffle plate (1).



7. 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.

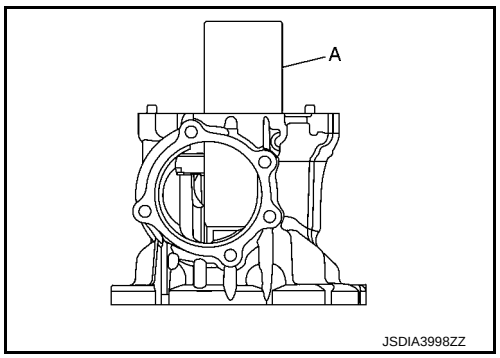


8. Remove plug and gasket.
9. Inspection components after disassembly. Refer to DLN-96, "Inspection".

ASSEMBLY

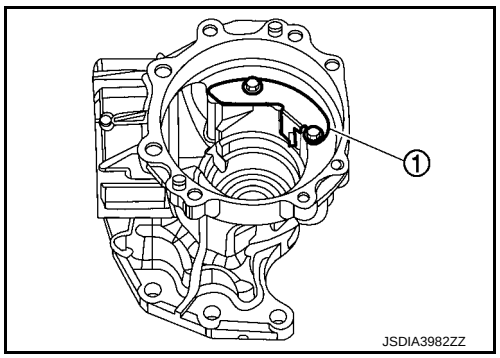
1. Select the ring gear bearing adjusting shim (transfer case side). Refer to DLN-88, "Adjustment".

2. Using a suitable tool (A,) install the selected ring gear bearing adjusting shim (transfer case side) and ring gear bearing outer race (transfer case side).



CAUTION:
- **Do not reuse ring gear bearing (transfer case side).**
- **Apply transfer oil to the ring gear bearing (transfer case side).**

3. Install baffle plate (1).
   - For tightening torque, refer to DLN-93, "Exploded View".



4. Install ring gear shaft assembly. Refer to DLN-82, "Disassembly and Assembly".

CAUTION:
Protect transfer case oil seals beforehand from being damaged by the spline of ring gear shaft.

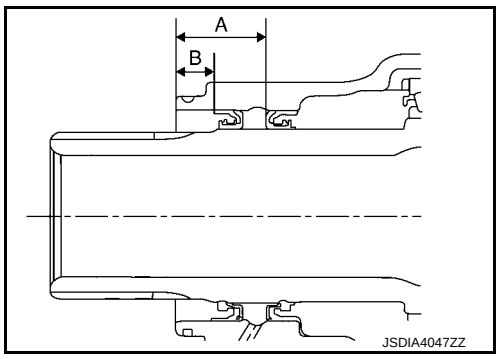
5. Install drive pinion assembly. Refer to DLN-86, "Disassembly and Assembly".
6. Install transfer cover to check and adjust each part. Refer to DLN-78, "Disassembly and Assembly".

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

7. Check backlash, tooth contact, total preload and companion flange runout. Refer to DLN-88, "Adjustment".

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

8. Reinstall transfer cover to install O-ring. Refer to DLN-78, "Disassembly and Assembly".
9. Using a suitable tool, install transfer case oil seals.



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.**
- **Install a new oil seal.**
- **When installing, do not incline oil seal.**
- **Apply multi-purpose grease onto oil seal lips, and transfer oil onto the circumference of the oil seal.**
- **Do not damage oil seals by spline of ring gear shaft.**

10. After installing transfer case oil seals to transfer case, remove wrapped vinyl from the spline of ring gear shaft.
11. Install O-ring to the transfer case.

CAUTION:
- **Do not reuse O-ring.**
- **Apply multi-purpose grease lightly and evenly onto O-ring.**
- **Install O-ring by hand, do not use a tool.**
- **Do not damage O-ring.**

Inspection

INFOID:0000000014912609

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)

General Specifications

INFOID:0000000014630246

ℓ (US pt, Imp pt)

Applied model		AWD
		MR20DD and RM31
		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:0000000014630247

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	P_1 + 0.7 – 1.0 (0.08 – 0.1, 7.0 – 8.0)
	Without oil seals (for transfer cover and transfer case)	P_1 + 0.5 – 0.8 (0.06 – 0.08, 5.0 – 7.0)

Backlash

INFOID:0000000014630248

Unit: mm (in)

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

Companion Flange Runout

INFOID:0000000014630249

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)

PRECAUTION

PRECAUTIONS

High Voltage Precautions

INFOID:0000000014912610

DANGER:

Since hybrid vehicles and electric vehicles contain a high voltage battery, there is the risk of electric shock, electric leakage, or similar accidents resulting in death or severe injury, if high voltage components and vehicle are mishandled. When performing an inspection or maintenance, be sure to comply with the instructions below to perform correct work procedures.

WARNING:

- **Be sure to remove the service plug in order to disconnect the high voltage circuits before performing inspection or maintenance of high voltage system harnesses and parts.**
- **The removed service plug must always be carried in a pocket of the responsible worker or placed in the tool box during the procedure to prevent the plug from being connected by mistake.**
- **Be sure to wear insulated protective equipment before beginning work on the high voltage system.**
- **Never allow workers other than the responsible person to touch the vehicle containing high voltage parts. To keep others from touching the high voltage parts, these parts must be covered with an insulating sheet except when using them.**

CAUTION:

- **Be sure to install the high voltage harness clips to the original positions to prevent damage to high voltage harness. If the clips are damaged, replace them with new ones before installing the high voltage harness.**
- **To prevent damage to parts, never allow coolant to splash on the high voltage harness connector. If coolant splashes on the high voltage harness connector, immediately remove moisture from the high voltage harness connector by using an air blow gun.**
- **Never bring the vehicle into the READY status with the service plug removed unless otherwise instructed in the Service Manual. A malfunction may occur if this is not observed.**

HIGH VOLTAGE HARNESS AND EQUIPMENT IDENTIFICATION

All the high voltage harnesses and connectors are orange. The Li-ion battery and other high voltage devices include an orange high voltage label. Never touch these harnesses and high voltage parts.

HANDLING OF HIGH VOLTAGE HARNESS AND TERMINALS

Immediately insulate disconnected high voltage connectors and terminals with insulating tape.

GUIDELINES ON WORKERS WITH MEDICAL ELECTRONICS

WARNING:

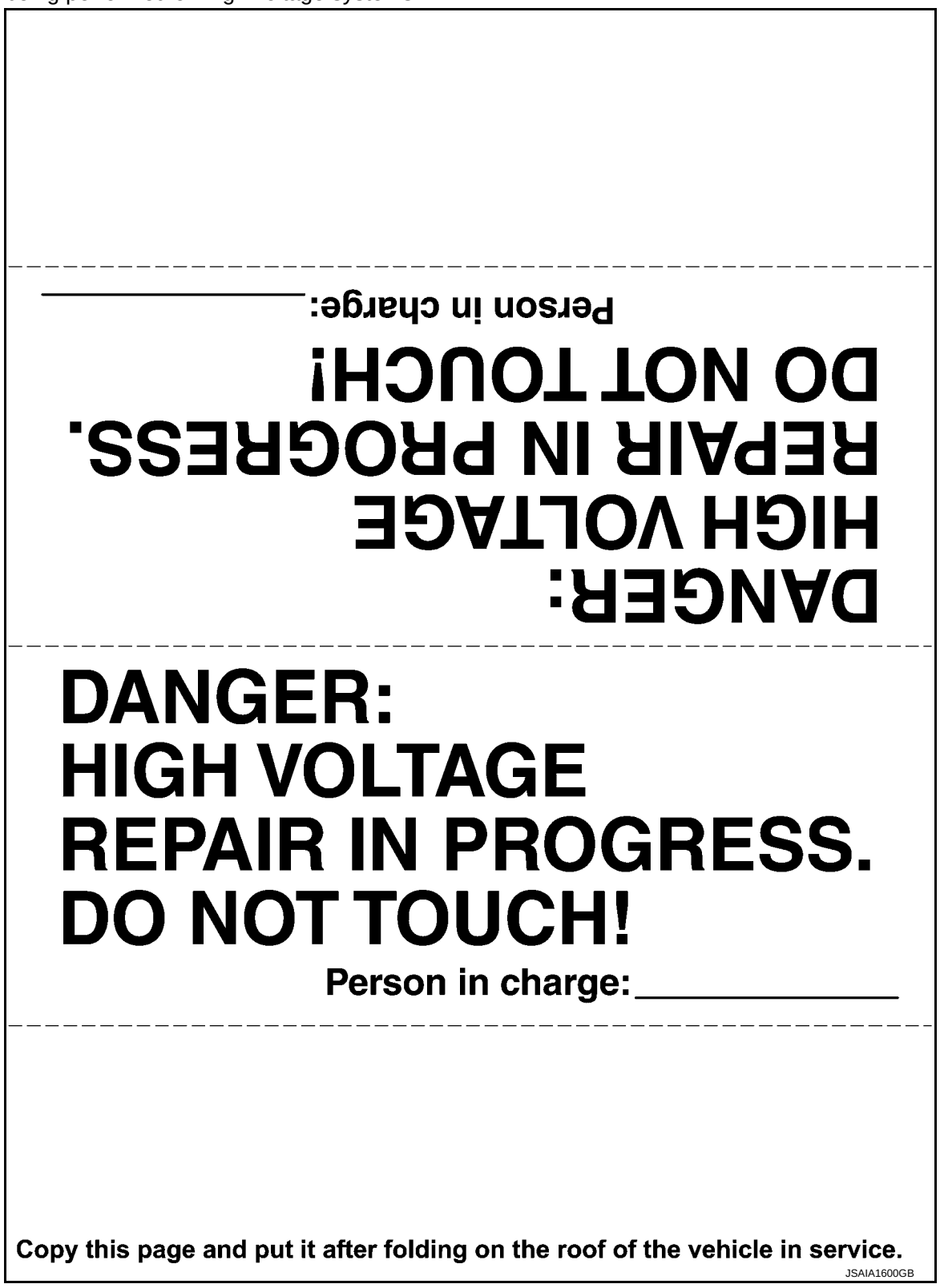
The vehicle contains parts that contain powerful magnets. If a person who is wearing a heart pacemaker or other medical device is close to these parts, the medical device may be affected by the magnets. Such persons must not perform work on the vehicle.

PROHIBITED ITEMS TO CARRY DURING THE WORK

Hybrid vehicles and electric vehicles contain parts with high voltage and intense magnetic force. Never carry metal products and magnetic recording media (e.g. credit card, debit card) to repair/inspect high voltage parts. If this is not observed, the metal products may create a risk of short circuit and the magnetic recording media may lose their magnetic recording.

POST A SIGN OF “DANGER! HIGH VOLTAGE AREA. KEEP OUT”

Call the attention of other workers and indicate "High voltage work in progress." Do not touch vehicles where work is being performed on high voltage systems.



Precautions Concerning On-board Servicing of Hybrid Systems

INFOID:0000000014912611

CAUTION:

Be sure to turn the ignition switch OFF before performing inspection and servicing inside the engine compartment or underneath the vehicle. If the ignition switch is ON (vehicle READY state), even if the engine is stopped, the conditions of the vehicle may cause the engine to start automatically.

If it is necessary to continually operate the engine during inspection or servicing, use the designated inspection mode. GI-71, "Description".

NOTE:

The engine starts when hood is opened with the vehicle in READY state.

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

INFOID:0000000014808107

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, it is recommended that all maintenance and repair be performed by an authorized NISSAN/INFINITI dealer.**
- **Improper repair, including incorrect removal and installation of the SRS, can lead to personal injury caused by unintentional activation of the system. For removal of Spiral Cable and Air Bag Module, see 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

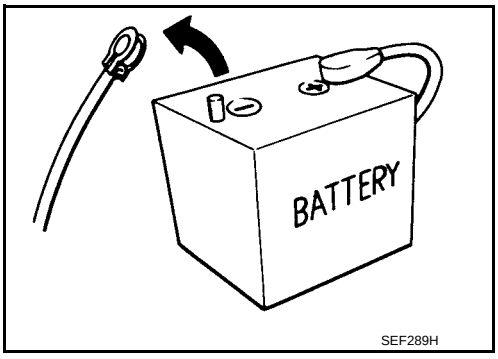
WARNING:

- **When working near the Air Bag Diagnosis Sensor Unit or other Air Bag 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 or batteries, and wait at least three minutes before performing any service.**

Precautions for Removing Battery Terminal

INFOID:0000000014912612

- With the adoption of Auto ACC function, ACC power is automatically supplied by operating the Intelligent Key or remote keyless entry or by opening/closing the driver side door. In addition, ACC power is supplied even after the ignition switch is turned to the OFF position, i.e. ACC power is supplied for a certain fixed time.
- When disconnecting the 12V battery terminal, turn off the ACC power before disconnecting the 12V battery terminal, observing “How to disconnect 12V battery terminal” described below.
  NOTE:
  Some ECUs operate for a certain fixed time even after ignition switch is turned OFF and ignition power supply is stopped. If the battery terminal is disconnected before ECU stops, accidental DTC detection or ECU data damage may occur.



SEF289H

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

HOW TO DISCONNECT 12V BATTERY TERMINAL

Disconnect 12V battery terminal according to instruction described below.

1. Open the trunk lid or back door.
2. Turn ignition switch to the ON position.
3. Turn ignition switch to the OFF position with the driver side door opened.
4. Get out of the vehicle and close the driver side door.
5. Wait at least 3 minutes.

CAUTION:
While waiting, never operate the vehicle such as locking, opening, and closing doors. Violation of this caution results in the activation of ACC power supply according to the Auto ACC function.

6. Remove 12V battery terminal.

CAUTION:
After installing 12V battery, always check self-diagnosis results of all ECUs and erase DTC.

Precaution for Propeller Shaft

INFOID:0000000014630251

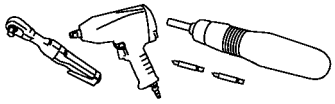
- Replace the propeller shaft assembly if there is a breakage or deflection on tube.
- Never hit the tube or apply an impact on it during repair service. Never damage the tube as well.
- The joint cannot be disassembled. Never disassemble it.
- If constant velocity joint was bent during propeller shaft 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

Commercial Service Tools

INFOID:0000000014630252

Tool name	Description
Power Tool  PIIB1407E	Loosening nuts, screws and bolts

SYSTEM DESCRIPTION

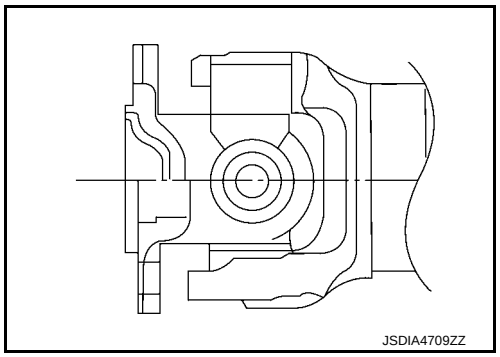
STRUCTURE AND OPERATION

Sectional View

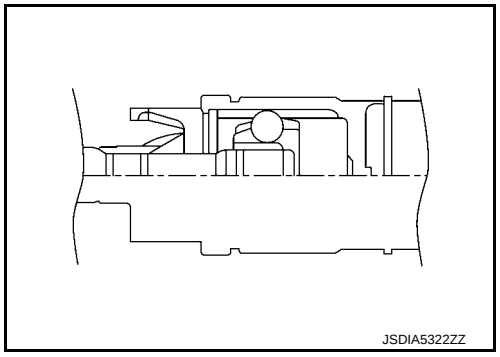
INFOID:0000000014630253

PART OF JOINT

Universal Type (Shell Type)



CVJ Type



SYMPTOM DIAGNOSIS

NOISE, VIBRATION AND HARSHNESS (NVH) TROUBLESHOOTING

NVH Troubleshooting Chart

INFOID:0000000014630254

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

Reference		DLN-105, "Inspection"	DLN-106, "Exploded View"	—	DLN-109, "Inspection"	—	DLN-105, "Inspection"	DLN-105, "Inspection"	NVH of REAR FINAL DRIVE in this section.	NVH in FAX, RAX, FSU, and RSU section.	NVH in WT section.	NVH in WT section.	NVH in FAX and RAX section.	NVH in BR section.	NVH in ST section.
Possible cause and SUSPECTED PARTS		Uneven rotating torque	Center bearing improper installation	Excessive center bearing axial end play	Center bearing mounting (insulator) cracks, damage or deterioration	Excessive joint angle	Rotation imbalance	Excessive runout	DIFFERENTIAL	AXLE AND SUSPENSION	TIRE	ROAD WHEEL	DRIVE SHAFT	BRAKE	STEERING
Symptom	Noise	×	×	×	×	×	×	×	×	×	×	×	×	×	×
	Shake		×			×				×	×	×	×	×	×
	Vibration	×	×	×	×	×	×	×		×	×		×		×

×: Applicable

PERIODIC MAINTENANCE

REAR PROPELLER SHAFT

Inspection

INFOID:0000000014630255

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.

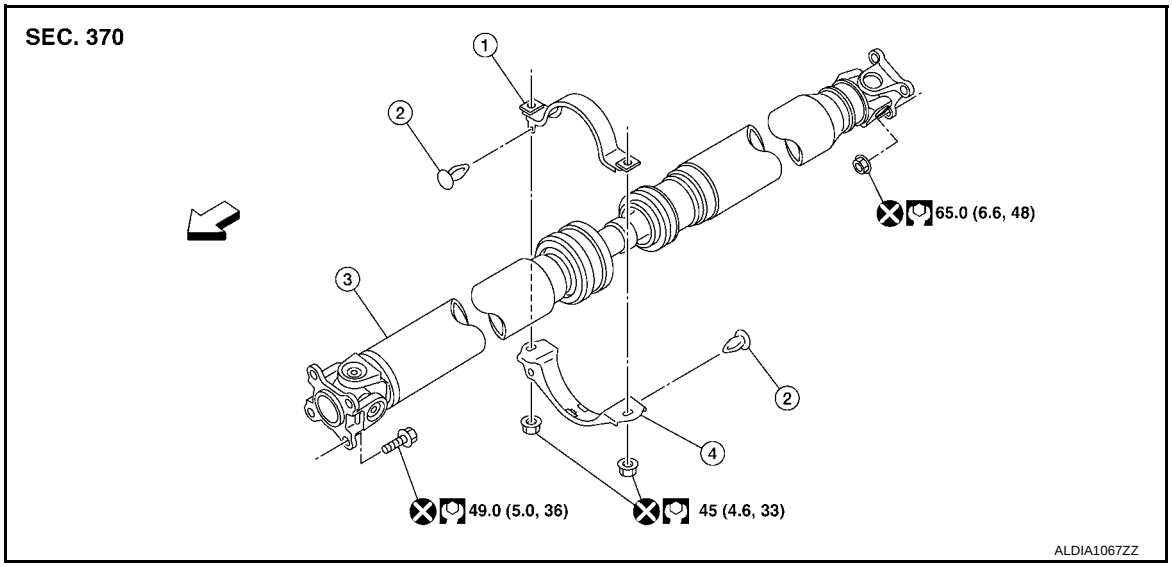
1. Check the propeller shaft for bend and damage. If damaged, replace propeller shaft assembly.
2. Perform a cruise test drive to check the propeller shaft for runout. If vibration occurs, separate propeller shaft at electric controlled coupling of final drive; then change the phase between electric 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-109, "Inspection".

REMOVAL AND INSTALLATION

REAR PROPELLER SHAFT

Exploded View

INFOID:0000000014914644



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

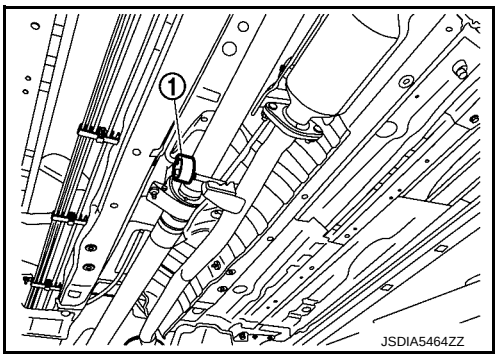
⇦ Vehicle front

Removal and Installation

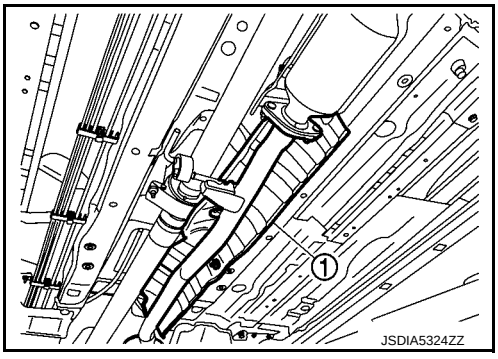
INFOID:0000000014914645

REMOVAL

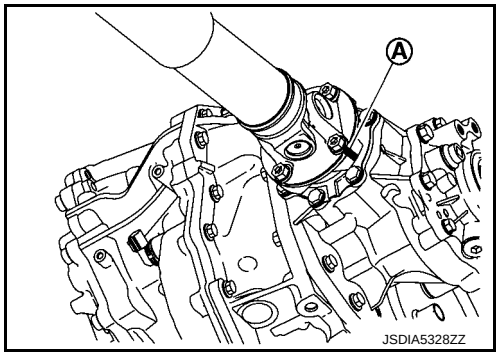
1. Position transaxle to the neutral position, and then release parking brake.
2. Remove mounting rubber (1) of muffler. Refer to EX-7, "Exploded View".



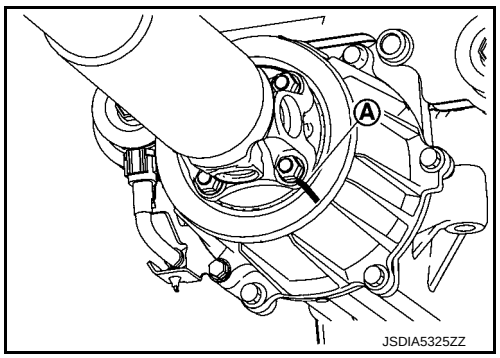
3. Remove heat insulator (1).



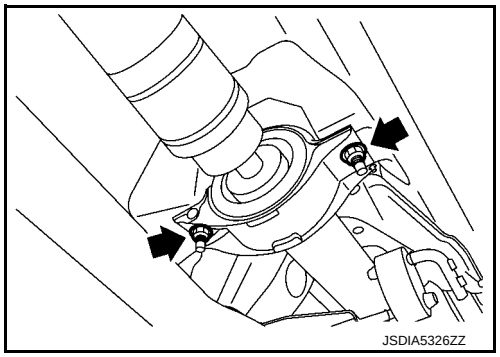
4. Place index marks (A) on propeller shaft flange yoke and transfer companion flange.
CAUTION:
Use paint for matching mark. Do not damage propeller shaft flange yoke or transfer companion flange.



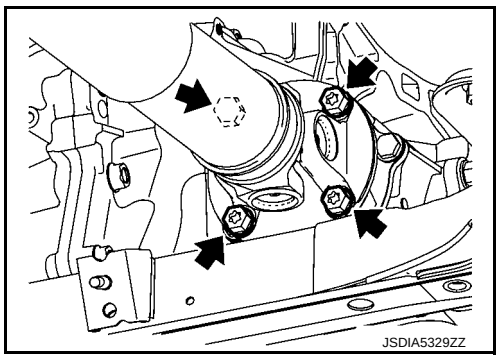
5. Place index marks (A) on propeller shaft flange yoke and electric controlled coupling.
CAUTION:
- **Use paint for matching mark. Do not damage propeller shaft flange yoke and electric controlled coupling.**
- **If the tip of stud bolt of electric controlled coupling has a paint mark, place a matching mark for identification of the position of applicable stud bolt.**



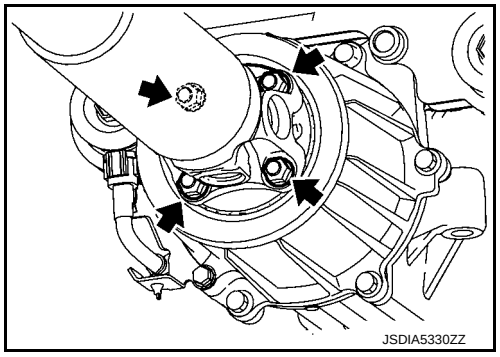
6. Loosen nuts (⬅) of center bearing mounting bracket.
NOTE:
Tighten nuts temporarily to prevent drop of propeller shaft.



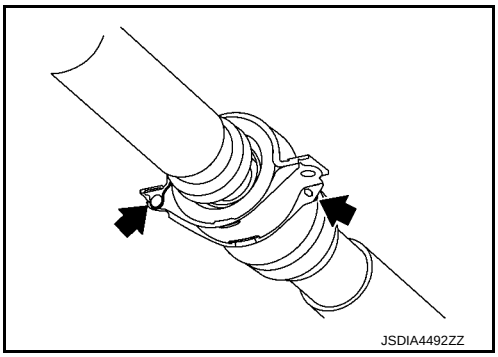
7. Remove bolts (⬅), then separate propeller shaft assembly from transfer companion flange.



8. Remove (⬅) nuts, then separate propeller shaft assembly from electric controlled coupling of final drive.
9. Remove (⬅)nuts.
10. Remove propeller shaft assembly.



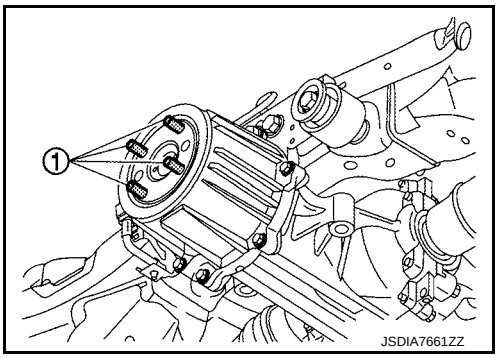
11. Remove clips, then remove center bearing mounting bracket (upper/lower).
12. Perform inspection after removal. Refer to DLN-109, "Inspection".


JSDIA4492ZZ

INSTALLATION

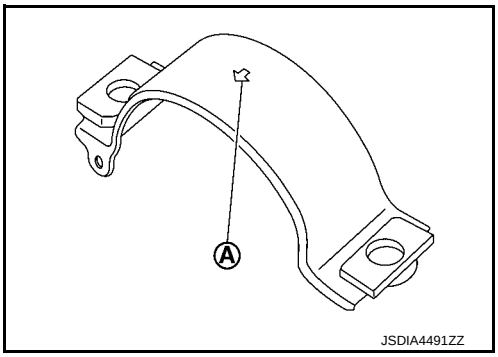
Note the following, and install in the reverse order of removal.

- For non-reusable parts, refer to DLN-106, "Exploded View".
- For each tightening torque, refer to DLN-106, "Exploded View".
- After removing propeller shaft, replace stud bolts (1) on electric controlled coupling. Refer to DLN-124, "Removal and Installation".
- Remove any moisture, oil, or dirt from mating surface of transfer companion flange, electric controlled coupling and propeller shaft flange.



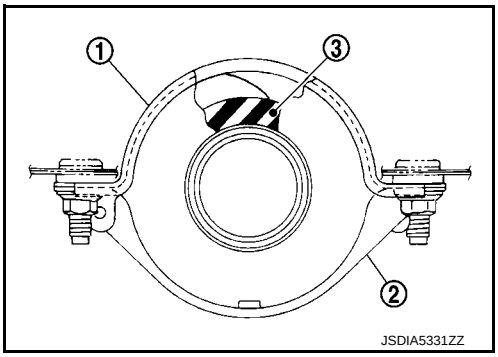
JSDIA7661ZZ

- Install center bearing mounting bracket (upper) with its arrow mark (A) facing forward.



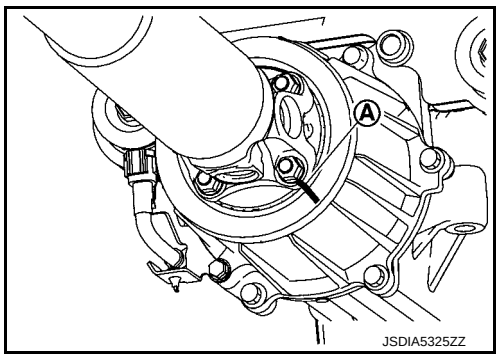
JSDIA4491ZZ

- Adjust position of center bearing mounting bracket (upper) (1), center bearing mounting bracket (lower) (2) sliding back and forth to prevent play in thrust direction of center bearing insulator (3). Install center bearing mounting bracket (upper/lower) to vehicle.
- Center bearing mounting bracket fixing nuts must be tightened in the order from left to right.

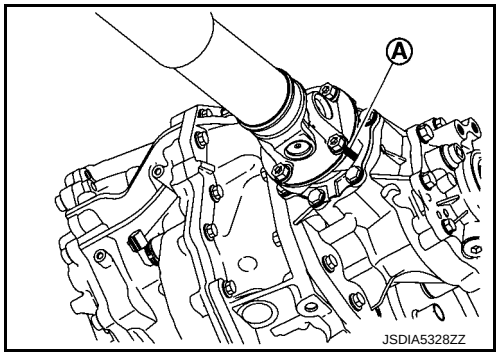


JSDIA5331ZZ

- Align matching marks (A) made during removal, install propeller shaft flange yoke and electric controlled coupling of final drive.



- Align matching marks (A) made during removal, to install propeller shaft flange yoke and transfer companion flange.



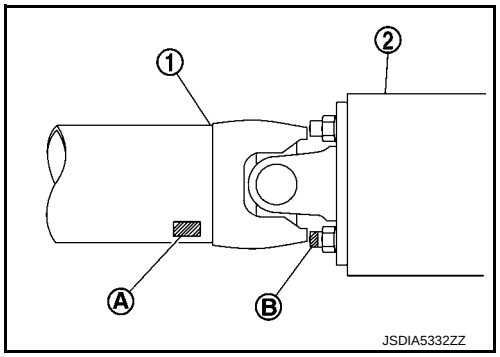
- If a new propeller shaft assembly, final drive assembly or electric controlled coupling has been installed, connect propeller shaft assembly and electric controlled coupling of final drive as follows:

- Install propeller shaft (1) while aligning its matching mark (A) of propeller shaft with matching mark (B) on stud bolt of electric controlled coupling (2) as close as possible.

CAUTION:

If a new stud bolt is installed, use the painted matching mark in removal as a guide.

- Perform inspection after installation. Refer to DLN-109, "Inspection".



Inspection

INFOID:0000000014914646

INSPECTION AFTER REMOVAL

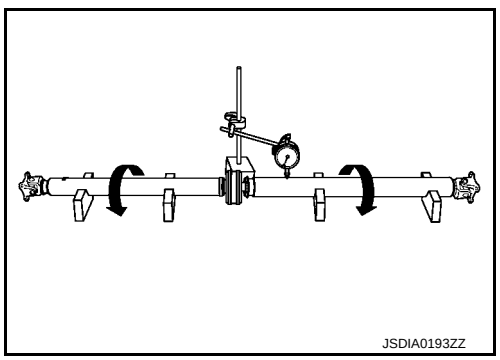
Appearance

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, install a new propeller shaft assembly.

Propeller shaft runout : Refer to DLN-105, "Inspection".



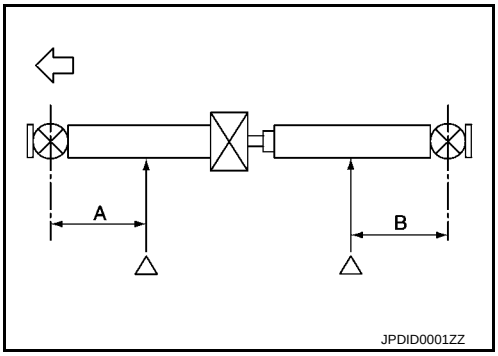
- Propeller shaft runout measuring point (Point "△").

⇦ : Front

Dimension

A : 533.5 mm (21.00 in)

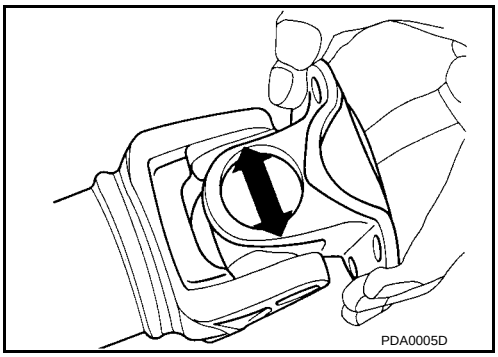
B : 492.0 mm (19.37 in)



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, install a new propeller shaft assembly.

Journal axial play : Refer to DLN-111, "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:

Never disassemble center bearing.

INSPECTION AFTER INSTALLATION

After assembly, perform a driving test to check propeller shaft vibration. If vibration is felt, 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)

General Specifications

INFOID:0000000014630259

Applied model		AWD
		MR20DD and RM31
		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)	1181.5 mm (46.52 in)
	2nd (CVJ joint center to spider)	983.4 mm (38.72 in)
Shaft outer diameter	1st	63.5 mm (2.500 in)
	2nd	70.0 mm (2.756 in)

Propeller Shaft Runout

INFOID:0000000014630260

Unit: mm (in)

Item	Standard
Propeller shaft runout	0.6 (0.024) or less

Journal Axial Play

INFOID:0000000014630261

Unit: mm (in)

Item	Standard
Journal axial play	0 (0)

PRECAUTION

PRECAUTIONS

High Voltage Precautions

INFOID:0000000014914709

DANGER:

Since hybrid vehicles and electric vehicles contain a high voltage battery, there is the risk of electric shock, electric leakage, or similar accidents resulting in death or severe injury, if high voltage components and vehicle are mishandled. When performing an inspection or maintenance, be sure to comply with the instructions below to perform correct work procedures.

WARNING:

- **Be sure to remove the service plug in order to disconnect the high voltage circuits before performing inspection or maintenance of high voltage system harnesses and parts.**
- **The removed service plug must always be carried in a pocket of the responsible worker or placed in the tool box during the procedure to prevent the plug from being connected by mistake.**
- **Be sure to wear insulated protective equipment before beginning work on the high voltage system.**
- **Never allow workers other than the responsible person to touch the vehicle containing high voltage parts. To keep others from touching the high voltage parts, these parts must be covered with an insulating sheet except when using them.**

CAUTION:

- **Be sure to install the high voltage harness clips to the original positions to prevent damage to high voltage harness. If the clips are damaged, replace them with new ones before installing the high voltage harness.**
- **To prevent damage to parts, never allow coolant to splash on the high voltage harness connector. If coolant splashes on the high voltage harness connector, immediately remove moisture from the high voltage harness connector by using an air blow gun.**
- **Never bring the vehicle into the READY status with the service plug removed unless otherwise instructed in the Service Manual. A malfunction may occur if this is not observed.**

HIGH VOLTAGE HARNESS AND EQUIPMENT IDENTIFICATION

All the high voltage harnesses and connectors are orange. The Li-ion battery and other high voltage devices include an orange high voltage label. Never touch these harnesses and high voltage parts.

HANDLING OF HIGH VOLTAGE HARNESS AND TERMINALS

Immediately insulate disconnected high voltage connectors and terminals with insulating tape.

GUIDELINES ON WORKERS WITH MEDICAL ELECTRONICS

WARNING:

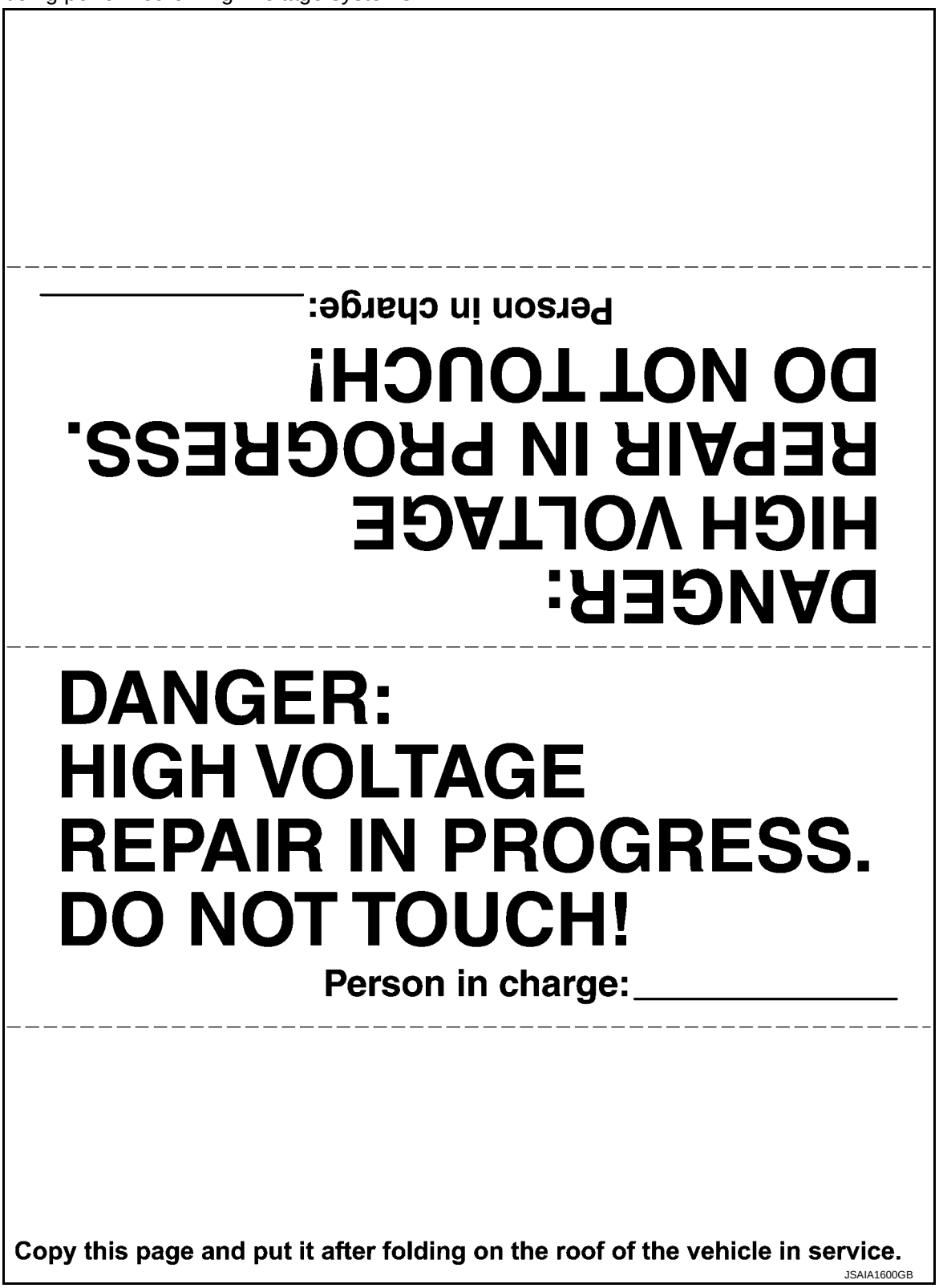
The vehicle contains parts that contain powerful magnets. If a person who is wearing a heart pacemaker or other medical device is close to these parts, the medical device may be affected by the magnets. Such persons must not perform work on the vehicle.

PROHIBITED ITEMS TO CARRY DURING THE WORK

Hybrid vehicles and electric vehicles contain parts with high voltage and intense magnetic force. Never carry metal products and magnetic recording media (e.g. credit card, debit card) to repair/inspect high voltage parts. If this is not observed, the metal products may create a risk of short circuit and the magnetic recording media may lose their magnetic recording.

POST A SIGN OF “DANGER! HIGH VOLTAGE AREA. KEEP OUT”

Call the attention of other workers and indicate "High voltage work in progress." Do not touch vehicles where work is being performed on high voltage systems.



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

INFOID:0000000014808108

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, it is recommended that all maintenance and repair be performed by an authorized NISSAN/INFINITI dealer.**
- **Improper repair, including incorrect removal and installation of the SRS, can lead to personal injury caused by unintentional activation of the system. For removal of Spiral Cable and Air Bag Module, see 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 Air Bag Diagnosis Sensor Unit or other Air Bag 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 or batteries, and wait at least three minutes before performing any service.**

Service Notice or Precautions for Rear Final Drive

INFOID:0000000014630263

- 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 multipurpose grease as specified for each vehicle, if necessary.

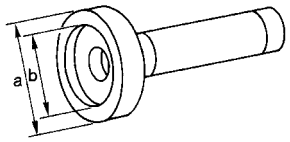
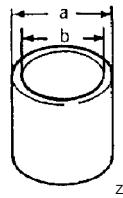
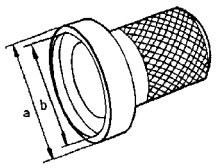
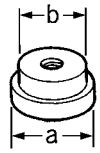
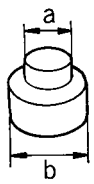
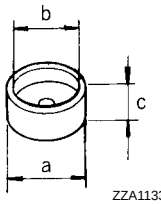
PREPARATION

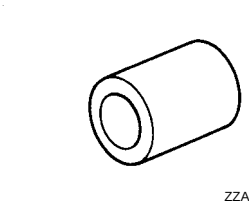
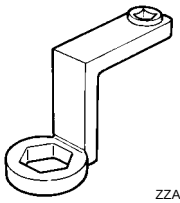
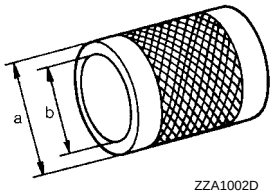
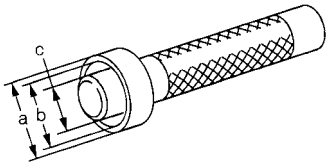
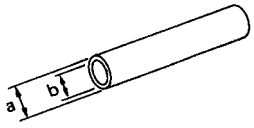
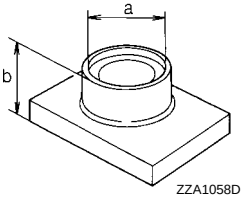
PREPARATION

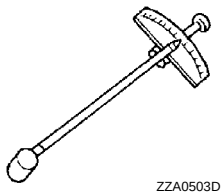
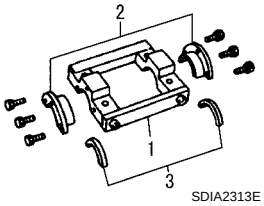
Special Service Tools

INFOID:0000000014630264

The actual shape of the tools may differ from those illustrated here.

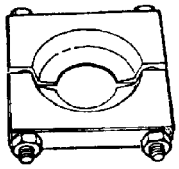
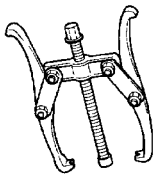
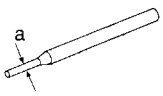
Tool number (TechMate No.) Tool name	Description
KV38100200 (J-26233) Drift a: 65 mm (2.56 in) dia. b: 49 mm (1.93 in) dia.  ZZA1143D	• Installing drive pinion oil seal • Installing side oil seal
ST27861000 (—) Drift a: 62 mm (2.44 in) dia. b: 52 mm (2.05 in) dia.  ZZA0832D	Installing drive pinion oil seal
ST35271000 (J-26091) Drift a: 72 mm (2.83 in) dia. b: 63 mm (2.48 in) dia.  ZZA0814D	Installing drive pinion oil seal
KV40100610 (J-26089) Drift a: 63 mm (2.48 in) dia. b: 54.3 mm (2.138 in) dia.  ZZA1000D	• 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.  ZZA1023D	Removing side bearing inner race
KV40105020 (—) Drift a: 39.7 mm (1.563 in) dia. b: 35 mm (1.38 in) dia. c: 15 mm (0.59 in)  ZZA1133D	Installing side bearing inner race

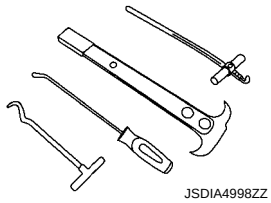
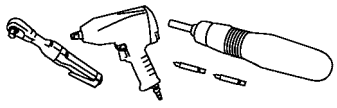
Tool number (TechMate No.) Tool name	Description
KV38109500 (—) Drive pinion socket  ZZA1205D	• Removing and installing drive pinion lock nut • Measuring preload torque
KV38109400 (—) Pinion nut wrench  ZZA1206D	Removing and installing drive pinion lock nut
ST33200000 (J-26082) Drift a: 60 mm (2.36 in) dia. b: 44.5 mm (1.752 in) dia.  ZZA1002D	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.  ZZA1046D	Installing pinion front bearing outer race
ST23860000 (—) Drift a: 38 mm (1.50 in) dia. b: 33 mm (1.30 in) dia.  ZZA0534D	• 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)  ZZA1058D	Installing pinion front bearing inner race

Tool number (TechMate No.) Tool name	Description
ST3127S000 (J-25765-A) Preload gauge  ZZA0503D	Measuring preload torque
KV381086S1 (—) Dummy cover set 1. KV38108610 (—) Dummy cover 2. KV38108621 (—) Dummy cover spacer 3. KV38108630 (—) Dummy cover shim  SDIA2313E	• Checking backlash • Checking drive gear runout • Checking tooth contact

Commercial Service Tools

INFOID:0000000014630265

Tool name	Description
Separator  ZZA0700D	• Removing side bearing inner race • Removing pinion rear bearing inner race
Puller  ZZA0119D	• Removing side bearing inner race • Removing pinion rear bearing inner race
Pin Punch a: 4.5 mm (0.177 in) dia.  NT410	Removing and installing lock pin

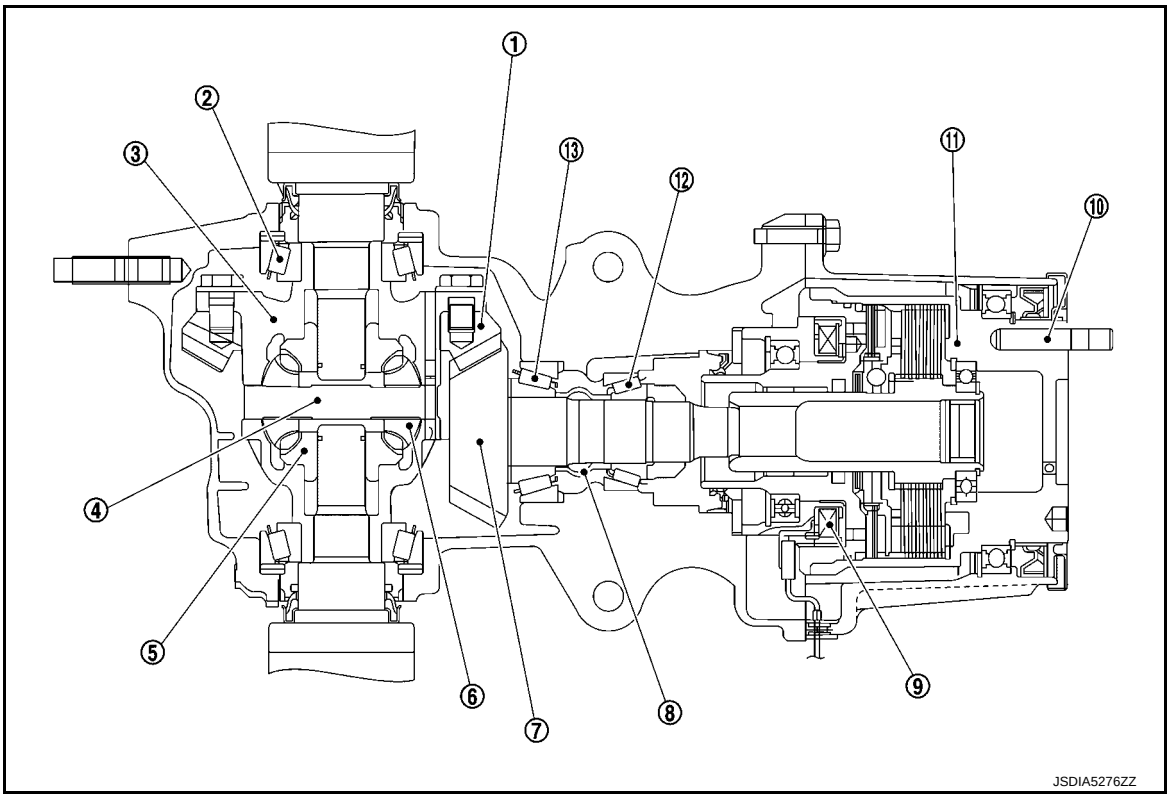
Tool name	Description
Oil seal Remover  JSDIA4998ZZ	Removing drive pinion oil seal
Power Tool  PIIB1407E	Loosening nuts, screws and bolts

SYSTEM DESCRIPTION

STRUCTURE AND OPERATION

Sectional View

INFOID:0000000014630266



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:0000000014630267

The electric controlled coupling operates as the AWD system. For the operation, refer to DLN-15, "Operation Description".

SYMPTOM DIAGNOSIS

NOISE, VIBRATION AND HARSHNESS (NVH) TROUBLESHOOTING

NVH Troubleshooting Chart

INFOID:0000000014630268

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

		Reference	DLN-144, "Inspection"	DLN-140, "Adjustment"	DLN-144, "Inspection"	DLN-140, "Adjustment"	—	DLN-121, "Inspection"	NVH of REAR PROPELLER SHAFT in this section.	NVH in FAX, RAX, FSU and RSU sections	NVH in WT section	NVH in WT section	NVH in FAX and RAX section	NVH in BR section	NVH in ST section
		Possible cause and SUSPECTED PARTS	Gear tooth rough	Gear contact improper	Tooth surfaces worn	Backlash incorrect	Companion flange excessive runout	Gear oil improper	PROPELLER SHAFT	AXLE AND SUSPENSION	TIRE	ROAD WHEEL	DRIVE SHAFT	BRAKE	STEERING
Symptom	Noise		×	×	×	×	×	×	×	×	×	×	×	×	×

×: Applicable

PERIODIC MAINTENANCE

REAR DIFFERENTIAL GEAR OIL

Inspection

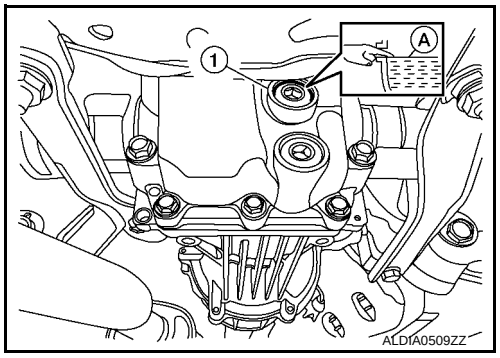
INFOID:0000000014630269

OIL LEAKS

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

OIL LEVEL

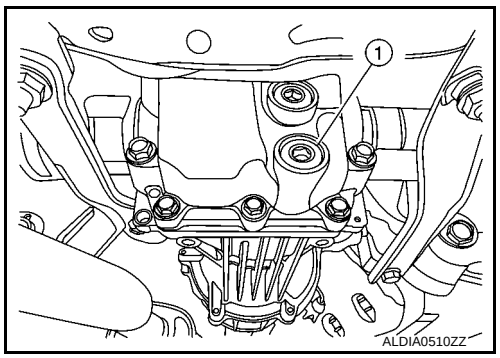
- Remove filler plug (1) and check oil level (A) from filler plug mounting hole as shown.
  CAUTION:
  Turn the ignition switch OFF before checking the oil level.
- Set a new gasket on filler plug and install it on final drive assembly. Refer to DLN-134, "Exploded View".
  CAUTION:
  Do not reuse gasket.



Draining

INFOID:0000000014630270

1. Turn the ignition switch to OFF.
2. Remove drain plug (1) and drain gear oil.
3. Set a new gasket on drain plug and install it to final drive assembly and tighten to the specified torque. Refer to DLN-134, "Exploded View".
   CAUTION:
   Do not reuse gasket.



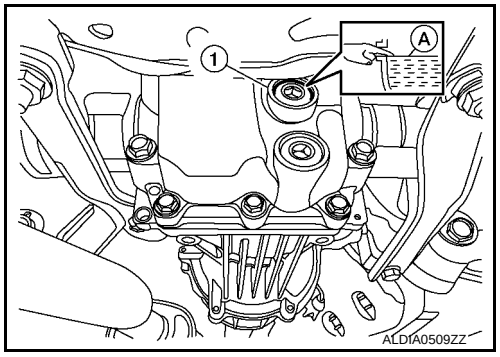
Refilling

INFOID:0000000014630271

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

Oil grade and viscosity	**: Refer to MA-11, "Fluids and Lubricants".**
Oil capacity	**: Refer to DLN-151, "General Specifications".**

2. After refilling oil, check oil level. Set a new gasket to filler plug, then install it to final drive assembly. Refer to DLN-134, "Exploded View".
   CAUTION:
   Do not reuse gasket.

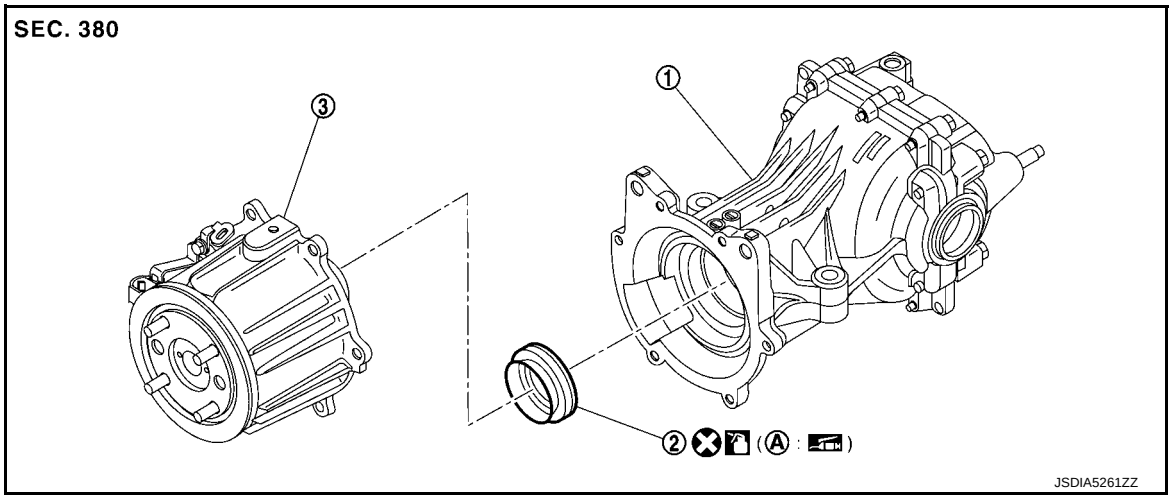


REMOVAL AND INSTALLATION

DRIVE PINION OIL SEAL

Exploded View

INFOID:0000000014630272



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

A. Oil seal lip

Removal and Installation

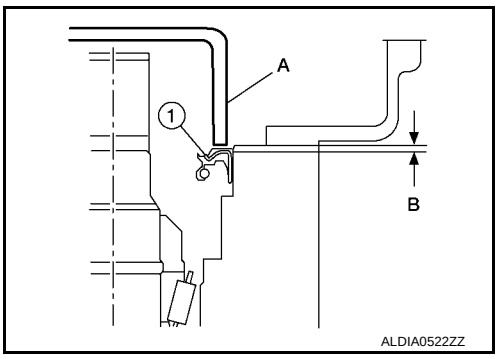
INFOID:0000000014630273

REMOVAL

1. Remove electric controlled coupling. Refer to DLN-124, "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 pinon 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 (—)

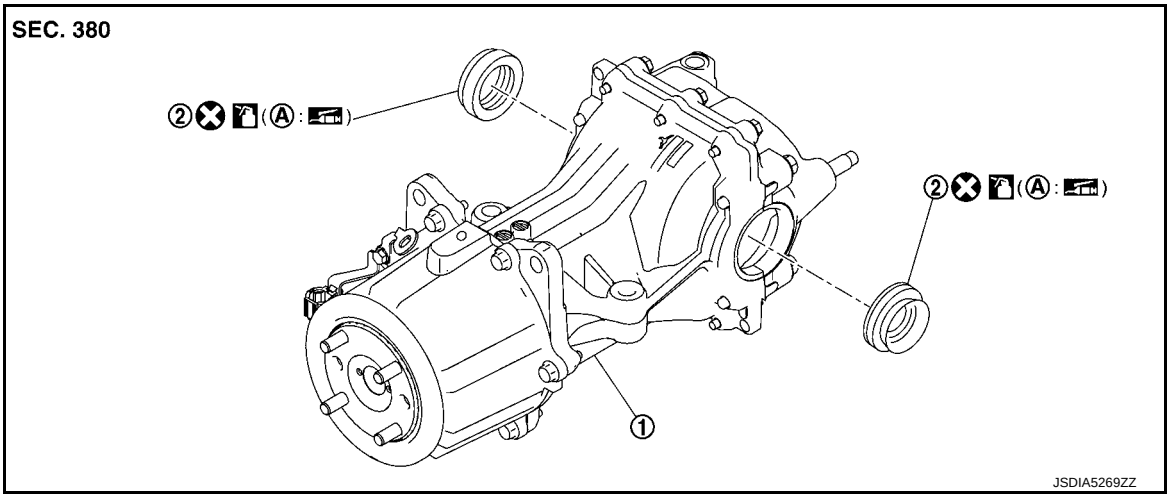
CAUTION:
- **Do not reuse oil seal.**
- **When installing, do not incline oil seal.**
- **Apply multi-purpose grease onto oil seal lips, and gear oil onto the circumference of oil seal.**

2. Install electric controlled coupling. Refer to DLN-124, "Removal and Installation".
3. Install rear propeller shaft. Refer to DLN-106, "Exploded View".
4. When oil leaks while removing, check oil level after the installation. Refer to DLN-121, "Inspection".

SIDE OIL SEAL

Exploded View

INFOID:0000000014630274



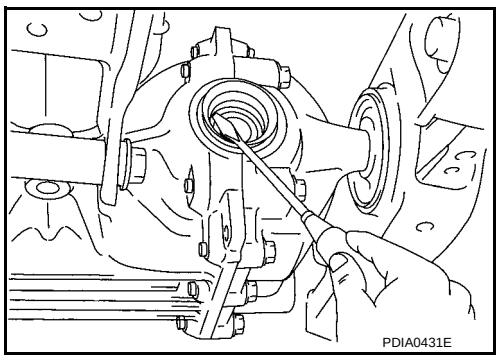
1. Rear final drive assembly
2. Side oil seal
A. Oil lip seal

Removal and Installation

INFOID:0000000014630275

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.

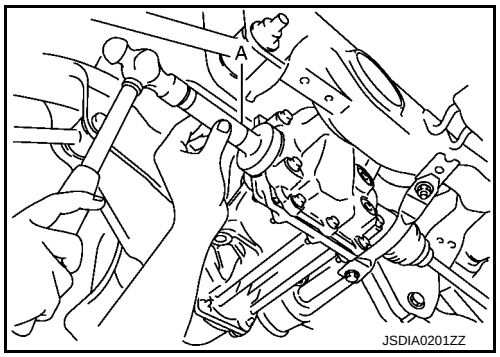


INSTALLATION

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

   Tool number : KV38100200 (J-26233)

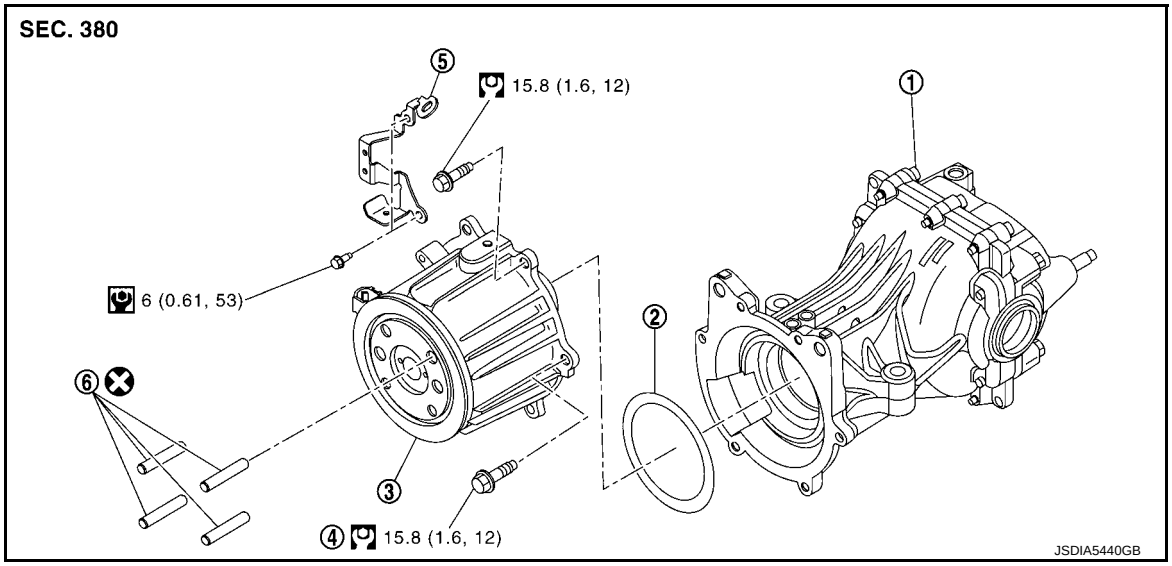
   CAUTION:
   - **Do not reuse oil seals.**
   - **When installing, do not incline oil seals.**
   - **Apply multi-purpose grease onto oil seal lips, and gear oil onto the circumference of oil seal.**
2. Install rear drive shafts. Refer to RAX-19, "Exploded View".
3. When oil leaks while removing, check oil level after the installation. Refer to DLN-121, "Inspection".



ELECTRIC CONTROLLED COUPLING

Exploded View

INFOID:0000000014630276



1. Rear final drive assembly
2. Wave spring
3. Electric controlled coupling assembly
4. Reamer bolt
4. Connector bracket
5. Bracket

:6. ·Stud bolt

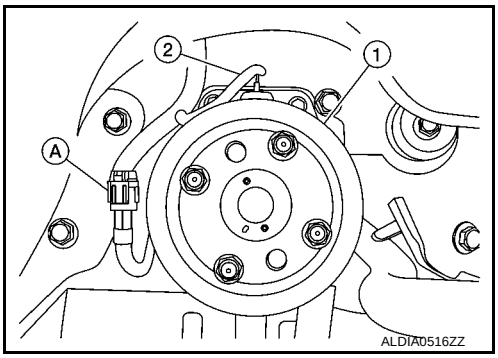
Removal and Installation

INFOID:0000000014630277

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 electric controlled coupling, and support the end of the propeller shaft. Refer to DLN-106, "Exploded View".
2. Remove electric controlled coupling breather hose (2) from electric controlled coupling (1).
3. Disconnect the electric controlled coupling harness connector (A).

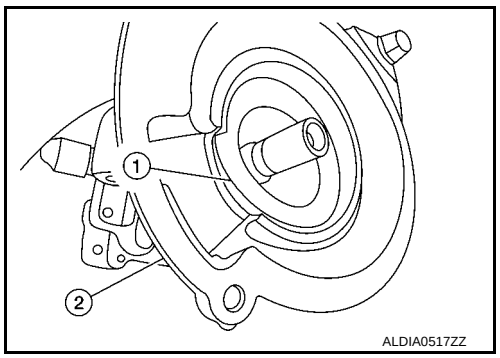


4. Remove harness connector bracket.
5. Remove bolts from electric controlled coupling.
6. Remove the electric controlled coupling.

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

7. Remove wave spring (1).

(2) : Rear final drive assembly



INSTALLATION

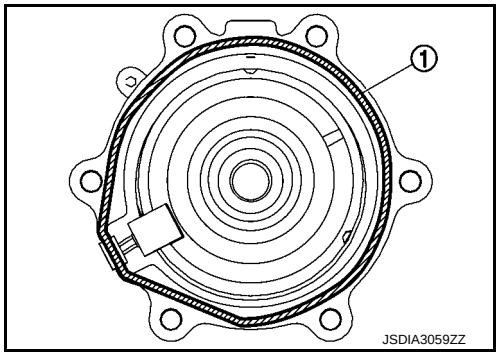
Installation is in the reverse order of removal.

CAUTION:

- **When replacing electric controlled coupling, perform writing unit characteristic. Refer to DLN-40, "Work Procedure".**
- **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 paint mark 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".**

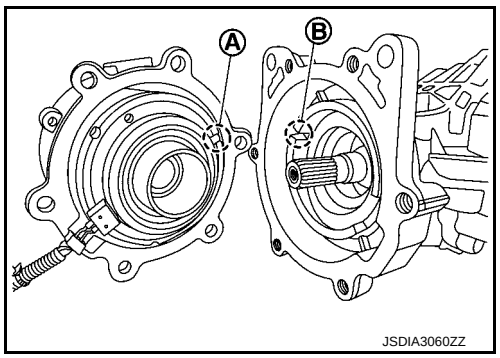
- Remove the old sealant from mating surfaces using a suitable tool before installing.
- Apply liquid gasket (1) to mating surface of coupling cover.
  Use Genuine Silicone RTV or equivalent. Refer to GI-22, "Recommended Chemical Products and Sealants".

  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.**

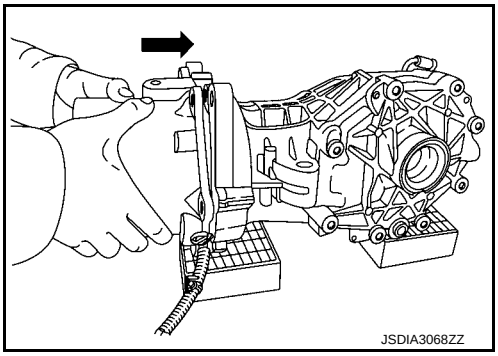


- Install electric controlled coupling to spline of drive pinion inside final drive assembly.

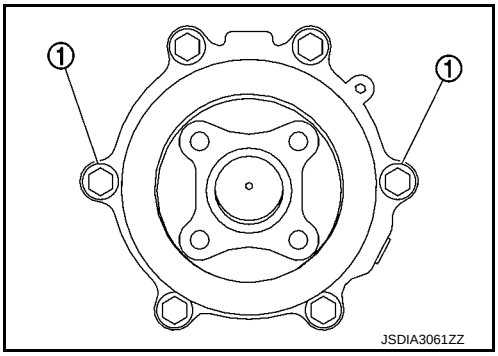
  CAUTION:
  - **Align the pin (A) on electric controlled coupling with the groove (B) of final drive assembly.**
  - **Be careful not to damage center oil seal.**



- 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 flection of the wave spring.



- 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.**
- If reamer bolts can be tightened all the way by hand torque them to the specified value.

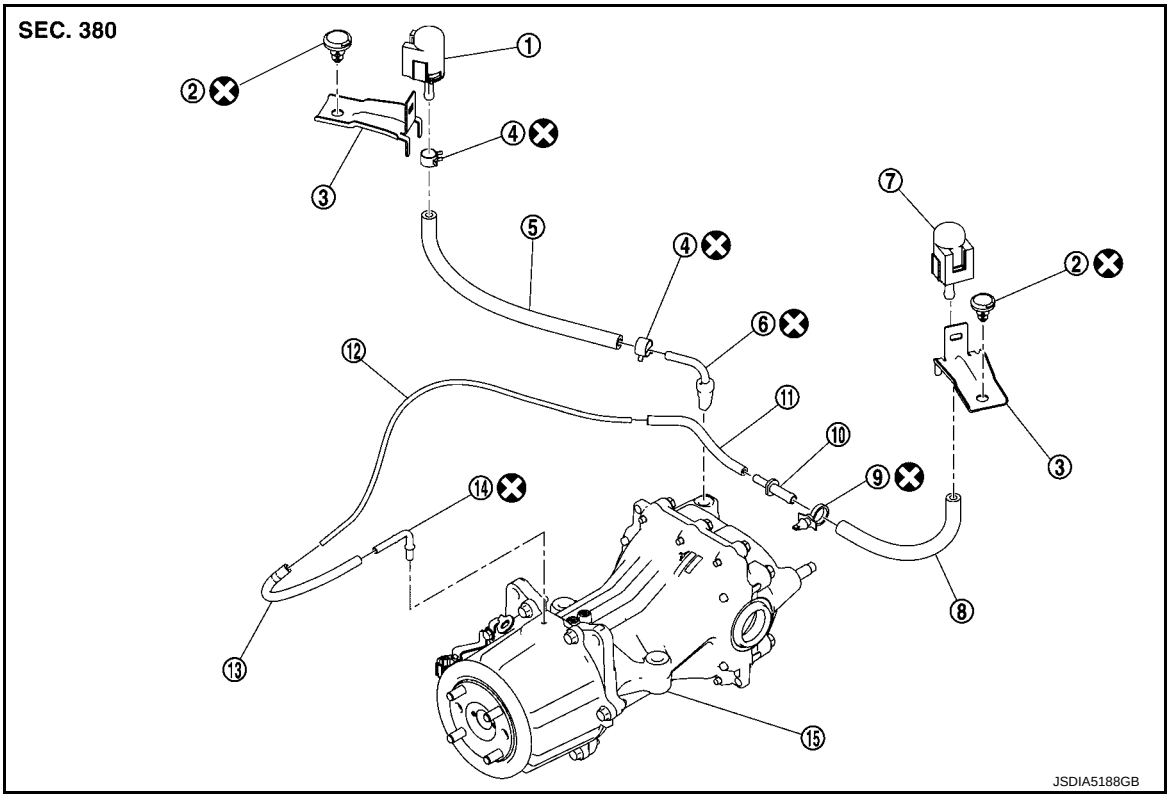


- When oil leaks while removing, check oil level after the installation. Refer to DLN-121, "Inspection".

AIR BREATHER

Exploded View

INFOID:0000000014630278



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

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

Removal and Installation

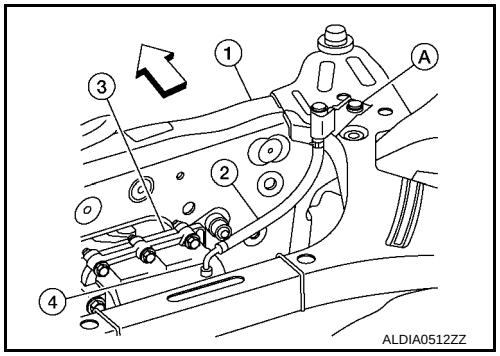
INFOID:0000000014630279

REMOVAL

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

(3) : Rear final drive assembly

⇦ : Front



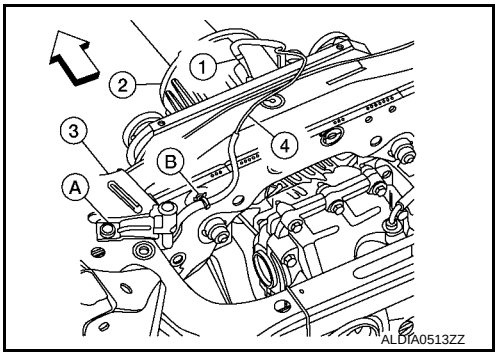
2. Remove air breather hose (2) and breather tube (4) together.
3. Loosen hose clamp and remove breather tube (4) from air breather hose (2).

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

(2) : Electric controlled coupling

⇦ : Front

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



INSTALLATION

Installation is in the reverse order of removal.

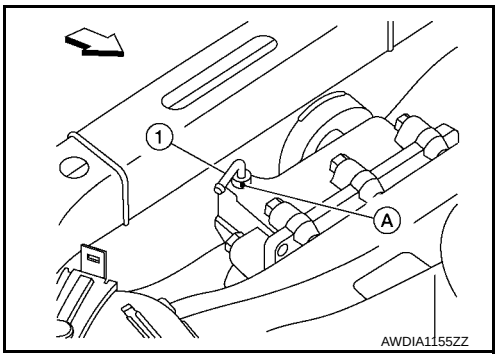
CAUTION:

- **Do not reuse hose clamps.**
- **Do not reuse trim clips.**
- **Do not reuse breather connectors (metal).**
- **Do not reuse clips.**

- 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.

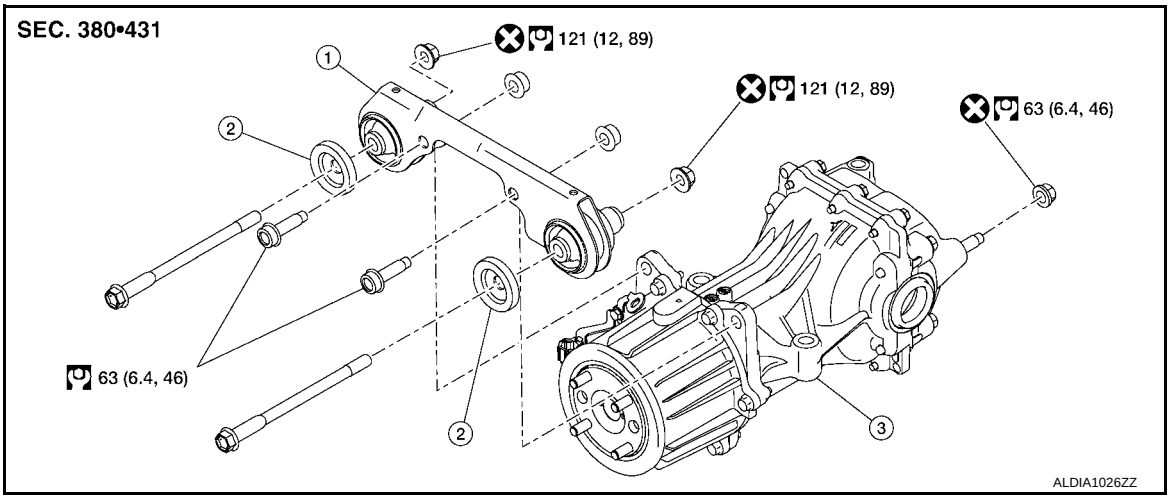


UNIT REMOVAL AND INSTALLATION

REAR FINAL DRIVE ASSEMBLY

Exploded View

INFOID:0000000014630280



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

Removal and Installation

INFOID:0000000014630281

REMOVAL

1. Remove rear propeller shaft. Refer to DLN-106, "Removal and Installation".
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.DLN-127, "Exploded View".
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.

CAUTION:

When replacing rear final drive assembly, perform writing unit characteristics. Refer to DLN-40, "Work Procedure".

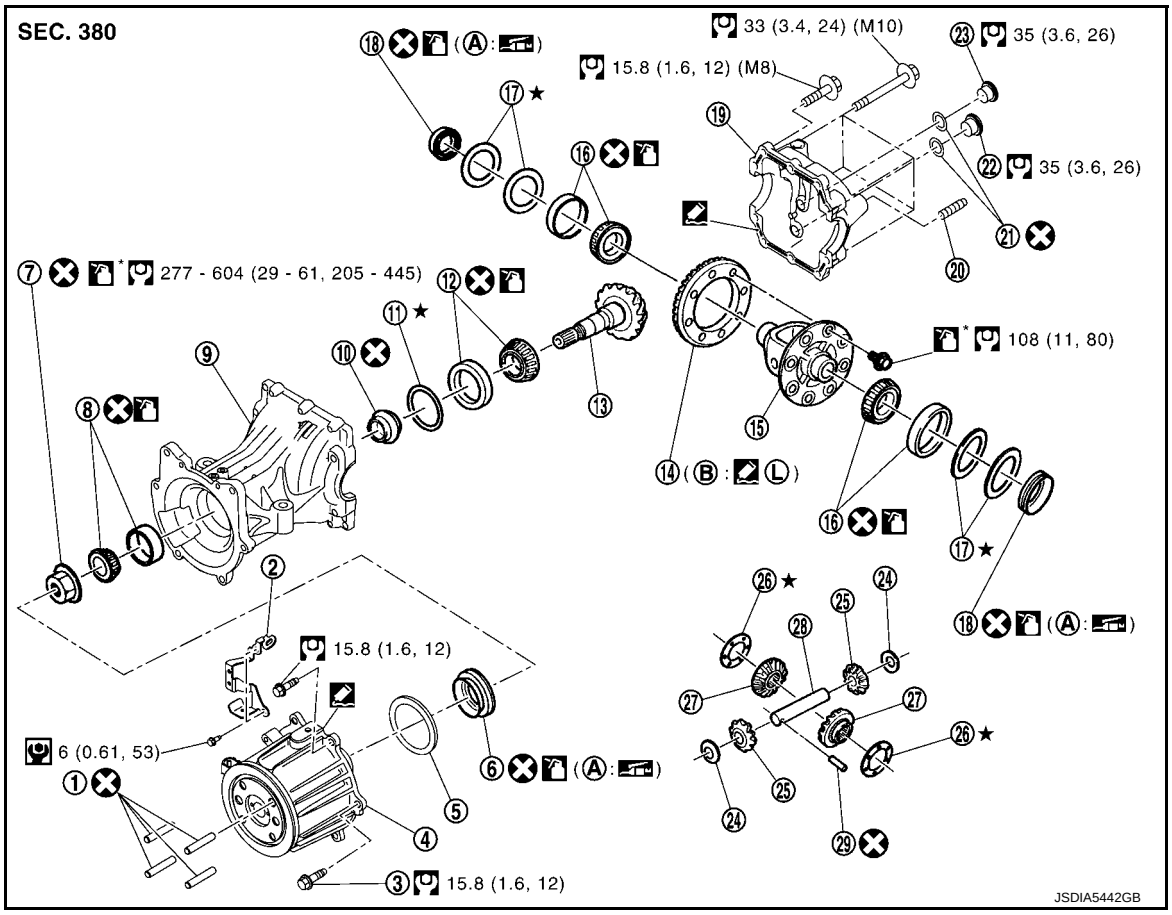
When oil leaks while removing final drive assembly, check oil level after the installation. Refer to DLN-121, "Inspection".

UNIT DISASSEMBLY AND ASSEMBLY

ELECTRIC CONTROLLED COUPLING

Exploded View

INFOID:0000000014630282



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		

: Apply Genuine Silicone RTV or equivalent. Refer to MA-11, "Fluids and Lubricants".

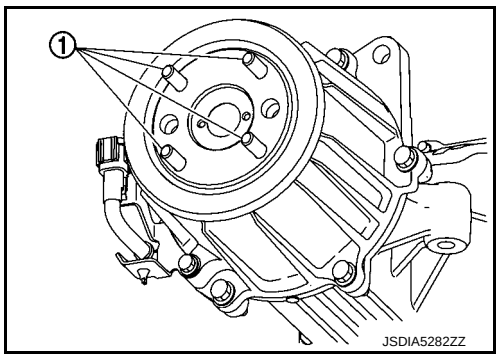
Ⓛ: Apply Genuine High Strength Thread Locking Sealant or equivalent. Refer to MA-11, "Fluids and Lubricants".

Disassembly and Assembly

INFOID:0000000014630283

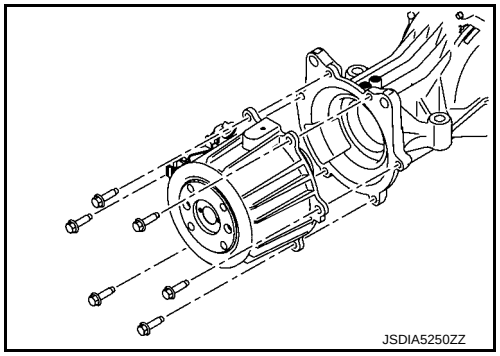
DISASSEMBLY

1. Remove stud bolts (1).

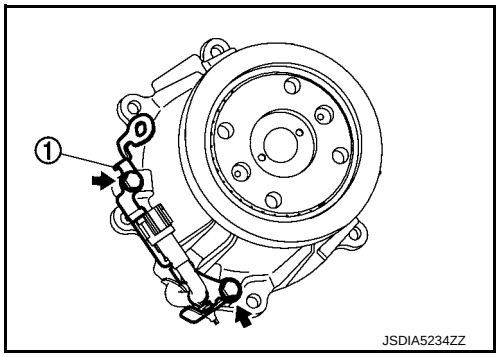


2. Remove electric controlled coupling assembly from final drive assembly.
3. Remove wave spring.
4. Remove drive pinion oil seal from the inside of gear carrier. Refer to DLN-145, "Disassembly and Assembly".

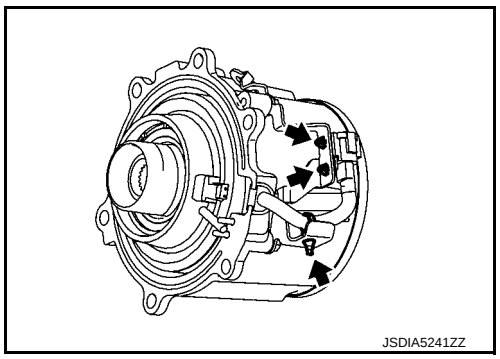
CAUTION:
When removing electric controlled coupling, replace drive pinion oil seal.



5. Remove connector bracket (1) from electric controlled coupling.



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

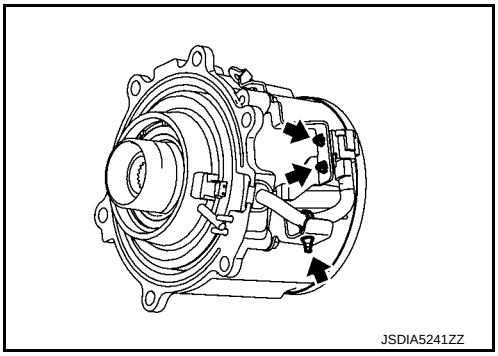


ASSEMBLY

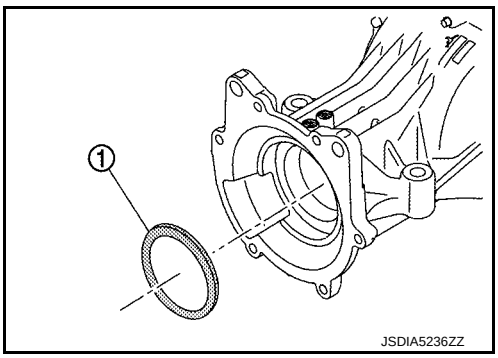
1. Install connector bracket to electric controlled coupling.
   - For tightening torque, refer to DLN-130, "Exploded View".

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-145, "Disassembly and Assembly".

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


JSDIA5241ZZ

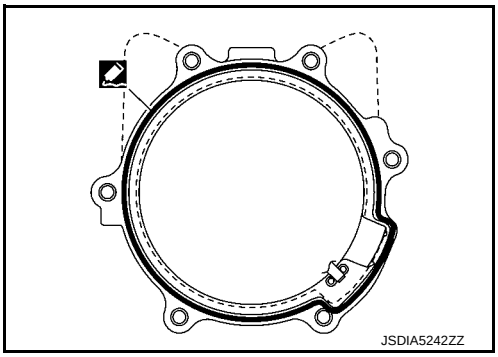
4. Install wave spring (1) to the inside of gear carrier.



JSDIA5236ZZ

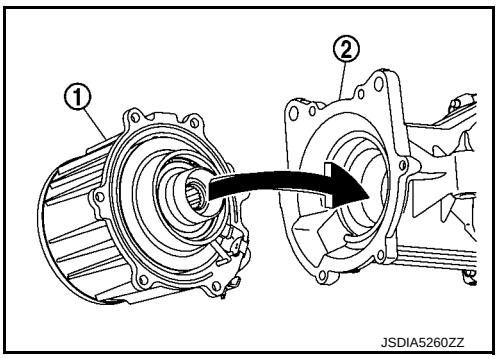
5. Apply liquid gasket to mating surface of electric controlled coupling assembly.

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.**


JSDIA5242ZZ

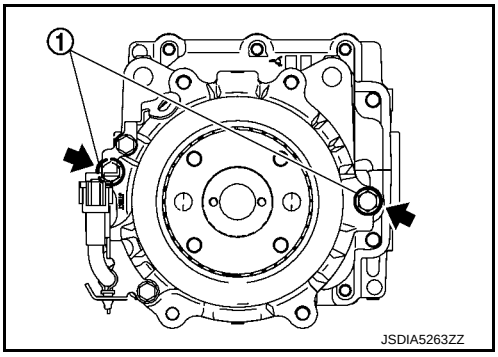
6. Match electric controlled coupling assembly (1) to spline of drive pinion, then install it to final drive assembly (2).

CAUTION:
Be careful not to damage drive pinion oil seal.



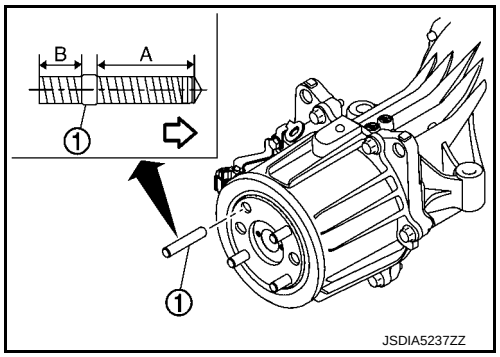
JSDIA5260ZZ

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-130, "Exploded View".



JSDIA5263ZZ

9. Install stud bolts (1).



⇦ : Electric controlled coupling side

Thread length

A : Long

B : Short

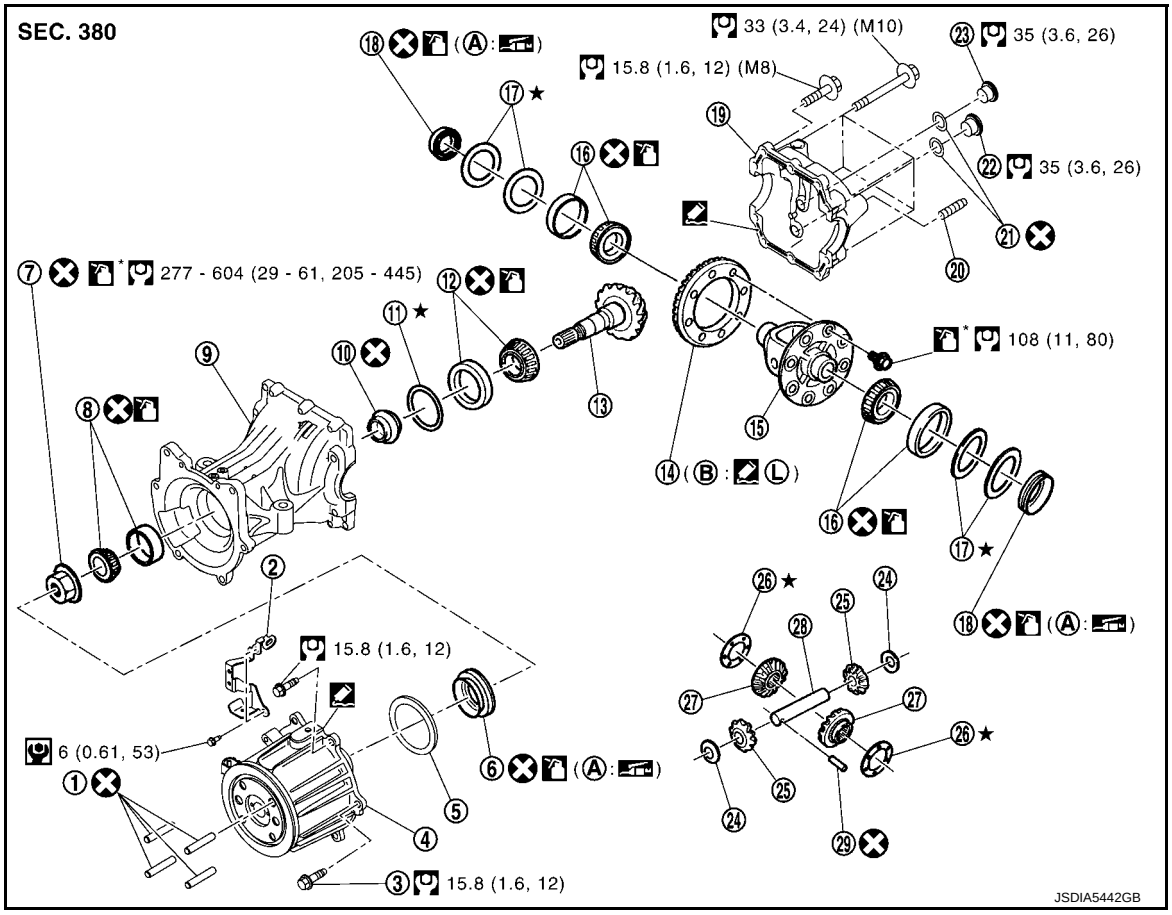
CAUTION:

- **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) ±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).**

DIFFERENTIAL ASSEMBLY

Exploded View

INFOID:0000000014630284



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		

: Apply Genuine Silicone RTV or equivalent. Refer to MA-11, "Fluids and Lubricants".

Ⓛ: Apply Genuine High Strength Thread Locking Sealant or equivalent. Refer to MA-11, "Fluids and Lubricants".

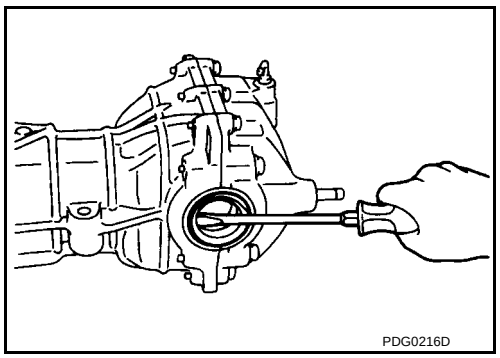
Disassembly and Assembly

INFOID:0000000014630285

DISASSEMBLY

1. Remove drain plug, filler plug and gaskets.

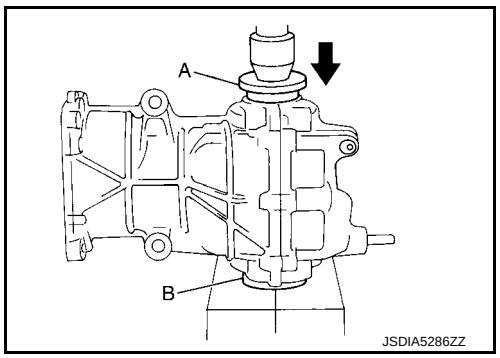
2. Remove the side oil seal, using oil seal remover (commercial service tool).
CAUTION:
Never damage gear carrier and rear cover.
3. Remove rear cover mounting bolts.



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)]

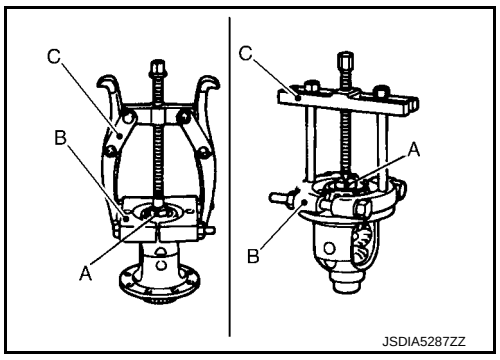
CAUTION:
The pressure shall be as low as possible to remove gear carrier assembly and rear cover assembly. The maximum pressure shall be 10 kN (1 ton, 1.0 Imp ton).
NOTE:
Differential assembly, side bearings, and adjusting washers are compressed and integrated in gear carrier and rear cover.



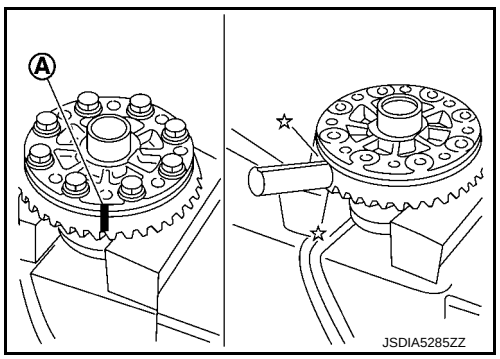
5. Remove stud bolt from rear cover.
NOTE:
It is not necessary to remove stud bolt except when it is replaced.
6. Remove side bearing adjusting shims and side bearing outer races.
CAUTION:
Mark the side bearing adjusting shims so that the original mounting positions (right/left) can be identified later.
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)

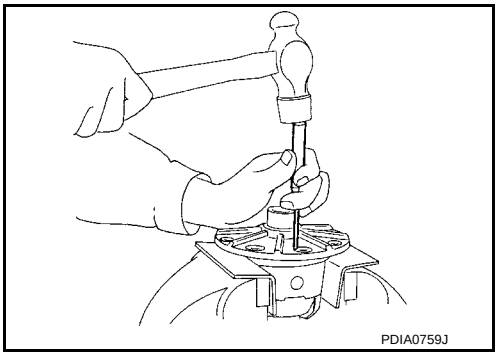
CAUTION:
- **To prevent damage to the side bearing and drive gear, place copper plates between these parts and vise.**
- **It is not necessary to remove side bearing inner race except when it is replaced.**



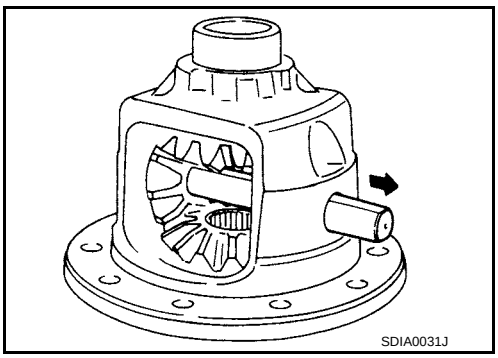
8. For proper reinstallation, paint matching marks Ⓐ on one differential assembly and drive gear.
CAUTION:
For matching marks, use paint. Never damage differential assembly and drive gear.
9. Remove drive gear mounting bolts and then remove drive gear from differential assembly.



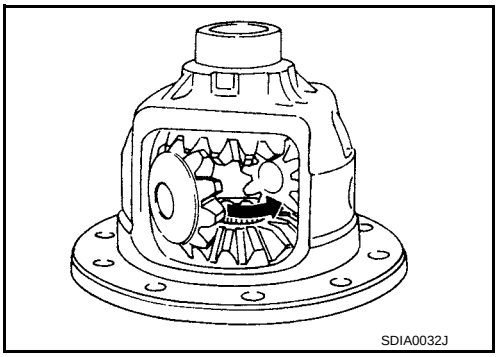
10. Remove lock pin of pinion mate shaft, using the pin punch (commercial service tool).


PDIA0759J

11. Remove pinion mate shaft.

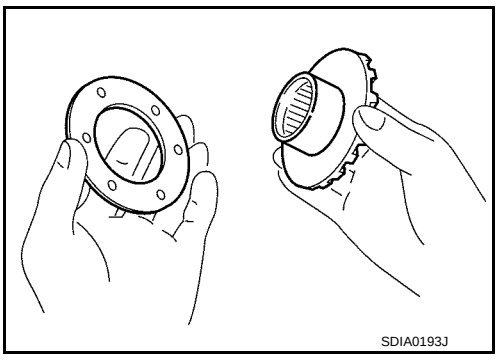

SDIA0031J

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-144, "Inspection".

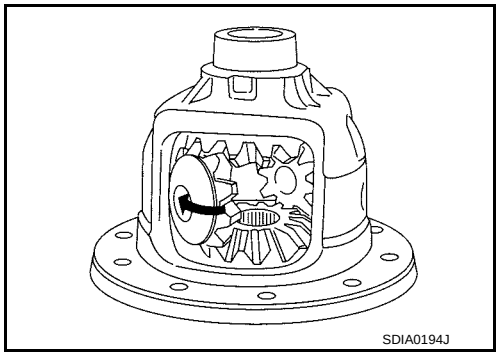

SDIA0032J

ASSEMBLY

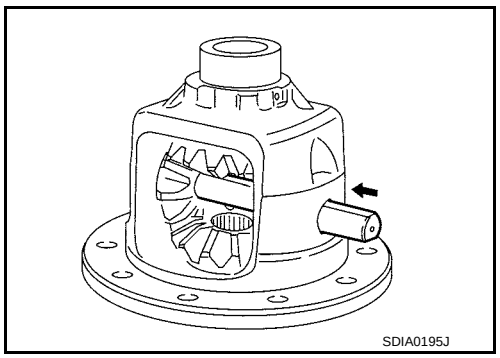
1. Install side gear thrust washers with the same thickness as the ones installed prior to disassembly or reinstall the old ones on the side gears.
2. Install side gears and side gear thrust washers into differential case.


SDIA0193J

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.

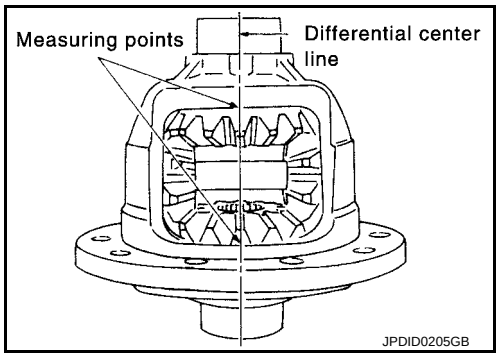

SDIA0194J

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


SDIA0195J

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.



JPDID0205GB

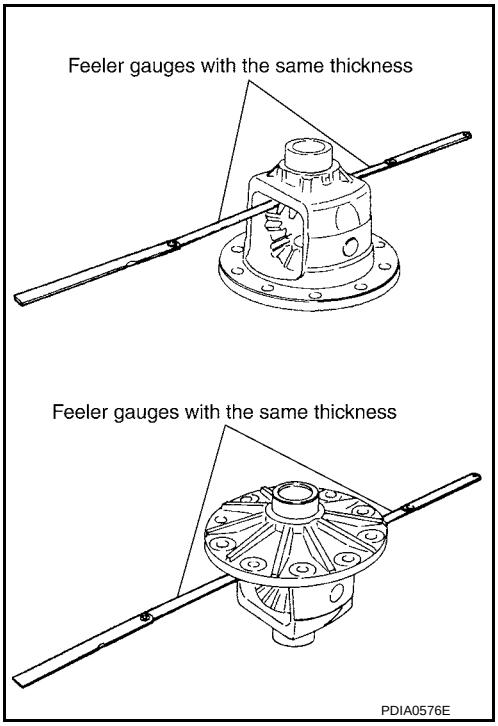
b. Using feeler gauge, measure the clearance between side gear back and differential case at 3 different points, while rotating side gear. Average the 3 readings, and then measure the clearance of the other side as well.

Side gear back clearance	**: Refer to DLN-151, "Differential Side Gear Clearance".**

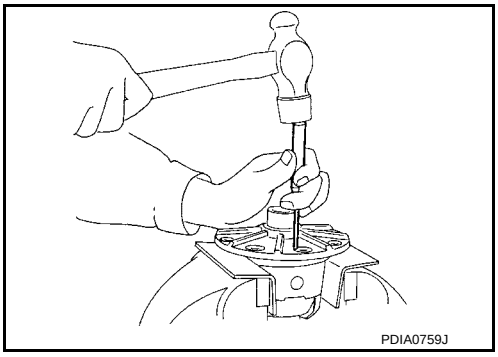
CAUTION:
To prevent side gear from tilting, insert feeler gauges with the same thickness from both sides.
- If the back clearance is outside the specification, use a thicker/thinner side gear thrust washer to adjust. For selecting thrust washer, refer to the latest parts information.

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.



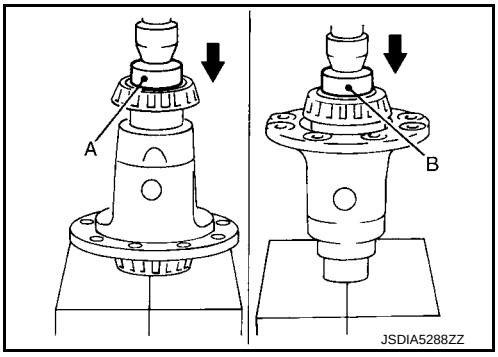
6. Drive a lock pin into pinion mate shaft, using the pin punch (commercial service tool).
CAUTION:
Never reuse lock pin.



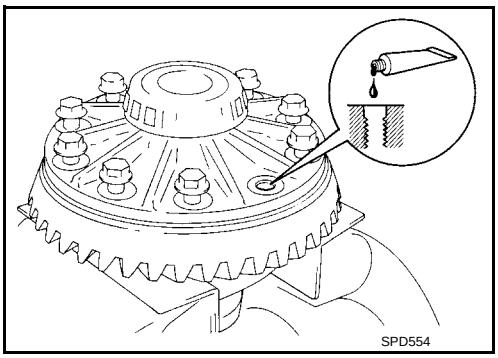
7. Press side bearing inner races to differential assembly, using the drifts (A and B).

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

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

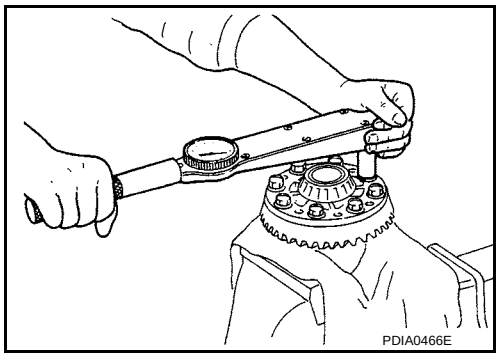


8. Apply thread locking sealant into the thread hole of drive gear.
CAUTION:
Clean and degrees drive gear back and threaded holes sufficiently.
9. Install the drive gear to differential assembly.
CAUTION:
Align the matching mark of differential assembly and drive gear.



10. Tighten the bolts in a crisscross fashion to the specified torque.
    - For tightening torque, refer to DLN-134, "Exploded View".

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



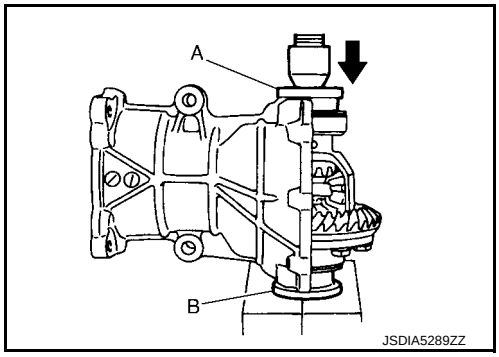
11. Assemble side bearing outer races to inner races.

    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)]



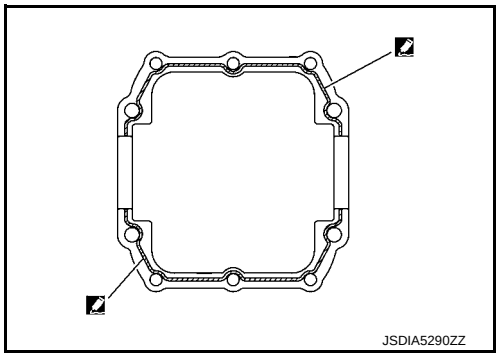
    CAUTION:
    - **The drift shall be placed on the center of the adjusting shims.**
    - **The pressure shall be as low as possible to install differential assembly into gear carrier assembly. The maximum pressure shall be 10 kN (1 ton, 1.1 US ton, 1.0 Imp ton).**
    - **If the adjusting shims are installed 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-140, "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.

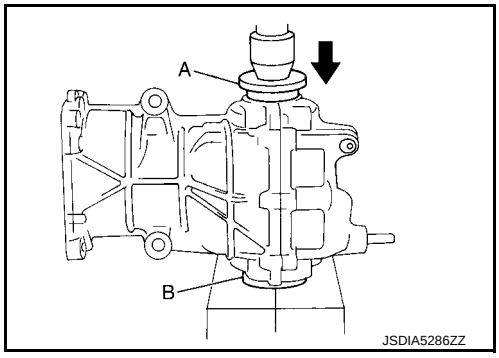
17. Apply liquid gasket to mating surface of rear cover.

    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.

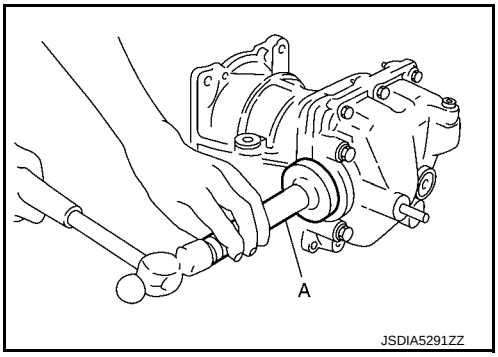
    A : Drift [KV40100610 (J-26089)]
    B : Drift [KV40100610 (J-26089)]



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

- **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-134, "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-140, "Adjustment".

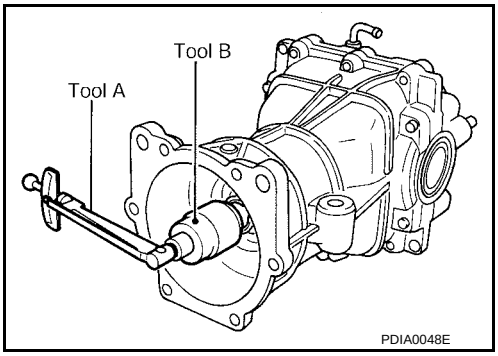


Adjustment

INFOID:0000000014630286

TOTAL PRELOAD TORQUE

1. Remove electric controlled coupling assembly. Refer to DLN-130, "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-151, "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.

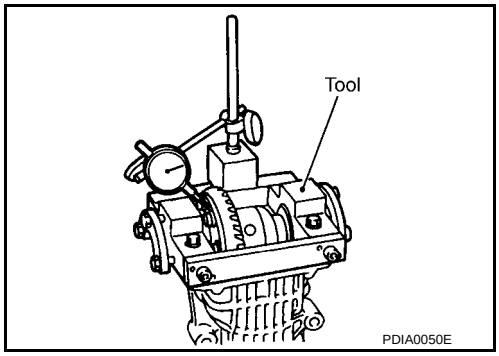
DRIVE GEAR RUNOUT

1. Remove rear cover. Refer to DLN-134, "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-134, "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-151, "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

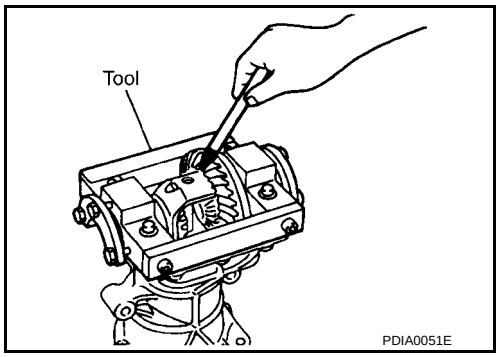
1. Remove rear cover. Refer to DLN-134, "Disassembly and Assembly".
2. Following the procedure below, install a dummy cover set [SST: KV381086S1 (—)] to gear carrier.

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-134, "Exploded View".
e. Tighten dummy cover spacer mounting bolts evenly to the specified torque.

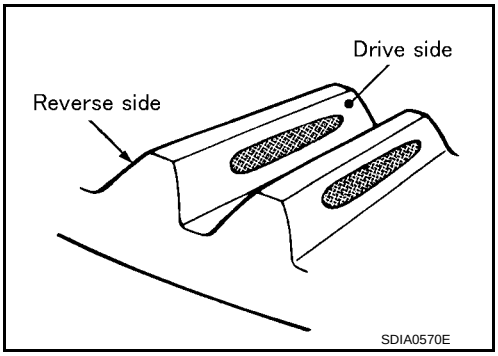
: 5.9 N·m (0.6 kg-m, 52 in-lb)

3. Apply red lead to drive gear.

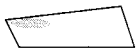
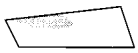
CAUTION:
Apply red lead to both the faces of 3 to 4 gears at 4 locations evenly spaced on drive gear.



4. Rotate drive gear back and forth several times, check drive pinion gear to drive gear tooth contact.
CAUTION:
Check tooth contact on drive side and reverse side.

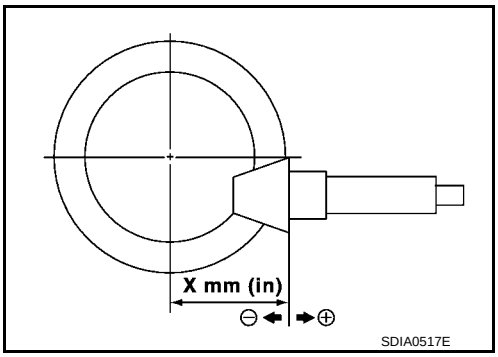


Tooth Contact Judgment Guide

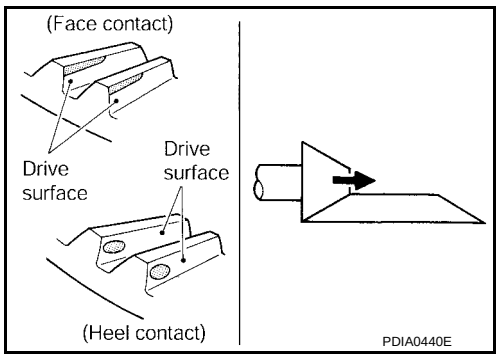
Tooth contact condition		Drive pinion adjusting shim selection value [mm (in)]		Adjustment (Yes/No)	Possible cause
Drive side	Back side				
Heel side Toe side 	Toe side Heel side 	Thicker ↑	+0.09 (+0.0035)	Yes	Occurrence of noise and scoring sound in all speed ranges.
			+0.06 (+0.0024)		Occurrence of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

SDIA2549E

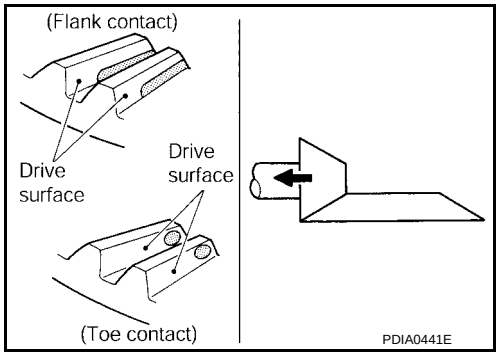
5. If tooth contact is improperly adjusted, follow the procedure below to adjust the pinion height (dimension X).



- 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.



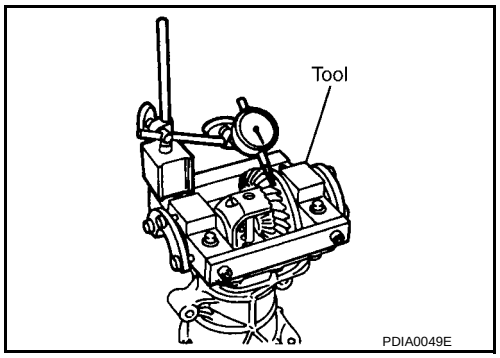
BACKLASH

1. Remove rear cover. Refer to DLN-134, "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-134, "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-151, "Backlash".

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

When the backlash is large:

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

When the backlash is small:

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

Inspection

INFOID:0000000014630287

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.

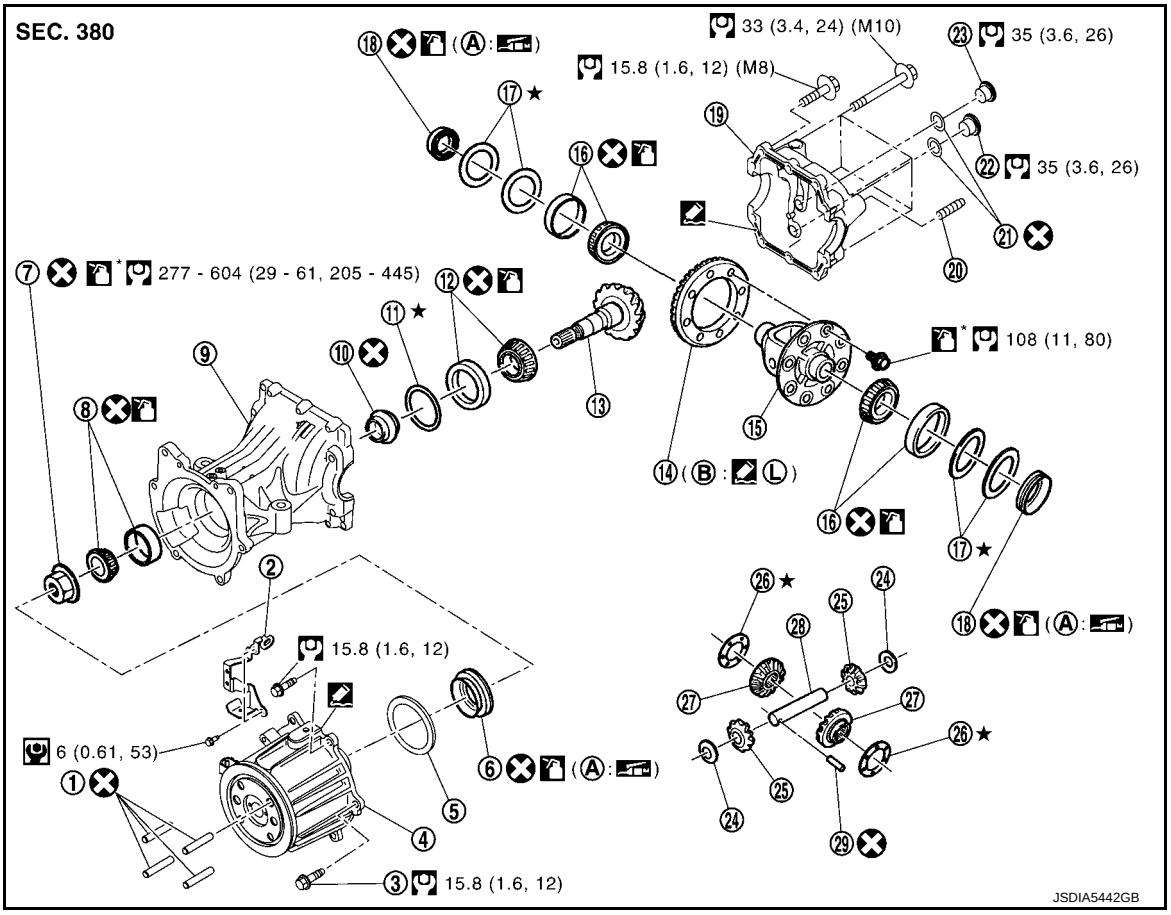
SIDE GEAR THRUST WASHER AND PINION MATE THRUST WASHER

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

DRIVE PINION

Exploded View

INFOID:0000000014630288



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		

: Apply Genuine Silicone RTV or equivalent. Refer to MA-11, "Fluids and Lubricants".

Ⓛ: Apply Genuine High Strength Thread Locking Sealant or equivalent. Refer to MA-11, "Fluids and Lubricants".

Disassembly and Assembly

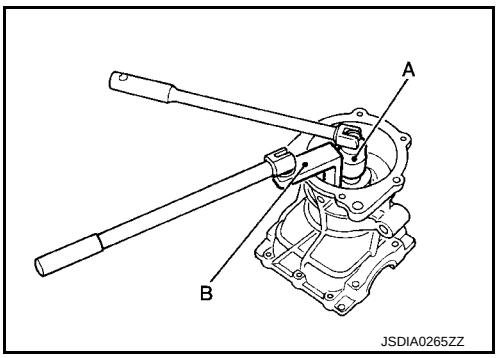
INFOID:0000000014630289

DISASSEMBLY

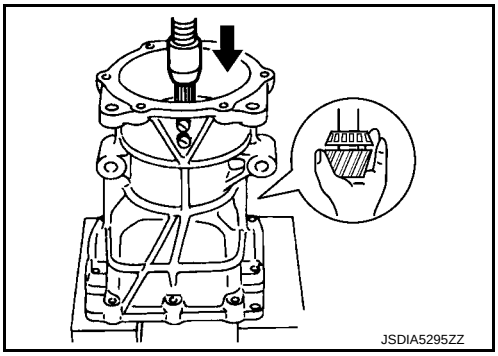
1. Remove electric controlled coupling assembly. Refer to DLN-130, "Disassembly and Assembly".
2. Remove differential assembly. Refer to DLN-134, "Disassembly and Assembly".
3. Remove drive pinion oil seal, using oil seal remover (commercial service tool).

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 (—)]

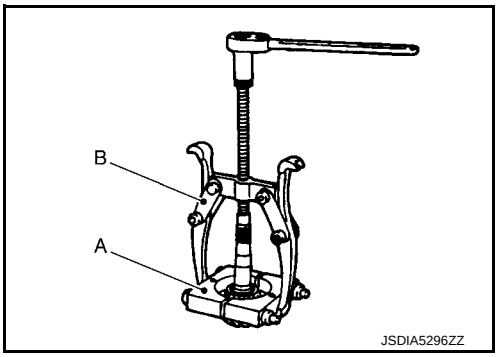


5. Press drive pinion assembly out of gear carrier.
CAUTION:
Never drop drive pinion assembly.
6. Remove pinion front bearing inner race.
7. Remove collapsible spacer.

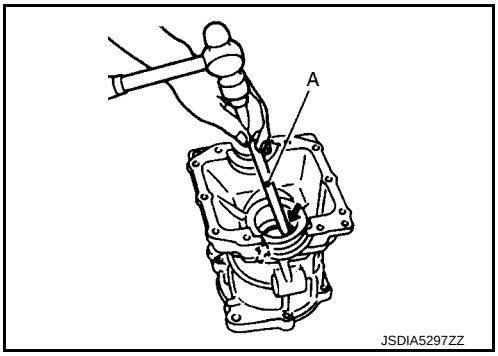


8. Remove pinion rear bearing inner race from drive pinion, using the separator (A) and the puller (B).

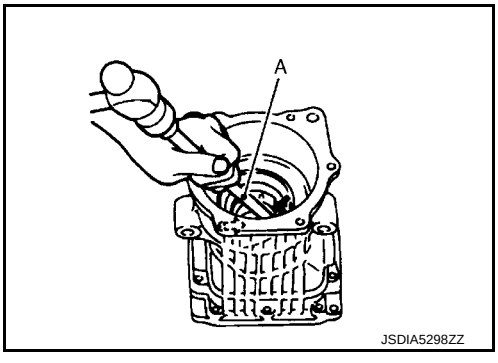
A : Separator (commercial service tool)
B : Puller (commercial service tool)



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.



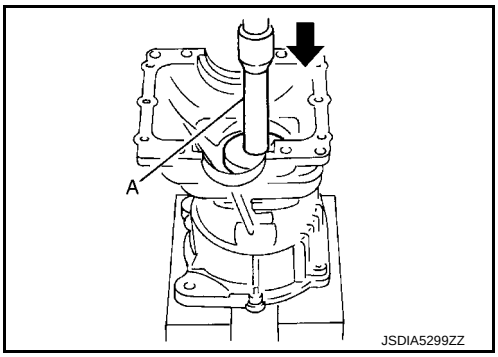
10. Using a brass rod or equivalent (A), tap drive pinion adjusting shim evenly from the 2 cutouts on gear carrier and remove drive pinion adjusting shim and pinion rear bearing outer race.
CAUTION:
Be careful not to damage gear carrier.
11. Perform inspection after disassembly. Refer to DLN-150, "Inspection".



ASSEMBLY

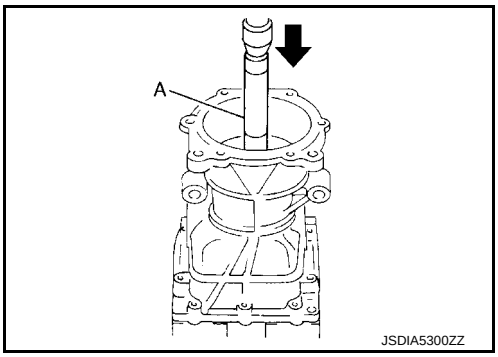
1. Install a drive pinion adjusting shim of the same thickness as was installed prior to disassembly. Press pinion rear bearing outer race into gear carrier, using the drift (A) [SST: ST33200000 (J-26082)].

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



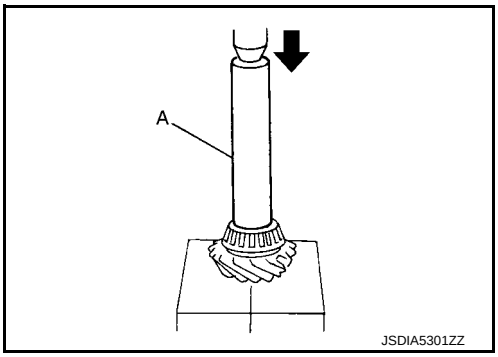
2. Press pinion front bearing outer race into gear carrier, using the drift (A) [SST: ST33230000 (J-25805-01)].

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.

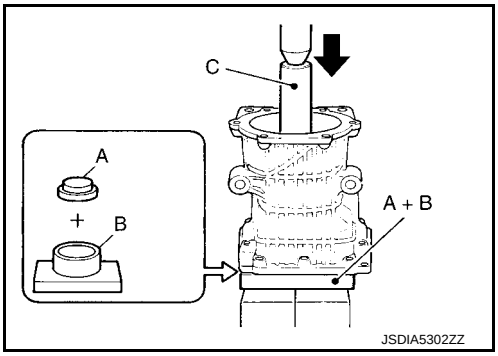
CAUTION:
- **Never assemble collapsible spacer.**
- **Apply gear oil to pinion rear bearing.**

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.**

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.

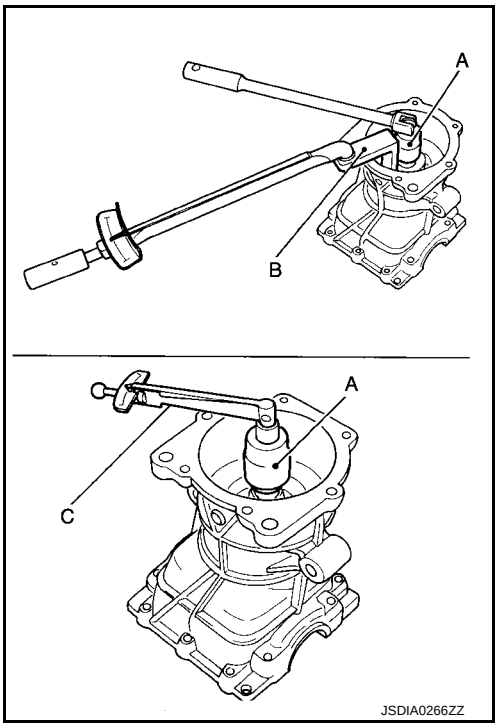
NOTE:
Use removed drive pinion lock nut only for the preload measurement.

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-151, "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-134, "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-140, "Adjustment".

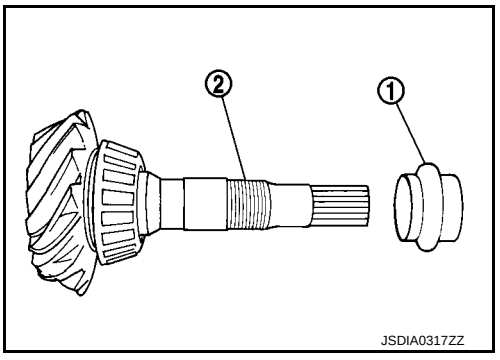
i. Remove differential assembly.

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.

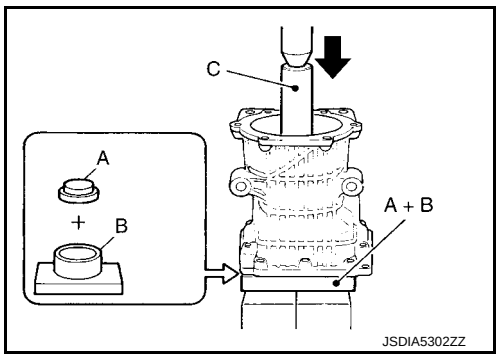
5. Assemble collapsible spacer ① to drive pinion ②.
CAUTION:
- **Be careful of the mounting direction of collapsible spacer.**
- **Never reuse collapsible spacer.**



6. Assemble drive pinion into gear carrier.
CAUTION:
Apply gear oil to pinion 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.**

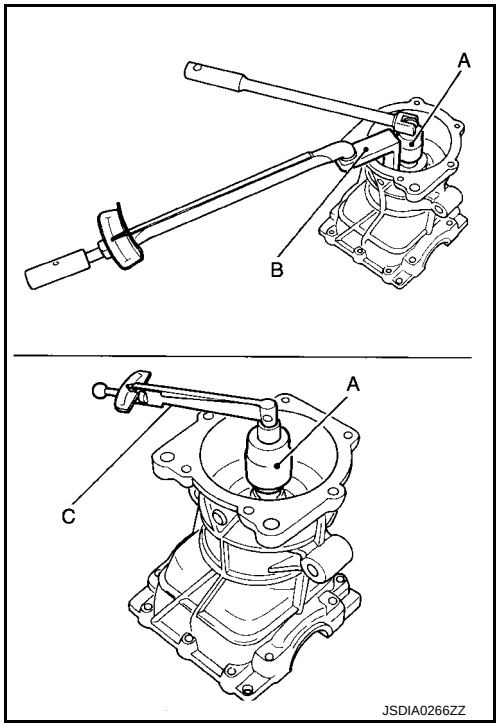
8. Using the drifts (A and C) and press stand (B), press pinion front bearing inner race to drive pinion as far as drive pinion lock nut can be tightened.



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

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)]

Drive pinion lock nut tightening torque	**: Refer to DLN-145, "Exploded View".**
Pinion bearing preload	**: Refer to DLN-151, "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.**

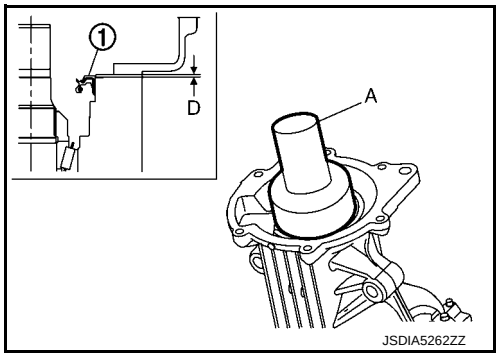
11. Install differential assembly. Refer to DLN-134, "Disassembly and Assembly".
CAUTION:
Never install rear cover at this timing.

12. Check and adjust drive gear runout, tooth contact, and drive gear to drive pinion backlash. Refer to DLN-140, "Adjustment".

13. Remove dummy cover set [SST: KV381086S1 (—)], then install rear cover, and side oil seal. Refer to DLN-134, "Disassembly and Assembly".

14. Check total preload torque. Refer to DLN-140, "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-130, "Disassembly and Assembly".

Inspection

INFOID:0000000014630290

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)

General Specifications

INFOID:0000000014630291

Applied model		AWD
		MR20DD and RM31
		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:0000000014630292

Unit: N·m (kg-m, in-lb)

Item	Standard
Pinion bearing (P_1)	0.69 – 1.18 (0.07 – 0.12, 7 – 10)
Side bearing (P_2)	0.66 – 1.00 (0.07 – 0.10, 6 – 8)
Side bearing to pinion bearing (Total preload) (Total preload = P_1 + P_2)	1.35 – 2.18 (0.14 – 0.22, 12 – 19)

Drive Gear Runout

INFOID:0000000014630293

Unit: mm (in)

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

Backlash

INFOID:0000000014630294

Unit: mm (in)

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

Differential Side Gear Clearance

INFOID:0000000014630295

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.)