

SECTION **DLN**
DRIVELINE

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DLN

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PRECAUTION

PRECAUTIONS

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

INFOID:000000013326326

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:000000013515979

- When removing the 12V battery terminal, turn OFF the ignition switch and wait at least 2 minutes.

NOTE:

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

- For vehicles with the two batteries, be sure to connect both batteries before turning ON the ignition switch.

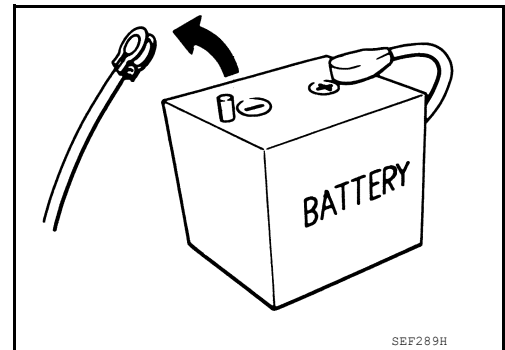
NOTE:

If the ignition switch is turned ON with any one of the terminals of the two batteries disconnected, then DTC may be detected.

- After installing the 12V battery, always check "Self Diagnosis Result" of all ECUs and erase DTC.

NOTE:

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



Service Notice or Precautions for Transfer

INFOID:000000012556085

- Never reuse transfer fluid, once it has been drained.
- Check the fluid level or replace the fluid only with the vehicle parked on level ground.
- During removal or installation, keep inside of transfer clear of dust or dirt.
- Replace all tires at the same time. Always use tires of the proper size and the same brand and pattern. Fitting improper size and unusually worn tires applies excessive force to vehicle mechanism and can cause longitudinal vibration.
- Disassembly should be done in a clean work area, it is preferable to work in dustproof 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.

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PRECAUTIONS

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< PRECAUTION >

- All parts should be carefully cleaned with a general purpose, non-flammable solvent before inspection or reassembly.
- 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.
- 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 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.
- Clean inner parts with lint-free cloth or towels. Do not use cotton work gloves and rags to prevent adhering fibers.

PREPARATION

< PREPARATION >

[TRANSFER: TX91A]

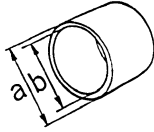
PREPARATION

PREPARATION

Special Service Tools

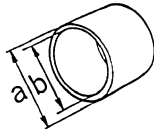
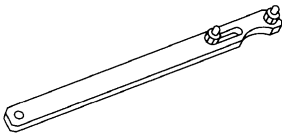
INFOID:0000000012556086

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

Tool number (TechMate No.) Tool name	Description
KV40104710 Drift  <p style="text-align: center;">ZZA1003D</p>	Installing rear oil seal a: 76.3 mm (3.004 in) dia. b: 67.9 mm (2.673 in) dia.

Commercial Service Tools

INFOID:0000000012556087

Tool name	Description
Drift  <p style="text-align: center;">ZZA1003D</p>	Installing front oil seal a: 70 mm (2.76 in) dia. b: 63 mm (2.48 in) dia.
Flange wrench  <p style="text-align: center;">NT035</p>	Removing and installing self-lock nut

Sealant or/and Lubricant

INFOID:0000000012556088

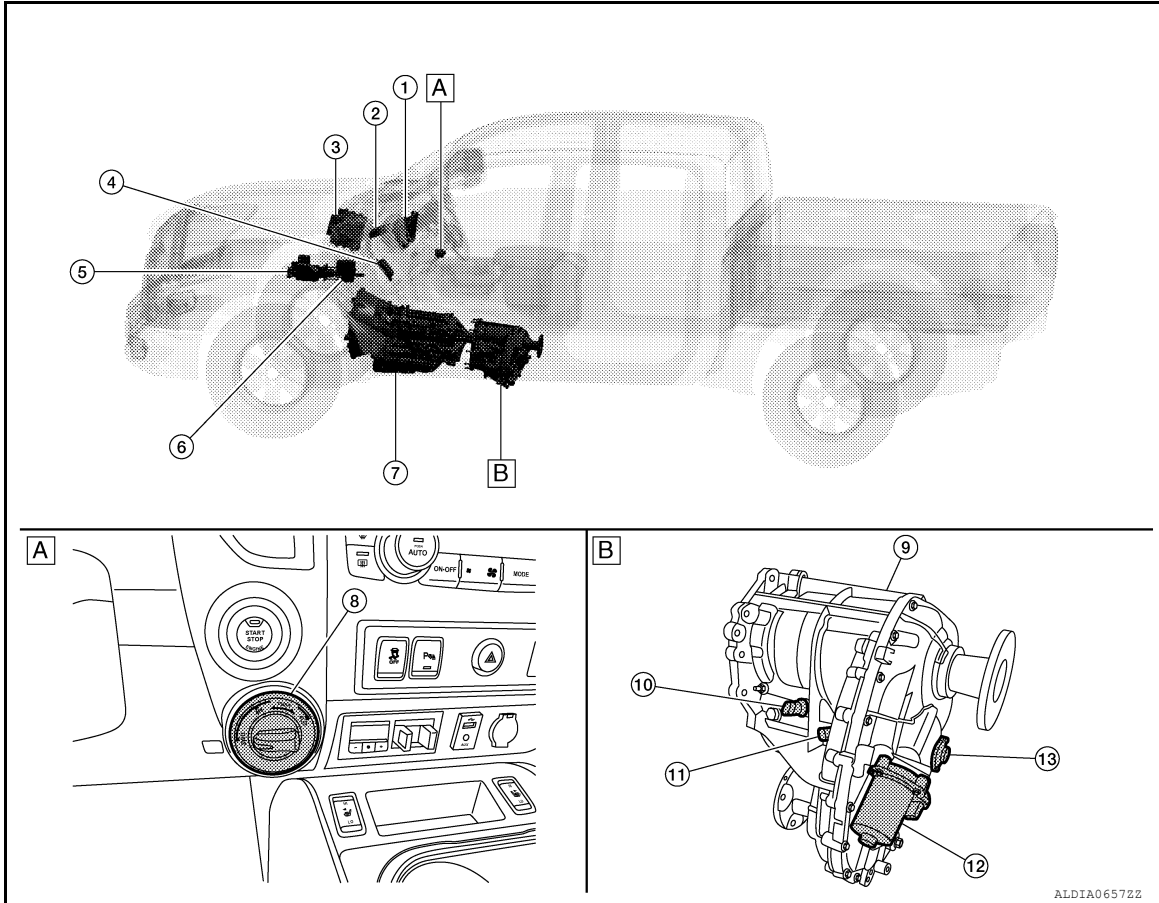
Name	Description
Sealant (Hylomar 102 silicone or equivalent)	<ul style="list-style-type: none"> • Thread of filler plug • Thread of drain plug

SYSTEM DESCRIPTION

COMPONENT PARTS

Component Parts Location

INFOID:000000012556089



A Center dash area

B Transfer

No.	Component	Function
①	Combination meter	<p>Mainly transmits the following signals to transfer control unit via CAN communication.</p> <ul style="list-style-type: none"> • Vehicle speed signal <p>Mainly receives the following signals from transfer control unit via CAN communication.</p> <ul style="list-style-type: none"> • 4WD warning lamp signal • 4WD mode indicator lamp signal • ATP warning lamp signal <p>For detailed installation location, refer to MWI-8, "METER SYSTEM : Component Parts Location".</p>
②	BCM	<p>Mainly transmits the following signals to transfer control unit via CAN communication.</p> <ul style="list-style-type: none"> • Sleep wake up signal • Stop lamp switch signal <p>Mainly receives the following signals from transfer control unit via CAN communication.</p> <ul style="list-style-type: none"> • Sleep-ready signal <p>For detailed installation location, refer to BCS-5, "BODY CONTROL SYSTEM : Component Parts Location".</p>
③	ECM	<p>Mainly transmits the following signals to transfer control unit via CAN communication.</p> <ul style="list-style-type: none"> • Engine speed signal <p>For detailed installation location, refer to EC-34, "Component Parts Location" (CUMMINS 5.0L) or EC-1269, "Component Parts Location" (VK56VD).</p>

COMPONENT PARTS

< SYSTEM DESCRIPTION >

[TRANSFER: TX91A]

No.	Component	Function
④	TCM	Mainly transmits the following signals to transfer control unit via CAN communication. <ul style="list-style-type: none"> • Gear position signal • Output shaft revolution signal For detailed installation location, refer to TM-15. "A/T CONTROL SYSTEM : Component Parts Location" (RE6R01A) or TM-265. "A/T CONTROL SYSTEM : Component Parts Location" (RE7R01B).
⑤	ABS actuator and electric unit (control unit)	Mainly transmits the following signals to transfer control unit via CAN communication. <ul style="list-style-type: none"> • Each wheel speed signal For detailed installation location, refer to BRC-9. "Component Parts Location" .
⑥	Transfer control unit	Refer to DLN-11. "Transfer Control Unit" .
⑦	Transmission assembly	—
⑧	4WD shift switch	Refer to DLN-12. "4WD Shift Switch" .
⑨	Transfer assembly	—
⑩	Range sensor	Refer to DLN-12. "Range Sensor" .
⑪	Mode sensor	Refer to DLN-12. "Mode Sensor" .
⑫	Transfer motor	Refer to DLN-11. "Transfer Motor" .
⑬	Transfer rotary position sensor	Refer to DLN-11. "Transfer Rotary Position Sensor" .

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Transfer Control Unit

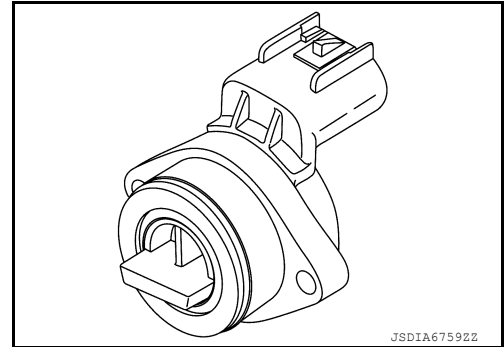
INFOID:000000012556090

Transfer control unit controls 4WD mode (2WD ⇔ 4H ⇔ 4LO) by input signals of each sensor and each switch, and it directs shifts from 4WD shift switch.

Transfer Rotary Position Sensor

INFOID:000000012556091

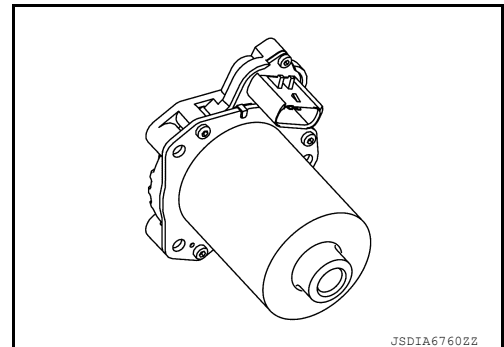
- Transfer rotary position sensor is installed to back side of transfer assembly.
- Transfer rotary position sensor detects rotation status of transfer motor and transmits signal to transfer control unit.



Transfer Motor

INFOID:000000012556092

- Transfer motor is installed to left side of transfer assembly.
- Transfer motor operates according to signal from transfer control unit and switches 4WD mode (2WD ⇔ 4H ⇔ 4LO).



COMPONENT PARTS

< SYSTEM DESCRIPTION >

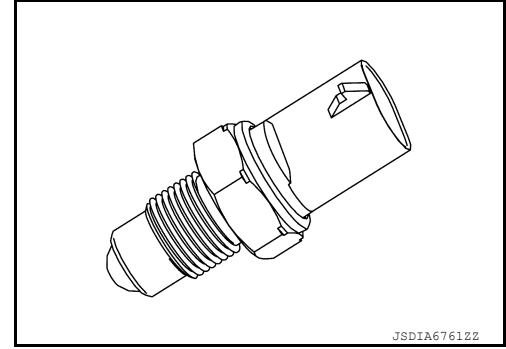
[TRANSFER: TX91A]

Mode Sensor

INFOID:000000012556093

- Mode sensor is installed to top of transfer assembly.
- Mode sensor detects engagement status of 2WD-4H sleeve and transmits signal to transfer control unit.

Item	4WD mode		
	2WD	4H	4LO
Mode sensor	OFF	ON	ON



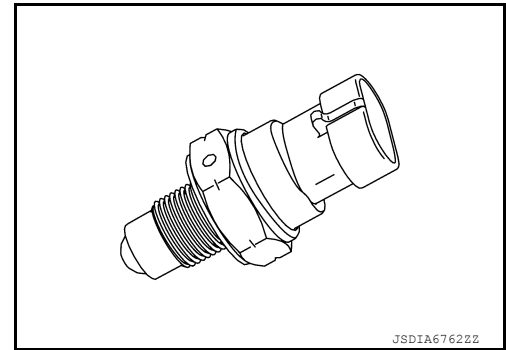
Range Sensor

INFOID:000000012556094

- Range sensor is installed to top of transfer assembly.
- Range sensor detects engagement status of 4H-4LO sleeve and transmits signal to transfer control unit.

Item		4WD mode			
		2WD	4H	(N)*	4LO
Range sensor	Switch 1	OFF	OFF	OFF	ON
	Switch 2	OFF	OFF	ON	ON

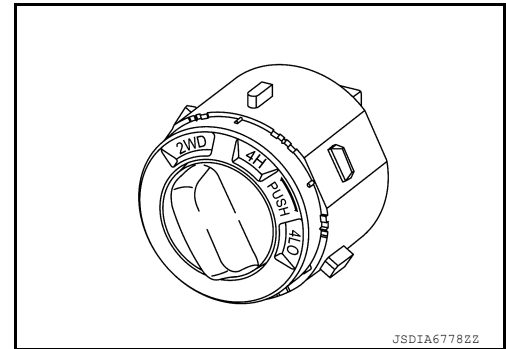
*: This is neutral position of 4H ⇔ 4LO.



4WD Shift Switch

INFOID:000000012556096

- The 4WD shift switch is installed to cluster lid C lower.
- Operating the 4WD shift switch at an engine start enables the selection of 4WD mode (2WD ⇔ 4H ⇔ 4LO).



STRUCTURE AND OPERATION

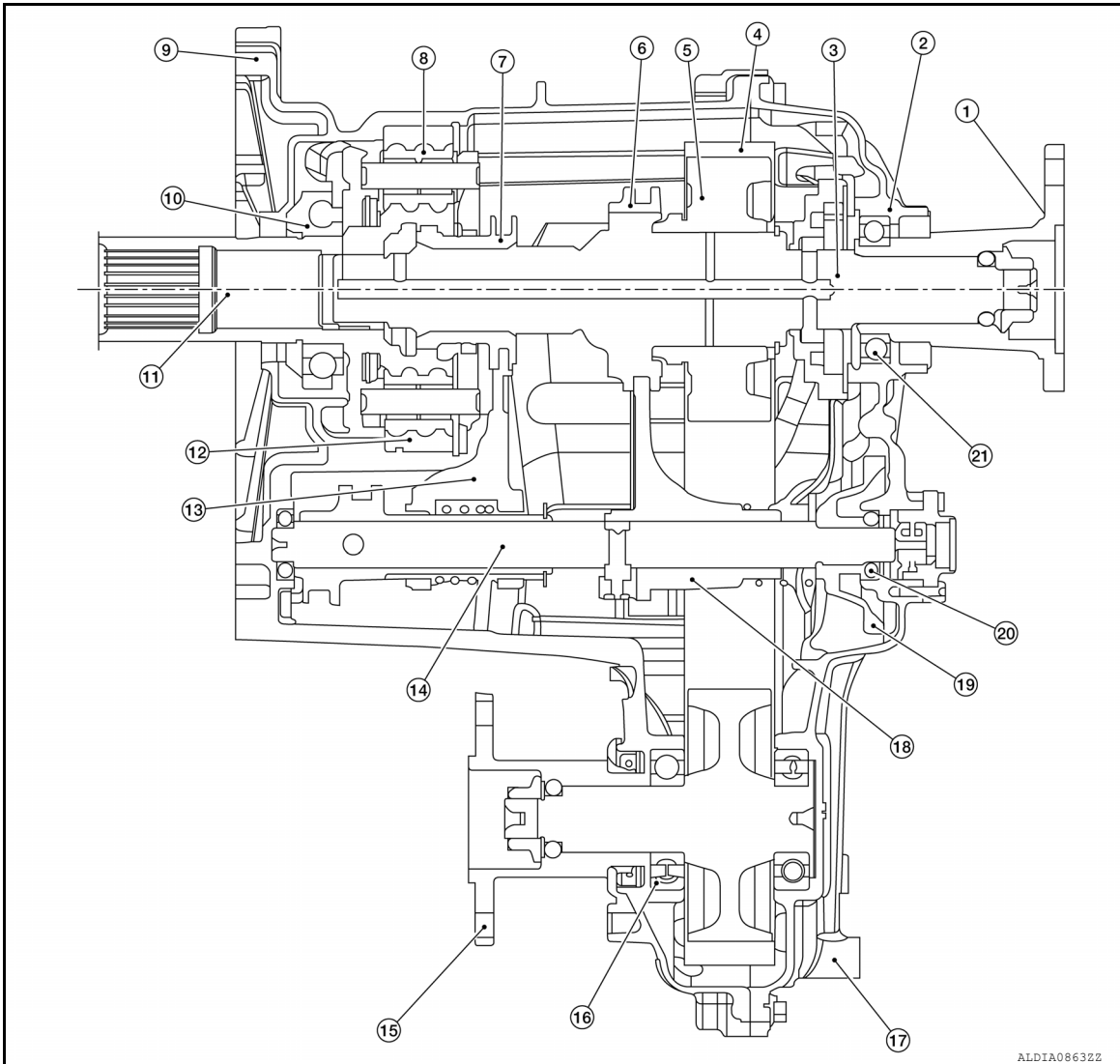
< SYSTEM DESCRIPTION >

[TRANSFER: TX91A]

STRUCTURE AND OPERATION

Sectional View

INFOID:000000012556098



- | | | |
|--------------------------|------------------------|----------------------------|
| 1. Rear companion flange | 2. Extension case | 3. Main shaft |
| 4. Drive chain | 5. Sprocket | 6. 2-4 sleeve |
| 7. H-L sleeve | 8. Sun gear | 9. Front case |
| 10. Input bearing | 11. Input shaft | 12. Internal gear |
| 13. Range fork | 14. Actuator shaft | 15. Front companion flange |
| 16. Front bearing | 17. Rear case | 18. Mode fork |
| 19. Shift rail gear | 20. Shift rail bearing | 21. Rear bearing |

Torque Split Mechanism

INFOID:000000012556099

TORQUE DISTRIBUTION FLOW

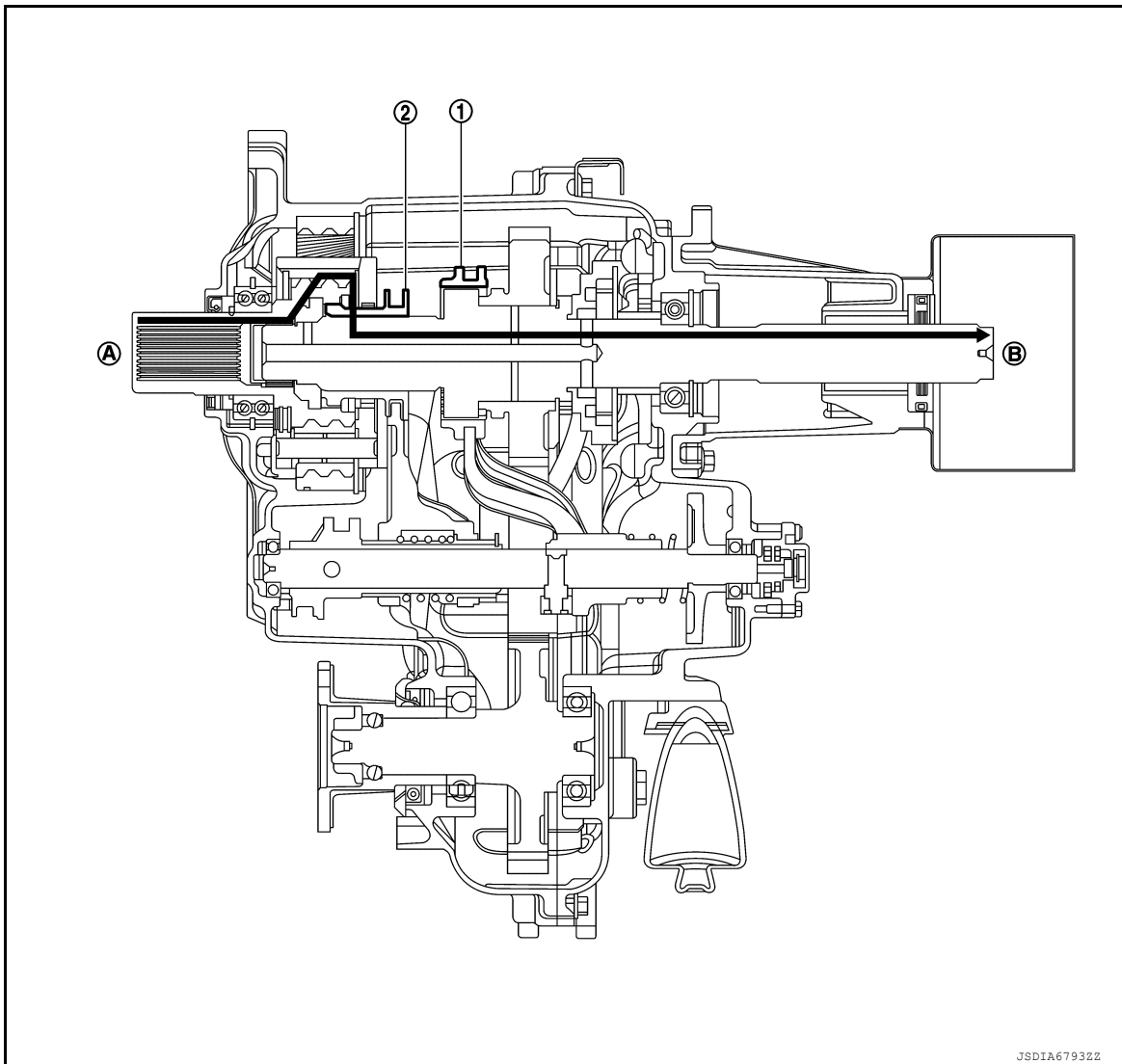
2WD Mode

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STRUCTURE AND OPERATION

< SYSTEM DESCRIPTION >

[TRANSFER: TX91A]



JSDIA67932Z

① 2-4 sleeve

② H-L sleeve

Ⓐ From transmission

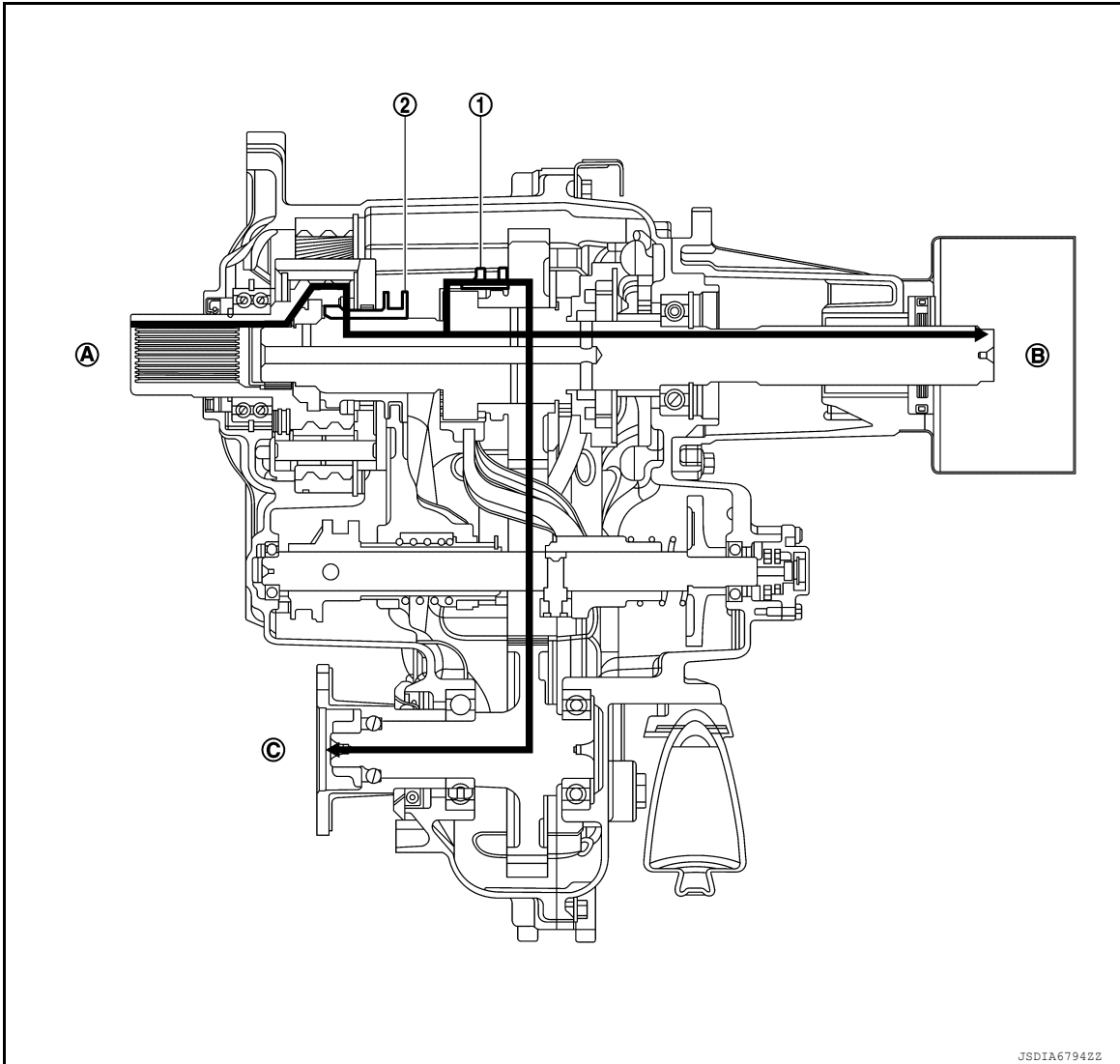
Ⓑ To rear propeller shaft

4H Mode

STRUCTURE AND OPERATION

< SYSTEM DESCRIPTION >

[TRANSFER: TX91A]



① 2-4 sleeve

② H-L sleeve

Ⓐ From transmission

Ⓑ To rear propeller shaft

Ⓒ To front propeller shaft

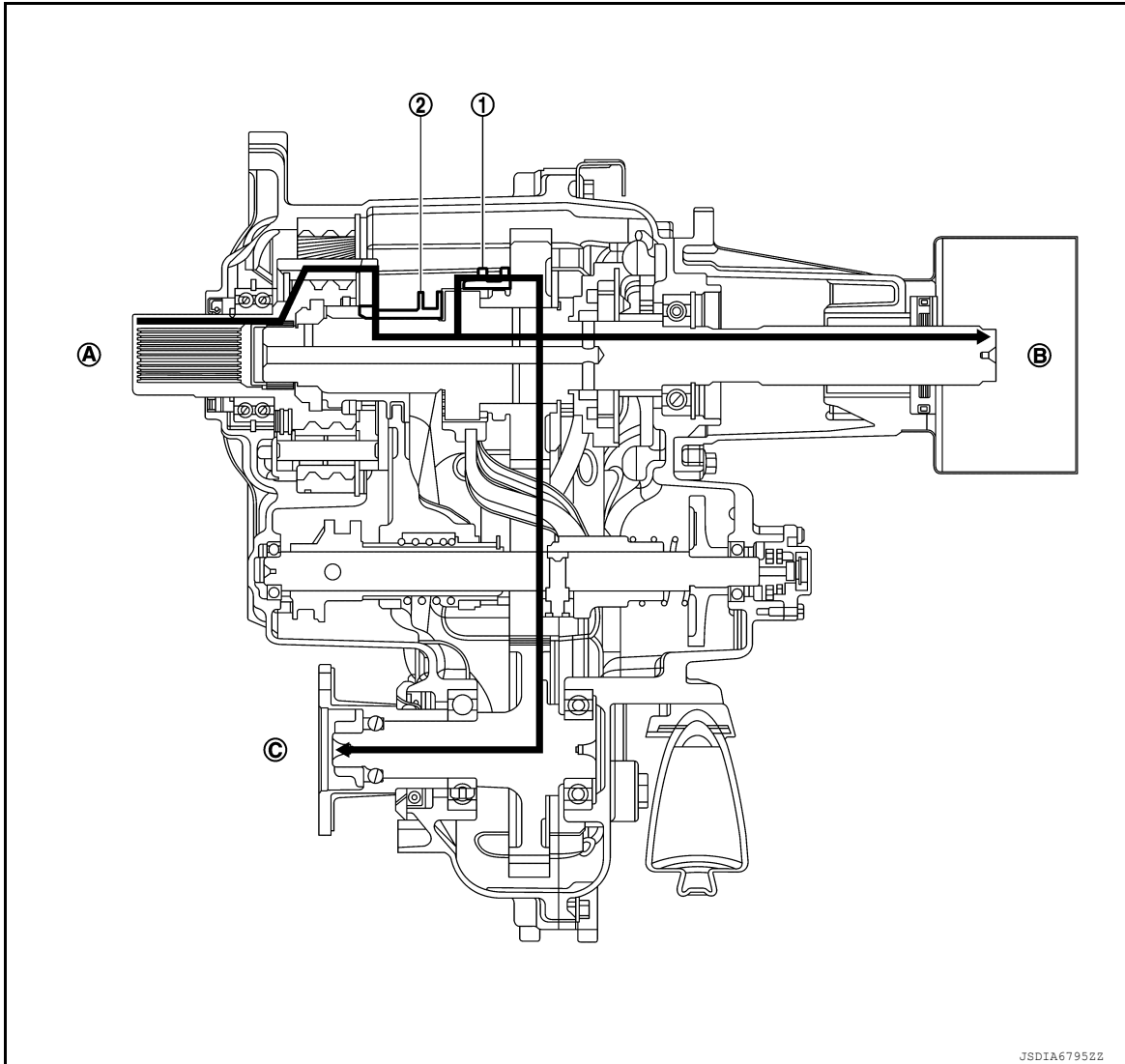
4LO Mode

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STRUCTURE AND OPERATION

< SYSTEM DESCRIPTION >

[TRANSFER: TX91A]



JSDIA67952Z

① 2-4 sleeve

② H-L sleeve

Ⓐ From transmission

Ⓑ To rear propeller shaft

Ⓒ To front propeller shaft

SYSTEM

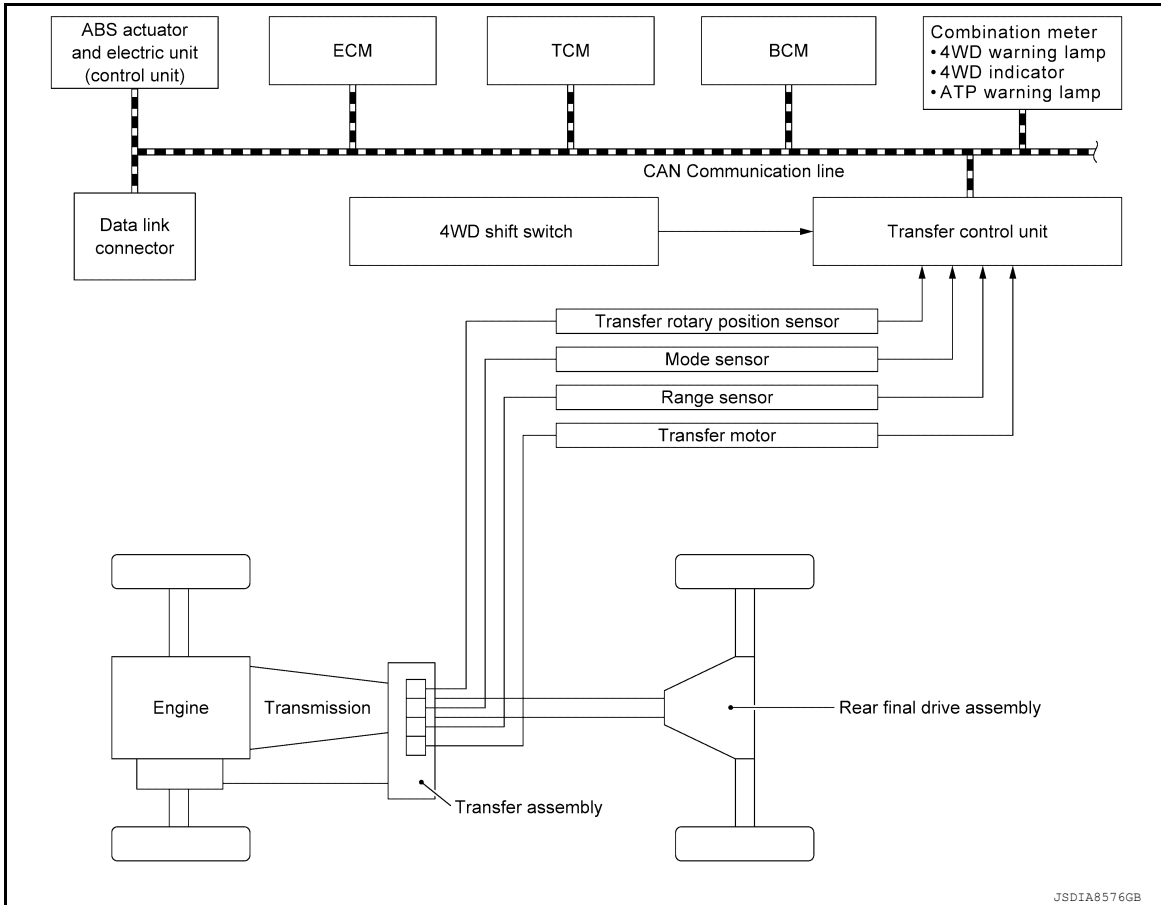
4WD SYSTEM

4WD SYSTEM : System Description

INFOID:000000012556100

- 4WD mode is selectable among 2WD mode, 4H mode, and 4LO mode by operating the 4WD shift switch.
- In accordance with fail-safe function, when system is malfunctioning, 4WD warning lamp on combination meter turns ON and 4WD control stops. For fail-safe function, refer to [DLN-27. "Fail-Safe"](#).

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
ECM	Mainly transmits the following signals to transfer control unit via CAN communication. <ul style="list-style-type: none"> • Engine speed signal
Combination meter	Mainly transmits the following signals to transfer control unit via CAN communication. <ul style="list-style-type: none"> • Vehicle speed signal Mainly receives the following signals from transfer control unit via CAN communication. <ul style="list-style-type: none"> • 4WD warning lamp signal • 4WD mode indicator lamp signal • ATP warning lamp signal
BCM	Mainly transmits the following signals to transfer control unit via CAN communication. <ul style="list-style-type: none"> • Sleep wake up signal • Stop lamp switch signal Mainly receives the following signals from transfer control unit via CAN communication. <ul style="list-style-type: none"> • Sleep-ready signal

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SYSTEM

< SYSTEM DESCRIPTION >

[TRANSFER: TX91A]

Component parts	Signal item
ABS actuator and electric unit (control unit)	Mainly transmits the following signals to transfer control unit via CAN communication. <ul style="list-style-type: none"> • Each wheel speed signal
TCM	Mainly transmits the following signals to transfer control unit via CAN communication. <ul style="list-style-type: none"> • Gear position signal • Output shaft revolution signal

OPERATIONAL CONDITIONS FOR 4WD MODE

4WD mode	Shifting condition
2WD ↔ 4H	Shifting between the 2WD and 4H modes must be performed at speed below 100 km/h (62 MPH).
4H ↔ 4LO	<ul style="list-style-type: none"> • Engine: Running (Stop the vehicle) • Vehicle speed: 0 km/h (0 MPH) • Brake pedal: Depress • Selector lever: N position • Steering wheel: Straight-ahead position

NOTE:

- The indicator blinks when shifting between 4H and 4LO.
- Some noise may be heard as the system shifts or engages; this is normal.

4WD SYSTEM : Fail-Safe

INFOID:0000000012556102

DTC	Vehicle condition
P1804	No impact to vehicle behavior.
P1808	4WD mode cannot be switched by operating 4WD shift switch.
P1809	4WD mode cannot be switched by operating 4WD shift switch.
P180C	4WD mode cannot be switched by operating 4WD shift switch.
P180D	4WD mode cannot be switched by operating 4WD shift switch.
P180F	4WD mode cannot be switched by operating 4WD shift switch.
P1811	4WD mode cannot be switched by operating 4WD shift switch.
P1813	When malfunction occurs due to duplicate input, the control continues according to the 4WD mode priority (2WD → 4H → 4LO). (For malfunction with no input, 4WD mode running at the occurrence of malfunction is maintained.)
P1814	After a malfunction is confirmed, 4WD mode can be switchable. (4WD mode temporarily not switchable only during diagnosis)
P1816	4WD mode cannot be switched by operating 4WD shift switch.
P1817	4WD mode cannot be switched by operating 4WD shift switch.
P1818	4WD mode cannot be switched by operating 4WD shift switch.
P1819	4WD mode cannot be switched by operating 4WD shift switch.
P181B	4WD mode cannot be switched by operating 4WD shift switch.
P181C	4WD mode cannot be switched by operating 4WD shift switch.
P1820	4WD mode cannot be switched by operating 4WD shift switch.
P182A	After a malfunction is confirmed, 4WD mode can be switchable. (4WD mode temporarily not switchable only during diagnosis)
P1855	4WD mode cannot be switched by operating 4WD shift switch.
P1867	No impact to vehicle behavior.
P186C	4WD mode cannot be switched by operating 4WD shift switch.
U1000	4H – 4LO switching is prohibited when a malfunction occurs in communications of ECM, TCM, or BCM.
U1010	4WD mode cannot be switched by operating 4WD shift switch.

WARNING LAMPS/INDICATOR LAMPS

SYSTEM

< SYSTEM DESCRIPTION >

[TRANSFER: TX91A]

WARNING LAMPS/INDICATOR LAMPS : 4WD Warning Lamp

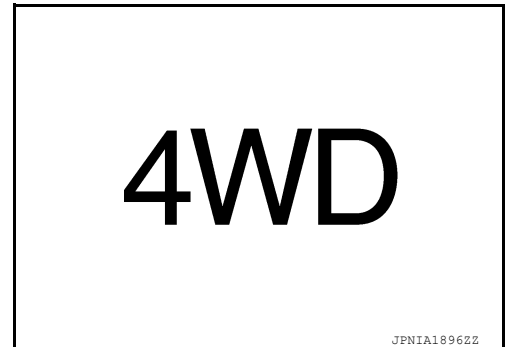
INFOID:000000013401930

NOTE:

The 4WD warning lamp may not be equipped by grade.

DESIGN/PURPOSE

4WD warning lamp warns the driver that 4WD system is not normal.



BULB CHECK

Turns ON after turning ON the ignition switch (engine stop) and turns OFF after the engine is started if system is normal.

LIGHTING AND SHUTOFF CONDITION

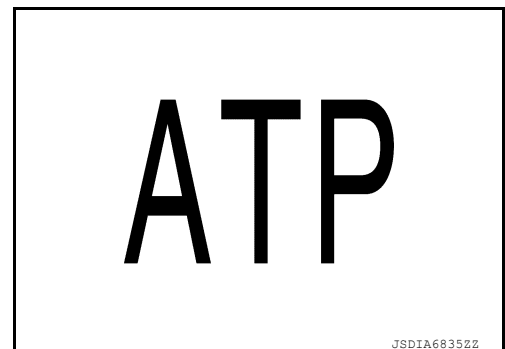
Condition	4WD warning lamp
4WD system malfunction	ON
Large difference in diameter of front/rear tires	Slow blinking: 1 time/2 seconds (Continuing to blink until turning ignition switch OFF)
Other than above (system is normal.)	OFF

WARNING LAMPS/INDICATOR LAMPS : ATP Warning Lamp

INFOID:000000013401933

DESIGN/PURPOSE

When the A/T shift selector is in P position, the vehicle may move if the transfer in neutral. ATP warning lamp warns the driver.



LIGHTING CONDITION

When all of the condition listed below are satisfied:

- Ignition switch ON
- When the A/T is in the parking condition and transfer gear is in the neutral.

SHUTOFF CONDITION

When any of the conditions listed below is satisfied:

- Ignition switch is in a position other than ON.
- Transfer gear is in a position other than neutral.
- A/T is in a position other than parking condition.

INFORMATION DISPLAY (COMBINATION METER)

INFORMATION DISPLAY (COMBINATION METER) : 4WD Warning

INFOID:000000012556103

DESIGN/PURPOSE

SYSTEM

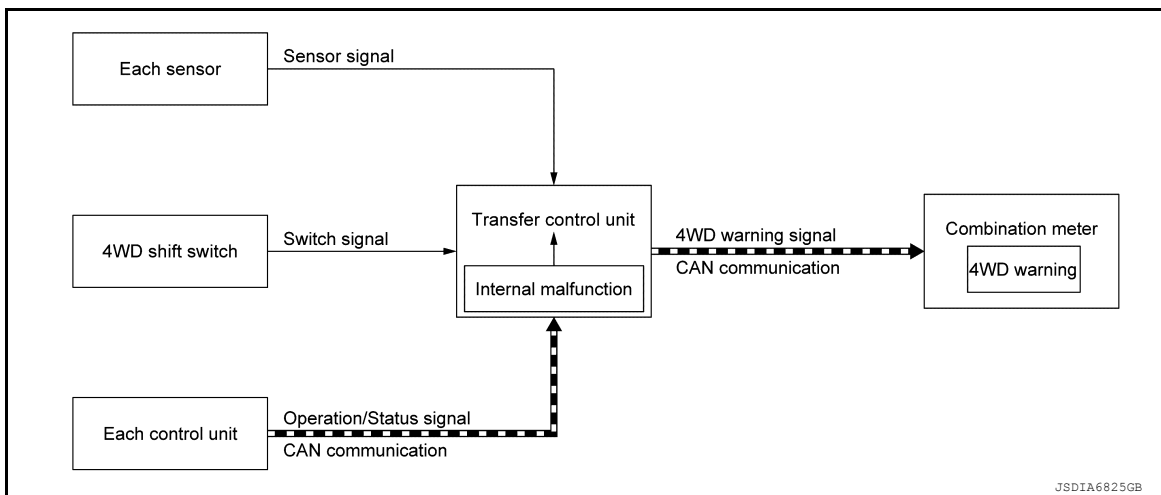
< SYSTEM DESCRIPTION >

[TRANSFER: TX91A]

4WD warning is displayed when the 4WD system has a malfunction. 4WD warning indicates that the vehicle is in fail-safe mode.

Symbol	Message	Condition
<h1>4WD</h1> <p style="font-size: small;">JPNIA1896ZZ</p>	4WD Error See Owner's Manual	4WD system malfunction.

SYSTEM DIAGRAM



SIGNAL PATH

- The transfer control unit judges and decides a mode from among normal mode and fail-safe mode, according to signals received from each switch, sensor, and control unit.
- The transfer control unit transmits 4WD warning signal to the combination meter via CAN communication when judging fail-safe mode.
- The combination meter displays 4WD warning on the information display when receiving 4WD warning signal transmitted from the transfer control unit.

WARNING CONDITION

4WD warning is displayed when the 4WD system goes into fail-safe mode.

WARNING CANCEL CONDITION

When any of the conditions listed below is satisfied:

- Ignition switch is in a position other than ON.
- 4WD warning becomes invisible when the 4WD system returns to normal.

INFORMATION DISPLAY (COMBINATION METER) : ATP Warning

INFOID:0000000012556104

DESIGN/PURPOSE

When the A/T shift selector is in P position, the vehicle may move if the transfer is in neutral. ATP warning is displayed to inform this condition to the driver.

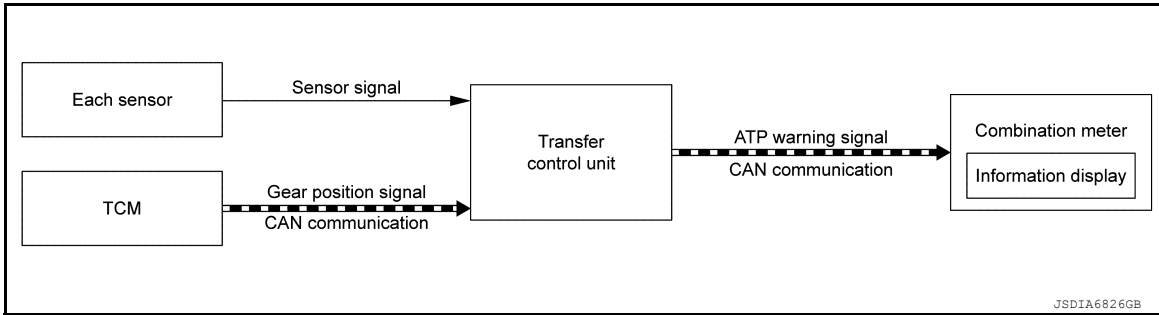
Symbol	Message	Condition
—	Pull the parking brake	A/T is in the parking condition and transfer gear is in the neutral.

SYSTEM

< SYSTEM DESCRIPTION >

[TRANSFER: TX91A]

SYSTEM DIAGRAM



SIGNAL PATH

- The transfer control unit judges and decides position of A/T and transfer gear, according to signals received from each sensor and TCM.
- The transfer control unit transmits ATP warning signal to the combination meter via CAN communication when judging A/T is in the parking condition and transfer gear is in the neutral.
- The combination meter displays ATP warning on the information display when receiving ATP warning signal transmitted from the transfer control unit.

WARNING CONDITION

ATP warning is displayed when the A/T is in the parking condition and transfer gear is in the neutral.

WARNING CANCEL CONDITION

When any of the conditions listed below is satisfied:

- Ignition switch is in a position other than ON.
- Transfer gear is in a position other than neutral.
- A/T is in a position other than parking condition.

INFORMATION DISPLAY (COMBINATION METER) : 4WD Indicator

INFOID:000000012556105

DESIGN/PURPOSE

Design	Purpose
<p>JSDIA68392Z</p>	<ul style="list-style-type: none"> • Displays driving conditions selected by the 4WD shift switch while engine is running. When the 4WD warning lamp is turned ON, all 4WD indicator will turn OFF. • Indicator flashes if transfer gear does not shift completely into 4H ⇔ 4LO. In this condition, the transfer gear may be in neutral.

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DIAGNOSIS SYSTEM (TRANSFER CONTROL UNIT)

< SYSTEM DESCRIPTION >

[TRANSFER: TX91A]

DIAGNOSIS SYSTEM (TRANSFER CONTROL UNIT)

CONSULT Function

INFOID:000000012556108

APPLICATION ITEMS

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

Mode	Function
All DTC Reading	Display all DTCs or diagnostic items that all ECUs are recording and judging.
Work Support	This mode enables a technician to adjust some devices faster and more accurately.
Self Diagnostic Results	Self-diagnostic results and freeze frame data can be read and erased quickly.*
Data Monitor	Monitor the input/output signal of the control unit in real time.
CAN Diagnosis	This mode displays a network diagnosis result about CAN by diagram.
CAN Diagnosis Support Monitor	It monitors the status of CAN communication.
ECU Identification	Display the ECU identification number (part number etc.) of the selected system.

*: The following diagnosis information is erased by erasing.

- DTC
- Freeze frame data (FFD)

ECU IDENTIFICATION

Transfer control unit part number can be read.

SELF DIAGNOSTIC RESULT

Refer to [DLN-28, "DTC Index"](#).

When "PRSNT" is displayed on self-diagnosis result.

- The system is presently malfunctioning.

When "PAST" is displayed on self-diagnosis result.

- System malfunction in the past is detected, but the system is presently normal.

FREEZE FRAME DATA (FFD)

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

Item name	Display item
IGN COUNTER (0 – 39)	The number of times that ignition switch is turned ON after the DTC is detected is displayed. <ul style="list-style-type: none">• When "0" is displayed: It indicates that the system is presently malfunctioning.• When except "0" is displayed: It indicates that system malfunction in the past is detected, but the system is presently normal. NOTE: Each time when ignition switch is turned OFF to ON, numerical number increases in 1→2→3...38→39. When the operation number of times exceeds 39, the number do not increase and "39" is displayed until self-diagnosis is erased.

DATA MONITOR

NOTE:

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

Monitor item (Unit)	Remarks
4L SWITCH [On/Off]	4WD shift switch signal (4L) is displayed.
4H SWITCH [On/Off]	4WD shift switch signal (4H) is displayed.
2WD SWITCH [On/Off]	4WD shift switch signal (2WD) is displayed.
4WD MODE [BOTNG/SWTNG/2WD/4L/LOCK]	Control status of 4WD mode is displayed. (LOCK means 4H of 4WD mode)
IGN SW [On/Off]	Ignition switch status is displayed.
BRAKE SWITCH [On/Off]	Stop lamp switch signal status via CAN communication line is displayed.

DIAGNOSIS SYSTEM (TRANSFER CONTROL UNIT)

< SYSTEM DESCRIPTION >

[TRANSFER: TX91A]

Monitor item (Unit)	Remarks
SLCT LVR POSI [D/N/R/P]	A/T shift selector position via CAN communication line is displayed.
MODE SENSOR [On/Off]	Mode sensor status is displayed.
RANGE SENSOR 2 [On/Off]	Range sensor status is displayed.
RANGE SENSOR 1 [On/Off]	Range sensor status is displayed.
4WD MODE IND [2WD/LOCK/4L]	Control status of 4WD mode indicator lamp is displayed. (LOCK means 4H of 4WD mode)
4WD FAIL LAMP [On/Off]	Control status of 4WD warning lamp is displayed.
ATP IND [On/Off]	Control status of ATP warning lamp is displayed.
MOTOR DRIVE A [HI/LO/PWM]	Driving status of transfer motor is displayed. (Drive side)
MOTOR DRIVE B [HI/LO/PWM]	Driving status of transfer motor is displayed. (Reverse side)
FLUID TEMP SE [V]	This item is not equipped, but displayed.
C/U POWER SUP [V]	Power supply voltage value of transfer control unit is displayed.
MOTOR POWER SUP [V]	Power supply voltage value of transfer motor unit is displayed.
ROTARY POSITION SENSOR [%]	Transfer rotary position sensor signal is displayed.
COMPR VHCL SPEED [km/h]	Vehicle speed calculated by transfer control unit is displayed.
VHCL/S SEN-FR [km/h]	Wheel speed (front) average calculated by transfer control unit.
VHCL/S SEN-RR [km/h]	Wheel speed (rear) average calculated by transfer control unit.
ENGINE SPEED SIG [rpm]	Engine status via CAN communication line is displayed.

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WORK SUPPORT

Function	Description
RPS OFFSET LEARNING VALUE CLEAR	Transfer rotary position sensor learning value is cleared.

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TRANSFER CONTROL UNIT

< ECU DIAGNOSIS INFORMATION >

[TRANSFER: TX91A]

ECU DIAGNOSIS INFORMATION

TRANSFER CONTROL UNIT

Reference Value

INFOID:0000000012556109

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	
4L SWITCH	4WD shift switch: 4LO	On	
	4WD shift switch: Except 4LO	Off	
4H SWITCH	4WD shift switch: 4H	On	
	4WD shift switch: Except 4H	Off	
2WD SWITCH	4WD shift switch: 2WD	On	
	4WD shift switch: Except 2WD	Off	
4WD MODE	Ignition switch: ON	4WD is booting	BOTNG
		4WD mode is switching	SWTNG
		4WD mode: 2WD	2WD
		4WD mode: 4H	LOCK
		4WD mode: 4LO	4L
IGN SW	Ignition switch: ON	On	
	Ignition switch: OFF	Off	
BRAKE SWITCH	Brake pedal: Depressed	On	
	Brake pedal: Released	Off	
SLCT LVR POSI	A/T shift selector: D	D	
	A/T shift selector: N	N	
	A/T shift selector: R	R	
	A/T shift selector: P	P	
MODE SENSOR	4WD shift switch: Except 2WD	On	
	4WD shift switch: 2WD	Off	
RANGE SENSOR 2	4WD shift switch: 4LO	On	
	4WD shift switch: Except 4LO	Off	
RANGE SENSOR 1	4WD shift switch: 4LO	On	
	4WD shift switch: Except 4LO	Off	
4WD MODE IND	4WD shift switch: 2WD	2WD	
	4WD shift switch: 4H	LOCK	
	4WD shift switch: 4LO	4L	
4WD FAIL LAMP	4WD warning lamp: ON	On	
	4WD warning lamp: OFF	Off	
ATP IND	ATP warning lamp: ON	On	
	ATP warning lamp: OFF	Off	
MOTOR DRIVE A	When transfer motor is driving. (100% duty controlled)	HI	
	When transfer motor is driving in reversal or stopping.	LO	
	When transfer motor is driving. (PWM output)	PWM	

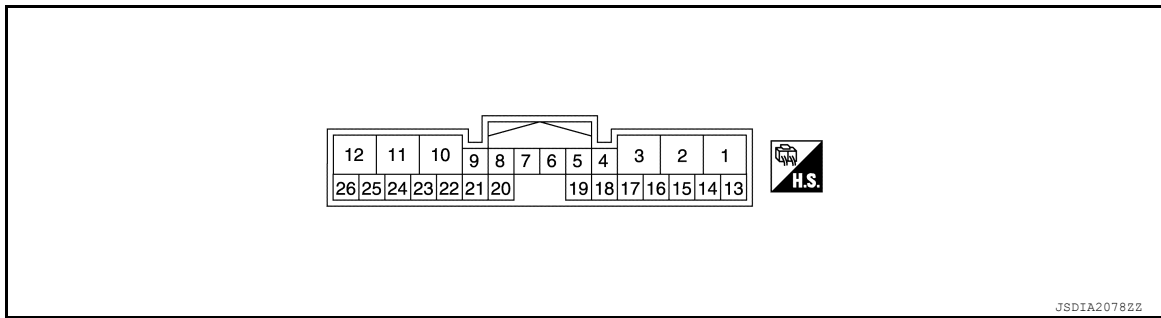
TRANSFER CONTROL UNIT

< ECU DIAGNOSIS INFORMATION >

[TRANSFER: TX91A]

Monitor item	Condition	Value/Status
MOTOR DRIVE B	When transfer motor is driving in reversal. (100% duty controlled)	HI
	When transfer motor is driving or stopping.	LO
	When transfer motor is driving in reversal. (PWM output)	PWM
FLUID TEMP SE	Always	255 V
C/U POWER SUP	Ignition switch: ON	Battery voltage
MOTOR POWER SUP	Ignition switch: ON	Battery voltage
ROTARY POSITION SENSOR	4WD mode: 2WD	11 - 14%
	4WD mode: 4H	34 - 44%
	4WD mode: 4LO	75 - 85%
COMPR VHCL SPEED	Vehicle driving CAUTION: Check air pressure of tire under standard condition.	Approx. equal to the indication on speedometer (inside of $\pm 10\%$)
	Vehicle stopped	0.00 km/h (0.00 mph)
VHCL/S SEN-FR	Vehicle driving CAUTION: Check air pressure of tire under standard condition.	Approx. equal to the indication on speedometer (inside of $\pm 10\%$)
	Vehicle stopped	0.00 km/h (0.00 mph)
VHCL/S SEN-RR	Vehicle driving CAUTION: Check air pressure of tire under standard condition.	Approx. equal to the indication on speedometer (inside of $\pm 10\%$)
	Vehicle stopped	0.00 km/h (0.00 mph)
ENGINE SPEED SIG	Engine: Running	Approx. equal to the indication on tachometer (inside of $\pm 10\%$)

TERMINAL LAYOUT



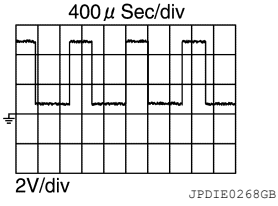
PHYSICAL VALUES

Terminal No. (Wire color)		Description		Condition	Value (Approx.)
+	-	Signal name	Input/ Output		
1 (Y/R)	Ground	Power supply (Transfer control unit)	Input	Always	Battery voltage
2 (B)	Ground	Ground	—	Always	0 V
3 (B)	Ground	Ground	—	Always	0 V
4 (GR)	Ground	Ignition switch	Input	Ignition switch: ON	Battery voltage
				Ignition switch: OFF	0 V

TRANSFER CONTROL UNIT

< ECU DIAGNOSIS INFORMATION >

[TRANSFER: TX91A]

Terminal No. (Wire color)		Description		Condition	Value (Approx.)	
+	-	Signal name	Input/ Output			
5 (L/O)	Ground	Transfer rotary position sensor power supply	Output	Ignition switch: ON	5 V	
				Ignition switch: OFF	0 V	
6 (Y)	Ground	Transfer rotary position sensor (GND)	—	Always	0 V	
9 (Y/R)	Ground	Power supply (4WD shift switch)	Output	Ignition switch: ON	5 V	
				Ignition switch: OFF	0 V	
10 (G)	Ground	Power supply (Transfer motor)	Input	Always	Battery voltage	
11 (L)	Ground	Motor drive A	Output	Transfer motor: Driving	0 V - Battery voltage	
12 (BR)	Ground	Motor drive B	Output	Transfer motor: Driving	0 V - Battery voltage	
13 (L)	—	CAN-H	Input/ Output	—	—	
14 (P)	—	CAN-L	Input/ Output	—	—	
15 (W/R)	Ground	Rotary position sensor input	Input	Ignition switch: ON		
18 (G/W)	Ground	4WD shift SW (2WD)	Input	Ignition switch: ON	4WD shift switch: 2WD	5 V
					4WD shift switch: Except 2WD	0 V
19 (O)	Ground	4WD shift SW (4H)	Input	Ignition switch: ON	4WD shift switch: 4H	5 V
					4WD shift switch: Except 4H	0 V
20 (R)	Ground	4WD shift SW (4LO)	Input	Ignition switch: ON	4WD shift switch: 4LO	5 V
					4WD shift switch: Except 4LO	0 V
21 (BR)	Ground	Range sensor 2 input	Input	Ignition switch: ON	4WD shift switch: 4LO	0 V
					4WD shift switch: 4H	5 V
					4WD shift switch: 2WD	5 V
22 (L/R)	Ground	Range sensor 1 input	Input	Ignition switch: ON	4WD shift switch: 4LO	0 V
					4WD shift switch: 4H	5 V
					4WD shift switch: 2WD	5 V
23 (V)	Ground	Mode sensor input	Input	Ignition switch: ON	4WD shift switch: 4LO	0 V
					4WD shift switch: 4H	0 V
					4WD shift switch: 2WD	5 V

CAUTION:

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

TRANSFER CONTROL UNIT

< ECU DIAGNOSIS INFORMATION >

[TRANSFER: TX91A]

Fail-Safe

INFOID:0000000012556110

DTC	Vehicle condition
P1804	No impact to vehicle behavior.
P1808	4WD mode cannot be switched by operating 4WD shift switch.
P1809	4WD mode cannot be switched by operating 4WD shift switch.
P180C	4WD mode cannot be switched by operating 4WD shift switch.
P180D	4WD mode cannot be switched by operating 4WD shift switch.
P180F	4WD mode cannot be switched by operating 4WD shift switch.
P1811	4WD mode cannot be switched by operating 4WD shift switch.
P1813	When malfunction occurs due to duplicate input, the control continues according to the 4WD mode priority (2WD → 4H → 4LO). (For malfunction with no input, 4WD mode running at the occurrence of malfunction is maintained.)
P1814	After a malfunction is confirmed, 4WD mode can be switchable. (4WD mode temporarily not switchable only during diagnosis)
P1816	4WD mode cannot be switched by operating 4WD shift switch.
P1817	4WD mode cannot be switched by operating 4WD shift switch.
P1818	4WD mode cannot be switched by operating 4WD shift switch.
P1819	4WD mode cannot be switched by operating 4WD shift switch.
P181B	4WD mode cannot be switched by operating 4WD shift switch.
P181C	4WD mode cannot be switched by operating 4WD shift switch.
P1820	4WD mode cannot be switched by operating 4WD shift switch.
P182A	After a malfunction is confirmed, 4WD mode can be switchable. (4WD mode temporarily not switchable only during diagnosis)
P1855	4WD mode cannot be switched by operating 4WD shift switch.
P1867	No impact to vehicle behavior.
P186C	4WD mode cannot be switched by operating 4WD shift switch.
U1000	4H – 4LO switching is prohibited when a malfunction occurs in communications of ECM, TCM, or BCM.
U1010	4WD mode cannot be switched by operating 4WD shift switch.

DTC Inspection Priority Chart

INFOID:0000000012556111

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

Priority	DTC	Item (CONSULT screen terms)	Reference
1	P1804	CONTROL UNIT 3	DLN-45, "DTC Description"
	P1809	CONTROL UNIT 4	DLN-47, "DTC Description"
	U1010	CONTROL UNIT (CAN)	DLN-87, "DTC Description"
2	P180C	SEN POWER SUPPLY (5V)	DLN-48, "DTC Description"
	P180F	MOTOR SYSTEM	DLN-54, "DTC Description"
	P1819	SHIFT ACT CIR	DLN-71, "DTC Description"
	P181C	MOTOR POWER SUPPLY	DLN-76, "DTC Description"

TRANSFER CONTROL UNIT

< ECU DIAGNOSIS INFORMATION >

[TRANSFER: TX91A]

Priority	DTC	Item (CONSULT screen terms)	Reference
3	P1808	VHCL SPEED SEN-ABS	DLN-46, "DTC Description"
	P180D	ROTARY POSITION SEN	DLN-51, "DTC Description"
	P1811	BATTERY VOLTAGE	DLN-56, "DTC Description"
	P1813	4WD MODE SW	DLN-59, "DTC Description"
	P1816	T/M RANGE SENSOR A	DLN-65, "DTC Description"
	P1818	SHIFT ACT POSI SW	DLN-68, "DTC Description"
	P181B	INCOMP SELF SHUT	DLN-73, "DTC Description"
	P1820	ENGINE SPEED	DLN-78, "DTC Description"
	P1855	VHCL SPEED SEN-RR	DLN-82, "DTC Description"
4	U1000	CAN COMM CIRCUIT	DLN-86, "DTC Description"
	P1814	4WD DETECT SWITCH	DLN-62, "DTC Description"
	P1817	SHIFT ACTUATOR	DLN-66, "DTC Description"
	P182A	HI-LO POSITION SEN	DLN-79, "DTC Description"
	P1867	INCOMPLETE SHIFT	DLN-83, "DTC Description"
	P186C	INCOMP RPS OFFSET LEARNING	DLN-85, "DTC Description"

DTC Index

INFOID:000000012556112

X: Turn ON —: Turn OFF

DTC	Display Items	4WD warning lamp	ATP warning lamp	Reference
P1804	CONTROL UNIT 3	—	—	DLN-45, "DTC Description"
P1808	VHCL SPEED SEN-ABS	X	—	DLN-46, "DTC Description"
P1809	CONTROL UNIT 4	X	—	DLN-47, "DTC Description"
P180C	SEN POWER SUPPLY (5V)	X	—	DLN-48, "DTC Description"
P180D	ROTARY POSITION SEN	X	—	DLN-51, "DTC Description"
P180F	MOTOR SYSTEM	X	—	DLN-54, "DTC Description"
P1811	BATTERY VOLTAGE	X	—	DLN-56, "DTC Description"
P1813	4WD MODE SW	X	—	DLN-59, "DTC Description"
P1814	4WD DETECT SWITCH	X	—	DLN-62, "DTC Description"
P1816	T/M RANGE SENSOR A	X	X*1	DLN-65, "DTC Description"
P1817	SHIFT ACTUATOR	X	—	DLN-66, "DTC Description"
P1818	SHIFT ACT POSI SW	X	—	DLN-68, "DTC Description"
P1819	SHIFT ACT CIR	X	—	DLN-71, "DTC Description"
P181B	INCOMP SELF SHUT	X	—	DLN-73, "DTC Description"
P181C	MOTOR POWER SUPPLY	X	—	DLN-76, "DTC Description"
P1820	ENGINE SPEED	X	—	DLN-78, "DTC Description"
P182A	HI-LO POSITION SEN	X	X	DLN-79, "DTC Description"
P1855	VHCL SPEED SEN-RR	X	—	DLN-82, "DTC Description"
P1867	INCOMPLETE SHIFT	—	X*2	DLN-83, "DTC Description"
P186C	INCOMP RPS OFFSET LEARNING	X	—	DLN-85, "DTC Description"
U1000	CAN COMM CIRCUIT	X	—	DLN-86, "DTC Description"
U1010	CONTROL UNIT (CAN)	X	—	DLN-87, "DTC Description"

*1: When shifted to P position.

*2: When shifted to P position during the occurrence of malfunction between 4H and 4LO.

WIRING DIAGRAM

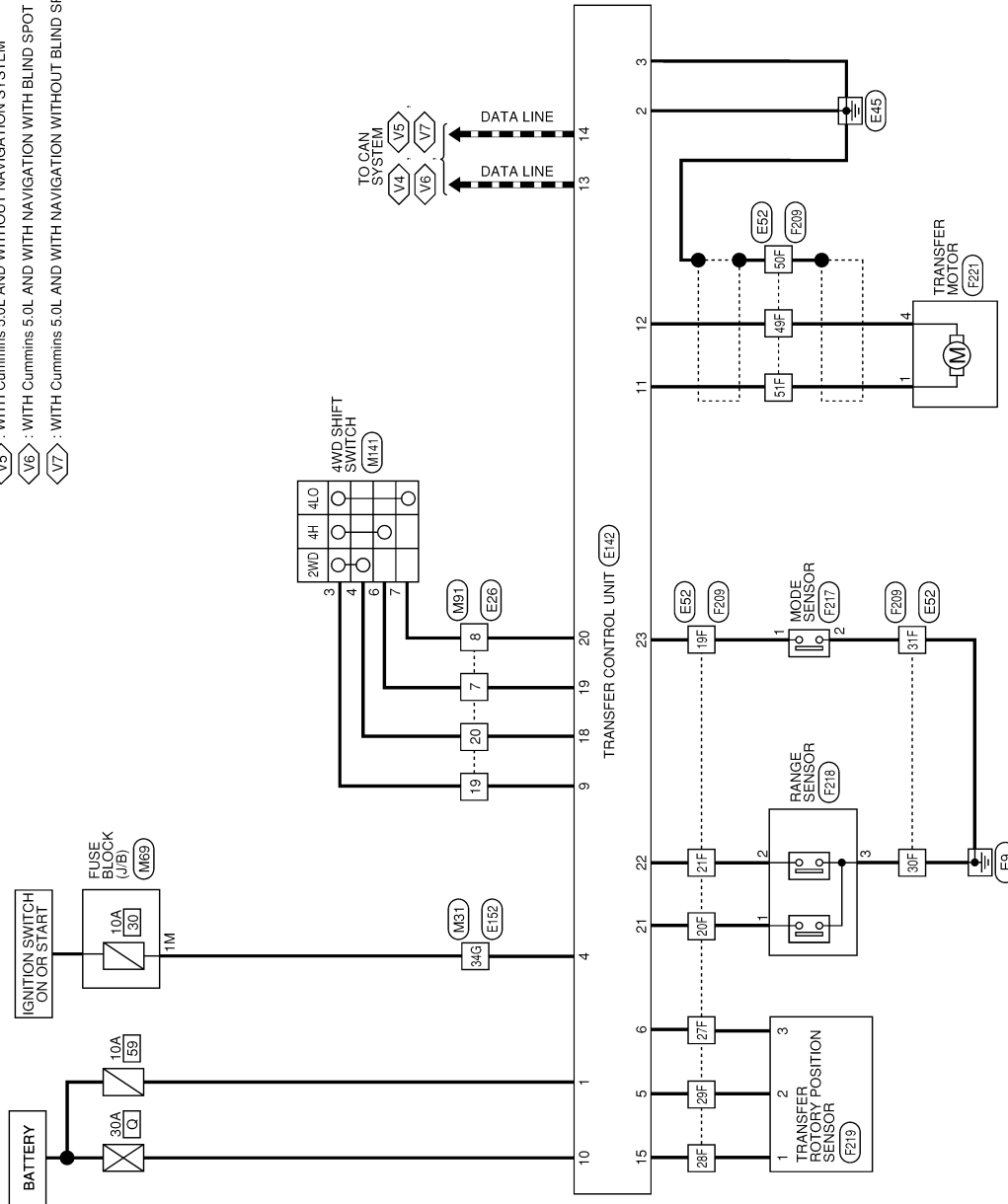
4WD SYSTEM

Wiring Diagram - Cummins 5.0L

INFOID:0000000012556113

- ▬ : CAN COMMUNICATION LINE FOR DIAGNOSIS
- ◊V4◊ : CAN GATEWAY SYSTEM - WITH Cummins 5.0L
- ◊V5◊ : WITH Cummins 5.0L AND WITHOUT NAVIGATION SYSTEM
- ◊V6◊ : WITH Cummins 5.0L AND WITH NAVIGATION WITH BLIND SPOT WARNING SYSTEMS
- ◊V7◊ : WITH Cummins 5.0L AND WITH NAVIGATION WITHOUT BLIND SPOT WARNING SYSTEMS

4WD SYSTEM - WITH Cummins 5.0L



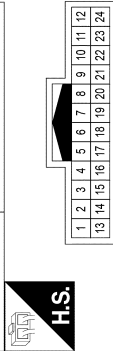
AADWA0431GB

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4WD SYSTEM

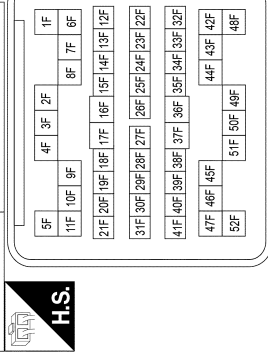
4WD SYSTEM CONNECTORS - WITH Cummins 5.0L

Connector No.	E26
Connector Name	WIRE TO WIRE
Connector Type	TH24MW-NH
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
1	LG/B	TO MAIN HARNESS
2	R/W	TO MAIN HARNESS
3	Y/R	TO MAIN HARNESS
4	G/R	TO MAIN HARNESS
5	G/W	TO MAIN HARNESS
6	P	TO MAIN HARNESS
7	O	TO MAIN HARNESS
8	R	TO MAIN HARNESS
9	G	TO MAIN HARNESS
10	LG	TO MAIN HARNESS
11	BR	TO MAIN HARNESS
12	GR	TO MAIN HARNESS
13	G	TO MAIN HARNESS
14	BR	TO MAIN HARNESS
15	-	TO MAIN HARNESS
16	-	TO MAIN HARNESS
17	W	TO MAIN HARNESS
18	-	TO MAIN HARNESS
19	Y/R	TO MAIN HARNESS
20	G/W	TO MAIN HARNESS
21	-	TO MAIN HARNESS
22	-	TO MAIN HARNESS
23	-	TO MAIN HARNESS
24	O/L	TO MAIN HARNESS

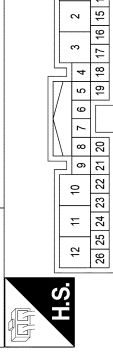
Connector No.	E52
Connector Name	WIRE TO WIRE
Connector Type	RK26FGY-RS20-X6
Connector Color	GRAY



Terminal No.	Color of Wire	Signal Name
1F	Y	TO ENGINE CONTROL NO. 2 HARNESS
2F	B	TO ENGINE CONTROL NO. 2 HARNESS
3F	BR	TO ENGINE CONTROL NO. 2 HARNESS
4F	W/R	TO ENGINE CONTROL NO. 2 HARNESS
5F	B/R	TO ENGINE CONTROL NO. 2 HARNESS
6F	O	TO ENGINE CONTROL NO. 2 HARNESS
7F	GR/Y	TO ENGINE CONTROL NO. 2 HARNESS
8F	V	TO ENGINE CONTROL NO. 2 HARNESS
9F	BR	TO ENGINE CONTROL NO. 2 HARNESS
10F	Y/B	TO ENGINE CONTROL NO. 2 HARNESS
11F	L	TO ENGINE CONTROL NO. 2 HARNESS
12F	R	TO ENGINE CONTROL NO. 2 HARNESS
13F	Y	TO ENGINE CONTROL NO. 2 HARNESS
14F	V	TO ENGINE CONTROL NO. 2 HARNESS
15F	SB	TO ENGINE CONTROL NO. 2 HARNESS
16F	P	TO ENGINE CONTROL NO. 2 HARNESS
17F	Y/R	TO ENGINE CONTROL NO. 2 HARNESS
18F	R	TO ENGINE CONTROL NO. 2 HARNESS
19F	V	TO ENGINE CONTROL NO. 2 HARNESS
20F	BR	TO ENGINE CONTROL NO. 2 HARNESS

21F	L/R	TO ENGINE CONTROL NO. 2 HARNESS
22F	L/W	TO ENGINE CONTROL NO. 2 HARNESS
23F	R/L	TO ENGINE CONTROL NO. 2 HARNESS
24F	W/L	TO ENGINE CONTROL NO. 2 HARNESS
25F	W/R	TO ENGINE CONTROL NO. 2 HARNESS
26F	B/R	TO ENGINE CONTROL NO. 2 HARNESS
27F	Y	TO ENGINE CONTROL NO. 2 HARNESS
28F	W/R	TO ENGINE CONTROL NO. 2 HARNESS
29F	L/O	TO ENGINE CONTROL NO. 2 HARNESS
30F	B	TO ENGINE CONTROL NO. 2 HARNESS
31F	B	TO ENGINE CONTROL NO. 2 HARNESS
32F	V/W	TO ENGINE CONTROL NO. 2 HARNESS
33F	GR	TO ENGINE CONTROL NO. 2 HARNESS
34F	L/R	TO ENGINE CONTROL NO. 2 HARNESS
35F	R/W	TO ENGINE CONTROL NO. 2 HARNESS
36F	L/B	TO ENGINE CONTROL NO. 2 HARNESS
37F	L	TO ENGINE CONTROL NO. 2 HARNESS
38F	R/Y	TO ENGINE CONTROL NO. 2 HARNESS
39F	R/Y	TO ENGINE CONTROL NO. 2 HARNESS
40F	B/R	TO ENGINE CONTROL NO. 2 HARNESS
41F	W	TO ENGINE CONTROL NO. 2 HARNESS
42F	Y	TO ENGINE CONTROL NO. 2 HARNESS
43F	B/P	TO ENGINE CONTROL NO. 2 HARNESS
44F	Y/B	TO ENGINE CONTROL NO. 2 HARNESS
45F	L/Y	TO ENGINE CONTROL NO. 2 HARNESS
46F	O	TO ENGINE CONTROL NO. 2 HARNESS
47F	W/R	TO ENGINE CONTROL NO. 2 HARNESS
48F	L	TO ENGINE CONTROL NO. 2 HARNESS
49F	BR	TO ENGINE CONTROL NO. 2 HARNESS
50F	SHIELD	TO ENGINE CONTROL NO. 2 HARNESS
51F	L	TO ENGINE CONTROL NO. 2 HARNESS

52F	BR	TO ENGINE CONTROL NO. 2 HARNESS
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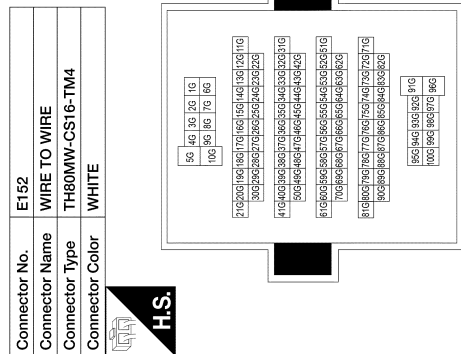
Terminal No.	Color of Wire	Signal Name
1	Y/R	ECU POWER
2	B	GND
3	B	GND
4	GR	IGN SW
5	L/O	ROTARY POSITION SENSOR SUPPLY
6	Y	ROTARY POSITION SENSOR RETURN
7	-	-
8	-	-
9	Y/R	4WD SHIFT SWITCH 5V SUPPLY
10	G	MOTOR POWER
11	L	MOTOR A
12	BR	MOTOR B
13	L	CAN-H
14	P	CAN-L
15	W/R	ROTARY POSITION SENSOR INPUT
16	-	-
17	-	-
18	G/W	2WD MODE SW
19	O	4H MODE SW
20	R	4LO MODE SW
21	BR	RANGE 2 SENSOR INPUT
22	L/R	RANGE 1 SENSOR INPUT
23	V	MODE SENSOR INPUT
24	-	-
25	-	-
26	-	-

4WD SYSTEM

< WIRING DIAGRAM >

[TRANSFER: TX91A]

4WD SYSTEM CONNECTORS - WITH Cummins 5.0L



Terminal No.	Color of Wire	Signal Name
1G	G	TO MAIN HARNESS
2G	B/R	TO MAIN HARNESS
3G	W/B	TO MAIN HARNESS
4G	B/W	TO MAIN HARNESS
5G	BR	TO MAIN HARNESS
6G	P	TO MAIN HARNESS - (WITH VC8VD)
6G	R/W	TO MAIN HARNESS - (WITH CUMMINS 5.0L)
7G	Y	TO MAIN HARNESS
8G	G	TO MAIN HARNESS
9G	R	TO MAIN HARNESS
10G	W	TO MAIN HARNESS
11G	R/G	TO MAIN HARNESS
12G	W/B	TO MAIN HARNESS
13G	BR	TO MAIN HARNESS
14G	Y/B	TO MAIN HARNESS
15G	G/W	TO MAIN HARNESS
16G	G	TO MAIN HARNESS
17G	G/Y	TO MAIN HARNESS
18G	G/Y	TO MAIN HARNESS
19G	Y/Y	TO MAIN HARNESS
20G	G/Y	TO MAIN HARNESS
21G	B/Y	TO MAIN HARNESS
22G	G/R	TO MAIN HARNESS - (WITH CUMMINS 5.0L)

Terminal No.	Color of Wire	Signal Name
22G	G/Y	TO MAIN HARNESS - (WITH VC8VD)
23G	Y/R	TO MAIN HARNESS
24G	G/B	TO MAIN HARNESS
25G	R/W	TO MAIN HARNESS
26G	R	TO MAIN HARNESS
27G	LG	TO MAIN HARNESS
28G	G/B	TO MAIN HARNESS
29G	G/B	TO MAIN HARNESS
30G	BR/Y	TO MAIN HARNESS
31G	P	TO MAIN HARNESS
32G	P	TO MAIN HARNESS
33G	Y/L	TO MAIN HARNESS
34G	GR	TO MAIN HARNESS
35G	G/R	TO MAIN HARNESS
36G	SB	TO MAIN HARNESS
37G	R/W	TO MAIN HARNESS
38G	BR	TO MAIN HARNESS
39G	BR	TO MAIN HARNESS
40G	-	TO MAIN HARNESS
41G	R/G	TO MAIN HARNESS
42G	O	TO MAIN HARNESS
43G	B	TO MAIN HARNESS
44G	R/Y	TO MAIN HARNESS
45G	G	TO MAIN HARNESS
46G	LG	TO MAIN HARNESS
47G	R	TO MAIN HARNESS
48G	W	TO MAIN HARNESS
49G	-	TO MAIN HARNESS
50G	BR	TO MAIN HARNESS
51G	R	TO MAIN HARNESS
52G	L	TO MAIN HARNESS
53G	W	TO MAIN HARNESS
54G	W	TO MAIN HARNESS
55G	G	TO MAIN HARNESS
56G	W	TO MAIN HARNESS
57G	Y	TO MAIN HARNESS
58G	BG	TO MAIN HARNESS
59G	BG	TO MAIN HARNESS
60G	BG	TO MAIN HARNESS
61G	B	TO MAIN HARNESS
62G	W	TO MAIN HARNESS
63G	R	TO MAIN HARNESS
64G	W/L	TO MAIN HARNESS
65G	W/R	TO MAIN HARNESS
66G	BG	TO MAIN HARNESS
67G	BG	TO MAIN HARNESS
68G	B	TO MAIN HARNESS
69G	Y	TO MAIN HARNESS
70G	L	TO MAIN HARNESS
71G	R/W	TO MAIN HARNESS
72G	L/W	TO MAIN HARNESS
73G	SHIELD	TO MAIN HARNESS

Terminal No.	Color of Wire	Signal Name
74G	W	TO MAIN HARNESS
75G	R	TO MAIN HARNESS
76G	R/G	TO MAIN HARNESS
77G	G	TO MAIN HARNESS
78G	W	TO MAIN HARNESS
79G	-	TO MAIN HARNESS
80G	R	TO MAIN HARNESS
81G	L	TO MAIN HARNESS
82G	R	TO MAIN HARNESS
83G	L	TO MAIN HARNESS
84G	L	TO MAIN HARNESS
85G	W/B	TO MAIN HARNESS
86G	B/R	TO MAIN HARNESS
87G	W/B	TO MAIN HARNESS
88G	P	TO MAIN HARNESS
89G	L	TO MAIN HARNESS
90G	G	TO MAIN HARNESS
91G	G	TO MAIN HARNESS
92G	V/W	TO MAIN HARNESS
93G	BR	TO MAIN HARNESS
94G	G	TO MAIN HARNESS
95G	G	TO MAIN HARNESS
96G	W	TO MAIN HARNESS
97G	R	TO MAIN HARNESS
98G	W/B	TO MAIN HARNESS
99G	BR	TO MAIN HARNESS
100G	GR/W	TO MAIN HARNESS

Connector No. F209
Connector Name WIRE TO WIRE
Connector Type RK26MGY-RS20-X6
Connector Color GRAY

Terminal No.	Color of Wire	Signal Name
1F	1F	1F
2F	2F	2F
3F	3F	3F
4F	4F	4F
5F	5F	5F
6F	6F	6F
7F	7F	7F
8F	8F	8F
9F	9F	9F
10F	10F	10F
11F	11F	11F
12F	12F	12F
13F	13F	13F
14F	14F	14F
15F	15F	15F
16F	16F	16F
17F	17F	17F
18F	18F	18F
19F	19F	19F
20F	20F	20F
21F	21F	21F
22F	22F	22F
23F	23F	23F
24F	24F	24F
25F	25F	25F
26F	26F	26F
27F	27F	27F
28F	28F	28F
29F	29F	29F
30F	30F	30F
31F	31F	31F
32F	32F	32F
33F	33F	33F
34F	34F	34F
35F	35F	35F
36F	36F	36F
37F	37F	37F
38F	38F	38F
39F	39F	39F
40F	40F	40F
41F	41F	41F
42F	42F	42F
43F	43F	43F
44F	44F	44F
45F	45F	45F
46F	46F	46F
47F	47F	47F
48F	48F	48F
49F	49F	49F
50F	50F	50F
51F	51F	51F
52F	52F	52F

Terminal No.	Color of Wire	Signal Name
6F	O/L	TO ENGINE ROOM HARNESS
7F	GR	TO ENGINE ROOM HARNESS
8F	P	TO ENGINE ROOM HARNESS
9F	BR/W	TO ENGINE ROOM HARNESS
10F	G/Y	TO ENGINE ROOM HARNESS
11F	L/W	TO ENGINE ROOM HARNESS
12F	R/W	TO ENGINE ROOM HARNESS
13F	G/Y	TO ENGINE ROOM HARNESS
14F	V/W	TO ENGINE ROOM HARNESS
15F	LG	TO ENGINE ROOM HARNESS
16F	R/Y	TO ENGINE ROOM HARNESS
17F	BR/Y	TO ENGINE ROOM HARNESS
18F	R	TO ENGINE ROOM HARNESS
19F	V	TO ENGINE ROOM HARNESS
20F	BR	TO ENGINE ROOM HARNESS
21F	L/R	TO ENGINE ROOM HARNESS
22F	L/LG	TO ENGINE ROOM HARNESS
23F	SB	TO ENGINE ROOM HARNESS
24F	W/L	TO ENGINE ROOM HARNESS
25F	W/B	TO ENGINE ROOM HARNESS
26F	B/Y	TO ENGINE ROOM HARNESS
27F	Y	TO ENGINE ROOM HARNESS
28F	W/R	TO ENGINE ROOM HARNESS
29F	L/O	TO ENGINE ROOM HARNESS
30F	B	TO ENGINE ROOM HARNESS
31F	B	TO ENGINE ROOM HARNESS
32F	V	TO ENGINE ROOM HARNESS
33F	BG	TO ENGINE ROOM HARNESS
34F	L/R	TO ENGINE ROOM HARNESS
35F	R/W	TO ENGINE ROOM HARNESS
36F	L/B	TO ENGINE ROOM HARNESS
37F	L/O	TO ENGINE ROOM HARNESS
38F	Y/W	TO ENGINE ROOM HARNESS
39F	R/Y	TO ENGINE ROOM HARNESS
40F	G/B	TO ENGINE ROOM HARNESS
41F	W	TO ENGINE ROOM HARNESS
42F	Y	TO ENGINE ROOM HARNESS
43F	B/P	TO ENGINE ROOM HARNESS
44F	Y/B	TO ENGINE ROOM HARNESS
45F	L/Y	TO ENGINE ROOM HARNESS
46F	O	TO ENGINE ROOM HARNESS
47F	W/L	TO ENGINE ROOM HARNESS
48F	L	TO ENGINE ROOM HARNESS
49F	BR	TO ENGINE ROOM HARNESS
50F	SHIELD	TO ENGINE ROOM HARNESS
51F	L	TO ENGINE ROOM HARNESS
52F	BR	TO ENGINE ROOM HARNESS

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4WD SYSTEM

< WIRING DIAGRAM >

[TRANSFER: TX91A]

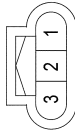
4WD SYSTEM CONNECTORS - WITH Cummins 5.0L

Connector No.	F217
Connector Name	MODE SENSOR (WITH CUMMINS 5.0L)
Connector Type	RH02FB
Connector Color	BLACK



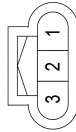
Terminal No.	Color of Wire	Signal Name
1	V	MODE SENS INPUT
2	B	GROUND

Connector No.	F218
Connector Name	RANGE SENSOR (WITH CUMMINS 5.0L)
Connector Type	RH03FB
Connector Color	BLACK



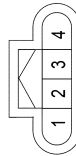
Terminal No.	Color of Wire	Signal Name
1	BR	RANGE 2 SENS INPUT
2	L/R	RANGE 1 SENS INPUT
3	B	GROUND

Connector No.	F219
Connector Name	TRANSFER ROTARY POSITION SENSOR (WITH CUMMINS 5.0L)
Connector Type	RH03FB
Connector Color	BLACK



Terminal No.	Color of Wire	Signal Name
1	W/R	RPS INPUT
2	L/O	RPS +5V
3	Y	RPS GROUND

Connector No.	F221
Connector Name	TRANSFER MOTOR (WITH CUMMINS 5.0L)
Connector Type	RH04FB
Connector Color	BLACK



Terminal No.	Color of Wire	Signal Name
1	L	MOTOR A
2	-	-
3	-	-
4	BR	MOTOR B

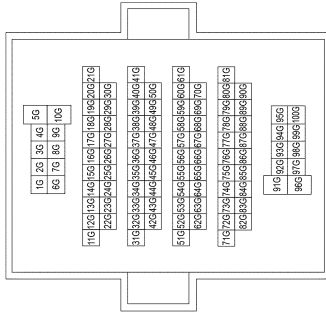
4WD SYSTEM

< WIRING DIAGRAM >

[TRANSFER: TX91A]

4WD SYSTEM CONNECTORS - WITH Cummins 5.0L

Connector No.	M31
Connector Name	WIRE TO WIRE
Connector Type	TH80FW-CS16-TM4
Connector Color	WHITE



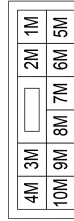
256	P/W	TO ENGINE ROOM HARNESS
266	R	TO ENGINE ROOM HARNESS
276	LG	TO ENGINE ROOM HARNESS
286	G/B	TO ENGINE ROOM HARNESS
296	G/B	TO ENGINE ROOM HARNESS
306	B/Y	TO ENGINE ROOM HARNESS
316	R	TO ENGINE ROOM HARNESS
326	R	TO ENGINE ROOM HARNESS
336	Y/L	TO ENGINE ROOM HARNESS
346	GR	TO ENGINE ROOM HARNESS
356	G/R	TO ENGINE ROOM HARNESS
366	SB	TO ENGINE ROOM HARNESS
376	P/W	TO ENGINE ROOM HARNESS
386	BR	TO ENGINE ROOM HARNESS
396	BR	TO ENGINE ROOM HARNESS
406	-	TO ENGINE ROOM HARNESS
416	P/G	TO ENGINE ROOM HARNESS
426	O	TO ENGINE ROOM HARNESS
436	G	TO ENGINE ROOM HARNESS
446	P/Y	TO ENGINE ROOM HARNESS
456	G	TO ENGINE ROOM HARNESS
466	LG	TO ENGINE ROOM HARNESS
476	R	TO ENGINE ROOM HARNESS
486	W	TO ENGINE ROOM HARNESS
496	-	TO ENGINE ROOM HARNESS
506	BR	TO ENGINE ROOM HARNESS
516	R	TO ENGINE ROOM HARNESS
526	L	TO ENGINE ROOM HARNESS
536	W	TO ENGINE ROOM HARNESS
546	W	TO ENGINE ROOM HARNESS
556	G	TO ENGINE ROOM HARNESS
566	W	TO ENGINE ROOM HARNESS
576	Y	TO ENGINE ROOM HARNESS
586	BG	TO ENGINE ROOM HARNESS
596	BG	TO ENGINE ROOM HARNESS
606	BG	TO ENGINE ROOM HARNESS
616	O	TO ENGINE ROOM HARNESS
626	O	TO ENGINE ROOM HARNESS
636	O	TO ENGINE ROOM HARNESS
646	W/L	TO ENGINE ROOM HARNESS
656	W/R	TO ENGINE ROOM HARNESS
666	BG	TO ENGINE ROOM HARNESS
676	O	TO ENGINE ROOM HARNESS
686	B	TO ENGINE ROOM HARNESS
696	Y	TO ENGINE ROOM HARNESS
706	L	TO ENGINE ROOM HARNESS
716	P/W	TO ENGINE ROOM HARNESS
726	L/W	TO ENGINE ROOM HARNESS
736	SHIELD	TO ENGINE ROOM HARNESS
746	W	TO ENGINE ROOM HARNESS
756	R	TO ENGINE ROOM HARNESS
766	P/G	TO ENGINE ROOM HARNESS
776	BG	TO ENGINE ROOM HARNESS

Terminal No.	Color of Wire	Signal Name
1G	G	TO ENGINE ROOM HARNESS
2G	B/R	TO ENGINE ROOM HARNESS
3G	W	TO ENGINE ROOM HARNESS
4G	B/W	TO ENGINE ROOM HARNESS
5G	BR	TO ENGINE ROOM HARNESS
6G	P/W	TO ENGINE ROOM HARNESS
7G	Y	TO ENGINE ROOM HARNESS
8G	G	TO ENGINE ROOM HARNESS
9G	R	TO ENGINE ROOM HARNESS
10G	W	TO ENGINE ROOM HARNESS
11G	P/G	TO ENGINE ROOM HARNESS
12G	W/B	TO ENGINE ROOM HARNESS
13G	BR	TO ENGINE ROOM HARNESS
14G	Y/B	TO ENGINE ROOM HARNESS
15G	G/W	TO ENGINE ROOM HARNESS
16G	G	TO ENGINE ROOM HARNESS
17G	O	TO ENGINE ROOM HARNESS
18G	G/Y	TO ENGINE ROOM HARNESS
19G	Y/W	TO ENGINE ROOM HARNESS
20G	G/Y	TO ENGINE ROOM HARNESS
21G	B/Y	TO ENGINE ROOM HARNESS
22G	G/R	TO ENGINE ROOM HARNESS - (WITH CUMMINS 5.0L)
22G	G/Y	TO ENGINE ROOM HARNESS - (WITH V656/D)
23G	Y/R	TO ENGINE ROOM HARNESS
24G	G/B	TO ENGINE ROOM HARNESS

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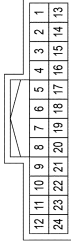
766	P	TO ENGINE ROOM HARNESS
766	-	TO ENGINE ROOM HARNESS
806	R	TO ENGINE ROOM HARNESS
816	L	TO ENGINE ROOM HARNESS
826	R	TO ENGINE ROOM HARNESS
836	L	TO ENGINE ROOM HARNESS
846	L	TO ENGINE ROOM HARNESS
856	W	TO ENGINE ROOM HARNESS
866	B/R	TO ENGINE ROOM HARNESS
876	W	TO ENGINE ROOM HARNESS
886	G	TO ENGINE ROOM HARNESS
896	P	TO ENGINE ROOM HARNESS
906	G	TO ENGINE ROOM HARNESS
916	P	TO ENGINE ROOM HARNESS
926	V/W	TO ENGINE ROOM HARNESS
936	BR	TO ENGINE ROOM HARNESS
946	B	TO ENGINE ROOM HARNESS
956	G	TO ENGINE ROOM HARNESS
966	R	TO ENGINE ROOM HARNESS
976	R	TO ENGINE ROOM HARNESS
986	W/B	TO ENGINE ROOM HARNESS
996	R	TO ENGINE ROOM HARNESS
1006	GR/W	TO ENGINE ROOM HARNESS

Connector No.	M69
Connector Name	FUSE BLOCK (J/B)
Connector Type	NS10FW-CS
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
1M	GR	IGNITION
2M	-	-
3M	-	-
4M	-	-
5M	P/Y	BATTERY
6M	R/W	TAIL LAMP 2
7M	-	-
8M	-	-
9M	-	-
10M	W/R	IGNITION

Connector No.	M91
Connector Name	WIRE TO WIRE
Connector Type	TH24FW-NH
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
1	G/W	TO ENGINE ROOM HARNESS
2	P/W	TO ENGINE ROOM HARNESS
3	Y/R	TO ENGINE ROOM HARNESS
4	G/R	TO ENGINE ROOM HARNESS
5	G	TO ENGINE ROOM HARNESS
6	P	TO ENGINE ROOM HARNESS
7	O	TO ENGINE ROOM HARNESS
8	R	TO ENGINE ROOM HARNESS
9	G	TO ENGINE ROOM HARNESS
10	LG	TO ENGINE ROOM HARNESS
11	BR	TO ENGINE ROOM HARNESS
12	GR	TO ENGINE ROOM HARNESS
13	G	TO ENGINE ROOM HARNESS
14	BR	TO ENGINE ROOM HARNESS
15	-	TO ENGINE ROOM HARNESS
16	-	TO ENGINE ROOM HARNESS
17	W	TO ENGINE ROOM HARNESS
18	-	TO ENGINE ROOM HARNESS
19	Y/R	TO ENGINE ROOM HARNESS
20	G/W	TO ENGINE ROOM HARNESS
21	-	TO ENGINE ROOM HARNESS
22	-	TO ENGINE ROOM HARNESS
23	-	TO ENGINE ROOM HARNESS
24	O/L	TO ENGINE ROOM HARNESS

A B C DLN E F G H I J K L M N O P

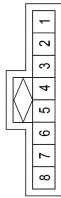
4WD SYSTEM

< WIRING DIAGRAM >

[TRANSFER: TX91A]

4WD SYSTEM CONNECTORS - WITH Cummins 5.0L

Connector No.	M141
Connector Name	4WD SHIFT SWITCH
Connector Type	A08FW
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
1	GR	ILLUMINATION -
2	-	-
3	Y/R	4WD SHIFT SWITCH 5V SUPPLY
4	G/W	2WD MODE SW
5	-	-
6	O	4H MODE SW
7	R	4LO MODE SW
8	L	ILLUMINATION +

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4WD SYSTEM

< WIRING DIAGRAM >

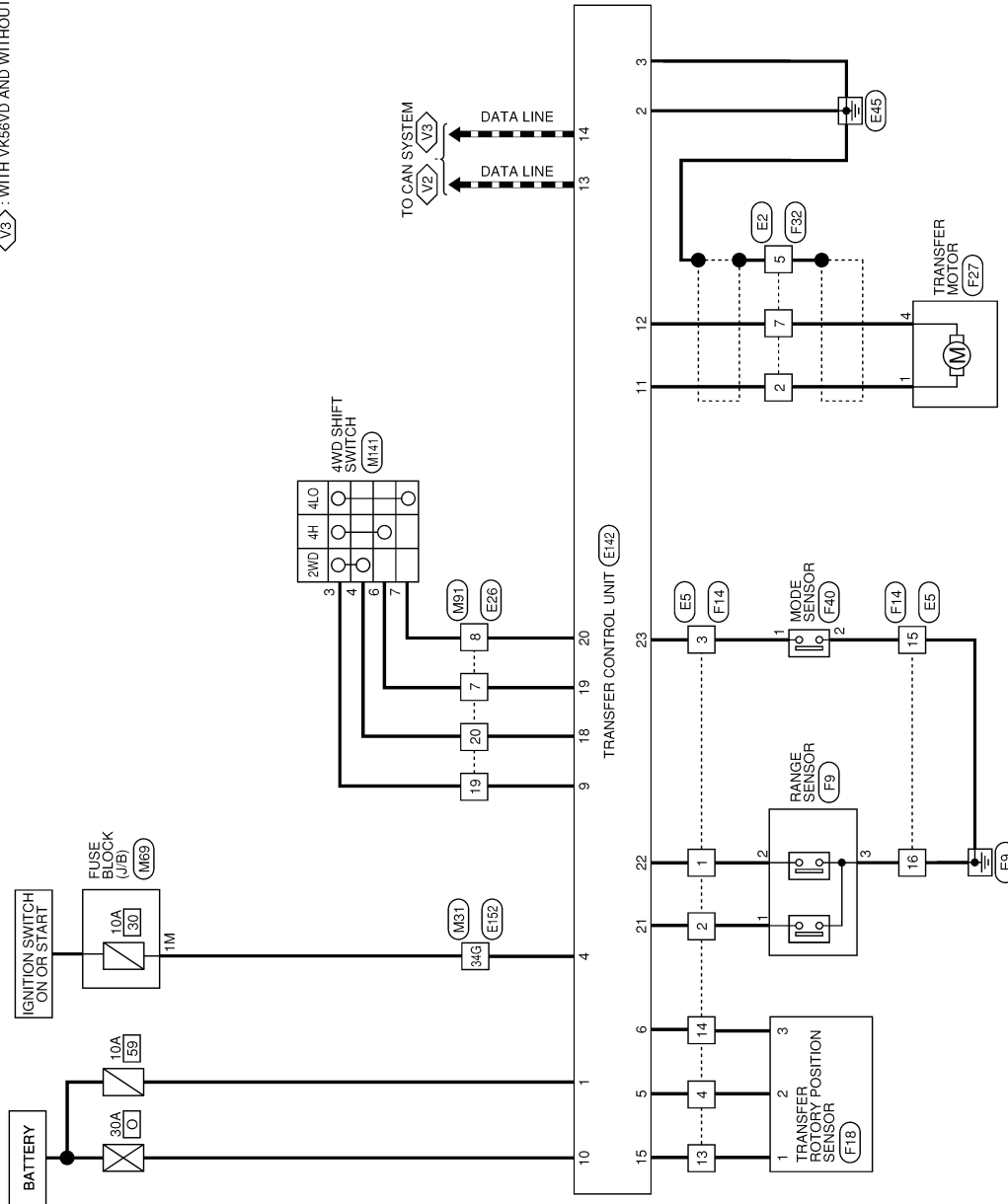
[TRANSFER: TX91A]

Wiring Diagram - VK56VD

INFOID:000000013790735

- ▬ : CAN COMMUNICATION LINE FOR DIAGNOSIS
- ◁V2▷ : WITH VK56VD AND WITH DRIVER ASSISTANCE SYSTEM
- ◁V3▷ : WITH VK56VD AND WITHOUT DRIVER ASSISTANCE SYSTEM

4WD SYSTEM - WITH VK56VD




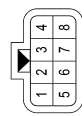
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4WD SYSTEM


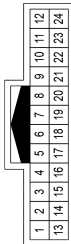
4WD SYSTEM CONNECTORS - WITH VK56VD

Connector No.	E2
Connector Name	WIRE TO WIRE
Connector Type	RS08MGY-PR
Connector Color	GRAY

Terminal No.	Color of Wire	Signal Name
1	W	TO ENGINE CONTROL HARNESS
2	L	TO ENGINE CONTROL HARNESS
3	R/W	TO ENGINE CONTROL HARNESS
4	W	TO ENGINE CONTROL HARNESS
5	SHIELD	TO ENGINE CONTROL HARNESS
6	B	TO ENGINE CONTROL HARNESS
7	BR	TO ENGINE CONTROL HARNESS
8	B	TO ENGINE CONTROL HARNESS

Connector No.	E5
Connector Name	WIRE TO WIRE
Connector Type	TH24MM-NH
Connector Color	WHITE


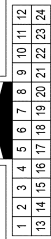



Terminal No.	Color of Wire	Signal Name
1	L/R	TO ENGINE CONTROL HARNESS
2	BR	TO ENGINE CONTROL HARNESS
3	V	TO ENGINE CONTROL HARNESS
4	L/O	TO ENGINE CONTROL HARNESS
5	W	TO ENGINE CONTROL HARNESS
6	P	TO ENGINE CONTROL HARNESS
7	Y/R	TO ENGINE CONTROL HARNESS
8	BR	TO ENGINE CONTROL HARNESS
9	W/L	TO ENGINE CONTROL HARNESS
10	L/Y	TO ENGINE CONTROL HARNESS
11	SB	TO ENGINE CONTROL HARNESS
12	L	TO ENGINE CONTROL HARNESS
13	W/R	TO ENGINE CONTROL HARNESS
14	Y	TO ENGINE CONTROL HARNESS
15	B	TO ENGINE CONTROL HARNESS

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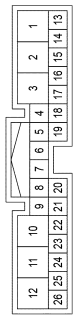
16	B	TO ENGINE CONTROL HARNESS
17	Y/R	TO ENGINE CONTROL HARNESS
18	B	TO ENGINE CONTROL HARNESS
19	B/R	TO ENGINE CONTROL HARNESS
20	GR	TO ENGINE CONTROL HARNESS
21	V/R	TO ENGINE CONTROL HARNESS
22	B	TO ENGINE CONTROL HARNESS
23	B	TO ENGINE CONTROL HARNESS
24	P	TO ENGINE CONTROL HARNESS

Connector No.	E26
Connector Name	WIRE TO WIRE
Connector Type	TH24MM-NH
Connector Color	WHITE

Terminal No.	Color of Wire	Signal Name
1	L/B	TO MAIN HARNESS
2	R/W	TO MAIN HARNESS
3	Y/R	TO MAIN HARNESS
4	G/R	TO MAIN HARNESS
5	G/W	TO MAIN HARNESS
6	P	TO MAIN HARNESS
7	O	TO MAIN HARNESS
8	R	TO MAIN HARNESS
9	G	TO MAIN HARNESS
10	LG	TO MAIN HARNESS
11	BR	TO MAIN HARNESS
12	GR	TO MAIN HARNESS
13	G	TO MAIN HARNESS
14	BR	TO MAIN HARNESS
15	-	TO MAIN HARNESS
16	-	TO MAIN HARNESS
17	W	TO MAIN HARNESS
18	-	TO MAIN HARNESS
19	Y/R	TO MAIN HARNESS
20	G/W	TO MAIN HARNESS
21	-	TO MAIN HARNESS
22	-	TO MAIN HARNESS
23	-	TO MAIN HARNESS
24	O/L	TO MAIN HARNESS

Connector No.	E142
Connector Name	TRANSFER CONTROL UNIT
Connector Type	TH20FW-TB6
Connector Color	WHITE

Terminal No.	Color of Wire	Signal Name
1	Y/R	ECU POWER
2	B	GND
3	B	GND
4	GR	IGN SW
5	L/O	ROTARY POSITION SENSOR 5V SUPPLY
6	Y	ROTARY POSITION SENSOR RETURN
7	-	-
8	-	-
9	Y/R	4WD SHIFT SWITCH 5V SUPPLY
10	G	MOTOR POWER
11	L	MOTOR A
12	BR	MOTOR B
13	L	CAN-H
14	P	CAN-L
15	W/R	ROTARY POSITION SENSOR INPUT
16	-	-
17	-	-
18	G/W	2WD MODE SW
19	O	4H MODE SW
20	R	4LO MODE SW
21	BR	RANGE 2 SENSOR INPUT
22	L/R	RANGE 1 SENSOR INPUT
23	V	MODE SENSOR INPUT
24	-	-
25	-	-
26	-	-

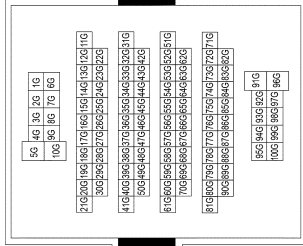
4WD SYSTEM

< WIRING DIAGRAM >

[TRANSFER: TX91A]

4WD SYSTEM CONNECTORS - WITH VK56VD

Connector No.	ET152
Connector Name	WIRE TO WIRE
Connector Type	TH80MW-CST6-TM4
Connector Color	WHITE



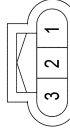
Terminal No.	Color of Wire	Signal Name
22G	G/Y	TO MAIN HARNESS - (WITH VK56VD)
23G	Y/R	TO MAIN HARNESS
24G	G/B	TO MAIN HARNESS
25G	R/W	TO MAIN HARNESS
26G	R	TO MAIN HARNESS
27G	LG	TO MAIN HARNESS
28G	G/B	TO MAIN HARNESS
29G	G/B	TO MAIN HARNESS
30G	B/Y	TO MAIN HARNESS
31G	P	TO MAIN HARNESS
32G	P	TO MAIN HARNESS
33G	Y/L	TO MAIN HARNESS
34G	GR	TO MAIN HARNESS
35G	G/R	TO MAIN HARNESS
36G	SB	TO MAIN HARNESS
37G	R/W	TO MAIN HARNESS
38G	BR	TO MAIN HARNESS
39G	BR	TO MAIN HARNESS
40G	-	TO MAIN HARNESS
41G	R/G	TO MAIN HARNESS
42G	O	TO MAIN HARNESS
43G	B	TO MAIN HARNESS
44G	R/Y	TO MAIN HARNESS
45G	G	TO MAIN HARNESS
46G	LG	TO MAIN HARNESS
47G	R	TO MAIN HARNESS
48G	W	TO MAIN HARNESS
49G	-	TO MAIN HARNESS
50G	BR	TO MAIN HARNESS
51G	R	TO MAIN HARNESS
52G	L	TO MAIN HARNESS
53G	W	TO MAIN HARNESS
54G	W	TO MAIN HARNESS
55G	G	TO MAIN HARNESS
56G	W	TO MAIN HARNESS
57G	Y	TO MAIN HARNESS
58G	BG	TO MAIN HARNESS
59G	BG	TO MAIN HARNESS
60G	BG	TO MAIN HARNESS
61G	B	TO MAIN HARNESS
62G	W	TO MAIN HARNESS
63G	R	TO MAIN HARNESS
64G	W/L	TO MAIN HARNESS
65G	W/R	TO MAIN HARNESS
66G	BG	TO MAIN HARNESS
67G	BG	TO MAIN HARNESS
68G	B	TO MAIN HARNESS
69G	Y	TO MAIN HARNESS
70G	L	TO MAIN HARNESS
71G	R/W	TO MAIN HARNESS
72G	L/W	TO MAIN HARNESS
73G	SHIELD	TO MAIN HARNESS

Terminal No.	Color of Wire	Signal Name
1G	G	TO MAIN HARNESS
2G	B/R	TO MAIN HARNESS
3G	W/B	TO MAIN HARNESS
4G	B/W	TO MAIN HARNESS
5G	BR	TO MAIN HARNESS
6G	P	TO MAIN HARNESS - (WITH VK56VD)
6G	R/W	TO MAIN HARNESS - (WITH CUMMINS 5.0L)
7G	Y	TO MAIN HARNESS
8G	G	TO MAIN HARNESS
9G	R	TO MAIN HARNESS
10G	W	TO MAIN HARNESS
11G	R/G	TO MAIN HARNESS
12G	W/B	TO MAIN HARNESS
13G	BR	TO MAIN HARNESS
14G	Y/B	TO MAIN HARNESS
15G	G/W	TO MAIN HARNESS
16G	G	TO MAIN HARNESS
17G	G/Y	TO MAIN HARNESS
18G	G/Y	TO MAIN HARNESS
19G	Y/W	TO MAIN HARNESS
20G	G/Y	TO MAIN HARNESS
21G	B/Y	TO MAIN HARNESS
22G	G/R	TO MAIN HARNESS - (WITH CUMMINS 5.0L)

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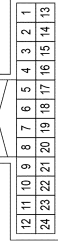
Terminal No.	Color of Wire	Signal Name
74G	W	TO MAIN HARNESS
75G	R	TO MAIN HARNESS
76G	R/G	TO MAIN HARNESS
77G	G	TO MAIN HARNESS
78G	W	TO MAIN HARNESS
79G	-	TO MAIN HARNESS
80G	R	TO MAIN HARNESS
81G	L	TO MAIN HARNESS
82G	R	TO MAIN HARNESS
83G	L	TO MAIN HARNESS
84G	L	TO MAIN HARNESS
85G	W/B	TO MAIN HARNESS
86G	B/R	TO MAIN HARNESS
87G	W/B	TO MAIN HARNESS
88G	P	TO MAIN HARNESS
89G	L	TO MAIN HARNESS
90G	G	TO MAIN HARNESS
91G	G	TO MAIN HARNESS
92G	V/W	TO MAIN HARNESS
93G	BR	TO MAIN HARNESS
94G	G	TO MAIN HARNESS
95G	G	TO MAIN HARNESS
96G	W	TO MAIN HARNESS
97G	R	TO MAIN HARNESS
98G	W/B	TO MAIN HARNESS
99G	BR	TO MAIN HARNESS
100G	GR/W	TO MAIN HARNESS

Connector No.	F9
Connector Name	RANGE SENSOR (WITH VK56VD)
Connector Type	RH03FB
Connector Color	BLACK



Terminal No.	Color of Wire	Signal Name
1	BR	RANGE 2 SENSOR INPUT
2	L/R	RANGE 1 SENSOR INPUT
3	B	GROUND

Connector No.	F14
Connector Name	WIRE TO WIRE
Connector Type	TH24FW-NH
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
1	L/R	TO ENGINE ROOM HARNESS
2	BR	TO ENGINE ROOM HARNESS
3	V	TO ENGINE ROOM HARNESS
4	L/O	TO ENGINE ROOM HARNESS
5	W	TO ENGINE ROOM HARNESS
6	P	TO ENGINE ROOM HARNESS
7	Y/R	TO ENGINE ROOM HARNESS
8	BR	TO ENGINE ROOM HARNESS
9	W/L	TO ENGINE ROOM HARNESS
10	L/Y	TO ENGINE ROOM HARNESS
11	SB	TO ENGINE ROOM HARNESS
12	L	TO ENGINE ROOM HARNESS
13	W/R	TO ENGINE ROOM HARNESS
14	Y	TO ENGINE ROOM HARNESS
15	B	TO ENGINE ROOM HARNESS
16	B	TO ENGINE ROOM HARNESS
17	Y/R	TO ENGINE ROOM HARNESS
18	B	TO ENGINE ROOM HARNESS
19	B/R	TO ENGINE ROOM HARNESS
20	GR	TO ENGINE ROOM HARNESS
21	W/R	TO ENGINE ROOM HARNESS
22	SHIELD	TO ENGINE ROOM HARNESS
23	SHIELD	TO ENGINE ROOM HARNESS
24	P	TO ENGINE ROOM HARNESS

A B C DLN E F G H I J K L M N O P

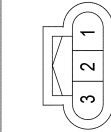
4WD SYSTEM

< WIRING DIAGRAM >

[TRANSFER: TX91A]

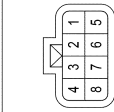
4WD SYSTEM CONNECTORS - WITH VK56VD

Connector No.	F18
Connector Name	TRANSFER ROTARY POSITION SENSOR (WITH VK56VD)
Connector Type	RH03FB
Connector Color	BLACK



H.S.

Connector No.	F32
Connector Name	WIRE TO WIRE
Connector Type	RS08FGY-PR
Connector Color	GRAY

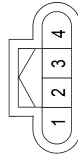


H.S.

Terminal No.	Color of Wire	Signal Name
1	W/R	RPS INPUT
2	L/O	RPS +5V
3	Y	RPS GROUND

H.S.

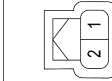
Connector No.	F27
Connector Name	TRANSFER MOTOR (WITH VK56VD)
Connector Type	RH04FB
Connector Color	BLACK



Terminal No.	Color of Wire	Signal Name
1	L	MOTOR A
2	-	-
3	-	-
4	BR	MOTOR B

Terminal No.	Color of Wire	Signal Name
1	W	TO ENGINE ROOM HARNESS
2	L	TO ENGINE ROOM HARNESS
3	RAW	TO ENGINE ROOM HARNESS
4	W	TO ENGINE ROOM HARNESS
5	SHIELD	TO ENGINE ROOM HARNESS
6	B	TO ENGINE ROOM HARNESS
7	BR	TO ENGINE ROOM HARNESS
8	B	TO ENGINE ROOM HARNESS

Connector No.	F40
Connector Name	MODE SENSOR (WITH VK56VD)
Connector Type	RH02FB
Connector Color	BLACK



H.S.

Terminal No.	Color of Wire	Signal Name
1	V	MODE SENSOR INPUT
2	B	GROUND

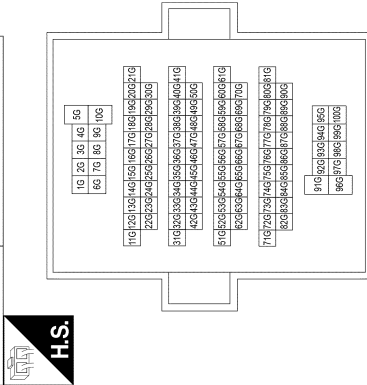
4WD SYSTEM

< WIRING DIAGRAM >

[TRANSFER: TX91A]

4WD SYSTEM CONNECTORS - WITH VK56VD

Connector No.	M31
Connector Name	WIRE TO WIRE
Connector Type	TH80FW-CS16-TM4
Connector Color	WHITE



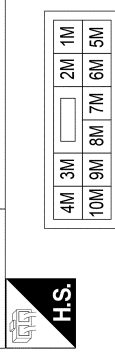
25G	P/W	TO ENGINE ROOM HARNESS
26G	R	TO ENGINE ROOM HARNESS
27G	LG	TO ENGINE ROOM HARNESS
28G	G/B	TO ENGINE ROOM HARNESS
29G	G/B	TO ENGINE ROOM HARNESS
30G	B/Y	TO ENGINE ROOM HARNESS
31G	R	TO ENGINE ROOM HARNESS
32G	R	TO ENGINE ROOM HARNESS
33G	Y/L	TO ENGINE ROOM HARNESS
34G	GR	TO ENGINE ROOM HARNESS
35G	G/R	TO ENGINE ROOM HARNESS
36G	SB	TO ENGINE ROOM HARNESS
37G	P/W	TO ENGINE ROOM HARNESS
38G	BR	TO ENGINE ROOM HARNESS
39G	BR	TO ENGINE ROOM HARNESS
40G	-	TO ENGINE ROOM HARNESS
41G	P/G	TO ENGINE ROOM HARNESS
42G	O	TO ENGINE ROOM HARNESS
43G	G	TO ENGINE ROOM HARNESS
44G	P/Y	TO ENGINE ROOM HARNESS
45G	G	TO ENGINE ROOM HARNESS
46G	LG	TO ENGINE ROOM HARNESS
47G	R	TO ENGINE ROOM HARNESS
48G	W	TO ENGINE ROOM HARNESS
49G	-	TO ENGINE ROOM HARNESS
50G	BR	TO ENGINE ROOM HARNESS
51G	R	TO ENGINE ROOM HARNESS
52G	L	TO ENGINE ROOM HARNESS
53G	W	TO ENGINE ROOM HARNESS
54G	W	TO ENGINE ROOM HARNESS
55G	G	TO ENGINE ROOM HARNESS
56G	W	TO ENGINE ROOM HARNESS
57G	Y	TO ENGINE ROOM HARNESS
58G	BG	TO ENGINE ROOM HARNESS
59G	BG	TO ENGINE ROOM HARNESS
60G	BG	TO ENGINE ROOM HARNESS
61G	O	TO ENGINE ROOM HARNESS
62G	W	TO ENGINE ROOM HARNESS
63G	O	TO ENGINE ROOM HARNESS
64G	W/L	TO ENGINE ROOM HARNESS
65G	W/R	TO ENGINE ROOM HARNESS
66G	BG	TO ENGINE ROOM HARNESS
67G	O	TO ENGINE ROOM HARNESS
68G	B	TO ENGINE ROOM HARNESS
69G	Y	TO ENGINE ROOM HARNESS
70G	L	TO ENGINE ROOM HARNESS
71G	P/W	TO ENGINE ROOM HARNESS
72G	L/W	TO ENGINE ROOM HARNESS
73G	SHIELD	TO ENGINE ROOM HARNESS
74G	W	TO ENGINE ROOM HARNESS
75G	R	TO ENGINE ROOM HARNESS
76G	P/G	TO ENGINE ROOM HARNESS
77G	BG	TO ENGINE ROOM HARNESS

Terminal No.	Color of Wire	Signal Name
1G	G	TO ENGINE ROOM HARNESS
2G	B/R	TO ENGINE ROOM HARNESS
3G	W	TO ENGINE ROOM HARNESS
4G	B/W	TO ENGINE ROOM HARNESS
5G	BR	TO ENGINE ROOM HARNESS
6G	P/W	TO ENGINE ROOM HARNESS
7G	Y	TO ENGINE ROOM HARNESS
8G	G	TO ENGINE ROOM HARNESS
9G	R	TO ENGINE ROOM HARNESS
10G	W	TO ENGINE ROOM HARNESS
11G	P/G	TO ENGINE ROOM HARNESS
12G	W/B	TO ENGINE ROOM HARNESS
13G	BR	TO ENGINE ROOM HARNESS
14G	Y/B	TO ENGINE ROOM HARNESS
15G	G/W	TO ENGINE ROOM HARNESS
16G	G	TO ENGINE ROOM HARNESS
17G	O	TO ENGINE ROOM HARNESS
18G	G/Y	TO ENGINE ROOM HARNESS
19G	Y/W	TO ENGINE ROOM HARNESS
20G	G/Y	TO ENGINE ROOM HARNESS
21G	B/Y	TO ENGINE ROOM HARNESS
22G	G/R	TO ENGINE ROOM HARNESS - (WITH CUMMINS 5.0L)
23G	G/Y	TO ENGINE ROOM HARNESS - (WITH VK56VD)
24G	Y/R	TO ENGINE ROOM HARNESS
25G	G/B	TO ENGINE ROOM HARNESS

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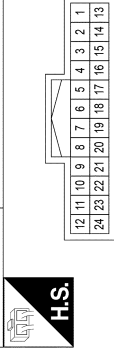
76G	P	TO ENGINE ROOM HARNESS
76G	-	TO ENGINE ROOM HARNESS
80G	R	TO ENGINE ROOM HARNESS
81G	L	TO ENGINE ROOM HARNESS
82G	R	TO ENGINE ROOM HARNESS
83G	L	TO ENGINE ROOM HARNESS
84G	L	TO ENGINE ROOM HARNESS
85G	W	TO ENGINE ROOM HARNESS
86G	B/R	TO ENGINE ROOM HARNESS
87G	W	TO ENGINE ROOM HARNESS
88G	G	TO ENGINE ROOM HARNESS
89G	P	TO ENGINE ROOM HARNESS
90G	G	TO ENGINE ROOM HARNESS
91G	P	TO ENGINE ROOM HARNESS
92G	V/W	TO ENGINE ROOM HARNESS
93G	BR	TO ENGINE ROOM HARNESS
94G	B	TO ENGINE ROOM HARNESS
95G	G	TO ENGINE ROOM HARNESS
96G	R	TO ENGINE ROOM HARNESS
97G	R	TO ENGINE ROOM HARNESS
98G	W/B	TO ENGINE ROOM HARNESS
99G	R	TO ENGINE ROOM HARNESS
100G	GR/W	TO ENGINE ROOM HARNESS

Connector No.	M69
Connector Name	FUSE BLOCK (J/B)
Connector Type	NS10FW-CS
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
1M	GR	IGNITION
2M	-	-
3M	-	-
4M	-	-
5M	P/Y	BATTERY
6M	R/W	TAIL LAMP 2
7M	-	-
8M	-	-
9M	-	-
10M	W/R	IGNITION

Connector No.	M91
Connector Name	WIRE TO WIRE
Connector Type	TH24FW-NH
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
1	G/W	TO ENGINE ROOM HARNESS
2	P/W	TO ENGINE ROOM HARNESS
3	Y/R	TO ENGINE ROOM HARNESS
4	G/R	TO ENGINE ROOM HARNESS
5	G	TO ENGINE ROOM HARNESS
6	P	TO ENGINE ROOM HARNESS
7	O	TO ENGINE ROOM HARNESS
8	R	TO ENGINE ROOM HARNESS
9	G	TO ENGINE ROOM HARNESS
10	LG	TO ENGINE ROOM HARNESS
11	BR	TO ENGINE ROOM HARNESS
12	GR	TO ENGINE ROOM HARNESS
13	G	TO ENGINE ROOM HARNESS
14	BR	TO ENGINE ROOM HARNESS
15	-	TO ENGINE ROOM HARNESS
16	-	TO ENGINE ROOM HARNESS
17	W	TO ENGINE ROOM HARNESS
18	-	TO ENGINE ROOM HARNESS
19	Y/R	TO ENGINE ROOM HARNESS
20	G/W	TO ENGINE ROOM HARNESS
21	-	TO ENGINE ROOM HARNESS
22	-	TO ENGINE ROOM HARNESS
23	-	TO ENGINE ROOM HARNESS
24	O/L	TO ENGINE ROOM HARNESS

A B C DLN E F G H I J K L M N O P

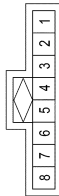
4WD SYSTEM

< WIRING DIAGRAM >

[TRANSFER: TX91A]

4WD SYSTEM CONNECTORS - WITH VK56VD

Connector No.	M141
Connector Name	4WD SHIFT SWITCH
Connector Type	A08FW
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
1	GR	ILLUMINATION -
2	-	-
3	Y/R	4WD SHIFT SWITCH 5V SUPPLY
4	G/W	2WD MODE SW
5	-	-
6	O	4H MODE SW
7	R	4LO MODE SW
8	L	ILLUMINATION +

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DIAGNOSIS AND REPAIR WORK FLOW

< BASIC INSPECTION >

[TRANSFER: TX91A]

BASIC INSPECTION

DIAGNOSIS AND REPAIR WORK FLOW

Work Flow

INFOID:0000000012556114

DETAILED FLOW

1. INTERVIEW FROM THE CUSTOMER

Clarify customer complaints before inspection. First of all, perform an interview utilizing [DLN-42, "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 fail-safe function. Refer to [DLN-27, "Fail-Safe"](#).

CAUTION:

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

>> GO TO 3.

3. PERFORM SELF-DIAGNOSIS

 **With CONSULT**

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

Is any DTC detected?

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

4. RECHECK SYMPTOM

 **With CONSULT**

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

NOTE:

If some DTCs are detected at the same time, determine the order for performing the diagnosis based on [DLN-27, "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-43, "Intermittent Incident"](#).

5. REPAIR OR REPLACE ERROR-DETECTED PARTS

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

>> GO TO 7.

6. IDENTIFY ERROR-DETECTED SYSTEM BY SYMPTOM DIAGNOSIS

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

Can the error-detected system be identified?

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DIAGNOSIS AND REPAIR WORK FLOW

< BASIC INSPECTION >

[TRANSFER: TX91A]

YES >> GO TO 7.

NO >> Check harness and connectors based on the information obtained by interview. Refer to [GI-43](#), "Intermittent Incident".

7.FINAL CHECK

With CONSULT

1. Check the reference value for "ALL MODE AWD/4WD".

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:000000012556115

Description

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

Interview sheet sample

Interview sheet					
Customer name	MR/MS	Registration number		Initial year registration	
		Vehicle type		VIN	
Storage date		Engine		Mileage	km (Mile)
Symptom	<input type="checkbox"/> Vehicle does not enter 4WD mode.				
	<input type="checkbox"/> 4WD warning lamp turns on.				
	<input type="checkbox"/> Heavy tight-corner braking symptom occurs				
	<input type="checkbox"/> Noise <input type="checkbox"/> Vibration				
	<input type="checkbox"/> Others ()				
First occurrence	<input type="checkbox"/> Recently <input type="checkbox"/> Others ()				
Frequency of occurrence	<input type="checkbox"/> Always <input type="checkbox"/> Under a certain conditions of <input type="checkbox"/> Sometimes (time(s)/day)				
Climate conditions	<input type="checkbox"/> Irrelevant				
	Weather	<input type="checkbox"/> Fine <input type="checkbox"/> Cloud <input type="checkbox"/> Rain <input type="checkbox"/> Snow <input type="checkbox"/> Others ()			
	Temperature	<input type="checkbox"/> Hot <input type="checkbox"/> Warm <input type="checkbox"/> Cool <input type="checkbox"/> Cold <input type="checkbox"/> Temperature [Approx. °C (°F)]			
Relative humidity		<input type="checkbox"/> High <input type="checkbox"/> Moderate <input type="checkbox"/> Low			
Road conditions		<input type="checkbox"/> Urban area <input type="checkbox"/> Suburb area <input type="checkbox"/> High way <input type="checkbox"/> Mounting road (uphill or down hill) <input type="checkbox"/> Rough road			
Operation conditions, etc.		<input type="checkbox"/> Irrelevant <input type="checkbox"/> When engine starts <input type="checkbox"/> During idling <input type="checkbox"/> During driving <input type="checkbox"/> During acceleration <input type="checkbox"/> At constant speed driving <input type="checkbox"/> During deceleration <input type="checkbox"/> During cornering (right curve or left curve)			

DIAGNOSIS AND REPAIR WORK FLOW

< BASIC INSPECTION >

[TRANSFER: TX91A]

Interview sheet

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

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Memo

DLN

TRANSFER ROTARY POSITION SENSOR LEARNING VALUE INITIALIZATION

< BASIC INSPECTION >

[TRANSFER: TX91A]

TRANSFER ROTARY POSITION SENSOR LEARNING VALUE INITIALIZATION

Description

INFOID:000000012556116

After replacing the following parts, transfer rotary position sensor learning value stored in the transfer control unit must be erased.

- Transfer assembly
- Transfer rotary position sensor

For how to erase the learning value, refer to [DLN-44. "Work Procedure"](#).

Work Procedure

INFOID:000000012556117

1. ERASE TRANSFER ROTARY POSITION SENSOR LEARNING VALUE

With CONSULT

1. Select "WORK SUPPORT" in "ALL MODE AWD/4WD".
2. Perform "RPS OFFSET LEARNING VALUE CLEAR" to the CONSULT display.

>> WORK END

P1804 TRANSFER CONTROL UNIT

< DTC/CIRCUIT DIAGNOSIS >

[TRANSFER: TX91A]

DTC/CIRCUIT DIAGNOSIS

P1804 TRANSFER CONTROL UNIT

DTC Description

INFOID:0000000012556118

DTC DETECTION LOGIC

Malfunction is detected in the memory (EEPROM) system of transfer control unit.

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition	
		Diagnosis condition	Ignition switch: ON
P1804	CONTROL UNIT 3 (Control unit 3)	Signal	—
		Threshold	Malfunction is detected in the memory (EEPROM) system of transfer control unit.
		Diagnosis delay time	—

POSSIBLE CAUSE

Transfer control unit

FAIL-SAFE

No impact to vehicle behavior.

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

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

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

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

Is DTC "P1804" detected?

- YES >> Proceed to diagnosis procedure. Refer to [DLN-45, "Diagnosis Procedure"](#).
NO-1 >> To check malfunction symptom before repair: Refer to [GI-43, "Intermittent Incident"](#).
NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000012556119

1. PERFORM SELF-DIAGNOSIS

With CONSULT

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

Is DTC "P1804" detected?

- YES >> Replace transfer control unit. Refer to [DLN-100, "Removal and Installation"](#).
NO >> Check transfer control unit pin terminals for damage or loose connection with harness connector.
If any items are damaged, repair or replace error-detected parts.

P1808 VEHICLE SPEED SENSOR (ABS)

< DTC/CIRCUIT DIAGNOSIS >

[TRANSFER: TX91A]

P1808 VEHICLE SPEED SENSOR (ABS)

DTC Description

INFOID:000000012556120

DTC DETECTION LOGIC

Malfunction is detected in vehicle speed signal that is output from ABS actuator and electric unit (control unit) through CAN communication.

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition	
P1808	VHCL SPEED SEN-ABS (Vehicle speed sensor-ABS)	Diagnosis condition	Vehicle speed: 30 km/h (19 MPH) or more
		Signal	Vehicle speed signal
		Threshold	Malfunction is detected in vehicle speed signal that is output from ABS actuator and electric unit (control unit) through CAN communication.
		Diagnosis delay time	20 seconds or more

POSSIBLE CAUSE

- Harness or connector (CAN communication line)
- ABS actuator and electric unit (control unit)

FAIL-SAFE

4WD mode cannot be switched by operating 4WD shift switch.

DTC CONFIRMATION PROCEDURE

CAUTION:

Be careful of the driving speed.

1. PRECONDITIONING

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

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Start the engine.
2. Drive vehicle and maintain the following conditions for 20 seconds or more.

Vehicle speed : 30 km/h (19 MPH) or more

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

Is DTC "P1808" detected?

- YES >> Proceed to diagnosis procedure. Refer to [DLN-46, "Diagnosis Procedure"](#).
- NO-1 >> To check malfunction symptom before repair: Refer to [GI-43, "Intermittent Incident"](#).
- NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:000000012556121

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

With CONSULT

1. Turn the ignition switch ON.
2. Perform self-diagnosis for "ABS".

Is any DTCs detected?

- YES >> Check DTC detected item. Refer to [BRC-55, "DTC Index"](#).
- NO >> INSPECTION END

P1809 TRANSFER CONTROL UNIT

< DTC/CIRCUIT DIAGNOSIS >

[TRANSFER: TX91A]

P1809 TRANSFER CONTROL UNIT

DTC Description

INFOID:000000013494840

DTC DETECTION LOGIC

AD converter system of transfer control unit is malfunctioning.

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition	
P1809	CONTROL UNIT 4 (Control unit 4)	Diagnosis condition	Ignition switch: ON
		Signal	—
		Threshold	AD converter system of transfer control unit is malfunctioning.
		Diagnosis delay time	—

POSSIBLE CAUSE

Transfer control unit

FAIL-SAFE

4WD mode cannot be switched by operating 4WD shift switch.

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

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

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

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

Is DTC "P1809" detected?

- YES >> Proceed to diagnosis procedure. Refer to [DLN-47, "Diagnosis Procedure"](#).
NO-1 >> To check malfunction symptom before repair: Refer to [GI-43, "Intermittent Incident"](#).
NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:000000013494841

1. PERFORM SELF-DIAGNOSIS

With CONSULT

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

Is DTC "P1809" detected?

- YES >> Replace transfer control unit. Refer to [DLN-100, "Removal and Installation"](#).
NO >> Check transfer control unit pin terminals for damage or loose connection with harness connector.
If any items are damaged, repair or replace error-detected parts.

P180C SENSOR POWER SUPPLY (5V)

< DTC/CIRCUIT DIAGNOSIS >

[TRANSFER: TX91A]

P180C SENSOR POWER SUPPLY (5V)

DTC Description

INFOID:000000012556122

DTC DETECTION LOGIC

Malfunction is detected in 5V power supply circuit.

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition	
P180C	SEN POWER SUPPLY (5V) [Sensor power supply (5V)]	Diagnosis condition	Ignition switch: ON
		Signal	—
		Threshold	Malfunction is detected in 5V power supply circuit
		Diagnosis delay time	—

POSSIBLE CAUSE

- Transfer rotary position sensor 5V power supply circuit
- 4WD shift switch 5V power supply circuit

FAIL-SAFE

4WD mode cannot be switched by operating 4WD shift switch.

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

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

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

Ⓟ With CONSULT

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

Is DTC "P180C" detected?

- YES >> Proceed to diagnosis procedure. Refer to [DLN-48, "Diagnosis Procedure"](#).
NO-1 >> To check malfunction symptom before repair: Refer to [GI-43, "Intermittent Incident"](#).
NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:000000012556123

1. CHECK TRANSFER ROTARY POSITION SENSOR POWER SUPPLY

1. Turn the ignition switch OFF.
2. Connect transfer rotary position sensor harness connector.
3. Turn the ignition switch ON.
CAUTION:
Never start the engine.
4. Check the voltage between transfer rotary position sensor harness connector and ground.

Transfer rotary position sensor		—	Voltage
Connector	Terminal		
F219 (Cummins 5.0L)	2	Ground	Approx. 5 V
F18 (VK56VD)			

Is the inspection result normal?

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

P180C SENSOR POWER SUPPLY (5V)

< DTC/CIRCUIT DIAGNOSIS >

[TRANSFER: TX91A]

2. CHECK TRANSFER ROTARY POSITION SENSOR CIRCUIT

1. Turn the ignition switch OFF.
2. Disconnect transfer control unit harness connector.
3. Check the continuity between transfer control unit harness connector and transfer rotary position sensor harness connector.

Transfer control unit		Transfer rotary position sensor		Continuity
Connector	Terminal	Connector	Terminal	
E142	5	F219 (Cummins 5.0L)	2	Existed
		F18 (VK56VD)		

4. Check the continuity between transfer rotary position sensor harness connector and ground.

Transfer rotary position sensor		—	Continuity
Connector	Terminal		
F219 (Cummins 5.0L)	2	Ground	Not existed
F18 (VK56VD)			

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair or replace error-detected parts.

3. CHECK 4WD SHIFT SWITCH POWER SUPPLY

1. Turn the ignition switch OFF.
2. Connect 4WD shift switch harness connector.
3. Turn the ignition switch ON.
CAUTION:
Never start the engine.
4. Check the voltage between 4WD shift switch harness connector and ground.

4WD shift switch		—	Voltage
Connector	Terminal		
M141	3	Ground	Approx. 5 V

Is the inspection result normal?

YES >> INSPECTION END

NO >> GO TO 4.

4. CHECK 4WD SHIFT SWITCH CIRCUIT

1. Turn the ignition switch OFF.
2. Disconnect transfer control unit harness connector.
3. Check the continuity between transfer control unit harness connector and 4WD shift switch harness connector.

Transfer control unit		4WD shift switch		Continuity
Connector	Terminal	Connector	Terminal	
E142	9	M141	3	Existed

4. Check the continuity between 4WD shift switch harness connector and ground.

4WD shift switch		—	Continuity
Connector	Terminal		
M141	3	Ground	Not existed

Is the inspection result normal?

YES >> INSPECTION END

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P180C SENSOR POWER SUPPLY (5V)

< DTC/CIRCUIT DIAGNOSIS >

[TRANSFER: TX91A]

NO >> Repair or replace error-detected parts.

P180D TRANSFER ROTARY POSITION SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[TRANSFER: TX91A]

P180D TRANSFER ROTARY POSITION SENSOR

DTC Description

INFOID:000000012556124

DTC DETECTION LOGIC

Deviation exists between actual angle detected by transfer rotary position sensor and the one recognized by transfer control unit.

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition	
P180D	ROTARY POSITION SEN (Rotary position sensor)	Diagnosis condition	Ignition switch: ON
		Signal	—
		Threshold	Deviation exists between actual angle detected by transfer rotary position sensor and the one recognized by transfer control unit
		Diagnosis delay time	—

POSSIBLE CAUSE

- Transfer rotary position sensor
- Transfer control unit

NOTE:

The transfer rotary position sensor learning value may be left unerased after the replacement of transfer assembly or transfer rotary position sensor.

FAIL-SAFE

4WD mode cannot be switched by operating 4WD shift switch.

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

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

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

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

Is DTC "P180D" detected?

- YES >> Proceed to diagnosis procedure. Refer to [DLN-51, "Diagnosis Procedure"](#).
- NO-1 >> To check malfunction symptom before repair: Refer to [GI-43, "Intermittent Incident"](#).
- NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:000000012556125

1. CHECK TRANSFER ROTARY POSITION SENSOR SIGNAL

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

P180D TRANSFER ROTARY POSITION SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[TRANSFER: TX91A]

+		-	Voltage
Transfer control unit			
Connector	Terminal		
E142	15	Ground	

- Start the engine.
- On CONSULT screen, select "ALL MODE AWD/4WD" >> "DATA MONITOR" >> "ROTARY POSITION SENSOR".
- Check that the "ROTARY POSITION SENSOR" value.

Monitor Item	Condition	Value
ROTARY POSITION SENSOR	4WD mode: 2WD	11 – 14%
	4WD mode: 4H	34 – 44%
	4WD mode: 4LO	75 – 85%

Is the inspection result normal?

- YES >> Replace transfer control unit. Refer to [DLN-100. "Removal and Installation"](#).
 NO >> GO TO 2.

2. CHECK TRANSFER ROTARY POSITION SENSOR POWER SUPPLY

- Turn the ignition switch OFF.
- Disconnect transfer rotary position sensor harness connector.
- Turn the ignition switch ON.
CAUTION:
Never start the engine.
- Check the voltage between transfer rotary position sensor harness connector terminals.

+		-	Voltage
Transfer rotary position sensor			
Connector	Terminal		
F219 (with Cummins 5.0L)	2	3	Approx. 5 V
F18 (with VK56VD)			

Is the inspection result normal?

- YES >> GO TO 4.
 NO >> GO TO 3.

3. CHECK TRANSFER ROTARY POSITION SENSOR CIRCUIT

- Turn the ignition switch OFF.
- Disconnect transfer control unit harness connector.
- Check the continuity between transfer control unit harness connector and transfer rotary position sensor harness connector.

P180D TRANSFER ROTARY POSITION SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[TRANSFER: TX91A]

Transfer control unit		Transfer rotary position sensor		Continuity
Connector	Terminal	Connector	Terminal	
E142	5	F219 (with Cummins 5.0L)	2	Existed
	6		3	
	5	F18 (with VK56VD)	2	
	6		3	

4. Check the continuity between transfer rotary position sensor harness connector and ground.

Transfer rotary position sensor		—	Continuity
Connector	Terminal		
F219 (with Cummins 5.0L)	2	Ground	Not existed
	3		
F18 (with VK56VD)	2		
	3		

Is the inspection result normal?

YES >> Replace transfer rotary position sensor. Refer to [DLN-106, "Removal and Installation"](#).

NO >> Repair or replace error-detected parts.

4. CHECK TRANSFER ROTARY POSITION SENSOR SIGNAL CIRCUIT

1. Turn the ignition switch OFF.
2. Disconnect transfer control unit harness connector.
3. Check the continuity between transfer control unit harness connector and transfer rotary position sensor harness connector.

Transfer control unit		Transfer rotary position sensor		Continuity
Connector	Terminal	Connector	Terminal	
E142	15	F219 (with Cummins 5.0L)	1	Existed
		F18 (with VK56VD)		

4. Check the continuity between transfer rotary position sensor harness connector and ground.

Transfer rotary position sensor		—	Continuity
Connector	Terminal		
F219 (with Cummins 5.0L)	1	Ground	Not existed
F18 (with VK56VD)			

Is the inspection result normal?

YES >> INSPECTION END

NO >> Repair or replace error-detected parts.

P180F MOTOR SYSTEM

DTC Description

INFOID:000000012556126

DTC DETECTION LOGIC

Malfunction is detected in transfer motor system.

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition	
P180F	MOTOR SYSTEM (Motor system)	Diagnosis condition	When all of the following conditions are satisfied: <ul style="list-style-type: none"> • Engine running • Transfer motor driving
		Signal	Motor drive (terminal #11 and #12)
		Threshold	Malfunction is detected in transfer motor system.
		Diagnosis delay time	—

POSSIBLE CAUSE

- Transfer control unit
- Transfer motor
- Harness or connectors (Transfer motor circuit are open or shorted)

FAIL-SAFE

4WD mode cannot be switched by operating 4WD shift switch.

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

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

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Turn the ignition switch OFF.
2. Start the engine.
3. Turn the 4WD shift switch 2WD → 4H → 4LO.

CAUTION:

Hold the 4WD shift switch at each position for 5 seconds or more.

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

Is DTC "P180F" detected?

- YES >> Proceed to diagnosis procedure. Refer to [DLN-54, "Diagnosis Procedure"](#).
- NO-1 >> To check malfunction symptom before repair: Refer to [GI-43, "Intermittent Incident"](#).
- NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:000000012556127

1. CHECK TRANSFER MOTOR CIRCUIT

1. Turn the ignition switch OFF.
2. Disconnect transfer control unit harness connector.
3. Disconnect transfer motor harness connector.
4. Check continuity between transfer control unit harness connector and transfer motor harness connector.

P180F MOTOR SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

[TRANSFER: TX91A]

Transfer control unit		Transfer motor		Continuity
Connector	Terminal	Connector	Terminal	
E142	11	F221 (with Cummins 5.0L)	1	Existed
	12		4	
	11	F27 (with VK56VD)	1	
	12		4	

5. Check the continuity between transfer motor harness connector and the ground.

Transfer motor		—	Continuity
Connector	Terminal		
F221 (with Cummins 5.0L)	1	Ground	Not existed
	4		
F27 (with VK56VD)	1		
	4		

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace error-detected parts.

2.CHECK TRANSFER MOTOR

Check the transfer motor. Refer to [DLN-55, "Component Inspection"](#).

Is the inspection result normal?

YES >> Replace the transfer control unit. Refer to [DLN-100, "Removal and Installation"](#).

NO >> Replace the transfer motor. Refer to [DLN-107, "Removal and Installation"](#).

Component Inspection

INFOID:0000000012556128

1.CHECK TRANSFER MOTOR

1. Remove transfer motor. Refer to [DLN-107, "Removal and Installation"](#).

2. Check the resistance between transfer motor terminals.

Transfer motor		Resistance
Terminal		
1	4	0.25 – 0.3 Ω

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace transfer motor. Refer to [DLN-107, "Removal and Installation"](#).

P1811 BATTERY VOLTAGE

< DTC/CIRCUIT DIAGNOSIS >

[TRANSFER: TX91A]

P1811 BATTERY VOLTAGE

DTC Description

INFOID:000000012556129

DTC DETECTION LOGIC

Malfunction is detected in transfer control unit power supply circuit when the engine is ON.

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition	
P1811	BATTERY VOLTAGE (Battery voltage)	Diagnosis condition	Engine running
		Signal	—
		Threshold	Malfunction is detected in transfer control unit power supply circuit when the engine is ON.
		Diagnosis delay time	2 seconds or more

POSSIBLE CAUSE

Harness or connector (transfer control unit power supply circuit is open or shorted)

FAIL-SAFE

4WD mode cannot be switched by operating 4WD shift switch.

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

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

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

Ⓟ With CONSULT

1. Start the engine and wait for 2 seconds or more.
2. Perform self-diagnosis for "ALL MODE AWD/4WD".

Is DTC "P1811" detected?

- YES >> Proceed to diagnosis procedure. Refer to [DLN-56, "Diagnosis Procedure"](#).
- NO-1 >> To check malfunction symptom before repair: Refer to [GI-43, "Intermittent Incident"](#).
- NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:000000012556130

1. CHECK TRANSFER CONTROL UNIT POWER SUPPLY (1)

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

Transfer control unit		—	Voltage
Connector	Terminal		
E142	1	Ground	Battery voltage

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

P1811 BATTERY VOLTAGE

< DTC/CIRCUIT DIAGNOSIS >

[TRANSFER: TX91A]

Transfer control unit		—	Voltage
Connector	Terminal		
E142	1	Ground	Battery voltage

Is the inspection result normal?

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

2.CHECK TRANSFER CONTROL UNIT POWER SUPPLY (2)

1. Turn the ignition switch OFF.
2. Check the 10A fuse (#59).
3. Check the harness for open or short between transfer control unit harness connector No.1 terminal and fuse box.

Is the inspection result normal?

- YES >> Perform the trouble diagnosis for power supply circuit. Refer to [PG-13, "Wiring Diagram - BATTERY POWER SUPPLY - WITH Cummins 5.0L -"](#).
- NO >> Repair or replace error-detected parts.

3.CHECK TRANSFER CONTROL UNIT POWER SUPPLY (3)

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

Transfer control unit		—	Voltage
Connector	Terminal		
E142	4	Ground	Approx. 0 V

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

Transfer control unit		—	Voltage
Connector	Terminal		
E142	4	Ground	Battery voltage

Is the inspection result normal?

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

4.CHECK TRANSFER CONTROL UNIT POWER SUPPLY (4)

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 transfer control unit harness connector and fuse block (J/B) harness connector.

Fuse block (J/B)		Transfer control unit		Continuity
Connector	Terminal	Connector	Terminal	
M69	1M	E142	4	Existed

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

Transfer control unit		—	Continuity
Connector	Terminal		
E142	4	Ground	Not existed

P1811 BATTERY VOLTAGE

< DTC/CIRCUIT DIAGNOSIS >

[TRANSFER: TX91A]

Is the inspection result normal?

YES >> Perform the trouble diagnosis for ignition power supply circuit. Refer to [PG-71, "Wiring Diagram - IGNITION POWER SUPPLY - WITH Cummins 5.0L -"](#).

NO >> Repair or replace error-detected parts.

5. CHECK TRANSFER CONTROL UNIT GROUND

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

Transfer control unit		—	Voltage
Connector	Terminal		
E142	2	Ground	Approx. 0 V
	3		

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

Transfer control unit		—	Continuity
Connector	Terminal		
E142	2	Ground	Existed
	3		

Is the inspection result normal?

YES >> INSPECTION END

NO >> Repair or replace error-detected parts.

P1813 4WD MODE SWITCH

< DTC/CIRCUIT DIAGNOSIS >

[TRANSFER: TX91A]

P1813 4WD MODE SWITCH

DTC Description

INFOID:000000012556131

DTC DETECTION LOGIC

Multiple signals received from 4WD shift switch are detected.

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition	
P1813	4WD MODE SW (4WD mode switch)	Diagnosis condition	When all of the following conditions are satisfied: <ul style="list-style-type: none">• Engine running• 4WD shift switch is switched
		Signal	4WD shift switch (terminal #18, #19 and #20)
		Threshold	Multiple signals received from 4WD shift switch are detected.
		Diagnosis delay time	1 seconds or more

POSSIBLE CAUSE

- 4WD shift switch
- Transfer control unit

FAIL-SAFE

When malfunction occurs due to duplicate input, the control continues according to the 4WD mode priority (2WD → 4H → 4LO). (For malfunction with no input, 4WD mode running at the occurrence of malfunction is maintained.)

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

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

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Turn the ignition switch OFF.
2. Start the engine.
3. Turn the 4WD shift switch 2WD → 4H → 4LO.

CAUTION:

Hold the 4WD shift switch at each position for 1 seconds or more.

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

Is DTC "P1813" detected?

- YES >> Proceed to diagnosis procedure. Refer to [DLN-59, "Diagnosis Procedure"](#).
NO-1 >> To check malfunction symptom before repair: Refer to [GI-43, "Intermittent Incident"](#).
NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:000000012556132

1. CHECK 4WD SHIFT SWITCH

Check 4WD shift switch. Refer to [DLN-60, "Component Inspection"](#).

Is the inspection result normal?

- YES >> GO TO 2.
NO >> Replace 4WD shift switch. Refer to [DLN-101, "Removal and Installation"](#).

2. CHECK 4WD SHIFT SWITCH CIRCUIT (1)

1. Disconnect transfer control unit harness connector.

P1813 4WD MODE SWITCH

< DTC/CIRCUIT DIAGNOSIS >

[TRANSFER: TX91A]

- Check the continuity between transfer control unit harness connector and 4WD shift switch harness connector.

Transfer control unit		4WD shift switch		Continuity
Connector	Terminal	Connector	Terminal	
E142	18	M141	3	Not existed
			4	Existed
			6	Not existed
			7	Not existed
	19		3	Not existed
			4	Not existed
			6	Existed
			7	Not existed
	20		3	Not existed
			4	Not existed
			6	Not existed
			7	Existed

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair or replace error-detected parts.

3.CHECK 4WD SHIFT SWITCH CIRCUIT (2)

Check the continuity between 4WD shift switch harness connector and ground.

4WD shift switch		—	Continuity
Connector	Terminal		
M141	4	Ground	Not existed
	6		
	7		

Is the inspection result normal?

YES >> Replace transfer control unit. Refer to [DLN-100, "Removal and Installation"](#).

NO >> Repair or replace error-detected parts.

Component Inspection

INFOID:000000012556133

1.CHECK 4WD SHIFT SWITCH

- Turn the ignition switch OFF.
- Remove 4WD shift switch. Refer to [DLN-101, "Removal and Installation"](#).
- Check the continuity between 4WD shift switch harness connector terminals.

4WD shift switch		Condition	Continuity
Terminal			
3	4	4WD shift switch: 2WD	Existed
		4WD shift switch: 4H or 4LO	Not existed
3	6	4WD shift switch: 4H	Existed
		4WD shift switch: 2WD or 4LO	Not existed
3	7	4WD shift switch: 4LO	Existed
		4WD shift switch: 2WD or 4H	Not existed

Is the inspection result normal?

P1813 4WD MODE SWITCH

< DTC/CIRCUIT DIAGNOSIS >

[TRANSFER: TX91A]

YES >> INSPECTION END

NO >> Replace 4WD shift switch. Refer to [DLN-101, "Removal and Installation"](#).

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P1814 4WD DETECT SWITCH

< DTC/CIRCUIT DIAGNOSIS >

[TRANSFER: TX91A]

P1814 4WD DETECT SWITCH

DTC Description

INFOID:000000012556134

DTC DETECTION LOGIC

Mode sensor detects 2WD despite 4WD recognized by transfer rotary position sensor.

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition	
P1814	4WD DETECT SWITCH (4WD detect switch)	Diagnosis condition	When all of the following conditions are satisfied: <ul style="list-style-type: none">• Ignition switch: ON• Vehicle: 4H or 4LO
		Signal	Mode sensor input (terminal #23)
		Threshold	Mode sensor detects 2WD despite 4WD recognized by transfer rotary position sensor.
		Diagnosis delay time	5 seconds or more

POSSIBLE CAUSE

- Mode sensor
- Harness or connector (Mode sensor circuit is open or shorted)

FAIL-SAFE

After a malfunction is confirmed, 4WD mode can be switchable. (4WD mode temporarily not switchable only during diagnosis)

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

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

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

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

Is DTC "P1814" detected?

- YES >> Proceed to diagnosis procedure. Refer to [DLN-62. "Diagnosis Procedure"](#).
NO-1 >> To check malfunction symptom before repair: Refer to [GI-43. "Intermittent Incident"](#).
NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:000000012556135

1. CHECK MODE SENSOR SIGNAL

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

Transfer control unit		—	Condition	Voltage
Connector	Terminal			
E142	23	Ground	4WD shift switch: 2WD	Approx. 5 V
			4WD shift switch: 4H	Approx. 0 V
			4WD shift switch: 4LO	Approx. 0 V

Is any DTCs detected?

YES >> INSPECTION END

P1814 4WD DETECT SWITCH

< DTC/CIRCUIT DIAGNOSIS >

[TRANSFER: TX91A]

NO >> GO TO 2.

2.CHECK MODE SENSOR CIRCUIT

1. Turn the ignition switch OFF.
2. Disconnect transfer control unit harness connector.
3. Disconnect mode sensor harness connector.
4. Check the continuity between transfer control unit harness connector and mode sensor harness connector.

Transfer control unit		Mode sensor		Continuity
Connector	Terminal	Connector	Terminal	
E142	23	F217 (with Cummins 5.0L)		Existed
		F40 (with VK56V)		

5. Check the continuity between mode sensor harness connector and ground.

Mode sensor		—	Continuity
Connector	Terminal		
F217 (with Cummins 5.0L)	1	Ground	Not existed
F40 (with VK56VD)			

Is inspection result normal?

YES >> GO TO 3.

NO >> Repair or replace error-detected parts.

3.CHECK MODE SENSOR GROUND

Check the continuity between mode sensor harness connector and ground.

Mode sensor		—	Continuity
Connector	Terminal		
F217 (with Cummins 5.0L)	2	Ground	Existed
F40 (with VK56VD)			

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair or replace error-detected parts.

4.CHECK MODE SENSOR

Check the mode sensor. Refer to [DLN-63, "Component Inspection"](#).

Is the inspection result normal?

YES >> INSPECTION END

NO >> Repair mode sensor. Refer to [DLN-108, "Removal and Installation"](#).

Component Inspection

INFOID:000000012556136

1.CHECK MODE SENSOR

1. Turn the ignition switch OFF.
2. Remove mode sensor. Refer to [DLN-108, "Removal and Installation"](#).
3. Check the continuity between mode sensor harness connector terminals.

Mode sensor		Condition	Continuity
Terminal			
1	2	While pushing switch of mode sensor.	Existed
		Other than the above.	Not existed

Is the inspection result normal?

P1814 4WD DETECT SWITCH

< DTC/CIRCUIT DIAGNOSIS >

[TRANSFER: TX91A]

YES >> INSPECTION END

NO >> Replace mode sensor. Refer to [DLN-108, "Removal and Installation"](#).

P1816 TRANSMISSION RANGE SWITCH

< DTC/CIRCUIT DIAGNOSIS >

[TRANSFER: TX91A]

P1816 TRANSMISSION RANGE SWITCH

DTC Description

INFOID:000000012556137

DTC DETECTION LOGIC

Malfunction is detected in shift position signal that is output from TCM through CAN communication.

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition	
P1816	T/M RANGE SENSOR A (Transmission range sensor A)	Diagnosis condition	When all of the following conditions are satisfied: • Ignition switch: ON • A/T shift selector is operated
		Signal	Shift position signal
		Threshold	Malfunction is detected in shift position signal that is output from TCM through CAN communication.
		Diagnosis delay time	—

POSSIBLE CAUSE

- Harness or connector (CAN communication line)
- TCM
- A/T shift selector

FAIL-SAFE

4WD mode cannot be switched by operating 4WD shift switch.

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

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

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Turn the ignition switch OFF to ON.
2. Shift the A/T shift selector in P position.
3. Perform self-diagnosis for "ALL MODE AWD/4WD".

Is DTC "P1816" detected?

- YES >> Proceed to diagnosis procedure. Refer to [DLN-65, "Diagnosis Procedure"](#).
NO-1 >> To check malfunction symptom before repair: Refer to [GI-43, "Intermittent Incident"](#).
NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:000000012556138

1. CHECK DTC OF TCM

With CONSULT

1. Turn the ignition switch ON.
2. Perform self-diagnosis for "TRANSMISSION".

Is any DTCs detected?

- YES >> Check the DTC. Refer to [TM-68, "DTC Index"](#) (RE6R01A) or [TM-333, "DTC Index"](#) (RE7R01B).
NO >> INSPECTION END

P1817 TRANSFER MOTOR

< DTC/CIRCUIT DIAGNOSIS >

[TRANSFER: TX91A]

P1817 TRANSFER MOTOR

DTC Description

INFOID:000000012556139

DTC DETECTION LOGIC

Malfunction is detected in transfer motor.

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition	
P1817	SHIFT ACTUATOR (Shift actuator)	Diagnosis condition	When all of the following conditions are satisfied: <ul style="list-style-type: none">• Engine running• Transfer motor driving
		Signal	—
		Threshold	Malfunction is detected in transfer motor.
		Diagnosis delay time	5 seconds or more

POSSIBLE CAUSE

- Transfer motor
- Transfer assembly

FAIL-SAFE

4WD mode cannot be switched by operating 4WD shift switch.

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

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

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Turn the ignition switch OFF.
2. Start the engine.
3. Turn the 4WD shift switch 2WD → 4H → 4LO.

CAUTION:

Hold the 4WD shift switch at each position for 5 seconds or more.

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

Is DTC "P1817" detected?

- YES >> Proceed to diagnosis procedure. Refer to [DLN-66, "Diagnosis Procedure"](#).
NO-1 >> To check malfunction symptom before repair: Refer to [GI-43, "Intermittent Incident"](#).
NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:000000012556140

1. CHECK TRANSFER MOTOR (1)

1. Turn the ignition switch OFF.
2. Remove the transfer motor. Refer to [DLN-107, "Removal and Installation"](#).
3. Visually check transfer motor gear for damage.

Is the inspection result normal?

- YES >> GO TO 2.
NO >> Replace the transfer motor. Refer to [DLN-107, "Removal and Installation"](#).

2. CHECK TRANSFER MOTOR (2)

Check the transfer motor. Refer to [DLN-67, "Component Inspection"](#).

Is the inspection result normal?

P1817 TRANSFER MOTOR

< DTC/CIRCUIT DIAGNOSIS >

[TRANSFER: TX91A]

YES >> Replace the transfer assembly. Refer to [DLN-116, "Removal and Installation"](#).

NO >> Replace the transfer motor. Refer to [DLN-107, "Removal and Installation"](#).

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Component Inspection

INFOID:0000000012556141

1. CHECK TRANSFER MOTOR

B

1. Remove transfer motor. Refer to [DLN-107, "Removal and Installation"](#).

2. Check the resistance between transfer motor terminals.

C

Transfer motor		Resistance
Terminal		
1	4	0.25 – 0.3 Ω

DLN

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace transfer motor. Refer to [DLN-107, "Removal and Installation"](#).

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P1818 ACTUATOR POSITION SWITCH

< DTC/CIRCUIT DIAGNOSIS >

[TRANSFER: TX91A]

P1818 ACTUATOR POSITION SWITCH

DTC Description

INFOID:000000012556142

DTC DETECTION LOGIC

Malfunction is detected in signal from transfer rotary position sensor.

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition	
P1818	SHIFT ACT POSI SW (Shift actuator position switch)	Diagnosis condition	Ignition switch: ON
		Signal	—
		Threshold	Malfunction is detected in signal from transfer rotary position sensor.
		Diagnosis delay time	—

POSSIBLE CAUSE

- Transfer rotary position sensor
- Harness or connector (Transfer rotary position sensor circuit is open or shorted)

FAIL-SAFE

4WD mode cannot be switched by operating 4WD shift switch.

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

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

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

Ⓟ With CONSULT

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

Is DTC "P1818" detected?

- YES >> Proceed to diagnosis procedure. Refer to [DLN-68, "Diagnosis Procedure"](#).
 NO-1 >> To check malfunction symptom before repair: Refer to [GI-43, "Intermittent Incident"](#).
 NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:000000012556143

1. CHECK TRANSFER ROTARY POSITION SENSOR POWER SUPPLY

1. Turn the ignition switch OFF.
2. Disconnect transfer rotary position sensor harness connector.
3. Turn the ignition switch ON.
CAUTION:
Never start the engine.
4. Check the voltage between transfer rotary position sensor harness connector and ground.

+		-	Voltage (Approx.)
Transfer rotary position sensor Connector	Terminal		
F219 (with Cummins 5.0L)	2	Ground	5 V
F18 (with VK56VD)			

Is the inspection result normal?

YES >> GO TO 3.

P1818 ACTUATOR POSITION SWITCH

< DTC/CIRCUIT DIAGNOSIS >

[TRANSFER: TX91A]

NO >> GO TO 2.

2. CHECK TRANSFER ROTARY POSITION SENSOR POWER SUPPLY CIRCUIT

1. Turn the ignition switch OFF.
2. Disconnect transfer control unit harness connector.
3. Check the continuity between transfer control unit harness connector and transfer rotary position sensor harness connector.

+		-		Continuity
Transfer control unit		Transfer rotary position sensor		
Connector	Terminal	Connector	Terminal	
E142	5	F219 (with Cummins 5.0L)	2	Existed
		F18 (with VK56VD)		

4. Check harness for short to ground and short to power.

Is the inspection result normal?

YES >> Perform trouble diagnosis for transfer control unit power supply circuit. Refer to [DLN-88, "Diagnosis Procedure"](#).

NO >> Repair or replace error-detected parts.

3. CHECK TRANSFER ROTARY POSITION SENSOR SIGNAL CIRCUIT

1. Turn the ignition switch OFF.
2. Disconnect transfer control unit harness connector.
3. Check the continuity between transfer control unit harness connector and transfer rotary position sensor harness connector.

+		-		Continuity
Transfer control unit		Transfer rotary position sensor		
Connector	Terminal	Connector	Terminal	
E142	6	F219 (Cummins 5.0L)	3	Existed
	15		1	
	6	F18 (VK56VD)	3	
	15		1	

4. Check harness for short to ground and short to power.

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair or replace error-detected parts.

4. CHECK TRANSFER ROTARY POSITION SENSOR SIGNAL

 **With CONSULT**


1. Reconnect all harness connectors disconnected.
2. Turn ignition switch ON.
3. On CONSULT screen, select "ALL MODE AWD/4WD" >> "DATA MONITOR" >> "ROTARY POSITION SENSOR".

Is the indicated value "100%"?

YES >> GO TO 5.

NO >> GO TO 7.

5. CHECK RANGE SENSOR STATUS

 **With CONSULT**

1. Turn ignition switch ON.
2. On CONSULT screen, select "ALL MODE AWD/4WD" >> "DATA MONITOR" >> "RANGE SENSOR 1" and "RANGE SENSOR 2".
3. Check the value of "RANGE SENSOR 1" and "RANGE SENSOR 2".

Do "RANGE SENSOR 1" and "RANGE SENSOR 2" display "ON"?

P1818 ACTUATOR POSITION SWITCH

< DTC/CIRCUIT DIAGNOSIS >

[TRANSFER: TX91A]

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

6. CHECK ACTUATOR SHAFT ACTUATION

Ⓜ With CONSULT

1. Turn ignition switch OFF.
2. Remove transfer motor. Refer to [DLN-107. "Removal and Installation"](#).
3. Connect transfer motor connector.
4. Turn ignition switch ON.
5. On CONSULT screen, select "ALL MODE AWD/4WD" >> "DATA MONITOR" >> "ROTARY POSITION SENSOR".
6. Rotate the actuator shaft clockwise until status below.

ROTARY POSITION SENSOR : 75% – 85%

7. Turn ignition switch OFF.
8. Install transfer motor.

NOTE:

When installing transfer motor, if there is misalignment between transfer motor axis and actuator shaft, rotate the transfer motor axis by hand.

9. Start the engine.
10. On CONSULT screen, select "ALL MODE AWD/4WD" >> "DATA MONITOR" >> "ROTARY POSITION SENSOR".
11. Check that the "ROTARY POSITION SENSOR" value.

Monitor Item	Condition	Value
ROTARY POSITION SENSOR	4WD mode: 2WD	11 – 14%
	4WD mode: 4H	34 – 44%
	4WD mode: 4LO	75 – 85%

Is the inspection result normal?

- YES >> INSPECTION END
NO >> GO TO 7.

7. REPLACE TRANSFER ROTARY POSITION SENSOR

Replace transfer rotary position sensor. Refer to [DLN-106. "Removal and Installation"](#).

>> INSPECTION END

P1819 ACTUATOR CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

[TRANSFER: TX91A]

P1819 ACTUATOR CIRCUIT

DTC Description

INFOID:000000012556144

DTC DETECTION LOGIC

Malfunction is detected in transfer motor circuit.

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition	
P1819	SHIFT ACT CIR (Shift actuator circuit)	Diagnosis condition	Ignition switch: ON
		Signal	—
		Threshold	Malfunction is detected in transfer motor circuit.
		Diagnosis delay time	—

POSSIBLE CAUSE

Harness or connectors
(Transfer motor circuit is open or shorted.)

FAIL-SAFE

4WD mode cannot be switched by operating 4WD shift switch.

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

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

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

Ⓜ With CONSULT

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

Is DTC "P1819" detected?

- YES >> Proceed to diagnosis procedure. Refer to [DLN-71, "Diagnosis Procedure"](#).
 NO-1 >> To check malfunction symptom before repair: Refer to [GI-43, "Intermittent Incident"](#).
 NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:000000012556145

1. CHECK TRANSFER MOTOR CIRCUIT

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

+		-		Continuity
Transfer control unit		Transfer motor		
Connector	Terminal	Connector	Terminal	
E142	11	F221 (Cummins 5.0L)	1	Existed
	12		4	
	11	F27 (VK56VD)	1	
	12		4	

- Check harness for short to power, short to ground, and short to each circuit.

Is the inspection result normal?

P1819 ACTUATOR CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

[TRANSFER: TX91A]

YES >> INSPECTION END

NO >> Repair or replace error-detected parts.

P181B INCOMPLETE SELF SHUT

< DTC/CIRCUIT DIAGNOSIS >

[TRANSFER: TX91A]

P181B INCOMPLETE SELF SHUT

DTC Description

INFOID:000000012556146

DTC DETECTION LOGIC

After ignition switch OFF, transfer control unit cannot perform self-shut.

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition	
P181B	INCOMP SELF SHUT (Incomplete self-shut)	Diagnosis condition	Ignition switch: ON
		Signal	—
		Threshold	After ignition switch OFF, transfer control unit cannot perform self-shut.
		Diagnosis delay time	—

NOTE:

If battery terminal is removed before transfer control unit stop, DTC P181B may be detected by transfer control unit.

POSSIBLE CAUSE

- Transfer control unit
- Harness or connector (transfer control unit power supply circuit is open or shorted)
- Battery performance degradation

FAIL-SAFE

4WD mode cannot be switched by operating 4WD shift switch.

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

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

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Turn the ignition switch ON.
2. Turn the ignition switch OFF and wait for 2 seconds or more.
3. Turn the ignition switch ON.
4. Perform self-diagnosis for "ALL MODE AWD/4WD".

Is DTC "P181B" detected?

- YES >> Proceed to diagnosis procedure. Refer to [DLN-73. "Diagnosis Procedure"](#).
NO-1 >> To check malfunction symptom before repair: Refer to [GI-43. "Intermittent Incident"](#).
NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:000000012556147

1. CHECK BATTERY PERFORMANCE

Check state of charge and any condition for battery. Refer to [PG-164. "Work Flow"](#).

Is the inspection result normal?

- YES >> GO TO 2.
NO >> Repair or replace the battery. Refer to [PG-176. "Removal and Installation - CUMMINS 5.0L"](#).

2. CHECK TRANSFER CONTROL UNIT POWER SUPPLY (1)

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

P181B INCOMPLETE SELF SHUT

< DTC/CIRCUIT DIAGNOSIS >

[TRANSFER: TX91A]

Transfer control unit		—	Voltage
Connector	Terminal		
E142	1	Ground	Battery voltage

4. Turn the ignition switch ON.

CAUTION:

Never start the engine.

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

Transfer control unit		—	Voltage
Connector	Terminal		
E142	1	Ground	Battery voltage

Is the inspection result normal?

YES >> GO TO 4.

NO >> GO TO 3.

3. CHECK TRANSFER CONTROL UNIT POWER SUPPLY (2)

1. Turn the ignition switch OFF.
2. Check the 10A fuse (#59).
3. Check the harness for open or short between transfer control unit harness connector No.1 terminal and fuse box.

Is the inspection result normal?

YES >> Perform the trouble diagnosis for power supply circuit. Refer to [PG-13, "Wiring Diagram - BATTERY POWER SUPPLY - WITH Cummins 5.0L -"](#).

NO >> Repair or replace error-detected parts.

4. CHECK TRANSFER CONTROL UNIT POWER SUPPLY (3)

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

Transfer control unit		—	Voltage
Connector	Terminal		
E142	4	Ground	Approx. 0 V

3. Turn the ignition switch ON.

CAUTION:

Never start the engine.

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

Transfer control unit		—	Voltage
Connector	Terminal		
E142	4	Ground	Battery voltage

Is the inspection result normal?

YES >> GO TO 6.

NO >> GO TO 5.

5. CHECK TRANSFER CONTROL UNIT POWER SUPPLY (4)

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 transfer control unit harness connector and fuse block (J/B) harness connector.

P181B INCOMPLETE SELF SHUT

< DTC/CIRCUIT DIAGNOSIS >

[TRANSFER: TX91A]

Fuse block (J/B)		Transfer control unit		Continuity
Connector	Terminal	Connector	Terminal	
M69	1M	E142	4	Existed

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

Transfer control unit		—	Continuity
Connector	Terminal		
E142	4	Ground	Not existed

Is the inspection result normal?

YES >> Perform the trouble diagnosis for ignition power supply circuit. Refer to [PG-71, "Wiring Diagram - IGNITION POWER SUPPLY - WITH Cummins 5.0L -"](#).

NO >> Repair or replace error-detected parts.

6. CHECK TRANSFER CONTROL UNIT GROUND

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

Transfer control unit		—	Voltage
Connector	Terminal		
E142	2	Ground	Approx. 0 V
	3		

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

Transfer control unit		—	Continuity
Connector	Terminal		
E142	2	Ground	Existed
	3		

Is the inspection result normal?

YES >> Replace the transfer control unit. Refer to [DLN-100, "Removal and Installation"](#).

NO >> Repair or replace error-detected parts.

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P181C TRANSFER MOTOR POWER SUPPLY

< DTC/CIRCUIT DIAGNOSIS >

[TRANSFER: TX91A]

P181C TRANSFER MOTOR POWER SUPPLY

DTC Description

INFOID:000000012556148

DTC DETECTION LOGIC

When starting the engine, abnormality is detected in power source of transfer motor.

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition	
P181C	MOTOR POWER SUPPLY (Motor power supply)	Diagnosis condition	Engine running
		Signal	Power supply (Transfer motor) (terminal #10)
		Threshold	When starting the engine, abnormality is detected in power source of transfer motor.
		Diagnosis delay time	2 seconds or more

POSSIBLE CAUSE

Malfunction of transfer control actuator (transfer motor) power supply circuit

FAIL-SAFE

4WD mode cannot be switched by operating 4WD shift switch.

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

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

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

Ⓟ With CONSULT

1. Start the engine and wait for 2 seconds or more.
2. Perform self-diagnosis for "ALL MODE AWD/4WD".

Is DTC "P181C" detected?

- YES >> Proceed to diagnosis procedure. Refer to [DLN-76, "Diagnosis Procedure"](#).
NO-1 >> To check malfunction symptom before repair: Refer to [GI-43, "Intermittent Incident"](#).
NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:000000012556149

1. CHECK TRANSFER MOTOR POWER SUPPLY

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

Transfer control unit		—	Voltage
Connector	Terminal		
E142	10	Ground	Battery voltage

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

P181C TRANSFER MOTOR POWER SUPPLY

< DTC/CIRCUIT DIAGNOSIS >

[TRANSFER: TX91A]

Transfer control unit		—	Voltage
Connector	Terminal		
E142	10	Ground	Battery voltage

Is the inspection result normal?

YES >> INSPECTION END

NO >> GO TO 2.

2.DETECT MALFUNCTIONING ITEM

Check the following.

- Harness for short or open between battery positive terminal and transfer control unit harness connector terminal 10. Refer to [PG-13. "Wiring Diagram - BATTERY POWER SUPPLY - WITH Cummins 5.0L -"](#).
- Battery
- 30A fusible link CUMMINS 5.0L (#Q) or VK56VD (#O). Refer to [PG-155. "Terminal Arrangement"](#).

Is the inspection result normal?

YES >> INSPECTION END

NO >> Repair or replace error-detected parts.

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P1820 ENGINE SPEED SIGNAL

< DTC/CIRCUIT DIAGNOSIS >

[TRANSFER: TX91A]

P1820 ENGINE SPEED SIGNAL

DTC Description

INFOID:0000000012556150

DTC DETECTION LOGIC

Malfunction is detected in engine speed signal that is output from ECM through CAN communication.

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition	
P1820	ENGINE SPEED SIG (Engine speed signal)	Diagnosis condition	Engine running and vehicle running
		Signal	Engine speed signal
		Threshold	Malfunction is detected in engine speed signal that is output from ECM through CAN communication.
		Diagnosis delay time	30 seconds or more

POSSIBLE CAUSE

- Harness or connector (CAN communication line)
- ECM

FAIL-SAFE

4WD mode cannot be switched by operating 4WD shift switch.

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

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

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Start the engine.
2. Drive vehicle and maintain the following conditions for 30 seconds or more.

Vehicle speed : More than 20 km/h (12 MPH)

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

Is DTC "P1820" detected?

YES >> Proceed to diagnosis procedure. Refer to [DLN-78, "Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-43, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000012556151

1. CHECK DTC OF ECM

With CONSULT

1. Turn the ignition switch ON.
2. Perform self-diagnosis for "ENGINE".

Is any DTCs detected?

YES >> Check DTC detected item. Refer to [EC-135, "DTC Index"](#) (CUMMINS 5.0L) or [EC-1366, "DTC Index"](#) (VK56VD).

NO >> INSPECTION END

P182A TRANSFER HI-LO POSITION SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[TRANSFER: TX91A]

P182A TRANSFER HI-LO POSITION SENSOR

DTC Description

INFOID:000000012556152

DTC DETECTION LOGIC

When deviated from position pattern of range sensor.

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition	
P182A	HI-LO POSITION SEN (High-low position sensor)	Diagnosis condition	When all of the following conditions are satisfied: • Ignition switch: ON • 4WD shift switch is switched between 4H and 4LO.
		Signal	Range sensor input (terminal #21 and #22)
		Threshold	When deviated from position pattern of range sensor.
		Diagnosis delay time	5 seconds or more

POSSIBLE CAUSE

- Range sensor
- Harness or connector (Range sensor circuit is open or shorted)

FAIL-SAFE

After a malfunction is confirmed, 4WD mode can be switchable. (4WD mode temporarily not switchable only during diagnosis)

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

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

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Turn the ignition switch OFF.
2. Start the engine.
3. Turn the 4WD shift switch 2WD → 4H → 4LO.

CAUTION:

Hold the 4WD shift switch at each position for 5 seconds or more.

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

Is DTC "P182A" detected?

YES >> Proceed to diagnosis procedure. Refer to [DLN-79, "Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-43, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:000000012556153

1. CHECK RANGE SENSOR SIGNAL

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

P182A TRANSFER HI-LO POSITION SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[TRANSFER: TX91A]

Transfer control unit		—	Condition	Voltage
Connector	Terminal			
E142	21	Ground	4WD shift switch: 2WD	Approx. 5 V
			4WD shift switch: 4H	Approx. 5 V
			4WD shift switch: 4LO	Approx. 0 V
	22		4WD shift switch: 2WD	Approx. 5 V
			4WD shift switch: 4H	Approx. 5 V
			4WD shift switch: 4LO	Approx. 0 V

Is any DTCs detected?

YES >> INSPECTION END

NO >> GO TO 2.

2.CHECK RANGE SENSOR CIRCUIT

1. Turn the ignition switch OFF.
2. Disconnect transfer control unit harness connector.
3. Disconnect range sensor harness connector.
4. Check the continuity between transfer control unit harness connector and range sensor harness connector.

Transfer control unit		Range sensor		Continuity
Connector	Terminal	Connector	Terminal	
E142	21	F218 (with Cummins 5.0L)	1	Existed
	22		2	
	21	F9 (with VK56VD)	1	
	22		2	

5. Check the continuity between mode sensor harness connector and ground.

Range sensor		—	Continuity
Connector	Terminal		
F218 (with Cummins 5.0L)	1	Ground	Not existed
	2		
F9 (with VK56VD)	1		
	2		

Is inspection result normal?

YES >> GO TO 3.

NO >> Repair or replace error-detected parts.

3.CHECK RANGE SENSOR GROUND

Check the continuity between mode sensor harness connector and ground.

Range sensor		—	Continuity
Connector	Terminal		
F218 (with Cummins 5.0L)	3	Ground	Existed
F9 (with VK56VD)			

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair or replace error-detected parts.

4.CHECK RANGE SENSOR

P182A TRANSFER HI-LO POSITION SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[TRANSFER: TX91A]

Check the range sensor. Refer to [DLN-81. "Component Inspection"](#).

Is the inspection result normal?

YES >> INSPECTION END

NO >> Repair range sensor. Refer to [DLN-110. "Removal and Installation"](#).

Component Inspection

INFOID:0000000012556154

1. CHECK RANGE SENSOR

1. Turn the ignition switch OFF.
2. Remove range sensor. Refer to [DLN-110. "Removal and Installation"](#).
3. Check the continuity between range sensor harness connector terminals.

Range sensor		Condition	Continuity
Terminal			
1	3	While pushing switch of range sensor.	Existed
		Other than the above.	Not existed
2	3	While pushing switch of range sensor.	Existed
		Other than the above.	Not existed

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace range sensor. Refer to [DLN-110. "Removal and Installation"](#).

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P1855 VEHICLE SPEED SENSOR (RR)

< DTC/CIRCUIT DIAGNOSIS >

[TRANSFER: TX91A]

P1855 VEHICLE SPEED SENSOR (RR)

DTC Description

INFOID:0000000012556158

DTC DETECTION LOGIC

Malfunction is detected in vehicle speed signal that is output from combination meter through CAN communication.

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition	
P1855	VHCL SPEED SEN-RR (Vehicle speed sensor-rear)	Diagnosis condition	Vehicle speed: 10 km/h (6 MPH) or more
		Signal	Vehicle speed signal
		Threshold	Malfunction is detected in vehicle speed signal that is output from combination meter through CAN communication.
		Diagnosis delay time	20 seconds or more

POSSIBLE CAUSE

- Harness or connector (CAN communication line)
- Combination meter

FAIL-SAFE

4WD mode cannot be switched by operating 4WD shift switch.

DTC CONFIRMATION PROCEDURE

CAUTION:

Be careful of the driving speed.

1. PRECONDITIONING

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

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Start the engine.
2. Drive vehicle and maintain the following conditions for 20 seconds or more.

Vehicle speed : 10 km/h (6 MPH) or more

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

Is DTC "P1855" detected?

- YES >> Proceed to diagnosis procedure. Refer to [DLN-82, "Diagnosis Procedure"](#).
- NO-1 >> To check malfunction symptom before repair: Refer to [GI-43, "Intermittent Incident"](#).
- NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000012556159

1. CHECK COMBINATION METER

Perform the trouble diagnosis of combination meter. Refer to [MWI-25, "On Board Diagnosis Function"](#).

Is the inspection result normal?

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

P1867 INCOMPLETE SHIFT

< DTC/CIRCUIT DIAGNOSIS >

[TRANSFER: TX91A]

P1867 INCOMPLETE SHIFT

DTC Description

INFOID:000000012556160

DTC DETECTION LOGIC

Malfunction is detected in transfer shift function.

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition	
P1867	INCOMPLETE SHIFT (Incomplete Shift)	Diagnosis condition	When all of the following conditions are satisfied: <ul style="list-style-type: none">• Engine running• 4WD shift switch is switched
		Signal	—
		Threshold	Malfunction is detected in transfer shift function.
		Diagnosis delay time	20 seconds or more

POSSIBLE CAUSE

- Transfer assembly
- Transfer motor

FAIL-SAFE

No impact to vehicle behavior.

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

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

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Turn the ignition switch OFF.
2. Start the engine.
3. Turn the 4WD shift switch 2WD ⇄ 4H ⇄ 4LO.

CAUTION:

Hold the 4WD shift switch at each position for 20 seconds or more.

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

Is DTC "P1867" detected?

YES >> Proceed to diagnosis procedure. Refer to [DLN-83, "Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-43, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:000000012556161

1. CHECK TRANSFER MOTOR CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect transfer control unit harness connector.
3. Disconnect transfer motor harness connector.
4. Check the continuity between transfer control unit harness connector and transfer motor harness connector.

P1867 INCOMPLETE SHIFT

< DTC/CIRCUIT DIAGNOSIS >

[TRANSFER: TX91A]

Transfer control unit		Transfer motor		Continuity
Connector	Terminal	Connector	Terminal	
E142	11	F221 (with Cummins 5.0L)	1	Not existed
	12		4	
	11	F27 (with VK56VD)	1	
	12		4	

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace error-detected parts.

2.CHECK DTC

Perform the "DTC CONFIRMATION PROCEDURE". Refer to [DLN-83, "DTC Description"](#).

Is DTC "P1867" detected?

YES >> Replace the transfer assembly. Refer to [DLN-116, "Removal and Installation"](#).

NO >> INSPECTION END

P186C INCOMP RPS OFFSET LEARNING

< DTC/CIRCUIT DIAGNOSIS >

[TRANSFER: TX91A]

P186C INCOMP RPS OFFSET LEARNING

DTC Description

INFOID:000000012556162

DTC DETECTION LOGIC

When turning the ignition switch ON, rotary position sensor offset value memorized by transfer control unit is abnormal.

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition	
P186C	INCOMP RPS OFFSET LEARNING (Incomplete rotary position sensor offset learning)	Diagnosis condition	Ignition switch: ON
		Signal	—
		Threshold	When turning the ignition switch ON, rotary position sensor offset value memorized by transfer control unit is abnormal.
		Diagnosis delay time	—

POSSIBLE CAUSE

Transfer control unit

FAIL-SAFE

4WD mode cannot be switched by operating 4WD shift switch.

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

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

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

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

Is DTC "P186C" detected?

- YES >> Proceed to diagnosis procedure. Refer to [DLN-85, "Diagnosis Procedure"](#).
NO-1 >> To check malfunction symptom before repair: Refer to [GI-43, "Intermittent Incident"](#).
NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:000000012556163

1. REPLACE THE TRANSFER CONTROL UNIT

Replace the transfer control unit. Refer to [DLN-100, "Removal and Installation"](#).

>> WORK END

U1000 CAN COMM CIRCUIT

DTC Description

INFOID:000000012556164

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

Transfer control unit is not transmitting/receiving CAN communication signal for 2 seconds or more.

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition	
U1000	CAN COMM CIRCUIT (CAN communication circuit)	Diagnosis condition	Ignition switch: ON
		Signal	CAN communication signal
		Threshold	Transfer control unit is not sending or receiving CAN communication
		Diagnosis delay time	2 seconds or more

POSSIBLE CAUSE

- CAN communication error
- Each control unit

FAIL-SAFE

4H – 4LO switching is prohibited when a malfunction occurs in communications of ECM, TCM, or BCM.

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

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

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

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

Is DTC "U1000" detected?

- YES >> Proceed to diagnosis procedure. Refer to [DLN-86, "Diagnosis Procedure"](#).
- NO-1 >> To check malfunction symptom before repair: Refer to [GI-43, "Intermittent Incident"](#).
- NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:000000012556165

Proceed to [LAN-51, "Trouble Diagnosis Flow Chart"](#).

U1010 CONTROL UNIT (CAN)

< DTC/CIRCUIT DIAGNOSIS >

[TRANSFER: TX91A]

U1010 CONTROL UNIT (CAN)

DTC Description

INFOID:000000012556166

DTC DETECTION LOGIC

Detecting error during the initial diagnosis of CAN controller of transfer control unit.

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition	
		Diagnosis condition	Ignition switch: ON
U1010	CONTROL UNIT (CAN) [Control unit (CAN)]	Signal	—
		Threshold	Error detected during the initial diagnosis of CAN controller of transfer control unit.
		Diagnosis delay time	Within 1 second

POSSIBLE CAUSE

Transfer control unit

FAIL-SAFE

4WD mode cannot be switched by operating 4WD shift switch.

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

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

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

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

Is DTC "U1010" detected?

- YES >> Proceed to diagnosis procedure. Refer to [DLN-87, "Diagnosis Procedure"](#).
NO-1 >> To check malfunction symptom before repair: Refer to [GI-43, "Intermittent Incident"](#).
NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:000000012556167

1. CHECK TRANSFER CONTROL UNIT

Check transfer control unit harness connector for disconnection and deformation.

Is the inspection result normal?

- YES >> Replace transfer control unit. Refer to [DLN-100, "Removal and Installation"](#).
NO >> Repair or replace error-detected parts.

POWER SUPPLY AND GROUND CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

[TRANSFER: TX91A]

POWER SUPPLY AND GROUND CIRCUIT

Diagnosis Procedure

INFOID:000000012556168

1. CHECK TRANSFER CONTROL UNIT POWER SUPPLY (1)

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

Transfer control unit		—	Voltage
Connector	Terminal		
E142	1	Ground	Battery voltage

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

Transfer control unit		—	Voltage
Connector	Terminal		
E142	1	Ground	Battery voltage

Is the inspection result normal?

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

2. CHECK TRANSFER CONTROL UNIT POWER SUPPLY (2)

1. Turn the ignition switch OFF.
2. Check the 10A fuse (#59).
3. Check the harness for open or short between transfer control unit harness connector No.1 terminal and fuse box.

Is the inspection result normal?

- YES >> Perform the trouble diagnosis for power supply circuit. Refer to [PG-13, "Wiring Diagram - BATTERY POWER SUPPLY - WITH Cummins 5.0L -"](#).
- NO >> Repair or replace error-detected parts.

3. CHECK TRANSFER CONTROL UNIT POWER SUPPLY (3)

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

Transfer control unit		—	Voltage
Connector	Terminal		
E142	4	Ground	Approx. 0 V

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

Transfer control unit		—	Voltage
Connector	Terminal		
E142	4	Ground	Battery voltage

Is the inspection result normal?

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

POWER SUPPLY AND GROUND CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

[TRANSFER: TX91A]

4. CHECK TRANSFER CONTROL UNIT POWER SUPPLY (4)

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 transfer control unit harness connector and fuse block (J/B) harness connector.

Fuse block (J/B)		Transfer control unit		Continuity
Connector	Terminal	Connector	Terminal	
M69	1M	E142	4	Existed

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

Transfer control unit		—	Continuity
Connector	Terminal		
E142	4	Ground	Not existed

Is the inspection result normal?

YES >> Perform the trouble diagnosis for ignition power supply circuit. Refer to [PG-71, "Wiring Diagram - IGNITION POWER SUPPLY - WITH Cummins 5.0L -"](#).

NO >> Repair or replace error-detected parts.

5. CHECK TRANSFER CONTROL UNIT GROUND

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

Transfer control unit		—	Voltage
Connector	Terminal		
E142	2	Ground	Approx. 0 V
	3		

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

Transfer control unit		—	Continuity
Connector	Terminal		
E142	2	Ground	Existed
	3		

Is the inspection result normal?

YES >> INSPECTION END

NO >> Repair or replace error-detected parts.

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4WD WARNING LAMP

< DTC/CIRCUIT DIAGNOSIS >

[TRANSFER: TX91A]

4WD WARNING LAMP

Component Function Check

INFOID:000000012556172

1. CHECK 4WD WARNING LAMP FUNCTION

Check that 4WD warning lamp turns ON until the engine started.

Is the inspection result normal?

YES >> INSPECTION END

NO >> Proceed diagnosis procedure. Refer to [DLN-90, "Diagnosis Procedure"](#).

Diagnosis Procedure

INFOID:000000012556173

1. CHECK DTC OF TRANSFER CONTROL UNIT

With CONSULT

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

Is any DTCs detected?

YES >> Check DTC detected item. Refer to [DLN-28, "DTC Index"](#).

NO >> GO TO 2.

2. CHECK 4WD WARNING LAMP SIGNAL

With CONSULT

1. Start the engine.
CAUTION:
Stop the vehicle.
2. Check "4WD FAIL LAMP" in "DATA MONITOR" for "ALL MODE AWD/4WD".

Does the item on "DATA MONITOR" indicate "Off"?

YES >> Check input/output signals of combination meter. Refer [MWI-30, "Reference Value"](#).

NO >> Replace transfer control unit. Refer to [DLN-100, "Removal and Installation"](#).

4WD INDICATOR

Component Function Check

INFOID:000000012556174

1. CHECK 4WD INDICATOR FUNCTION

1. Start the engine
CAUTION:
Never drive the vehicle.
2. Turn the 4WD shift switch 2WD → 4H → 4LO.
3. Check the 4WD shift switch position and the indication of the 4WD indicator mutually coincide. Refer to [DLN-21. "INFORMATION DISPLAY \(COMBINATION METER\) : 4WD Indicator"](#).

Is the inspection result normal?

- YES >> INSPECTION END
- NO >> Proceed to diagnosis procedure. Refer to [DLN-91. "Diagnosis Procedure"](#).

Diagnosis Procedure

INFOID:000000012556175

1. CHECK DTC OF TRANSFER CONTROL UNIT

 With CONSULT

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

Is any DTCs detected?

- YES >> Check DTC detected item. Refer to [DLN-28. "DTC Index"](#).
- NO >> GO TO 2.

2. CHECK 4WD INDICATOR SIGNAL

 With CONSULT

1. Start the engine.
CAUTION:
Never drive the vehicle.
2. Turn the 4WD shift switch 2WD → 4H → 4LO.
3. Check "4WD MODE IND" of CONSULT "DATA MONITOR" for "ALL MODE AWD/4WD".

Monitor item	Condition	Status
4WD MODE IND	4WD shift switch: 2WD	2WD
	4WD shift switch: 4H	LOCK
	4WD shift switch: 4LO	4L

Is the inspection result normal?

- YES >> Check input/output signals of combination meter. Refer [MWI-30. "Reference Value"](#).
- NO >> Replace transfer control unit. Refer to [DLN-100. "Removal and Installation"](#).

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HEAVY TIGHT-CORNER BRAKING SYMPTOM OCCURS

< SYMPTOM DIAGNOSIS >

[TRANSFER: TX91A]

SYMPTOM DIAGNOSIS

HEAVY TIGHT-CORNER BRAKING SYMPTOM OCCURS

Description

INFOID:0000000012556176

Heavy tight-corner braking symptom may occur depending on driving conditions (4WD mode is 4H and 4LO). This is not malfunction.

NOTE:

- Light tight-corner braking symptom may occur depending on driving conditions. This is not malfunction.
- 4WD warning lamp may blink.

4WD MODE DOES NOT CHANGE

< SYMPTOM DIAGNOSIS >

[TRANSFER: TX91A]

4WD MODE DOES NOT CHANGE

Description

INFOID:000000012556177

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

Diagnosis Procedure

INFOID:000000012556178

1. CHECK DTC OF TRANSFER CONTROL UNIT

With CONSULT

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

Is any DTC detected?

- YES >> Check DTC detected item. Refer to [DLN-28, "DTC Index"](#).
NO >> GO TO 2.

2. CHECK INFORMATION DISPLAY (COMBINATION METER)

Perform the trouble diagnosis of combination meter. Refer to [MWI-25, "On Board Diagnosis Function"](#).

Is the inspection result normal?

- YES >> Check intermittent incident. Refer to [GI-43, "Intermittent Incident"](#).
NO >> Repair or replace the error-detected parts.

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4WD INDICATOR CONTINUES BLINKING

< SYMPTOM DIAGNOSIS >

[TRANSFER: TX91A]

4WD INDICATOR CONTINUES BLINKING

Description

INFOID:000000012556179

After shift the 4WD mode 4H to 4L, 4WD indicator continues to blink.

Diagnosis Procedure

INFOID:000000012556180

1. CHECK OPERATION CONDITION OF 4WD MODE

1. Turn ignition switch OFF.
2. Shift the 4WD mode depending on operation condition. Refer to [DLN-17, "4WD SYSTEM : System Description"](#).

Does the 4WD indicator stop to blink?

- YES >> INSPECTION END
NO >> GO TO 2.

2. CHECK 4WD INDICATOR LAMP

Check 4WD indicator function. Refer to [DLN-91, "Component Function Check"](#).

Is the inspection result normal?

- YES >> GO TO 3.
NO >> Proceed to diagnosis procedure. Refer to [DLN-91, "Diagnosis Procedure"](#).

3. CHECK DTC OF TRANSFER CONTROL UNIT

Ⓟ With CONSULT

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

Is any DTC detected?

- YES >> Check DTC detected item. Refer to [DLN-28, "DTC Index"](#).
NO >> Transfer assembly is mechanical malfunction. Replace transfer assembly. Refer to [DLN-116, "Removal and Installation"](#).

4WD WARNING LAMP BLINKS SLOWLY

< SYMPTOM DIAGNOSIS >

[TRANSFER: TX91A]

4WD WARNING LAMP BLINKS SLOWLY

Description

INFOID:000000012556181

4WD warning lamp blinks at approximately 2 seconds intervals while driving.

Diagnosis Procedure

INFOID:000000012556182

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.TERMINAL INSPECTION

Check intermittent incident. Refer to [GI-43. "Intermittent Incident"](#).

Is the inspection result normal?

YES >> Replace transfer control unit. Refer to [DLN-100. "Removal and Installation"](#).

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

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ATP WARNING LAMP DOES NOT TURN ON

< SYMPTOM DIAGNOSIS >

[TRANSFER: TX91A]

ATP WARNING LAMP DOES NOT TURN ON

Description

INFOID:000000012556183

ATP warning lamp does not turn ON when 4WD shift switch from 4H to 4LO or 4LO to 4H with A/T selector lever in P position.

Diagnosis Procedure

INFOID:000000012556184

1. CHECK DTC OF TRANSFER CONTROL UNIT

With CONSULT

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

Is any DTC detected?

- YES >> Check DTC detected item. Refer to [DLN-28, "DTC Index"](#).
NO >> GO TO 2.

2. CHECK COMBINATION METER

Perform the trouble diagnosis of combination meter. Refer to [MWI-25, "On Board Diagnosis Function"](#).

Is the inspection result normal?

- YES >> Check intermittent incident. Refer to [GI-43, "Intermittent Incident"](#).
NO >> Repair or replace the error-detected parts.

NOISE, VIBRATION AND HARSHNESS (NVH) TROUBLESHOOTING

< SYMPTOM DIAGNOSIS >

[TRANSFER: TX91A]

NOISE, VIBRATION AND HARSHNESS (NVH) TROUBLESHOOTING

NVH Troubleshooting Chart

INFOID:000000012556185

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-98. "Inspection"			-		Front oil seal: DLN-102. "Exploded View" Rear oil seal: DLN-104. "Exploded View"		-		-		-	
		TRANSFER FLUID (Level low)	TRANSFER FLUID (Wrong)	TRANSFER FLUID (Level too high)	LIQUID GASKET (Damaged)	OIL SEAL (Worn or damaged)	GEAR (Worn or damaged)	BEARING (Worn or damaged)	TRANSFER CASE (Damaged)					
SUSPECTED PARTS (Possible cause)														
Symptom	Noise	1	2				3	3	3					
	Transfer fluid leakage		4	1	2	2			3					

NOTE:

When transfer inner parts are malfunction, replace transfer assembly.

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PERIODIC MAINTENANCE

TRANSFER FLUID

Inspection

INFOID:000000012556186

FLUID LEAKS

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

FLUID LEVEL

1. Remove filler plug (1). Then check that fluid is filled from hole for the filler plug.

CAUTION:

Do not start engine while checking fluid level.

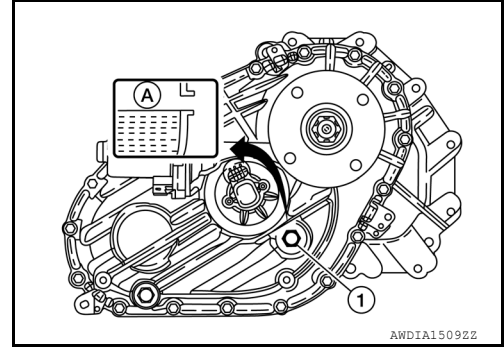
2. Transfer oil level (A) should be level with bottom of filler plug hole.
3. Apply sealant to thread of filler plug (1), and install it on transfer and then tighten to the specified torque.

CAUTION:

Remove old sealant adhering to thread of filler plug.

Specified torque : 20.5 N·m (2.1 kg-m, 15 ft-lb)

Sealant : Hylomar 102 silicone or equivalent



Draining

INFOID:000000012556187

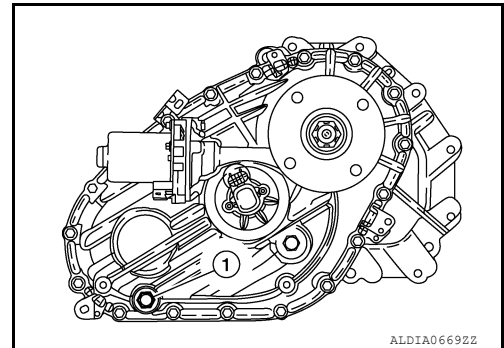
1. Stop the engine.
2. Remove the drain plug (1) and drain transfer fluid.
3. Apply sealant to thread of drain plug, and install it to transfer and tighten to the specified torque.

CAUTION:

Remove old sealant adhering to thread of drain plug.

Specified torque : 20.5 N·m (2.1 kg-m, 15 ft-lb)

Sealant : Hylomar 102 silicone or equivalent



Refilling

INFOID:000000012556188

1. Remove filler plug (1). Fill with new transfer fluid up to hole for the filler plug (A).

Recommended fluid and capacity

: Refer to [MA-59, "Cummins \(5.0L V8D\) Engine : Fluids and Lubricants"](#) (Cummins 5.0L models), [MA-13, "VK56VD Gasoline Engine : Fluids and Lubricants"](#) (VK56VD models).

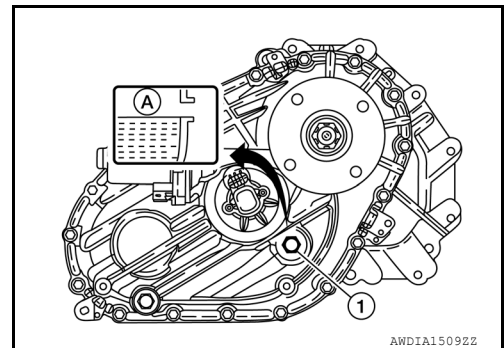
CAUTION:

Carefully fill the fluid. (Fill for approximately 3 minutes.)

2. Leave the vehicle for 3 minutes, and check the fluid level again.
3. Apply sealant to thread of filler plug, and install it on transfer and tighten to the specified torque.

CAUTION:

Remove old sealant adhering to thread of filler plug.



TRANSFER FLUID

< PERIODIC MAINTENANCE >

[TRANSFER: TX91A]

Specified torque : 20.5 N·m (2.1 kg-m, 15 ft-lb)
Sealant : Hylomar 102 silicone or equivalent

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TRANSFER CONTROL UNIT

< REMOVAL AND INSTALLATION >

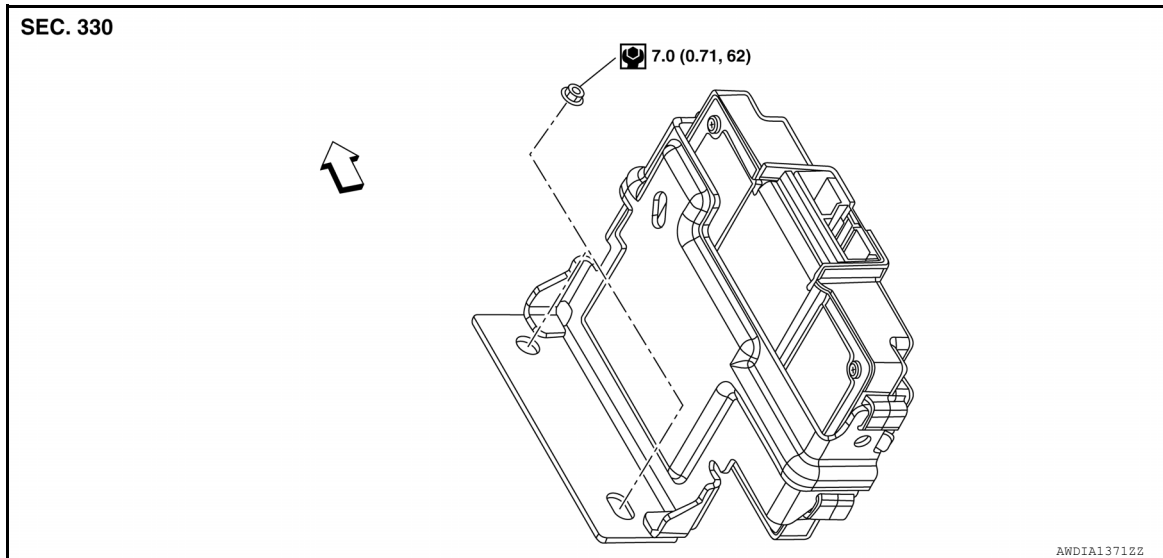
[TRANSFER: TX91A]

REMOVAL AND INSTALLATION

TRANSFER CONTROL UNIT

Exploded View

INFOID:000000012556189



1. Transfer control unit

↔ : Front

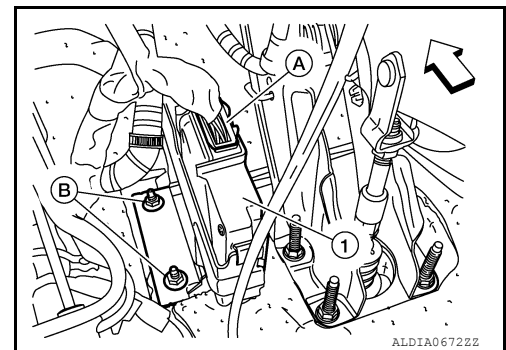
Removal and Installation

INFOID:000000012556190

REMOVAL

1. Turn the ignition switch OFF.
2. Disconnect the harness connector (A) from the transfer control unit (1).
3. Remove nuts (B) and remove transfer control unit (1).

↔ : Front



INSTALLATION

Installation is in the reverse order of removal.

4WD SHIFT SWITCH

< REMOVAL AND INSTALLATION >

[TRANSFER: TX91A]

4WD SHIFT SWITCH

Removal and Installation

INFOID:000000012556191

REMOVAL

1. Remove cluster lid C finisher (LH). Refer to [IP-16. "CLUSTER LID C FINISHER : Removal and Installation"](#).
2. Disconnect the harness connector from 4WD shift switch.
3. Remove the 4WD shift switch.

INSTALLATION

Installation is in the reverse order of removal.

Inspection

INFOID:000000012556192

INSPECTION AFTER INSTALLATION

Check that the actual 4WD mode and the indication of the 4WD indicator mutually coincide when the 4WD shift switch is switched to each position.

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FRONT OIL SEAL

< REMOVAL AND INSTALLATION >

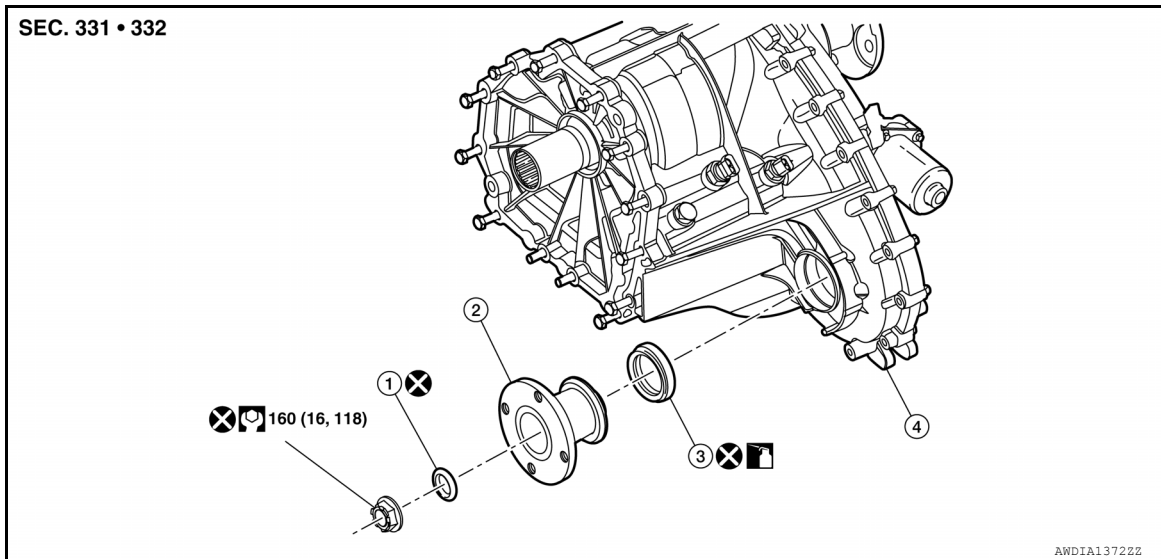
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FRONT OIL SEAL

Exploded View

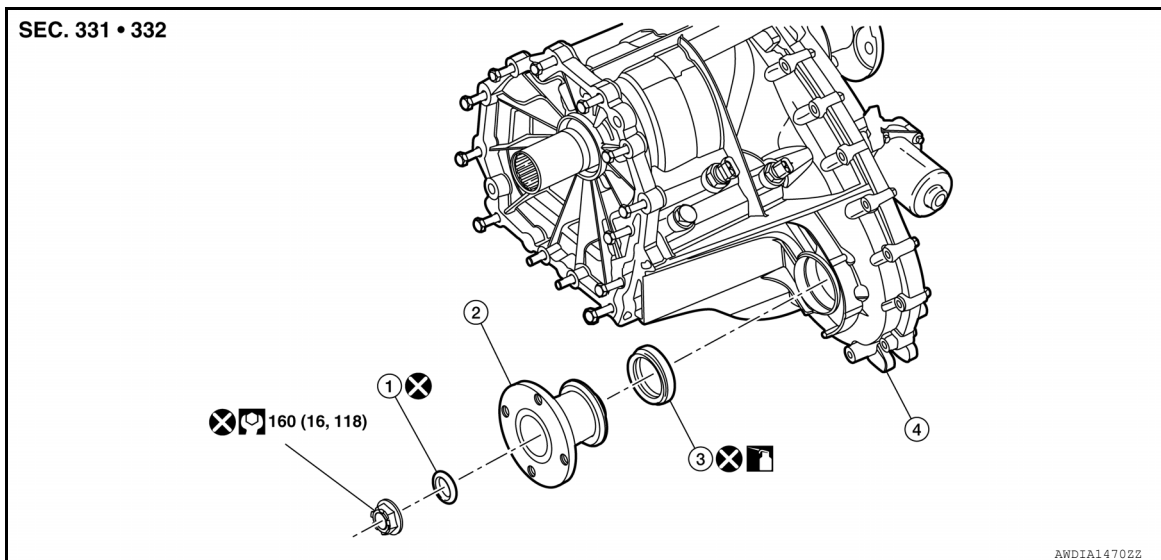
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Cummins 5.0L Models



1. O-ring
2. Front companion flange
3. Front oil seal
4. Transfer assembly

VK56VD Models



1. O-ring
2. Front companion flange
3. Front oil seal
4. Transfer assembly

Removal and Installation

INFOID:000000012556194

REMOVAL

1. Remove the drain plug to drain the transfer fluid. Refer to [DLN-98, "Draining"](#).
2. Remove the front propeller shaft. Refer to [DLN-123, "Removal and Installation"](#).
3. Remove self-lock nut from companion flange using suitable tool.

CAUTION:

Do not reuse self-lock nut.

4. Remove the O-ring.

FRONT OIL SEAL

< REMOVAL AND INSTALLATION >

[TRANSFER: TX91A]

CAUTION:

Do not reuse O-ring.

- Put a matching mark on top of the front output shaft (B) in line with the mark on the front companion flange (A).

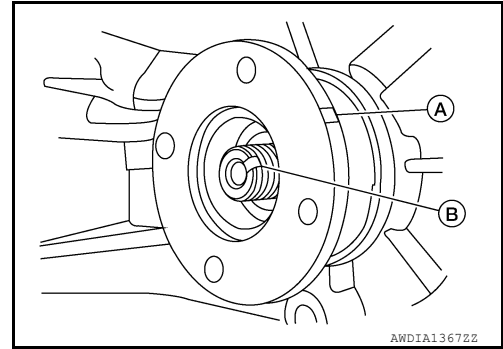
CAUTION:

Use paint to make the matching mark on the front drive companion flange and front output shaft. Do not damage the front drive shaft.

- Remove the front companion flange, using suitable tool.
- Remove front oil seal.

CAUTION:

- Do not damage the front case or front output shaft.
- Do not reuse front oil seal.

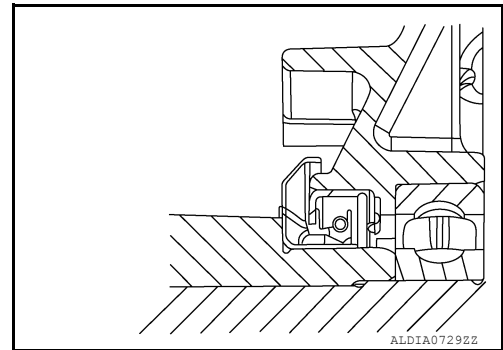


INSTALLATION

- Install front oil seal using suitable tool until the end of the seal is flush with the face of front case.

CAUTION:

- Do not reuse front oil seal.
- Apply transfer fluid onto circumference of oil seal.



- Align the matching mark on the front drive shaft (B) with the matching mark on the front companion flange (A), then install the front companion flange.

CAUTION:

Do not damage the front oil seal lip.

- Install the O-ring between front companion flange and the self locking nut.

CAUTION:

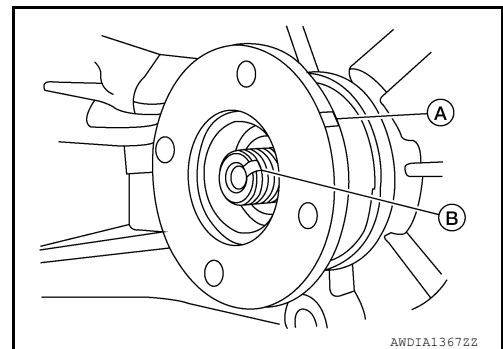
- Do not reuse the O-ring.
- Do not damage the O-ring.

- Tighten the self-lock nut to specified torque.

CAUTION:

Do not reuse self-lock nut.

- Install front propeller shaft. Refer to [DLN-123, "Removal and Installation"](#).
- Fill with new transfer fluid. Refer to [DLN-98, "Refilling"](#).



Inspection

INFOID:000000012556195

INSPECTION AFTER INSTALLATION

Check for fluid leaks and the fluid level. Refer to [DLN-98, "Inspection"](#).

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REAR OIL SEAL

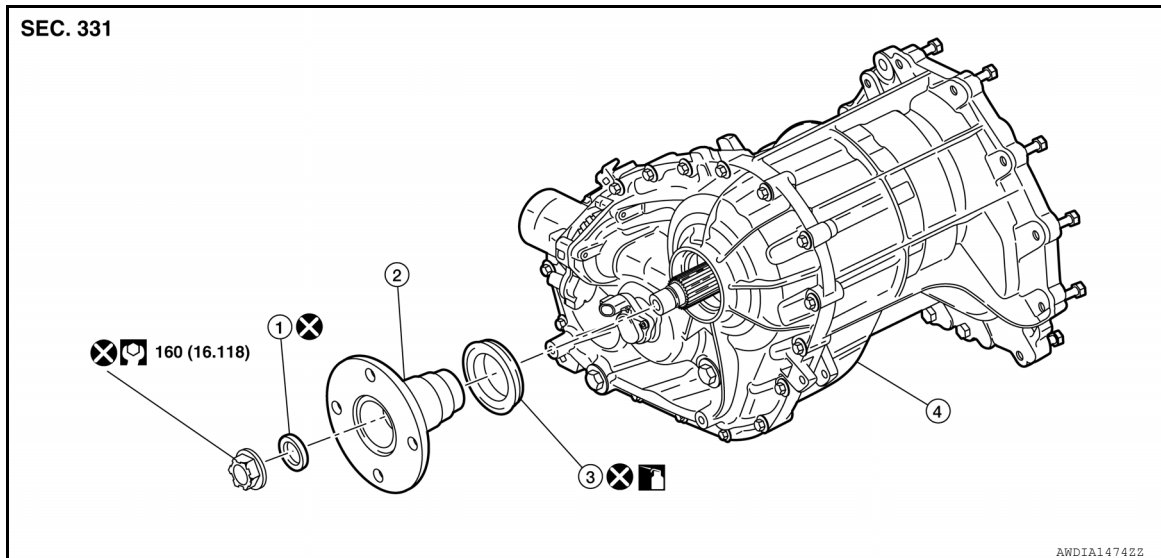
< REMOVAL AND INSTALLATION >

[TRANSFER: TX91A]

REAR OIL SEAL

Exploded View

INFOID:000000012556196



1. O-ring
2. Companion flange
3. Rear oil seal
4. Transfer assembly

Removal and Installation

INFOID:000000012556197

REMOVAL

1. Remove the drain plug to drain the transfer fluid. Refer to [DLN-98, "Draining"](#).
2. Remove the rear propeller shaft. Refer to [DLN-133, "Removal and Installation"](#).
3. Remove self-lock nut from companion flange using suitable tool.

CAUTION:

Do not reuse self-lock nut

4. Remove the O-ring.

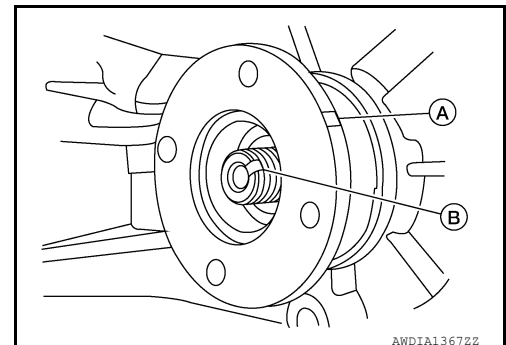
CAUTION:

Do not reuse O-ring

5. Put a matching mark on top of the front output shaft (B) in line with the mark on the front companion flange (A).

CAUTION:

Use paint to make the matching mark on the rear drive companion flange and rear output shaft. Do not damage the rear output shaft.



6. Remove the companion flange using suitable tool.
7. Remove the rear oil seal.

CAUTION:

- Do not damage the rear case and main shaft.
- Do not reuse rear oil seal.

INSTALLATION

REAR OIL SEAL

< REMOVAL AND INSTALLATION >

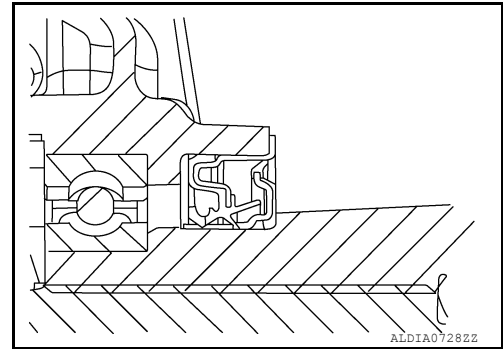
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1. Install rear oil seal with Tool until the end is flush with the face of front case.

Tool number : KV40104710 (—)

CAUTION:

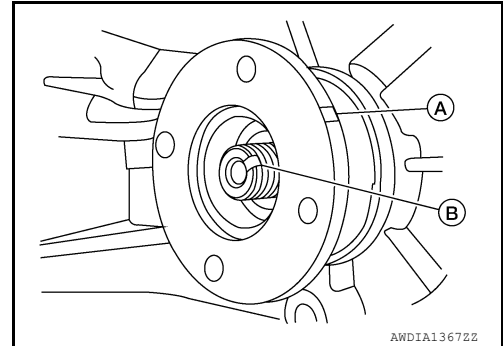
- Do not reuse rear oil seal.
- Apply transfer fluid onto circumference of oil seal.



2. Align the marching mark on the front drive shaft (B) with the matching mark on the front companion flange (A), then install the front companion flange.

CAUTION:

Do not damage the front oil seal lip.



3. Install the O-ring between front companion flange and the self locking nut.

CAUTION:

- Do not reuse the O-ring.
- Do not damage the O-ring.

4. Tighten the self-lock nut to the specified torque.

CAUTION:

Do not reuse self-locking nut.

5. Install the rear propeller shaft. Refer to [DLN-133. "Removal and Installation"](#).

6. Fill with new transfer fluid. Refer to [DLN-98. "Refilling"](#).

Inspection

INFOID:000000012556198

INSPECTION AFTER INSTALLATION

Check for fluid leaks and the fluid level. Refer to [DLN-98. "Inspection"](#).

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TRANSFER ROTARY POSITION SENSOR

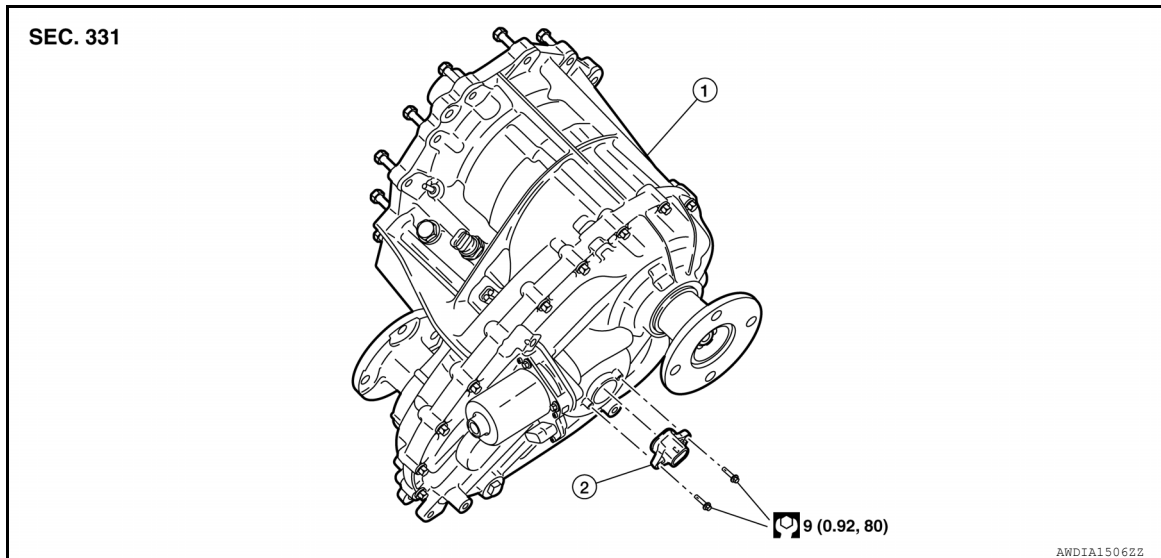
< REMOVAL AND INSTALLATION >

[TRANSFER: TX91A]

TRANSFER ROTARY POSITION SENSOR

Exploded View

INFOID:000000012556199



1. Transfer assembly

2. Transfer rotary position sensor

Removal and Installation

INFOID:000000012556200

REMOVAL

1. Disconnect the negative battery cable.
2. Disconnect the harness connector from the transfer rotary position sensor.
3. Remove the transfer rotary position sensor.

INSTALLATION

Installation is in the reverse order of removal.

CAUTION:

Do not damage the O-ring on the transfer rotary position sensor.

Inspection and Adjustment

INFOID:000000012556201

INSPECTION AFTER INSTALLATION

Check for fluid leaks and the fluid level. Refer to [DLN-98, "Inspection"](#).

ADJUSTMENT AFTER INSTALLATION

When replacing transfer rotary position sensor, clear the transfer rotary position sensor learning value stored in transfer control unit. Refer to [DLN-44, "Description"](#).

TRANSFER MOTOR

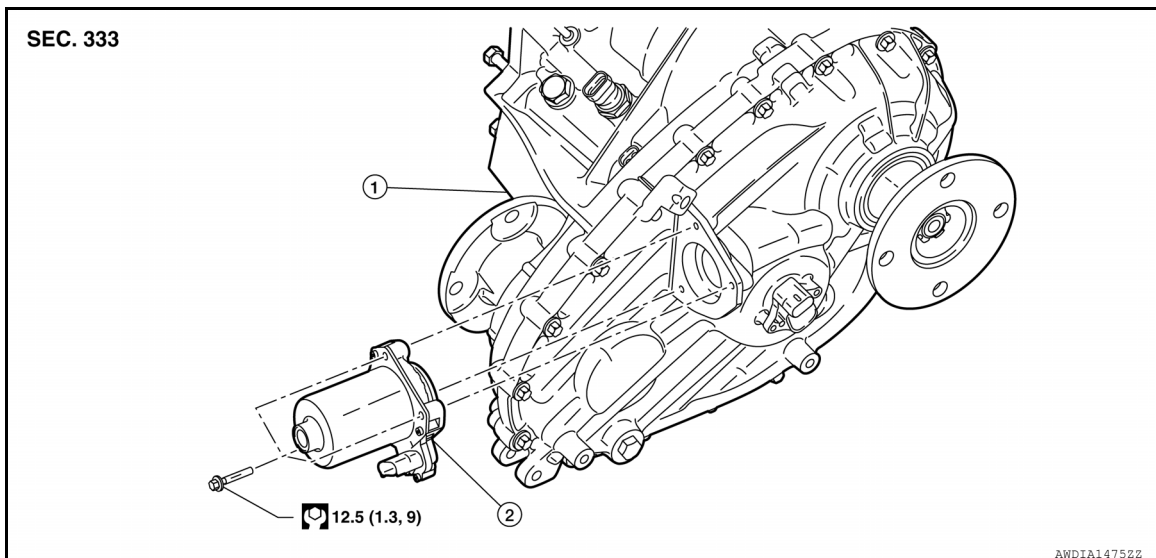
< REMOVAL AND INSTALLATION >

[TRANSFER: TX91A]

TRANSFER MOTOR

Exploded View

INFOID:000000012556202



1. Transfer assembly

2. Transfer motor

Removal and Installation

INFOID:000000012556203

REMOVAL

1. Disconnect the negative battery cable.
2. Disconnect the harness connector from the transfer motor.
3. Remove the bolts and transfer motor.

INSTALLATION

Installation is in the reverse order of removal.

- When installing transfer motor, if there is misalignment between transfer motor axis and actuator shaft, rotate the transfer motor axis by hand.
- Do not damage the O-ring of transfer motor when installing transfer motor.

Inspection

INFOID:000000012556204

INSPECTION AFTER INSTALLATION

Check for fluid leaks and the fluid level. Refer to [DLN-98. "Inspection"](#).

MODE SENSOR

< REMOVAL AND INSTALLATION >

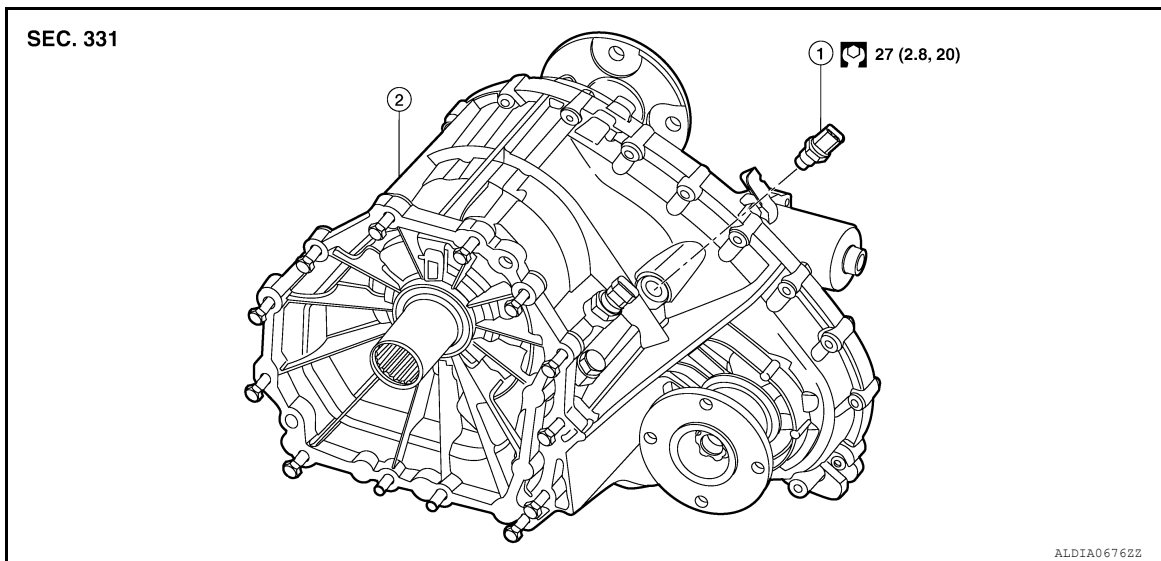
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MODE SENSOR

Exploded View

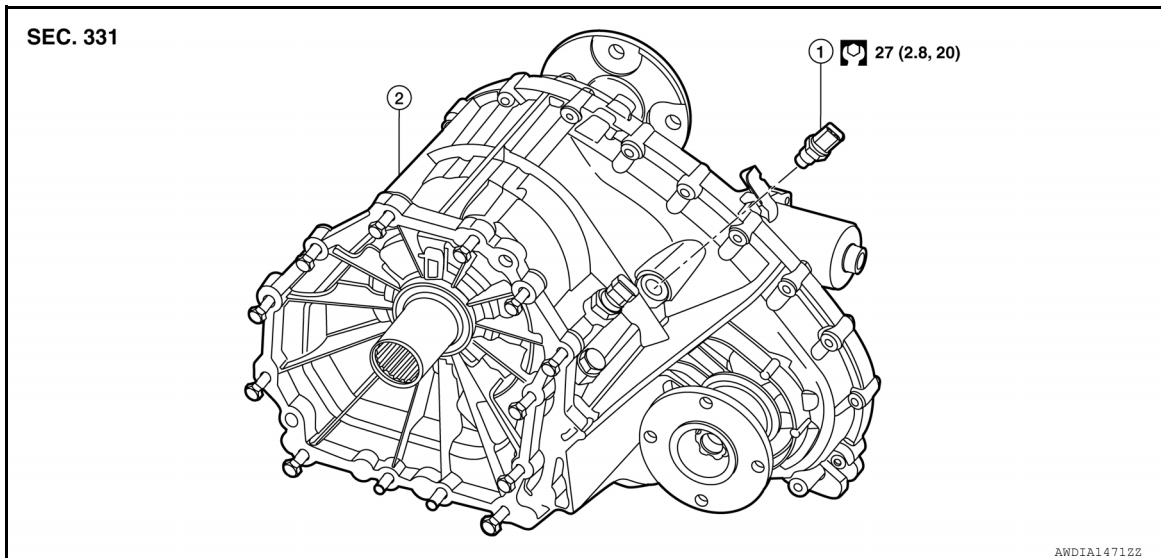
INFOID:000000012556205

Cummins 5.0L Models



1. Mode sensor
2. Transfer assembly

VK56VD Models



1. Mode sensor
2. Transfer assembly

Removal and Installation

INFOID:000000012556206

REMOVAL

1. Disconnect the negative battery cable.
2. Disconnect the harness connector from the mode sensor.
3. Remove the mode sensor.

INSTALLATION

Installation is in the reverse order of removal.

CAUTION:

Do not damage the O-ring on the mode sensor.

MODE SENSOR

< REMOVAL AND INSTALLATION >

[TRANSFER: TX91A]

Inspection

INFOID:000000012556207

INSPECTION AFTER INSTALLATION

Check for fluid leaks and the fluid level. Refer to [DLN-98. "Inspection"](#).

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RANGE SENSOR

< REMOVAL AND INSTALLATION >

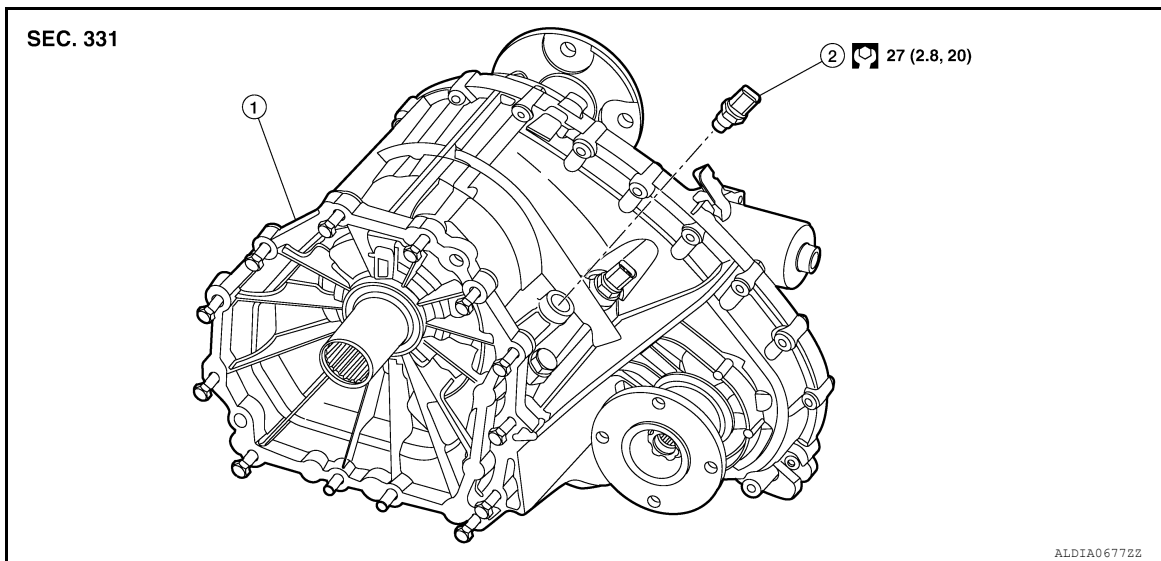
[TRANSFER: TX91A]

RANGE SENSOR

Exploded View

INFOID:000000012556208

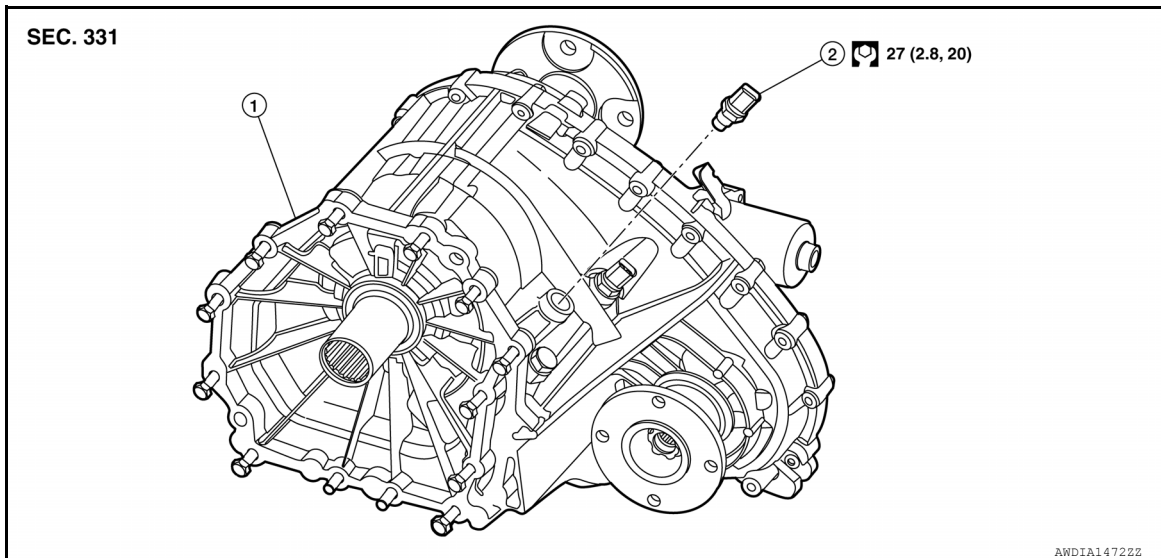
Cummins 5.0L Models



1. Transfer assembly

2. Range sensor

VK56VD Models



1. Transfer assembly

2. Range sensor

Removal and Installation

INFOID:000000012556209

REMOVAL

1. Disconnect the negative battery cable.
2. Disconnect the harness connector from the range sensor.
3. Remove the range sensor.

INSTALLATION

Installation is in the reverse order of removal.

CAUTION:

Do not damage the O-ring on the range sensor.

RANGE SENSOR

< REMOVAL AND INSTALLATION >

[TRANSFER: TX91A]

Inspection

INFOID:000000012556210

INSPECTION AFTER INSTALLATION

Check for fluid leaks and the fluid level. Refer to [DLN-98. "Inspection"](#).

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AIR BREATHER

< REMOVAL AND INSTALLATION >

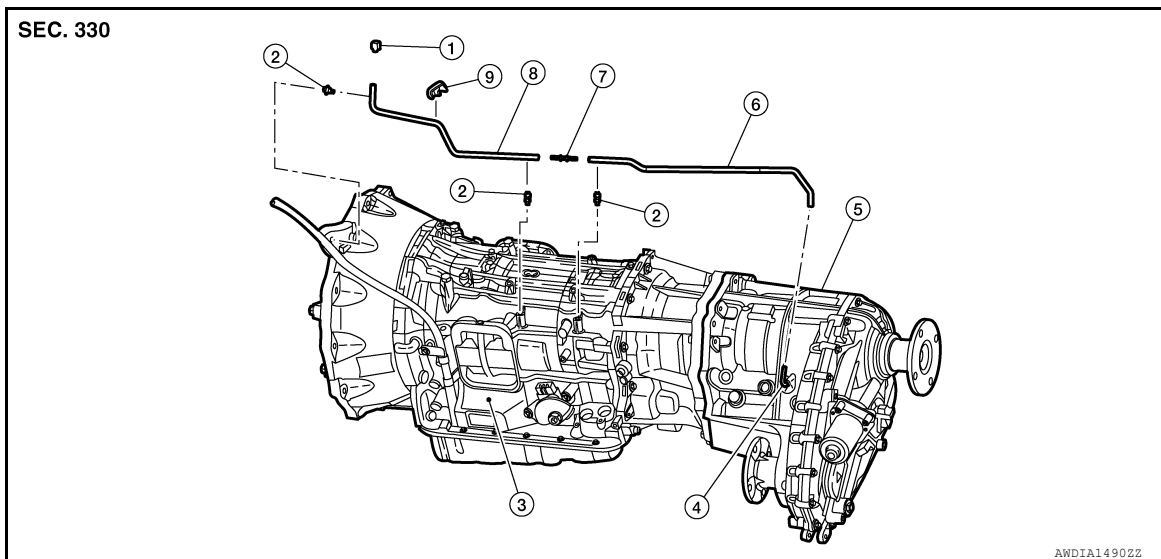
[TRANSFER: TX91A]

AIR BREATHER

Exploded View

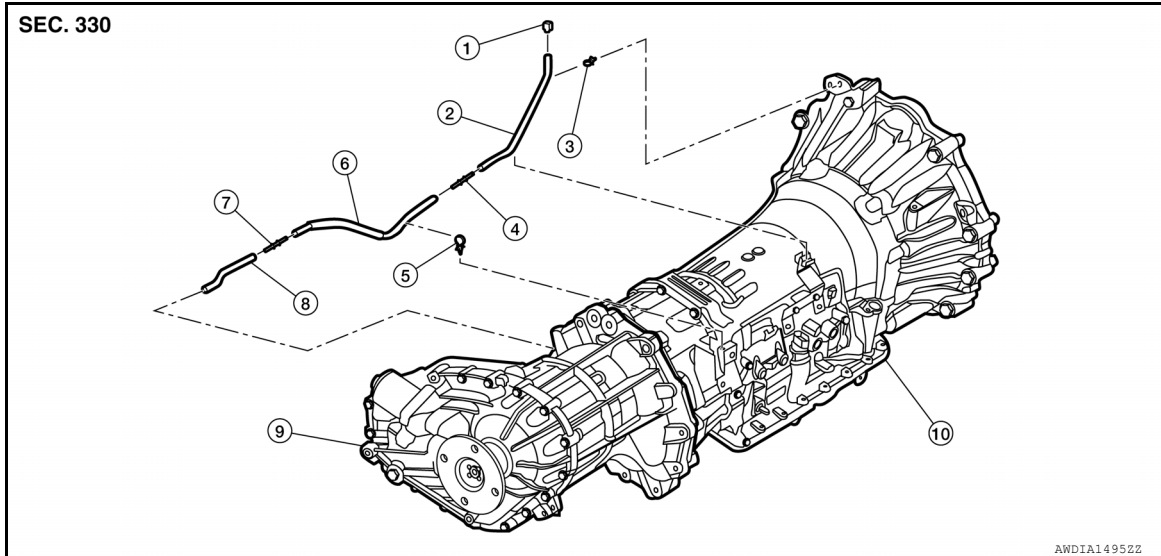
INFOID:000000012556217

Cummins 5.0L Models



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|-------------------|----------------------|--------------------|
| 1. Air breather | 2. Hose clip | 3. A/T assembly |
| 4. Breather tube | 5. Transfer assembly | 6. Breather hose A |
| 7. Hose connector | 8. Breather hose B | 9. Clip |

VK56VD Models



- | | | |
|-------------------|--------------------|----------------------|
| 1. Air breather | 2. Breather hose A | 3. Hose clip |
| 4. Hose connector | 5. Hose clip | 6. Breather hose B |
| 7. Hose connector | 8. Breather hose C | 9. Transfer assembly |
| 10. A/T assembly | | |

Removal and Installation - Cummins 5.0L Models

INFOID:000000012556218

REMOVAL

1. Release clip from bracket.
2. Release breather hose B from clip and remove breather hose B from connector tube.
3. Release breather hose A from clip and remove breather hose A from breather tube.

AIR BREATHER

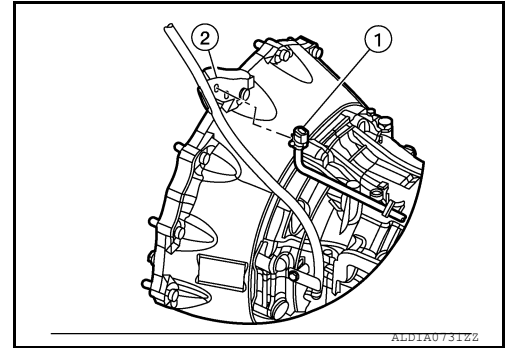
< REMOVAL AND INSTALLATION >

[TRANSFER: TX91A]

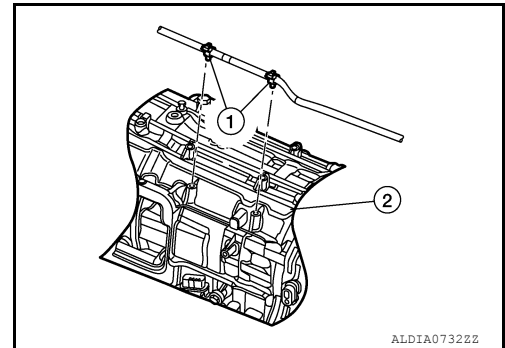
INSTALLATION

Installation is in the reverse order of removal.

1. Insert the clip of the air breather (1) securely to the bracket (2).



2. Insert the clips on the hose (1) securely into the A/T assembly (2).

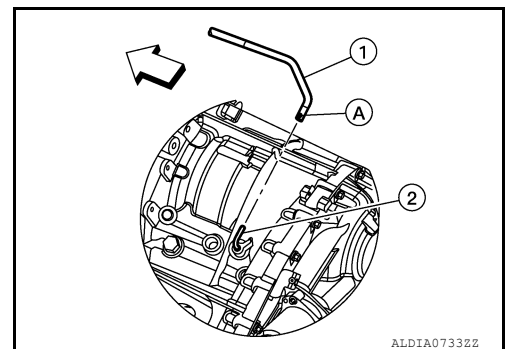


3. Set breather hose A (1) to the breather tube (2) with the paint mark (A) facing upward.

NOTE:

Be sure to insert breather hose A (1) to breather tube (2) until hose end reaches the bending radius of tube.

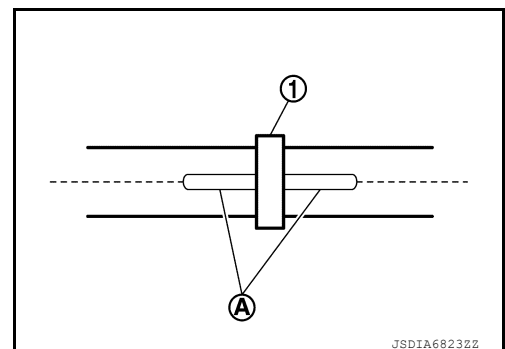
← : Front



4. When inserting breather hose A and breather hose B to hose connector (1), be sure to insert it fully until it reaches the stop.

CAUTION:

Align paint marks (A) on each breather hose.



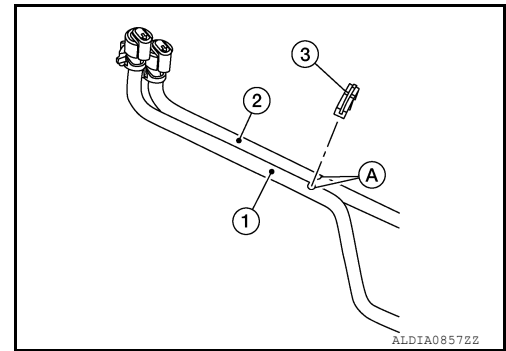
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AIR BREATHER

< REMOVAL AND INSTALLATION >

[TRANSFER: TX91A]

5. Secure transfer breather hose (1) to A/T breather hose (2) at paint marks (A) with clip (3).



Removal and Installation - VK56VD Models

INFOID:000000013761279

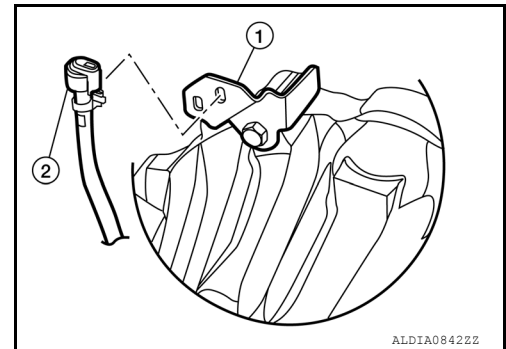
REMOVAL

1. Release clip from bracket.
2. Release breather hose A from connector tube and remove breather hose A from clip.
3. Release breather hose B from clip and remove breather hose B from connector tube.
4. Release breather hose C from clip and remove breather hose C from breather tube.

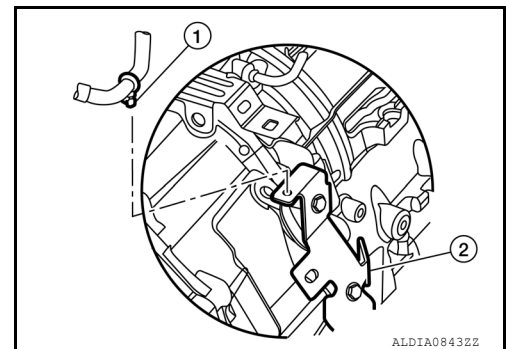
INSTALLATION

Installation is in the reverse order of removal.

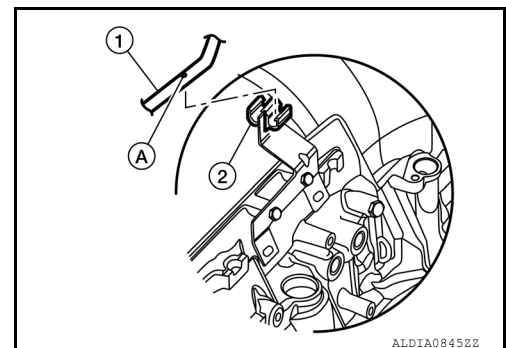
1. Insert the clip of the air breather (2) securely to the bracket (1).



2. Insert the clip on breather hose B (1) securely into the bracket (2).



3. Insert breather hose A (1) into the clip (2) with the paint mark (A) facing upward.



AIR BREATHER

< REMOVAL AND INSTALLATION >

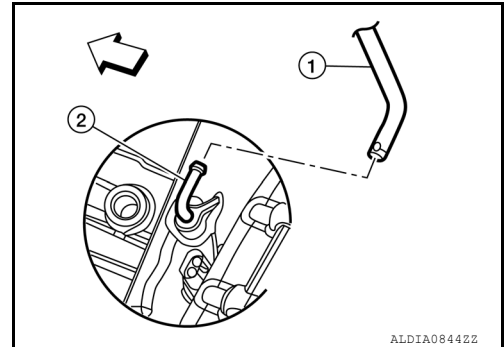
[TRANSFER: TX91A]

4. Set breather hose C (1) to the breather tube (2) with the paint mark facing upward.

NOTE:

Be sure to insert breather hose C (1) to breather tube (2) until hose end reaches the bending radius of tube.

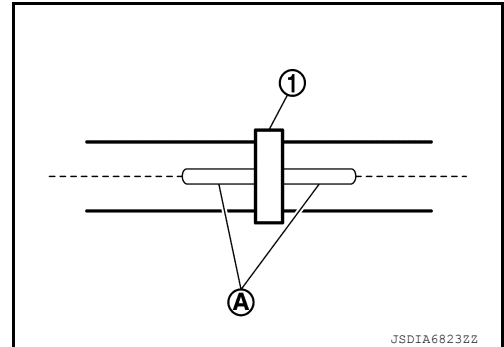
← : Front



5. When inserting breather hose A and breather hose B to hose connector (1), and breather hose B and breather hose C to hose connector, be sure to insert it fully until it reaches the stop.

CAUTION:

Align paint marks (A) on each breather hose.



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TRANSFER ASSEMBLY

< UNIT REMOVAL AND INSTALLATION >

[TRANSFER: TX91A]

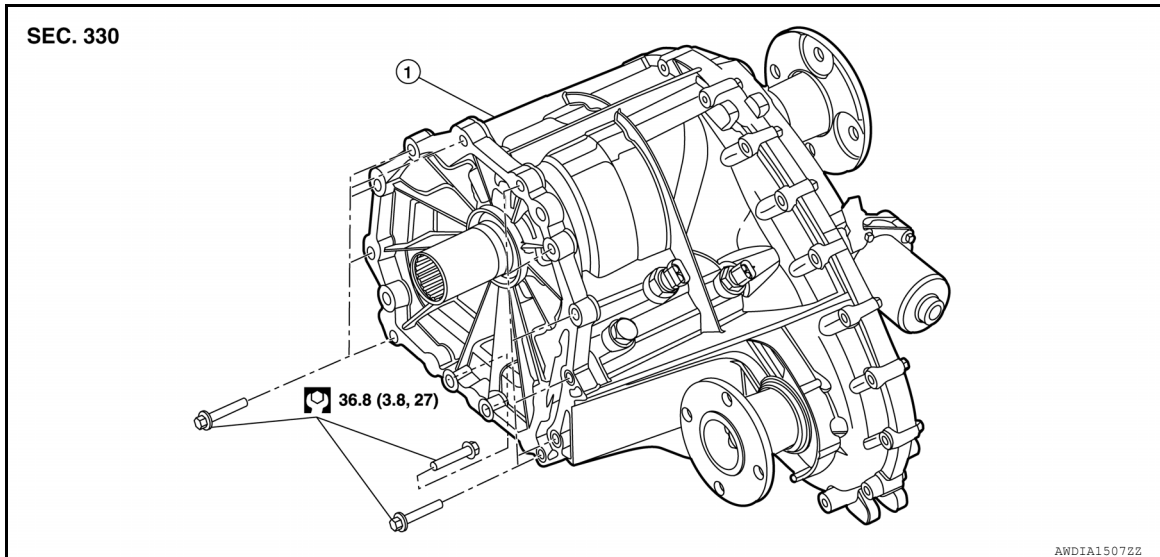
UNIT REMOVAL AND INSTALLATION

TRANSFER ASSEMBLY

Exploded View

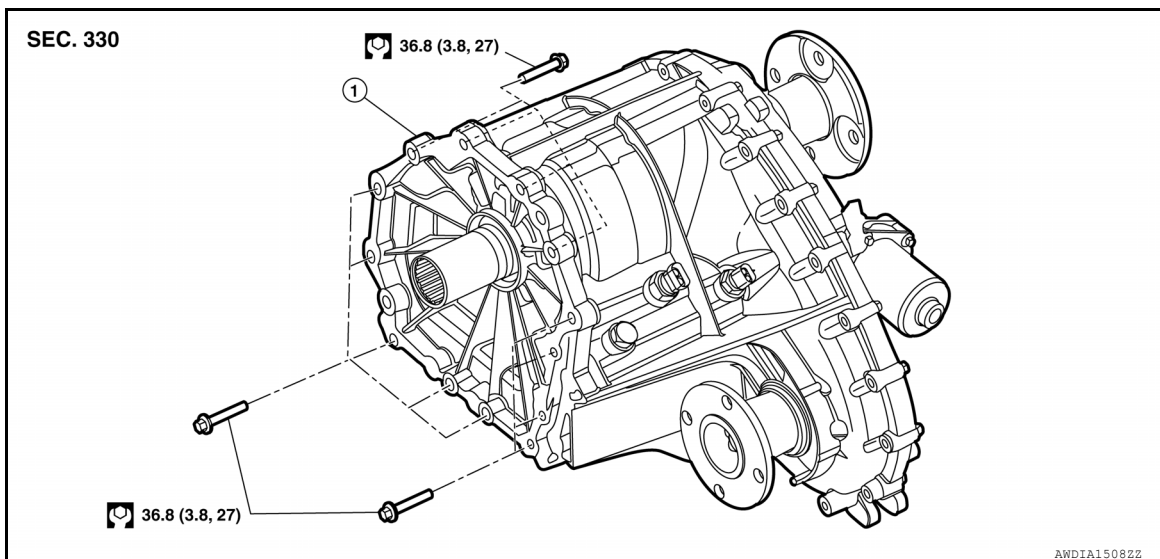
INFOID:000000012556221

Cummins 5.0L



1. Transfer assembly

VK56VD



1. Transfer assembly

Removal and Installation

INFOID:000000012556222

REMOVAL

1. Remove rear propeller shaft. Refer to [DLN-133, "Removal and Installation"](#).
2. Remove front propeller shaft. Refer to [DLN-123, "Removal and Installation"](#).
3. Disconnect the harness connectors from the transfer motor, transfer rotary position sensor, mode sensor, and range sensor and separate harnesses from transfer assembly.
4. Remove transfer breather hose A from transfer assembly. Refer to [DLN-112, "Exploded View"](#) (Cummins 5.0L models), [DLN-114, "Removal and Installation - VK56VD Models"](#) (VK56VD models).

TRANSFER ASSEMBLY

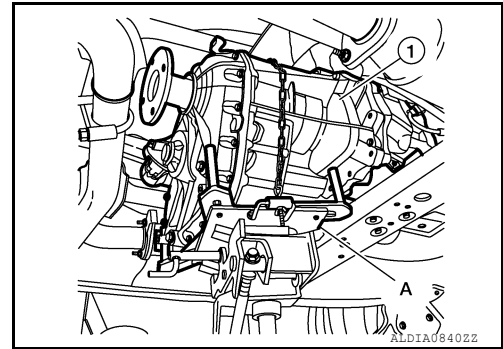
[TRANSFER: TX91A]

< UNIT REMOVAL AND INSTALLATION >

- Support transfer assembly (1) with a jack (A).

CAUTION:

Secure transfer assembly to a jack.



- Remove transfer mounting bolts and separate transfer from A/T assembly.

CAUTION:

Secure transfer assembly to a jack.

INSTALLATION

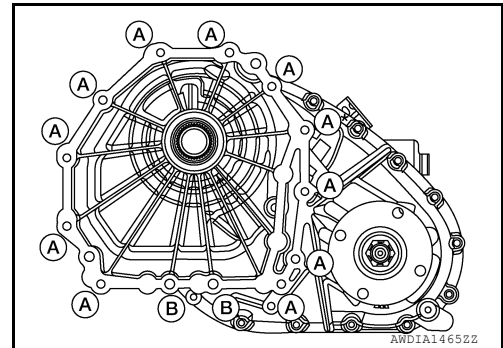
Installation in the reverse order of removal.

Cummins 5.0L Models:

- When installing the transfer to the A/T assembly, install the bolts following the standard below, tighten bolts to the specified torque.

Bolt symbol	A	B
Insertion direction	Transmission to transfer	Transfer to transmission

*Tighten bolt with bracket

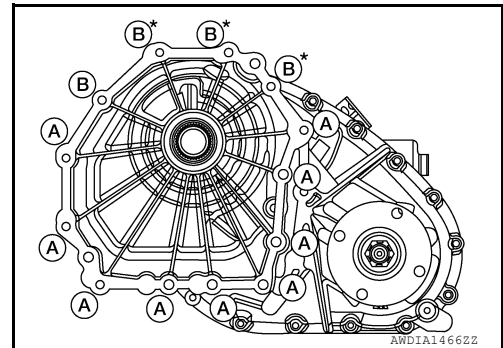


VK56VD Models:

- When installing the transfer to the A/T assembly, install the bolts following the standard below, tighten bolts to the specified torque.

Bolt symbol	A	B
Insertion direction	Transmission to transfer	Transfer to transmission

*Tighten bolt with bracket



Inspection and Adjustment

INFOID:000000012556223

INSPECTION AFTER INSTALLATION

Check for fluid leaks and the fluid level. Refer to [DLN-98, "Inspection"](#).

ADJUSTMENT AFTER INSTALLATION

When replacing transfer assembly, clear the transfer rotary position sensor learning value stored in transfer control unit. Refer to [DLN-44, "Description"](#).

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SERVICE DATA AND SPECIFICATIONS (SDS)

< SERVICE DATA AND SPECIFICATIONS (SDS)

[TRANSFER: TX91A]

SERVICE DATA AND SPECIFICATIONS (SDS)

SERVICE DATA AND SPECIFICATIONS (SDS)

General Specifications

INFOID:0000000012556224

Applied model	Axle	4WD	
	Engine	Cummins 5.0L	VK56VD
	Transmission	6 A/T	7 A/T
Transfer model	TX91A		
Gear ratio	4H	1.000	
	4LO	2.717	
Fluid capacity	1.8 ℓ (3-7/8 US pt, 3-1/8 Imp pt)		

PRECAUTIONS

[FRONT PROPELLER SHAFT: 2F (Double Cardan)]

< PRECAUTION >

PRECAUTION

PRECAUTIONS

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

INFOID:000000013326328

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.

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PREPARATION

[FRONT PROPELLER SHAFT: 2F (Double Cardan)]

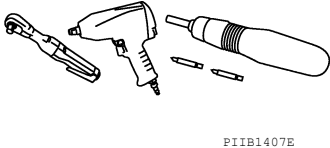
< PREPARATION >

PREPARATION

PREPARATION

Commercial Service Tool

INFOID:000000012544389

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

NOISE, VIBRATION, AND HARSHNESS (NVH) TROUBLESHOOTING

< SYSTEM DESCRIPTION >

[FRONT PROPELLER SHAFT: 2F (Double Cardan)]

SYSTEM DESCRIPTION

NOISE, VIBRATION, AND HARSHNESS (NVH) TROUBLESHOOTING

NVH Troubleshooting Chart

INFOID:000000012544390

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

Reference page		DLN-123	DLN-123	DLN-127	DLN-147	FAX-5	FSU-5	WT-64	WT-64	DLN-122	BR-7	ST-32
Possible cause and suspected parts		Uneven rotation torque	Rotation imbalance	Excessive run out	Differential	Axle	Suspension	Tires	Road wheel	Drive shaft	Brakes	Steering
Symptom	Noise	x	x	x	x	x	x	x	x	x	x	x
	Shake					x	x	x	x	x	x	x
	Vibration	x	x	x		x	x	x		x		x

x: Applicable

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PROPELLER SHAFT ASSEMBLY

< BASIC INSPECTION >

[FRONT PROPELLER SHAFT: 2F (Double Cardan)]

BASIC INSPECTION

PROPELLER SHAFT ASSEMBLY

Inspection

INFOID:000000013268439

APPEARANCE AND NOISE INSPECTION

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

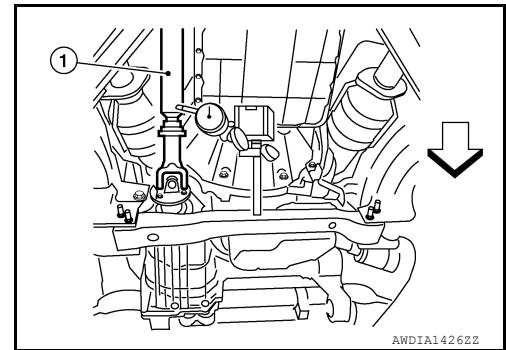
PROPELLER SHAFT VIBRATION

NOTE:

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

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

Propeller shaft runout : Refer to [DLN-127, "General Specification"](#).

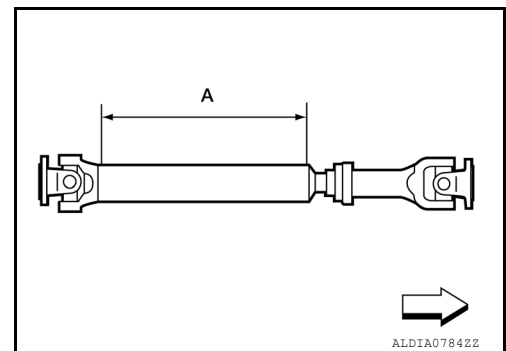


2. If the runout still exceeds specifications, disconnect the propeller shaft at the final drive companion flange; then rotate the companion flange 90°, 180°, 270° and reconnect propeller shaft.
3. Check the runout again. If the runout still exceeds specifications, replace the propeller shaft assembly.

(A) : Runout measuring range

⇐ : Front

4. After installation, check for vibration by driving the vehicle.



FRONT PROPELLER SHAFT

< UNIT REMOVAL AND INSTALLATION >

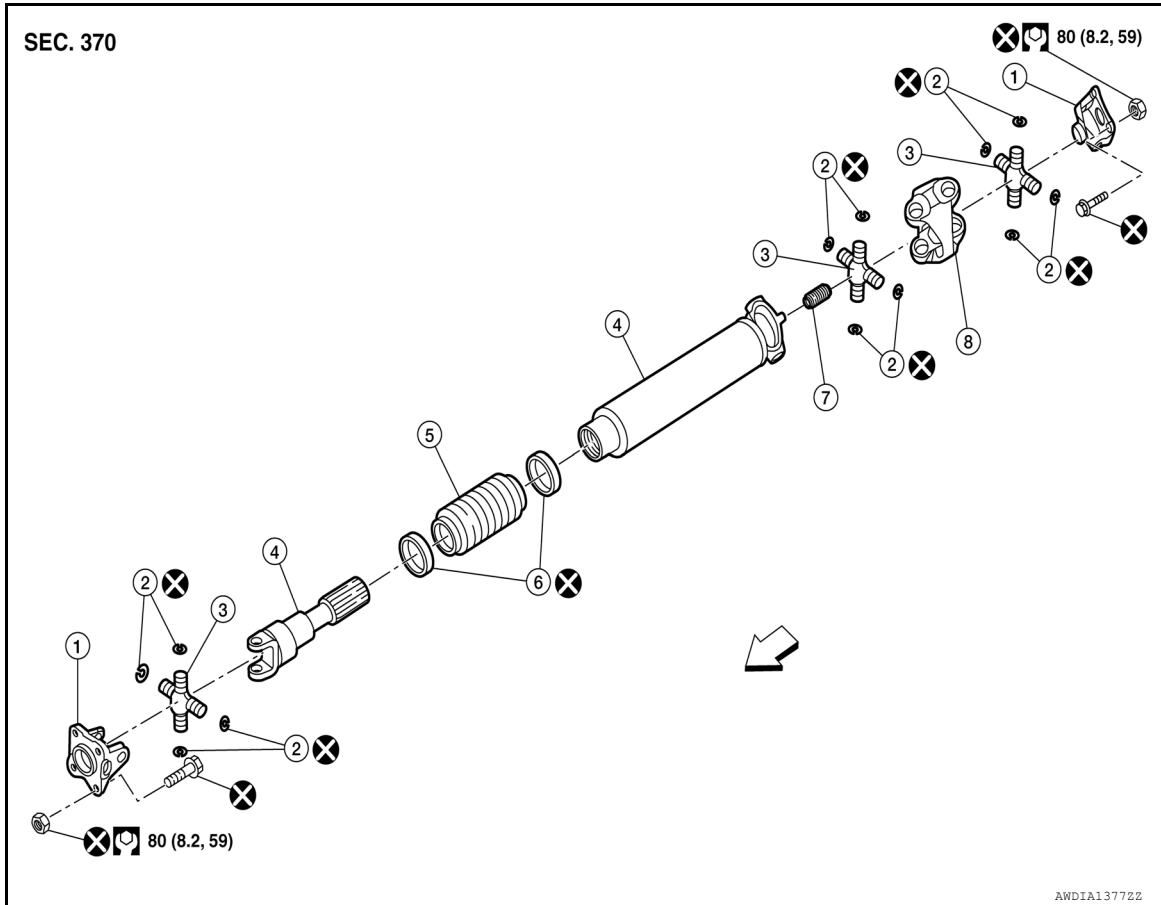
[FRONT PROPELLER SHAFT: 2F (Double Cardan)]

UNIT REMOVAL AND INSTALLATION

FRONT PROPELLER SHAFT

Exploded View

INFOID:0000000013268440



- | | | |
|-------------------------|----------------|------------|
| 1. Flange yoke | 2. Snap rings | 3. Journal |
| 4. Propeller shaft tube | 5. Boot | 6. Clamps |
| 7. Spring | 8. Center yoke | ⇐ Front |

⊗ : Always replace after every disassembly

⊞ : N·m (kg-m, ft-lb)

Removal and Installation

INFOID:0000000012544392

REMOVAL

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

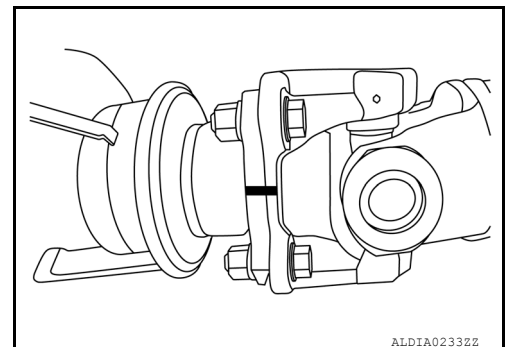
CAUTION:

For matching marks, use paint. Do not damage the flange yoke and companion flange of the front final drive.

- Put matching marks on the front propeller shaft flange yoke and the transfer companion flange.

CAUTION:

For matching marks, use paint. Do not damage the flange yoke and companion flange of the transfer case.



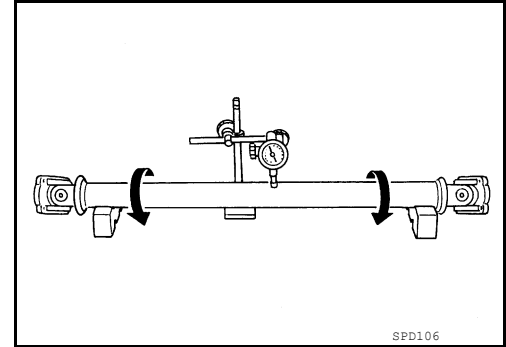
FRONT PROPELLER SHAFT

< UNIT REMOVAL AND INSTALLATION > [FRONT PROPELLER SHAFT: 2F (Double Cardan)]

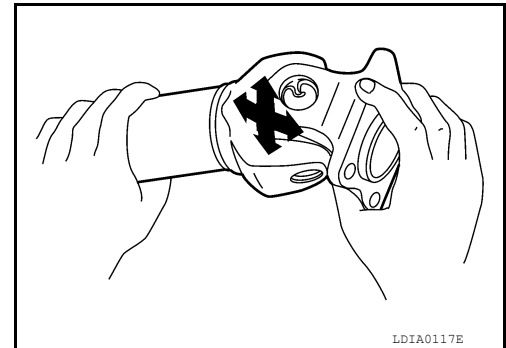
3. Remove the bolts and then remove the front propeller shaft from the front final drive and transfer.

INSPECTION

- Inspect the propeller shaft runout using suitable tool. If runout exceeds the limit, replace the propeller shaft assembly. Refer to [DLN-127. "General Specification"](#).



- While holding the flange yoke on one side, check axial play of the joint as shown. If the journal axial play exceeds the specification, repair or replace the journal parts. Refer to [DLN-127. "General Specification"](#).
- Check the propeller shaft tube surface for dents or cracks. If damage is detected, replace the propeller shaft assembly.



INSTALLATION

Installation is in the reverse order of removal.

- After installation, check for vibration by driving the vehicle. Refer to [DLN-121. "NVH Troubleshooting Chart"](#).

CAUTION:

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

FRONT PROPELLER SHAFT

< UNIT DISASSEMBLY AND ASSEMBLY >

[FRONT PROPELLER SHAFT: 2F (Double Cardan)]

UNIT DISASSEMBLY AND ASSEMBLY

FRONT PROPELLER SHAFT

Disassembly and Assembly

INFOID:000000012544393

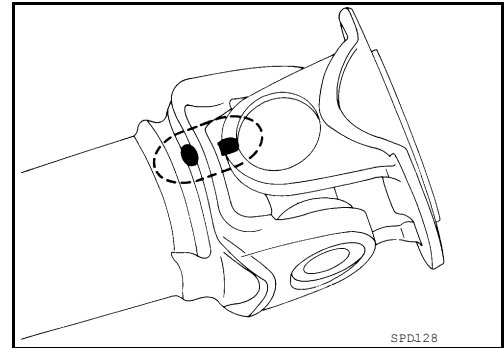
DISASSEMBLY

Journal

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

CAUTION:

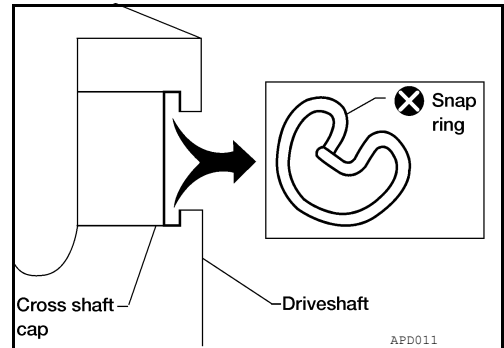
For matching marks, use paint. Do not damage the front propeller shaft or flange yoke.



2. Remove the snap rings.

CAUTION:

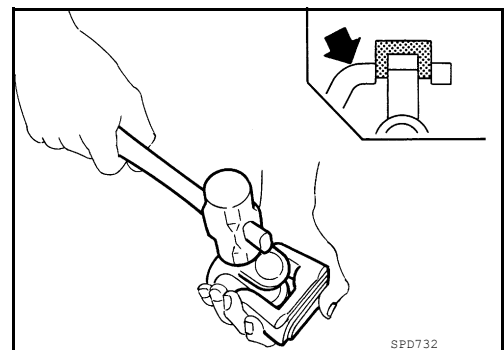
Do not reuse snap rings.



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

NOTE:

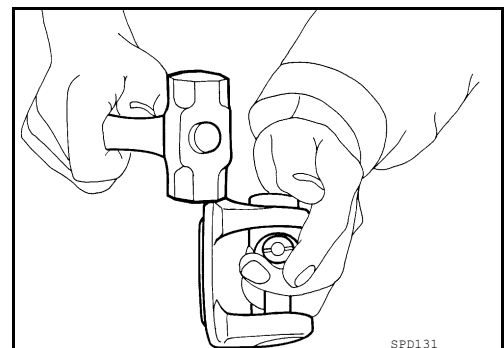
Put marks on the disassembled parts so that they can be reinstalled in their original positions from which they were removed.



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

NOTE:

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



ASSEMBLY

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FRONT PROPELLER SHAFT

< UNIT DISASSEMBLY AND ASSEMBLY >

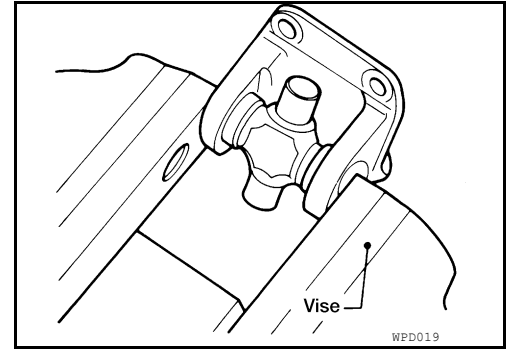
[FRONT PROPELLER SHAFT: 2F (Double Cardan)]

Journal

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

NOTE:

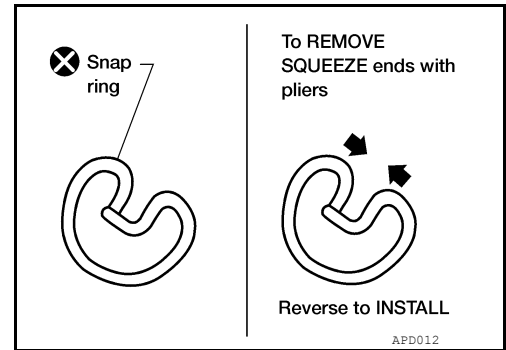
During assembly, use caution so that the needle bearings do not fall down.



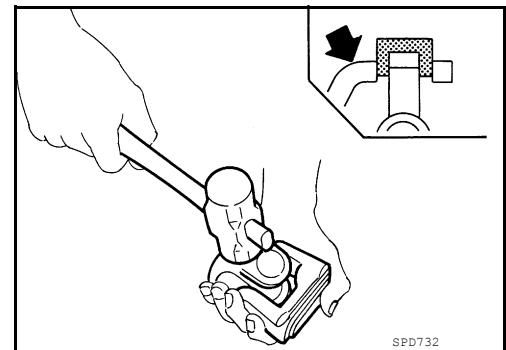
2. Install new snap rings that will provide the specified play in an axial direction of the journal.

CAUTION:

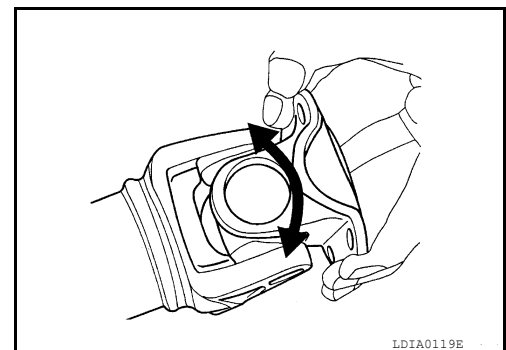
Do not reuse snap rings.



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



4. Make sure that the journal moves smoothly and is below the joint flex effort specification. Refer to [DLN-127. "General Specification"](#).



SERVICE DATA AND SPECIFICATIONS (SDS)

< SERVICE DATA AND SPECIFICATIONS (SDS) [FRONT PROPELLER SHAFT: 2F (Double Cardan)]

SERVICE DATA AND SPECIFICATIONS (SDS)

SERVICE DATA AND SPECIFICATIONS (SDS)

General Specification

INFOID:0000000012544394

Unit mm (in)

Applied model	4WD
Propeller shaft model	2F (Double Cardan)
Number of joints	2
Coupling method with front final drive	Flange type
Coupling method with transfer	Flange type
Installed shaft length (Spider to spider)	660.7 ± 1.5 (26.01 ± 0.06)
Shaft outer diameter	76.2 (3)

PROPELLER SHAFT RUNOUT

Unit mm (in)

Item	Limit
Propeller shaft runout	0.60 (0.024)

PROPELLER SHAFT JOINT FLEX EFFORT

Unit N·m (kg·m, in·lb)

Item	Limit
Propeller shaft joint flex effort	2.26 (0.23, 20) or less

JOURNAL AXIAL PLAY

Unit mm (in)

Item	Limit
Journal axial play	0.02 (0.0008) or less

PRECAUTIONS

[REAR PROPELLER SHAFT: 3F(2CVJ), 3S(2CVJ)]

< PRECAUTION >

PRECAUTION

PRECAUTIONS

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

INFOID:000000013500364

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.

PREPARATION

[REAR PROPELLER SHAFT: 3F(2CVJ), 3S(2CVJ)]


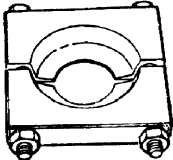
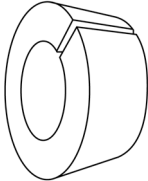
< PREPARATION >

PREPARATION

PREPARATION

Commercial Service Tool

INFOID:000000012544405

Tool name	Description
<p>Power tool</p>  <p>PIIB1407E</p>	<p>Loosening nuts, screws and bolts</p>
<p>205-D002 Bearing splitter</p>  <p>ZZA0700D</p>	<p>Removing center support bearing</p>
<p>CVJ boots protector</p>  <p>ALDIA07852Z</p>	<p>Removal and Installation for propeller shaft</p>

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NOISE, VIBRATION, AND HARSHNESS (NVH) TROUBLESHOOTING

< SYSTEM DESCRIPTION >

[REAR PROPELLER SHAFT: 3F(2CVJ), 3S(2CVJ)]

SYSTEM DESCRIPTION

NOISE, VIBRATION, AND HARSHNESS (NVH) TROUBLESHOOTING

NVH Troubleshooting Chart

INFOID:000000012544406

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

Reference page		DLN-131	DLN-131	DLN-142	DLN-217	RAX-4	RSU-4	WT-64	WT-64	FAX-5	BR-7	SI-32
Possible cause and suspected parts		Uneven rotation torque	Rotation imbalance	Excessive run out	Differential	Axle	Suspension	Tires	Road wheel	Drive shaft	Brakes	Steering
Symptom	Noise	x	x	x	x	x	x	x	x	x	x	x
	Shake					x	x	x	x	x	x	x
	Vibration	x	x	x		x	x	x		x		x

x: Applicable

PROPELLER SHAFT ASSEMBLY

< BASIC INSPECTION >

[REAR PROPELLER SHAFT: 3F(2CVJ), 3S(2CVJ)]

BASIC INSPECTION

PROPELLER SHAFT ASSEMBLY

Inspection

INFOID:0000000013268445

APPEARANCE AND NOISE INSPECTION

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

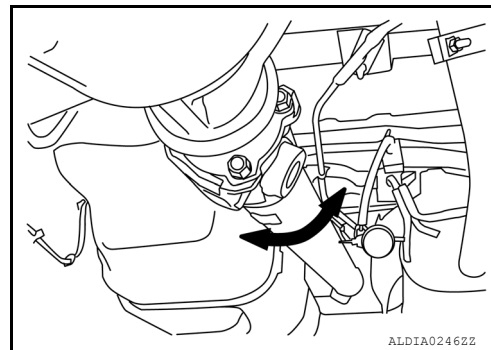
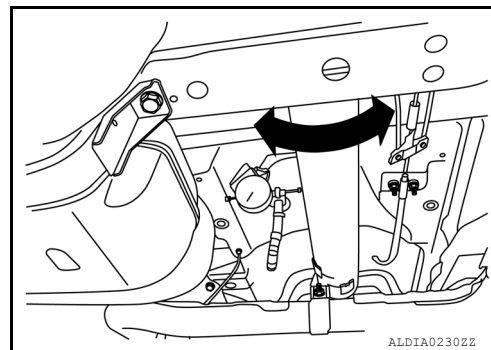
PROPELLER SHAFT VIBRATION

NOTE:

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

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

Propeller shaft runout : Refer to [DLN-142, "General Specification"](#).



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

REAR PROPELLER SHAFT

< UNIT REMOVAL AND INSTALLATION >

[REAR PROPELLER SHAFT: 3F(2CVJ), 3S(2CVJ)]

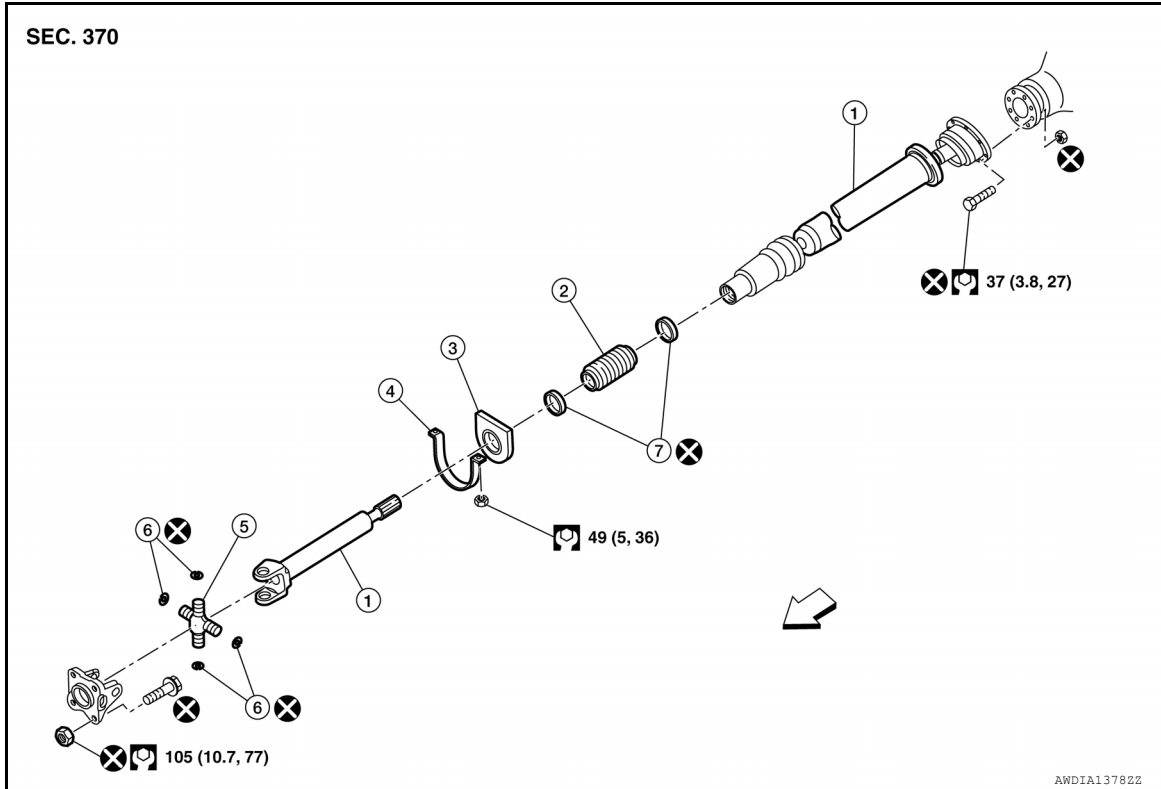
UNIT REMOVAL AND INSTALLATION

REAR PROPELLER SHAFT

Exploded View

INFOID:000000013268446

3F(2CVJ)



- | | | |
|-----------------------------------|---------------------|---------------------------|
| 1. Propeller shaft tube | 2. Boot | 3. Center support bearing |
| 4. Center support bearing bracket | 5. Journal assembly | 6. Snap rings |
| 7. Clamps | ⇐ Front | |

⊗ : Always replace after every disassembly

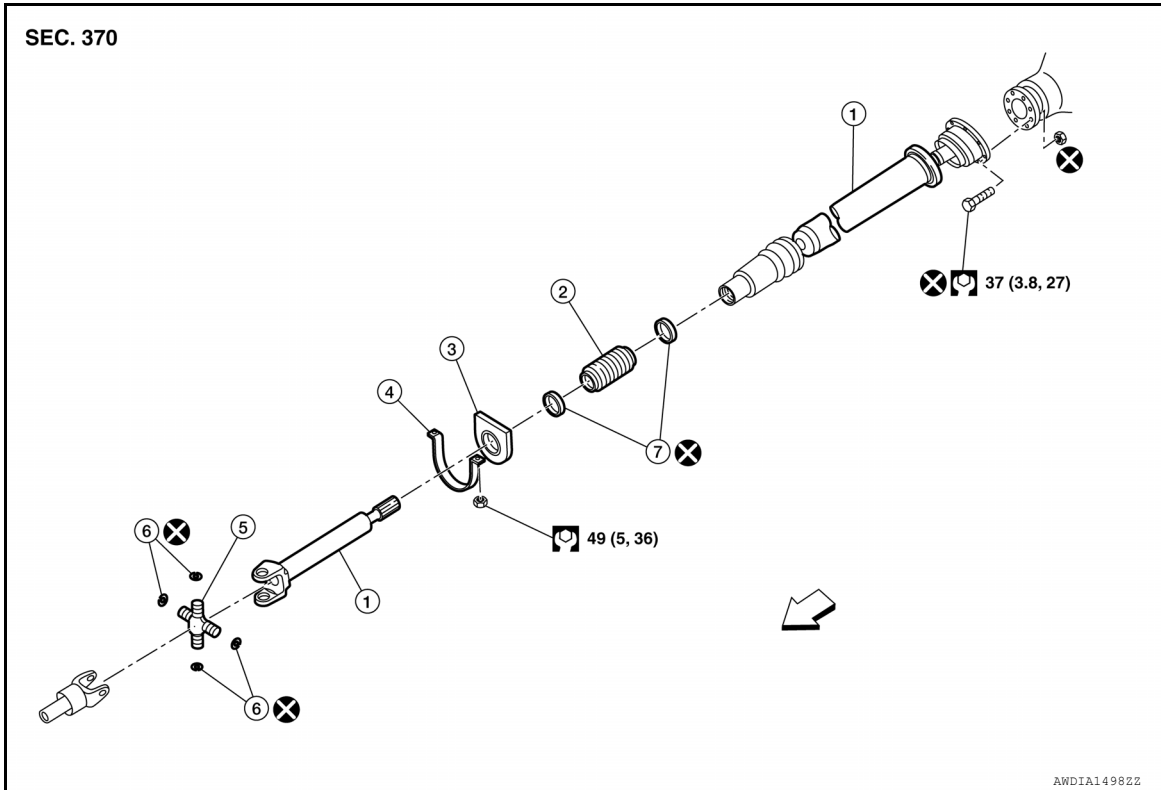
⊞ : N·m (kg·m, ft·lb)

REAR PROPELLER SHAFT

< UNIT REMOVAL AND INSTALLATION >

[REAR PROPELLER SHAFT: 3F(2CVJ), 3S(2CVJ)]

3S(2CVJ)



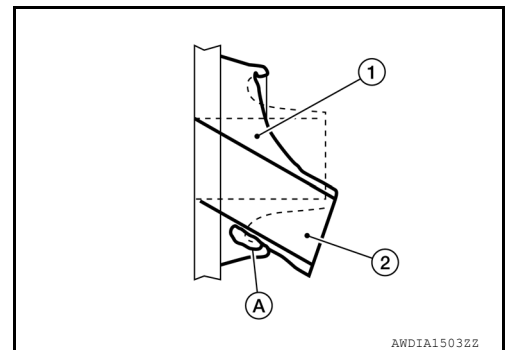
- | | | |
|-----------------------------------|---------------------|---------------------------|
| 1. Propeller shaft tube | 2. Boot | 3. Center support bearing |
| 4. Center support bearing bracket | 5. Journal assembly | 6. Snap rings |
| 7. Clamps | ← Front | |
- : Always replace after every disassembly
 : N·m (kg·m, ft·lb)

Removal and Installation

INFOID:000000012544408

CAUTION:

- Do not damage (A) CVJ boot (1) by bending propeller shaft (2) during removal and installation.

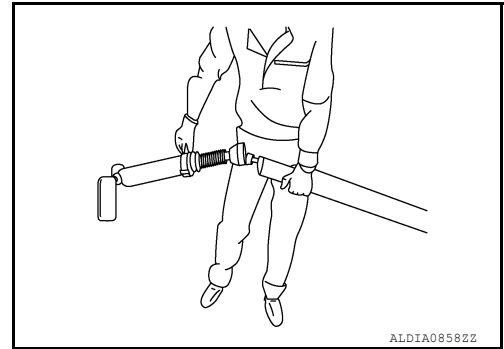


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REAR PROPELLER SHAFT

< UNIT REMOVAL AND INSTALLATION >

[REAR PROPELLER SHAFT: 3F(2CVJ), 3S(2CVJ)]



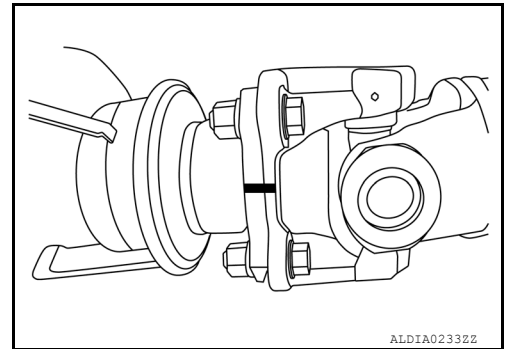
- To prevent damage to CVJ boot use suitable tool during removal and installation.

REMOVAL

1. Move the shift selector to the N position and release the parking brake.
2. Put matching marks on the rear propeller shaft flange yoke and the companion flange A/T assembly as shown.

CAUTION:

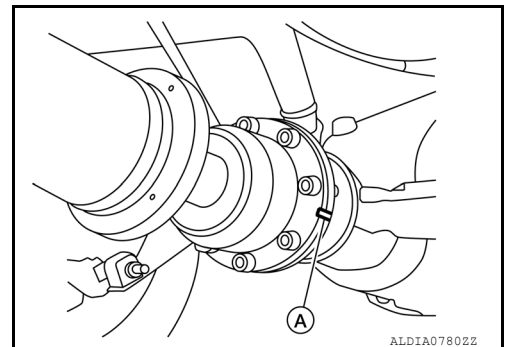
For matching marks, use paint. Do not damage the rear propeller shaft flange yoke or the companion flange.



3. Put matching marks (A) on the rear propeller shaft flange yoke and the companion flange of the rear final drive as shown.

CAUTION:

For matching marks, use paint. Do not damage the rear propeller shaft flange yoke or the companion flange when removing and installing propeller shaft, be careful so as not to let the propeller shaft hang down.



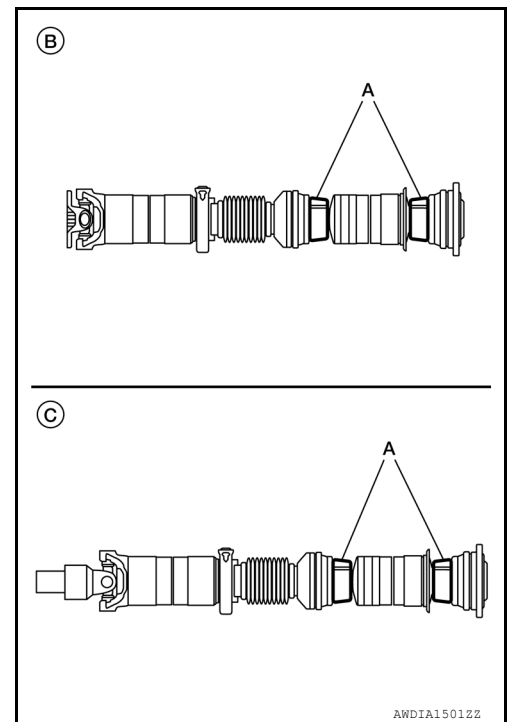
REAR PROPELLER SHAFT

< UNIT REMOVAL AND INSTALLATION >

[REAR PROPELLER SHAFT: 3F(2CVJ), 3S(2CVJ)]

4. Install suitable tool (A) to CVJ boots to prevent damage during removal.

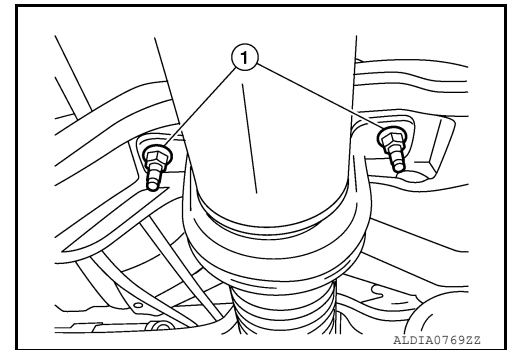
- (A) : suitable tool
- (B) : 3F(2CVJ)
- (C) : 3S(2CVJ)



5. Remove the center support bearing bracket nuts (1), and remove the propeller shaft from the vehicle.

CAUTION:

Do not damage CVJ boot by bending propeller shaft during removal and installation. Be careful so as not to let the propeller shaft hang down.



6. Remove bolts fixing propeller shaft to A/T assembly (2WD) or transfer case (4WD).
7. Remove bolts fixing propeller shaft to rear final drive and remove propeller shaft from vehicle.

INSPECTION AFTER REMOVAL

REAR PROPELLER SHAFT

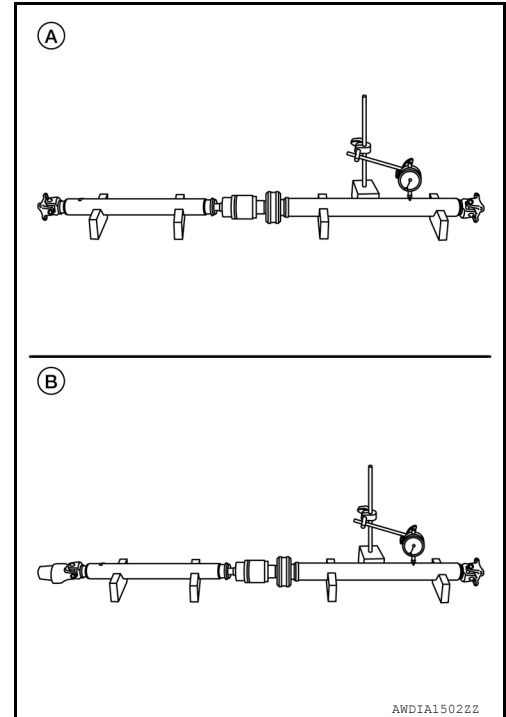
< UNIT REMOVAL AND INSTALLATION >

[REAR PROPELLER SHAFT: 3F(2CVJ), 3S(2CVJ)]

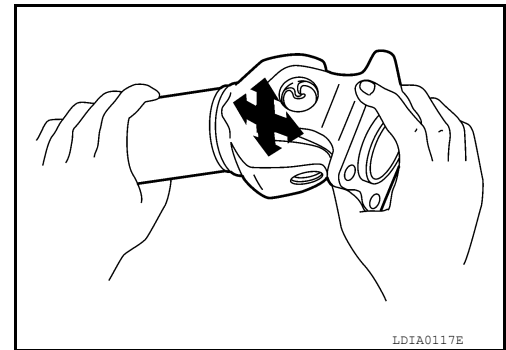
- Inspect the propeller shaft runout. If runout exceeds the limit, replace the propeller shaft assembly. Refer to [DLN-142, "General Specification"](#).

(A) : 3F(2CVJ)

(B) : 3S(2CVJ)



- While holding the flange yoke on one side, check axial play of the joint as shown. If the journal axial play exceeds the specification, repair or replace the journal parts. Refer to [DLN-142, "General Specification"](#).
- Check the propeller shaft tube for bend and damage. If damage is detected, replace the propeller shaft assembly.

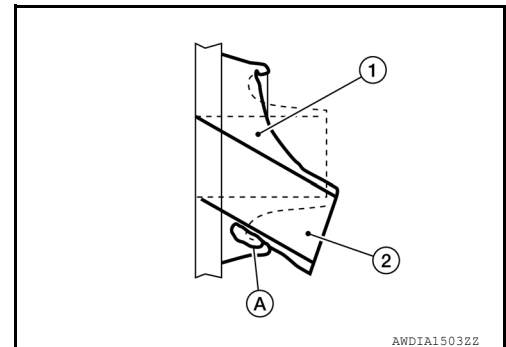


INSTALLATION

Installation is in the reverse order of removal.

CAUTION:

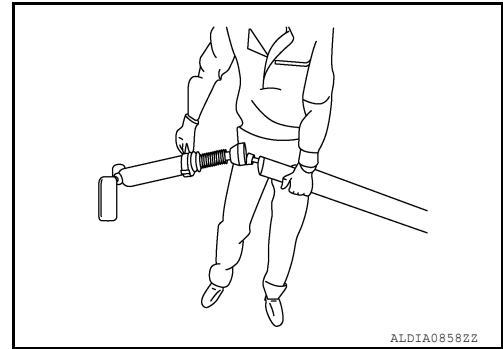
- Do not damage (A) CVJ boot (1) by bending propeller shaft (2) during removal and installation.



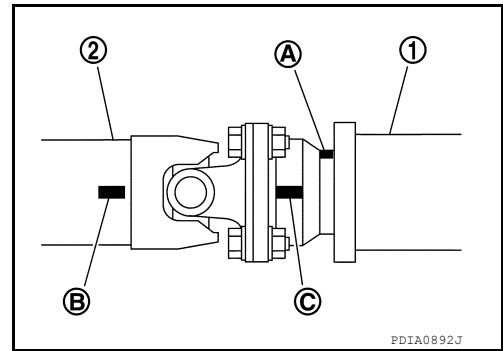
REAR PROPELLER SHAFT

< UNIT REMOVAL AND INSTALLATION >

[REAR PROPELLER SHAFT: 3F(2CVJ), 3S(2CVJ)]

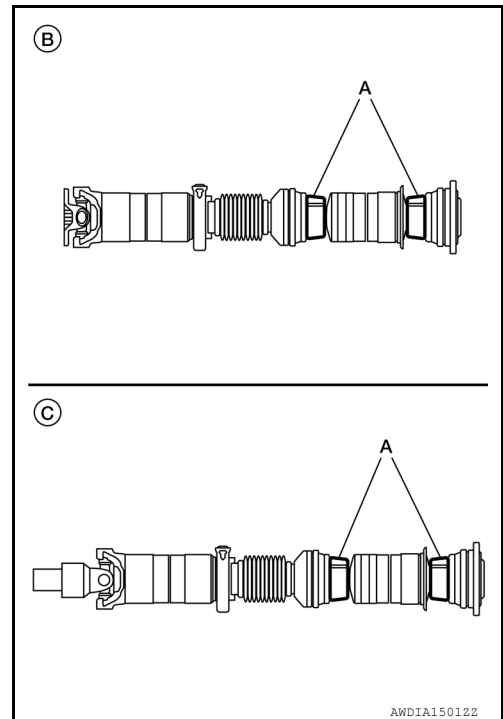


- To prevent damage to CVJ boot use suitable tool during removal and installation.
- After installation, check for vibration by driving the vehicle. Refer to [DLN-130, "NVH Troubleshooting Chart"](#).
- If propeller shaft assembly or final drive assembly has been replaced, connect them as follows:
 - Face companion flange mark (A) of the A/T assembly (1) up. With the mark (A) faced up, couple the propeller shaft and the companion flange so that the matching mark (B) of the propeller shaft (2) can be positioned as close as possible with the matching mark (C) of the A/T assembly companion flange.
 - Face companion flange mark (A) of the final drive (1) up. With the mark (A) faced up, couple the propeller shaft and the companion flange so that the matching mark (B) of the propeller shaft (2) can be positioned as close as possible with the matching mark (C) of the final drive companion flange.
- Tighten propeller shaft and final drive bolts and nuts to specifications. Refer to [DLN-132, "Exploded View"](#).



- CAUTION:**
- Do not reuse the bolts and nuts. Always install new ones.
 - Remove suitable tool (A) to CVJ boots to prevent damage during removal.

- (A) : Suitable tool
- (B) : 3F(2CVJ)
- (C) : 3S(2CVJ)



REAR PROPELLER SHAFT

< UNIT DISASSEMBLY AND ASSEMBLY >

[REAR PROPELLER SHAFT: 3F(2CVJ), 3S(2CVJ)]

UNIT DISASSEMBLY AND ASSEMBLY

REAR PROPELLER SHAFT

Disassembly and Assembly

INFOID:000000013268449

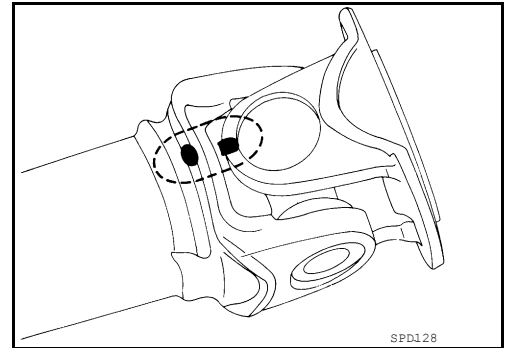
DISASSEMBLY

Journal bearing

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

CAUTION:

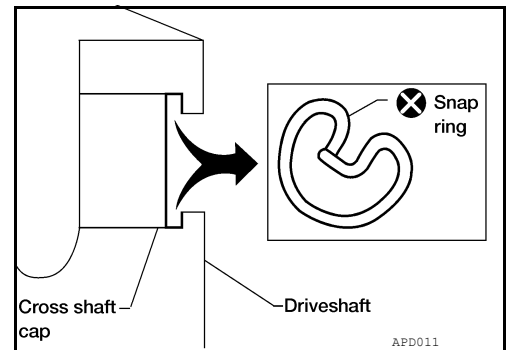
For matching marks use paint. Do not damage the rear propeller shaft or flange yoke.



2. Remove the snap rings.

CAUTION:

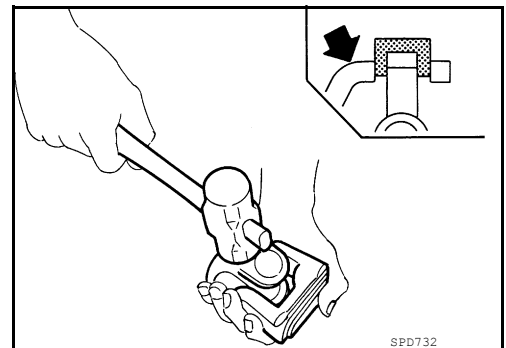
Do not reuse snap rings.



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

NOTE:

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



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

NOTE:

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



Center Support Bearing

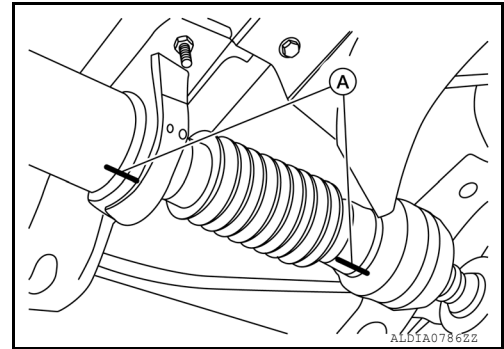
1. Remove the propeller shaft assembly from the vehicle. Refer to [DLN-133, "Removal and Installation"](#).

REAR PROPELLER SHAFT

< UNIT DISASSEMBLY AND ASSEMBLY >

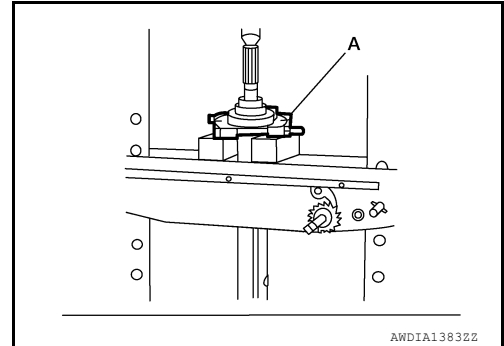
[REAR PROPELLER SHAFT: 3F(2CVJ), 3S(2CVJ)]

- Put matching marks (A) on the propeller shaft tube and the CVJ.
CAUTION:
For matching marks, use paint. Do not damage the propeller shaft tube or CVJ.
- Remove and discard the clamp near the center support bearing, then slide the CVJ off of propeller shaft tube.



- Press the center support bearing off the propeller shaft tube using Tool and suitable hydraulic press.

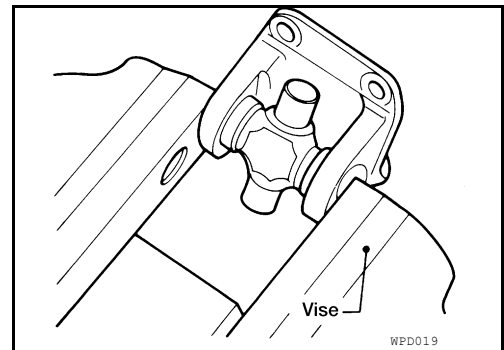
Tool : 205-D002 (—)



ASSEMBLY

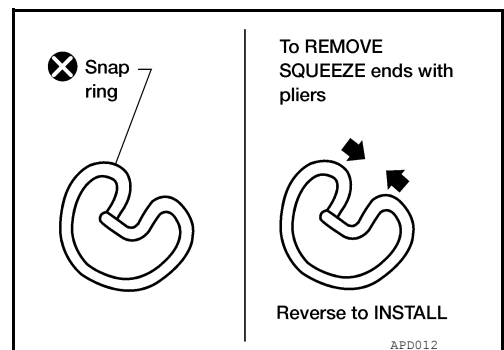
Journal bearing

- Assemble the journal bearings. Apply multipurpose grease on the bearing inner surface.
NOTE:
During assembly, use caution so that the needle bearings do not fall down.



- Install new snap rings that will provide the specified play in an axial direction of the journal, and install them.

CAUTION:
Do not reuse snap rings



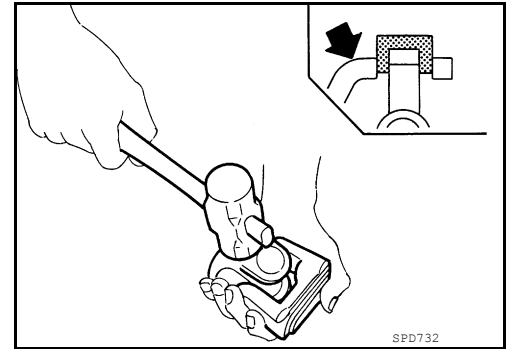
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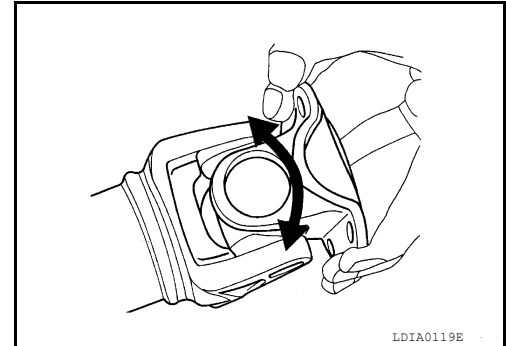
< UNIT DISASSEMBLY AND ASSEMBLY >

[REAR PROPELLER SHAFT: 3F(2CVJ), 3S(2CVJ)]

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

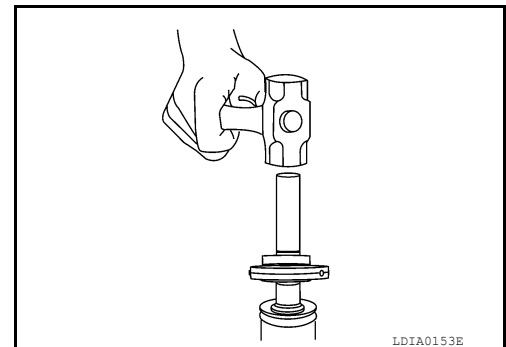


4. Make sure that the journal bearing moves smoothly and is below the propeller joint flex effort specification. Refer to [DLN-142, "General Specification"](#).

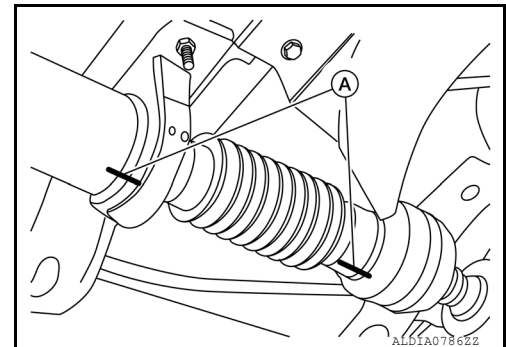


Center Support Bearing

1. Apply a thin coat of multi-purpose grease to both the propeller shaft tube and the inside surface of the center support bearing.
2. Install the center support bearing on the propeller shaft tube using a suitable pipe pressing on the inner race.



3. Install a new clamp over the boot on the CVJ.
4. Align the matching marks (A) and install CVJ on the propeller shaft tube.



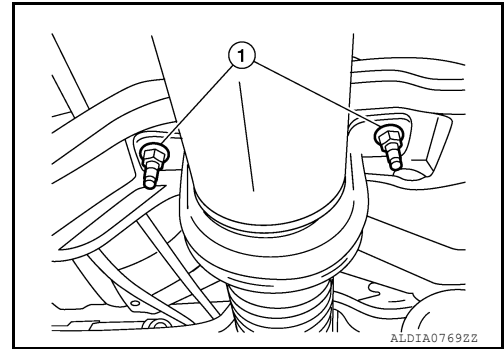
5. Clean the surfaces and position the boot over the propeller shaft tube and tighten the clamp.

REAR PROPELLER SHAFT

< UNIT DISASSEMBLY AND ASSEMBLY >

[REAR PROPELLER SHAFT: 3F(2CVJ), 3S(2CVJ)]

6. Install the center support bearing bracket, tighten nuts (1) to specification, and install the rear propeller shaft assembly in the vehicle. Refer to [DLN-132. "Exploded View"](#).



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SERVICE DATA AND SPECIFICATIONS (SDS)

< SERVICE DATA AND SPECIFICATIONS (SDS) [REAR PROPELLER SHAFT: 3F(2CVJ), 3S(2CVJ)]

SERVICE DATA AND SPECIFICATIONS (SDS)

SERVICE DATA AND SPECIFICATIONS (SDS)

General Specification

INFOID:000000012544410

2WD Model

Unit: mm (in)

Applied model	2WD	
Propeller shaft model	3S(2CVJ)	
Number of joints	3	
Coupling method with rear final drive	Flange type	
Coupling method with transmission	Sleeve type	
Installed shaft length	1st (Spider to Flange)	2395.2 ± 4.5 (94.29 ± 0.17)
Shaft outer diameter	1st	$88.9 + 0.00 - 0.13$ ($3.50 + 0.00 - 0.01$)
	2nd	$88.9 + 0.00 - 0.13$ ($3.50 + 0.00 - 0.01$)

4WD Model

Unit: mm (in)

Applied model	4WD	
Propeller shaft model	3F(2CVJ)	
Number of joints	3	
Coupling method with rear final drive	Flange type	
Coupling method with transmission	Flange type	
Installed shaft length	1st (Spider to Flange)	2023.2 ± 4.5 (79.65 ± 0.17)
Shaft outer diameter	1st	$88.9 + 0.00 - 0.13$ ($3.50 + 0.00 - 0.01$)
	2nd	$88.9 + 0.00 - 0.13$ ($3.50 + 0.00 - 0.01$)

PROPELLER SHAFT RUNOUT

Unit: mm (in)

Item	Limit
Propeller shaft runout limit	0.60 (0.024) or less

JOURNAL AXIAL PLAY

Unit: mm (in)

Item	Limit
Journal axial play	0.02 (0.0008) or less

PROPELLER SHAFT JOINT FLEX EFFORT

Unit: N·m (kg-m, in-lb)

Item	Limit
Propeller shaft joint flex effort	2.26 (0.23, 20) or less

PRECAUTION

PRECAUTIONS

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

INFOID:000000013326356

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 Servicing Front Final Drive

INFOID:000000012544413

- Before starting diagnosis of the vehicle, understand the symptoms well. Perform correct and systematic operations.
- Check for the correct installation status prior to removal or disassembly. When matching marks are required, be certain they do not interfere with the function of the parts they are applied to.
- Overhaul should be done in a clean work area, a dust proof area is recommended.
- Before disassembly, completely remove sand and mud from the exterior of the unit, preventing them from entering into the unit during disassembly or assembly.
- Always use shop paper for cleaning the inside of components.
- Avoid using cotton gloves or a shop cloth to prevent the entering of lint.
- Check appearance of the disassembled parts for damage, deformation, and abnormal wear. Replace them with new ones if necessary.
- Gaskets, seals and O-rings should be replaced any time the unit is disassembled.
- Clean and flush the parts sufficiently and blow them dry.
- Be careful not to damage sliding surfaces and mating surfaces.
- When applying sealant, remove the old sealant from the mating surface; then remove any moisture, oil, and foreign materials from the application and mating surfaces.
- In principle, tighten nuts or bolts gradually in several steps working diagonally from inside to outside. If a tightening sequence is specified, observe it.
- During assembly, observe the specified tightening torque.
- Add new differential gear oil, petroleum jelly, or multi-purpose grease, as specified.

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PREPARATION

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[FRONT FINAL DRIVE: MA235]

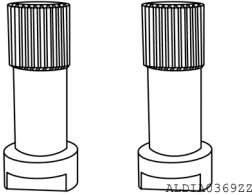
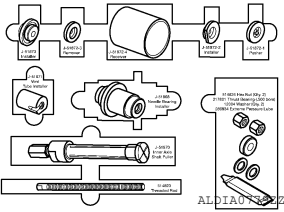
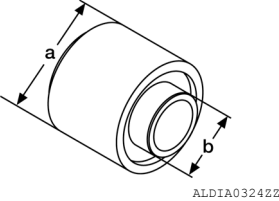
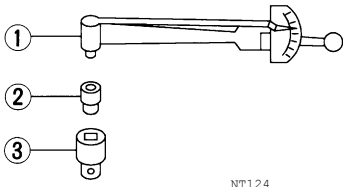
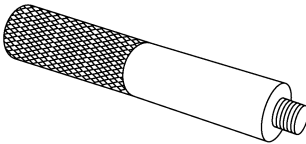
PREPARATION

PREPARATION

Special Service Tool

INFOID:000000012544414

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

Tool number (TechMate No.) Tool name	Description
<p>— (J-51044) Drive gear holder</p> 	<p>Removing drive gear</p>
<p>— (J-51879) 150+ Front axle kit</p> 	<ul style="list-style-type: none"> • Remove and install insulator bushings • Install needle bearings • Remove intermediate shaft
<p>— (J-50982) Pinion Seal Installer</p> 	<p>Installing front oil seal. a: 90 mm (3.54 in) dia. b: 55.3 mm (2.18 in) dia.</p>
<p>ST3127S000 (J-25765-A) Preload gauge 1. GG91030000 (J-25765) Torque wrench 2. HT62940000 (—) Socket adapter (1/2") 3. HT62900000 (—) Socket adapter (3/8")</p> 	<p>Inspecting drive pinion bearing preload and total preload</p>
<p>— (C-4171) Handle</p> 	<ul style="list-style-type: none"> • Removing drive pinion front bearing outer race • Removing drive pinion rear bearing outer race

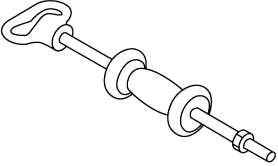

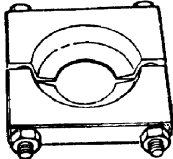
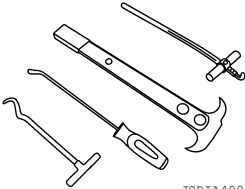
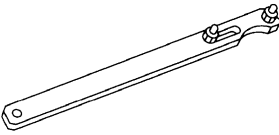
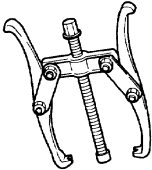
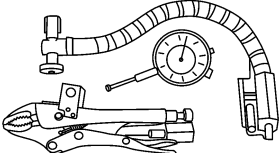
Commercial Service Tool

INFOID:000000012544415

PREPARATION

< PREPARATION >

[FRONT FINAL DRIVE: MA235]

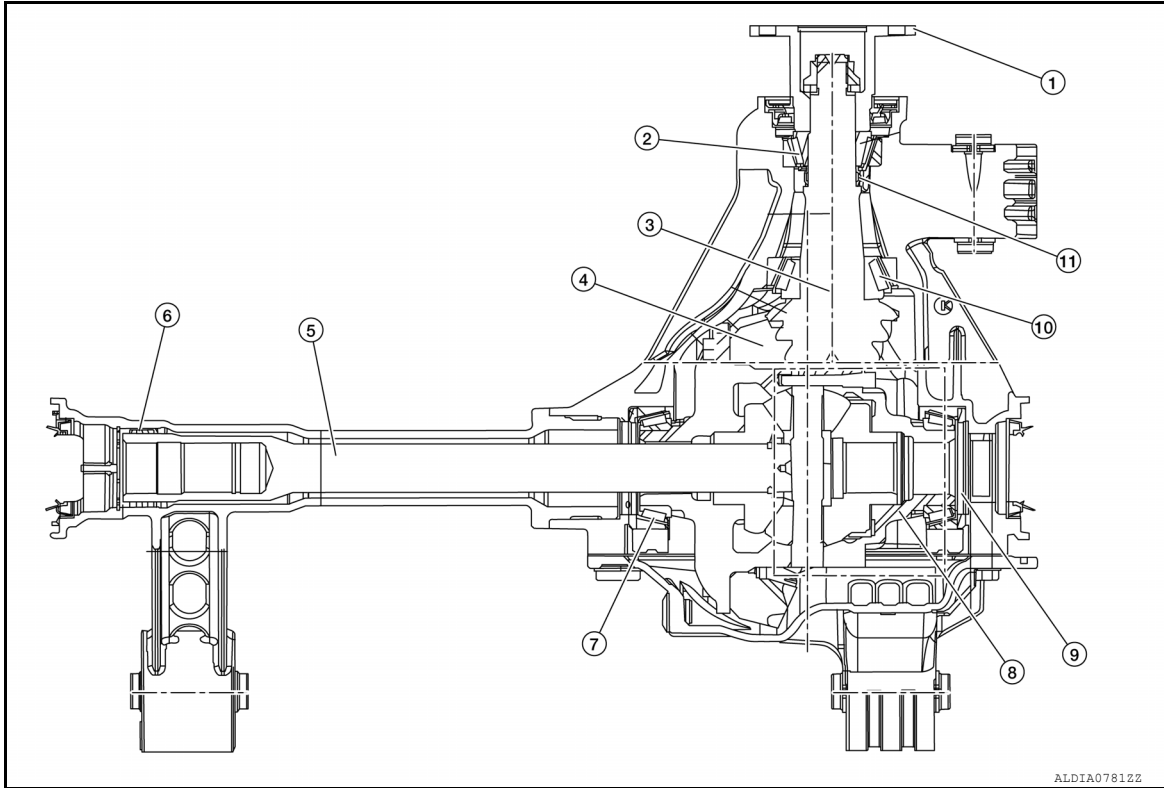
(TechMate No.) Tool name	Description	A
(J-02619-5) Slide hammer  ALDIA0775Z2	<ul style="list-style-type: none"> • Removing front oil seal • Removing side oil seal 	B C
Power tool  PIIB1407E	Loosening nuts, screws and bolts	DLN E
Separator  ZZA0700D	<ul style="list-style-type: none"> • Removing side bearing inner race. • Removing drive pinion rear bearing inner race. 	F G H
Oil seal remover  JSDIA4998Z2	<ul style="list-style-type: none"> • Removing side oil seal • Removing front oil seal 	I J
Flange wrench  NT035	Removing and installing drive pinion lock nut	K L M
Puller  ZZA0119D	Removing companion flange	N O
— (J-45101) Dial indicator set  AWDIA1066Z2	Measuring Tool	P

SYSTEM DESCRIPTION

STRUCTURE AND OPERATION

Sectional View

INFOID:000000013366740



ALDIA07812Z

- | | | |
|-------------------------|--------------------------|----------------------|
| 1. Companion flange | 2. Pinion front bearing | 3. Drive pinion |
| 4. Drive gear | 5. Intermediate shaft | 6. Needle bearing |
| 7. Side bearing | 8. Differential assembly | 9. Differential shim |
| 10. Pinion rear bearing | 11. Collapsible spacer | |

NOISE, VIBRATION AND HARSHNESS (NVH) TROUBLESHOOTING

< SYMPTOM DIAGNOSIS >

[FRONT FINAL DRIVE: MA235]

SYMPTOM DIAGNOSIS

NOISE, VIBRATION AND HARSHNESS (NVH) TROUBLESHOOTING

NVH Troubleshooting Chart

INFOID:000000012544416

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

Reference page	DLN-159	DLN-159	DLN-159	DLN-159	DLN-159	DLN-148	DLN-121	FAX-5	FSU-5	WT-64	WT-64	FAX-5	BR-7	ST-32
Possible cause and SUSPECTED PARTS	Gear tooth rough	Gear contact improper	Tooth surfaces worn	Incorrect backlash	Companion flange excessive runout	Gear oil improper	PROPELLER SHAFT	FRONT AXLE	FRONT SUSPENSION	TIRES	ROAD WHEEL	DRIVE SHAFT	BRAKES	STEERING
Symptom	Noise	x	x	x	x	x	x	x	x	x	x	x	x	x

x: Applicable

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PERIODIC MAINTENANCE

FRONT DIFFERENTIAL GEAR OIL

Inspection

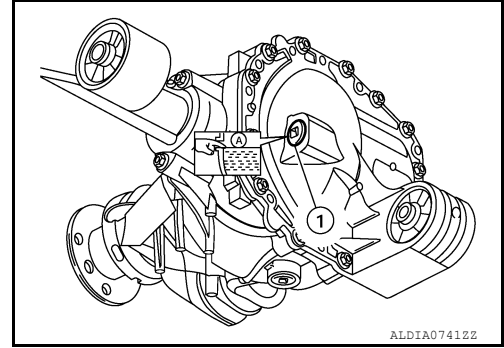
INFOID:000000013191025

OIL LEAKS

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

OIL LEVEL

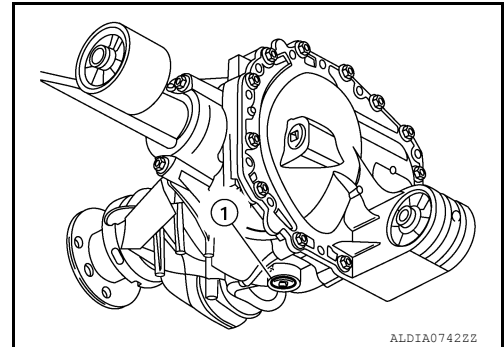
1. Check oil level (A) from filler plug hole as shown in the figure after removing filler plug (1) and gasket from final drive assembly.
CAUTION:
Turn the ignition switch OFF while checking oil level.
 - Oil level should be level with bottom of filler plug hole.
2. Set a gasket on filler plug and install it on final drive assembly.
CAUTION:
Do not reuse gasket.
3. Tighten filler plug to the specified torque. Refer to [DLN-159, "Disassembly and Assembly"](#).



Draining

INFOID:000000013191026

1. Turn the ignition switch OFF.
2. Remove drain plug (1) and gasket.
3. Drain gear oil.
4. Install a gasket on drain plug and install it to final drive assembly.
CAUTION:
Do not reuse gasket.
5. Tighten drain plug to the specified torque. Refer to [DLN-159, "Disassembly and Assembly"](#).



Refilling

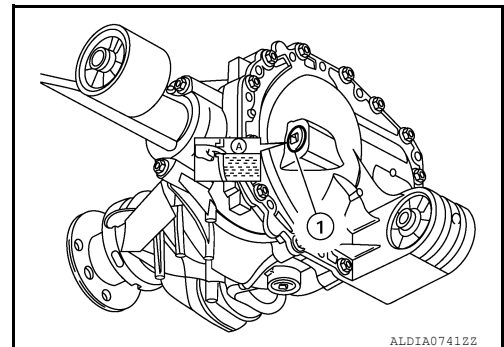
INFOID:000000013191027

1. Remove filler plug (1) and gasket. Then fill with new gear oil until oil level (A) reaches the specified level near filler plug mounting hole.
CAUTION:
Do not overfill front final drive.

Oil grade and viscosity : Refer to [MA-13, "VK56VD Gasoline Engine : Fluids and Lubricants"](#) or, [MA-59, "Cummins \(5.0L V8D\) Engine : Fluids and Lubricants"](#).

Standard Oil capacity : Refer to [DLN-172, "General Specification"](#).

2. Install a gasket on filler plug, and install it to final drive assembly.
CAUTION:
Do not reuse gasket.
3. Tighten filler plug to the specified torque. Refer to [DLN-159, "Disassembly and Assembly"](#).



REMOVAL AND INSTALLATION

SIDE OIL SEAL

Removal and Installation

INFOID:000000012544419

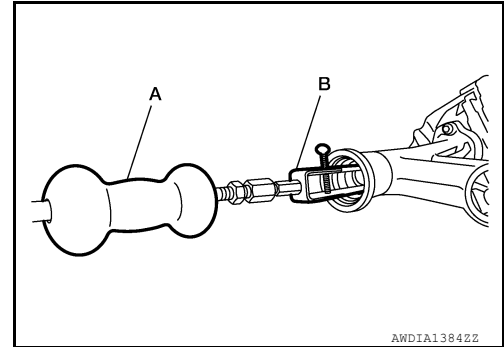
REMOVAL

1. Drain gear oil. Refer to [DLN-148, "Draining"](#).
2. Remove the front drive shafts from front final drive assembly. Refer to [FAX-16, "Removal and Installation"](#).
3. Remove the side oil seal using Tool (A) and Tool (B).

CAUTION:**Do not damage gear carrier.**

Tool : — (J-02619-5)

Tool : — (J-51870)



INSTALLATION

1. Apply multi-purpose grease to the lips of the new side oil seal. Then install the new side oil seal evenly using suitable tool.
 - Do not reuse side oil seal.
 - Do not incline the new side oil seal when installing.
 - Apply multi-purpose grease to the lips of the new side oil seal.
2. Installation of the remaining components is in the reverse order of removal.

CAUTION:**Check the front differential gear oil level after installation. Refer to [DLN-148, "Inspection"](#).**

FRONT OIL SEAL

Removal and Installation

INFOID:000000012544420

REMOVAL

1. Remove the front propeller shaft. Refer to [DLN-123, "Removal and Installation"](#).
2. Measure the total preload torque. Refer to [DLN-159, "Disassembly and Assembly"](#).

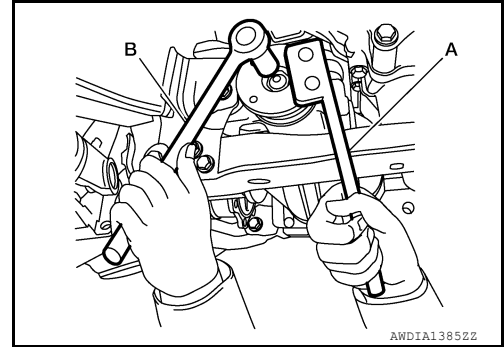
NOTE:

Record the total preload torque measurement.

3. Check companion flange runout. Refer to [DLN-159, "Disassembly and Assembly"](#).
4. Remove the drive pinion lock nut using suitable tools (A) and (B).

CAUTION:

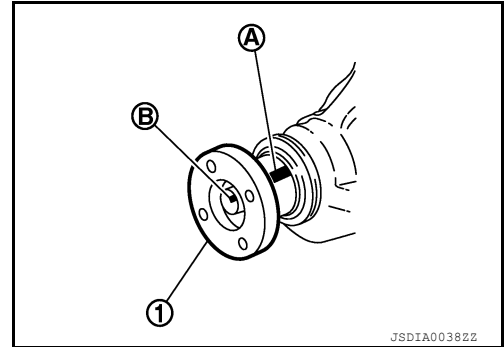
Do not reuse drive pinion lock nut.



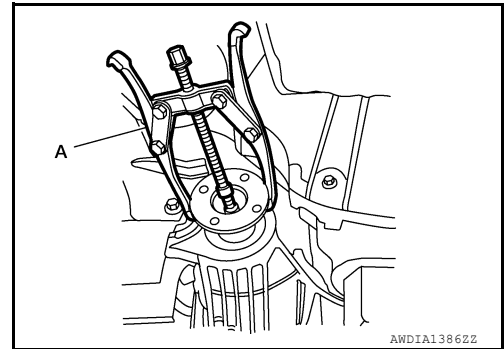
5. Put matching mark (B) on the end of the drive pinion that aligns with matching mark (A) on companion flange (1).

CAUTION:

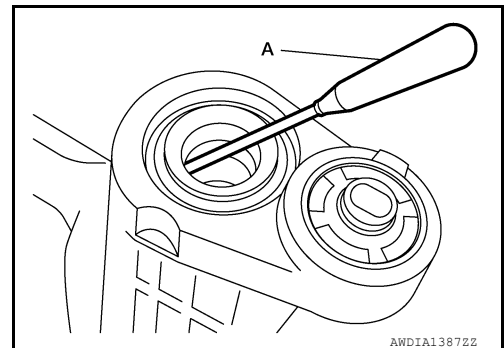
Use paint to make the matching marks. Do not damage the companion flange or drive pinion.



6. Remove companion flange using suitable tool (A).



7. Remove the front oil seal using suitable tool (A).



FRONT OIL SEAL

< REMOVAL AND INSTALLATION >

[FRONT FINAL DRIVE: MA235]

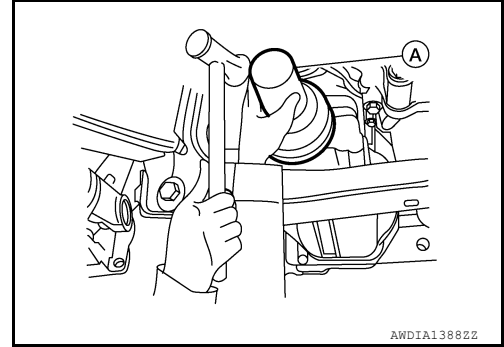
INSTALLATION

1. Apply multi-purpose grease to the lips of the new front oil seal. Then install front oil seal in evenly using Tool (A).

Tool number : — (J-50982)

CAUTION:

- Do not reuse front oil seal.
- Do not incline the new front oil seal when installing.
- Apply multi-purpose grease to the lips of the new front oil seal.



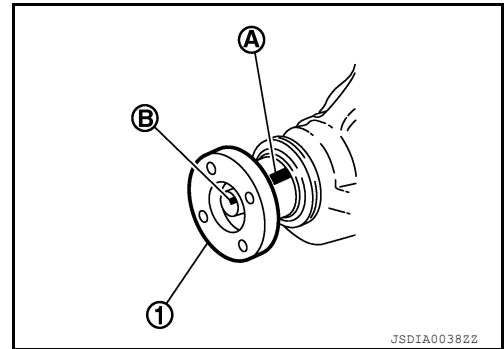
2. Align the matching mark (B) of drive pinion with the matching mark (A) of companion flange (1), then install the companion flange.
3. Apply sealant to the threads of the drive pinion and seat of new drive pinion lock nut, and temporarily tighten drive pinion lock nut to drive pinion.

CAUTION:

- Do not reuse drive pinion lock nut.
- Apply sealant to the threads of the drive pinion and seating surface of the new drive pinion lock nut.

NOTE:

Apply anti-corrosion oil to the spline of the drive pinion.



4. While holding companion flange with suitable tool (B), tighten drive pinion lock nut to the specified torque so as to keep the bearing preload within a standard values, check bearing preload using Tool (A).

Tool number : ST3127S000 (—)

Total preload torque : Refer to [DLN-172, "Inspection and Adjustment"](#).

Drive pinion lock nut tightening torque: : Refer to [DLN-159, "Exploded View"](#).

CAUTION:

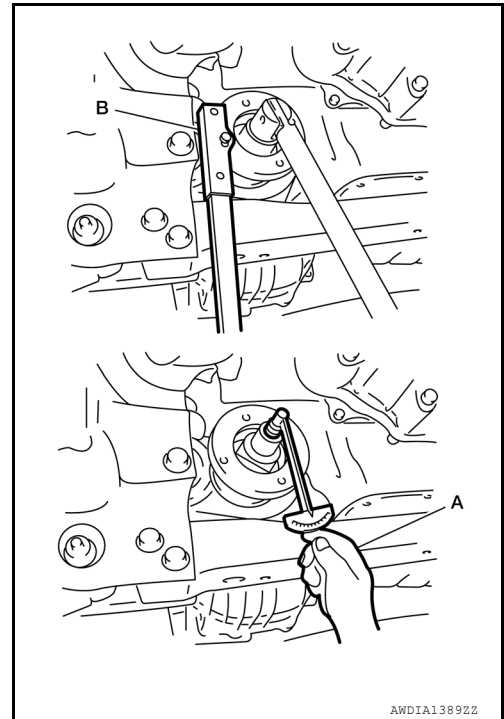
- Adjust to the lower limit of the drive pinion lock nut tightening torque first.
- If the preload torque exceeds the specified value, replace collapsible spacer and tighten it again to adjust. Never loosen drive pinion lock nut to adjust the preload torque.

5. Make a stamping for identification of front oil seal replacement frequency.

CAUTION:

Make a stamping after replacing front oil seal.

6. Install front propeller shaft. Refer to [DLN-123, "Removal and Installation"](#).
7. Refill gear oil to the final drive. Refer to [DLN-148, "Refilling"](#).
8. Check companion flange runout. Refer to [DLN-159, "Disassembly and Assembly"](#).



AIR BREATHER

< REMOVAL AND INSTALLATION >

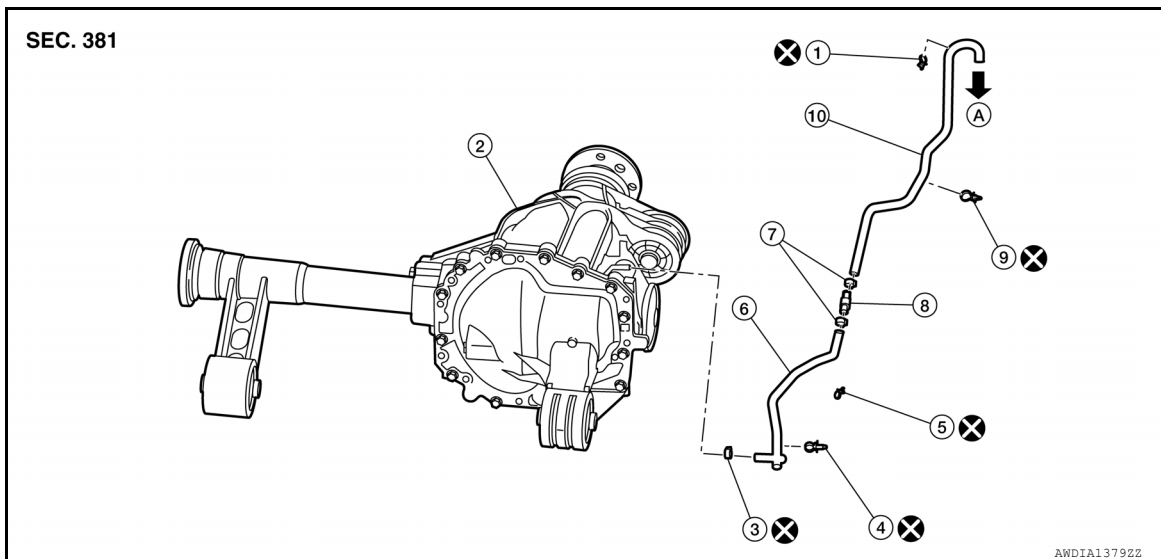
[FRONT FINAL DRIVE: MA235]

AIR BREATHER

Exploded View

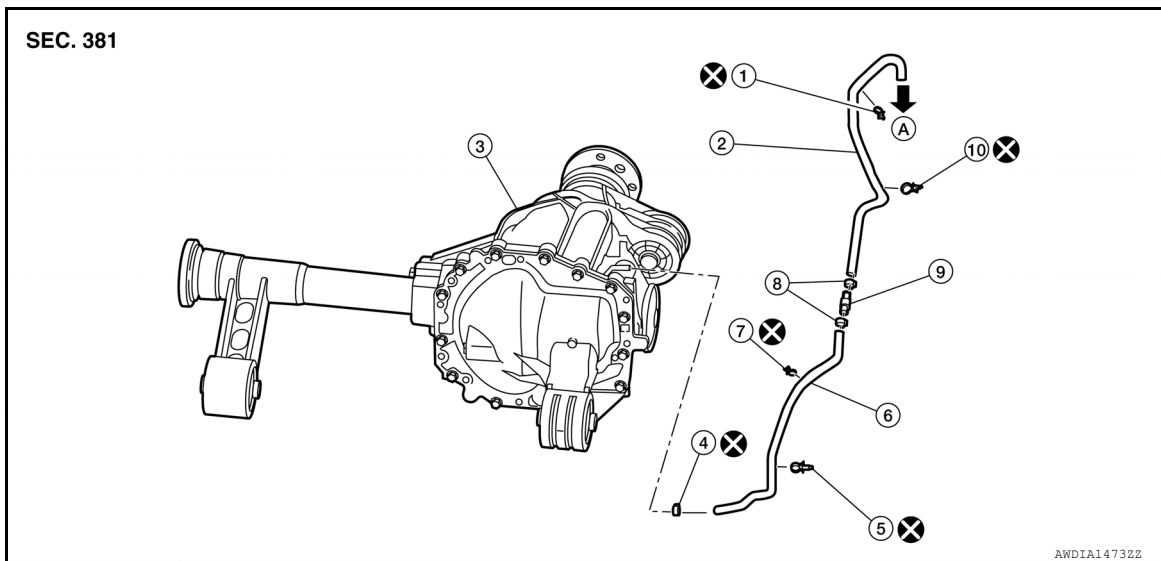
INFOID:000000013189352

Cummins 5.0L Models



- | | | |
|-------------------------|-------------------------|------------------------|
| 1. Clip D | 2. Final drive assembly | 3. Hose clamp |
| 4. Clip A | 5. Clip B | 6. Air breather hose A |
| 7. Hose clamps | 8. Hose connector | 9. Clip C |
| 10. Air breather hose B | A. To frame | |

VK56VD Models



- | | | |
|---------------|------------------------|-------------------------|
| 1. Clip D | 2. Air breather hose B | 3. Final drive assembly |
| 4. Hose clamp | 5. Clip A | 6. Air breather hose A |
| 7. Clip B | 8. Hose clamps | 9. Hose connector |
| 10. Clip C | A. To frame | |

Removal and Installation: Cummins 5.0 L Models

INFOID:000000013189353

REMOVAL

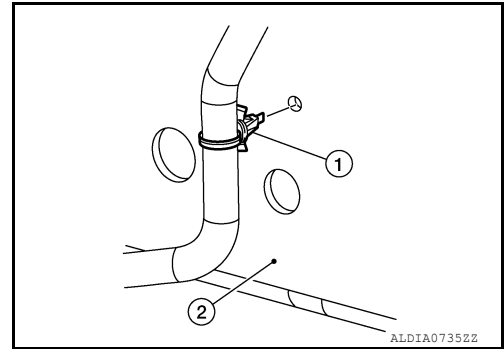
1. Remove wheel and tire (LH) using power tool. Refer to [WT-69. "Removal and Installation"](#).
2. Loosen hose clamp, and remove air breather hose A from final drive assembly.

AIR BREATHER

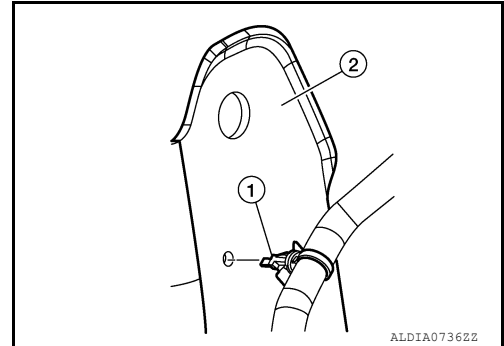
< REMOVAL AND INSTALLATION >

[FRONT FINAL DRIVE: MA235]

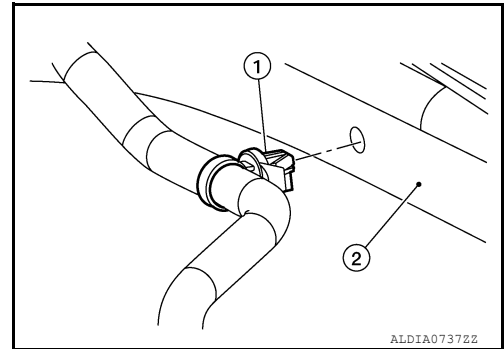
3. Remove clip A (1) from frame (2).



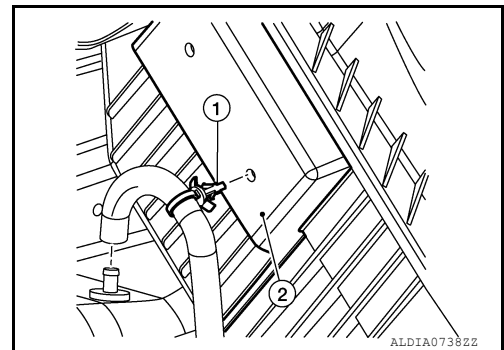
4. Remove clip B (1) from bracket (2) of frame.



5. Remove clip C (1) from frame (2).



6. Remove clip D (1) from frame (2).



7. Remove air breather hose assembly.
8. Separate air breather hose A and air breather hose B from hose connector.

INSTALLATION

Installation is in the reverse order of removal.

CAUTION:

- Do not reuse clips.
- Do not reuse hose clamps.

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AIR BREATHER

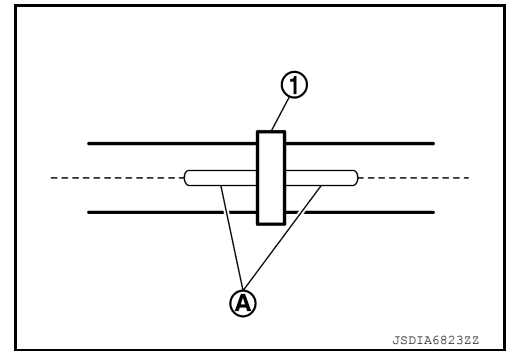
< REMOVAL AND INSTALLATION >

[FRONT FINAL DRIVE: MA235]

- When inserting air breather hoses A and B to hose connector (1), be sure to insert it fully until its end reaches the stop.

CAUTION:

Align paint marks (A) on each air breather hose A and B.



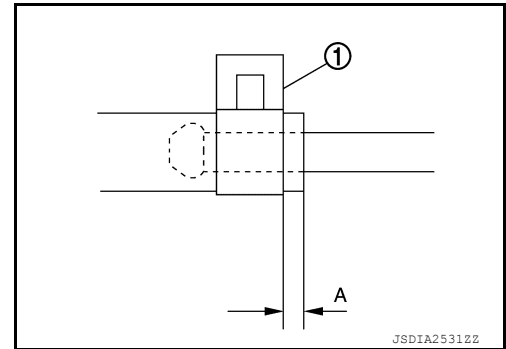
- When inserting air breather hose B to final drive assembly, be sure to insert it fully until its end reaches the stop.

CAUTION:

- Set hose clamp (1) at the end of air breather hose with dimension (A) from the hose edge.

Dimension (A) : 5 – 7 mm (0.20 – 0.28 in)

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

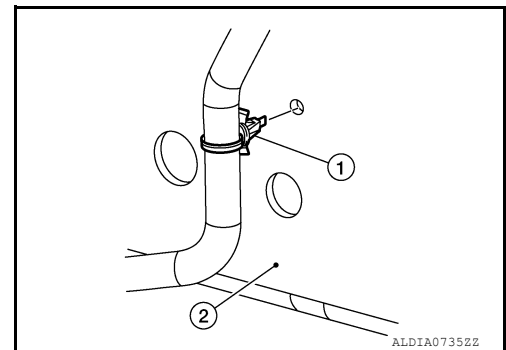


Removal and Installation: VK56VD Models

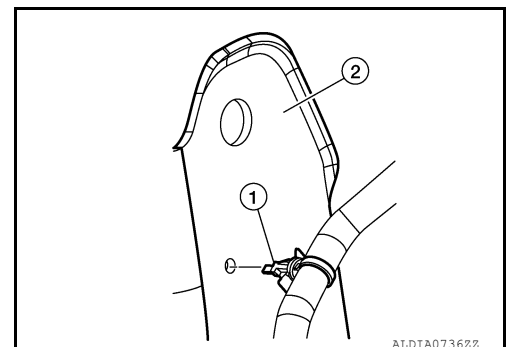
INFOID:000000013776715

REMOVAL

- Remove wheel and tire (LH) using power tool. Refer to [WT-69. "Removal and Installation"](#).
- Loosen hose clamp, and remove air breather hose A from final drive assembly.
- Remove clip A (1) from frame (2).



- Remove clip B (1) from bracket (2) of frame.

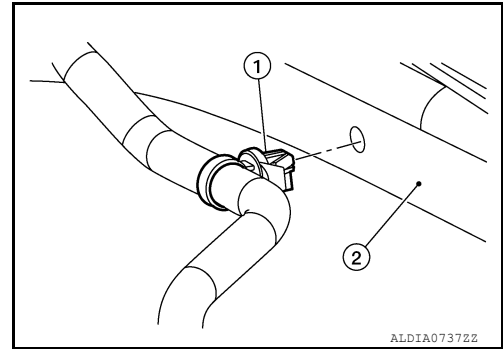


AIR BREATHER

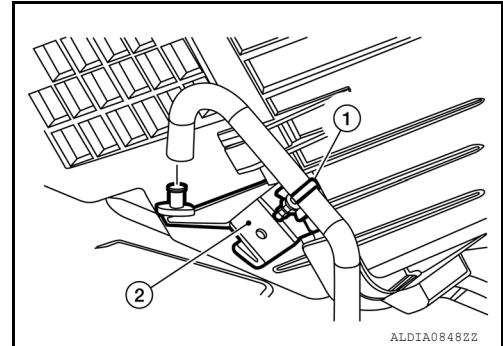
< REMOVAL AND INSTALLATION >

[FRONT FINAL DRIVE: MA235]

5. Remove clip C (1) from frame (2).



6. Remove clip D (1) from frame (2).



7. Remove air breather hose assembly.

8. Separate air breather hose A and air breather hose B from hose connector.

INSTALLATION

Installation is in the reverse order of removal.

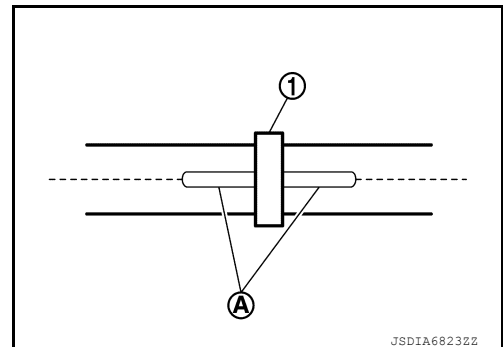
CAUTION:

- Do not reuse clips.
- Do not reuse hose clamps.

- When inserting air breather hoses A and B to hose connector (1), be sure to insert it fully until its end reaches the stop.

CAUTION:

Align paint marks (A) on each air breather hose A and B.



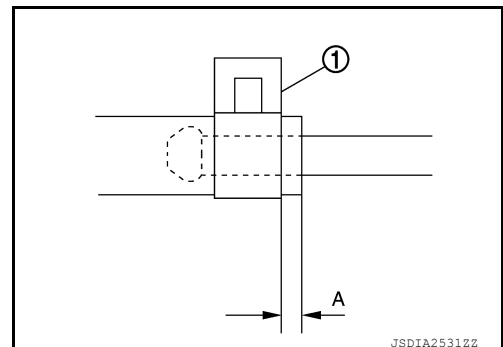
- When inserting air breather hose B to final drive assembly, be sure to insert it fully until its end reaches the stop.

CAUTION:

- Set hose clamp (1) at the end of air breather hose with dimension (A) from the hose edge.

Dimension (A) : 5 – 7 mm (0.20 – 0.28 in)

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



CARRIER COVER

Removal and Installation

INFOID:000000012544421

REMOVAL

1. Drain differential gear oil. Refer to [DLN-148, "Draining"](#).
2. Remove the front final drive assembly. Refer to [DLN-157, "Removal and Installation"](#).
3. Remove the carrier cover bolts and separate the carrier cover from the gear carrier.
CAUTION:
 - Do not damage the mating surface.
 - Do not insert flat-bladed screwdriver, this will damage the mating surface.
 - Do not reuse gasket

INSTALLATION

1. Install the carrier cover and gasket to the gear carrier. Tighten the bolts to the specified torque. Refer to [DLN-159, "Exploded View"](#).
2. Install the front final drive assembly. Refer to [DLN-157, "Removal and Installation"](#).
CAUTION:
Do not reuse gasket.
3. Fill the front final drive assembly with recommended differential gear oil. Refer to [DLN-148, "Refilling"](#).

FRONT FINAL DRIVE

< UNIT REMOVAL AND INSTALLATION >

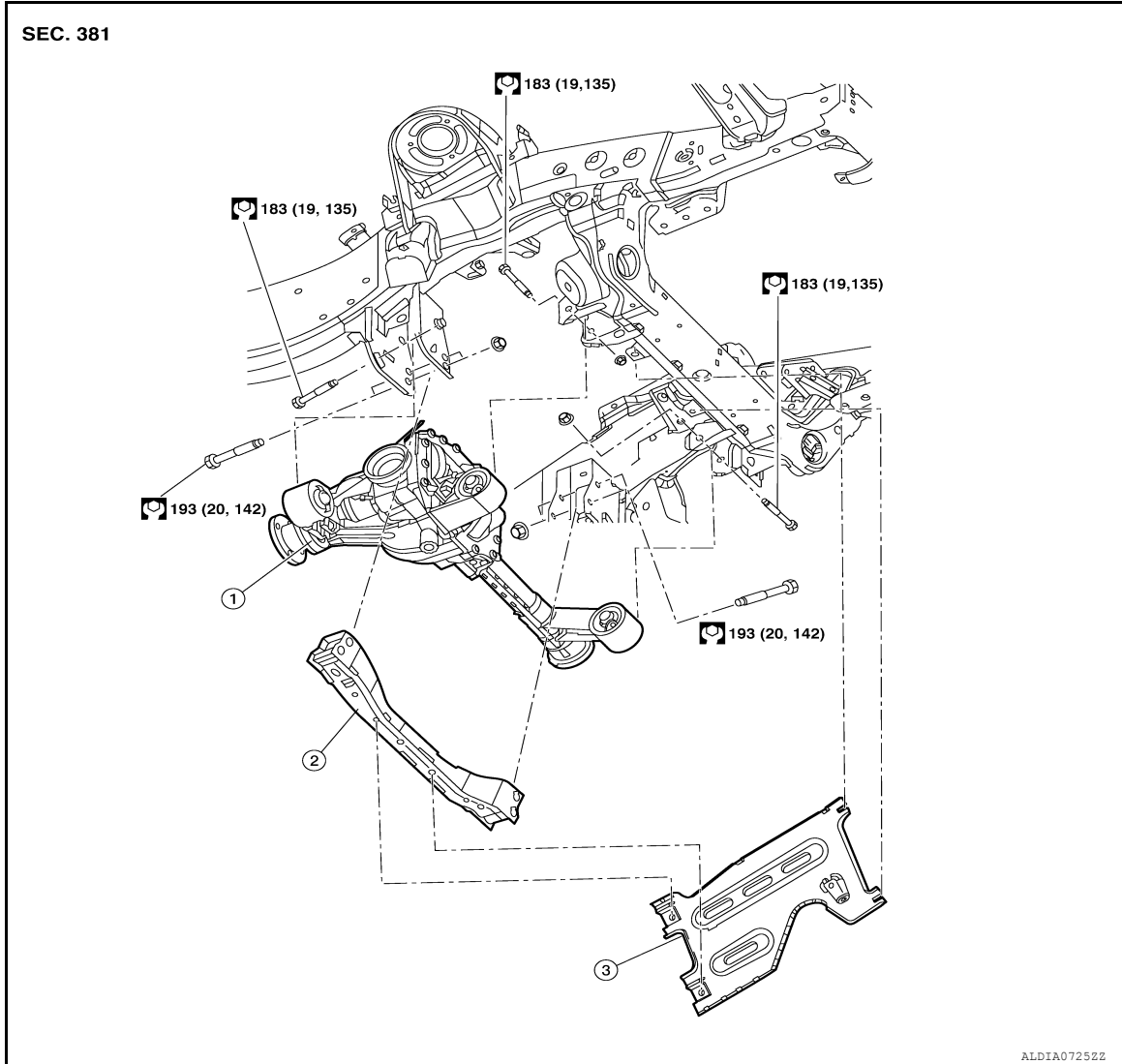
[FRONT FINAL DRIVE: MA235]

UNIT REMOVAL AND INSTALLATION

FRONT FINAL DRIVE

Exploded View

INFOID:000000013287132



1. Front final drive assembly

2. Front cross member assembly

3. Front under cover

⇐: Front

Removal and Installation

INFOID:000000012544422

REMOVAL

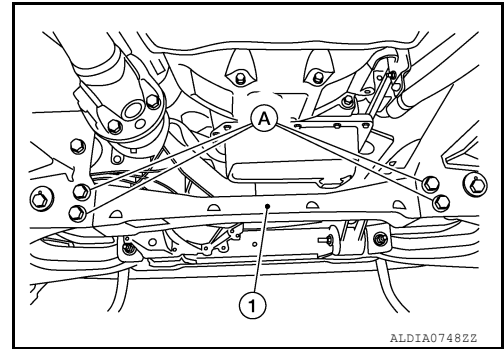
1. Remove the engine under cover. [EXT-30, "ENGINE UNDER COVER : Removal and Installation"](#).
2. Remove the drive shafts (LH/RH). Refer to [FAX-16, "Removal and Installation"](#).

FRONT FINAL DRIVE

< UNIT REMOVAL AND INSTALLATION >

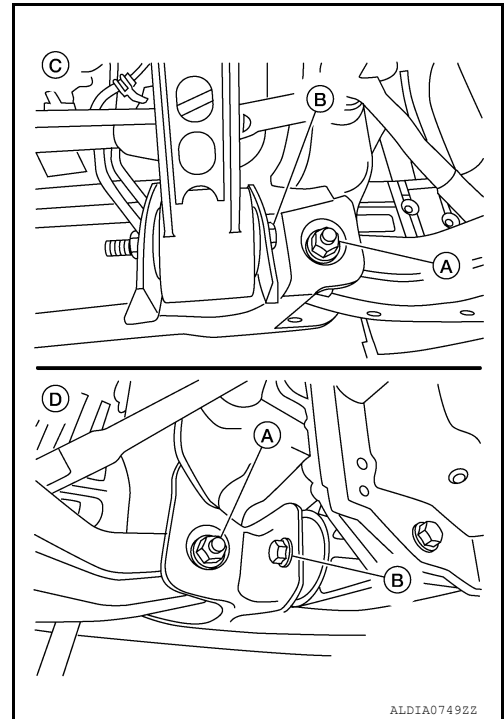
[FRONT FINAL DRIVE: MA235]

3. Remove bolts (A) and remove front cross member (1).



4. Remove the front propeller shaft. Refer to [DLN-123. "Removal and Installation"](#).
5. Disconnect the breather hose from the front final drive assembly. Refer to [DLN-152. "Removal and Installation: Cummins 5.0 L Models"](#) (Cummins 5.0L models) or, [DLN-154. "Removal and Installation: VK56VD Models"](#) (VK56VD models).
6. Support the front final drive assembly using a suitable jack.
7. Loosen front lower link bolts (A) enough to remove final drive assembly bolts (B).

(C) : Passenger side
(D) : Driver side



8. Remove the front final drive assembly bolts, then remove the front final drive assembly.

CAUTION:

Support the front final drive assembly while removing using a suitable jack.

INSTALLATION

Installation is in the reverse order of removal.

CAUTION:

- Make sure there are no pinched or restricted areas on the breather hose caused by folding or bending when installing it.
- Check the front final drive assembly fluid level and add the specified fluid as necessary. Refer to [DLN-148. "Inspection"](#).

Inspection

INFOID:000000013287133

INSPECTION AFTER INSTALLATION

When oil leaks while removing/installing final drive assembly, check oil level after the installation. Refer to [DLN-148. "Inspection"](#).

FRONT FINAL DRIVE

< UNIT DISASSEMBLY AND ASSEMBLY >

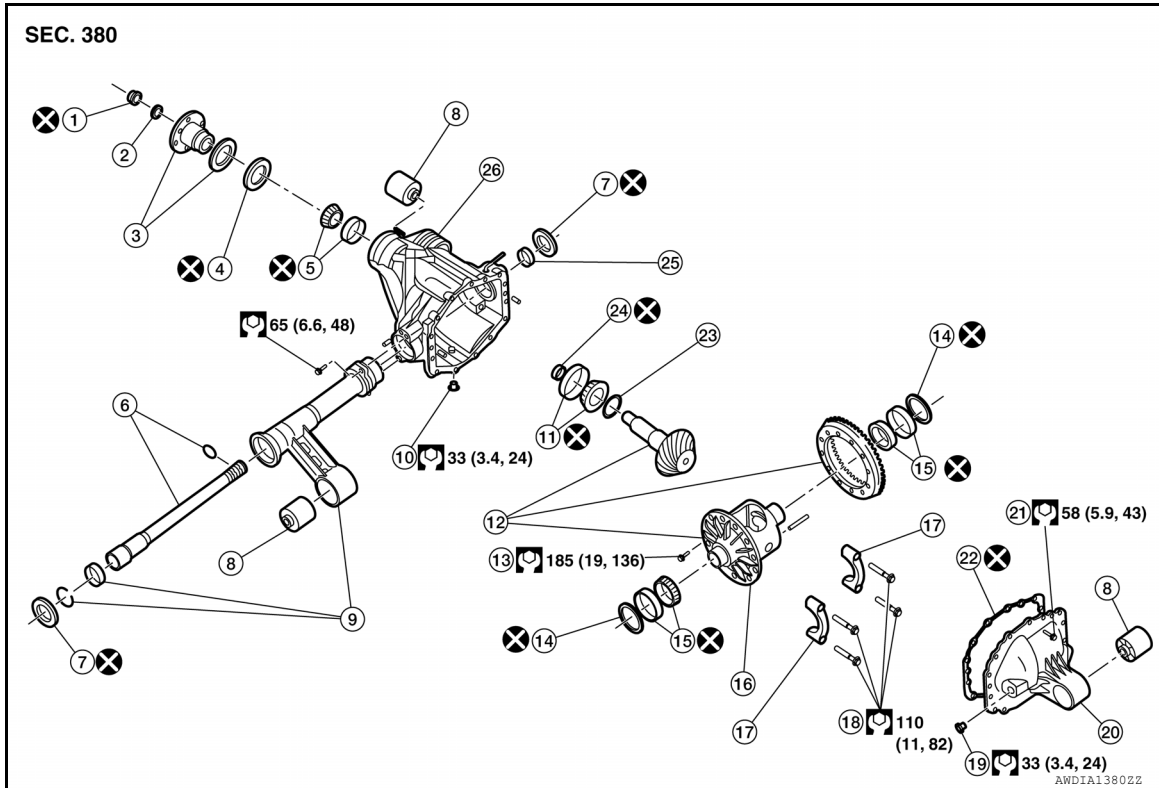
[FRONT FINAL DRIVE: MA235]

UNIT DISASSEMBLY AND ASSEMBLY

FRONT FINAL DRIVE

Exploded View

INFOID:000000013287137



- | | | |
|---------------------------|-----------------------------------|--|
| 1. Drive pinion lock nut | 2. Front pinion shim | 3. Pinion flange assembly |
| 4. Front oil seal | 5. Pinion front bearing | 6. Intermediate shaft assembly |
| 7. Side oil seal | 8. Insulator bushing | 9. Axle tube assembly |
| 10. Drain plug | 11. Pinion rear bearing | 12. Drive pinion and drive gear assembly |
| 13. Drive gear bolts | 14. Side bearing adjusting washer | 15. Differential side bearing |
| 16. Differential assembly | 17. Differential bearing cap | 18. Differential bearing cap bolts |
| 19. Filler plug | 20. Carrier cover | 21. Carrier cover bolts |
| 22. Carrier cover gasket | 23. Pinion thrust washer | 24. Collapsible spacer |
| 25. Needle bearing | 26. Gear carrier | |

Disassembly and Assembly

INFOID:000000012544423

DISASSEMBLY

Differential Assembly

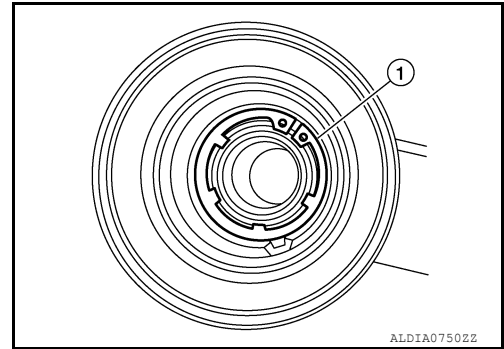
1. Drain the differential gear oil. Refer to [DLN-148, "Draining"](#).
2. Remove side oil seals. Refer to [DLN-149, "Removal and Installation"](#).

FRONT FINAL DRIVE

< UNIT DISASSEMBLY AND ASSEMBLY >

[FRONT FINAL DRIVE: MA235]

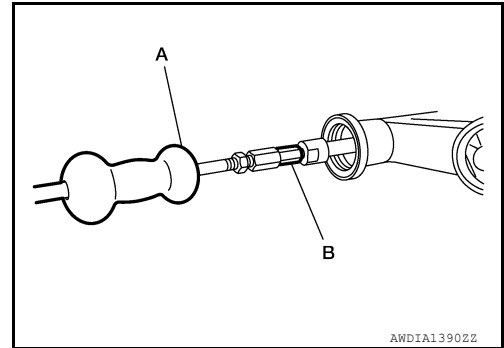
3. Remove snap ring (1) from axle tube assembly.



4. Remove intermediate shaft using Tool (A) and Tool (B) as shown.

Tool (A) : — (J-26941)

Tool (B) : — (J-51870)



5. Remove the carrier cover bolts and separate the carrier cover from the gear carrier.

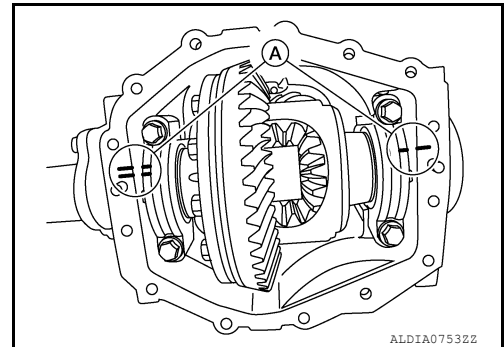
CAUTION:

Do not reuse the gasket.

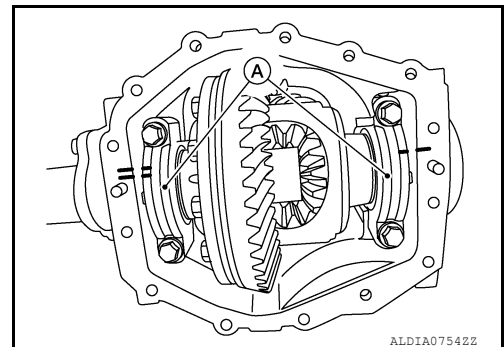
6. For proper reinstallation, paint matching marks (A) on one side of the side bearing cap and gear carrier.

CAUTION:

- For matching marks, use paint. Do not damage side bearing cap or gear carrier.
- Side bearing caps are line-board during manufacture. The matching marks are used to reinstall them in their original positions.



7. Remove the side bearing cap bolts and remove side bearing caps (A).



FRONT FINAL DRIVE

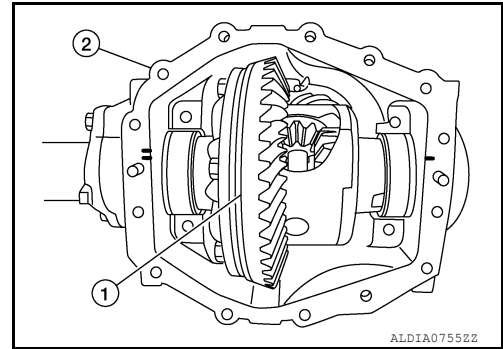
< UNIT DISASSEMBLY AND ASSEMBLY >

[FRONT FINAL DRIVE: MA235]

8. Lift the differential assembly (1) out of the gear carrier case (2).

CAUTION:

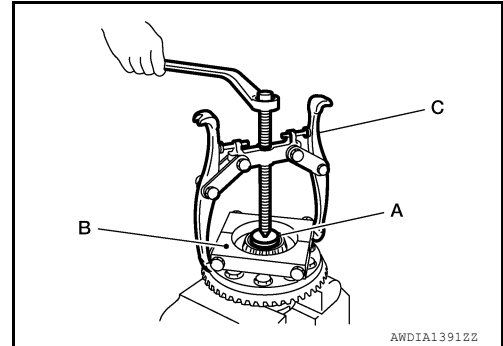
Keep side bearing outer races together with side bearing inner races. Do not mix them up.



9. Remove side bearing inner race (A) using suitable tool (B) and (C) as shown.

CAUTION:

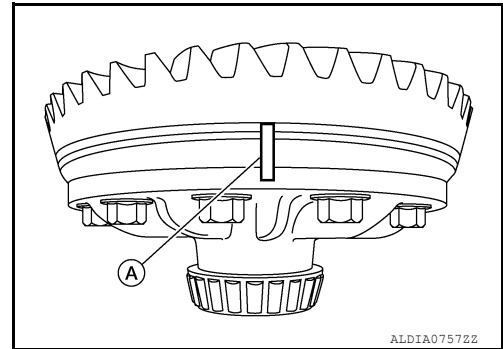
- Do not remove side bearing inner race unless it is being replaced.
- Place copper plates between the vise and the side bearing inner race and drive gear to prevent damage.
- Engage puller jaws in groove to prevent damage to bearing.
- Keep side bearing outer races together with side bearing inner races. Do not mix them up.



10. For proper reinstallation, paint matching marks (A) on the differential case and drive gear.

CAUTION:

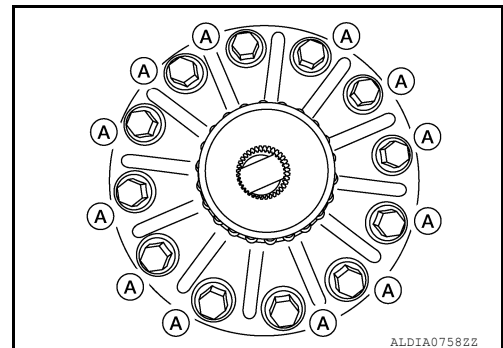
Use paint for matching marks. Do not damage differential case or drive gear.



11. Remove the drive gear bolts (A).

CAUTION:

Drive gear bolts are left hand threaded.



12. Tap the drive gear off the differential case using suitable tool.

CAUTION:

Tap evenly all around to keep drive gear from bending.

Drive Pinion Disassembly

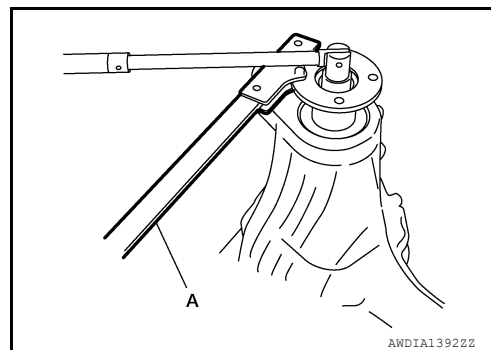
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FRONT FINAL DRIVE

< UNIT DISASSEMBLY AND ASSEMBLY >

[FRONT FINAL DRIVE: MA235]

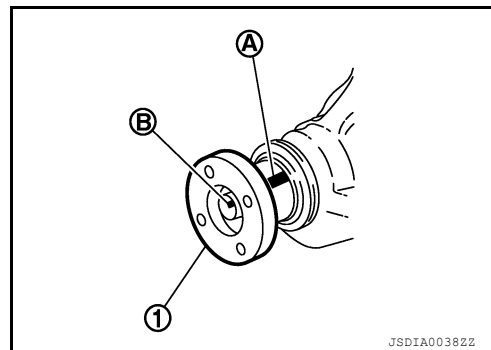
1. Remove the drive pinion lock nut using suitable tool (A).



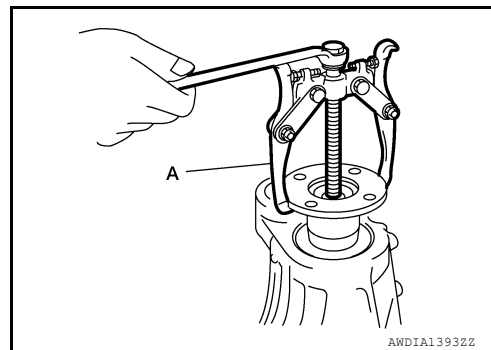
2. Put matching mark (B) on the end of the drive pinion that aligns with matching mark (A) on the companion flange (1).

CAUTION:

Use paint to make the matching marks. Do not damage the companion flange or drive pinion.



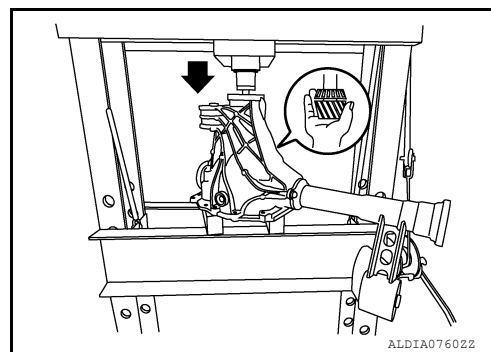
3. Remove the companion flange using suitable tool (A).



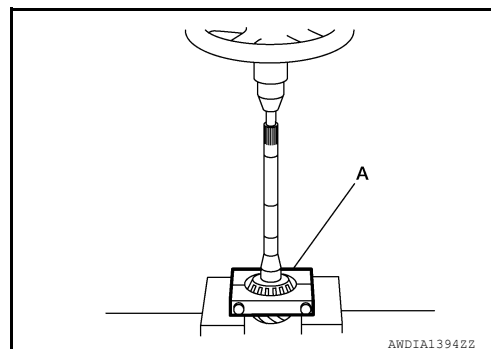
4. Press the drive pinion assembly in the direction shown (←) (with rear inner bearing race and collapsible spacer) out of the gear carrier.

CAUTION:

Do not drop drive pinion assembly.



5. Remove the drive pinion rear bearing inner race and drive pinion height adjusting washer using suitable tool (A).

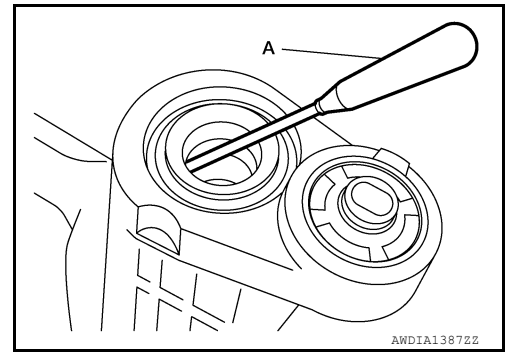


FRONT FINAL DRIVE

< UNIT DISASSEMBLY AND ASSEMBLY >

[FRONT FINAL DRIVE: MA235]

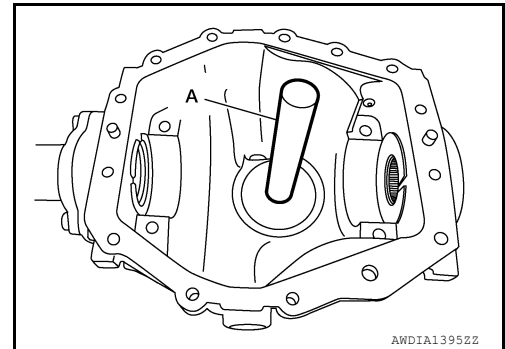
6. Remove the front oil seal using suitable tool (A).



7. Remove the drive pinion front bearing inner race.
8. Remove the drive pinion front bearing outer race using suitable tool (A) as shown. Locate the suitable tool on the back edge of the drive pinion front bearing outer race, then drive the drive pinion front bearing outer race out.

CAUTION:

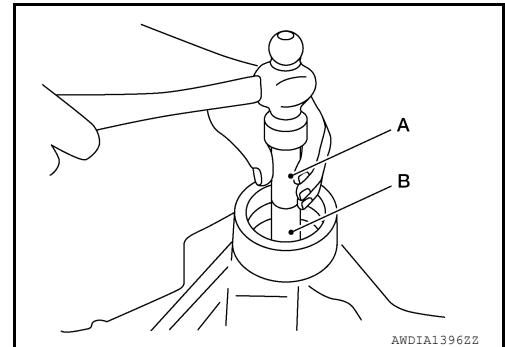
Do not damage gear carrier.



9. Remove the drive pinion rear bearing outer race using suitable tools (A) and (B) as shown. Locate the suitable tool on the back edge of the drive pinion rear bearing outer race, then drive the drive pinion rear bearing outer race out.

CAUTION:

Do not damage gear carrier.



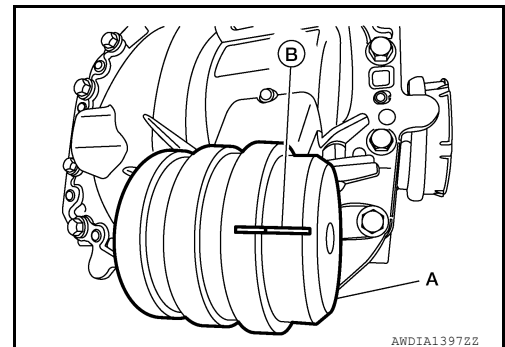
INSULATOR BUSHINGS

1. Fit Tool (A) onto insulator bushing to put mark (B) on carrier case in proper position for installation

CAUTION:

Use paint to make the matching marks.

Tool set (A) : — (J-51879)



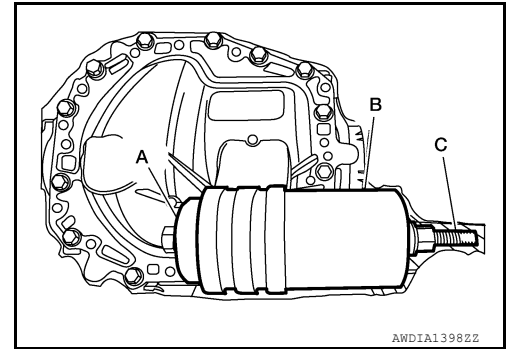
FRONT FINAL DRIVE

< UNIT DISASSEMBLY AND ASSEMBLY >

[FRONT FINAL DRIVE: MA235]

2. Install Tool (A) onto insulator bushing, install Tool (B) on the opposite side of insulator bushing and attach Tool (A) and Tool (B) using Tool (C).
3. Using Tools (A/B/C) press insulator bushing out.

Tool set (A/B/C) : — (J-51879)



INSPECTION AFTER DISASSEMBLY

Clean the disassembled parts. Then inspect the parts for wear or damage. If wear or damage are found, follow the measures below.

Drive Pinion and Drive Gear

- If the drive pinion and drive gear teeth do not mesh or line-up correctly, determine the cause and adjust, repair, or replace as necessary.
- If the drive pinion or drive gear are worn, cracked, damaged, pitted or chipped (by friction) noticeably, replace with new drive pinion and drive gear.
- Drive pinion and drive gear are supplied in matched sets only. Matching numbers on both drive pinion and drive gear are etched for verification. If a new drive pinion and drive gear set are being used, verify the numbers of each drive pinion and drive gear before proceeding with assembly.

Bearing

- If bearings are chipped (by friction), pitted, worn, rusted, scratched, or unusual noise is coming from bearing, replace with new bearing assembly (as a new set).
- Bearing must be replaced with a new one whenever disassembled.

Side Gear and Pinion Mate Gear

- If any cracks or damage are found on the surface of the teeth, replace with new one.
- If any worn or chipped marks are found on the side of the side gear and pinion mate gear which contact the thrust washer, replace with new one.
- Replace both side gear and pinion mate gear as a set when replacing side gear or pinion mate gear.

Side Gear Thrust Washer and Pinion Mate Thrust Washer

- If any chips (by friction), damage, or unusual wear are found, replace with new one.

Gear Carrier

- If any wear or cracks are found on the contact sides of gear carrier, replace with new one.

Companion Flange

- If any chips (about 0.1mm, 0.004 in) or other damage on the companion flange surface which contacts the front oil seal lips are found, replace with new one.

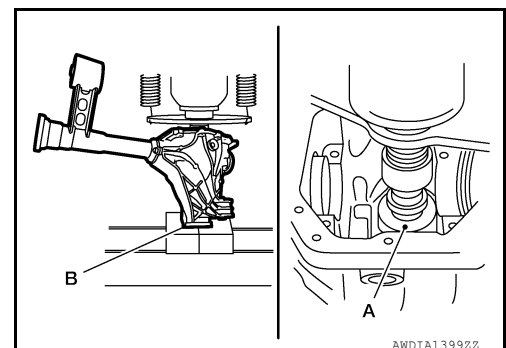
ASSEMBLY

Drive Pinion Assembly

1. Install drive pinion rear bearing outer race using Tool (A) and Tool (B).

Tool (A) : — (J-8092)

Tool (B) : — (J-51869)

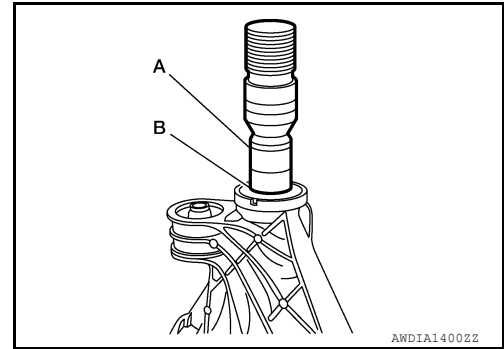


FRONT FINAL DRIVE

< UNIT DISASSEMBLY AND ASSEMBLY >

[FRONT FINAL DRIVE: MA235]

2. Install drive pinion front bearing outer race using suitable tool (A) and suitable tool (B).



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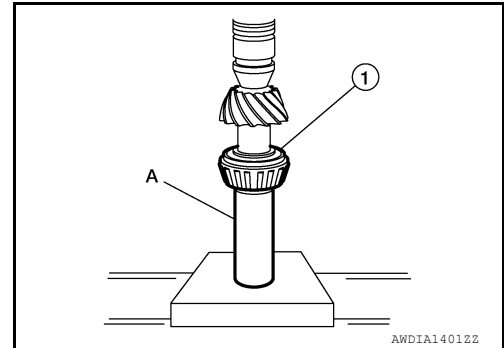
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3. Select drive pinion height adjusting washer.
4. Install the selected drive pinion height adjusting washer (1) to the drive pinion. Press the drive pinion rear bearing inner race to it using suitable tool (A).

CAUTION:

Do not reuse drive pinion rear bearing inner race.



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5. Install the collapsible spacer to the drive pinion.

CAUTION:

Do not reuse collapsible spacer.

6. Apply differential gear oil to the drive pinion rear bearing, and install the drive pinion assembly to the gear carrier.
7. Apply differential gear oil to the drive pinion front bearing, and install the drive pinion front bearing inner race to the drive pinion assembly.

CAUTION:

Do not reuse drive pinion front bearing inner race.

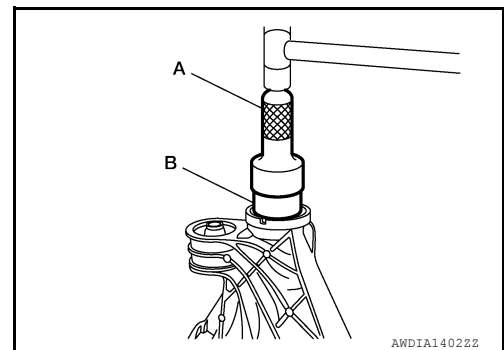
8. Apply multi-purpose grease to the lips of the new front oil seal. Then drive the new front oil seal in evenly using Tools (A) and (B).

Tool (A) : KV38100500 (J-25273)

Tool (B) : — (J-50982)

CAUTION:

- Do not reuse front oil seal.
- Do not angle the new front oil seal when installing.
- Apply multi-purpose grease to the lips of the new front oil seal.



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9. Install the companion flange to the drive pinion while aligning the matching marks. Tap the companion flange until fully seated using suitable tool.

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FRONT FINAL DRIVE

< UNIT DISASSEMBLY AND ASSEMBLY >

[FRONT FINAL DRIVE: MA235]

10. Apply anti-corrosive oil to the threads of the drive pinion and the seating surface of the new drive pinion lock nut. Then adjust the drive pinion lock nut tightening torque using suitable tool (A), and check the drive pinion bearing preload torque using Tool (B).

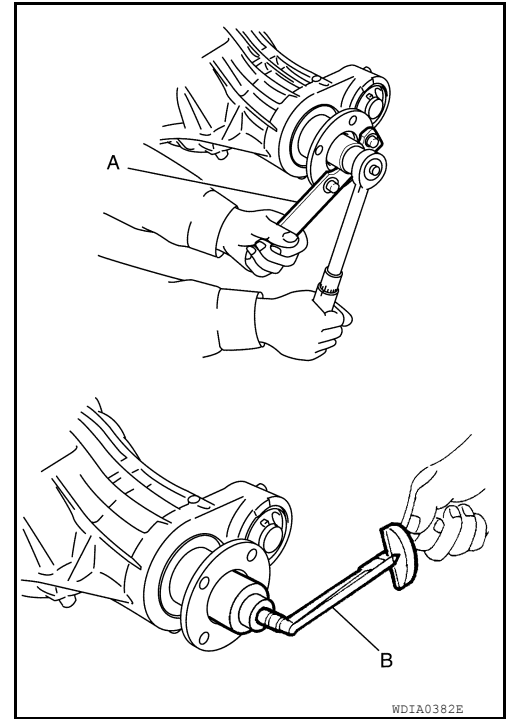
Tool number (B): ST3127S000 (J-25765-A)

Drive pinion bearing preload torque:

Refer to [DLN-172, "Inspection and Adjustment"](#)

CAUTION:

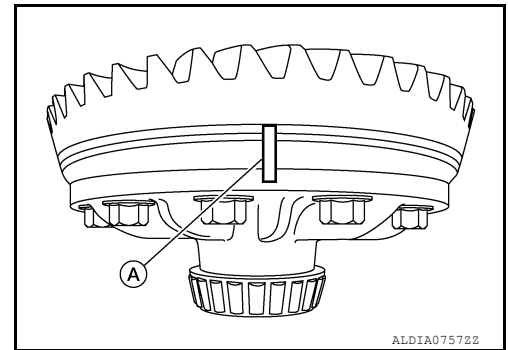
- Do not reuse drive pinion lock nut.
- Apply anti-corrosive oil to the threads of the drive pinion and the seating surface of the new drive pinion lock nut.
- Adjust the drive pinion lock nut tightening torque to the lower limit first. Do not exceed the drive pinion lock nut specified torque. Refer to [DLN-159, "Disassembly and Assembly"](#).
- If the drive pinion bearing preload torque exceeds the specified value, replace collapsible spacer and tighten it again to adjust. Do not loosen drive pinion lock nut to adjust the drive pinion bearing preload torque.
- After adjustment, rotate drive pinion back and forth 2 to 3 times to check for unusual noise, rotation malfunction, and other malfunctions.



11. Check companion flange runout.
12. Install the differential case assembly.

Differential Assembly

1. Align the matching mark (A) of the differential assembly with the mark of the drive gear, then place the drive gear onto the differential case.

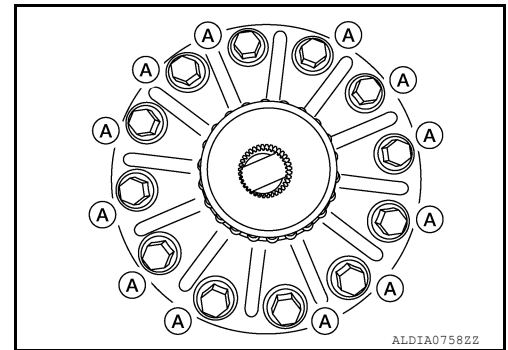


2. Install and tighten the new drive gear bolts (A) to the specified torque.

Bolt (A) : 185 N·m (19 kg-m, 136 ft-lb)

CAUTION:

- Make sure the drive gear back and threaded holes are clean.
- Do not reuse drive gear bolts.
- Drive gear bolts are left hand threaded.
- Tighten new drive gear bolts in a criss-cross pattern.



FRONT FINAL DRIVE

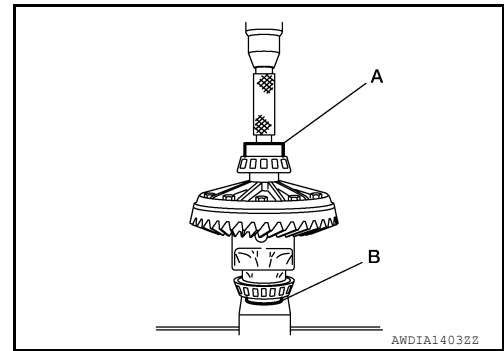
< UNIT DISASSEMBLY AND ASSEMBLY >

[FRONT FINAL DRIVE: MA235]

3. Press the new side bearing inner races to the differential assembly using suitable tool (A) and suitable tool (B).

CAUTION:

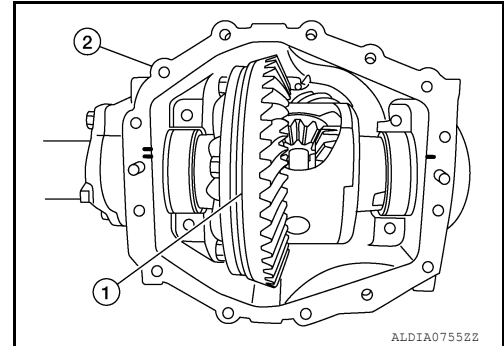
Do not reuse side bearing inner races.



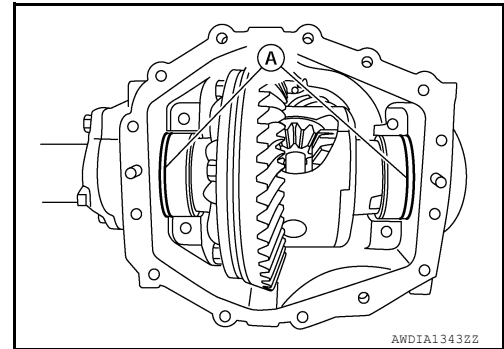
4. Apply differential gear oil to the side bearings, and install the differential assembly (1) with the side bearing outer races into the gear carrier (2).

CAUTION:

Do not reuse side bearing outer race when replacing side bearing inner race (replace as a set).



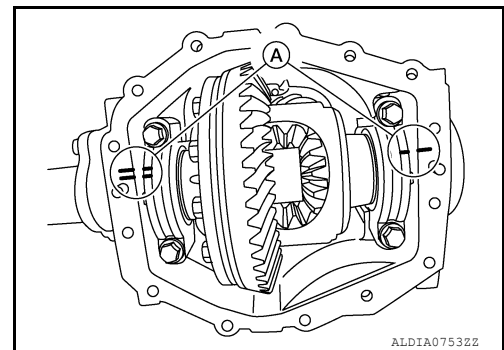
5. Insert side bearing adjusting washers (A) in place between side bearings and gear carrier.



6. Install the side bearing caps with the matching marks (A) aligned and hand tighten.

NOTE:

Do not torque caps at this step.



7. Check and adjust tooth contact, backlash, drive gear runout and total preload torque. Recheck above items. Refer to [DLN-171, "Inspection"](#).
8. Tighten side bearing cap bolts to the specified torque.

Torque : 110 N·m (11 kg-m, 82 ft-lb)

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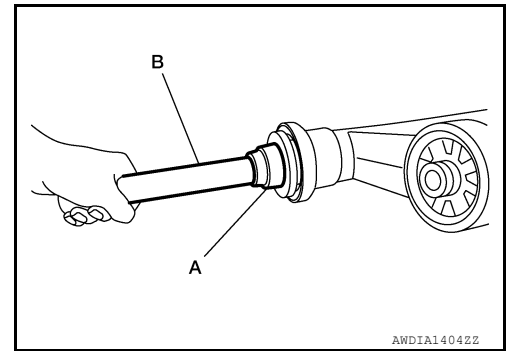
FRONT FINAL DRIVE

< UNIT DISASSEMBLY AND ASSEMBLY >

[FRONT FINAL DRIVE: MA235]

9. Install needle bearings using Tool (A) and Tool (B).

Tool (A) : — (J-51868)
Tool (B) : — (J-8092)



10. Apply multi-purpose grease to the lips of the new side oil seal. Then drive the new side oil seal in evenly to the gear carrier using suitable tool.

CAUTION:

- Do not reuse side oil seal.
- Do not incline the new side oil seal when installing.
- Apply multi-purpose grease to the lips of the new side oil seal.

11. Install the carrier cover and gasket to the gear carrier. Tighten the bolts to the specified torque.

Torque : 58 N·m (5.9 kg-m, 43 ft-lb)

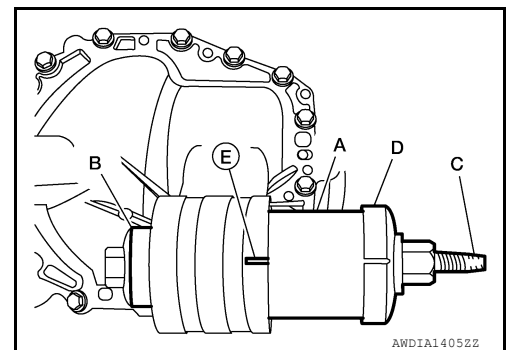
INSULATOR BUSHINGS

1. Align Tool (D) and insulator bushing (A) to mark (E) on carrier case.

CAUTION:

Match alignment mark on Tool (D) to paint mark (E) for proper installation, alignment mark on Tool (D) must be within $\pm 2^\circ$ of paint mark (E).

2. Install tool (B) on the opposite side of Bushing slot using Tool (C).
3. Press insulator bushing in using Tools (B/C/D).



Tool set (A/B/C/D/E) : — (J-51879)

ASSEMBLY INSPECTION AND ADJUSTMENT

- Drain the differential gear oil before inspection and adjustment. Refer to [DLN-148. "Draining"](#).
- Remove and install the carrier cover as necessary for inspection and adjustment. Refer to [DLN-156. "Removal and Installation"](#).

Total Preload Torque

1. Install the differential side shaft and differential side flange.

CAUTION:

The differential side shaft and differential side flange must be installed in order to measure total preload torque.

2. Rotate the drive pinion back and forth two to three times to check for unusual noise and rotation malfunction.
3. Rotate the drive pinion at least 20 times to check for smooth operation of the bearings.

FRONT FINAL DRIVE

< UNIT DISASSEMBLY AND ASSEMBLY >

[FRONT FINAL DRIVE: MA235]

4. Measure total preload torque using Tool (A).

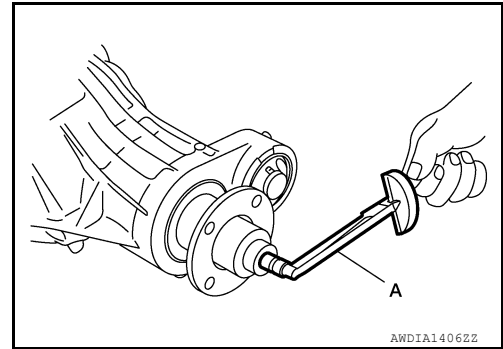
Tool : ST3127S000 (J-25765-A)

Total preload torque

: Refer to [DLN-172, "Inspection and Adjustment"](#)

NOTE:

Total preload torque = Drive pinion bearing preload torque + Side bearing preload torque



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

If the total preload torque is greater than specification

On drive pinion bearings: Replace the collapsible spacer.

On side bearings: Use thinner side bearing adjusting washers by the same amount to each side. For selecting adjusting washer refer to [DLN-172, "Inspection and Adjustment"](#).

If the total preload torque is less than specification

On drive pinion bearings: Tighten the drive pinion lock nut.

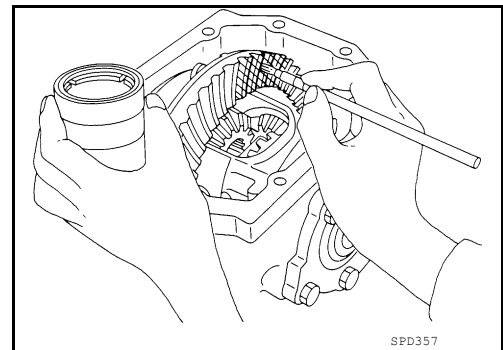
On side bearings: Use thicker side bearing adjusting washers by the same amount to each side. For selecting adjusting washer, refer to [DLN-172, "Inspection and Adjustment"](#).

Tooth Contact

1. Apply red lead to the drive gear.

NOTE:

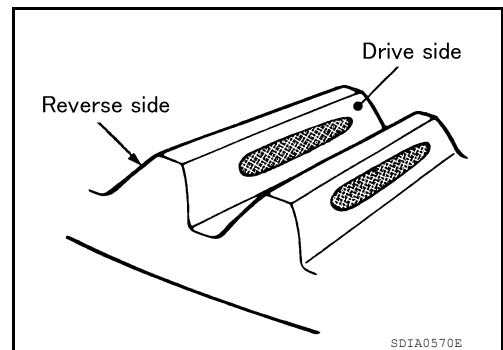
Apply red lead to both faces of all gears then check all gears.



2. Rotate the drive gear back and forth several times. Then check for correct drive pinion to drive gear tooth contact as shown.

CAUTION:

Check tooth contact on drive side and reverse side.

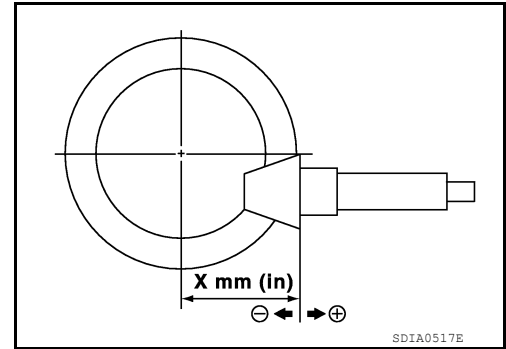


FRONT FINAL DRIVE

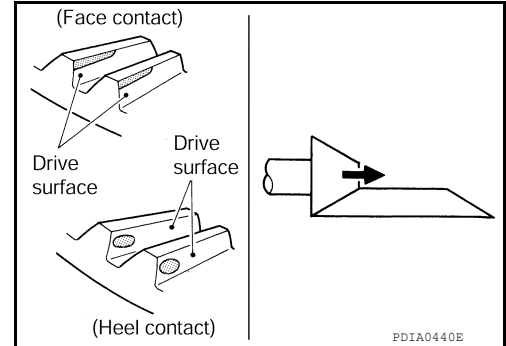
< UNIT DISASSEMBLY AND ASSEMBLY >

[FRONT FINAL DRIVE: MA235]

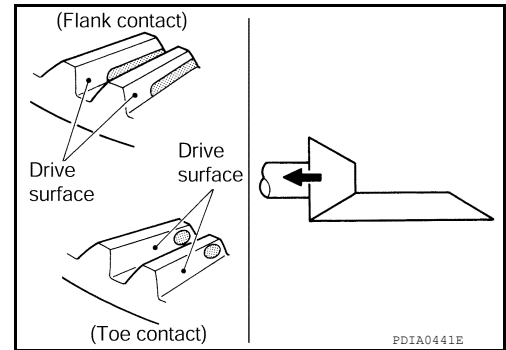
3. If the tooth contact is improperly adjusted, follow the procedure below to adjust the drive pinion height (dimension X).



- If the tooth contact is near the face (face contact), or near the heel (heel contact), use a thicker drive pinion height adjusting washer to move drive pinion closer to the drive gear. Refer to [DLN-172, "Inspection and Adjustment"](#).



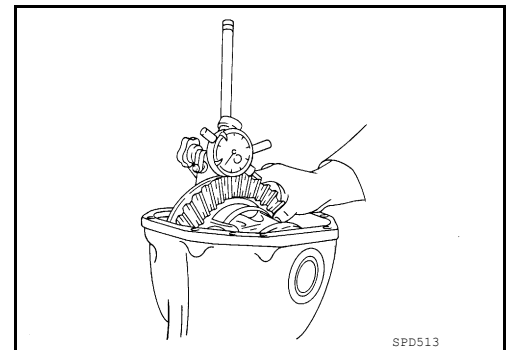
- If the tooth contact is near the flank (flank contact), or near the toe (toe contact), use a thinner drive pinion height adjusting washer to move the drive pinion farther from the drive gear. Refer to [DLN-172, "Inspection and Adjustment"](#).



Backlash

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

Backlash: Refer to [DLN-172, "Inspection and Adjustment"](#).



- If the backlash is outside of the specification, change the thickness of the side bearing adjusting washers.

If the backlash is greater than specification:

Make drive gear back side adjusting washer thicker, and drive gear tooth side adjusting washer thinner by the same amount. For selecting adjusting washers, Refer to [DLN-172, "Inspection and Adjustment"](#).

FRONT FINAL DRIVE

< UNIT DISASSEMBLY AND ASSEMBLY >

[FRONT FINAL DRIVE: MA235]

If the backlash is less than specification:

Make drive gear back side adjusting washer thinner, and drive gear tooth side adjusting washer thinner by the same amount. For selecting adjusting washers, Refer to [DLN-172, "Inspection and Adjustment"](#).

CAUTION:

Do not change the total amount of washers as it will change the side bearing preload torque.

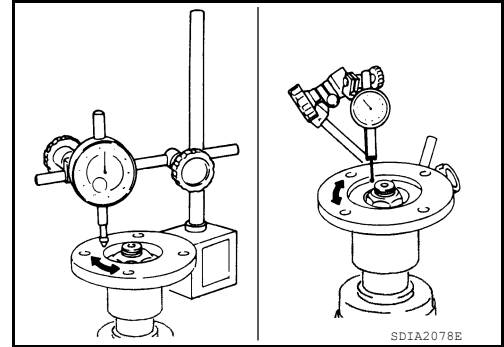
Companion Flange Runout

1. Rotate companion flange and check for runout on the companion flange face (inner side of the bolt holes) and companion flange inner side (socket diameter) using suitable tool.

Runout limit

Companion flange face: Refer to [DLN-172, "Inspection and Adjustment"](#).

Companion flange inner side: Refer to [DLN-172, "Inspection and Adjustment"](#).



2. If the runout is outside the runout limit, follow the procedure below to adjust.
 - a. Rotate the companion flange on the drive pinion by 90°, 180° and 270° while checking for the position where the runout is minimum.
 - b. If the runout is still outside of the runout limit after the companion flange has been rotated on the drive pinion, possible cause could be an assembly malfunction of drive pinion and drive pinion bearing or a malfunctioning drive pinion bearing.
 - c. If the runout is still outside of the runout limit after repair of the assembly of drive pinion and drive pinion bearing or drive pinion bearing, replace the companion flange.

Inspection

INFOID:000000013287136

INSPECTION AFTER DISASSEMBLY

Side Shaft

- If it is chipped (by friction), cracked, damaged, or unusually worn, replace.

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.

SERVICE DATA AND SPECIFICATIONS (SDS)

< SERVICE DATA AND SPECIFICATIONS (SDS)

[FRONT FINAL DRIVE: MA235]

SERVICE DATA AND SPECIFICATIONS (SDS)

SERVICE DATA AND SPECIFICATIONS (SDS)

General Specification

INFOID:0000000012544424

Applied model	4WD	
	Cummins 5.0L	VK56VD
	S, SL, SV	OR (PRO-4X)
Final drive model	MA235	
Gear ratio	3.916	3.357
Number of teeth (Drive gear/Drive pinion)	47/12	48/13
Differential gear oil capacity (Approx.)	1.51 ℓ (3-1/4 US pt, 2-5/8 Imp pt)	
Number of pinion gears	2	
Drive pinion adjustment spacer type	Collapsible	

Inspection and Adjustment

INFOID:0000000012544425

PRELOAD TORQUE

(Gear ratio:3.916 type)

Unit: N·m (kg-m, in-lb)

Item	Standard
Drive pinion bearing preload torque	3.0 - 3.8 (0.31 - 0.39, 27 - 34)
Side bearing preload torque	1.2 - 2.3 (0.12 - 0.23, 11 - 20)
Total preload torque	4.2 - 6.1 (0.43 - 0.62, 37 - 54)

BACKLASH

Unit: mm (in)

Item	Standard
Drive gear to drive pinion backlash	0.13 - 0.23 (0.0051 - 0.009)

COMPANION FLANGE RUNOUT

Unit: mm (in)

Item	Limit
Companion flange face	0.13 (0.0051)
Companion flange inner side	0.13 (0.0051)

SELECTIVE PARTS

Drive Pinion Height Adjusting Washers

SERVICE DATA AND SPECIFICATIONS (SDS)

< SERVICE DATA AND SPECIFICATIONS (SDS)

[FRONT FINAL DRIVE: MA235]

Unit: mm (in)

Thickness	Package part number*	
0.5131 (0.0202)		A
0.5395 (0.0212)		
0.5639 (0.0222)		B
0.5893 (0.0232)		
0.6147 (0.0242)		
0.6401 (0.0252)		
0.6655 (0.0262)		C
0.6909 (0.0272)		
0.7163 (0.0282)		
0.7417 (0.0292)		
0.7671 (0.0302)		DLN
0.7925 (0.0312)		
0.8179 (0.0322)		
0.8433 (0.0332)		
0.8687 (0.0342)		E
0.8941 (0.0352)		
0.9195 (0.0362)		
0.9449 (0.0372)		F

38154 EZ40B

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

Side Bearing Adjusting Washers

Unit: mm (in)

Thickness	Package part number*	
5.5880 (0.2200)		G
5.6134 (0.2210)		
5.6388 (0.2220)		H
5.6642 (0.2230)		
5.6896 (0.2240)		
5.7150 (0.2250)		I
5.7404 (0.2260)		
5.7658 (0.2270)		
5.7912 (0.2280)		J
5.8166 (0.2290)		
5.8420 (0.2300)		
5.8674 (0.2310)		
5.8928 (0.2320)		K
5.9182 (0.2330)		
5.9436 (0.2340)		
5.9690 (0.2350)		L
5.9944 (0.2360)		
6.0198 (0.2370)		
6.0706 (0.2390)		
6.0960 (0.3581)		
6.1214 (0.2410)		M
6.1468 (0.2420)		
6.1722 (0.2430)		
6.1976 (0.2440)		N
6.2230 (0.2450)		
6.2484 (0.2460)		
6.2738 (0.2470)		
6.2992 (0.2480)		O
6.3246 (0.2490)		
6.3500 (0.2500)		
6.3754 (0.2510)		
6.4008 (0.2520)		P
6.4262 (0.2530)		
6.4516 (0.2540)		
6.4770 (0.2550)		
6.5024 (0.2560)		
6.5278 (0.2570)		
6.5532 (0.2580)		

38453 EZ40B

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

PRECAUTION

PRECAUTIONS

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

INFOID:000000013500365

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 Servicing Rear Final Drive

INFOID:000000012544427

- Before starting diagnosis of the vehicle, understand the symptoms well. Perform correct and systematic operations.
- Check for the correct installation status prior to removal or disassembly. When matching marks are required, be certain they do not interfere with the function of the parts they are applied to.
- Overhaul should be done in a clean work area, a dust proof area is recommended.
- Before disassembly, completely remove sand and mud from the exterior of the unit, preventing them from entering into the unit during disassembly or assembly.
- Always use shop paper for cleaning the inside of components.
- Avoid using cotton gloves or a shop cloth to prevent the entering of lint.
- Check appearance of the disassembled parts for damage, deformation, and abnormal wear. Replace them with new ones if necessary.
- Gaskets, seals and O-rings should be replaced any time the unit is disassembled.
- Clean and flush the parts sufficiently and blow them dry.
- Be careful not to damage sliding surfaces and mating surfaces.
- When applying sealant, remove the old sealant from the mating surface; then remove any moisture, oil, and foreign materials from the application and mating surfaces.
- In principle, tighten nuts or bolts gradually in several steps working diagonally from inside to outside. If a tightening sequence is specified, observe it.
- During assembly, observe the specified tightening torque.
- Add new differential gear oil, petroleum jelly, or multi-purpose grease, as specified.

PREPARATION

< PREPARATION >

[REAR FINAL DRIVE: MA248]

PREPARATION

PREPARATION

Special Service Tool

INFOID:0000000012544428

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

Tool number (TechMate No.) Tool name	Description
— (J-50982) Pinion seal installer	Installing front oil seal a: 95.1 mm b: 55.43 mm
— (J-44421) Pinion Driver	Removing pinion gear from carrier
— (J-8092) Driver handle	Installing bearing outer race (Use with J-51041, J-51040)
— (J-51041) Outer pinion race installer	Installing drive pinion front bearing outer race a. 80 mm b. 20.1 mm c. 62.9 mm
— (J-51040) Inner pinion race installer	Installing drive pinion rear bearing outer race a: 103.35 mm b: 24.7 mm c: 78.5 mm
— (J-51047) Side bearing remover pilot	Removing and Installing side bearing inner race a: 41.8 mm b: 39.3 mm c: 50.8 mm

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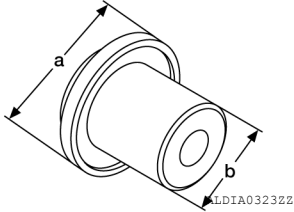
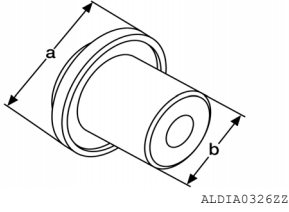
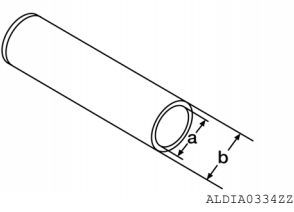
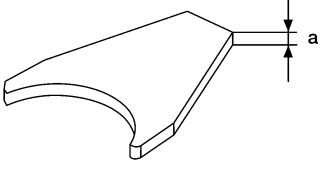
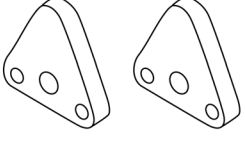
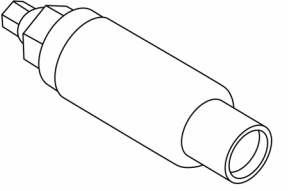
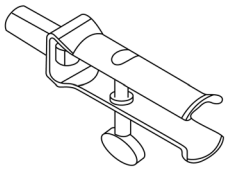
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PREPARATION

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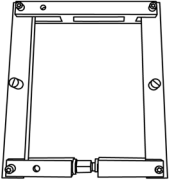
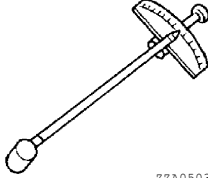
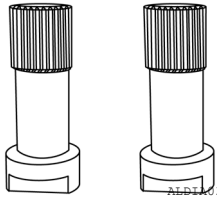
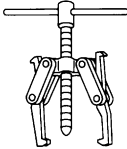
[REAR FINAL DRIVE: MA248]

Tool number (TechMate No.) Tool name	Description
<p>— (J-51045) Side bearing installer</p>  <p style="text-align: right; font-size: small;">ALDIA03232Z</p>	<p>Installing side bearing inner race a: 63.5 mm b: 39.6 mm</p>
<p>— (J-51046) Side bearing installer</p>  <p style="text-align: right; font-size: small;">ALDIA03262Z</p>	<p>Installing side bearing inner race a: 63.5 mm b: 42 mm</p>
<p>— (J-44412) Pinion bearing driver</p>  <p style="text-align: right; font-size: small;">ALDIA03342Z</p>	<p>Installing drive pinion rear bearing inner race a: 52.2 mm b: 63.6 mm</p>
<p>— (J-51042) Shim installer</p>  <p style="text-align: right; font-size: small;">AWDIA10682Z</p>	<p>Installing side bearing adjusting shim a: 4.84 mm</p>
<p>— (J-51043) Axle housing spreader adapters</p>  <p style="text-align: right; font-size: small;">ALDIA03362Z</p>	<p>Removing differential case assembly</p>
<p>— (J-51048) Pinion axle installer</p>  <p style="text-align: right; font-size: small;">ALDIA03332Z</p>	<p>Installing companion flange</p>
<p>— (J-26941) Puller</p>  <p style="text-align: right; font-size: small;">ALDIA03352Z</p>	<p>Bearing/seal remover</p>

PREPARATION


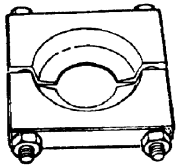
< PREPARATION >

[REAR FINAL DRIVE: MA248]

Tool number (TechMate No.) Tool name		Description	
— (J-24385-C) Axle housing spreader	 <small>ALDFA03142Z</small>	Removing differential case assembly	A B C
— (J-25765-B) Preload gauge	 <small>ZZA0503D</small>	Measuring preload torque	DLN E F
— (J-51044) Drive gear holder	 <small>ALDFA03692Z</small>	Removing drive gear	G H
— (OTC-1031) Puller	 <small>NT077</small>	Two jaw puller	I J K

Commercial Service Tool

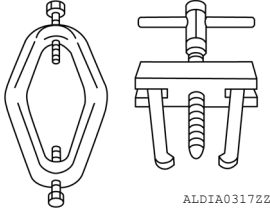
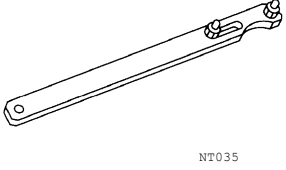
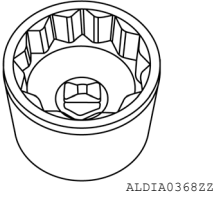
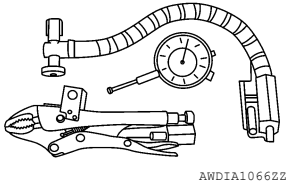
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Tool name		Description	
Power tool	 <small>PIIB1407E</small>	Loosening nuts, screws and bolts	L M N
(OTC-1123) Puller	 <small>ZZA0700D</small>	Bearing split plate	O P

PREPARATION

< PREPARATION >

[REAR FINAL DRIVE: MA248]

Tool name	Description
<p>(J-8433) Puller set</p> 	<p>Removing side bearing inner race</p>
<p>Flange wrench</p> 	<p>Removing and installing drive pinion lock nut</p>
<p>— (EN-48702) Socket</p> 	<p>Removing companion flange • 36 mm</p>
<p>— (J-45101) Dial indicator set</p> 	<p>Measuring Tool</p>

NOISE, VIBRATION AND HARSHNESS (NVH) TROUBLESHOOTING

< SYSTEM DESCRIPTION >

[REAR FINAL DRIVE: MA248]

SYSTEM DESCRIPTION

NOISE, VIBRATION AND HARSHNESS (NVH) TROUBLESHOOTING

NVH Troubleshooting Chart

INFOID:000000012544430

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

Reference page		DLN-189	DLN-189	DLN-189	DLN-189	DLN-189	DLN-181	DLN-130	RAX-4	RSU-4	WT-64	WT-64	RAX-4	BR-7	ST-32
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	REAR AXLE	REAR SUSPENSION	TIRES	ROAD WHEEL	AXLE SHAFT	BRAKES	STEERING
Symptom	Noise	x	x	x	x	x	x	x	x	x	x	x	x	x	x

x: Applicable

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DESCRIPTION

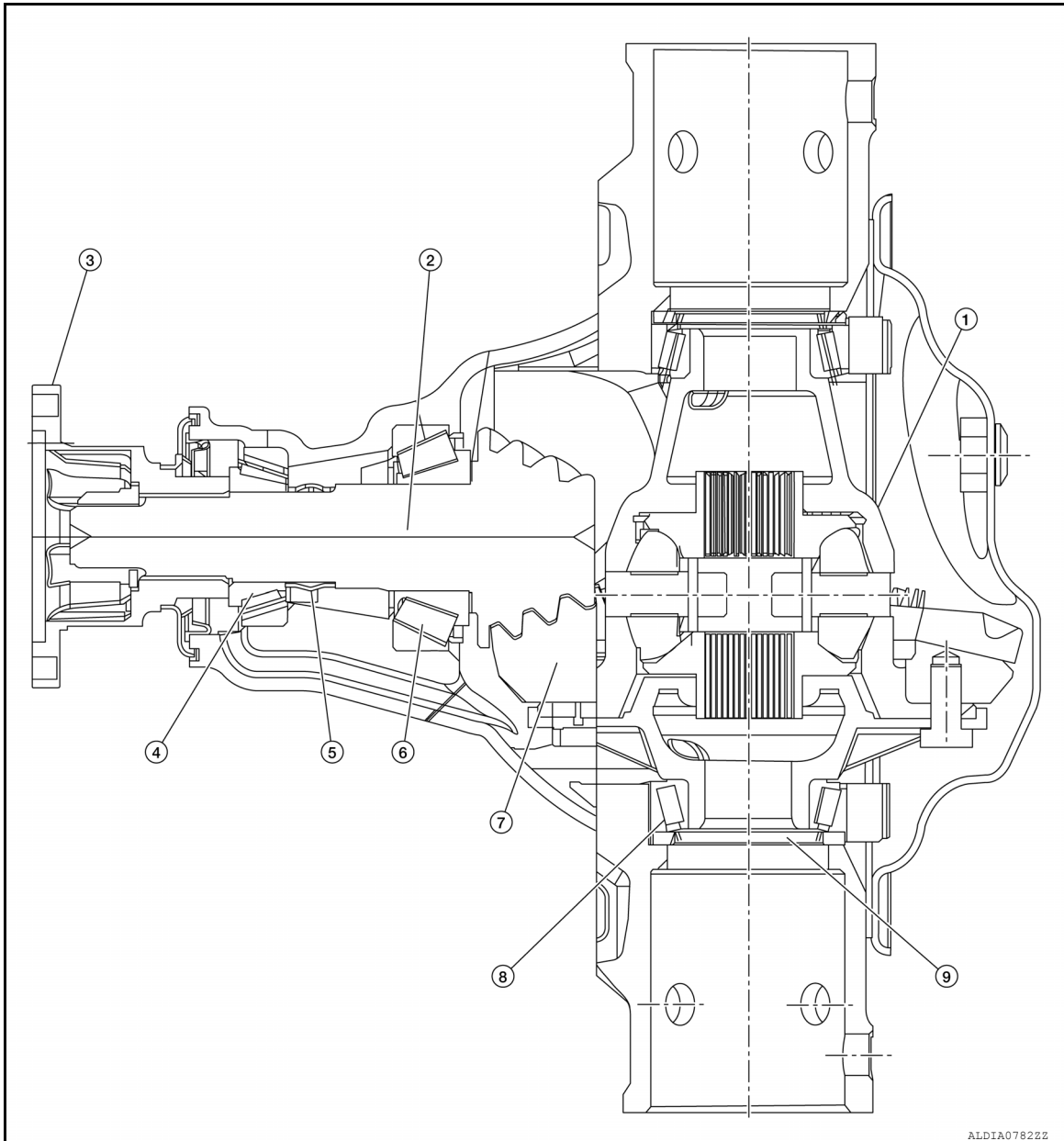
< SYSTEM DESCRIPTION >

[REAR FINAL DRIVE: MA248]

DESCRIPTION

Cross-Sectional View

INFOID:000000012544431



- | | | |
|-------------------------------|------------------------------|--------------------------------|
| 1. Differential case | 2. Drive pinion | 3. Companion flange |
| 4. Drive pinion front bearing | 5. collapsible spacer | 6. Drive pinion rear bearing |
| 7. Drive gear | 8. Differential side bearing | 9. Side bearing adjusting shim |

REAR DIFFERENTIAL GEAR OIL

< PERIODIC MAINTENANCE >

[REAR FINAL DRIVE: MA248]

PERIODIC MAINTENANCE

REAR DIFFERENTIAL GEAR OIL

Inspection

INFOID:0000000013312704

OIL LEAKAGE

- Check that oil is not leaking from final drive assembly or around it.
- When oil leaking, drain all gear oil, and then fill with specified amount of gear oil. Refer to [DLN-181, "Draining"](#), [DLN-181, "Refilling"](#).

CAUTION:

Oil volume cannot be checked by oil level height.

NOTE:

Oil is refilled up to filler plug hole.

OIL LEVEL

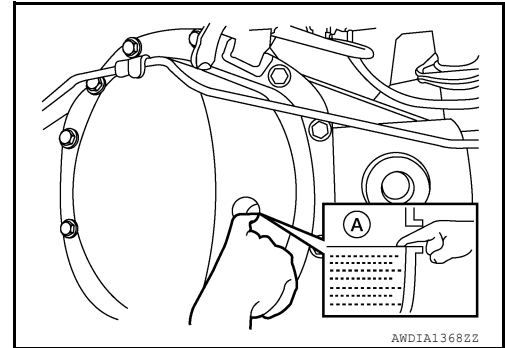
- Remove filler plug (1) and check oil level (A) from filler plug hole as shown.

CAUTION:

Do not start engine while checking oil level.

- Install filler plug and tighten to specification.

Filler plug torque : Refer to [DLN-189, "Exploded View"](#).

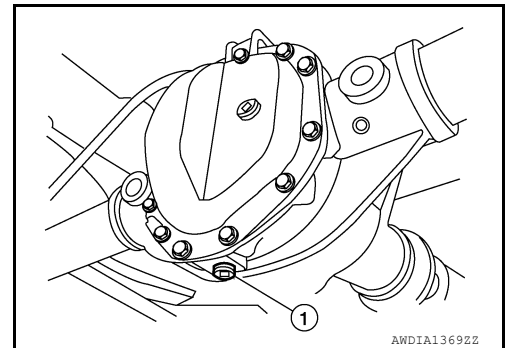


Draining

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1. Stop engine.
2. Remove drain plug (1) and drain gear oil.
3. Install the drain plug and tighten to specification.

Drain plug torque : Refer to [DLN-189, "Exploded View"](#).



Refilling

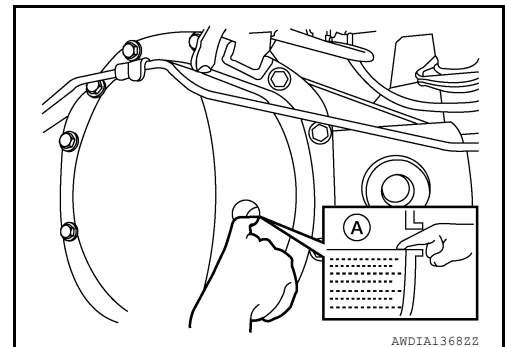
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1. Drain all gear oil. Refer to [DLN-181, "Draining"](#).

CAUTION:

Drain gear oil until gear oil starts to drip.

2. Remove filler plug.
3. Fill with specified amount of gear oil (A).



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REAR DIFFERENTIAL GEAR OIL

< PERIODIC MAINTENANCE >

[REAR FINAL DRIVE: MA248]

Oil grade and viscosity : Refer to [MA-13, "VK56VD Gasoline Engine : Fluids and Lubricants"](#), or [MA-59, "Cummins \(5.0L V8D\) Engine : Fluids and Lubricants"](#).

Oil capacity : Refer to [MA-13, "VK56VD Gasoline Engine : Fluids and Lubricants"](#) or, [MA-59, "Cummins \(5.0L V8D\) Engine : Fluids and Lubricants"](#).

NOTE:

Oil is not refilled up to filler plug mounting hole.

CAUTION:

Oil volume cannot be checked by oil level height.

4. Install filler plug and tighten to specification.

Filler plug torque : Refer to [DLN-189, "Exploded View"](#).

REMOVAL AND INSTALLATION

FRONT OIL SEAL

Removal and Installation

INFOID:000000012544434

REMOVAL

1. Drain the differential gear oil. Refer to [DLN-181, "Draining"](#).
2. Disconnect rear propeller shaft and support rear propeller shaft using suitable wire. Refer to [DLN-133, "Removal and Installation"](#).
3. Remove the axle shaft assemblies (LH/RH). Refer to [RAX-6, "Removal and Installation"](#).
4. Measure the total preload torque. Refer to [DLN-189, "Disassembly and Assembly"](#).

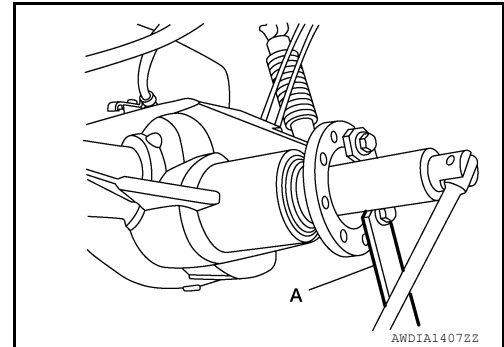
NOTE:

Record the total preload torque measurement.

5. Remove the drive pinion nut using suitable tool (A).

CAUTION:

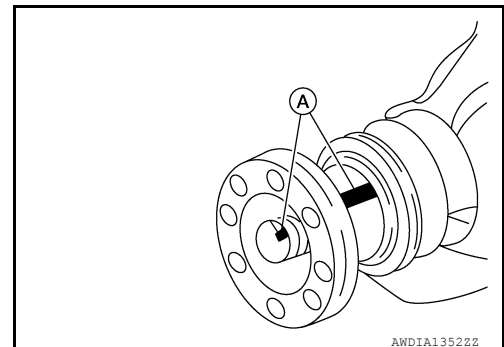
- Do not use power tool to remove drive pinion lock nut.
- Do not reuse drive pinion lock nut or washer.



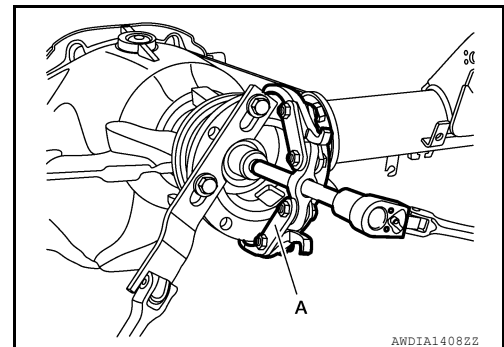
6. Put matching marks (A) on the companion flange and drive pinion using paint.

CAUTION:

Use paint to make the matching marks. Do not damage the companion flange or drive pinion.



7. Remove the companion flange using suitable tool (A).



FRONT OIL SEAL

< REMOVAL AND INSTALLATION >

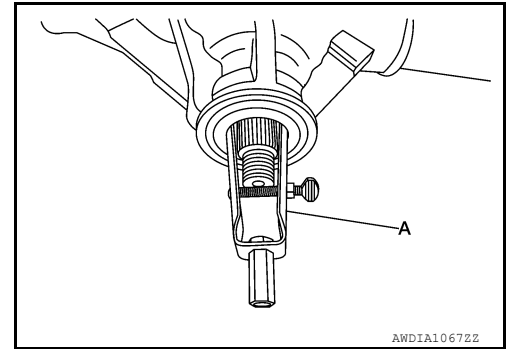
[REAR FINAL DRIVE: MA248]

8. Remove the front oil seal using Tool (A).

CAUTION:

Do not reuse front oil seal.

Tool (A) : — (J-26941)



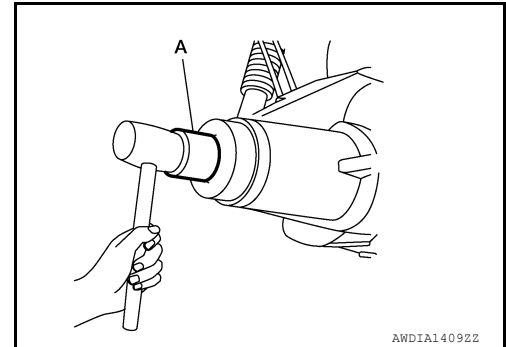
INSTALLATION

1. Clean the threads and splines of the drive pinion.
2. Apply multi-purpose grease to the lips of the new front oil seal and drive the new front oil seal in evenly until it becomes flush with the gear carrier using Tool (A).

Tool number : — (J-50982)

CAUTION:

- Do not reuse front oil seal.
- Do not incline the new front oil seal when installing.
- Apply multi-purpose grease to the lips and differential gear oil to the circumference of the new front oil seal.



3. Apply spline sealant 1.5mm (0.059 in) diameter bead 360 degrees around splines inside of the companion flange and install it on the drive pinion, aligning the matching marks.
 - Use spline sealant (Loctite 565) or equivalent. Refer to [GI-22, "Recommended Chemical Products and Sealants"](#).
4. Install the new drive pinion lock nut and washer and temporarily tighten using Tool (A).

Tool number (A): — (J-45012)

CAUTION:

- Do not use power tool to install drive pinion lock nut.
- Do not reuse drive pinion lock nut or washer.

5. Measure the total preload torque as necessary using Tool (B).
 - a. Use the Pre-measured total preload torque recorded during removal and add an additional preload torque "A" to the recorded pre-measured value. Use this calculated value when adjusting the total preload torque "T", when not replacing the collapsible spacer.

Pre-measured total preload torque + Additional torque "A" = Total preload torque "T"

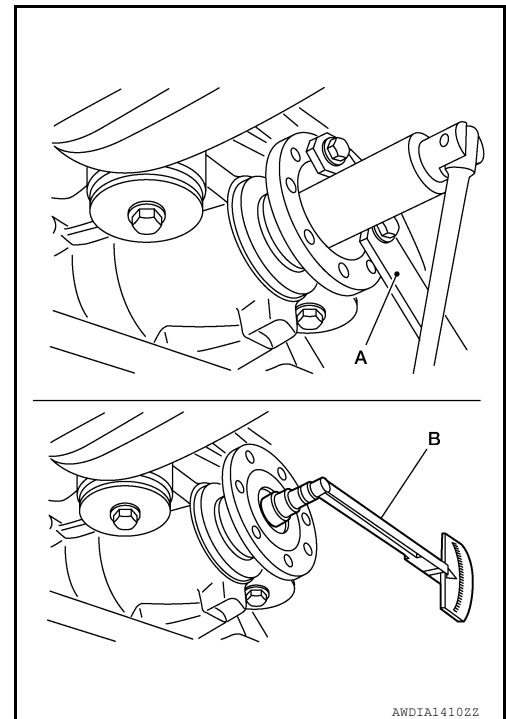
Additional preload torque "A" : Refer to [DLN-202, "Pre-load Torque"](#).

Total preload torque "T" : Refer to [DLN-202, "Pre-load Torque"](#).

- b. Tighten drive pinion lock nut in increments and measure total preload torque several times to prevent overtightening.

CAUTION:

Do not loosen drive pinion lock nut to adjust the total preload torque. If the total preload torque exceeds the specifications, replace the collapsible spacer and the drive pinion front bearing. Then tighten it again to adjust. Refer to [DLN-189, "Disassembly and Assembly"](#).



FRONT OIL SEAL

< REMOVAL AND INSTALLATION >

[REAR FINAL DRIVE: MA248]

- c. Rotate the drive pinion several times, each time the drive pinion lock nut is tightened to seat the pinion bearings.
CAUTION:
After adjustment, rotate drive pinion back and forth 2 to 3 times to check for unusual noise, rotation malfunction, and other malfunctions.
- 6. Installation of the remaining components is in the reverse order of removal.
CAUTION:
Fill the rear final drive with new differential gear oil level after installation. Refer to [DLN-181, "Inspection"](#).

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CARRIER COVER

< REMOVAL AND INSTALLATION >

[REAR FINAL DRIVE: MA248]

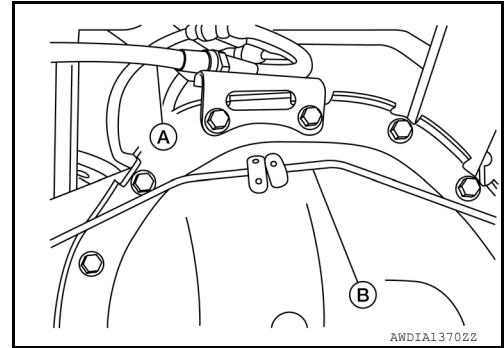
CARRIER COVER

Removal and Installation

INFOID:000000012544435

REMOVAL

1. Drain the differential gear oil. Refer to [DLN-181, "Draining"](#).
2. Remove the rear stabilizer bar clamps and bushings and position rear stabilizer bar out of the way. Refer to [RSU-6, "Exploded View"](#).
3. Disconnect the parking brake cable (A) and brake tube (B) from the carrier cover.



4. Remove the carrier cover bolts and separate the carrier cover from the gear carrier.
CAUTION:
 - Do not damage the mating surface.
 - Do not insert flat-bladed screwdriver, this will damage the mating surface.

INSTALLATION

1. Apply medium strength thread locking sealant into the threaded holes for the carrier cover. Install dry carrier cover gasket and carrier cover and bracket and tighten carrier cover bolts to the specification. Refer to [DLN-189, "Exploded View"](#).
CAUTION:
 - If carrier cover gasket is damaged replace it.
 - Remove any moisture, oil, or foreign material adhering to the application and mating surfaces.**NOTE:**

Use Genuine Medium Strength Locking Sealant or equivalent. Refer to [GI-22, "Recommended Chemical Products and Sealants"](#).
2. Connect the parking brake cable and brake tube to the carrier cover.

REAR FINAL DRIVE

< UNIT REMOVAL AND INSTALLATION >

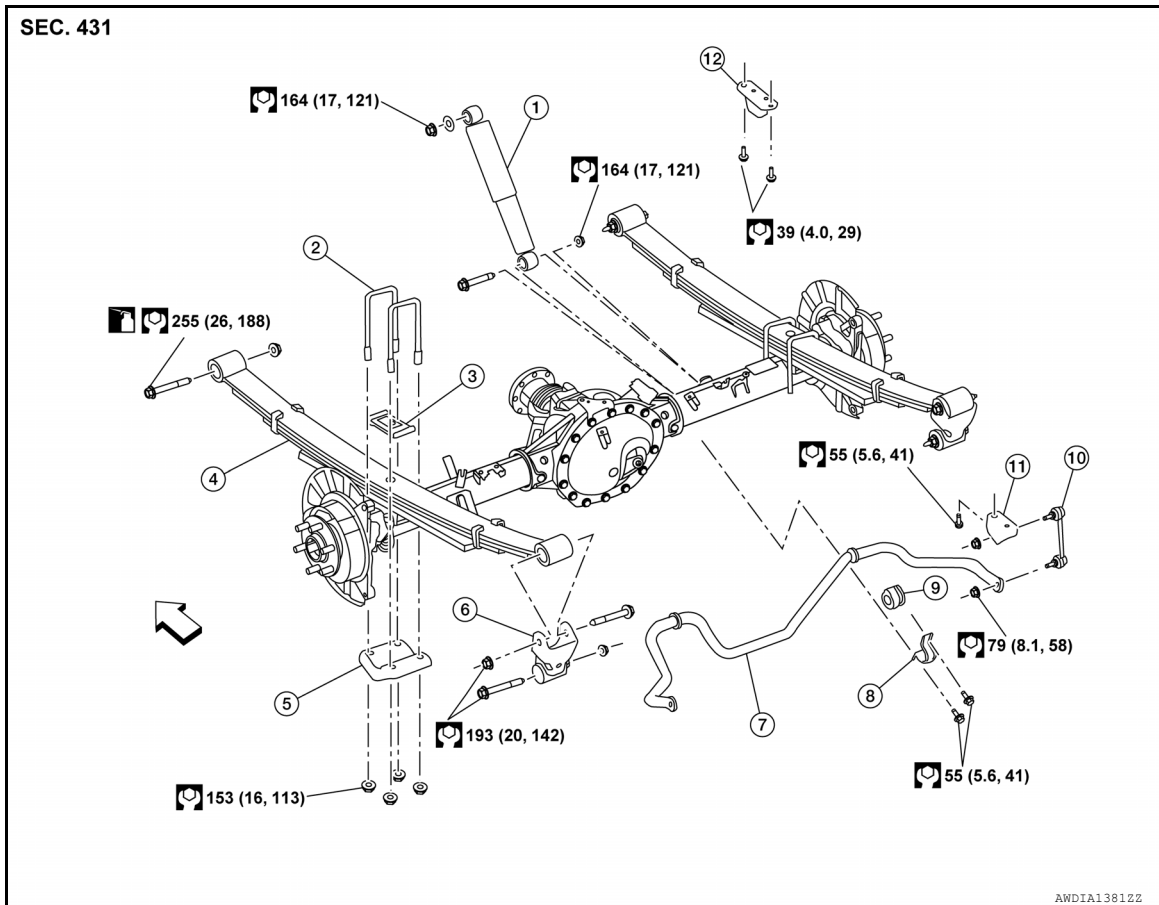
[REAR FINAL DRIVE: MA248]

UNIT REMOVAL AND INSTALLATION

REAR FINAL DRIVE

Exploded View

INFOID:000000013407735



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| 1. Shock absorber | 2. Rear spring U-bolts | 3. Rear spring upper seat |
| 4. Rear leaf spring | 5. Rear spring lower seat | 6. Shackle assembly |
| 7. Stabilizer bar | 8. Stabilizer bar clamp | 9. Stabilizer bar bushing |
| 10. Connecting rod | 11. Connecting rod bracket | 12. Bumper assembly |

↩ Front

Removal and Installation

INFOID:000000012544436

REMOVAL

CAUTION:

- Do not damage spline, companion flange and front oil seal when removing propeller shaft.
- Before removing final drive assembly or rear axle assembly, disconnect ABS sensor harness connector from the assembly and move it away from final drive/rear axle assembly area. Failure to do so may result in sensor wires being damaged and sensor becoming inoperative.

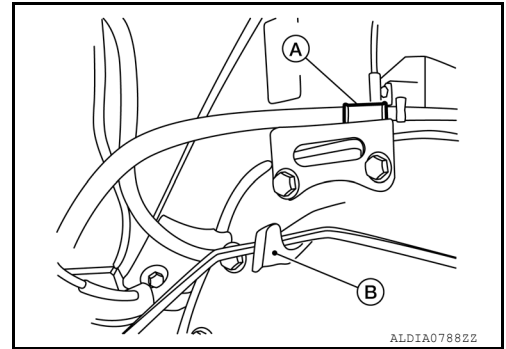
1. Disconnect the propeller shaft from the rear final drive assembly and support the propeller shaft with suitable wire. Refer to [DLN-132, "Exploded View"](#).
2. Disconnect the rear final drive air breather hose from the rear final drive assembly.
3. Disconnect the following components from the rear final drive assembly.
 - Brake tube block connectors. Refer to [BR-27, "REAR : Removal and Installation"](#).
 - ABS sensor wire harness. Refer to [BRC-163, "Removal and Installation"](#).

REAR FINAL DRIVE

< UNIT REMOVAL AND INSTALLATION >

[REAR FINAL DRIVE: MA248]

- Parking brake cable (A).
- Brake tube (B).



4. Remove the rear stabilizer bar. Refer to [RSU-6, "Exploded View"](#).
5. Support rear final drive assembly using a suitable jack.
CAUTION:
Secure rear final drive assembly to jack while removing it.
6. Remove rear shock absorber lower bolts. Refer to [RSU-10, "Removal and Installation"](#).
7. Remove leaf spring U-bolt nuts. Refer to [RSU-6, "Removal and Installation"](#).
8. Remove rear final drive assembly.
CAUTION:
Secure rear final drive assembly to the jack while removing it.

INSTALLATION

Installation is in the reverse order of removal.

CAUTION:

- Check the rear final drive assembly differential gear oil after installation. Refer to [DLN-181, "Inspection"](#).

REAR FINAL DRIVE ASSEMBLY

< UNIT DISASSEMBLY AND ASSEMBLY >

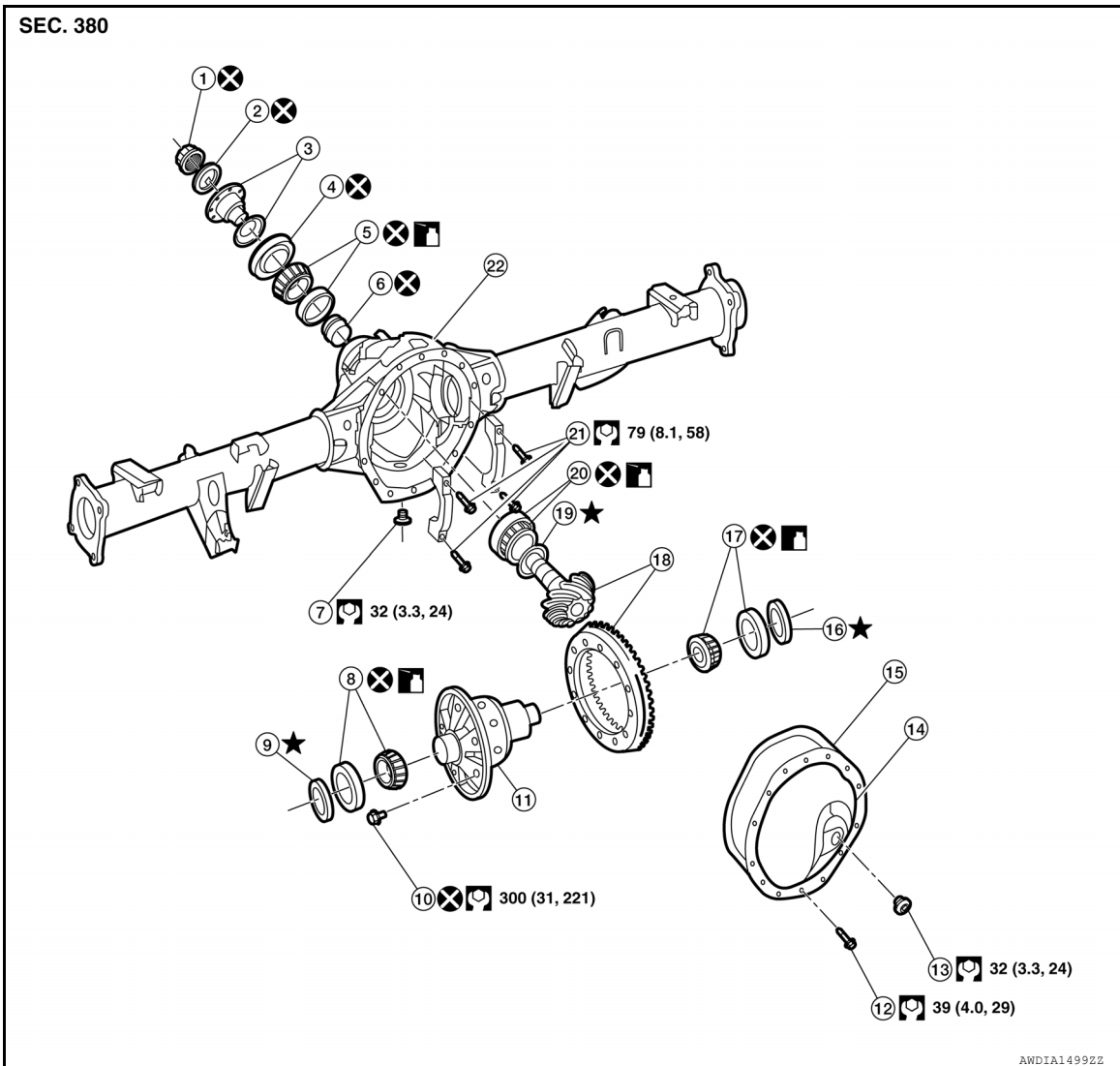
[REAR FINAL DRIVE: MA248]

UNIT DISASSEMBLY AND ASSEMBLY

REAR FINAL DRIVE ASSEMBLY

Exploded View

INFOID:0000000013296291



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| 1. Drive pinion lock nut | 2. Drive pinion lock nut washer | 3. Companion flange assembly |
| 4. Front oil seal | 5. Drive pinion front bearing | 6. Collapsible spacer |
| 7. Drain plug | 8. Side bearing assembly LH | 9. Side bearing adjusting shim LH |
| 10. Ring gear bolts | 11. Differential assembly | 12. Carrier cover bolts |
| 13. Filler plug | 14. Carrier cover | 15. Carrier cover gasket |
| 16. Side bearing adjusting shim RH | 17. Side bearing assembly RH | 18. Drive pinion and drive gear assembly |
| 19. Drive pinion washer | 20. Drive pinion read bearing | 21. Bearing cap bolts |
| 22. Gear carrier | | |

Disassembly and Assembly

INFOID:0000000012544437

DISASSEMBLY

NOTE:

If disassembly is being done on-vehicle, perform the following prior to disassembly:

REAR FINAL DRIVE ASSEMBLY

< UNIT DISASSEMBLY AND ASSEMBLY >

[REAR FINAL DRIVE: MA248]

- Disconnect the propeller shaft from the rear final drive and support the propeller shaft using suitable tool. Refer to or [DLN-133, "Removal and Installation"](#).
- Remove the spare tire.

Differential Assembly

1. Remove the carrier cover bolts and carrier cover gasket.

NOTE:

The carrier cover gasket is reusable. Only replace the carrier cover gasket if it is damaged.

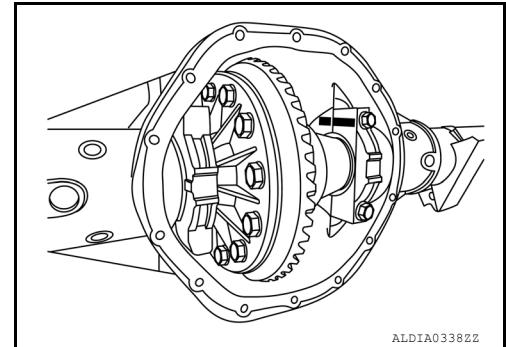
CAUTION:

- Do not damage the mating surface.
- Do not insert flat-bladed screwdriver, this will damage the mating surface.

2. For proper reinstallation, paint matching mark (1) on one side of side bearing cap.

CAUTION:

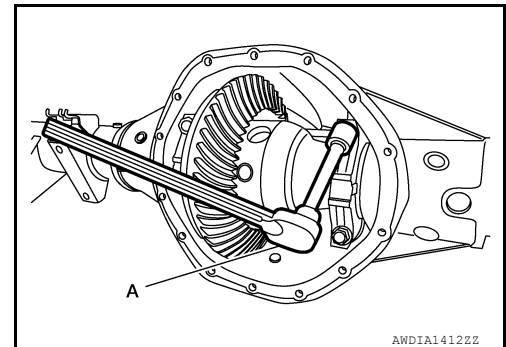
- Side bearing caps are line-board for initial assembly. The matching marks are used to reinstall them in their original positions.
- For matching mark, use paint. Do not damage side bearing cap.



3. Remove side bearing caps using suitable tool (A).

CAUTION:

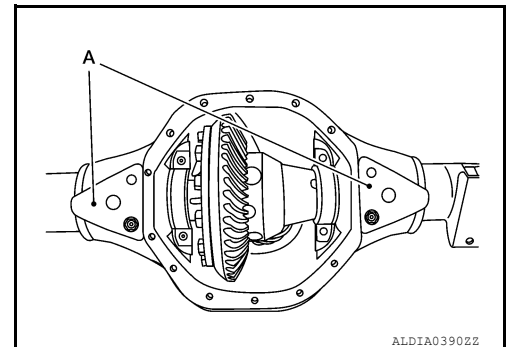
Do not use power tool to remove side bearing caps.



4. Remove differential case assembly.

- a. Attach Tool (A) to gear carrier.

Tool number (A): — (J-51043)



- b. Attach Tool (B) to Tool (A) and position Tool (C) in the proper orientation to measure the axle housing spread.

Tool number (A): — (J-51043)

(B): — (J-24385-C)

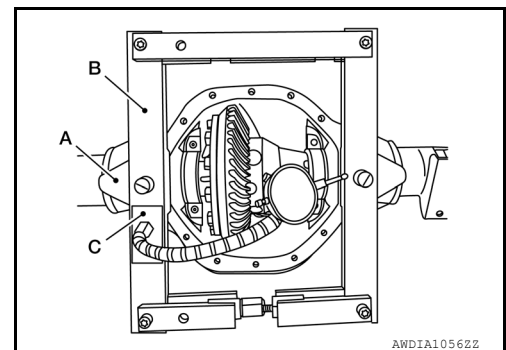
(C): — (J-45101)

WARNING:

Be cautious when using Tool (A,B), the differential case assembly is heavy and could cause serious injury.

CAUTION:

- Using a dial indicator (C) do not exceed a spread of 0.381mm (0.015 in) when using axle housing spreader.



REAR FINAL DRIVE ASSEMBLY

< UNIT DISASSEMBLY AND ASSEMBLY >

[REAR FINAL DRIVE: MA248]

- Remove Tool from gear carrier immediately after differential case removal, to avoid damage to gear carrier.

5. Remove side bearing outer races and side bearing adjusting shims. Keep side bearing and outer races together. Do not mix them up. Also, keep side bearing adjusting shims together with bearings.

CAUTION:

If reusing side bearing outer races and side bearing adjusting shims:

- Do not mix them up.
- Tag the side bearing outer races and the side bearing adjusting shims so they are installed in the same position they were removed from.

6. Remove side bearing using Tool (A) and suitable tool.

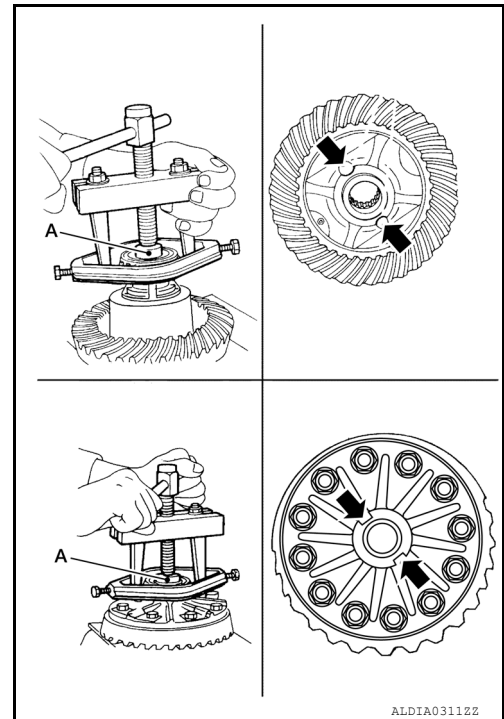
Tool (A) : — (J-51047)

CAUTION:

- Engage puller jaws in groove (←) to prevent damage.
- To prevent damage to the side bearing and drive gear, place copper plates between these parts and vise.
- Do not reuse side bearing if removed. Replace side bearing and bearing outer race as a set.

NOTE:

It is not necessary to remove side bearing except if it needs to be replaced.



7. For proper reinstallation, paint matching mark on differential assembly and drive gear.

CAUTION:

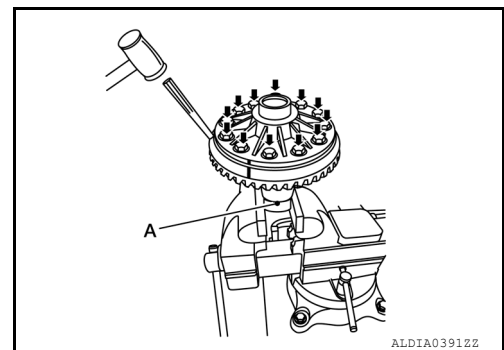
Use paint for matching marks. Do not damage differential case or drive gear

8. Remove drive gear bolts.

Tool (A) : — (J-51044)

CAUTION:

- Secure the differential assembly in a vise using Tool (A).
- Drive gear bolts are left hand threaded.
- Do not damage drive gear by removing bolts improperly.



9. Tap the drive gear off the differential assembly uniformly using suitable tool.

CAUTION:

- Tap evenly all around to keep drive gear from binding.
- Do not pry.
- Do strike top of drive gear bolts to remove the drive gear.

NOTE:

Do not disassemble the differential assembly, it is not serviceable. Replace it as an assembly (if necessary).

Drive Pinion Assembly

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REAR FINAL DRIVE ASSEMBLY

< UNIT DISASSEMBLY AND ASSEMBLY >

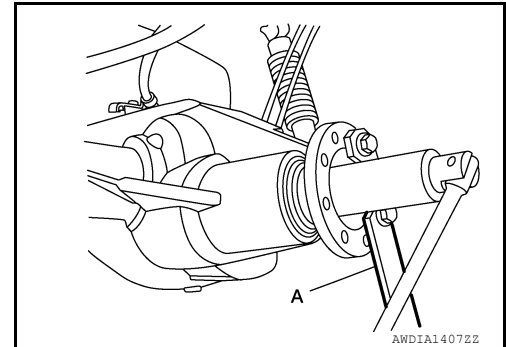
[REAR FINAL DRIVE: MA248]

NOTE:

If assembly is being done on-vehicle, perform the following prior to after assembly:

- Install the propeller shaft to the rear final drive. Refer to [DLN-133. "Removal and Installation"](#).
- Install the spare tire.

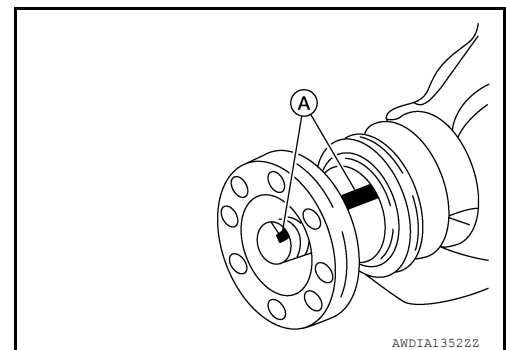
1. Remove differential case assembly.
2. Remove drive pinion lock nut and washer using suitable tool (A).



3. Put matching marks on the companion flange at location (A) and drive pinion using paint as shown.

CAUTION:

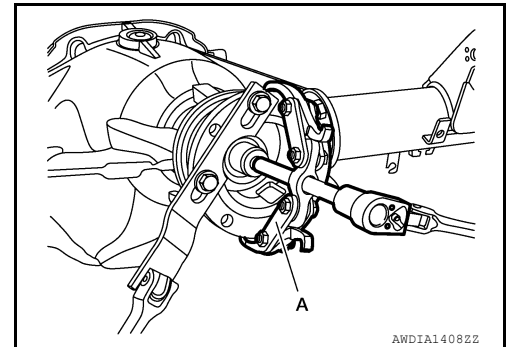
Use paint to make the matching marks. Do not damage the companion flange or drive pinion.



4. Remove companion flange and deflector using a suitable tool (A).

CAUTION:

Do not damage companion flange or deflector.

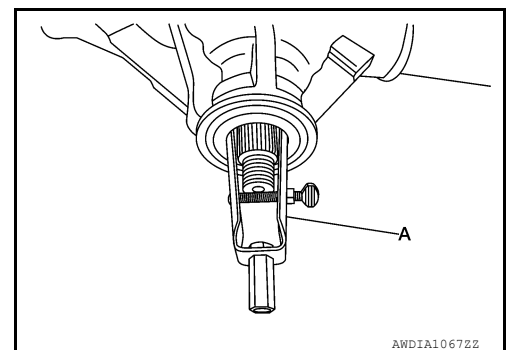


5. Remove front oil seal using Tool (A).

Tool number : — (J-26941)

CAUTION:

Do not damage gear carrier.



6. Remove drive pinion front bearing thrust washer.

REAR FINAL DRIVE ASSEMBLY

< UNIT DISASSEMBLY AND ASSEMBLY >

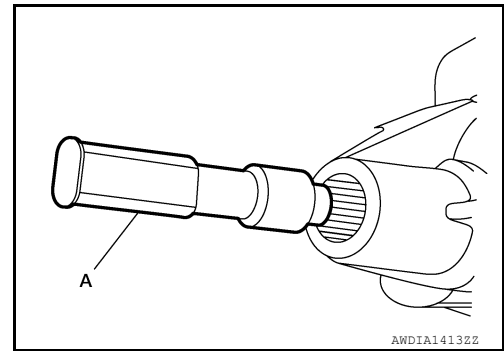
[REAR FINAL DRIVE: MA248]

7. Remove drive pinion assembly (with rear inner bearing race and collapsible spacer) out of gear carrier using Tool (A).

CAUTION:

Do not drop drive pinion assembly.

Tool number (A) : — (J-44421)



8. Remove collapsible spacer from drive pinion assembly and discard collapsible spacer.

CAUTION:

Do not reuse the collapsible spacer.

9. Remove drive pinion front bearing.

CAUTION:

Do not reuse drive pinion front bearing.

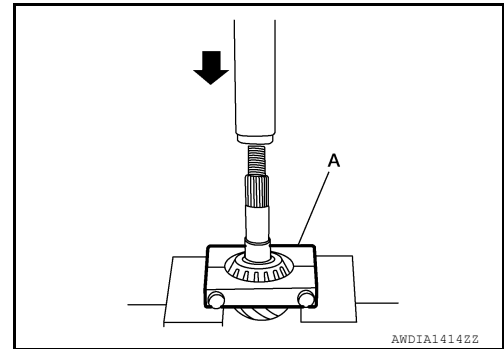
10. Remove drive pinion rear bearing and drive pinion washer using suitable tool (A).

NOTE:

- The drive pinion washer is matched to the carrier for proper drive pinion height. No drive pinion height adjustment is necessary if reusing original drive pinion washer.

CAUTION:

- **Do not reuse drive pinion rear bearing.**
- **Do not discard drive pinion washer, reuse if not damaged.**

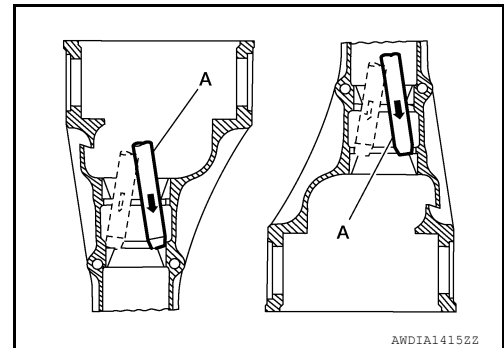


11. Clean threads and splines of the drive pinion, if reusing drive pinion.

12. Tap drive pinion front and rear bearing outer races uniformly using suitable tool (A) to remove.

CAUTION:

- **Do not reuse bearing outer races. Replace bearing and outer races as a set.**
- **Do not damage gear carrier.**



INSPECTION AFTER DISASSEMBLY

Clean and inspect the disassembled parts. If part are worn or damaged, follow the measures below.

Drive Pinion and Drive Gear

- If the drive pinion and drive gear teeth do not mesh or line-up correctly, determine the cause and adjust, repair, or replace as necessary.
- If the drive pinion or drive gear are worn, cracked, damaged, pitted or chipped (by friction) noticeably, replace with new drive pinion and drive gear.
- Drive pinion and drive gear are supplied in matched sets only. Matching numbers on both drive pinion and drive gear are etched for verification. If a new drive pinion and drive gear set are being used, verify the numbers of each drive pinion and drive gear before proceeding with assembly.

Bearing

- If bearings are chipped (by friction), pitted, worn, rusted, scratched, or unusual noise is coming from bearing, replace with new bearing assembly (as a new set).
- Bearing must be replaced with a new one whenever disassembled.

Side Gear and Pinion Mate Gear

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REAR FINAL DRIVE ASSEMBLY

< UNIT DISASSEMBLY AND ASSEMBLY >

[REAR FINAL DRIVE: MA248]

- If any cracks or damage are found on the surface of the teeth, replace case assembly.
- If any worn or chipped marks are found on the side of the side gear and pinion mate gear which contact the thrust washer, replace case assembly.

Drive Pinion Washer

- If any chips (by friction), damage, or unusual wear are found, replace with new one. Refer to ASSEMBLY INSPECTION AND ADJUSTMENT.

Side Bearing Adjusting Shim

- If any chips (by friction), damage, or unusual wear are found, replace with new one. Refer to ASSEMBLY INSPECTION AND ADJUSTMENT.

Gear Carrier

- If any wear or cracks are found on the contact sides of gear carrier, replace with new one.

Companion Flange

- If any chips or other damage on the companion flange surface which contacts the front oil seal lips are found, replace with new one.

Differential Case Assembly

- If any wear or cracks are found on the case assembly, replace with new one.

ASSEMBLY

Drive Pinion Assembly

NOTE:

If assembly is being done on-vehicle, perform the following after assembly:

- Connect the propeller shaft to the rear final drive. Refer to [DLN-133, "Removal and Installation"](#).
- Install the spare tire.

1. Install the new drive pinion front bearing outer race (2) and the new drive pinion rear bearing outer race (1), using Tools (A, B, C).

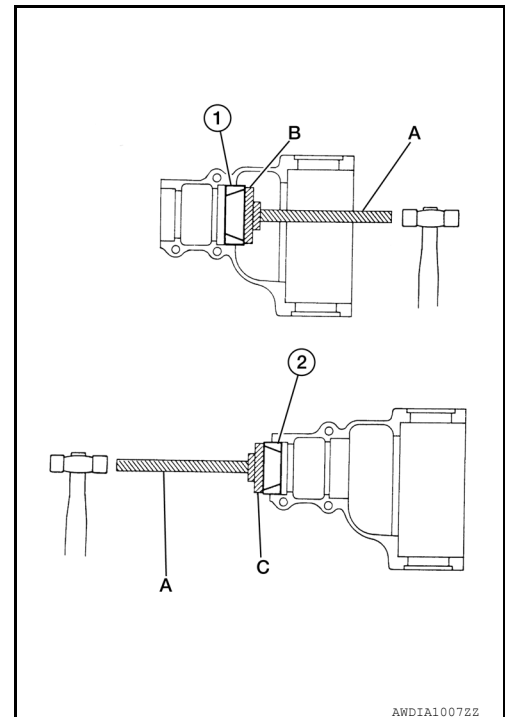
Tool (A): — (J-8092)

(B): — (J-51040)

(C): — (J-51041)

CAUTION:

Do not reuse drive pinion front and rear bearing outer race. Replace with bearing as a set.



REAR FINAL DRIVE ASSEMBLY

< UNIT DISASSEMBLY AND ASSEMBLY >

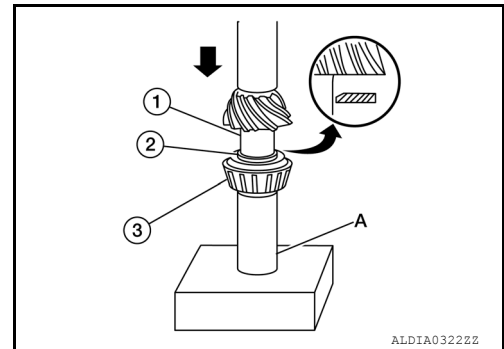
[REAR FINAL DRIVE: MA248]

2. Install the drive pinion washer (2) to the drive pinion (1). Press on the new drive pinion rear bearing (3) using Tool (A) and suitable tool.

Tool (A): — (J-44412)

CAUTION:

- Install the drive pinion washer in the proper direction as shown.
- Do not reuse drive pinion rear bearing.
- Be sure that drive pinion rear bearing is properly seated to the drive pinion.



3. Assemble the new collapsible spacer to the drive pinion.

CAUTION:

Do not reuse collapsible spacer.

4. Apply differential gear oil to the drive pinion rear bearing, and install the drive pinion assembly into the gear carrier.
5. Apply differential gear oil to the new drive pinion front bearing and install it onto the pinion assembly.

CAUTION:

Do not reuse drive pinion front bearing.

6. Install the companion flange and washer onto the drive pinion.
7. Seat the drive pinion bearing using Tool.

Tool — (J-51048)

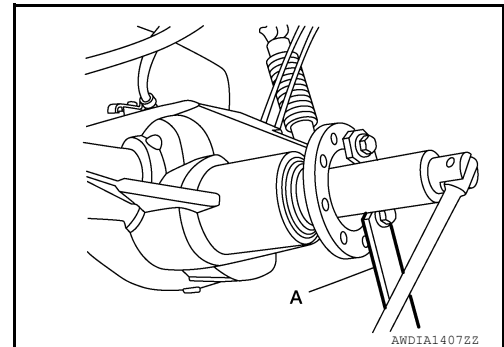
If no Tool is available to seat the drive pinion bearing, perform the following.

- a. Using the old washer and drive pinion lock nut, tighten the drive pinion lock nut using suitable tool (A) until the hand-felt lash has been removed.

CAUTION:

Do not use power tool to seat the drive pinion bearing.

- b. Remove the drive pinion lock nut, washer and companion flange using suitable tools.

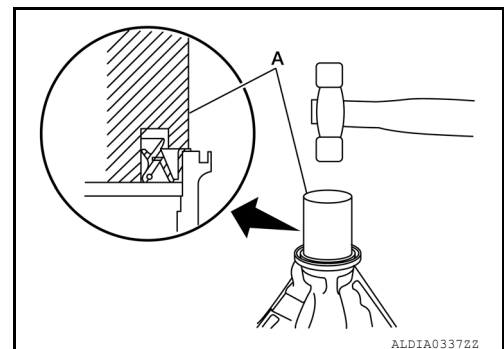


8. Install the new front oil seal in evenly until it becomes flush with the gear carrier using Tool (A).

Tool number : — (J-50982)

CAUTION:

- Do not reuse front oil seal.
- Do not incline the new front oil seal when installing.
- Apply multi-purpose grease to the lips of the new front oil seal.



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REAR FINAL DRIVE ASSEMBLY

< UNIT DISASSEMBLY AND ASSEMBLY >

[REAR FINAL DRIVE: MA248]

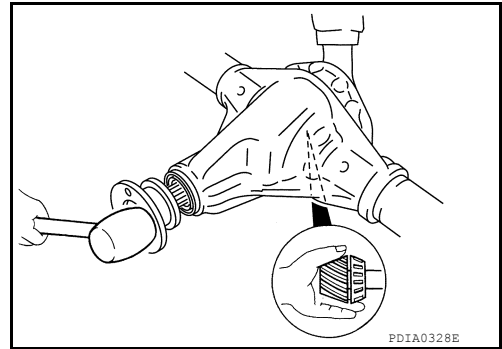
9. Apply spline sealant 1.5 mm (0.059 in) diameter bead 360 degrees around splines inside of the pinion flange and install the companion flange to the drive pinion, aligning the matching marks.

CAUTION:

Do not damage companion flange, deflector or front oil seal.

NOTE:

Use Spline Sealant (Loctite 565) or equivalent. Refer to [GI-22, "Recommended Chemical Products and Sealants"](#).



10. Install the new drive pinion lock nut and washer and temporarily tighten using Tool (A).

Tool : — (J-45012)

CAUTION:

- Do not use power tool to install drive pinion lock nut.
- Do not reuse drive pinion lock nut or washer.

11. Adjust the drive pinion preload torque using Tool (B).

Tool : — (J-25765-B)

Drive pinion bearing preload torque:

Refer to [DLN-202, "Preload Torque"](#)

- a. Tighten drive pinion lock nut in small increments and measure drive pinion bearing preload torque several times to prevent overtightening.
- b. Rotate the drive pinion several times, each time the drive pinion lock nut is tightened to seat the drive pinion bearings.

CAUTION:

- Do not loosen drive pinion lock nut to adjust the drive pinion bearing preload torque. If the drive pinion bearing preload torque exceeds specification, disassemble and replace the collapsible spacer and the drive pinion front bearing. Then tighten it again to adjust. Refer to [DLN-189, "Exploded View"](#).
- After adjustment, rotate drive pinion back and forth two to three times to check for unusual noise, rotation malfunction, and other malfunctions.

12. Check companion flange runout. Refer to [DLN-189, "Disassembly and Assembly"](#).

13. Install differential case assembly. Refer to [DLN-189, "Disassembly and Assembly"](#).

Differential Assembly

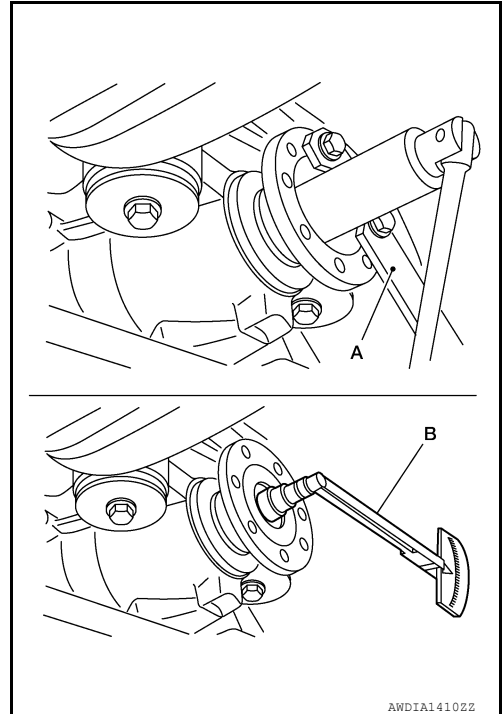
NOTE:

Do not disassemble differential assembly, it is not serviceable. Replace it as an assembly.

1. Secure the differential assembly in a vice using Tool (A)

Tool : — (J-51044)

2. Apply thread locking sealant the point (A) into the thread hole for the drive gear (1).



REAR FINAL DRIVE ASSEMBLY

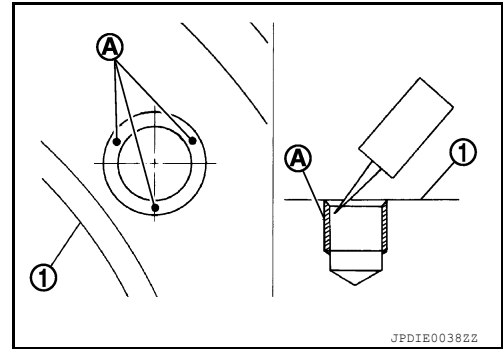
< UNIT DISASSEMBLY AND ASSEMBLY >

[REAR FINAL DRIVE: MA248]

Use Genuine High Strength thread locking Sealant or equivalent. Refer to [GI-22, "Recommended Chemical Products and Sealants"](#).

CAUTION:

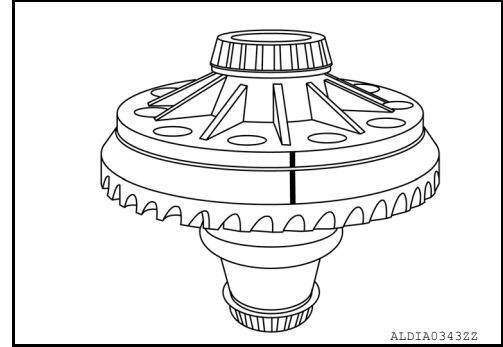
- Completely clean and degrease the drive gear back face, thread holes.
- Apply thread locking sealant onto the first and second threads under the thread hole chamfering of the drive gear on three or more different points.
- Use genuine high strength thread locking sealant or equivalent. Refer to [GI-22, "Recommended Chemical Products and Sealants"](#).



3. Align the matching mark of the differential case with the mark of the drive gear (if reusing drive gear), then hand thread all the drive gear bolts to the drive gear.

CAUTION:

- Drive gear bolts are left hand threaded.
- Do not reuse drive gear bolts.



4. Draw the gear onto the differential assembly by tightening drive gear in a crisscross pattern.

CAUTION:

- Do not use power tool to tighten drive gear bolts
- Drive gear bolts are left hand threaded.

5. Tighten the drive gear bolts to specification:

Drive gear torque specification : Refer to [DLN-189, "Exploded View"](#).

CAUTION:

- Do not reuse drive gear bolts.
- Tighten drive gear bolts in a crisscross pattern.
- Drive gear bolts are left hand threaded.

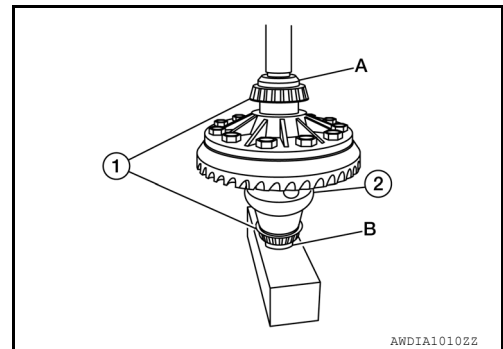
6. Press the new side bearings (1) onto the differential assembly (2) using Tool (A) and Tool (B).

Tool (A): — (J-51045 or J-51046)

Tool (B): — (J-51047)

CAUTION:

Do not reuse side bearing inner race if removed. Be sure that the side bearings are properly seated onto the differential assembly.



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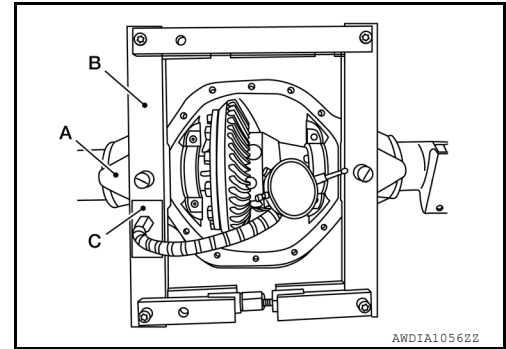
REAR FINAL DRIVE ASSEMBLY

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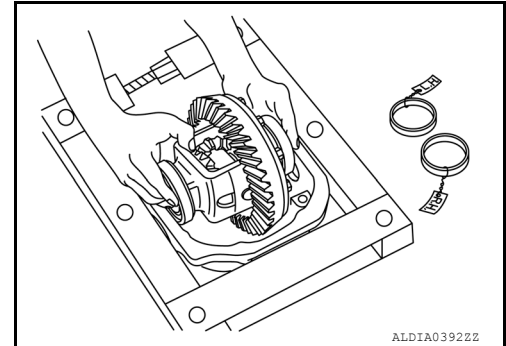
[REAR FINAL DRIVE: MA248]

7. If Tool was removed after disassembly reinstall Tools (A, B, C).

Tool number (A): — (J-51043)
(B): — (J-24385-C)
(C): — (J-45101)



8. Apply gear oil to side bearings. Install differential assembly with side bearing outer races into gear carrier.



9. Insert the left and right side bearing adjusting shims (2) in place between the side bearing outer race (3) and gear carrier (1) using Tool (A).

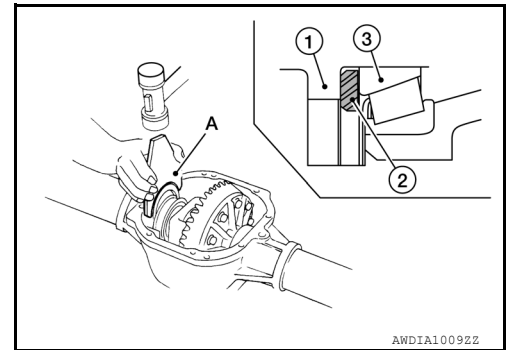
Tool (A): — (J-51042)

CAUTION:

- Install the side bearing adjusting shims in the proper direction as shown.
- Do not strike the side bearing adjusting shims with a hammer.

NOTE:

Use axle housing spreader tool if necessary.



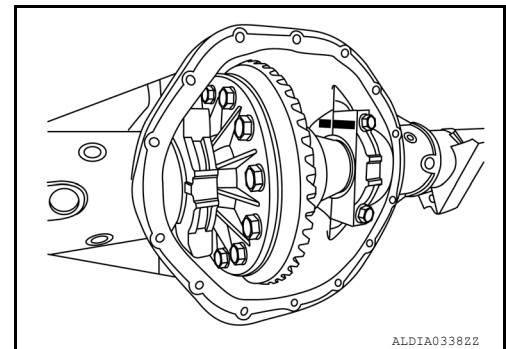
10. Install the side bearing caps with the matching marks aligned and tighten the side bearing cap bolts to specification.

Side bearing cap bolt torque specification:

Refer to [DLN-189, "Exploded View"](#)

CAUTION:

Tighten side bearing cap bolts in a crisscross pattern.



11. Check and adjust backlash, tooth contact and total preload torque. Refer to [DLN-189, "Disassembly and Assembly"](#).

12. Install the carrier cover and gasket to the gear carrier. Refer to [DLN-186, "Removal and Installation"](#).

INSPECTION AND ADJUSTMENT

- Drain the differential gear oil before inspection and adjustment. Refer to [DLN-181, "Draining"](#).
- Remove axle shaft assemblies (LH/RH) before inspection and adjustment. Refer to [RAX-6, "Removal and Installation"](#).
- Disconnect the propeller shaft from the rear final drive assembly and support the propeller shaft with suitable wire. Refer to [DLN-132, "Exploded View"](#).

REAR FINAL DRIVE ASSEMBLY

< UNIT DISASSEMBLY AND ASSEMBLY >

[REAR FINAL DRIVE: MA248]

- Remove and install the carrier cover as necessary for inspection and adjustment. Refer to [DLN-186, "Removal and Installation"](#).

Total Preload Torque

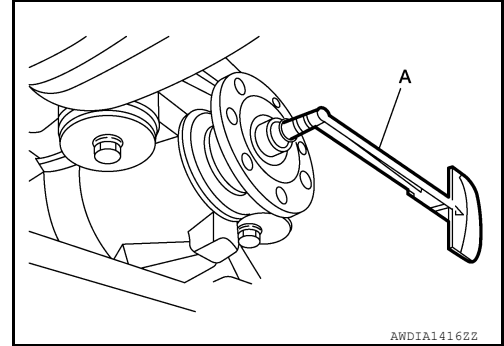
1. Rotate the drive pinion back and forth two to three times to check for unusual noise and rotation malfunction.
2. Rotate the drive pinion at least 20 times to check for smooth operation of the bearings.
3. Measure total preload torque using Tool (A).

Total preload torque : Refer to [DLN-202, "Preload Torque"](#).

NOTE:

Total preload torque = Drive pinion bearing preload torque + Side bearing preload torque.

- If the measured value is greater than specification, adjust as necessary.
- Adjust the drive pinion bearing preload torque first, then adjust the total preload torque by selecting side bearing adjusting shims.
- The differential gear case assembly must be removed to adjust the drive pinion bearing preload.



Tool : ST3127S000 (J-25765-B)

If the total preload torque is greater than specification

- On drive pinion bearings** : Replace collapsible spacer.
- On side bearings** : Use thinner side bearing adjusting washers by the same amount on each side. Refer to [DLN-189, "Exploded View"](#).

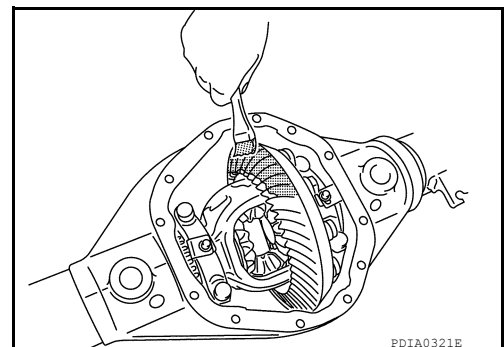
If the total preload torque is less than specification

- On drive pinion bearings** : Tighten drive pinion lock nut.
- On side bearings** : Use thicker side bearing adjusting washers by the same amount on each side. Refer to [DLN-189, "Exploded View"](#).

Tooth Contact

Checking gear tooth contact pattern is necessary to verify correct relationship between drive gear and drive pinion. Gears which are not positioned in proper arrangement may be noisy and/or have a short life. Check gear tooth contact pattern to obtain the best contact for low noise and long life.

1. Thoroughly clean drive gear and drive pinion teeth.
2. Apply red lead to the drive gear.
 - Apply red lead to both faces of all gears then check all gears.



REAR FINAL DRIVE ASSEMBLY

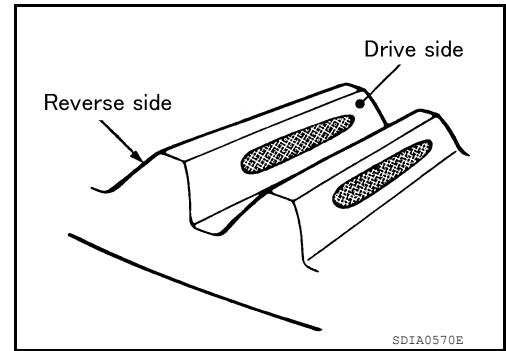
< UNIT DISASSEMBLY AND ASSEMBLY >

[REAR FINAL DRIVE: MA248]

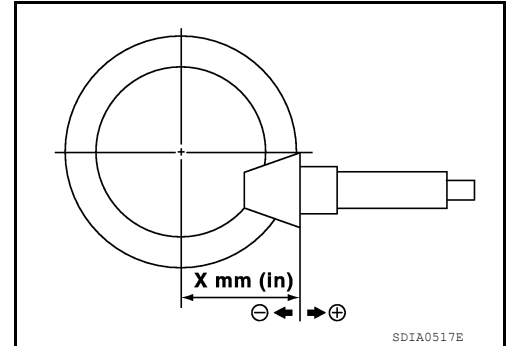
3. Rotate the drive gear back and forth several times. Then check for correct drive pinion to drive gear tooth contact as shown.

CAUTION:

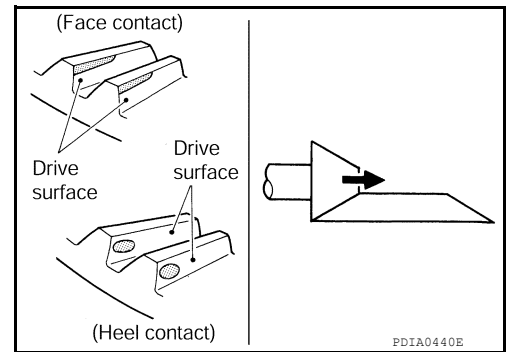
Check tooth contact on drive side and reverse side.



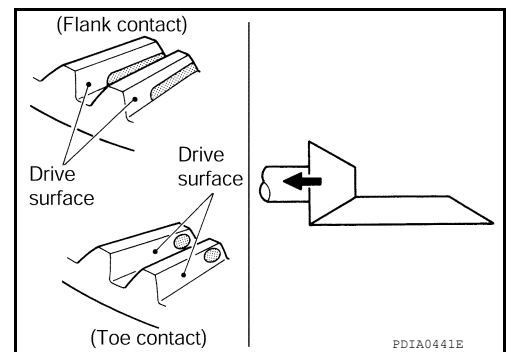
4. If the tooth contact is improperly adjusted, follow the procedure below to adjust the pinion height (dimension X).



- If the tooth contact is near the face (face contact), or near the heel (heel contact), use a thicker drive pinion height adjusting washers to move the drive pinion closer to the drive gear. Refer to [DLN-189, "Exploded View"](#).



- If the tooth contact is near the flank (flank contact), or near the toe (toe contact), use a thinner drive pinion height adjusting washers to move the drive pinion farther from the drive gear. Refer to [DLN-189, "Exploded View"](#).



Backlash

REAR FINAL DRIVE ASSEMBLY

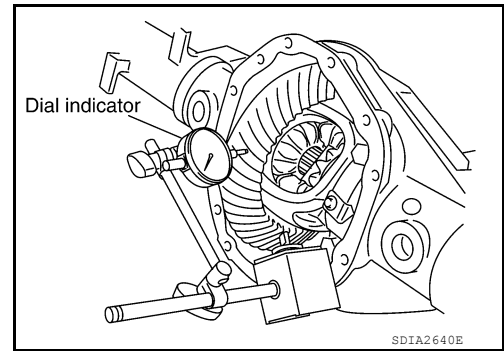
< UNIT DISASSEMBLY AND ASSEMBLY >

[REAR FINAL DRIVE: MA248]

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

Backlash : Refer to [DLN-202, "Backlash"](#).

- If the backlash is outside of the specification, change the thickness of each side bearing adjusting shim.



If the total preload torque is greater than specification

On drive pinion bearings : Replace collapsible spacer.

On side bearings : Use thinner side bearing adjusting washers by the same amount on each side. Refer to [DLN-189, "Exploded View"](#).

If the total preload torque is less than specification

On drive pinion bearings : Tighten drive pinion lock nut.

On side bearings : Use thicker side bearing adjusting washers by the same amount on each side. Refer to [DLN-189, "Exploded View"](#).

CAUTION:

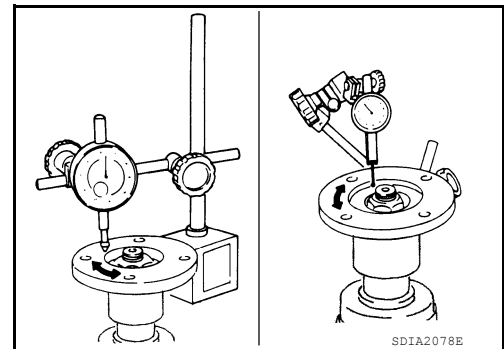
Do not change the total thickness of side bearing adjusting shims as it will change the total preload torque.

Companion Flange Runout

1. Rotate companion flange and check for runout on the companion flange face (inner side of the bolt holes) and companion flange inner side (socket diameter) using suitable tool.

Runout limit : Refer to [DLN-203, "Companion Flange Runout"](#)

2. If the runout is outside the runout limit, follow the procedure below to adjust.
 - a. Rotate the companion flange on the drive pinion by 90°, 180° and 270° while checking for the position where the runout is minimum.
 - b. If the runout is still outside of the runout limit after the companion flange has been rotated on the drive pinion, possible cause could be an assembly malfunction of drive pinion and drive pinion bearing or a malfunctioning drive pinion bearing.
 - c. If the runout is still outside of the runout limit after replacing the companion flange. Replace the rear final drive assembly. Refer to [DLN-187, "Removal and Installation"](#).



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SERVICE DATA AND SPECIFICATIONS (SDS)

< SERVICE DATA AND SPECIFICATIONS (SDS)

[REAR FINAL DRIVE: MA248]

SERVICE DATA AND SPECIFICATIONS (SDS)

SERVICE DATA AND SPECIFICATIONS (SDS)

General Specification

INFOID:0000000012544438

Applied model	2WD, 4WD	
	VK56VD	Cummins 5.0L
Vehicle grade	S, SL, SV	
Final drive model	MA248	
Gear ratio	3.357	3.916
Number of pinion gears	4	
Number of teeth (Drive gear / drive pinion)	47/14	47/12
Oil capacity (Approx.)	2.6 ℓ (5-1/2 US pt, 4-5/8 Imp pt)	
Drive pinion adjustment spacer type	Collapsible	

Preload Torque

INFOID:0000000013407862

PRELOAD TORQUE - REMOVAL AND INSTALLATION [WITHOUT REPLACING COLLAPSIBLE SPACER]

Unit: N·m (kg·m, in·lb)

Item	Standard
Pre-measured total preload torque [measured before removal of drive pinion lock nut] Maximum	6.47 (0.66, 57)
Additional preload torque "A" [add to pre-measured total preload torque during installation of new drive pinion lock nut]	0.35 - 0.58 (0.03 - 0.06, 3 - 5)
Total preload torque "T" [after installation of new drive pinion lock nut] = pre-measured total preload torque + additional preload torque	4.05 - 6.82 (0.40 - 0.68, 35 - 59)

PRELOAD TORQUE - DISASSEMBLY AND ASSEMBLY [REPLACING COLLAPSIBLE SPACER]

Unit: N·m (kg·m, in·lb)

Item	Standard
Drive pinion bearing preload torque	3.12 - 4.42 (0.32 - 0.45, 28 - 39)
Side bearing preload torque (reference value = total preload torque - drive pinion bearing preload torque)	0.50 - 1.70 (0.05 - 0.17, 4 - 15)
Total preload torque (total preload torque = drive pinion bearing preload torque + side bearing preload torque)	3.62 - 6.12 (0.37 - 0.62, 32 - 54)

Backlash

INFOID:0000000013407863

Unit: mm (in)

Item	Standard
Drive gear to drive pinion gear	0.152 - 0.245 (0.0060 - 0.0096)

SERVICE DATA AND SPECIFICATIONS (SDS)

< SERVICE DATA AND SPECIFICATIONS (SDS)

[REAR FINAL DRIVE: MA248]

Companion Flange Runout

INFOID:000000013407865

Unit: mm (in)

Item	Limit
Companion flange face	0.13 (0.0051) or less
Companion flange inner side	

SELECTIVE PARTS

Drive Pinion Washer

Unit: mm (in)

Thickness	Part number*
1.09 - 1.52	38154 EZ40A

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

Side Bearing Adjusting Washer

Unit: mm (in)

Thickness	Part number*
5.59 - 6.52	38453 EZ40A

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

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PRECAUTIONS

< PRECAUTION >

[REAR FINAL DRIVE: MA248 (ELD)]

PRECAUTION

PRECAUTIONS

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

INFOID:000000013326357

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

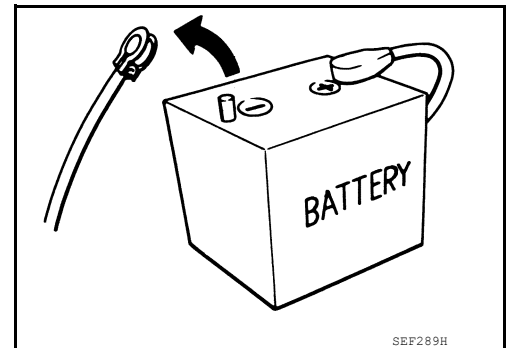
WARNING:

- 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.

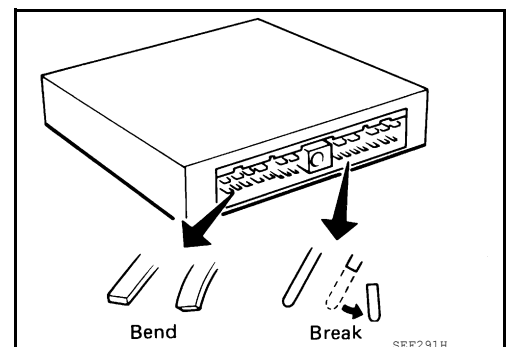
Precaution

INFOID:000000012544494

- Before connecting or disconnecting differential lock control unit harness connector, turn ignition switch "OFF" and disconnect the battery cable from the negative terminal. Because battery voltage is applied to differential lock control unit even if ignition switch is turned "OFF".



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

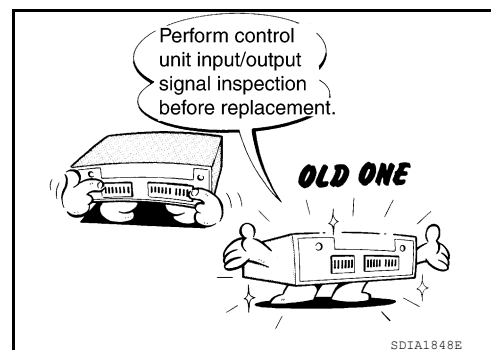


PRECAUTIONS

< PRECAUTION >

[REAR FINAL DRIVE: MA248 (ELD)]

- Before replacing differential lock control unit, perform differential lock control unit input/output signal inspection and make sure whether differential lock control unit functions properly or not. Refer to [DLN-218, "Reference Value"](#).



Precaution for Servicing Rear Final Drive

INFOID:000000012544495

- Before starting diagnosis of the vehicle, understand the symptoms well. Perform correct and systematic operations.
- Check for the correct installation status prior to removal or disassembly. When matching marks are required, be certain they do not interfere with the function of the parts they are applied to.
- Overhaul should be done in a clean work area, a dust proof area is recommended.
- Before disassembly, completely remove sand and mud from the exterior of the unit, preventing them from entering into the unit during disassembly or assembly.
- Always use shop paper for cleaning the inside of components.
- Avoid using cotton gloves or a shop cloth to prevent the entering of lint.
- Check appearance of the disassembled parts for damage, deformation, and abnormal wear. Replace them with new ones if necessary.
- Gaskets, seals and O-rings should be replaced any time the unit is disassembled.
- Clean and flush the parts sufficiently and blow them dry.
- Be careful not to damage sliding surfaces and mating surfaces.
- When applying sealant, remove the old sealant from the mating surface; then remove any moisture, oil, and foreign materials from the application and mating surfaces.
- In principle, tighten nuts or bolts gradually in several steps working diagonally from inside to outside. If a tightening sequence is specified, observe it.
- During assembly, observe the specified tightening torque.
- Add new differential gear oil, petroleum jelly, or multi-purpose grease, as specified.

PREPARATION

< PREPARATION >

[REAR FINAL DRIVE: MA248 (ELD)]

PREPARATION

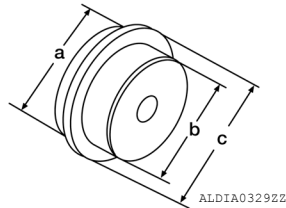
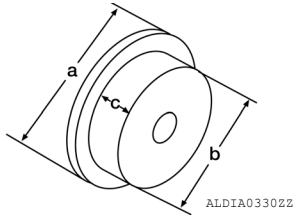
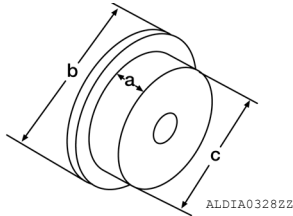
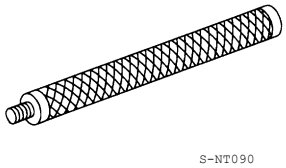
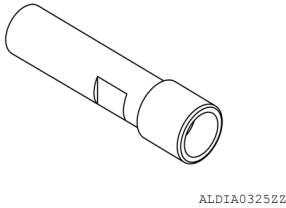
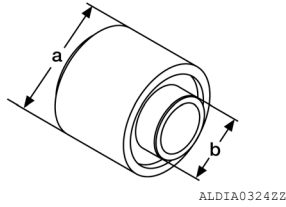
PREPARATION

Special Service Tool

INFOID:000000013407868

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

Tool number (TechMate No.) Tool name	Description
— (J-50982) Pinion seal installer	Installing front oil seal a: 95.1 mm b: 55.43 mm
— (J-44421) Pinion Driver	Removing pinion gear from carrier
— (J-8092) Driver handle	Installing bearing outer race (Use with J-51041, J-51040))
— (J-51041) Outer pinion race installer	Installing drive pinion front bearing outer race a: 80 mm b: 20.1 mm c: 62.9 mm
— (J-51040) Inner pinion race installer	Installing drive pinion rear bearing outer race a: 103.35 mm b: 24.7 mm c: 78.5 mm
— (J-51047) Side bearing remover pilot	Removing and Installing side bearing inner race a: 41.8 mm b: 39.3 mm c: 50.8 mm



PREPARATION

< PREPARATION >

[REAR FINAL DRIVE: MA248 (ELD)]

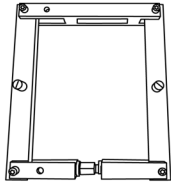
Tool number (TechMate No.) Tool name	Description	
— (J-51045) Side bearing installer	Installing side bearing inner race a: 63.5 mm b: 39.6 mm	A B C
— (J-51046) Side bearing installer	Installing side bearing inner race a: 63.5 mm b: 42 mm	DLN E F
— (J-44412) Pinion bearing driver	Installing drive pinion rear bearing inner race a: 52.2 mm b: 63.6 mm	G H
— (J-51042) Shim installer	Installing side bearing adjusting shim a: 4.84 mm	I J K
— (J-51043) Axle housing spreader adapters	Removing differential case assembly	L M
— (J-51048) Pinion axle installer	Installing companion flange	N O
— (J-26941) Puller	Bearing/seal remover	P

PREPARATION

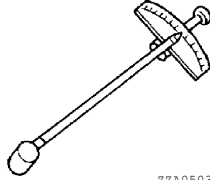
< PREPARATION >

[REAR FINAL DRIVE: MA248 (ELD)]

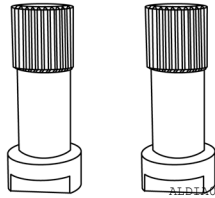
Tool number (TechMate No.) Tool name	Description
— (J-24385-C) Axle housing spreader	Removing differential case assembly
— (J-25765-B) Preload gauge	Measuring preload torque
— (J-51044) Drive gear holder	Removing drive gear
— (OTC-1031) Puller	Two jaw puller



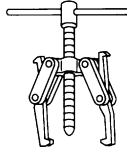
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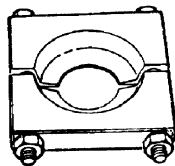
Commercial Service Tool

INFOID:000000013407869

Tool name	Description
Power tool	Loosening nuts, screws and bolts
(OTC-1123) Puller	Bearing split plate



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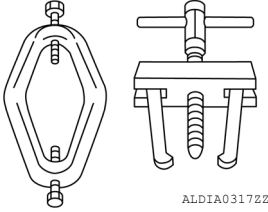
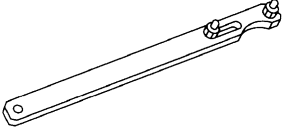
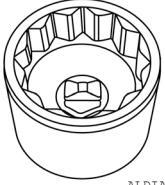
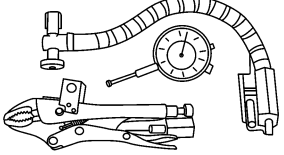


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PREPARATION

< PREPARATION >

[REAR FINAL DRIVE: MA248 (ELD)]

Tool name	Description
<p>(J-8433) Puller set</p>  <p>ALDIA03172Z</p>	<p>Removing side bearing inner race</p>
<p>Flange wrench</p>  <p>NT035</p>	<p>Removing and installing drive pinion lock nut</p>
<p>— (EN-48702) Socket</p>  <p>ALDIA03682Z</p>	<p>Removing companion flange • 36 mm</p>
<p>— (J-45101) Dial indicator set</p>  <p>AWDIA10662Z</p>	<p>Measuring Tool</p>

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DIFFERENTIAL LOCK SYSTEM

< SYSTEM DESCRIPTION >

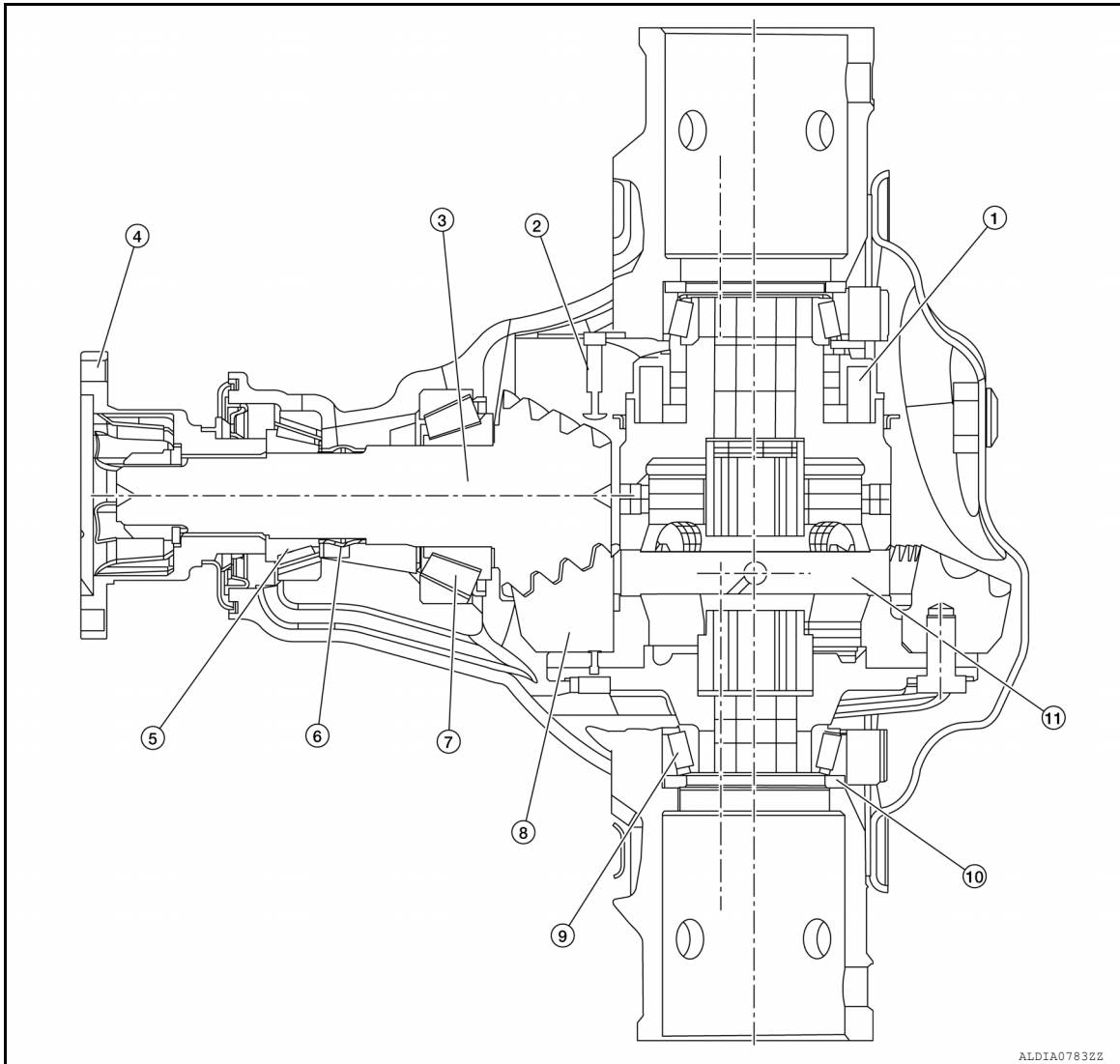
[REAR FINAL DRIVE: MA248 (ELD)]

SYSTEM DESCRIPTION

DIFFERENTIAL LOCK SYSTEM

Cross-Sectional View

INFOID:000000012544441



- | | | |
|---------------------------------|--------------------------------------|------------------------------|
| 1. Differential lock solenoid | 2. Differential lock position switch | 3. Drive pinion |
| 4. Companion flange | 5. Drive pinion front bearing | 6. Collapsible spacer |
| 7. Drive pinion rear bearing | 8. Drive gear | 9. Differential side bearing |
| 10. Side bearing adjusting shim | 11. Differential case | |

System Description

INFOID:000000013476193

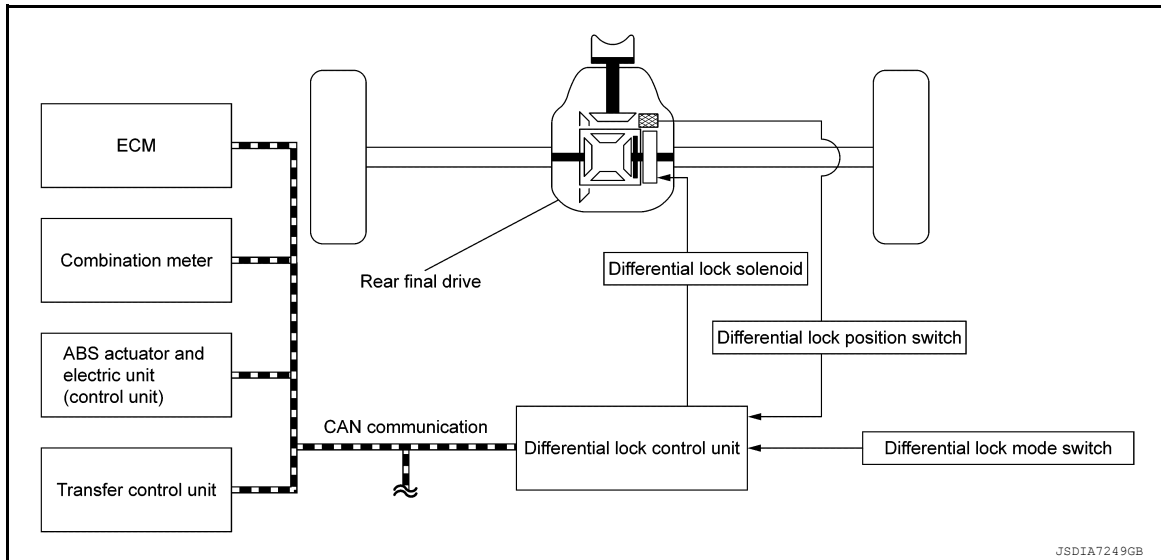
- Differential lock system is a device that locks differential function and facilitates emergency escaping of the vehicle when being stuck on a rough road, muddy road, deep snowy road, or when driving is impossible due to one-sided wheel spin.
- Lock/unlock of rear differential is switched according to operation of differential lock mode switch.
- Fail-safe function deactivates differential lock system when the system is malfunctioning. Refer to [DLN-220, "Fail-Safe"](#).

DIFFERENTIAL LOCK SYSTEM

[REAR FINAL DRIVE: MA248 (ELD)]

< SYSTEM DESCRIPTION >

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 receives the following signal from differential lock control unit via CAN communication: <ul style="list-style-type: none"> Differential lock indicator lamp signal
ABS actuator and electric unit (control unit)	Mainly transmits the following signals to differential lock control unit via CAN communication: <ul style="list-style-type: none"> Each wheel speed signal ABS operation signal VDC operation signal ABS malfunction signal VDC malfunction signal
ECM	Mainly transmits the following signal to differential lock control unit via CAN communication: <ul style="list-style-type: none"> Engine speed signal
Transfer control unit	Mainly transmits the following signal to differential lock control unit via CAN communication: <ul style="list-style-type: none"> 4WD mode signal

CONDITION FOR OPERATE DIFFERENTIAL LOCK

Differential lock mode switch	4WD mode	ABS or VDC operation	Vehicle speed	Differential lock operation
ON	2WD	—	—	OFF
	4H	—	—	OFF
	4L	OFF*	7 km/h (4 MPH) or more	OFF
			7 km/h (4 MPH) or less	ON

*: VDC function is not operate when 4WD mode is "4L".

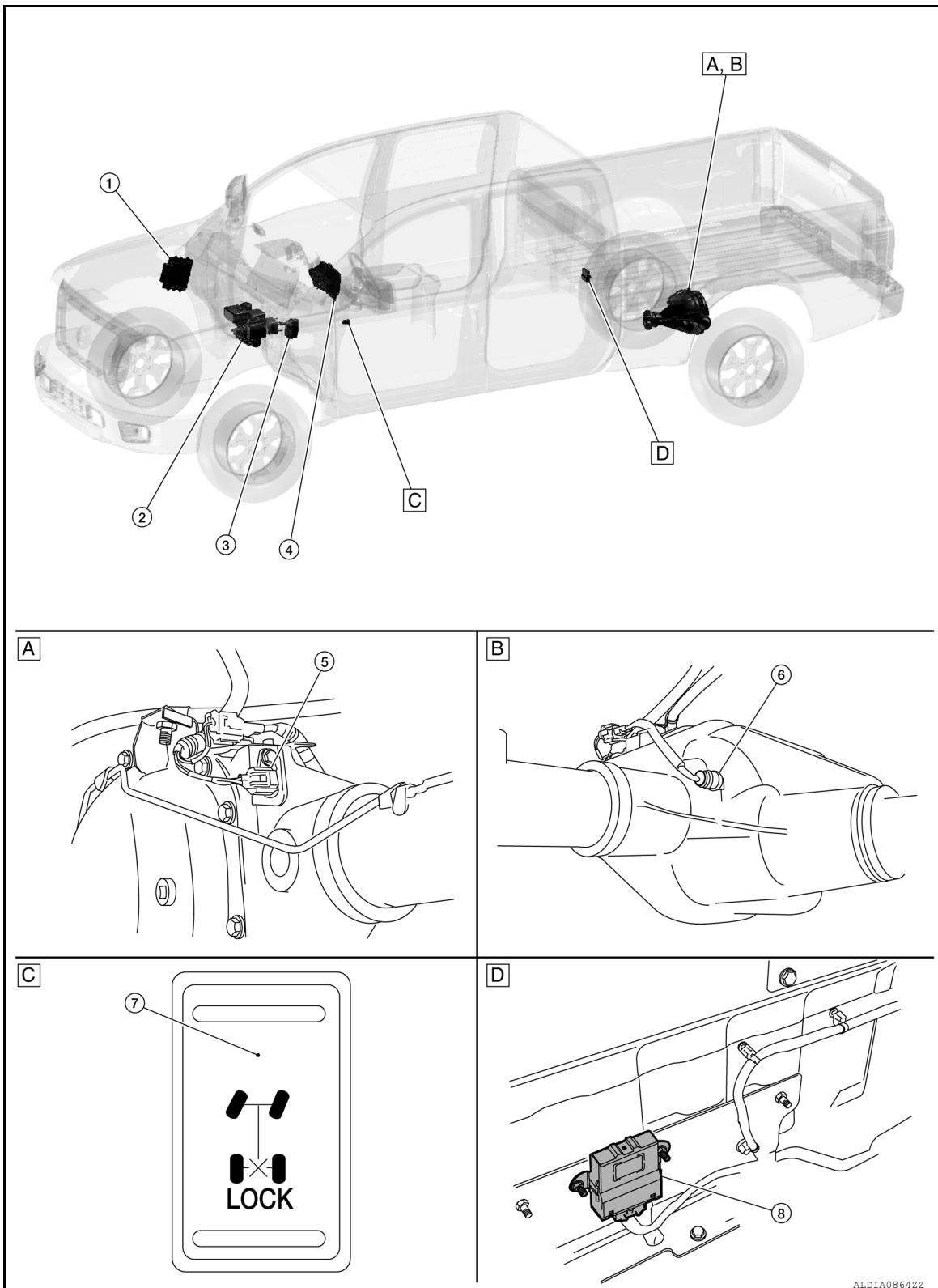
DIFFERENTIAL LOCK SYSTEM

< SYSTEM DESCRIPTION >

[REAR FINAL DRIVE: MA248 (ELD)]

Component Parts Location

INFOID:000000012544444



A. Rear differential area

B. Rear differential area

C. Differential lock mode switch (view of switch removed from vehicle)

D. Rear passenger compartment (view with rear trim panel removed)

DIFFERENTIAL LOCK SYSTEM

[REAR FINAL DRIVE: MA248 (ELD)]

< SYSTEM DESCRIPTION >

Component Description

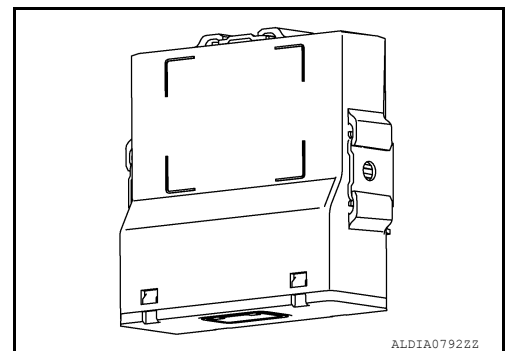
INFOID:000000012544445

No.	Component	Function
1.	ECM	Mainly transmits the following signal to differential lock control unit via CAN communication. <ul style="list-style-type: none"> • Engine speed signal For detailed installation location, refer to EC-34. "Component Parts Location" (CUMMINS 5.0L) or EC-1269. "Component Parts Location" (VK56VD)
2.	ABS actuator and electric unit (control unit)	Mainly transmits the following signal to differential lock control unit via CAN communication. <ul style="list-style-type: none"> • Each wheel speed signal • ABS operation signal • VDC operation signal • ABS malfunction signal • ABS malfunction signal For detailed installation location, refer to BRC-9. "Component Parts Location" .
3.	Transfer control unit	Mainly transmits the following signal to differential lock control unit via CAN communication. <ul style="list-style-type: none"> • 4WD mode signal For detailed installation location, refer to DLN-212. "Component Parts Location" .
4.	Combination meter	Illuminates DIFF LOCK indicator to indicate the differential lock is locked or in standby condition. Refer to MWI-11. "METER SYSTEM : Design" .
5.	Differential lock solenoid	Refer to DLN-213. "Differential Lock Solenoid" .
6.	Differential lock position switch	Detects differential lock/unlock condition based on the position of the pressure plate.
7.	Differential lock mode switch	Allows driver input for differential LOCK/UNLOCK to the differential lock control unit.
8.	Differential lock control unit	<ul style="list-style-type: none"> • Controls differential lock solenoid to lock/unlock the differential. • As a fail-safe function, the differential lock disengages when a malfunction is detected within the differential lock system. For detailed installation location, refer to DLN-212. "Component Parts Location" .

Differential Lock Control Unit

INFOID:000000013477993

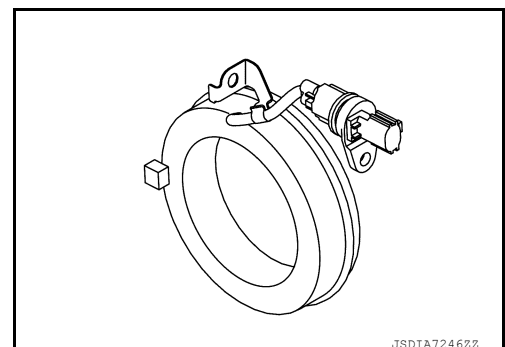
- Differential lock control unit, according to signal from differential lock mode switch, controls differential lock solenoid and switches status of rear differential (lock/unlock).
- Fail-safe mode is available if malfunction is detected in differential lock system. For fail-safe, refer to [DLN-220. "Fail-Safe"](#).



Differential Lock Solenoid

INFOID:000000013477994

Differential lock solenoid controls pressure plate according to signal from differential lock control unit.



DIFFERENTIAL LOCK SYSTEM

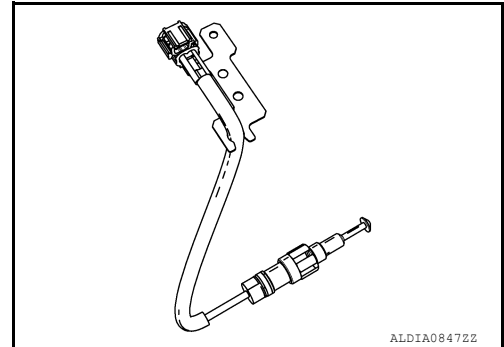
< SYSTEM DESCRIPTION >

[REAR FINAL DRIVE: MA248 (ELD)]

Differential Lock Position Switch

INFOID:000000013477995

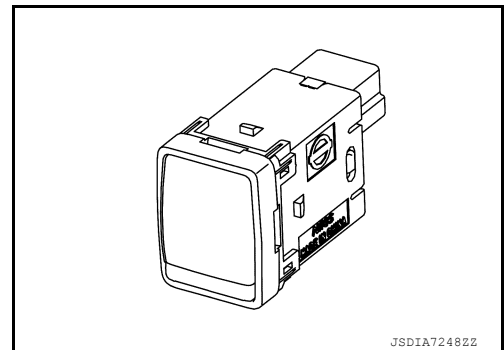
Differential lock position switch detects status of rear differential (lock/unlock) according to the position of pressure plate and transmits signal to differential lock control unit.



Differential Lock Mode Switch

INFOID:000000013477996

Differential lock mode switch activates or deactivates differential lock system according to switch position.



DIAGNOSIS SYSTEM (DIFFERENTIAL LOCK CONTROL UNIT)

< SYSTEM DESCRIPTION >

[REAR FINAL DRIVE: MA248 (ELD)]

DIAGNOSIS SYSTEM (DIFFERENTIAL LOCK CONTROL UNIT)

CONSULT Function

INFOID:000000013478001

APPLICATION ITEMS

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

Diagnostic test mode	Function
ECU Identification	Differential lock 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 differential lock control unit can be read.

*: The following diagnosis information is erased by erasing:

- DTC
- Freeze frame data (FFD)

ECU IDENTIFICATION

Differential lock control unit part number can be read.

SELF DIAGNOSTIC RESULT

Refer to [DLN-220, "DTC Index"](#).

When "PRNT" is displayed on self-diagnosis result.

- The system is presently malfunctioning.

When "PAST" is displayed on self-diagnosis result.

- System malfunction in the past is detected, but the system is presently normal.

FREEZE FRAME DATA (FFD)

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

Item name	Display item
IGN COUNTER (0 – 39)	The number of times that ignition switch is turned ON after the DTC is detected is displayed. <ul style="list-style-type: none">• When "0" is displayed: It indicates that the system is presently malfunctioning.• When except "0" is displayed: It indicates that system malfunction in the past is detected, but the system is presently normal. NOTE: Each time when ignition switch is turned OFF to ON, numerical number increases in 1→2→3...38→39. When the operation number of times exceeds 39, the number do not increase and "39" is displayed until self-diagnosis is erased.

DATA MONITOR

NOTE:

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

Monitor item (Unit)	Remarks
CONT MODUL VOLT (V)	Power supply voltage for differential lock control unit is displayed.
SOLENOID VOLT (V)	Power supply voltage for differential lock solenoid is displayed.
4WD MODE (2H/4H/4Lo)	4WD shift switch status is displayed.
INDICATOR (On/Off/FLASH)	Control status of differential lock indicator lamp is displayed.
D-LOCK SW SIG (On/Off)	Differential lock mode switch position is displayed.
D-LOCK PERMIT SIGNAL (On/Off)	Differential lock operation permission by differential lock control unit is displayed.
D-LOCK POS SW (On/Off)	Condition of differential lock position switch is displayed.
BUZ SIG (On/Off)	Buzzer is not equipped, but it is displayed.
SOLENOID DRIVE MONITOR (On/Off)	Monitored driving status of differential lock solenoid is displayed.
FAIL-SAFE RELAY SIGNAL (On/Off)	Signal state for operating the fail-safe relay is displayed.
WHEEL SPD SEN RR (km/h or mph)	Wheel speed calculated by rear RH wheel sensor signal is displayed.

DIAGNOSIS SYSTEM (DIFFERENTIAL LOCK CONTROL UNIT)

< SYSTEM DESCRIPTION >

[REAR FINAL DRIVE: MA248 (ELD)]

Monitor item (Unit)	Remarks
WHEEL SPD SEN RL (km/h or mph)	Wheel speed calculated by rear LH wheel sensor signal is displayed.
VHCL/S SEN-RR (km/h or mph)	Average of rear wheel sensors (left and right) is displayed.

NOISE, VIBRATION AND HARSHNESS (NVH) TROUBLESHOOTING

< SYSTEM DESCRIPTION >

[REAR FINAL DRIVE: MA248 (ELD)]

NOISE, VIBRATION AND HARSHNESS (NVH) TROUBLESHOOTING

NVH Troubleshooting Chart

INFOID:000000012544447

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

Reference page	DLN-292	DLN-292	DLN-292	DLN-292	DLN-292	DLN-306	DLN-130	RAX-4	RSU-4	WT-64	WT-64	RAX-4	BR-7	ST-32
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	REAR AXLE	REAR SUSPENSION	TIRES	ROAD WHEEL	AXLE SHAFT	BRAKES	STEERING
Symptom	Noise	x	x	x	x	x	x	x	x	x	x	x	x	x

x: Applicable

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DIFFERENTIAL LOCK CONTROL UNIT

< ECU DIAGNOSIS INFORMATION >

[REAR FINAL DRIVE: MA248 (ELD)]

ECU DIAGNOSIS INFORMATION

DIFFERENTIAL LOCK CONTROL UNIT

Reference Value

INFOID:000000013478002

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
CONT MODUL VOLT	Ignition switch: ON		Battery voltage
SOLENOID VOLT	Ignition switch: ON		Battery voltage
4WD MODE	4WD shift switch: 2H		2H
	4WD shift switch: 4H		4H
	4WD shift switch: 4L		4L
INDICATOR	Differential lock indicator lamp: ON		On
	Differential lock indicator lamp: OFF		Off
	Differential lock indicator lamp: Flash		FLASH
D-LOCK SW SIG	Differential lock mode switch: ON		On
	Differential lock mode switch: OFF		Off
D-LOCK PERMIT SIGNAL	Differential lock mode switch: OFF		Off
	Differential lock mode switch: ON	4WD shift switch: Except 4L	Off
		• 4WD shift switch: 4L • Vehicle speed above 7 km/h (4 MPH)	Off
		• 4WD shift switch: 4L • Vehicle speed below 7 km/h (4 MPH)	On
D-LOCK POS SW	Differential lock system: Lock mode		On
	Differential lock system: Unlock mode		Off
	Differential lock standby condition		Off
BUZ SIG	Always		Off
SOLENOID DRIVE MONITOR	Differential lock mode switch: OFF		Off
	Differential lock mode switch: ON	4WD shift switch: Except 4L	Off
		• 4WD shift switch: 4L • Vehicle speed above 7 km/h (4 MPH)	Off
		• 4WD shift switch: 4L • Vehicle speed below 7 km/h (4 MPH)	On
FAIL-SAFE RELAY SIGNAL	Differential lock system: In fail-safe mode		On
	Differential lock system: Not malfunction		Off
WHEEL SPD SEN RR	Vehicle stopped		0.00 km/h (0.00 mph)
	Vehicle running (in straight-ahead driving) CAUTION: Check air pressure of tire under standard condition.		Nearly matches the speed meter display (±10% or less)
WHEEL SPD SEN RL	Vehicle stopped		0.00 km/h (0.00 mph)
	Vehicle running (in straight-ahead driving) CAUTION: Check air pressure of tire under standard condition.		Nearly matches the speed meter display (±10%)

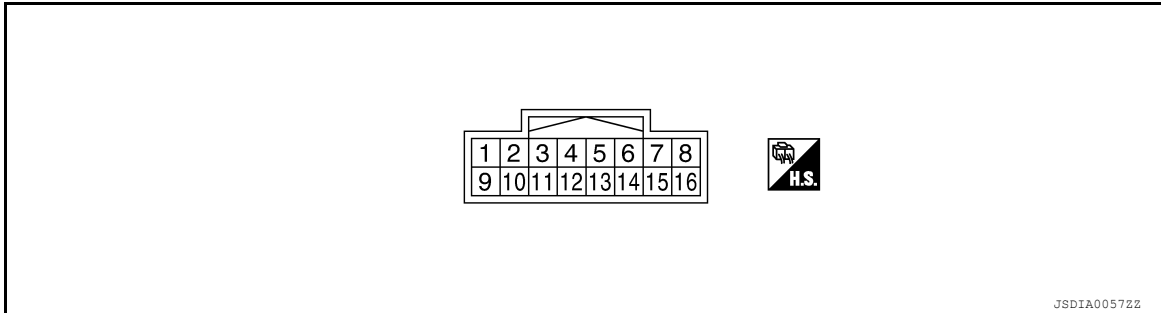
DIFFERENTIAL LOCK CONTROL UNIT

< ECU DIAGNOSIS INFORMATION >

[REAR FINAL DRIVE: MA248 (ELD)]

Monitor item	Condition	Value/Status
VHCL/S SEN-RR	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%)

TERMINAL LAYOUT



PHYSICAL VALUES

Terminal No. (Wire color)		Description		Condition	Value (Approx.)
+	-	Signal name	Input/ Output		
1 (Y)	Ground	Differential lock solenoid (+)	Output	Ignition switch: ON	Differential lock mode switch: ON Battery voltage
				Ignition switch: OFF	Differential lock mode switch: OFF 0 V
2 (V)	Ground	Differential lock solenoid (-)	Input	Ignition switch: ON	Differential lock mode switch: ON 0 V
				Ignition switch: OFF	Differential lock mode switch: OFF Battery voltage
5 (G/O)	Ground	Differential lock mode switch (ON)	Input	Ignition switch: ON	Differential lock mode switch: ON Battery voltage
				Ignition switch: OFF	Differential lock mode switch: OFF 0 V
7 (P)	Ground	Ignition signal	Input	Ignition switch: ON	Battery voltage
				Ignition switch: OFF	0 V
8 (L)	—	CAN-high	Input/ Output	—	—
9 (BR)	Ground	Power supply for solenoid	Input	Always	Battery voltage
10 (B)	Ground	Ground	—	Always	0 V
11 (B)	Ground	Ground	—	Always	0 V
12 (L)	Ground	Differential lock position switch	Input	Ignition switch: ON	Differential lock system: Lock mode (Differential lock indicator lamp: ON) 0 V
					Differential lock system: Unlock mode (Differential lock indicator lamp: OFF) Battery voltage
					Differential lock standby condition (Differential lock indicator lamp: Flash) Battery voltage
14 (O)	Ground	Differential lock mode switch (OFF)	Input	Ignition switch: ON	Differential lock mode switch: ON 0 V
					Differential lock mode switch: OFF Battery voltage
15 (Y/R)	Ground	Power supply for control unit (back-up)	Input	Always	Battery voltage
16 (R)	—	CAN-low	Input/ Output	—	—

CAUTION:

DIFFERENTIAL LOCK CONTROL UNIT

< ECU DIAGNOSIS INFORMATION >

[REAR FINAL DRIVE: MA248 (ELD)]

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

Fail-Safe

INFOID:000000013478003

If any malfunction occurs in differential lock system, and control unit detects the malfunction, differential lock control unit controls becomes the fail-safe mode depending on DTC.

DTC	Vehicle condition
Except the following DTC	Rear differential lock is disengaged.
•P1856 •P18D0 •P18CD	No impact to vehicle behavior. (Differential lock system can operate.)

DTC Inspection Priority Chart

INFOID:000000013478004

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

Priority	Detected items (DTC)
1	<ul style="list-style-type: none">• U1000 CAN COMM CIRCUIT• U1010 CONTROL UNIT (CAN)
2	Other than the above

DTC Index

INFOID:000000013478005

DTC	Display Item	Reference
P1836	CONTROL UNIT 3	DLN-242, "DTC Description"
P1838	ON SW	DLN-243, "DTC Description"
P1839	POSI SW ON	DLN-246, "DTC Description"
P1844	RELAY	DLN-249, "DTC Description"
P1848	SOL DISCONNECT	DLN-250, "DTC Description"
P1849	SOL SHORT	DLN-254, "DTC Description"
P1850	SOL CURRENT	DLN-258, "DTC Description"
P1856	VDC SYSTEM	DLN-260, "DTC Description"
P18CB	SOLENOID POWER SUPPLY	DLN-261, "DTC Description"
P18CC	WHEEL SPEED SIGNAL	DLN-264, "DTC Description"
P18CD	INCOMPLETE SELF SHUTDOWN	DLN-265, "DTC Description"
P18CE	DIFF LOCK POSITION SWITCH	DLN-267, "DTC Description"
P18D0	ABS SYSTEM	DLN-270, "DTC Description"
U1000	CAN COMM CIRCUIT	DLN-271, "DTC Description"
U1010	CONTROL UNIT (CAN)	DLN-272, "DTC Description"

NOTE:

If some DTCs are displayed at the same time, refer to [DLN-220, "DTC Inspection Priority Chart"](#).

REAR FINAL DRIVE

[REAR FINAL DRIVE: MA248 (ELD)]

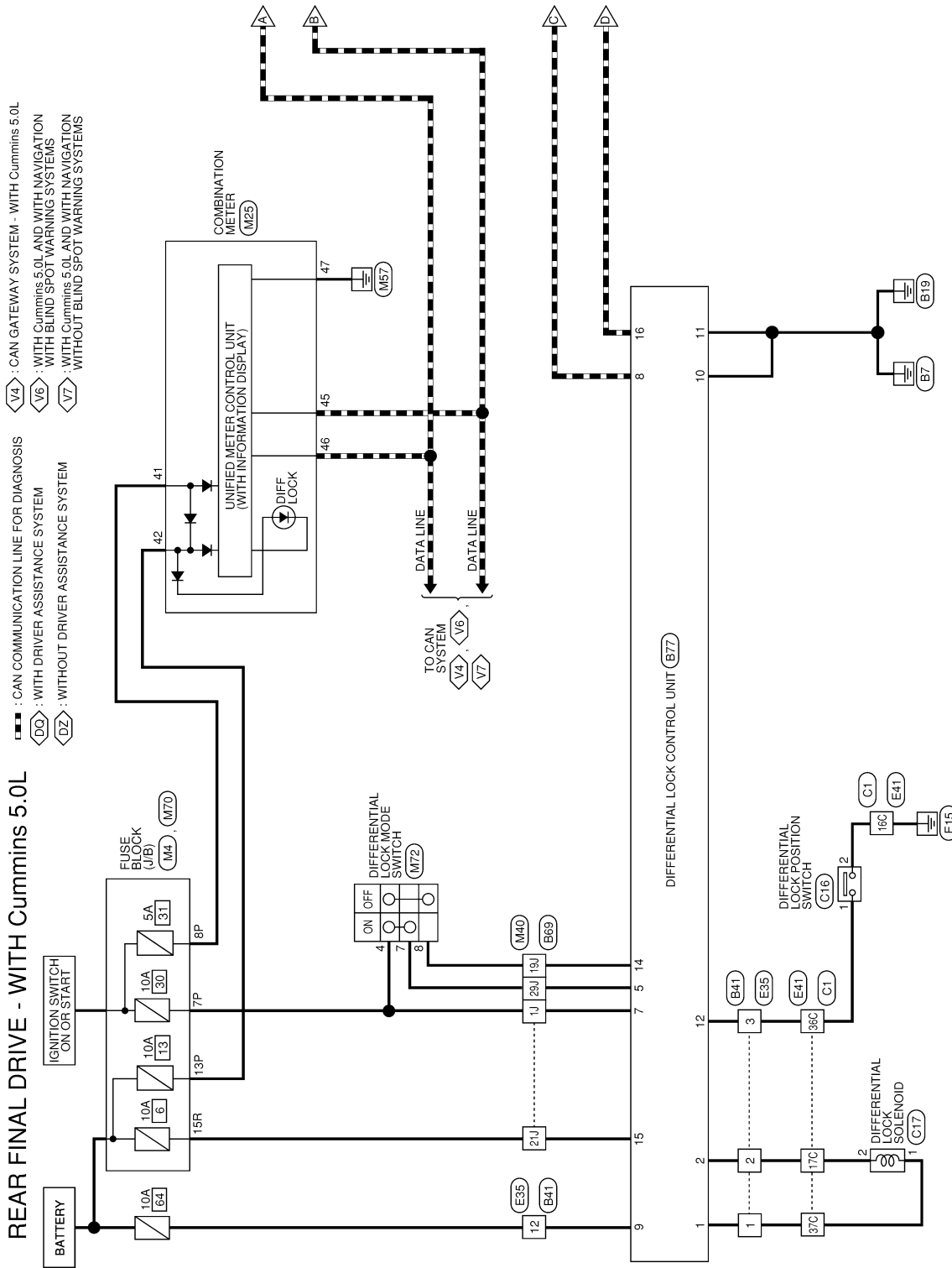
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WIRING DIAGRAM

REAR FINAL DRIVE

Wiring Diagram - Cummins 5.0L

INFOID:000000012544488



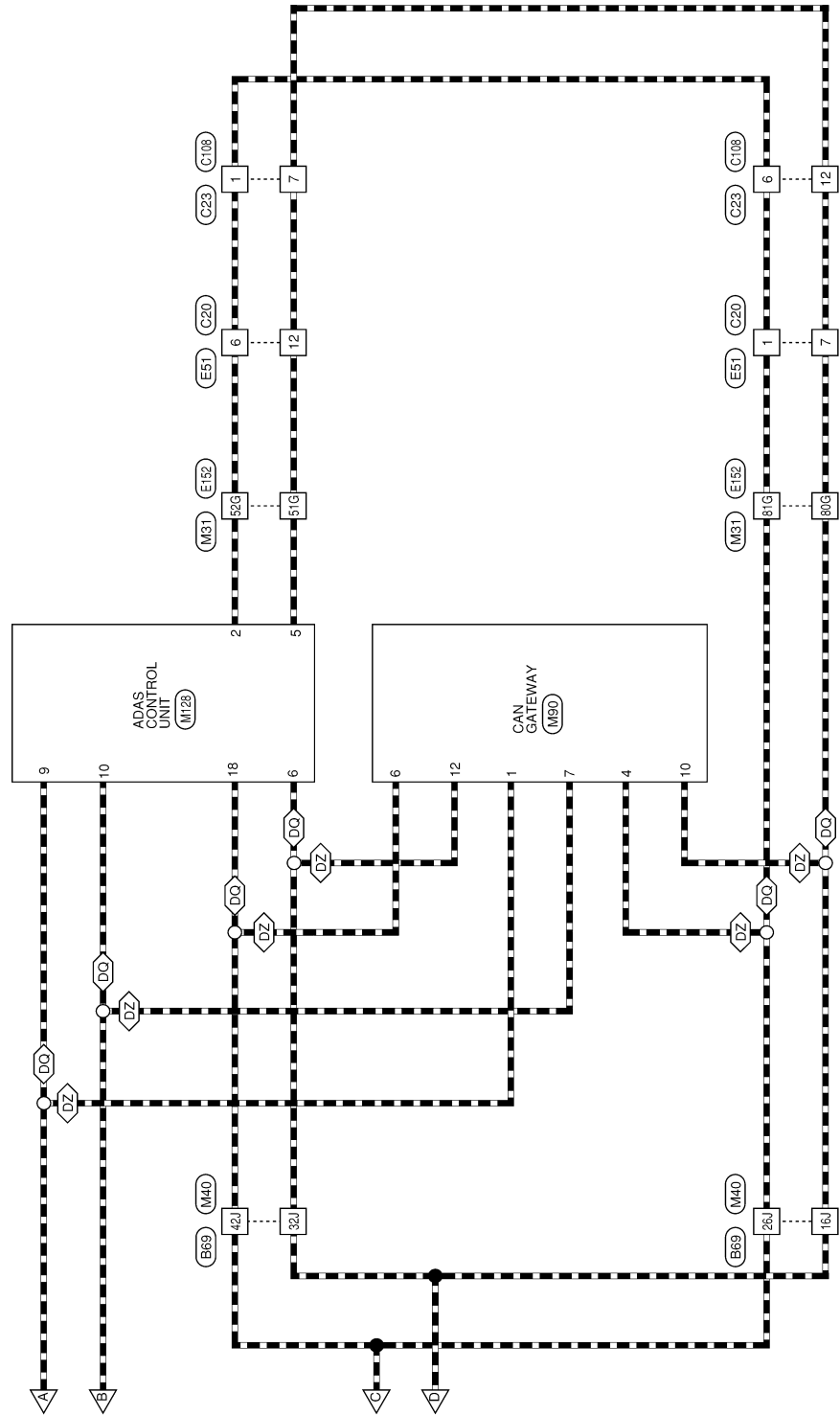
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[REAR FINAL DRIVE: MA248 (ELD)]



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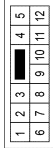
REAR FINAL DRIVE

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[REAR FINAL DRIVE: MA248 (ELD)]

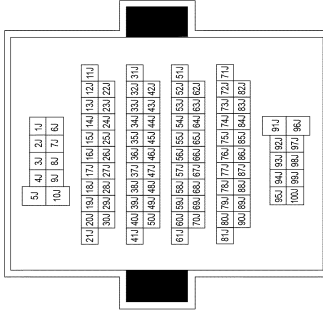
REAR FINAL DRIVE CONNECTORS - WITH Cummins 5.0L

Connector No.	B41
Connector Name	WIRE TO WIRE
Connector Type	NS12MW-CS
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
1	Y	TO ENGINE ROOM HARNESS
2	V	TO ENGINE ROOM HARNESS
3	L	TO ENGINE ROOM HARNESS
4	L/G	TO ENGINE ROOM HARNESS
5	R/G	TO ENGINE ROOM HARNESS
6	SB	TO ENGINE ROOM HARNESS
7	P	TO ENGINE ROOM HARNESS
8	L	TO ENGINE ROOM HARNESS
9	SHIELD	TO ENGINE ROOM HARNESS
10	W/G	TO ENGINE ROOM HARNESS
11	L	TO ENGINE ROOM HARNESS
12	BR	TO ENGINE ROOM HARNESS

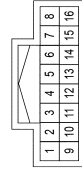
Connector No.	B69
Connector Name	WIRE TO WIRE
Connector Type	TH80MW-CS16-TM4
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
21	20	18
22	28	27
23	26	25
24	24	23
25	22	21
26	20	19
27	18	17
28	16	15
29	14	13
30	12	11
31	10	9
32	8	7
33	6	5
34	4	3
35	2	1
36	1	1
37	1	1
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54J	L	TO MAIN HARNESS
55J	R	TO MAIN HARNESS
56J	W	TO MAIN HARNESS
57J	L/G	TO MAIN HARNESS
58J	O	TO MAIN HARNESS
59J	-	TO MAIN HARNESS
60J	SHIELD	TO MAIN HARNESS
61J	G	TO MAIN HARNESS
62J	-	TO MAIN HARNESS
63J	R/W	TO MAIN HARNESS
64J	L/W	TO MAIN HARNESS
65J	SHIELD	TO MAIN HARNESS
66J	B	TO MAIN HARNESS
67J	SHIELD	TO MAIN HARNESS
68J	O/V	TO MAIN HARNESS
69J	SHIELD	TO MAIN HARNESS
70J	BR	TO MAIN HARNESS
71J	L/W	TO MAIN HARNESS
72J	-	TO MAIN HARNESS
73J	-	TO MAIN HARNESS
74J	SHIELD	TO MAIN HARNESS
75J	L/G/B	TO MAIN HARNESS
76J	R	TO MAIN HARNESS
77J	SHIELD	TO MAIN HARNESS
78J	GR/B	TO MAIN HARNESS
79J	B	TO MAIN HARNESS
80J	W	TO MAIN HARNESS
81J	SHIELD	TO MAIN HARNESS
82J	L/R	TO MAIN HARNESS
83J	-	TO MAIN HARNESS
84J	-	TO MAIN HARNESS
85J	Y/B	TO MAIN HARNESS
86J	G	TO MAIN HARNESS
87J	B/R	TO MAIN HARNESS
88J	SHIELD	TO MAIN HARNESS
89J	GR/R	TO MAIN HARNESS
90J	L	TO MAIN HARNESS
91J	L/B	TO MAIN HARNESS
92J	SB	TO MAIN HARNESS
93J	B	TO MAIN HARNESS
94J	L	TO MAIN HARNESS
95J	LG	TO MAIN HARNESS
96J	R	TO MAIN HARNESS
97J	B/Y	TO MAIN HARNESS
98J	L/B	TO MAIN HARNESS
99J	W/L	TO MAIN HARNESS
100J	SB	TO MAIN HARNESS

Connector No.	B77
Connector Name	DIFFERENTIAL LOCK CONTROL UNIT
Connector Type	TH16FW-NH
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
1	Y	SOLENOID (+)
2	V	SOLENOID (-)
3	-	-
4	-	-
5	G/O	DIFF LOCK ON SW
6	-	-
7	P	IGN
8	L	CAN-H
9	BR	SOL BATT
10	B	GND
11	B	GND
12	L	DIFF LOCK POSITION SW
13	-	-
14	O	DIFF LOCK OFF SW
15	Y/R	VBATT
16	R	CAN-L

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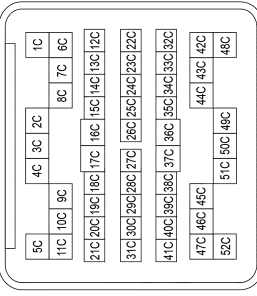
REAR FINAL DRIVE

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[REAR FINAL DRIVE: MA248 (ELD)]



REAR FINAL DRIVE CONNECTORS - WITH Cummins 5.0L

Connector No.	C1
Connector Name	WIRE TO WIRE
Connector Type	RK26FGY-RS20-X6
Connector Color	GRAY



Terminal No.	Color of Wire	Signal Name
1C	Y/V	TO ENGINE ROOM HARNESS
2C	W/L	TO ENGINE ROOM HARNESS
3C	B	TO ENGINE ROOM HARNESS
4C	B/W	TO ENGINE ROOM HARNESS
5C	B/Y	TO ENGINE ROOM HARNESS
6C	Y	TO ENGINE ROOM HARNESS
7C	G/R	TO ENGINE ROOM HARNESS - (WITH CUMMINS 5.0L)
8C	R	TO ENGINE ROOM HARNESS - (WITH VK56V/D)
9C	B	TO ENGINE ROOM HARNESS - (WITH CUMMINS 5.0L)
10C	O/B	TO ENGINE ROOM HARNESS - (WITH VK56V/D)
11C	W/L	TO ENGINE ROOM HARNESS - (WITH CUMMINS 5.0L)
12C	SB	TO ENGINE ROOM HARNESS - (WITH VK56V/D)
13C	GR/R	TO ENGINE ROOM HARNESS - (WITH CUMMINS 5.0L)
14C	GR	TO ENGINE ROOM HARNESS - (WITH VK56V/D)
15C	B	TO ENGINE ROOM HARNESS - (WITH CUMMINS 5.0L)
16C	R/W	TO ENGINE ROOM HARNESS - (WITH VK56V/D)
17C	Y	TO ENGINE ROOM HARNESS
18C	B	TO ENGINE ROOM HARNESS
19C	B/G	TO ENGINE ROOM HARNESS
20C	Y	TO ENGINE ROOM HARNESS
21C	B	TO ENGINE ROOM HARNESS
22C	Y	TO ENGINE ROOM HARNESS
23C	B	TO ENGINE ROOM HARNESS
24C	B/G	TO ENGINE ROOM HARNESS
25C	Y	TO ENGINE ROOM HARNESS
26C	B	TO ENGINE ROOM HARNESS
27C	V	TO ENGINE ROOM HARNESS
28C	G/W	TO ENGINE ROOM HARNESS
29C	R/L/G	TO ENGINE ROOM HARNESS
30C	P/L	TO ENGINE ROOM HARNESS
31C	B	TO ENGINE ROOM HARNESS
32C	R	TO ENGINE ROOM HARNESS
33C	L/W	TO ENGINE ROOM HARNESS
34C	L	TO ENGINE ROOM HARNESS
35C	R/W	TO ENGINE ROOM HARNESS
36C	L	TO ENGINE ROOM HARNESS
37C	Y	TO ENGINE ROOM HARNESS
38C	GR	TO ENGINE ROOM HARNESS
39C	R	TO ENGINE ROOM HARNESS
40C	P	TO ENGINE ROOM HARNESS
41C	V	TO ENGINE ROOM HARNESS
42C	L/G/B	TO ENGINE ROOM HARNESS
43C	Y/B	TO ENGINE ROOM HARNESS
44C	R	TO ENGINE ROOM HARNESS
45C	G	TO ENGINE ROOM HARNESS
46C	BR	TO ENGINE ROOM HARNESS
47C	B	TO ENGINE ROOM HARNESS
48C	Y/R	TO ENGINE ROOM HARNESS
49C	R/Y	TO ENGINE ROOM HARNESS - (WITH CUMMINS 5.0L)
50C	B	TO ENGINE ROOM HARNESS - (WITH VK56V/D)
51C	B/Y	TO ENGINE ROOM HARNESS - (WITH CUMMINS 5.0L)
52C	V	TO ENGINE ROOM HARNESS - (WITH VK56V/D)

Connector No.	C16
Connector Name	DIFFERENTIAL LOCK POSITION SWITCH
Connector Type	RS02FGY
Connector Color	GRAY



Terminal No.	Color of Wire	Signal Name
1	L	DIFF LOCK POSITION SW
2	B	GROUND

Connector No.	C17
Connector Name	DIFFERENTIAL LOCK SOLENOID
Connector Type	RK02FB
Connector Color	BLACK

Terminal No.	Color of Wire	Signal Name
1	Y	SOLENOID (+)
2	V	SOLENOID (-)



Connector No.	C20
Connector Name	WIRE TO WIRE
Connector Type	RH12MB
Connector Color	BLACK

Terminal No.	Color of Wire	Signal Name
1	L	TO ENGINE ROOM HARNESS
2	B	TO ENGINE ROOM HARNESS

3	Y	TO ENGINE ROOM HARNESS
4	W	TO ENGINE ROOM HARNESS
5	LG	TO ENGINE ROOM HARNESS
6	L	TO ENGINE ROOM HARNESS
7	R	TO ENGINE ROOM HARNESS
8	-	TO ENGINE ROOM HARNESS
9	-	TO ENGINE ROOM HARNESS
10	-	TO ENGINE ROOM HARNESS
11	-	TO ENGINE ROOM HARNESS
12	R	TO ENGINE ROOM HARNESS

Connector No.	C23
Connector Name	WIRE TO WIRE
Connector Type	RH12FB
Connector Color	BLACK

Terminal No.	Color of Wire	Signal Name
1	L	TO SIDE RADAR SUB HARNESS
2	B	TO SIDE RADAR SUB HARNESS
3	-	TO SIDE RADAR SUB HARNESS
4	-	TO SIDE RADAR SUB HARNESS
5	LG	TO SIDE RADAR SUB HARNESS
6	L	TO SIDE RADAR SUB HARNESS
7	R	TO SIDE RADAR SUB HARNESS
8	Y	TO SIDE RADAR SUB HARNESS
9	-	TO SIDE RADAR SUB HARNESS
10	-	TO SIDE RADAR SUB HARNESS
11	W	TO SIDE RADAR SUB HARNESS
12	R	TO SIDE RADAR SUB HARNESS

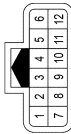
REAR FINAL DRIVE

< WIRING DIAGRAM >

[REAR FINAL DRIVE: MA248 (ELD)]

REAR FINAL DRIVE CONNECTORS - WITH Cummins 5.0L

Connector No.	C108
Connector Name	WIRE TO WIRE
Connector Type	RH12MB
Connector Color	BLACK



Terminal No.	Color of Wire	Signal Name
1	L	TO CHASSIS HARNESS
2	B	TO CHASSIS HARNESS
3	-	TO CHASSIS HARNESS
4	-	TO CHASSIS HARNESS
5	LG	TO CHASSIS HARNESS
6	L	TO CHASSIS HARNESS
7	R	TO CHASSIS HARNESS
8	R	TO CHASSIS HARNESS
9	-	TO CHASSIS HARNESS
10	-	TO CHASSIS HARNESS
11	W	TO CHASSIS HARNESS
12	R	TO CHASSIS HARNESS

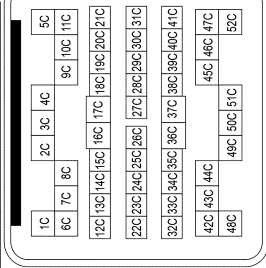
Connector No.	E35
Connector Name	WIRE TO WIRE
Connector Type	NS12FW-CS
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
1	Y	TO BODY HARNESS
2	V	TO BODY HARNESS
3	L	TO BODY HARNESS
4	W	TO BODY HARNESS
5	R/G	TO BODY HARNESS
6	SB	TO BODY HARNESS
7	P	TO BODY HARNESS
8	L	TO BODY HARNESS
9	SHIELD	TO BODY HARNESS
10	B	TO BODY HARNESS
11	R	TO BODY HARNESS

12	BR	TO BODY HARNESS
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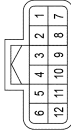
Connector No.	E41
Connector Name	WIRE TO WIRE
Connector Type	RK26MGY-RS20-X6
Connector Color	GRAY



Terminal No.	Color of Wire	Signal Name
1C	Y/V	TO CHASSIS HARNESS
2C	W/L	TO CHASSIS HARNESS
3C	B	TO CHASSIS HARNESS
4C	BR/W	TO CHASSIS HARNESS
5C	BRY	TO CHASSIS HARNESS
6C	Y	TO CHASSIS HARNESS
7C	R	TO CHASSIS HARNESS - (WITH VK56VD)
7C	G/R	TO CHASSIS HARNESS - (WITH CUMMINS 5.0L)
8C	O/B	TO CHASSIS HARNESS - (WITH VK56VD)
8C	B	TO CHASSIS HARNESS - (WITH CUMMINS 5.0L)
9C	SB	TO CHASSIS HARNESS - (WITH VK56VD)
9C	W/L	TO CHASSIS HARNESS - (WITH CUMMINS 5.0L)
10C	GR	TO CHASSIS HARNESS - (WITH VK56VD)
10C	GR/R	TO CHASSIS HARNESS - (WITH CUMMINS 5.0L)
11C	R/W	TO CHASSIS HARNESS - (WITH VK56VD)
11C	B	TO CHASSIS HARNESS - (WITH CUMMINS 5.0L)
12C	Y	TO CHASSIS HARNESS
13C	B	TO CHASSIS HARNESS
14C	BG	TO CHASSIS HARNESS
15C	Y	TO CHASSIS HARNESS
16C	B	TO CHASSIS HARNESS
17C	V	TO CHASSIS HARNESS
18C	BG	TO CHASSIS HARNESS
19C	L	TO CHASSIS HARNESS

20C	BG	TO CHASSIS HARNESS
21C	B	TO CHASSIS HARNESS
22C	SHIELD	TO CHASSIS HARNESS
23C	G/B	TO CHASSIS HARNESS
24C	G/Y	TO CHASSIS HARNESS
25C	W	TO CHASSIS HARNESS
26C	B	TO CHASSIS HARNESS
27C	LG	TO CHASSIS HARNESS
28C	GW	TO CHASSIS HARNESS
29C	G/R	TO CHASSIS HARNESS - (WITH BULB CHECK)
29C	R/G	TO CHASSIS HARNESS - (WITHOUT BULB CHECK)
30C	R/L	TO CHASSIS HARNESS
31C	B	TO CHASSIS HARNESS
32C	R	TO CHASSIS HARNESS
33C	L/W	TO CHASSIS HARNESS
34C	L	TO CHASSIS HARNESS
35C	R/W	TO CHASSIS HARNESS
36C	L	TO CHASSIS HARNESS
37C	Y	TO CHASSIS HARNESS
38C	BR	TO CHASSIS HARNESS
39C	R	TO CHASSIS HARNESS
40C	P	TO CHASSIS HARNESS
41C	V	TO CHASSIS HARNESS
42C	G/B	TO CHASSIS HARNESS
43C	Y/B	TO CHASSIS HARNESS
44C	R	TO CHASSIS HARNESS
46C	G	TO CHASSIS HARNESS
46C	BR	TO CHASSIS HARNESS
47C	B	TO CHASSIS HARNESS
48C	Y/R	TO CHASSIS HARNESS
49C	V	TO CHASSIS HARNESS - (WITH VK56VD)
49C	R/Y	TO CHASSIS HARNESS - (WITH CUMMINS 5.0L)
50C	B/Y	TO CHASSIS HARNESS - (WITH VK56VD)
50C	B	TO CHASSIS HARNESS - (WITH CUMMINS 5.0L)
51C	B	TO CHASSIS HARNESS - (WITH VK56VD)
51C	V	TO CHASSIS HARNESS - (WITH CUMMINS 5.0L)
52C	V/W	TO CHASSIS HARNESS
52C	B	TO CHASSIS HARNESS - (WITHOUT PPV)
52C	L	TO CHASSIS HARNESS - (WITH PPV)

Connector No.	E51
Connector Name	WIRE TO WIRE
Connector Type	RH12FB
Connector Color	BLACK



Terminal No.	Color of Wire	Signal Name
1	L	TO CHASSIS HARNESS
2	B	TO CHASSIS HARNESS
3	R	TO CHASSIS HARNESS
4	W	TO CHASSIS HARNESS
5	G	TO CHASSIS HARNESS
6	L	TO CHASSIS HARNESS
7	R	TO CHASSIS HARNESS
8	-	TO CHASSIS HARNESS
9	-	TO CHASSIS HARNESS
10	-	TO CHASSIS HARNESS
11	-	TO CHASSIS HARNESS
12	R	TO CHASSIS HARNESS

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A B C DLN E F G H I J K L M N O P

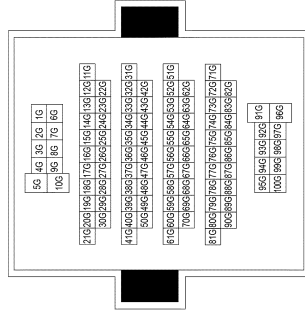
REAR FINAL DRIVE

< WIRING DIAGRAM >

[REAR FINAL DRIVE: MA248 (ELD)]

REAR FINAL DRIVE CONNECTORS - WITH Cummins 5.0L

Connector No.	E152
Connector Name	WIRE TO WIRE
Connector Type	TH80MW-CST6-TM4
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
1G	G	TO MAIN HARNESS
2G	B/R	TO MAIN HARNESS
3G	W/B	TO MAIN HARNESS
4G	B/W	TO MAIN HARNESS
5G	BR	TO MAIN HARNESS
6G	R/W	TO MAIN HARNESS
7G	Y	TO MAIN HARNESS
8G	G	TO MAIN HARNESS
9G	R	TO MAIN HARNESS
10G	W	TO MAIN HARNESS
11G	R/G	TO MAIN HARNESS
12G	W/B	TO MAIN HARNESS
13G	BR	TO MAIN HARNESS
14G	Y/B	TO MAIN HARNESS
15G	G/W	TO MAIN HARNESS
16G	G	TO MAIN HARNESS
17G	G/Y	TO MAIN HARNESS
18G	G/Y	TO MAIN HARNESS
19G	Y/W	TO MAIN HARNESS
20G	G/Y	TO MAIN HARNESS
21G	B/Y	TO MAIN HARNESS
22G	G/R	TO MAIN HARNESS - (WITH CUMMINS 5.0L)
23G	G/Y	TO MAIN HARNESS - (WITH VK58VD)
24G	Y/R	TO MAIN HARNESS

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Terminal No.	Color of Wire	Signal Name
24G	G/B	TO MAIN HARNESS
25G	R/W	TO MAIN HARNESS
26G	R	TO MAIN HARNESS
27G	LG	TO MAIN HARNESS
28G	G/B	TO MAIN HARNESS
29G	G/B	TO MAIN HARNESS
30G	B/Y	TO MAIN HARNESS
31G	P	TO MAIN HARNESS
32G	P	TO MAIN HARNESS
33G	Y/L	TO MAIN HARNESS
34G	GR	TO MAIN HARNESS
35G	G/R	TO MAIN HARNESS
36G	SB	TO MAIN HARNESS
37G	R/W	TO MAIN HARNESS
38G	BR	TO MAIN HARNESS
39G	BR	TO MAIN HARNESS
40G	-	TO MAIN HARNESS
41G	R/G	TO MAIN HARNESS
42G	O	TO MAIN HARNESS
43G	B	TO MAIN HARNESS
44G	R/Y	TO MAIN HARNESS
45G	G	TO MAIN HARNESS
46G	LG	TO MAIN HARNESS
47G	R	TO MAIN HARNESS
48G	W	TO MAIN HARNESS
49G	-	TO MAIN HARNESS
50G	BR	TO MAIN HARNESS
51G	R	TO MAIN HARNESS
52G	L	TO MAIN HARNESS
53G	W	TO MAIN HARNESS
54G	W	TO MAIN HARNESS
55G	G	TO MAIN HARNESS
56G	W	TO MAIN HARNESS
57G	Y	TO MAIN HARNESS
58G	BG	TO MAIN HARNESS
59G	BG	TO MAIN HARNESS
60G	BG	TO MAIN HARNESS
61G	B	TO MAIN HARNESS
62G	W	TO MAIN HARNESS
63G	R	TO MAIN HARNESS
64G	W/L	TO MAIN HARNESS
65G	W/R	TO MAIN HARNESS
66G	BG	TO MAIN HARNESS
67G	BG	TO MAIN HARNESS
68G	B	TO MAIN HARNESS
69G	Y	TO MAIN HARNESS
70G	L	TO MAIN HARNESS
71G	R/W	TO MAIN HARNESS
72G	L/W	TO MAIN HARNESS
73G	SHIELD	TO MAIN HARNESS
74G	W	TO MAIN HARNESS
75G	R	TO MAIN HARNESS
76G	R/G	TO MAIN HARNESS

Terminal No.	Color of Wire	Signal Name
77G	G	TO MAIN HARNESS
78G	W	TO MAIN HARNESS
79G	-	TO MAIN HARNESS
80G	R	TO MAIN HARNESS
81G	L	TO MAIN HARNESS
82G	R	TO MAIN HARNESS
83G	L	TO MAIN HARNESS
84G	L	TO MAIN HARNESS
85G	W/B	TO MAIN HARNESS
86G	B/R	TO MAIN HARNESS
87G	W/B	TO MAIN HARNESS
88G	P	TO MAIN HARNESS
89G	L	TO MAIN HARNESS
90G	G	TO MAIN HARNESS
91G	G	TO MAIN HARNESS
92G	V/W	TO MAIN HARNESS
93G	BR	TO MAIN HARNESS
94G	G	TO MAIN HARNESS
95G	G	TO MAIN HARNESS
96G	W	TO MAIN HARNESS
97G	R	TO MAIN HARNESS
98G	W/B	TO MAIN HARNESS
99G	BR	TO MAIN HARNESS
100G	GR/W	TO MAIN HARNESS

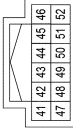
Connector No.	M4
Connector Name	FUSE BLOCK (J/B)
Connector Type	NS16FW-CS
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
1P	R	IGNITION
2P	Y	IGNITION
3P	G	IGNITION RELAY OUT
4P	B/W	RR DEF RLY
5P	B/W	RR DEF RLY
6P	O	RR DEF RLY OUT
7P	G	IGNITION
8P	W	IGNITION
9P	L	BATTERY
10P	-	-
11P	-	-
12P	-	-
13P	R	BATTERY
14P	Y	BATTERY

15P	Y/LG	BATTERY
16P	W	BLOWER FAN RELAY OUT

Connector No.	M25
Connector Name	COMBINATION METER (WITH TYPE A)
Connector Type	TH12FW-NH
Connector Color	WHITE



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

REAR FINAL DRIVE

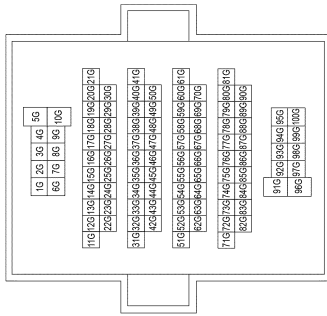
< WIRING DIAGRAM >

[REAR FINAL DRIVE: MA248 (ELD)]

A
B
C
DLN
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J
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M
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P

REAR FINAL DRIVE CONNECTORS - WITH Cummins 5.0L

Connector No.	M31
Connector Name	WIRE TO WIRE
Connector Type	TH80FW-CS16-TM4
Connector Color	WHITE



76G	P	TO ENGINE ROOM HARNESS
76G	-	TO ENGINE ROOM HARNESS
80G	R	TO ENGINE ROOM HARNESS
81G	L	TO ENGINE ROOM HARNESS
82G	R	TO ENGINE ROOM HARNESS
83G	L	TO ENGINE ROOM HARNESS
84G	L	TO ENGINE ROOM HARNESS
86G	W	TO ENGINE ROOM HARNESS
86G	B/R	TO ENGINE ROOM HARNESS
87G	W	TO ENGINE ROOM HARNESS
88G	G	TO ENGINE ROOM HARNESS
89G	P	TO ENGINE ROOM HARNESS
90G	G	TO ENGINE ROOM HARNESS
91G	P	TO ENGINE ROOM HARNESS
92G	V/W	TO ENGINE ROOM HARNESS
93G	BR	TO ENGINE ROOM HARNESS
94G	B	TO ENGINE ROOM HARNESS
95G	G	TO ENGINE ROOM HARNESS
96G	R	TO ENGINE ROOM HARNESS
97G	R	TO ENGINE ROOM HARNESS
98G	W/B	TO ENGINE ROOM HARNESS
99G	R	TO ENGINE ROOM HARNESS
100G	GRW	TO ENGINE ROOM HARNESS

25G	R/W	TO ENGINE ROOM HARNESS
26G	R	TO ENGINE ROOM HARNESS
27G	L/G	TO ENGINE ROOM HARNESS
28G	G/B	TO ENGINE ROOM HARNESS
29G	G/B	TO ENGINE ROOM HARNESS
30G	B/R	TO ENGINE ROOM HARNESS
31G	R	TO ENGINE ROOM HARNESS
32G	R	TO ENGINE ROOM HARNESS
33G	Y/L	TO ENGINE ROOM HARNESS
34G	GR	TO ENGINE ROOM HARNESS
35G	G/R	TO ENGINE ROOM HARNESS
36G	S/B	TO ENGINE ROOM HARNESS
37G	R/W	TO ENGINE ROOM HARNESS
38G	BR	TO ENGINE ROOM HARNESS
39G	BR	TO ENGINE ROOM HARNESS
40G	-	TO ENGINE ROOM HARNESS
41G	R/G	TO ENGINE ROOM HARNESS
42G	O	TO ENGINE ROOM HARNESS
43G	G	TO ENGINE ROOM HARNESS
44G	R/Y	TO ENGINE ROOM HARNESS
45G	G	TO ENGINE ROOM HARNESS
46G	L/G	TO ENGINE ROOM HARNESS
47G	R	TO ENGINE ROOM HARNESS
48G	W	TO ENGINE ROOM HARNESS
49G	-	TO ENGINE ROOM HARNESS
50G	BR	TO ENGINE ROOM HARNESS
51G	R	TO ENGINE ROOM HARNESS
52G	L	TO ENGINE ROOM HARNESS
53G	W	TO ENGINE ROOM HARNESS
54G	W	TO ENGINE ROOM HARNESS
55G	G	TO ENGINE ROOM HARNESS
56G	W	TO ENGINE ROOM HARNESS
57G	Y	TO ENGINE ROOM HARNESS
58G	B/G	TO ENGINE ROOM HARNESS
59G	B/G	TO ENGINE ROOM HARNESS
60G	B/G	TO ENGINE ROOM HARNESS
61G	O	TO ENGINE ROOM HARNESS
62G	W	TO ENGINE ROOM HARNESS
63G	O	TO ENGINE ROOM HARNESS
64G	W/L	TO ENGINE ROOM HARNESS
65G	W/R	TO ENGINE ROOM HARNESS
66G	B/G	TO ENGINE ROOM HARNESS
67G	O	TO ENGINE ROOM HARNESS
68G	B	TO ENGINE ROOM HARNESS
69G	Y	TO ENGINE ROOM HARNESS
70G	L	TO ENGINE ROOM HARNESS
71G	R/W	TO ENGINE ROOM HARNESS
72G	L/W	TO ENGINE ROOM HARNESS
73G	SHIELD	TO ENGINE ROOM HARNESS
74G	W	TO ENGINE ROOM HARNESS
75G	R	TO ENGINE ROOM HARNESS
76G	R/G	TO ENGINE ROOM HARNESS
77G	B/G	TO ENGINE ROOM HARNESS

Terminal No.	Color of Wire	Signal Name
1G	G	TO ENGINE ROOM HARNESS
2G	B/R	TO ENGINE ROOM HARNESS
3G	W	TO ENGINE ROOM HARNESS
4G	B/W	TO ENGINE ROOM HARNESS
5G	BR	TO ENGINE ROOM HARNESS
6G	R/W	TO ENGINE ROOM HARNESS
7G	Y	TO ENGINE ROOM HARNESS
8G	G	TO ENGINE ROOM HARNESS
9G	R	TO ENGINE ROOM HARNESS
10G	W	TO ENGINE ROOM HARNESS
11G	R/G	TO ENGINE ROOM HARNESS
12G	W/B	TO ENGINE ROOM HARNESS
13G	BR	TO ENGINE ROOM HARNESS
14G	Y/B	TO ENGINE ROOM HARNESS
15G	G/W	TO ENGINE ROOM HARNESS
16G	G	TO ENGINE ROOM HARNESS
17G	O	TO ENGINE ROOM HARNESS
18G	G/Y	TO ENGINE ROOM HARNESS
19G	Y/W	TO ENGINE ROOM HARNESS
20G	G/Y	TO ENGINE ROOM HARNESS
21G	B/Y	TO ENGINE ROOM HARNESS
22G	G/R	TO ENGINE ROOM HARNESS - (WITH CUMMINS 5.0L)
22G	G/Y	TO ENGINE ROOM HARNESS - (WITH VK56V/D)
23G	Y/R	TO ENGINE ROOM HARNESS
24G	G/B	TO ENGINE ROOM HARNESS

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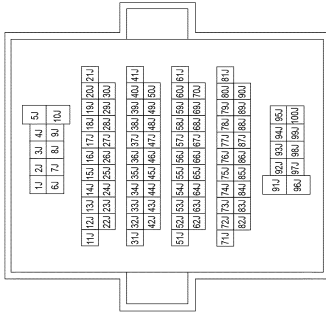
REAR FINAL DRIVE

< WIRING DIAGRAM >

[REAR FINAL DRIVE: MA248 (ELD)]

REAR FINAL DRIVE CONNECTORS - WITH Cummins 5.0L

Connector No.	M40
Connector Name	WIRE TO WIRE
Connector Type	TH80FW-CST6-TM4
Connector Color	WHITE



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

Terminal No.	Color of Wire	Signal Name
1J	G	TO BODY HARNESS
2J	R/Y	TO BODY HARNESS
3J	L	TO BODY HARNESS
4J	L/B	TO BODY HARNESS
5J	B	TO BODY HARNESS
6J	BR	TO BODY HARNESS
7J	BG	TO BODY HARNESS
8J	SB	TO BODY HARNESS
9J	BR	TO BODY HARNESS
10J	R	TO BODY HARNESS
11J	O/B	TO BODY HARNESS
12J	L	TO BODY HARNESS
13J	W	TO BODY HARNESS
14J	Y	TO BODY HARNESS
15J	-	TO BODY HARNESS
16J	R	TO BODY HARNESS
17J	G	TO BODY HARNESS
18J	SB	TO BODY HARNESS
19J	O	TO BODY HARNESS
20J	O/B	TO BODY HARNESS
21J	Y	TO BODY HARNESS
22J	P	TO BODY HARNESS
23J	W	TO BODY HARNESS
24J	W/R	TO BODY HARNESS
25J	P	TO BODY HARNESS
26J	L	TO BODY HARNESS
27J	R	TO BODY HARNESS

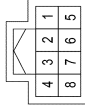
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81J	SHIELD	TO BODY HARNESS
82J	L/R	TO BODY HARNESS
83J	-	TO BODY HARNESS
84J	-	TO BODY HARNESS
85J	W	TO BODY HARNESS
86J	G	TO BODY HARNESS
87J	W	TO BODY HARNESS
88J	SHIELD	TO BODY HARNESS
89J	R	TO BODY HARNESS
90J	L	TO BODY HARNESS
91J	L/B	TO BODY HARNESS
92J	SB	TO BODY HARNESS
93J	B	TO BODY HARNESS
94J	LG	TO BODY HARNESS
95J	L	TO BODY HARNESS
96J	G	TO BODY HARNESS
97J	B/Y	TO BODY HARNESS
98J	L/B	TO BODY HARNESS
99J	W/L	TO BODY HARNESS
100J	Y	TO BODY HARNESS

Connector No.	M70
Connector Name	FUSE BLOCK (J/B)
Connector Type	NS16BFR-CS
Connector Color	BROWN



Connector No.	M72
Connector Name	DIFFERENTIAL LOCK MODE SWITCH
Connector Type	TH08FB-NH
Connector Color	BLACK



Terminal No.	Color of Wire	Signal Name
1	GR	ILLUMINATION -
2	-	-
3	-	-
4	G	IGNITION
5	L	ILLUMINATION +
6	-	-
7	G/O	DIFF LOCK ON SW
8	O	DIFF LOCK OFF SW

Connector No.	M90
Connector Name	CAN GATEWAY
Connector Type	TH12FW-NH
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
1	L	CAN 1 H
2	-	-
3	BG	BATTERY
4	L	CAN 2 H
5	B	GND
6	L	CAN 3 H
7	P	CAN 1 L
8	-	-
9	G	IGNITION
10	R	CAN 2 L
11	B	GND
12	R	CAN 3 L

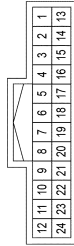
REAR FINAL DRIVE

< WIRING DIAGRAM >

[REAR FINAL DRIVE: MA248 (ELD)]

REAR FINAL DRIVE CONNECTORS - WITH Cummins 5.0L

Connector No.	M128
Connector Name	ADAS CONTROL UNIT
Connector Type	TH24FW-NH
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
1	B	GND
2	L	ITS.CAN-H
3	G	IGN
4	GR	BUZZER OUTPUT
5	R	ITS.CAN-L
6	R	CAN-L
7	G/R	SW LED
8	-	-
9	L	CAN-H
10	P	CAN-L
11	G	SW 1
12	-	-
13	-	-
14	-	-
15	-	-
16	-	-
17	G/B	LED 1
18	L	CAN-H
19	-	-
20	-	-
21	-	-
22	-	-
23	L/G	BSW SW
24	-	-

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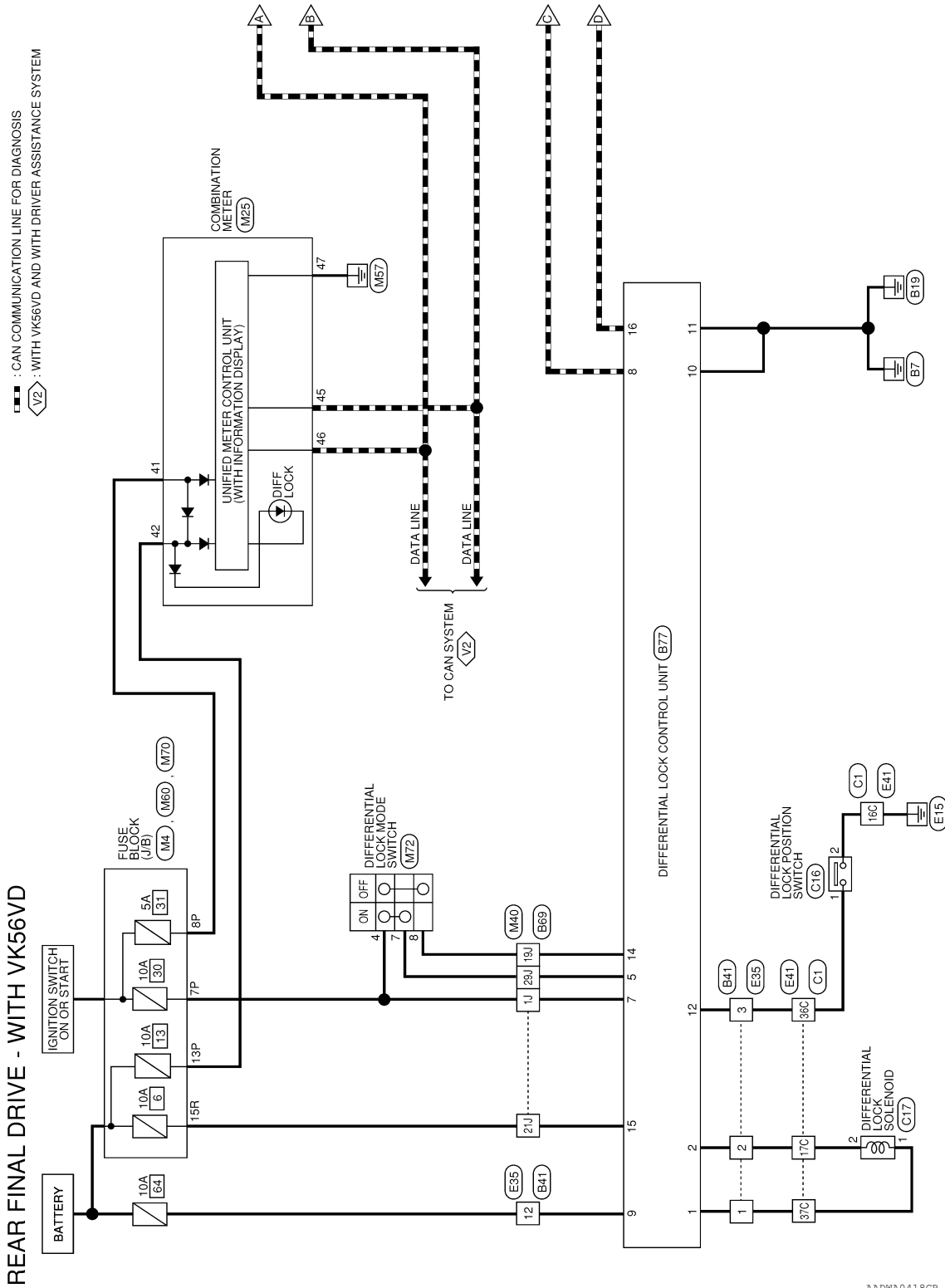
REAR FINAL DRIVE

[REAR FINAL DRIVE: MA248 (ELD)]

< WIRING DIAGRAM >

Wiring Diagram - VK56VD

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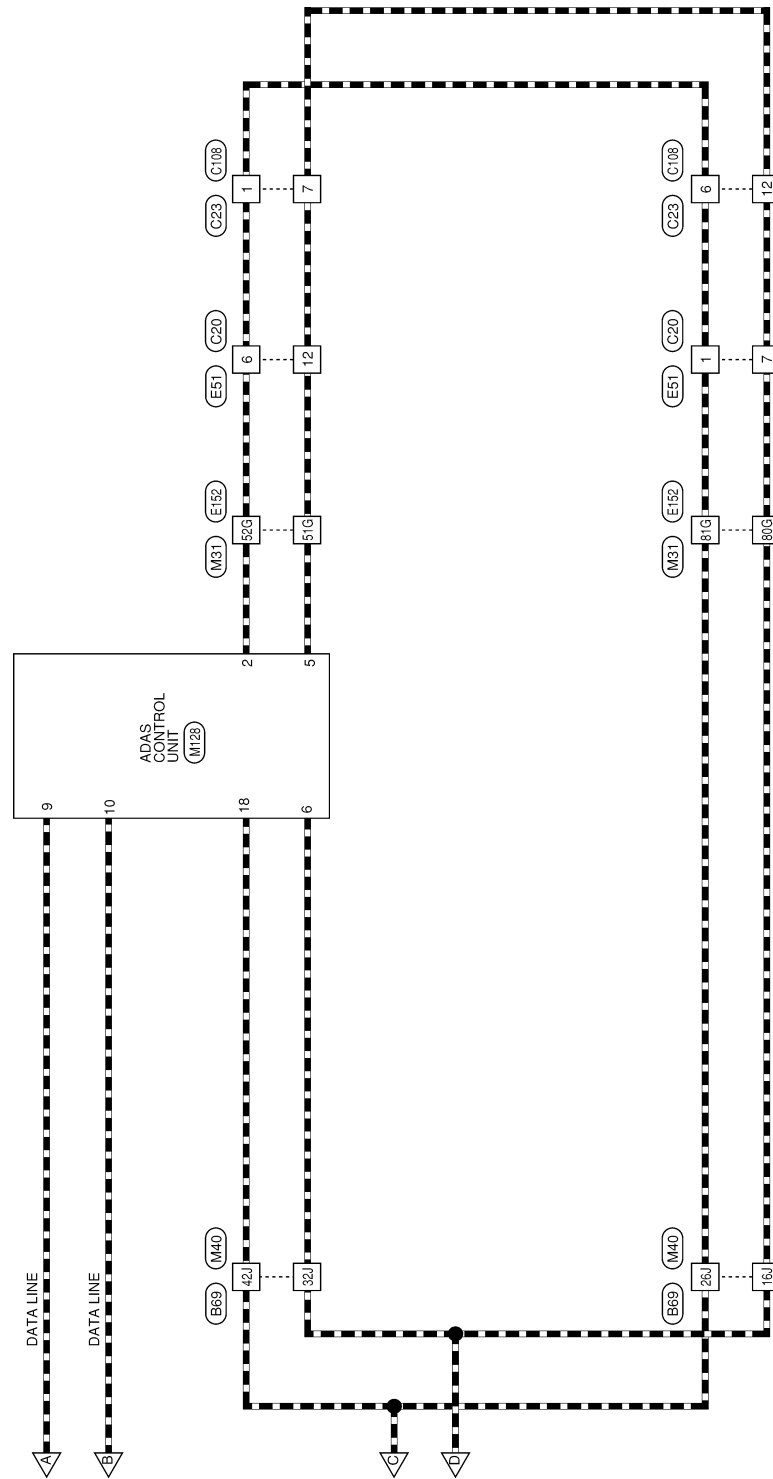


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REAR FINAL DRIVE

< WIRING DIAGRAM >

[REAR FINAL DRIVE: MA248 (ELD)]



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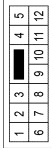
REAR FINAL DRIVE

< WIRING DIAGRAM >

[REAR FINAL DRIVE: MA248 (ELD)]

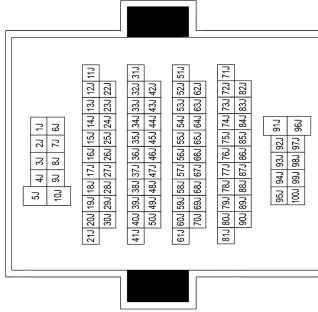
REAR FINAL DRIVE CONNECTORS - WITH VK56VD

Connector No.	B41
Connector Name	WIRE TO WIRE
Connector Type	NS12MW-CS
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
1	Y	TO ENGINE ROOM HARNESS
2	V	TO ENGINE ROOM HARNESS
3	L	TO ENGINE ROOM HARNESS
4	L/G	TO ENGINE ROOM HARNESS
5	R/G	TO ENGINE ROOM HARNESS
6	SB	TO ENGINE ROOM HARNESS
7	P	TO ENGINE ROOM HARNESS
8	L	TO ENGINE ROOM HARNESS
9	SHIELD	TO ENGINE ROOM HARNESS
10	W/G	TO ENGINE ROOM HARNESS
11	L	TO ENGINE ROOM HARNESS
12	BR	TO ENGINE ROOM HARNESS

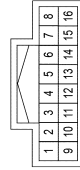
Connector No.	B69
Connector Name	WIRE TO WIRE
Connector Type	TH80MW-CS16-TM4
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
1	Y	TO ENGINE ROOM HARNESS
2	V	TO ENGINE ROOM HARNESS
3	L	TO ENGINE ROOM HARNESS
4	L/G	TO ENGINE ROOM HARNESS
5	R/G	TO ENGINE ROOM HARNESS
6	SB	TO ENGINE ROOM HARNESS
7	P	TO ENGINE ROOM HARNESS
8	L	TO ENGINE ROOM HARNESS
9	SHIELD	TO ENGINE ROOM HARNESS
10	W/G	TO ENGINE ROOM HARNESS
11	L	TO ENGINE ROOM HARNESS
12	BR	TO ENGINE ROOM HARNESS

54J	L	TO MAIN HARNESS
55J	R	TO MAIN HARNESS
56J	W	TO MAIN HARNESS
57J	L/G	TO MAIN HARNESS
58J	O	TO MAIN HARNESS
59J	-	TO MAIN HARNESS
60J	SHIELD	TO MAIN HARNESS
61J	G	TO MAIN HARNESS
62J	-	TO MAIN HARNESS
63J	R/W	TO MAIN HARNESS
64J	L/W	TO MAIN HARNESS
65J	SHIELD	TO MAIN HARNESS
66J	B	TO MAIN HARNESS
67J	SHIELD	TO MAIN HARNESS
68J	O/V	TO MAIN HARNESS
69J	SHIELD	TO MAIN HARNESS
70J	BR	TO MAIN HARNESS
71J	L/W	TO MAIN HARNESS
72J	-	TO MAIN HARNESS
73J	-	TO MAIN HARNESS
74J	SHIELD	TO MAIN HARNESS
75J	L/G/B	TO MAIN HARNESS
76J	R	TO MAIN HARNESS
77J	SHIELD	TO MAIN HARNESS
78J	GR/B	TO MAIN HARNESS
79J	B	TO MAIN HARNESS
80J	W	TO MAIN HARNESS
81J	SHIELD	TO MAIN HARNESS
82J	L/R	TO MAIN HARNESS
83J	-	TO MAIN HARNESS
84J	-	TO MAIN HARNESS
85J	Y/B	TO MAIN HARNESS
86J	G	TO MAIN HARNESS
87J	B/R	TO MAIN HARNESS
88J	SHIELD	TO MAIN HARNESS
89J	GR/R	TO MAIN HARNESS
90J	L	TO MAIN HARNESS
91J	L/B	TO MAIN HARNESS
92J	SB	TO MAIN HARNESS
93J	B	TO MAIN HARNESS
94J	L	TO MAIN HARNESS
95J	LG	TO MAIN HARNESS
96J	R	TO MAIN HARNESS
97J	B/Y	TO MAIN HARNESS
98J	L/B	TO MAIN HARNESS
99J	W/L	TO MAIN HARNESS
100J	SB	TO MAIN HARNESS

Connector No.	B77
Connector Name	DIFFERENTIAL LOCK CONTROL UNIT
Connector Type	TH16FW-NH
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
1	Y	SOLENOID (+)
2	V	SOLENOID (-)
3	-	-
4	-	-
5	G/O	DIFF LOCK ON SW
6	-	-
7	P	IGN
8	L	CAN-H
9	BR	SOL BATT
10	B	GND
11	B	GND
12	L	DIFF LOCK POSITION SW
13	-	-
14	O	DIFF LOCK OFF SW
15	Y/R	VBATT
16	R	CAN-L

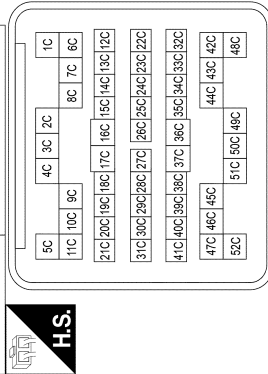
REAR FINAL DRIVE

< WIRING DIAGRAM >

[REAR FINAL DRIVE: MA248 (ELD)]

REAR FINAL DRIVE CONNECTORS - WITH VK56VD

Connector No.	C1
Connector Name	WIRE TO WIRE
Connector Type	RK26FGY-RS20-X6
Connector Color	GRAY



Terminal No.	Color of Wire	Signal Name
1C	Y/Y	TO ENGINE ROOM HARNESS
2C	W/L	TO ENGINE ROOM HARNESS
3C	B	TO ENGINE ROOM HARNESS
4C	BR/W	TO ENGINE ROOM HARNESS
5C	BR/Y	TO ENGINE ROOM HARNESS
6C	Y	TO ENGINE ROOM HARNESS
7C	G/R	TO ENGINE ROOM HARNESS - (WITH CUMMINS V8D)
8C	R	TO ENGINE ROOM HARNESS - (WITH VK56VD)
9C	B	TO ENGINE ROOM HARNESS - (WITH CUMMINS V8D)
10C	O/B	TO ENGINE ROOM HARNESS - (WITH VK56VD)
11C	W/L	TO ENGINE ROOM HARNESS - (WITH CUMMINS V8D)
12C	SB	TO ENGINE ROOM HARNESS - (WITH VK56VD)
13C	GR/R	TO ENGINE ROOM HARNESS - (WITH CUMMINS V8D)
14C	GR	TO ENGINE ROOM HARNESS - (WITH VK56VD)
15C	B	TO ENGINE ROOM HARNESS - (WITH CUMMINS V8D)
16C	R/W	TO ENGINE ROOM HARNESS - (WITH VK56VD)
17C	Y	TO ENGINE ROOM HARNESS
18C	B	TO ENGINE ROOM HARNESS
19C	B/G	TO ENGINE ROOM HARNESS
20C	L	TO ENGINE ROOM HARNESS
21C	W	TO ENGINE ROOM HARNESS
22C	L/G	TO ENGINE ROOM HARNESS

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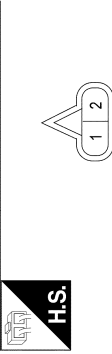
22C	SHIELD	TO ENGINE ROOM HARNESS
23C	G/B	TO ENGINE ROOM HARNESS
24C	G/B	TO ENGINE ROOM HARNESS
25C	W	TO ENGINE ROOM HARNESS
26C	B	TO ENGINE ROOM HARNESS
27C	LG	TO ENGINE ROOM HARNESS
28C	G/W	TO ENGINE ROOM HARNESS
29C	R/LG	TO ENGINE ROOM HARNESS
30C	R/L	TO ENGINE ROOM HARNESS
31C	B	TO ENGINE ROOM HARNESS
32C	R	TO ENGINE ROOM HARNESS
33C	L/W	TO ENGINE ROOM HARNESS
34C	L	TO ENGINE ROOM HARNESS
35C	R/W	TO ENGINE ROOM HARNESS
36C	L	TO ENGINE ROOM HARNESS
37C	Y	TO ENGINE ROOM HARNESS
38C	GR	TO ENGINE ROOM HARNESS
39C	R	TO ENGINE ROOM HARNESS
40C	P	TO ENGINE ROOM HARNESS
41C	V	TO ENGINE ROOM HARNESS
42C	LG/B	TO ENGINE ROOM HARNESS
43C	Y/B	TO ENGINE ROOM HARNESS
44C	R	TO ENGINE ROOM HARNESS
45C	G	TO ENGINE ROOM HARNESS
46C	BR	TO ENGINE ROOM HARNESS
47C	B	TO ENGINE ROOM HARNESS
48C	Y/R	TO ENGINE ROOM HARNESS
49C	R/Y	TO ENGINE ROOM HARNESS - (WITH CUMMINS V8D)
49C	V	TO ENGINE ROOM HARNESS - (WITH VK56VD)
50C	B	TO ENGINE ROOM HARNESS - (WITH CUMMINS V8D)
50C	B/Y	TO ENGINE ROOM HARNESS - (WITH VK56VD)
51C	V	TO ENGINE ROOM HARNESS - (WITH CUMMINS V8D)
51C	B	TO ENGINE ROOM HARNESS - (WITH VK56VD)
52C	V/W	TO ENGINE ROOM HARNESS

Connector No.	C16
Connector Name	DIFFERENTIAL LOCK POSITION SWITCH
Connector Type	RS02FGY
Connector Color	GRAY



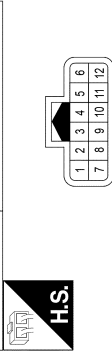
Terminal No.	Color of Wire	Signal Name
1	L	DIFF LOCK POSITION SW
2	B	GROUND

Connector No.	C17
Connector Name	DIFFERENTIAL LOCK SOLENOID
Connector Type	RK02FB
Connector Color	BLACK



Terminal No.	Color of Wire	Signal Name
1	Y	SOLENOID (+)
2	V	SOLENOID (-)

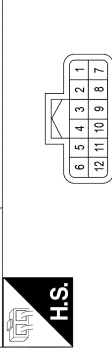
Connector No.	C20
Connector Name	WIRE TO WIRE
Connector Type	RH12MB
Connector Color	BLACK



Terminal No.	Color of Wire	Signal Name
1	L	TO ENGINE ROOM HARNESS
2	B	TO ENGINE ROOM HARNESS

3	Y	TO ENGINE ROOM HARNESS
4	W	TO ENGINE ROOM HARNESS
5	LG	TO ENGINE ROOM HARNESS
6	L	TO ENGINE ROOM HARNESS
7	R	TO ENGINE ROOM HARNESS
8	-	TO ENGINE ROOM HARNESS
9	-	TO ENGINE ROOM HARNESS
10	-	TO ENGINE ROOM HARNESS
11	-	TO ENGINE ROOM HARNESS
12	R	TO ENGINE ROOM HARNESS

Connector No.	C23
Connector Name	WIRE TO WIRE
Connector Type	RH12FB
Connector Color	BLACK



Terminal No.	Color of Wire	Signal Name
1	L	TO CHASSIS HARNESS
2	B	TO CHASSIS HARNESS
3	-	TO CHASSIS HARNESS
4	-	TO CHASSIS HARNESS
5	LG	TO CHASSIS HARNESS
6	L	TO CHASSIS HARNESS
7	R	TO CHASSIS HARNESS
8	Y	TO CHASSIS HARNESS
9	-	TO CHASSIS HARNESS
10	-	TO CHASSIS HARNESS
11	W	TO CHASSIS HARNESS
12	R	TO CHASSIS HARNESS

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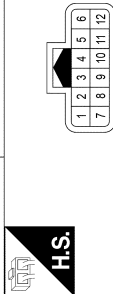
REAR FINAL DRIVE

< WIRING DIAGRAM >

[REAR FINAL DRIVE: MA248 (ELD)]

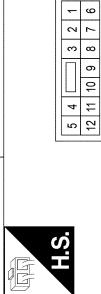
REAR FINAL DRIVE CONNECTORS - WITH VK56VD

Connector No.	C108
Connector Name	WIRE TO WIRE
Connector Type	RH12MB
Connector Color	BLACK



Terminal No.	Color of Wire	Signal Name
1	L	TO CHASSIS HARNESS
2	B	TO CHASSIS HARNESS
3	-	TO CHASSIS HARNESS
4	-	TO CHASSIS HARNESS
5	LG	TO CHASSIS HARNESS
6	L	TO CHASSIS HARNESS
7	R	TO CHASSIS HARNESS
8	R	TO CHASSIS HARNESS
9	-	TO CHASSIS HARNESS
10	-	TO CHASSIS HARNESS
11	W	TO CHASSIS HARNESS
12	R	TO CHASSIS HARNESS

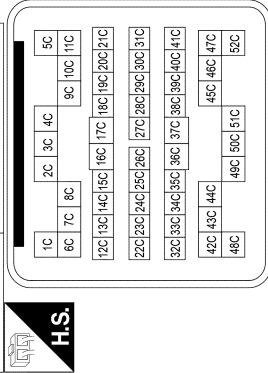
Connector No.	E35
Connector Name	WIRE TO WIRE
Connector Type	NS12FW-CS
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
1	Y	TO BODY HARNESS
2	V	TO BODY HARNESS
3	L	TO BODY HARNESS
4	W	TO BODY HARNESS
5	R/G	TO BODY HARNESS
6	SB	TO BODY HARNESS
7	P	TO BODY HARNESS
8	L	TO BODY HARNESS
9	SHIELD	TO BODY HARNESS
10	B	TO BODY HARNESS
11	R	TO BODY HARNESS

12	BR	TO BODY HARNESS
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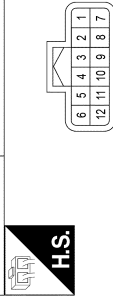
Connector No.	E41
Connector Name	WIRE TO WIRE
Connector Type	RK26MGY-RS20-X6
Connector Color	GRAY



Terminal No.	Color of Wire	Signal Name
1C	Y/V	TO CHASSIS HARNESS
2C	W/L	TO CHASSIS HARNESS
3C	B	TO CHASSIS HARNESS
4C	BR/W	TO CHASSIS HARNESS
5C	B/R/Y	TO CHASSIS HARNESS
6C	Y	TO CHASSIS HARNESS
7C	G/R	TO CHASSIS HARNESS - (WITH CUMMINS V&D)
7C	R	TO CHASSIS HARNESS - (WITH VK56VD)
8C	B	TO CHASSIS HARNESS - (WITH CUMMINS V&D)
8C	O/B	TO CHASSIS HARNESS - (WITH VK56VD)
9C	W/L	TO CHASSIS HARNESS - (WITH CUMMINS V&D)
9C	SB	TO CHASSIS HARNESS - (WITH VK56VD)
10C	GR/R	TO CHASSIS HARNESS - (WITH CUMMINS V&D)
10C	GR	TO CHASSIS HARNESS - (WITH VK56VD)
11C	B	TO CHASSIS HARNESS - (WITH CUMMINS V&D)
11C	R/W	TO CHASSIS HARNESS - (WITH VK56VD)
12C	Y	TO CHASSIS HARNESS
13C	B	TO CHASSIS HARNESS
14C	BG	TO CHASSIS HARNESS
15C	Y	TO CHASSIS HARNESS
16C	B	TO CHASSIS HARNESS
17C	V	TO CHASSIS HARNESS
18C	BG	TO CHASSIS HARNESS
19C	L	TO CHASSIS HARNESS

20C	B/G	TO CHASSIS HARNESS
21C	B	TO CHASSIS HARNESS
22C	SHIELD	TO CHASSIS HARNESS
23C	G/B	TO CHASSIS HARNESS
24C	G/Y	TO CHASSIS HARNESS
25C	W	TO CHASSIS HARNESS
26C	B	TO CHASSIS HARNESS
27C	LG	TO CHASSIS HARNESS
28C	GW	TO CHASSIS HARNESS
29C	G/R	TO CHASSIS HARNESS - (WITH BULB CHECK)
29C	R/G	TO CHASSIS HARNESS - (WITHOUT BULB CHECK)
30C	R/L	TO CHASSIS HARNESS
31C	B	TO CHASSIS HARNESS
32C	R	TO CHASSIS HARNESS
33C	L/W	TO CHASSIS HARNESS
34C	L	TO CHASSIS HARNESS
35C	R/W	TO CHASSIS HARNESS
36C	L	TO CHASSIS HARNESS
37C	Y	TO CHASSIS HARNESS
38C	BR	TO CHASSIS HARNESS
39C	R	TO CHASSIS HARNESS
40C	P	TO CHASSIS HARNESS
41C	V	TO CHASSIS HARNESS
42C	G/B	TO CHASSIS HARNESS
43C	Y/B	TO CHASSIS HARNESS
44C	R	TO CHASSIS HARNESS
46C	G	TO CHASSIS HARNESS
46C	BR	TO CHASSIS HARNESS
47C	B	TO CHASSIS HARNESS
48C	Y/R	TO CHASSIS HARNESS
49C	R/Y	TO CHASSIS HARNESS - (WITH CUMMINS V&D)
49C	V	TO CHASSIS HARNESS - (WITH VK56VD)
50C	B	TO CHASSIS HARNESS - (WITH CUMMINS V&D)
50C	B/Y	TO CHASSIS HARNESS - (WITH VK56VD)
51C	V	TO CHASSIS HARNESS - (WITH CUMMINS V&D)
51C	B	TO CHASSIS HARNESS - (WITH VK56VD)
52C	B	TO CHASSIS HARNESS - (WITHOUT FFV)
52C	L	TO CHASSIS HARNESS - (WITH FFV)
52C	V/W	TO CHASSIS HARNESS

Connector No.	E51
Connector Name	WIRE TO WIRE
Connector Type	RH12FB
Connector Color	BLACK



Terminal No.	Color of Wire	Signal Name
1	L	TO CHASSIS HARNESS
2	B	TO CHASSIS HARNESS
3	R	TO CHASSIS HARNESS
4	W	TO CHASSIS HARNESS
5	G	TO CHASSIS HARNESS
6	L	TO CHASSIS HARNESS
7	R	TO CHASSIS HARNESS
8	-	TO CHASSIS HARNESS
9	-	TO CHASSIS HARNESS
10	-	TO CHASSIS HARNESS
11	-	TO CHASSIS HARNESS
12	R	TO CHASSIS HARNESS

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REAR FINAL DRIVE

< WIRING DIAGRAM >

[REAR FINAL DRIVE: MA248 (ELD)]

REAR FINAL DRIVE CONNECTORS - WITH VK56VD

Connector No.	E152
Connector Name	WIRE TO WIRE
Connector Type	TH80MW-CST6-TM4
Connector Color	WHITE

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

16: 16
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 9: 9
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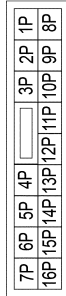
24G	G/B	TO MAIN HARNESS
25G	R/W	TO MAIN HARNESS
26G	R	TO MAIN HARNESS
27G	LG	TO MAIN HARNESS
28G	G/B	TO MAIN HARNESS
29G	G/B	TO MAIN HARNESS
30G	BR/Y	TO MAIN HARNESS
31G	P	TO MAIN HARNESS
32G	P	TO MAIN HARNESS
33G	Y/L	TO MAIN HARNESS
34G	GR	TO MAIN HARNESS
35G	G/R	TO MAIN HARNESS
36G	SB	TO MAIN HARNESS
37G	R/W	TO MAIN HARNESS
38G	BR	TO MAIN HARNESS
39G	BR	TO MAIN HARNESS
40G	-	TO MAIN HARNESS
41G	R/G	TO MAIN HARNESS
42G	O	TO MAIN HARNESS
43G	B	TO MAIN HARNESS
44G	R/Y	TO MAIN HARNESS
45G	G	TO MAIN HARNESS
46G	LG	TO MAIN HARNESS
47G	R	TO MAIN HARNESS
48G	W	TO MAIN HARNESS
49G	-	TO MAIN HARNESS
50G	BR	TO MAIN HARNESS
51G	R	TO MAIN HARNESS
52G	L	TO MAIN HARNESS
53G	W	TO MAIN HARNESS
54G	W	TO MAIN HARNESS
55G	G	TO MAIN HARNESS
56G	W	TO MAIN HARNESS
57G	Y	TO MAIN HARNESS
58G	BG	TO MAIN HARNESS
59G	BG	TO MAIN HARNESS
60G	BG	TO MAIN HARNESS
61G	B	TO MAIN HARNESS
62G	W	TO MAIN HARNESS
63G	R	TO MAIN HARNESS
64G	W/L	TO MAIN HARNESS
65G	W/R	TO MAIN HARNESS
66G	BG	TO MAIN HARNESS
67G	BG	TO MAIN HARNESS
68G	B	TO MAIN HARNESS
69G	Y	TO MAIN HARNESS
70G	L	TO MAIN HARNESS
71G	R/W	TO MAIN HARNESS
72G	L/W	TO MAIN HARNESS
73G	SHIELD	TO MAIN HARNESS
74G	W	TO MAIN HARNESS
75G	R	TO MAIN HARNESS
76G	R/G	TO MAIN HARNESS

Terminal No.	Color of Wire	Signal Name
1G	G	TO MAIN HARNESS
2G	B/R	TO MAIN HARNESS
3G	W/B	TO MAIN HARNESS
4G	B/W	TO MAIN HARNESS
5G	BR	TO MAIN HARNESS
6G	R/W	TO MAIN HARNESS
7G	Y	TO MAIN HARNESS
8G	G	TO MAIN HARNESS
9G	R	TO MAIN HARNESS
10G	W	TO MAIN HARNESS
11G	R/G	TO MAIN HARNESS
12G	W/B	TO MAIN HARNESS
13G	BR	TO MAIN HARNESS
14G	Y/B	TO MAIN HARNESS
15G	G/W	TO MAIN HARNESS
16G	G	TO MAIN HARNESS
17G	G/Y	TO MAIN HARNESS
18G	G/Y	TO MAIN HARNESS
19G	Y/Y	TO MAIN HARNESS
20G	G/Y	TO MAIN HARNESS
21G	B/Y	TO MAIN HARNESS
22G	G/R	TO MAIN HARNESS - (WITH CUMMINS V8D)
23G	G/Y	TO MAIN HARNESS - (WITH VK56VD)
24G	Y/R	TO MAIN HARNESS

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77G	G	TO MAIN HARNESS
78G	W	TO MAIN HARNESS
79G	-	TO MAIN HARNESS
80G	R	TO MAIN HARNESS
81G	L	TO MAIN HARNESS
82G	R	TO MAIN HARNESS
83G	L	TO MAIN HARNESS
84G	L	TO MAIN HARNESS
85G	W/B	TO MAIN HARNESS
86G	B/R	TO MAIN HARNESS
87G	W/B	TO MAIN HARNESS
88G	P	TO MAIN HARNESS
89G	L	TO MAIN HARNESS
90G	G	TO MAIN HARNESS
91G	G	TO MAIN HARNESS
92G	V/W	TO MAIN HARNESS
93G	BR	TO MAIN HARNESS
94G	G	TO MAIN HARNESS
95G	G	TO MAIN HARNESS
96G	W	TO MAIN HARNESS
97G	R	TO MAIN HARNESS
98G	W/B	TO MAIN HARNESS
99G	BR	TO MAIN HARNESS
100G	GR/W	TO MAIN HARNESS

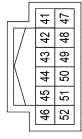
Connector No.	M4
Connector Name	FUSE BLOCK (J/B)
Connector Type	NS16FW-CS
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
1P	R	IGNITION
2P	Y	IGNITION
3P	G	IGNITION RELAY OUT
4P	B/W	RR DEF RLY
5P	B/W	RR DEF RLY
6P	O	RR DEF RLY OUT
7P	G	IGNITION
8P	W	IGNITION
9P	L	BATTERY
10P	-	-
11P	-	-
12P	-	-
13P	R	BATTERY
14P	Y	BATTERY

15P	Y/LG	BATTERY
16P	W	BLOWER FAN RELAY OUT

Connector No.	M25
Connector Name	COMBINATION METER (WITH TYPE A)
Connector Type	TH12FW-NH
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
41	W	IGN
42	R	BAT
43	Y/Y	FUEL SENSOR GND
44	GR	ILL CONT OUTPUT
45	P	CAN-L
46	L	CAN-H
47	B	G1
48	BR/Y	FUEL SENSOR
49	-	-
50	-	-
51	LG	M CAN-L
52	SB	M CAN-H



A B C DLN E F G H I J K L M N O P

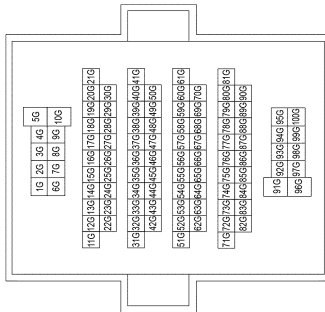
REAR FINAL DRIVE

< WIRING DIAGRAM >

[REAR FINAL DRIVE: MA248 (ELD)]

REAR FINAL DRIVE CONNECTORS - WITH VK56VD

Connector No.	M31
Connector Name	WIRE TO WIPE
Connector Type	TH80FW-CST16-TM4
Connector Color	WHITE



76G	P	TO ENGINE ROOM HARNESS
79G	-	TO ENGINE ROOM HARNESS
80G	R	TO ENGINE ROOM HARNESS
81G	L	TO ENGINE ROOM HARNESS
82G	R	TO ENGINE ROOM HARNESS
83G	L	TO ENGINE ROOM HARNESS
84G	L	TO ENGINE ROOM HARNESS
86G	W	TO ENGINE ROOM HARNESS
86G	BR	TO ENGINE ROOM HARNESS
87G	W	TO ENGINE ROOM HARNESS
88G	G	TO ENGINE ROOM HARNESS
89G	P	TO ENGINE ROOM HARNESS
90G	G	TO ENGINE ROOM HARNESS
91G	P	TO ENGINE ROOM HARNESS
92G	VW	TO ENGINE ROOM HARNESS
93G	BR	TO ENGINE ROOM HARNESS
94G	B	TO ENGINE ROOM HARNESS
95G	G	TO ENGINE ROOM HARNESS
96G	R	TO ENGINE ROOM HARNESS
97G	R	TO ENGINE ROOM HARNESS
98G	W/B	TO ENGINE ROOM HARNESS
99G	R	TO ENGINE ROOM HARNESS
100G	GRW	TO ENGINE ROOM HARNESS

25G	RAW	TO ENGINE ROOM HARNESS
26G	R	TO ENGINE ROOM HARNESS
27G	LG	TO ENGINE ROOM HARNESS
28G	G/B	TO ENGINE ROOM HARNESS
29G	G/B	TO ENGINE ROOM HARNESS
30G	BRY	TO ENGINE ROOM HARNESS
31G	R	TO ENGINE ROOM HARNESS
32G	R	TO ENGINE ROOM HARNESS
33G	YL	TO ENGINE ROOM HARNESS
34G	GR	TO ENGINE ROOM HARNESS
35G	G/R	TO ENGINE ROOM HARNESS
36G	SB	TO ENGINE ROOM HARNESS
37G	RAW	TO ENGINE ROOM HARNESS
38G	BR	TO ENGINE ROOM HARNESS
39G	BR	TO ENGINE ROOM HARNESS
40G	-	TO ENGINE ROOM HARNESS
41G	R/G	TO ENGINE ROOM HARNESS
42G	O	TO ENGINE ROOM HARNESS
43G	G	TO ENGINE ROOM HARNESS
44G	R/Y	TO ENGINE ROOM HARNESS
45G	G	TO ENGINE ROOM HARNESS
46G	LG	TO ENGINE ROOM HARNESS
47G	R	TO ENGINE ROOM HARNESS
48G	W	TO ENGINE ROOM HARNESS
49G	-	TO ENGINE ROOM HARNESS
50G	BR	TO ENGINE ROOM HARNESS
51G	R	TO ENGINE ROOM HARNESS
52G	L	TO ENGINE ROOM HARNESS
53G	W	TO ENGINE ROOM HARNESS
54G	W	TO ENGINE ROOM HARNESS
55G	G	TO ENGINE ROOM HARNESS
56G	W	TO ENGINE ROOM HARNESS
57G	Y	TO ENGINE ROOM HARNESS
58G	BG	TO ENGINE ROOM HARNESS
59G	BG	TO ENGINE ROOM HARNESS
60G	BG	TO ENGINE ROOM HARNESS
61G	O	TO ENGINE ROOM HARNESS
62G	W	TO ENGINE ROOM HARNESS
63G	O	TO ENGINE ROOM HARNESS
64G	W/L	TO ENGINE ROOM HARNESS
65G	W/R	TO ENGINE ROOM HARNESS
66G	BG	TO ENGINE ROOM HARNESS
67G	O	TO ENGINE ROOM HARNESS
68G	B	TO ENGINE ROOM HARNESS
69G	Y	TO ENGINE ROOM HARNESS
70G	L	TO ENGINE ROOM HARNESS
71G	RAW	TO ENGINE ROOM HARNESS
72G	L/W	TO ENGINE ROOM HARNESS
73G	SHIELD	TO ENGINE ROOM HARNESS
74G	W	TO ENGINE ROOM HARNESS
75G	R	TO ENGINE ROOM HARNESS
76G	R/G	TO ENGINE ROOM HARNESS
77G	BG	TO ENGINE ROOM HARNESS

Terminal No.	Color of Wire	Signal Name
1G	G	TO ENGINE ROOM HARNESS
2G	B/R	TO ENGINE ROOM HARNESS
3G	W	TO ENGINE ROOM HARNESS
4G	BR/W	TO ENGINE ROOM HARNESS
5G	BR	TO ENGINE ROOM HARNESS
6G	RAW	TO ENGINE ROOM HARNESS
7G	Y	TO ENGINE ROOM HARNESS
8G	G	TO ENGINE ROOM HARNESS
9G	R	TO ENGINE ROOM HARNESS
10G	W	TO ENGINE ROOM HARNESS
11G	R/G	TO ENGINE ROOM HARNESS
12G	W/B	TO ENGINE ROOM HARNESS
13G	BR	TO ENGINE ROOM HARNESS
14G	Y/B	TO ENGINE ROOM HARNESS
15G	G/W	TO ENGINE ROOM HARNESS
16G	G	TO ENGINE ROOM HARNESS
17G	O	TO ENGINE ROOM HARNESS
18G	G/Y	TO ENGINE ROOM HARNESS
19G	Y/V	TO ENGINE ROOM HARNESS
20G	G/Y	TO ENGINE ROOM HARNESS
21G	B/Y	TO ENGINE ROOM HARNESS
22G	G/R	TO ENGINE ROOM HARNESS - (WITH CUMMINS V8D)
22G	G/Y	TO ENGINE ROOM HARNESS - (WITH VK56VD)
23G	Y/R	TO ENGINE ROOM HARNESS
24G	G/B	TO ENGINE ROOM HARNESS

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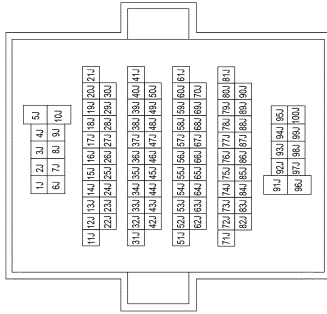
REAR FINAL DRIVE

< WIRING DIAGRAM >

[REAR FINAL DRIVE: MA248 (ELD)]

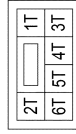
REAR FINAL DRIVE CONNECTORS - WITH VK56VD

Connector No.	M40
Connector Name	WIRE TO WIRE
Connector Type	TH80FW-CS16-TM4
Connector Color	WHITE



81J	SHIELD	TO BODY HARNESS
82J	L/R	TO BODY HARNESS
83J	-	TO BODY HARNESS
84J	-	TO BODY HARNESS
85J	W	TO BODY HARNESS
86J	G	TO BODY HARNESS
87J	W	TO BODY HARNESS
88J	SHIELD	TO BODY HARNESS
89J	R	TO BODY HARNESS
90J	L	TO BODY HARNESS
91J	L/B	TO BODY HARNESS
92J	SB	TO BODY HARNESS
93J	B	TO BODY HARNESS
94J	LG	TO BODY HARNESS
95J	L	TO BODY HARNESS
96J	G	TO BODY HARNESS
97J	B/Y	TO BODY HARNESS
98J	L/B	TO BODY HARNESS
99J	W/L	TO BODY HARNESS
100J	Y	TO BODY HARNESS

Connector No.	M60
Connector Name	FUSE BLOCK (J/B)
Connector Type	NS06FW-CS
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
1T	-	-
2T	SB	BATTERY
3T	R	RR DEF RLY
4T	G	BATTERY
5T	-	-
6T	-	-

Connector No.	M70
Connector Name	FUSE BLOCK (J/B)
Connector Type	NS16FBR-CS
Connector Color	BROWN



Terminal No.	Color of Wire	Signal Name
1R	L	TAIL LAMP 2
2R	G/R	IGNITION
3R	Y/R	BATTERY
4R	-	-
5R	W	BATTERY
6R	G/W	ACCESSORY
7R	-	-
8R	-	-
9R	-	-
10R	W	BATTERY
11R	-	-
12R	BG	BATTERY
13R	B	ACCESSORY
14R	G/Y	BATTERY
15R	Y	BATTERY
16R	G/R	ACCESSORY

Terminal No.	Color of Wire	Signal Name
1J	G	TO BODY HARNESS
2J	R/Y	TO BODY HARNESS
3J	L	TO BODY HARNESS
4J	L/B	TO BODY HARNESS
5J	B	TO BODY HARNESS
6J	BR	TO BODY HARNESS
7J	BG	TO BODY HARNESS
8J	SB	TO BODY HARNESS
9J	BR	TO BODY HARNESS
10J	R	TO BODY HARNESS
11J	O/B	TO BODY HARNESS
12J	L	TO BODY HARNESS
13J	W	TO BODY HARNESS
14J	Y	TO BODY HARNESS
15J	-	TO BODY HARNESS
16J	R	TO BODY HARNESS
17J	G	TO BODY HARNESS
18J	SB	TO BODY HARNESS
19J	O	TO BODY HARNESS
20J	O/B	TO BODY HARNESS
21J	Y	TO BODY HARNESS
22J	P	TO BODY HARNESS
23J	W	TO BODY HARNESS
24J	W/R	TO BODY HARNESS
25J	P	TO BODY HARNESS
26J	L	TO BODY HARNESS
27J	R	TO BODY HARNESS

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REAR FINAL DRIVE

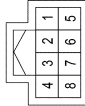
< WIRING DIAGRAM >

[REAR FINAL DRIVE: MA248 (ELD)]

REAR FINAL DRIVE CONNECTORS - WITH VK56VD

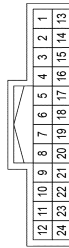
15	-	-	-
16	-	-	-
17	G/B	LED 1	-
18	L	ITS CAN-H	-
19	-	-	-
20	-	-	-
21	-	-	-
22	-	-	-
23	LG	SW	-
24	-	-	-

Connector No.	M72
Connector Name	DIFFERENTIAL LOCK MODE SWITCH
Connector Type	TH08FB-NH
Connector Color	BLACK



Terminal No.	Color of Wire	Signal Name
1	GR	ILLUMINATION -
2	-	-
3	-	-
4	G	IGN
5	L	ILLUMINATION +
6	-	-
7	G/O	DIFF LOCK ON SW
8	O	DIFF LOCK OFF SW

Connector No.	M128
Connector Name	ADAS CONTROL UNIT
Connector Type	TH24FW-NH
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
1	B	GND
2	L	ITS CAN-H
3	G	IGN
4	GR	BUZZER OUTPUT
5	R	ITS CAN-L
6	R	ITS CAN-L
7	G/R	SW LED
8	-	-
9	L	CAN-H
10	P	CAN-L
11	G	SW 1
12	-	-
13	-	-
14	-	-

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DIAGNOSIS AND REPAIR WORKFLOW

< BASIC INSPECTION >

[REAR FINAL DRIVE: MA248 (ELD)]

BASIC INSPECTION

DIAGNOSIS AND REPAIR WORKFLOW

Work Flow

INFOID:000000013478006

DETAILED FLOW

1. INTERVIEW FROM THE CUSTOMER

Clarify customer complaints before inspection. First of all, perform an interview utilizing [DLN-240, "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 fail-safe function. Refer to [DLN-220, "Fail-Safe"](#).

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

CONSULT

Select "Self Diagnostic Result" mode of "DIFF LOCK".

Is any DTC detected?

YES >> Record or print self-diagnosis results. GO TO 4.

NO >> GO TO 6.

4. RECHECK SYMPTOM

CONSULT

1. Erase "Self Diagnostic Result" mode of "DIFF LOCK".

2. Perform DTC confirmation procedures for the malfunctioning system.

NOTE:

If some DTCs are detected at the same time, determine the order for performing the diagnosis based on [DLN-220, "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-43, "Intermittent Incident"](#).

5. REPAIR OR REPLACE THE MALFUNCTIONING PARTS

- Repair or replace the malfunctioning parts.
- Reconnect part or connector after repairing or replacing.
- When DTC is detected, erase "Self Diagnostic Result" mode of "DIFF LOCK".

>> GO TO 7.

6. IDENTIFY MALFUNCTIONING SYSTEM BY SYMPTOM DIAGNOSIS

Estimate malfunctioning system based on symptom diagnosis and perform inspection.

Can the error-detected system be identified?

DIAGNOSIS AND REPAIR WORKFLOW

< BASIC INSPECTION >

[REAR FINAL DRIVE: MA248 (ELD)]

Interview sheet

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

Memo

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P1836 DIFFERENTIAL LOCK CONTROL UNIT

< DTC/CIRCUIT DIAGNOSIS >

[REAR FINAL DRIVE: MA248 (ELD)]

DTC/CIRCUIT DIAGNOSIS

P1836 DIFFERENTIAL LOCK CONTROL UNIT

DTC Description

INFOID:0000000013478429

DTC DETECTION LOGIC

Malfunction is detected in the memory (EEPROM) system of differential lock control unit.

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detection condition	
P1836	CONTROL UNIT 3 (Control unit 3)	Diagnosis condition	When ignition switch is ON.
		Signal (terminal)	—
		Threshold	—
		Diagnosis delay time	—

POSSIBLE CAUSE

Internal malfunction of differential lock control unit.

FAIL-SAFE

When differential lock system is malfunctioning, fail-safe status activates and rear differential lock is disengaged.

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 "DIFF LOCK".

Is DTC "P1836" detected?

- YES >> Proceed to diagnosis procedure. Refer to [DLN-242. "Diagnosis Procedure"](#).
NO-1 >> To check malfunction symptom before repair: Refer to [GI-43. "Intermittent Incident"](#).
NO-2 >> Confirmation after repair: Inspection End.

Diagnosis Procedure

INFOID:0000000013478430

1. PERFORM SELF DIAGNOSTIC RESULT

Ⓟ CONSULT

After erasing the DTC, perform DTC confirmation procedure again. Refer to [DLN-242. "DTC Description"](#).

Is DTC "P1836" detected?

- YES >> Replace differential lock control unit. Refer [DLN-281. "Removal and Installation"](#).
NO >> Check differential lock control unit pin terminals for damage or loose connection with harness connector. If any items are damaged, repair or replace the malfunctioning parts.

P1838 DIFFERENTIAL LOCK MODE SWITCH

< DTC/CIRCUIT DIAGNOSIS >

[REAR FINAL DRIVE: MA248 (ELD)]

P1838 DIFFERENTIAL LOCK MODE SWITCH

DTC Description

INFOID:000000013478431

DTC DETECTION LOGIC

More than two switch inputs are simultaneously detected due to short circuit of differential lock mode switch.

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detection condition	
		Diagnosis condition	When ignition switch is ON.
P1838	ON SW (Differential lock ON switch)	Signal (terminal)	Differential lock mode switch (terminal 5 and 14)
		Threshold	—
		Diagnosis delay time	—

POSSIBLE CAUSE

- Malfunction of differential lock mode switch
- Malfunction of differential lock mode switch circuit
- Internal malfunction of differential lock control unit

FAIL-SAFE

When differential lock system is malfunctioning, fail-safe status activates and rear differential lock is disengaged.

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. Start the engine.
CAUTION:
Stop the vehicle.
2. Operate differential lock mode switch to each position.
3. Select "Self Diagnostic Result" mode of "DIFF LOCK".

Is DTC "P1838" detected?

- YES >> Proceed to diagnosis procedure. Refer to [DLN-243, "Diagnosis Procedure"](#).
- NO-1 >> To check malfunction symptom before repair: Refer to [GI-43, "Intermittent Incident"](#).
- NO-2 >> Confirmation after repair: Inspection End.

Diagnosis Procedure

INFOID:000000013478432

1. CHECK DIFFERENTIAL LOCK MODE SWITCH

Check differential lock mode switch. Refer to [DLN-245, "Component Inspection"](#).

Is the inspection result normal?

- YES >> GO TO 2.
- NO >> Replace differential lock mode switch.

2. CHECK IGNITION VOLTAGE FOR DIFFERENTIAL LOCK MODE SWITCH

1. Turn the ignition switch OFF.
2. Disconnect differential lock mode switch harness connector.
3. Check the voltage between differential lock mode switch harness connector and ground.

P1838 DIFFERENTIAL LOCK MODE SWITCH

< DTC/CIRCUIT DIAGNOSIS >

[REAR FINAL DRIVE: MA248 (ELD)]

Differential lock mode switch		—	Voltage (Approx.)
Connector	Terminal		
M72	4	Ground	0 V

4. Turn the ignition switch ON.

CAUTION:

Never start the engine.

5. Check the voltage between differential lock mode switch harness connector and ground.

Differential lock mode switch		—	Voltage (Approx.)
Connector	Terminal		
M72	4	Ground	Battery voltage

Is the inspection result normal?

YES >> GO TO 4.

NO >> GO TO 3.

3. CHECK IGNITION SIGNAL CIRCUIT FOR DIFFERENTIAL LOCK MODE SWITCH

1. Turn the ignition switch OFF.

2. Check fuse [No. 31 located in the fuse block (J/B)].

3. Disconnect fuse block (J/B) harness connector.

4. Check the continuity between differential lock mode switch harness connector and fuse block (J/B) harness connector.

Differential lock mode switch		Fuse block (J/B)		Continuity
Connector	Terminal	Connector	Terminal	
M72	4	M4	7P	Yes

5. Check the continuity between differential lock mode switch harness connector and the ground.

Differential lock mode switch		—	Continuity
Connector	Terminal		
M72	4	Ground	No

Is the inspection result normal?

YES >> Perform the trouble diagnosis for ignition power supply circuit. Refer to [PG-13, "Wiring Diagram - BATTERY POWER SUPPLY - WITH Cummins 5.0L -"](#).

NO >> Repair or replace the malfunctioning parts.

4. CHECK DIFFERENTIAL LOCK MODE SWITCH SIGNAL

1. Turn the ignition switch OFF.

2. Connect differential lock mode switch harness connector.

3. Disconnect differential lock control unit harness connector.

4. Turn the ignition switch ON.

CAUTION:

Never start the engine.

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

Differential lock control unit		—	Condition	Voltage (Approx.)
Connector	Terminal			
B77	5	Ground	Differential lock mode switch: ON	Battery voltage
			Differential lock mode switch: OFF	0 V
	14		Differential lock mode switch: ON	0 V
			Differential lock mode switch: OFF	Battery voltage

Is the inspection result normal?

P1838 DIFFERENTIAL LOCK MODE SWITCH

[REAR FINAL DRIVE: MA248 (ELD)]

< DTC/CIRCUIT DIAGNOSIS >

- YES >> GO TO 5.
- NO >> GO TO 6.

5.CHECK DIFFERENTIAL LOCK MODE SWITCH SIGNAL CIRCUIT

1. Turn the ignition switch OFF.
2. Disconnect differential lock mode switch harness connector.
3. Check the continuity between differential lock control unit harness connector and differential lock mode switch harness connector.

Differential lock control unit		Differential lock mode switch		Continuity
Connector	Terminal	Connector	Terminal	
B77	5	M72	7	Yes
			8	No
	14		7	No
			8	Yes

4. Check the continuity between differential lock control unit harness connector and ground.

Differential lock control unit		—	Continuity
Connector	Terminal		
B77	5	Ground	No
	14		

Is the inspection result normal?

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

6.CHECK TERMINALS AND HARNESS CONNECTORS

- Check differential lock control unit pin terminals for damage or loose connection with harness connector.
- Check differential lock mode switch pin terminals for damage or loose connection with harness connector.

Is the inspection result normal?

- YES >> Replace differential lock control unit. Refer to [DLN-281, "Removal and Installation"](#).
- NO >> Repair or replace the malfunctioning parts.

Component Inspection

INFOID:000000013478433

1.CHECK DIFFERENTIAL LOCK MODE SWITCH

1. Turn the ignition switch OFF.
2. Remove differential lock mode switch.
3. Check the continuity between differential lock mode switch connector terminals.

Differential lock mode switch		Condition	Continuity
Terminal			
4	7	Differential lock mode switch: ON	Yes
		Differential lock mode switch: OFF	No
	8	Differential lock mode switch: ON	No
		Differential lock mode switch: OFF	Yes

Is the inspection result normal?

- YES >> Inspection End.
- NO >> Replace differential lock mode switch.

P1839 DIFFERENTIAL LOCK POSITION SWITCH

< DTC/CIRCUIT DIAGNOSIS >

[REAR FINAL DRIVE: MA248 (ELD)]

P1839 DIFFERENTIAL LOCK POSITION SWITCH

DTC Description

INFOID:000000013478434

DTC DETECTION LOGIC

When differential lock position switch is ON, rotation difference occurs in wheel speed (rear wheel right and left).

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detection condition	
		Diagnosis condition	Engine running and vehicle running
P1839	POSI SW ON (Differential lock position switch ON)	Signal (terminal)	Differential lock position switch (terminal 12)
		Threshold	—
		Diagnosis delay time	—

POSSIBLE CAUSE

- Malfunction of differential lock position switch
- Malfunction of differential lock position switch circuit
- Internal malfunction of differential lock control unit

FAIL-SAFE

When differential lock system is malfunctioning, fail-safe status activates and rear differential lock is disengaged.

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. Start the engine.
2. Turn the differential lock mode switch ON.
3. Drive at 20km/h (12 MPH) or less for approx. 1 minute on the curved road.
4. Select "Self Diagnostic Result" mode of "DIFF LOCK".

Is DTC "P1839" detected?

- YES >> Proceed to diagnosis procedure. Refer to [DLN-246, "Diagnosis Procedure"](#).
NO-1 >> To check malfunction symptom before repair: Refer to [GI-43, "Intermittent Incident"](#).
NO-2 >> Confirmation after repair: Inspection End.

Diagnosis Procedure

INFOID:000000013478435

1. CHECK DIFFERENTIAL LOCK POSITION SWITCH GROUND CIRCUIT

Check the continuity between differential lock position switch harness connector and ground.

1. Turn the ignition switch OFF.
2. Disconnect differential lock position switch harness connector.
3. Check the continuity between differential lock position switch harness connector and ground.

Differential lock position switch		—	Continuity
Connector	Terminal		
C16	2	Ground	Yes

Is the inspection result normal?

- YES >> GO TO 2.

P1839 DIFFERENTIAL LOCK POSITION SWITCH

[REAR FINAL DRIVE: MA248 (ELD)]

< DTC/CIRCUIT DIAGNOSIS >

NO >> Repair or replace the malfunctioning parts.

2.CHECK DIFFERENTIAL LOCK POSITION SWITCH SIGNAL CIRCUIT

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

Differential lock control unit		Differential lock position switch		Continuity
Connector	Terminal	Connector	Terminal	
B77	12	C16	1	Yes

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

Differential lock control unit		—	Continuity
Connector	Terminal		
B77	12	Ground	No

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair or replace the malfunctioning parts.

3.CHECK DIFFERENTIAL LOCK POSITION SWITCH SIGNAL

1. Connect differential lock control unit harness connector.
2. Turn the ignition switch ON.
CAUTION:
Never start the engine.
3. Check the voltage between differential lock position switch harness connector and ground.

Differential lock position switch		—	Voltage (Approx.)
Connector	Terminal		
C16	1	Ground	Battery voltage

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair or replace the malfunctioning parts.

4.CHECK DIFFERENTIAL LOCK POSITION SWITCH

Check differential lock position switch. Refer to [DLN-247, "Component Inspection"](#).

Is the inspection result normal?

YES >> GO TO 5.

NO >> Replace differential lock position switch. Refer to [DLN-283, "Removal and Installation"](#).

5.CHECK TERMINALS AND HARNESS CONNECTORS

- Check differential lock control unit pin terminals for damage or loose connection with harness connector.
- Check differential lock position switch pin terminals for damage or loose connection with harness connector.

Is the inspection result normal?

YES >> Replace differential lock control unit. Refer to [DLN-281, "Removal and Installation"](#).

NO >> Repair or replace the malfunctioning parts.

Component Inspection

INFOID:0000000013478436

1.CHECK DIFFERENTIAL LOCK POSITION SWITCH

1. Turn the ignition switch OFF.
2. Remove differential lock position switch. Refer to [DLN-283, "Removal and Installation"](#).

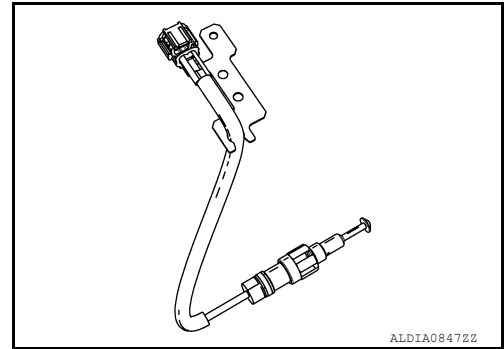
P1839 DIFFERENTIAL LOCK POSITION SWITCH

< DTC/CIRCUIT DIAGNOSIS >

[REAR FINAL DRIVE: MA248 (ELD)]

3. Check the continuity between differential lock position switch connector terminals.

Differential lock position switch		Condition	Continuity
Terminal			
1	2	While pulling rod (A) of differential lock position switch (Differential system is locked state.)	Yes
		While pushing rod (A) of differential lock position switch (Differential system is unlocked state.)	No



Is the inspection result normal?

YES >> Inspection End.

NO >> Replace differential lock position switch. Refer to [DLN-283, "Removal and Installation"](#).

P1844 RELAY

< DTC/CIRCUIT DIAGNOSIS >

[REAR FINAL DRIVE: MA248 (ELD)]

P1844 RELAY

DTC Description

INFOID:000000013478437

DTC DETECTION LOGIC

Differential lock control unit detects as irregular by comparing target value with monitor value.

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detection condition	
		Diagnosis condition	When ignition switch is ON.
P1844	RELAY (Relay)	Signal (terminal)	—
		Threshold	—
		Diagnosis delay time	—

POSSIBLE CAUSE

Internal malfunction of differential lock control unit

FAIL-SAFE

When differential lock system is malfunctioning, fail-safe status activates and rear differential lock is disengaged.

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

- Turn the ignition switch OFF to ON.
- Select "Self Diagnostic Result" mode of "DIFF LOCK".

Is DTC "P1844" detected?

- YES >> Proceed to diagnosis procedure. Refer to [DLN-249, "Diagnosis Procedure"](#).
- NO-1 >> To check malfunction symptom before repair: Refer to [GI-43, "Intermittent Incident"](#).
- NO-2 >> Confirmation after repair: Inspection End.

Diagnosis Procedure

INFOID:000000013478438

1. CHECK POWER SUPPLY AND GROUND CIRCUIT

Perform the trouble diagnosis of the power supply and ground circuit. Refer to [DLN-273, "Diagnosis Procedure"](#).

Is the inspection result normal?

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

2. CHECK TERMINALS AND HARNESS CONNECTORS

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

Is the inspection result normal?

- YES >> Replace differential lock control unit. Refer to [DLN-281, "Removal and Installation"](#).
- NO >> Repair or replace the malfunctioning parts.

P1848 DIFFERENTIAL LOCK SOLENOID

< DTC/CIRCUIT DIAGNOSIS >

[REAR FINAL DRIVE: MA248 (ELD)]

P1848 DIFFERENTIAL LOCK SOLENOID

DTC Description

INFOID:000000013478439

DTC DETECTION LOGIC

An open was detected in the differential lock solenoid or circuit.

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detection condition	
P1848	SOL DISCONNECT (Solenoid disconnect)	Diagnosis condition	When all of the following conditions are satisfied: • When ignition switch is ON. • Differential lock mode switch: ON
		Signal (terminal)	Differential lock solenoid (terminal 1 and 2)
		Threshold	—
		Diagnosis delay time	—

POSSIBLE CAUSE

- Internal malfunction of differential lock solenoid
- Malfunction of differential lock solenoid circuit (open)
- Malfunction of differential lock solenoid command current
- Differential lock solenoid relay does not switch to ON position.

FAIL-SAFE

When differential lock system is malfunctioning, fail-safe status activates and rear differential lock is disengaged.

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.
CAUTION:
Never start the engine.
2. Turn the differential lock mode switch ON.
3. Select "Self Diagnostic Result" mode of "DIFF LOCK".

Is DTC "P1848" detected?

- YES >> Proceed to diagnosis procedure. Refer to [DLN-250, "Diagnosis Procedure"](#).
 NO-1 >> To check malfunction symptom before repair: Refer to [GI-43, "Intermittent Incident"](#).
 NO-2 >> Confirmation after repair: Inspection End.

Diagnosis Procedure

INFOID:000000013478440

1. CHECK DIFFERENTIAL LOCK SOLENOID POWER SUPPLY VOLTAGE

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

Differential lock control unit		—	Voltage (Approx.)
Connector	Terminal		
B77	9	Ground	Battery voltage

3. Turn the ignition switch ON.

CAUTION:

P1848 DIFFERENTIAL LOCK SOLENOID

< DTC/CIRCUIT DIAGNOSIS >

[REAR FINAL DRIVE: MA248 (ELD)]

Never start the engine.

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

Differential lock control unit		—	Voltage (Approx.)
Connector	Terminal		
B77	9	Ground	Battery voltage

Is the inspection result normal?

YES >> GO TO 3.

NO >> GO TO 2.

2.CHECK DIFFERENTIAL LOCK SOLENOID POWER SUPPLY CIRCUIT

1. Turn the ignition switch OFF.
2. Check the 10A fuse (#64).
3. Disconnect fusible link box LH connector.
4. Check the continuity between differential lock control unit harness connector and fusible link box LH harness connector.

Differential lock control unit		Fusible link box LH		Continuity
Connector	Terminal	Connector	Terminal	
B77	9	E27 (Cummins 5.0L)	1	Yes
		E148 (VK56VD)	3	

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

Differential lock control unit		—	Continuity
Connector	Terminal		
B77	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 - WITH Cummins 5.0L -"](#) or [PG-34. "Wiring Diagram - BATTERY POWER SUPPLY - WITH VK56VD -"](#).

NO >> Repair or replace the malfunctioning parts.

3.CHECK DIFFERENTIAL LOCK CONTROL UNIT GROUND

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

Differential lock control unit		—	Continuity
Connector	Terminal		
B77	10	Ground	Yes
	11		

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair or replace the malfunctioning parts.

4.CHECK DIFFERENTIAL LOCK SOLENOID CIRCUIT

Check the resistance between differential lock control unit harness connector.

Differential lock control unit			Resistance (Approx.)
Connector	Terminal		
B77	1	2	3.8 Ω

Is the inspection result normal?

P1848 DIFFERENTIAL LOCK SOLENOID

[REAR FINAL DRIVE: MA248 (ELD)]

< DTC/CIRCUIT DIAGNOSIS >

- YES >> GO TO 6.
NO >> GO TO 5.

5. CHECK HARNESS FOR DIFFERENTIAL LOCK SOLENOID CIRCUIT

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

Differential lock control unit		Differential lock solenoid		Continuity
Connector	Terminal	Connector	Terminal	
B77	1	C17	1	Yes
	2		2	

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

Differential lock control unit		—	Continuity
Connector	Terminal		
B77	1	Ground	No
	2		

Is the inspection result normal?

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

6. CHECK DIFFERENTIAL LOCK SOLENOID

Check differential lock solenoid. Refer to [DLN-252. "Component Inspection"](#).

Is the inspection result normal?

- YES >> GO TO 7.
NO >> Differential lock solenoid is malfunctioning. Replace differential assembly. Refer to [DLN-292. "Disassembly and Assembly"](#).

7. CHECK TERMINALS AND HARNESS CONNECTORS

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

Is the inspection result normal?

- YES >> After erasing the DTC, perform DTC confirmation procedure again. If DTC "P1848" is detected, replace differential lock control unit. Refer to [DLN-281. "Removal and Installation"](#).
NO >> Repair or replace the malfunctioning parts.

Component Inspection

INFOID:000000013478441

1. CHECK DIFFERENTIAL LOCK SOLENOID OPERATION

1. Turn the ignition switch OFF.
2. Disconnect differential lock solenoid harness connector.
3. Apply 12 V to differential lock solenoid connector #1 (-) and #2 (+) terminals.

CAUTION:

- Never make the terminals short.
- Connect the fuse between differential lock solenoid connector terminals.

Does differential lock solenoid operate?

- YES >> GO TO 2.
NO >> Differential lock solenoid is malfunctioning. Replace differential assembly. Refer to [DLN-292. "Disassembly and Assembly"](#).

2. CHECK DIFFERENTIAL LOCK SOLENOID RESISTANCE

1. Turn the ignition switch OFF.
2. Check the resistance between differential lock solenoid harness connector terminals.

P1848 DIFFERENTIAL LOCK SOLENOID

< DTC/CIRCUIT DIAGNOSIS >

[REAR FINAL DRIVE: MA248 (ELD)]

Differential lock solenoid		Resistance (Approx.)
Terminal		
1	2	3.2 Ω

Is the inspection result normal?

YES >> Inspection End.

NO >> Differential lock solenoid is malfunctioning. Replace differential assembly. Refer to [DLN-292, "Dis-assembly and Assembly"](#).

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P1849 DIFFERENTIAL LOCK SOLENOID

< DTC/CIRCUIT DIAGNOSIS >

[REAR FINAL DRIVE: MA248 (ELD)]

P1849 DIFFERENTIAL LOCK SOLENOID

DTC Description

INFOID:000000013478442

DTC DETECTION LOGIC

A short was detected in the differential lock solenoid internal circuit or in the harness.

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detection condition	
P1849	SOL SHORT (Solenoid short)	Diagnosis condition	When all of the following conditions are satisfied: • When ignition switch is ON. • Differential lock mode switch: ON
		Signal (terminal)	Differential lock solenoid (terminal 1 and 2)
		Threshold	—
		Diagnosis delay time	—

POSSIBLE CAUSE

- Internal malfunction of differential lock solenoid
- Malfunction of differential lock solenoid circuit (short)

FAIL-SAFE

When differential lock system is malfunctioning, fail-safe status activates and rear differential lock is disengaged.

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.
CAUTION:
Never start the engine.
2. Turn the differential lock mode switch ON.
3. Select "Self Diagnostic Result" mode of "DIFF LOCK".

Is DTC "P1849" detected?

- YES >> Proceed to diagnosis procedure. Refer to [DLN-254, "Diagnosis Procedure"](#).
 NO-1 >> To check malfunction symptom before repair: Refer to [GI-43, "Intermittent Incident"](#).
 NO-2 >> Confirmation after repair: Inspection End.

Diagnosis Procedure

INFOID:000000013478443

1. CHECK DIFFERENTIAL LOCK SOLENOID POWER SUPPLY VOLTAGE

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

Differential lock control unit		—	Voltage (Approx.)
Connector	Terminal		
B77	9	Ground	Battery voltage

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

P1849 DIFFERENTIAL LOCK SOLENOID

< DTC/CIRCUIT DIAGNOSIS >

[REAR FINAL DRIVE: MA248 (ELD)]

Differential lock control unit		—	Voltage (Approx.)
Connector	Terminal		
B77	9	Ground	Battery voltage

Is the inspection result normal?

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

2. CHECK DIFFERENTIAL LOCK SOLENOID POWER SUPPLY CIRCUIT

1. Turn the ignition switch OFF.
2. Check the 10A (#64).
3. Disconnect fusible link box LH harness connector.
4. Check the continuity between differential lock control unit harness connector and ground.

Differential lock control unit		Fusible link box LH		Continuity
Connector	Terminal	Connector	Terminal	
B77	9	E27 (Cummins 5.0L)	1	Yes
		E148 (VK56VD)	3	

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

Differential lock control unit		—	Continuity
Connector	Terminal		
B77	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 - WITH Cummins 5.0L -"](#) or [PG-34. "Wiring Diagram - BATTERY POWER SUPPLY - WITH VK56VD -"](#).
- NO >> Repair or replace the malfunctioning parts.

3. CHECK DIFFERENTIAL LOCK CONTROL UNIT GROUND

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

Differential lock control unit		—	Continuity
Connector	Terminal		
B77	10	Ground	Yes
	11		

Is the inspection result normal?

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

4. CHECK DIFFERENTIAL LOCK SOLENOID CIRCUIT

Check the resistance between differential lock control unit harness connector.

Differential lock control unit			Resistance (Approx.)
Connector	Terminal		
B77	1	2	3.8 Ω

Is the inspection result normal?

- YES >> GO TO 6.
- NO >> GO TO 5.

5. CHECK HARNESS FOR DIFFERENTIAL LOCK SOLENOID CIRCUIT

P1849 DIFFERENTIAL LOCK SOLENOID

[REAR FINAL DRIVE: MA248 (ELD)]

< DTC/CIRCUIT DIAGNOSIS >

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

Differential lock control unit		Differential lock solenoid		Continuity
Connector	Terminal	Connector	Terminal	
B77	1	C17	1	Yes
	2		2	

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

Differential lock control unit		—	Continuity
Connector	Terminal		
B77	1	Ground	No
	2		

Is the inspection result normal?

YES >> GO TO 6.

NO >> Repair or replace the malfunctioning parts.

6.CHECK DIFFERENTIAL LOCK SOLENOID

Check differential lock solenoid. Refer to [DLN-256, "Component Inspection"](#).

Is the inspection result normal?

YES >> GO TO 7.

NO >> Differential lock solenoid is malfunctioning. Replace differential assembly. Refer to [DLN-292, "Dis-assembly and Assembly"](#).

7.CHECK TERMINALS AND HARNESS CONNECTORS

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

Is the inspection result normal?

YES >> After erasing the DTC, perform DTC confirmation procedure again. If DTC "P1849" is detected, replace differential lock control unit. Refer to [DLN-281, "Removal and Installation"](#).

NO >> Repair or replace the malfunctioning parts.

Component Inspection

INFOID:000000013478444

1.CHECK DIFFERENTIAL LOCK SOLENOID OPERATION

1. Turn the ignition switch OFF.
2. Disconnect differential lock solenoid harness connector.
3. Apply 12 V to differential lock solenoid connector #1 (-) and #2 (+) terminals.

CAUTION:

- Never make the terminals short.
- Connect the fuse between differential lock solenoid connector terminals.

Does differential lock solenoid operate?

YES >> GO TO 2.

NO >> Differential lock solenoid is malfunctioning. Replace differential assembly. Refer to [DLN-292, "Dis-assembly and Assembly"](#).

2.CHECK DIFFERENTIAL LOCK SOLENOID RESISTANCE

1. Turn the ignition switch OFF.
2. Check the resistance between differential lock solenoid harness connector terminals.

Differential lock solenoid		Resistance (Approx.)
Terminal		
1	2	3.2 Ω

P1849 DIFFERENTIAL LOCK SOLENOID

< DTC/CIRCUIT DIAGNOSIS >

[REAR FINAL DRIVE: MA248 (ELD)]

Is the inspection result normal?

YES >> Inspection End.

NO >> Differential lock solenoid is malfunctioning. Replace differential assembly. Refer to [DLN-292. "Dis-assembly and Assembly"](#).

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P1850 DIFFERENTIAL LOCK CONTROL UNIT

< DTC/CIRCUIT DIAGNOSIS >

[REAR FINAL DRIVE: MA248 (ELD)]

P1850 DIFFERENTIAL LOCK CONTROL UNIT

DTC Description

INFOID:000000013478445

DTC DETECTION LOGIC

When differential lock mode switch is ON and difference between request current and actual current more than threshold.

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detection condition	
P1850	SOL CURRENT (Solenoid current)	Diagnosis condition	When all of the following conditions are satisfied: <ul style="list-style-type: none">• When ignition switch is ON.• Differential lock mode switch: ON
		Signal (terminal)	—
		Threshold	—
		Diagnosis delay time	—

POSSIBLE CAUSE

- Internal malfunction of differential lock control unit
- Malfunction of differential lock solenoid circuit

FAIL-SAFE

When differential lock system is malfunctioning, fail-safe status activates and rear differential lock is disengaged.

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.
CAUTION:
Never start the engine.
2. Turn the differential lock mode switch ON.
3. Select "Self Diagnostic Result" mode of "DIFF LOCK".

Is DTC "P1850" detected?

- YES >> Proceed to diagnosis procedure. Refer to [DLN-258, "Diagnosis Procedure"](#).
NO-1 >> To check malfunction symptom before repair: Refer to [GI-43, "Intermittent Incident"](#).
NO-2 >> Confirmation after repair: Inspection End.

Diagnosis Procedure

INFOID:000000013478446

1. CHECK DIFFERENTIAL LOCK SOLENOID CIRCUIT

Check differential lock solenoid circuit. Refer to [DLN-250, "Diagnosis Procedure"](#).

Is the inspection result normal?

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

2. PERFORM SELF DIAGNOSTIC RESULT

CONSULT

After erasing the DTC, perform DTC confirmation procedure again. Refer to [DLN-258, "DTC Description"](#).

Is DTC "P1850" detected?

P1850 DIFFERENTIAL LOCK CONTROL UNIT

[REAR FINAL DRIVE: MA248 (ELD)]

< DTC/CIRCUIT DIAGNOSIS >

- YES >> Replace differential lock control unit. Refer [DLN-281, "Removal and Installation"](#).
NO >> Check differential lock control unit pin terminals for damage or loose connection with harness connector. If any items are damaged, repair or replace the malfunctioning parts.

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P1856 VDC SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

[REAR FINAL DRIVE: MA248 (ELD)]

P1856 VDC SYSTEM

DTC Description

INFOID:000000013478447

DTC DETECTION LOGIC

Malfunction is detected in VDC system that is output from ABS actuator and electric unit (control unit) through CAN communication.

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detection condition	
P1856	VDC SYSTEM (VDC system)	Diagnosis condition	Engine running and vehicle running
		Signal (terminal)	VDC malfunction signal
		Threshold	—
		Diagnosis delay time	—

POSSIBLE CAUSE

VDC system malfunction

FAIL-SAFE

No impact to vehicle behavior. (Differential lock system can operate.)

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. Select "Self Diagnostic Result" mode of "DIFF LOCK".

Is DTC "P1856" detected?

- YES >> Proceed to diagnosis procedure. Refer to [DLN-260, "Diagnosis Procedure"](#).
NO-1 >> To check malfunction symptom before repair: Refer to [GI-43, "Intermittent Incident"](#).
NO-2 >> Confirmation after repair: Inspection End.

Diagnosis Procedure

INFOID:000000013478448

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

CONSULT

Select "Self Diagnostic Result" mode of "ABS".

Is any DTC detected?

- YES >> Check the DTC. Refer to [BRC-55, "DTC Index"](#).
NO >> GO TO 2.

2. CHECK TERMINALS AND HARNESS CONNECTORS

Check differential lock 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 "P1856" is detected, replace differential lock control unit. Refer to [DLN-281, "Removal and Installation"](#).
NO >> Repair or replace the malfunctioning parts.

P18CB DIFFERENTIAL LOCK SOLENOID POWER SUPPLY

< DTC/CIRCUIT DIAGNOSIS >

[REAR FINAL DRIVE: MA248 (ELD)]

P18CB DIFFERENTIAL LOCK SOLENOID POWER SUPPLY

DTC Description

INFOID:000000013478449

DTC DETECTION LOGIC

When engine is running and differential lock solenoid power supply and ignition signal voltage is higher than 9 V and differential lock mode switch ON, differences between ignition signal voltage and differential lock solenoid power supply voltage higher than 4.6 V.

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detection condition	
		Diagnosis condition	
P18CB	SOLENOID POWER SUPPLY (Solenoid power supply)	Diagnosis condition	When all of the following conditions are satisfied: • When Ignition switch is ON. • Differential lock mode switch: ON
		Signal (terminal)	• Ignition signal (terminal 7) • Solenoid power supply (terminal 9)
		Threshold	—
		Diagnosis delay time	—

POSSIBLE CAUSE

- Malfunction of differential lock solenoid power supply or ignition signal voltage circuit (short)
- Internal malfunction of differential lock control unit

FAIL-SAFE

When differential lock system is malfunctioning, fail-safe status activates and rear differential lock is disengaged.

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.
CAUTION:
Never start the engine.
2. Turn the differential lock mode switch ON.
3. Select "Self Diagnostic Result" mode of "DIFF LOCK".

Is DTC "P18CB" detected?

- YES >> Proceed to diagnosis procedure. Refer to [DLN-261, "Diagnosis Procedure"](#).
 NO-1 >> To check malfunction symptom before repair: Refer to [GI-43, "Intermittent Incident"](#).
 NO-2 >> Confirmation after repair: Inspection End.

Diagnosis Procedure

INFOID:000000013478450

1. CHECK IGNITION SIGNAL VOLTAGE

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

Differential lock control unit		—	Voltage (Approx.)
Connector	Terminal		
B77	7	Ground	0 V

P18CB DIFFERENTIAL LOCK SOLENOID POWER SUPPLY

< DTC/CIRCUIT DIAGNOSIS >

[REAR FINAL DRIVE: MA248 (ELD)]

- Turn the ignition switch ON.

CAUTION:

Never start the engine.

- Check the voltage between differential lock control unit harness connector and ground.

Differential lock control unit		—	Voltage (Approx.)
Connector	Terminal		
B77	7	Ground	Battery voltage

Is the inspection result normal?

YES >> GO TO 3.

NO >> GO TO 2.

2.CHECK IGNITION SIGNAL CIRCUIT

- Turn the ignition switch OFF.
- Check fuse [No. 30 located in the fuse block (J/B)].
- Disconnect fuse block (J/B) harness connector.
- Check the continuity between differential lock control unit harness connector and fuse block (J/B) harness connector.

Differential lock control unit		Fuse block (J/B)		Continuity
Connector	Terminal	Connector	Terminal	
B77	7	M4	7P	Yes

- Check the continuity between differential lock control unit harness connector and the ground.

Differential lock control unit		—	Continuity
Connector	Terminal		
B77	7	Ground	No

Is the inspection result normal?

YES >> Perform the trouble diagnosis for ignition power supply circuit. Refer to [PG-13. "Wiring Diagram - BATTERY POWER SUPPLY - WITH Cummins 5.0L -"](#).

NO >> Repair or replace the malfunctioning parts.

3.CHECK DIFFERENTIAL LOCK SOLENOID POWER SUPPLY VOLTAGE

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

Differential lock control unit		—	Voltage (Approx.)
Connector	Terminal		
B77	9	Ground	Battery voltage

- Turn the ignition switch ON.

CAUTION:

Never start the engine.

- Check the voltage between differential lock control unit harness connector and ground.

Differential lock control unit		—	Voltage (Approx.)
Connector	Terminal		
B77	9	Ground	Battery voltage

Is the inspection result normal?

YES >> GO TO 5.

NO >> GO TO 4.

4.CHECK DIFFERENTIAL LOCK SOLENOID POWER SUPPLY CIRCUIT

P18CB DIFFERENTIAL LOCK SOLENOID POWER SUPPLY

< DTC/CIRCUIT DIAGNOSIS >

[REAR FINAL DRIVE: MA248 (ELD)]

1. Turn the ignition switch OFF.
2. Check the 10A fuse (#64).
3. Disconnect fusible link box LH connector.
4. Check the continuity between differential lock control unit harness connector and fusible link box LH harness connector.

Differential lock control unit		Fusible link box LH		Continuity
Connector	Terminal	Connector	Terminal	
B77	9	E27 (Cummins 5.0L)	1	Yes
		E148 (VK56VD)	3	

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

Differential lock control unit		—	Continuity
Connector	Terminal		
B77	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 - WITH Cummins 5.0L -"](#) or [PG-34, "Wiring Diagram - BATTERY POWER SUPPLY - WITH VK56VD -"](#).
- NO >> Repair or replace the malfunctioning parts.

5.CHECK DIFFERENTIAL LOCK CONTROL UNIT GROUND

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

Differential lock control unit		—	Continuity
Connector	Terminal		
B77	10	Ground	Yes
	11		

Is the inspection result normal?

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

6.CHECK TERMINALS AND HARNESS CONNECTORS

Check differential lock 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 "P18CB" is detected, replace differential lock control unit. Refer to [DLN-281, "Removal and Installation"](#).
- NO >> Repair or replace the malfunctioning parts.

P18CC WHEEL SPEED SIGNAL

< DTC/CIRCUIT DIAGNOSIS >

[REAR FINAL DRIVE: MA248 (ELD)]

P18CC WHEEL SPEED SIGNAL

DTC Description

INFOID:000000013478451

DTC DETECTION LOGIC

Malfunction is detected in wheel speed signal that is output from ABS actuator and electric unit (control unit) through CAN communication.

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detection condition	
P18CC	WHEEL SPEED SIGNAL (Wheel speed signal)	Diagnosis condition	Engine running and vehicle running
		Signal (terminal)	Each wheel speed signal
		Threshold	—
		Diagnosis delay time	—

POSSIBLE CAUSE

ABS malfunction

- Wheel speed signal error

FAIL-SAFE

When differential lock system is malfunctioning, fail-safe status activates and rear differential lock is disengaged.

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. Select "Self Diagnostic Result" mode of "DIFF LOCK".

Is DTC "P18CC" detected?

- YES >> Proceed to diagnosis procedure. Refer to [DLN-264, "Diagnosis Procedure"](#).
NO-1 >> To check malfunction symptom before repair: Refer to [GI-43, "Intermittent Incident"](#).
NO-2 >> Confirmation after repair: Inspection End.

Diagnosis Procedure

INFOID:000000013478452

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

Ⓟ CONSULT

Select "Self Diagnostic Result" mode of "ABS".

Is any DTC detected?

- YES >> Check the DTC. Refer to [BRC-55, "DTC Index"](#).
NO >> GO TO 2.

2. CHECK TERMINALS AND HARNESS CONNECTORS

Check differential lock 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 "P18CC" is detected, replace differential lock control unit. Refer to [DLN-281, "Removal and Installation"](#).
NO >> Repair or replace the malfunctioning parts.

P18CD SELF SHUTDOWN

< DTC/CIRCUIT DIAGNOSIS >

[REAR FINAL DRIVE: MA248 (ELD)]

P18CD SELF SHUTDOWN

DTC Description

INFOID:000000013478453

DTC DETECTION LOGIC

When ignition switch is ON, self-shut down of differential lock control unit was incomplete.

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detection condition	
		Diagnosis condition	Signal (terminal)
P18CD	INCOMPLETE SELF SHUT-DOWN (Incomplete self shutdown)	When Ignition switch is ON.	Power supply for control unit (back-up) (terminal 15)
		—	—
		—	—
		—	—

POSSIBLE CAUSE

- Malfunction of differential lock control unit power supply circuit (open or short)
- Battery power supply
- Internal malfunction of differential lock control unit
- When battery is less than 6.5V at cranking, P18CD may be recorded
However, no impact to vehicle behavior will result. (Differential lock system will operate)

FAIL-SAFE

When differential lock system is malfunctioning, fail-safe status activates and rear differential lock is disengaged.

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 "DIFF LOCK".

Is DTC "P18CD" detected?

- YES >> Proceed to diagnosis procedure. Refer to [DLN-265, "Diagnosis Procedure"](#).
 NO-1 >> To check malfunction symptom before repair: Refer to [GI-43, "Intermittent Incident"](#).
 NO-2 >> Confirmation after repair: Inspection End.

Diagnosis Procedure

INFOID:000000013478454

1. CHECK DIFFERENTIAL LOCK CONTROL UNIT POWER SUPPLY VOLTAGE

1. Turn the ignition switch OFF.
2. Check the voltage between differential lock control unit harness connector and ground.
3. Turn the ignition switch ON.

CAUTION:

NEVER start the engine

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

Differential lock control unit		—	Voltage (Approx.)
Connector	Terminal		
B77	15	Ground	Battery voltage

Is the inspection result normal?

P18CD SELF SHUTDOWN

< DTC/CIRCUIT DIAGNOSIS >

[REAR FINAL DRIVE: MA248 (ELD)]

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

2.CHECK DIFFERENTIAL LOCK CONTROL UNIT POWER SUPPLY CIRCUIT

1. Turn the ignition switch OFF.
2. Check fuse [No. 6 located in the fuse block (J/B)].
3. Disconnect fuse block (J/B) harness connector.
4. Check the continuity between differential lock control unit harness connector and fuse block (J/B) harness connector.

Differential lock control unit		Fuse block (J/B)		Continuity
Connector	Terminal	Connector	Terminal	
B77	15	M70	15R	Yes

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

Differential lock control unit		—	Continuity
Connector	Terminal		
B77	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 - WITH Cummins 5.0L -"](#).
NO >> Repair or replace the malfunctioning parts.

3.CHECK DIFFERENTIAL LOCK CONTROL UNIT GROUND

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

Differential lock control unit		—	Continuity
Connector	Terminal		
B77	10	Ground	Yes
	11		

Is the inspection result normal?

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

4.CHECK TERMINALS AND HARNESS CONNECTORS

Check differential lock 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 "P18CD" is detected, replace differential lock control unit. Refer to [DLN-281, "Removal and Installation"](#).
NO >> Repair or replace the malfunctioning parts.

P18CE DIFFERENTIAL LOCK POSITION SWITCH

< DTC/CIRCUIT DIAGNOSIS >

[REAR FINAL DRIVE: MA248 (ELD)]

P18CE DIFFERENTIAL LOCK POSITION SWITCH

DTC Description

INFOID:000000013478455

DTC DETECTION LOGIC

When differential lock position switch is OFF, rotation fixing occurs in wheel speed (rear wheel right and left).

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detection condition	
		Diagnosis condition	Engine running and vehicle running
P18CE	DIFF LOCK POSITION SWITCH (Differential lock position switch)	Signal (terminal)	Differential lock position switch (terminal 12)
		Threshold	—
		Diagnosis delay time	—

POSSIBLE CAUSE

- Malfunction of differential lock position switch
- Malfunction of differential lock position switch circuit
- Internal malfunction of differential lock control unit

FAIL-SAFE

When differential lock system is malfunctioning, fail-safe status activates and rear differential lock is disengaged.

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. Start the engine.
2. Turn the differential lock mode switch OFF.
3. Drive at 20km/h (12 MPH) or less for approx. 1 minute on the curved road.
4. Select "Self Diagnostic Result" mode of "DIFF LOCK".

Is DTC "P18CE" detected?

- YES >> Proceed to diagnosis procedure. Refer to [DLN-267, "Diagnosis Procedure"](#).
 NO-1 >> To check malfunction symptom before repair: Refer to [GI-43, "Intermittent Incident"](#).
 NO-2 >> Confirmation after repair: Inspection End.

Diagnosis Procedure

INFOID:000000013478456

1. CHECK DIFFERENTIAL LOCK POSITION SWITCH GROUND CIRCUIT

Check the continuity between differential lock position switch harness connector and ground.

1. Turn the ignition switch OFF.
2. Disconnect differential lock position switch harness connector.
3. Check the continuity between differential lock position switch harness connector and ground.

Differential lock position switch		—	Continuity
Connector	Terminal		
C16	2	Ground	Yes

Is the inspection result normal?

- YES >> GO TO 2.
 NO >> Repair or replace damaged parts.

P18CE DIFFERENTIAL LOCK POSITION SWITCH

< DTC/CIRCUIT DIAGNOSIS >

[REAR FINAL DRIVE: MA248 (ELD)]

2. CHECK DIFFERENTIAL LOCK POSITION SWITCH SIGNAL CIRCUIT

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

Differential lock control unit		Differential lock position switch		Continuity
Connector	Terminal	Connector	Terminal	
B77	12	C16	1	Yes

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

Differential lock control unit		—	Continuity
Connector	Terminal		
B77	12	Ground	No

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair or replace the malfunctioning parts.

3. CHECK DIFFERENTIAL LOCK POSITION SWITCH SIGNAL

1. Connect differential lock control unit harness connector.
2. Turn the ignition switch ON.

CAUTION:

Never start the engine.

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

Differential lock position switch		—	Voltage (Approx.)
Connector	Terminal		
C16	1	Ground	Battery voltage

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair or replace the malfunctioning parts.

4. CHECK DIFFERENTIAL LOCK POSITION SWITCH

Check differential lock position switch. Refer to [DLN-247, "Component Inspection"](#).

Is the inspection result normal?

YES >> GO TO 5.

NO >> Replace differential lock position switch. Refer to [DLN-283, "Removal and Installation"](#).

5. CHECK TERMINALS AND HARNESS CONNECTORS

- Check differential lock control unit pin terminals for damage or loose connection with harness connector.
- Check differential lock position switch pin terminals for damage or loose connection with harness connector.

Is the inspection result normal?

YES >> Replace differential lock control unit. Refer to [DLN-281, "Removal and Installation"](#).

NO >> Repair or replace the malfunctioning parts.

Component Inspection

INFOID:000000013478457

1. CHECK DIFFERENTIAL LOCK POSITION SWITCH

1. Turn the ignition switch OFF.
2. Remove differential lock position switch. Refer to [DLN-283, "Removal and Installation"](#).

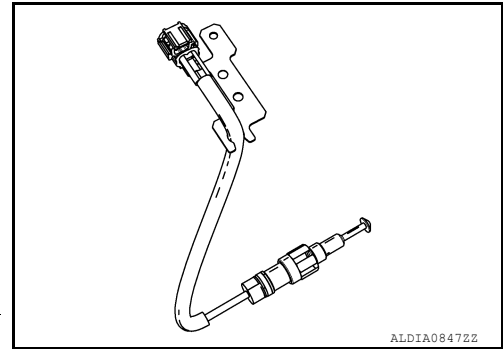
P18CE DIFFERENTIAL LOCK POSITION SWITCH

< DTC/CIRCUIT DIAGNOSIS >

[REAR FINAL DRIVE: MA248 (ELD)]

3. Check the continuity between differential lock position switch connector terminals.

Differential lock position switch		Condition	Continuity
Terminal			
1	2	While pulling rod (A) of differential lock position switch (Differential system is locked state.)	Yes
		While pushing rod (A) of differential lock position switch (Differential system is unlocked state.)	No



Is the inspection result normal?

YES >> Inspection End.

NO >> Replace differential lock position switch. Refer to [DLN-283, "Removal and Installation"](#).

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P18D0 ABS SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

[REAR FINAL DRIVE: MA248 (ELD)]

P18D0 ABS SYSTEM

DTC Description

INFOID:000000013478458

DTC DETECTION LOGIC

Malfunction is detected in ABS that is output from ABS actuator and electric unit (control unit) through CAN communication.

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detection condition	
P18D0	ABS SYSTEM (ABS system)	Diagnosis condition	Engine running and vehicle running
		Signal (terminal)	ABS malfunction signal
		Threshold	—
		Diagnosis delay time	—

POSSIBLE CAUSE

ABS malfunction

FAIL-SAFE

No impact to vehicle behavior. (Differential lock system can operate.)

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. Select "Self Diagnostic Result" mode of "DIFF LOCK".

Is DTC "P18D0" detected?

- YES >> Proceed to diagnosis procedure. Refer to [DLN-270, "Diagnosis Procedure"](#).
NO-1 >> To check malfunction symptom before repair: Refer to [GI-43, "Intermittent Incident"](#).
NO-2 >> Confirmation after repair: Inspection End.

Diagnosis Procedure

INFOID:000000013478459

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

2. CHECK TERMINALS AND HARNESS CONNECTORS

Check differential lock 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 "P18D0" is detected, replace differential lock control unit. Refer to [DLN-281, "Removal and Installation"](#).
NO >> Repair or replace the malfunctioning parts.

U1000 CAN COMM CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

[REAR FINAL DRIVE: MA248 (ELD)]

U1000 CAN COMM CIRCUIT

DTC Description

INFOID:000000013478460

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

Differential lock control unit is not transmitting/receiving CAN communication signal for 2 seconds or more.

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detection condition	
U1000	CAN COMM CIRCUIT (CAN communication circuit)	Diagnosis condition	When Ignition switch is ON.
		Signal (terminal)	CAN communication signal
		Threshold	—
		Diagnosis delay time	2 seconds or more

POSSIBLE CAUSE

- CAN communication error
- Internal malfunction of differential lock control unit

FAIL-SAFE

When differential lock system is malfunctioning, fail-safe status activates and rear differential lock is disengaged.

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. Perform "Self Diagnostic Result" mode of "DIFF LOCK".

Is DTC "U1000" detected?

- YES >> Proceed to diagnosis procedure. Refer to [DLN-271, "Diagnosis Procedure"](#).
- NO-1 >> To check malfunction symptom before repair: Refer to [GI-43, "Intermittent Incident"](#).
- NO-2 >> Confirmation after repair: Inspection End.

Diagnosis Procedure

INFOID:000000013478461

Proceed to [LAN-51, "Trouble Diagnosis Flow Chart"](#).

U1010 CONTROL UNIT (CAN)

< DTC/CIRCUIT DIAGNOSIS >

[REAR FINAL DRIVE: MA248 (ELD)]

U1010 CONTROL UNIT (CAN)

DTC Description

INFOID:000000013478462

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

Detecting error during the initial diagnosis of CAN controller of differential lock control unit.

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detection condition	
U1010	CONTROL UNIT (CAN) [Control unit (CAN)]	Diagnosis condition	When Ignition switch is ON.
		Signal (terminal)	—
		Threshold	—
		Diagnosis delay time	—

POSSIBLE CAUSE

Internal malfunction of differential lock control unit

FAIL-SAFE

When differential lock system is malfunctioning, fail-safe status activates and rear differential lock is disengaged.

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. Perform "Self Diagnostic Result" mode of "DIFF LOCK".

Is DTC "U1010" detected?

- YES >> Proceed to diagnosis procedure. Refer to [DLN-272, "Diagnosis Procedure"](#).
NO-1 >> To check malfunction symptom before repair: Refer to [GI-43, "Intermittent Incident"](#).
NO-2 >> Confirmation after repair: Inspection End.

Diagnosis Procedure

INFOID:000000013478463

1. PERFORM SELF DIAGNOSTIC RESULT

CONSULT

After erasing the DTC, perform DTC confirmation procedure again. Refer to [DLN-272, "DTC Description"](#).

Is DTC "U1010" detected?

- YES >> Replace differential lock control unit. Refer to [DLN-281, "Removal and Installation"](#).
NO >> Check differential lock control unit pin terminals for damage or loose connection with harness connector. If any items are damaged, repair or replace the malfunctioning parts.

POWER SUPPLY AND GROUND CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

[REAR FINAL DRIVE: MA248 (ELD)]

POWER SUPPLY AND GROUND CIRCUIT

Diagnosis Procedure

INFOID:000000013478464

1. CHECK IGNITION SIGNAL VOLTAGE

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

Differential lock control unit		—	Voltage (Approx.)
Connector	Terminal		
B77	7	Ground	0 V

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

Differential lock control unit		—	Voltage (Approx.)
Connector	Terminal		
B77	7	Ground	Battery voltage

Is the inspection result normal?

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

2. CHECK IGNITION SIGNAL CIRCUIT

1. Turn the ignition switch OFF.
2. Check fuse [No. 30 located in the fuse block (J/B)].
3. Disconnect fuse block (J/B) harness connector.
4. Check the continuity between differential lock control unit harness connector and fuse block (J/B) harness connector.

Differential lock control unit		Fuse block (J/B)		Continuity
Connector	Terminal	Connector	Terminal	
B77	7	M4	7P	Yes

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

Differential lock control unit		—	Continuity
Connector	Terminal		
B77	7	Ground	No

Is the inspection result normal?

- YES >> Perform the trouble diagnosis for ignition power supply circuit. Refer to [PG-13, "Wiring Diagram - BATTERY POWER SUPPLY - WITH Cummins 5.0L -"](#).
- NO >> Repair or replace the malfunctioning parts.

3. CHECK DIFFERENTIAL LOCK CONTROL UNIT POWER SUPPLY VOLTAGE

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

Differential lock control unit		—	Voltage (Approx.)
Connector	Terminal		
B77	15	Ground	Battery voltage

3. Turn the ignition switch ON.

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POWER SUPPLY AND GROUND CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

[REAR FINAL DRIVE: MA248 (ELD)]

CAUTION:

Never start the engine.

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

Differential lock control unit		—	Voltage (Approx.)
Connector	Terminal		
B77	15	Ground	Battery voltage

Is the inspection result normal?

YES >> GO TO 5.

NO >> GO TO 4.

4.CHECK DIFFERENTIAL LOCK CONTROL UNIT POWER SUPPLY CIRCUIT

1. Turn the ignition switch OFF.
2. Check fuse [No. 6 located in the fuse block (J/B)].
3. Disconnect fuse block (J/B) harness connector.
4. Check the continuity between differential lock control unit harness connector and fuse block (J/B) harness connector.

Differential lock control unit		Fuse block (J/B)		Continuity
Connector	Terminal	Connector	Terminal	
B77	15	M70	15R	Yes

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

Differential lock control unit		—	Continuity
Connector	Terminal		
B77	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 - WITH Cummins 5.0L -"](#) or [PG-34. "Wiring Diagram - BATTERY POWER SUPPLY - WITH VK56VD -"](#).

NO >> Repair or replace the malfunctioning parts.

5.CHECK DIFFERENTIAL LOCK SOLENOID POWER SUPPLY VOLTAGE

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

Differential lock control unit		—	Voltage (Approx.)
Connector	Terminal		
B77	9	Ground	Battery voltage

3. Turn the ignition switch ON.

CAUTION:

Never start the engine.

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

Differential lock control unit		—	Voltage (Approx.)
Connector	Terminal		
B77	9	Ground	Battery voltage

Is the inspection result normal?

YES >> GO TO 7.

NO >> GO TO 6

6.CHECK DIFFERENTIAL LOCK SOLENOID POWER SUPPLY CIRCUIT

POWER SUPPLY AND GROUND CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

[REAR FINAL DRIVE: MA248 (ELD)]

1. Turn the ignition switch OFF.
2. Check the 10A fuse (#64).
3. Disconnect fusible link box LH connector.
4. Check the continuity between differential lock control unit harness connector and fusible link box LH harness connector.

Differential lock control unit		Fusible link box LH		Continuity
Connector	Terminal	Connector	Terminal	
B77	9	E27 (Cummins 5.0L)	1	Yes
		E148 (VK56VD)	3	

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

Differential lock control unit		—	Continuity
Connector	Terminal		
B77	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 - WITH Cummins 5.0L -"](#) or [PG-34, "Wiring Diagram - BATTERY POWER SUPPLY - WITH VK56VD -"](#).
- NO >> Repair or replace the malfunctioning parts.

7. CHECK DIFFERENTIAL LOCK CONTROL UNIT GROUND

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

Differential lock control unit		—	Continuity
Connector	Terminal		
B77	10	Ground	Yes
	11		

Is the inspection result normal?

- YES >> Inspection End.
- NO >> Repair or replace the malfunctioning parts.

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DIFFERENTIAL LOCK INDICATOR LAMP

< DTC/CIRCUIT DIAGNOSIS >

[REAR FINAL DRIVE: MA248 (ELD)]

DIFFERENTIAL LOCK INDICATOR LAMP

Component Function Check

INFOID:000000013478465

1. DIFFERENTIAL LOCK INDICATOR LAMP OPERATION CHECK

Check that differential lock indicator lamp turns ON after the ignition switch is turned ON (engine stop) and turns OFF after the engine is started.

Is the inspection result normal?

YES >> Inspection End.

NO >> Proceed to [DLN-276, "Diagnosis Procedure"](#).

Diagnosis Procedure

INFOID:000000013478466

1. PERFORM SELF DIAGNOSTIC RESULT

CONSULT

Select "Self Diagnostic Result" mode of "DIFF LOCK".

Is any DTC detected?

YES >> Perform trouble diagnosis for detected DTC. Refer to [DLN-220, "DTC Index"](#).

NO >> GO TO 2.

2. CHECK DIFFERENTIAL LOCK MODE SWITCH

Perform the trouble diagnosis for differential lock mode switch. Refer to [DLN-243, "Diagnosis Procedure"](#).

Is the inspection results normal?

YES >> GO TO 3.

NO >> Repair or replace the malfunctioning parts.

3. CHECK DIFFERENTIAL LOCK INDICATOR LAMP SIGNAL

CONSULT

1. Start the engine.

CAUTION:

Stop the vehicle.

2. Change 4WD shift switch to 4L.

3. Change differential lock mode switch to ON.

4. Check "INDICATOR" in "Data Monitor" mode of "DIFF LOCK".

Does the item on "Data Monitor" indicate "On" or "FLASH"?

YES >> Perform the trouble diagnosis for combination meter. Refer to [MWI-25, "On Board Diagnosis Function"](#).

NO >> Replace differential lock control unit. Refer to [DLN-281, "Removal and Installation"](#).

DIFF LOCK INDICATOR LAMP DOES NOT TURN ON WITH DIFFERENTIAL LOCK SWITCHED ON

< SYMPTOM DIAGNOSIS >

[REAR FINAL DRIVE: MA248 (ELD)]

SYMPTOM DIAGNOSIS

DIFF LOCK INDICATOR LAMP DOES NOT TURN ON WITH DIFFERENTIAL LOCK SWITCHED ON

Inspection Procedure

INFOID:0000000012544490

SYMPTOM:

DIFF LOCK indicator lamp does not turn ON when turning differential lock mode switch to "ON" after engine start.

DIAGNOSTIC PROCEDURE

1. CHECK DIFF LOCK INDICATOR LAMP

Confirm the DIFF LOCK indicator lamp proves out when ignition switch is turned ON.

Is the inspection result normal?

YES >> GO TO 2.

NO >> Go to [DLN-276, "Component Function Check"](#).

2. CHECK SELF-DIAGNOSTIC RESULTS

Select "Self Diagnostic Result" mode of "DIFF LOCK". Refer to [DLN-215, "CONSULT Function"](#).

Is any DTC detected by self-diagnosis?

YES >> Check the malfunctioning system. Refer to [DLN-220, "DTC Index"](#).

NO >> GO TO 3.

3. CHECK DIFFERENTIAL LOCK MODE SWITCH OPERATION

Check differential lock mode switch. Refer to [DLN-243, "Diagnosis Procedure"](#).

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair component, harness or connector.

4. CHECK DIFFERENTIAL LOCK CONTROL UNIT POWER SUPPLY AND GROUND CIRCUIT

Check differential lock control unit power supply and ground circuit. Refer to [DLN-273, "Diagnosis Procedure"](#).

Is the inspection result normal?

YES >> Replace the differential lock control unit. Refer to [DLN-281, "Removal and Installation"](#).

NO >> Repair harness or connector.

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DIFF LOCK INDICATOR LAMP FLASHES WHILE DRIVING

< SYMPTOM DIAGNOSIS >

[REAR FINAL DRIVE: MA248 (ELD)]

DIFF LOCK INDICATOR LAMP FLASHES WHILE DRIVING

Description

INFOID:000000012544491

The DIFF LOCK indicator lamp will flash once every 2 seconds when the differential lock system is in standby condition. Standby condition is the time between when the differential lock mode switch is turned ON and when the differential lock control unit sees all conditions are met to engage the differential lock. The DIFF LOCK indicator lamp should be OFF if there has been a fault detected. For more information regarding the differential lock system operation, refer to the Owner's Manual.

Inspection Procedure

INFOID:000000012544492

SYMPTOM:

DIFF LOCK indicator lamp sometimes flashes while driving.

DIAGNOSTIC PROCEDURE

1.CHECK SELF-DIAGNOSTIC RESULTS

Select "Self Diagnostic Result" mode of "DIFF LOCK". Refer to [DLN-215, "CONSULT Function"](#).

Is any malfunction detected by self-diagnosis?

YES >> Check the malfunctioning system. Refer to [DLN-220, "DTC Index"](#).

NO >> GO TO 2.

2.CHECK DIFFERENTIAL LOCK MODE SWITCH

Perform trouble diagnosis for differential lock mode switch. Refer to [DLN-243, "Diagnosis Procedure"](#).

Is the inspection result normal?

YES >> Condition is intermittent. Refer to [GI-43, "Intermittent Incident"](#).

NO >> Repair or replace malfunctioning component.

REAR DIFFERENTIAL GEAR OIL

< PERIODIC MAINTENANCE >

[REAR FINAL DRIVE: MA248 (ELD)]

PERIODIC MAINTENANCE

REAR DIFFERENTIAL GEAR OIL

Inspection

INFOID:0000000013312709

OIL LEAKAGE

- Check that oil is not leaking from final drive assembly or around it.
- When oil is leaking, drain all gear oil, and then fill with specified amount of gear oil. Refer to [DLN-279, "Draining"](#), [DLN-279, "Refilling"](#).

CAUTION:

Oil volume cannot be checked by oil level height.

NOTE:

Oil is refilled up to filler plug hole.

OIL LEVEL

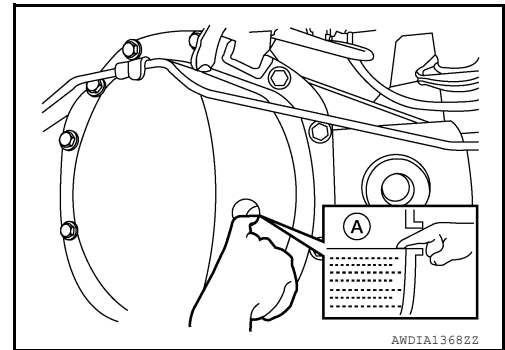
- Remove filler plug (1) and check oil level (A) from filler plug hole as shown.

CAUTION:

Do not start engine while checking oil level.

- Install the filler plug and tighten to specification.

Filler plug torque : Refer to [DLN-292, "Exploded View"](#).

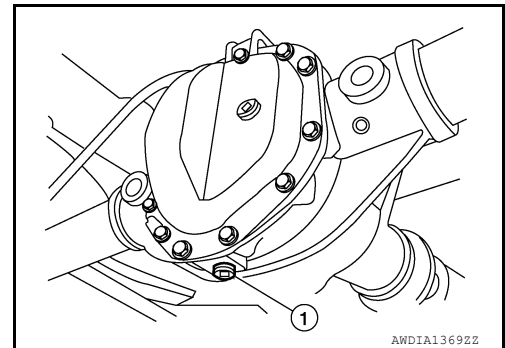


Draining

INFOID:0000000013312710

1. Stop engine.
2. Remove drain plug (1) and drain gear oil.
3. Install the drain plug to specification.

Drain plug torque : Refer to [DLN-292, "Exploded View"](#).



Refilling

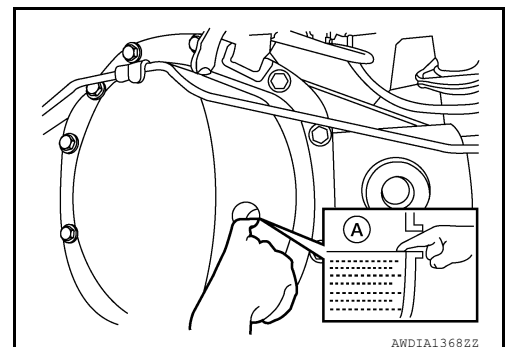
INFOID:0000000013312711

1. Drain all gear oil. Refer to [DLN-279, "Draining"](#).

CAUTION:

Drain gear oil until gear oil starts to drip.

2. Remove filler plug (1).
3. Fill with specified amount of gear oil.



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REAR DIFFERENTIAL GEAR OIL

< PERIODIC MAINTENANCE >

[REAR FINAL DRIVE: MA248 (ELD)]

Oil grade and viscosity : Refer to [MA-13, "VK56VD Gasoline Engine : Fluids and Lubricants"](#) or, [MA-59, "Cummins \(5.0L V8D\) Engine : Fluids and Lubricants"](#).

Oil capacity : Refer to [MA-13, "VK56VD Gasoline Engine : Fluids and Lubricants"](#) or, [MA-59, "Cummins \(5.0L V8D\) Engine : Fluids and Lubricants"](#).

NOTE:

Oil is refilled up to filler plug hole.

CAUTION:

Oil volume cannot be checked by oil level height.

4. Install the filler plug and tighten to specification.

Filler plug torque : Refer to [DLN-292, "Exploded View"](#).

DIFFERENTIAL LOCK CONTROL UNIT

< REMOVAL AND INSTALLATION >

[REAR FINAL DRIVE: MA248 (ELD)]

REMOVAL AND INSTALLATION

DIFFERENTIAL LOCK CONTROL UNIT

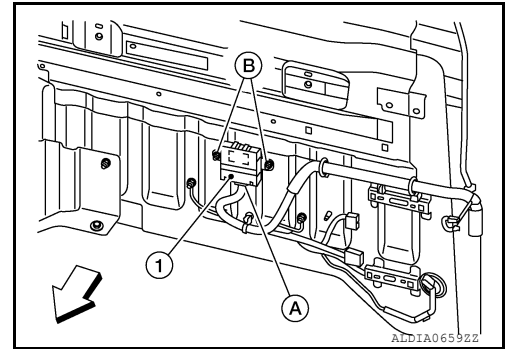
Removal and Installation

INFOID:0000000012544500

REMOVAL

1. Disconnect the battery or batteries. Refer to [PG-174. "Battery Disconnect"](#).
2. Remove jack and tools.
3. Remove upper bracket of center seat belt retractor and belt assembly. Refer to [SB-14. "SEAT BELT RETRACTOR : Removal and Installation"](#).
4. Reposition rear panel out of the way. Refer to [INT-30. "Removal and Installation"](#).
5. Reposition the carpet to access differential lock control unit to disconnect harness connector.
6. Remove the nuts (B) disconnect the harness connector (A) from the differential lock control unit (1) and remove differential lock control unit (1).

⇐ : Front



INSTALLATION

Installation is in the reverse order of removal.

- Tighten the differential lock control unit nuts to the specified torque.

Differential lock control unit nuts : 3.5 N·m (0.36 kg-m, 31 in-lb)

DIFFERENTIAL LOCK MODE SWITCH

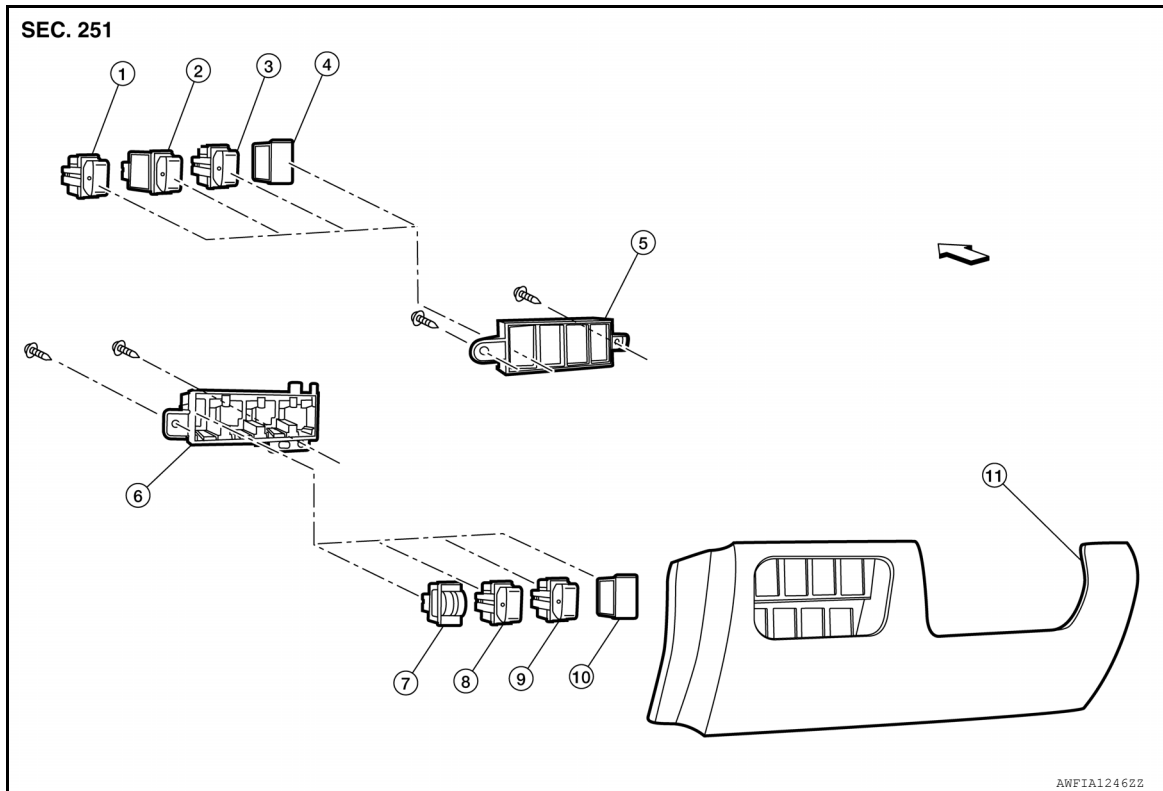
< REMOVAL AND INSTALLATION >

[REAR FINAL DRIVE: MA248 (ELD)]

DIFFERENTIAL LOCK MODE SWITCH

Exploded View

INFOID:000000013516005



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|---|----------------------------------|--------------------------------|
| 1. Front fog lamp switch | 2. AC 120v outlet main switch | 3. Cargo lamp switch |
| 4. Mask | 5. Upper switch carrier | 6. Lower switch carrier |
| 7. Headlamp aiming switch (if equipped) | 8. Differential lock mode switch | 9. Hill descent control switch |
| 10. Mask | 11. Instrument lower panel LH | ⇐ Front |

Removal and Installation

INFOID:000000013516006

REMOVAL

1. Remove instrument lower panel LH, refer to [IP-22. "Removal and Installation"](#).
2. Remove screws from upper switch carrier.
3. Remove upper switch carrier from instrument lower panel LH.
4. Using a suitable tool, release pawls and remove differential lock mode switch.

INSTALLATION

Installation is in the reverse order of removal.

DIFFERENTIAL LOCK POSITION SWITCH

< REMOVAL AND INSTALLATION >

[REAR FINAL DRIVE: MA248 (ELD)]

DIFFERENTIAL LOCK POSITION SWITCH

Removal and Installation

INFOID:000000012544501

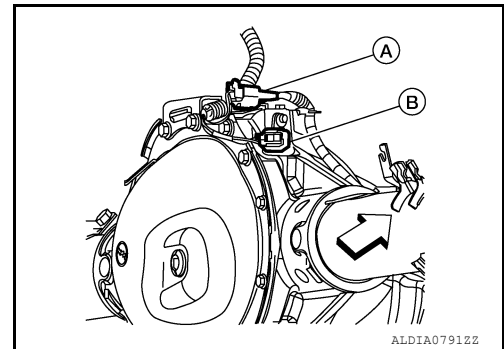
REMOVAL

CAUTION:

- Be careful not to damage spline, companion flange and front oil seal when removing propeller shaft.
- Before removing rear final drive assembly or rear axle assembly, disconnect ABS sensor harness connector from the assembly and move it away from rear final drive assembly/rear axle assembly area. Failure to do so may result in sensor wires being damaged and sensor becoming inoperative.

1. Drain rear final drive gear oil. Refer to [DLN-279, "Draining"](#).
2. Remove rear propeller shaft. Refer to [DLN-133, "Removal and Installation"](#).
3. Remove rear axle shafts (LH/RH). Refer to [RAX-6, "Removal and Installation"](#).
4. Remove the carrier cover. Refer to [DLN-289, "Removal and Installation"](#).
5. Remove differential lock solenoid harness connector (B) bolt and disconnect differential lock position harness connector (A) from the differential lock position switch.

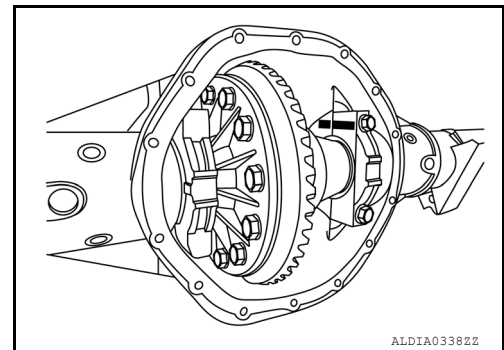
⇐ : Front



6. For installation, apply a paint matching mark (1) on one side of side bearing cap.

CAUTION:

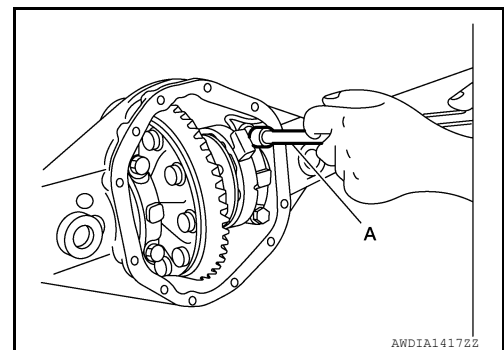
- Side bearing caps are line-board for initial assembly. The matching marks are used to install them in their original positions.
- For matching mark, use paint. Do not damage side bearing cap.



7. Remove side bearing caps using suitable tool.

CAUTION:

- Do not use power tool to remove side bearing caps.



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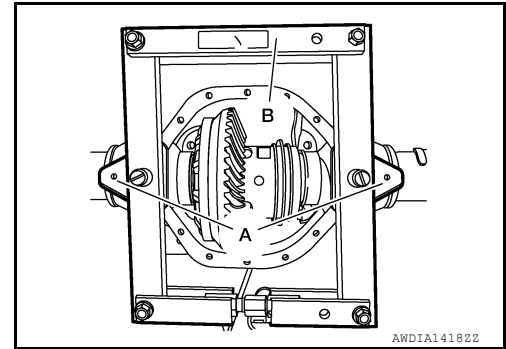
DIFFERENTIAL LOCK POSITION SWITCH

< REMOVAL AND INSTALLATION >

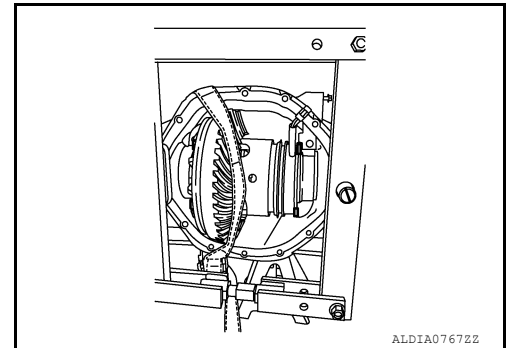
[REAR FINAL DRIVE: MA248 (ELD)]

8. Install Tool (A) and Tool (B) to spread the gear carrier.

Tool (A) : — (J-51043)
Tool (B) : — (J-24385-C)



9. Support differential assembly with strap and remove enough to disengage differential lock position switch.



10. Remove differential lock position switch.

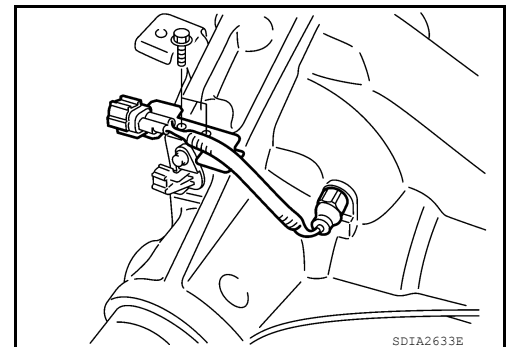
INSTALLATION

1. Apply sealant to threads of differential lock position switch.
• Use Genuine Silicone RTV or equivalent. Refer to [GI-22. "Recommended Chemical Products and Sealants"](#).

CAUTION:

Remove old sealant adhering to gear carrier and differential lock position switch. Also remove any moisture, oil, or foreign material adhering to application and gear carrier and differential lock position switch.

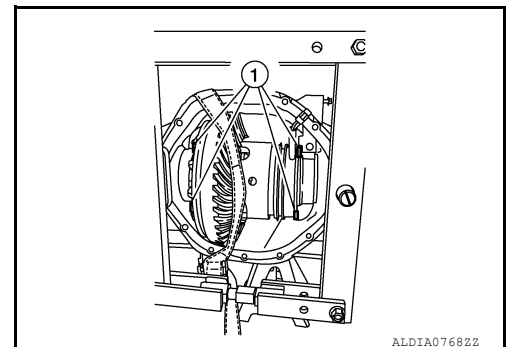
2. Install differential lock position switch on gear carrier and tighten differential lock position switch bolts with the specified torque. Refer to [DLN-292. "Exploded View"](#).



3. Slide the differential assembly back into position.

CAUTION:

Make sure the anti-rotation tabs (1) are aligned vertically.



DIFFERENTIAL LOCK POSITION SWITCH

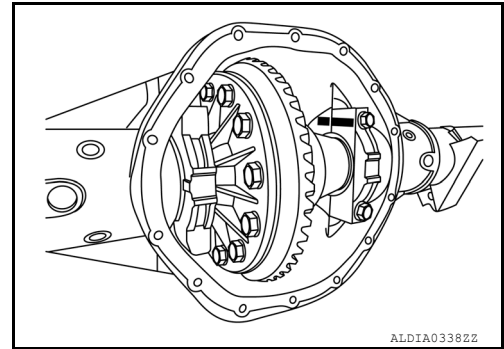
< REMOVAL AND INSTALLATION >

[REAR FINAL DRIVE: MA248 (ELD)]

- 4. Align paint matching mark on side bearing caps with that on gear carrier and install side bearing caps on gear carrier without tightening to specification.

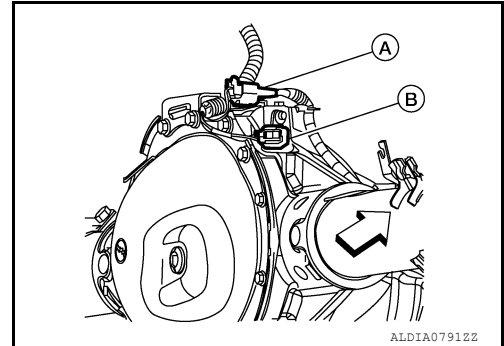
CAUTION:

Do not tighten at this point. This allows further tightening of side bearing adjusters.



- 5. Connect differential lock solenoid harness (B) and differential lock position switch harness connector (A). Then install it to gear carrier, tighten to the specified torque. Refer to [DLN-292, "Exploded View"](#).

⇐ : Front



- 6. Adjust backlash of drive gear and drive pinion. Refer to [DLN-292, "Disassembly and Assembly"](#).
- 7. Check total preload torque. Refer to [DLN-292, "Disassembly and Assembly"](#).
- 8. Check tooth contact. Refer to [DLN-292, "Disassembly and Assembly"](#).
- 9. Install the carrier cover to the gear carrier. Tighten the bolts to the specified torque. Refer to [DLN-292, "Disassembly and Assembly"](#).
- 10. Installation of the remaining components is in the reverse order of removal.

CAUTION:

Fill the rear final drive assembly with recommended differential gear oil. Refer to [DLN-279, "Refilling"](#).

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FRONT OIL SEAL

Removal and Installation

INFOID:000000012544502

REMOVAL

1. Drain the differential gear oil. Refer to [DLN-181, "Draining"](#).
2. Disconnect rear propeller shaft and support the propeller shaft using suitable wire. Refer to [DLN-133, "Removal and Installation"](#).
3. Remove the axle shaft assemblies (LH/RH). Refer to [RAX-6, "Removal and Installation"](#).
4. Measure the total preload torque. Refer to [DLN-189, "Disassembly and Assembly"](#).

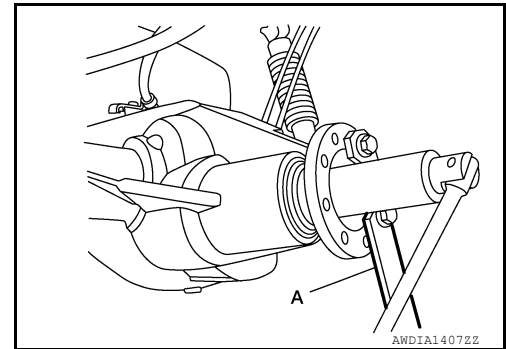
NOTE:

Record the total preload torque measurement.

5. Remove the drive pinion nut using suitable tool (A).

CAUTION:

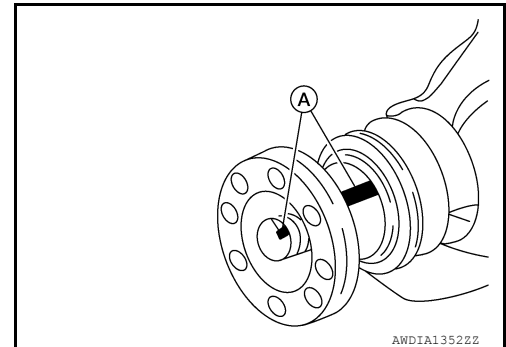
- Do not use power tool to remove drive pinion lock nut.
- Do not reuse drive pinion lock nut or washer.



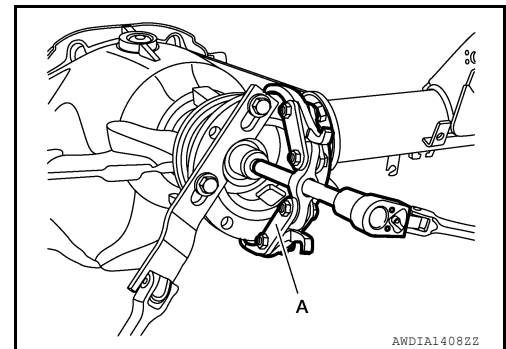
6. Put matching marks (A) on the companion flange and drive pinion using paint.

CAUTION:

Use paint to make the matching marks. Do not damage the companion flange or drive pinion.



7. Remove the companion flange using suitable tool (A).



FRONT OIL SEAL

< REMOVAL AND INSTALLATION >

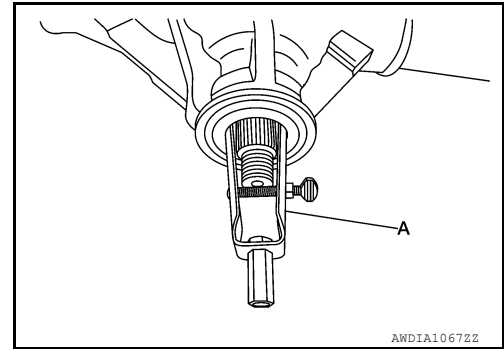
[REAR FINAL DRIVE: MA248 (ELD)]

8. Remove the front oil seal using Tool (A).

CAUTION:

Do not reuse front oil seal.

Tool (A) : — (J-26941)



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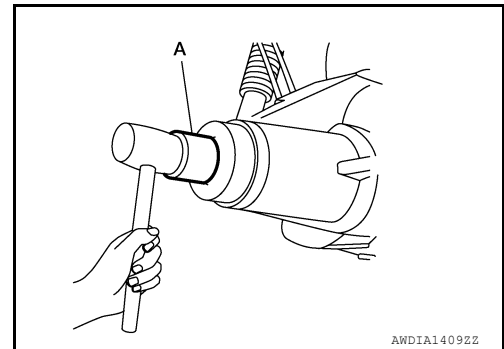
INSTALLATION

1. Clean the threads and splines of the drive pinion.
2. Apply multi-purpose grease to the lips of the new front oil seal then drive the new front oil seal in evenly until it becomes flush with the gear carrier using Tool (A).

Tool number : — (J-50982)

CAUTION:

- Do not reuse front oil seal.
- Do not incline the new front oil seal when installing.
- Apply multi-purpose grease to the lips and differential gear oil to the circumference of the new front oil seal.



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3. Apply spline sealant 1.5mm (0.059 in) diameter bead 360 degrees around splines inside of the companion flange and install it on the drive pinion, aligning the matching marks.
 - Use spline sealant (Loctite 565) or equivalent. Refer to [GI-22, "Recommended Chemical Products and Sealants"](#).
4. Install the new drive pinion lock nut and washer and temporarily tighten using Tool (A).

Tool number (A): — (J-45012)

CAUTION:

- Do not use power tool to install drive pinion lock nut.
- Do not reuse drive pinion lock nut or washer.

5. Measure the total preload torque as necessary using Tool (B).
 - a. Use the Pre-measured total preload torque recorded during removal and add an additional preload torque "A" to the recorded pre-measured value. Use this calculated value when adjusting the total preload torque "T", when not replacing the collapsible spacer.

Pre-measured total preload torque + Additional torque "A" = Total preload torque "T"

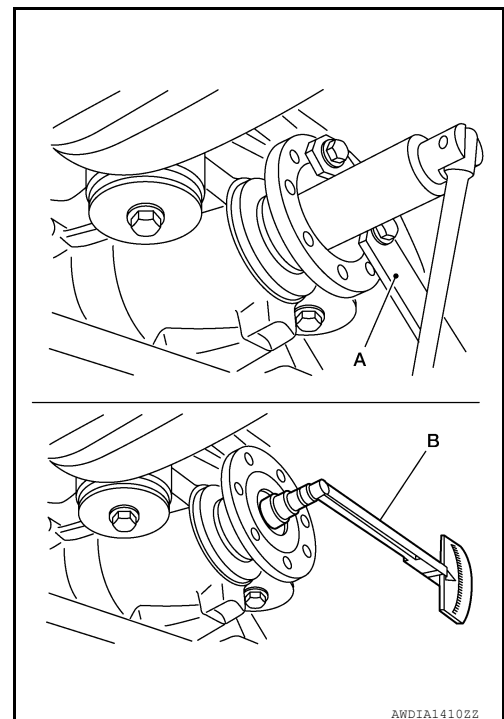
Additional preload torque "A" : Refer to [DLN-306, "Pre-load Torque"](#).

Total preload torque "T" : Refer to [DLN-306, "Pre-load Torque"](#).

- b. Tighten drive pinion lock nut in increments and measure total preload torque several times to prevent overtightening.

CAUTION:

Do not loosen drive pinion lock nut to adjust the total preload torque. If the total preload torque exceeds the specifications, replace the collapsible spacer and tighten it again to adjust. Refer to [DLN-189, "Disassembly and Assembly"](#).



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FRONT OIL SEAL

< REMOVAL AND INSTALLATION >

[REAR FINAL DRIVE: MA248 (ELD)]

- c. Rotate the drive pinion several times, each time the drive pinion lock nut is tightened to seat the pinion bearings.
CAUTION:
After adjustment, rotate drive pinion back and forth 2 to 3 times to check for unusual noise, rotation malfunction, and other malfunctions.
6. Installation of the remaining components is in the reverse order of removal.
CAUTION:
Check the differential gear oil level after installation. Refer to [DLN-181, "Inspection"](#).

CARRIER COVER

< REMOVAL AND INSTALLATION >

[REAR FINAL DRIVE: MA248 (ELD)]

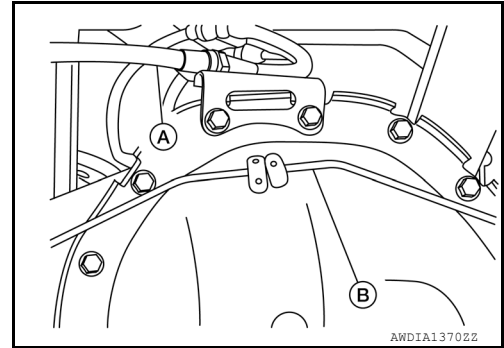
CARRIER COVER

Removal and Installation

INFOID:000000012544503

REMOVAL

1. Drain the differential gear oil. Refer to [DLN-279, "Draining"](#).
2. Remove the rear stabilizer bar clamps and bushings and position rear stabilizer bar out of the way. Refer to [RSU-6, "Exploded View"](#).
3. Disconnect the parking brake cable (A) and brake tube (B) from the carrier cover.



4. Remove the carrier cover bolts and separate the carrier cover from the gear carrier.
CAUTION:
 - Do not damage the mating surface.
 - Do not insert flat-bladed screwdriver, this will damage the mating surface.

INSTALLATION

1. Apply medium strength thread locking sealant into the threaded holes for the carrier cover. install dry carrier cover gasket and carrier cover and bracket and tighten carrier cover bolts to the specification. Refer to [DLN-292, "Exploded View"](#).
CAUTION:
 - If carrier cover gasket is damaged replace it.
 - Remove any moisture, oil, or foreign material adhering to the application and mating surfaces.**NOTE:**
Use Genuine Medium Strength Locking Sealant or equivalent. Refer to [GI-22, "Recommended Chemical Products and Sealants"](#).
2. Connect the parking brake cable and brake tube to the carrier cover.
3. Fill the rear final drive assembly with recommended differential gear oil. Refer to [DLN-279, "Refilling"](#).

REAR FINAL DRIVE ASSEMBLY

< UNIT REMOVAL AND INSTALLATION >

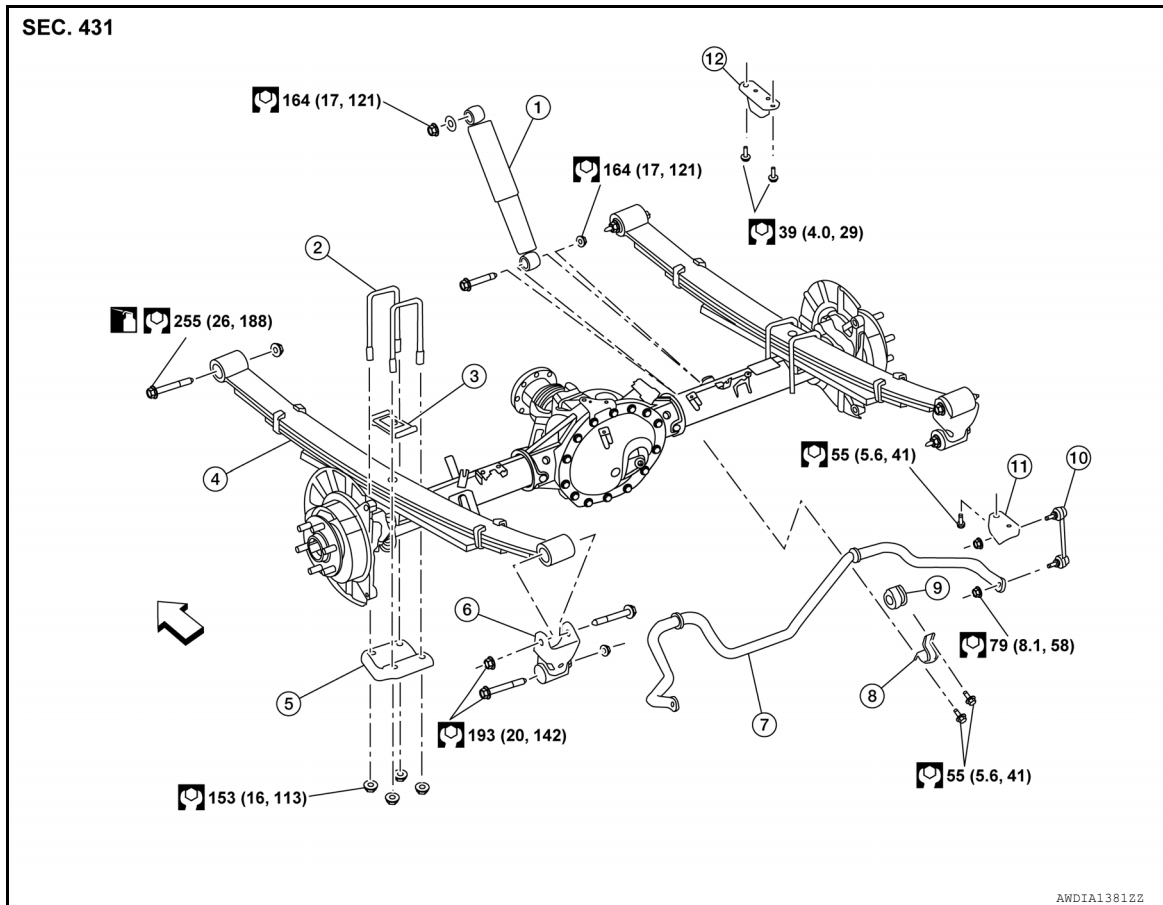
[REAR FINAL DRIVE: MA248 (ELD)]

UNIT REMOVAL AND INSTALLATION

REAR FINAL DRIVE ASSEMBLY

Exploded View

INFOID:000000013407897



- | | | |
|---------------------|----------------------------|---------------------------|
| 1. Shock absorber | 2. Rear spring U-bolts | 3. Rear spring upper seat |
| 4. Rear leaf spring | 5. Rear spring lower seat | 6. Shackle assembly |
| 7. Stabilizer bar | 8. Stabilizer bar clamp | 9. Stabilizer bar bushing |
| 10. Connecting rod | 11. Connecting rod bracket | 12. Bumper assembly |

⇐ Front

Removal and Installation

INFOID:000000012544504

REMOVAL

CAUTION:

- Do not damage spline, companion flange and front oil seal when removing propeller shaft.
- Before removing final drive assembly or rear axle assembly, disconnect ABS sensor harness connector from the assembly and move it away from final drive/rear axle assembly area. Failure to do so may result in sensor wires being damaged and sensor becoming inoperative.

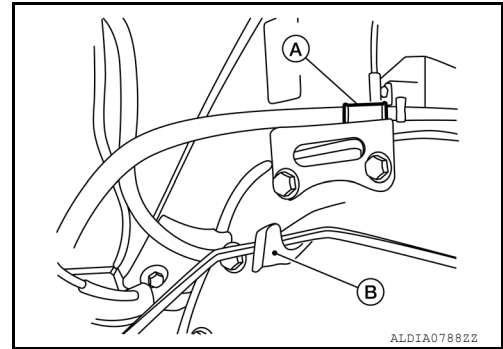
1. Disconnect the propeller shaft from the rear final drive assembly and support the propeller shaft using suitable wire. Refer to [DLN-132, "Exploded View"](#).
2. Disconnect the rear final drive air breather hose from the rear final drive assembly.
3. Disconnect the following components from the rear final drive assembly.
 - Brake tube block connectors. Refer to [BR-25, "REAR : Exploded View"](#).
 - ABS sensor wire harness. Refer to [BRC-163, "Removal and Installation"](#).

REAR FINAL DRIVE ASSEMBLY

< UNIT REMOVAL AND INSTALLATION >

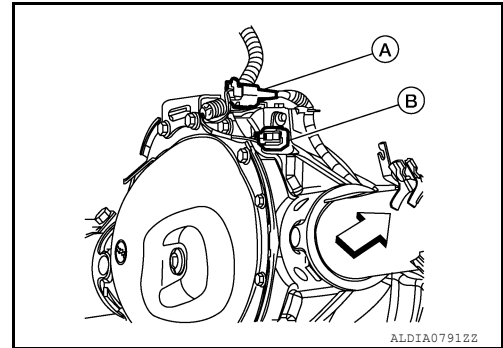
[REAR FINAL DRIVE: MA248 (ELD)]

- Parking brake cable (A).
- Brake tube (B).



- Differential lock position switch harness connector (A).
- Differential lock solenoid harness connector (B).

← : Front



4. Remove the rear stabilizer bar. Refer to [DLN-290, "Exploded View"](#).
5. Disconnect brake hose from brake tube at the mounting clip on top of rear final drive assembly. Then remove the metal clip to disconnect brake line from the mounting clip on top of the rear final drive assembly.
6. Support rear final drive using a suitable jack.
CAUTION:
Secure transfer assembly and transmission assembly to a jack.
7. Remove rear shock absorber lower bolts. Refer to [RSU-10, "Removal and Installation"](#).
8. Remove leaf spring U-bolt nuts. Refer to [RSU-6, "Removal and Installation"](#).
9. Remove rear final drive assembly.
CAUTION:
Secure rear final drive assembly to the jack while removing it.

INSTALLATION

Installation is in the reverse order of removal.

CAUTION:

- **Check the rear final drive assembly differential gear oil after installation. Refer to [DLN-279, "Refilling"](#).**

REAR FINAL DRIVE

< UNIT DISASSEMBLY AND ASSEMBLY >

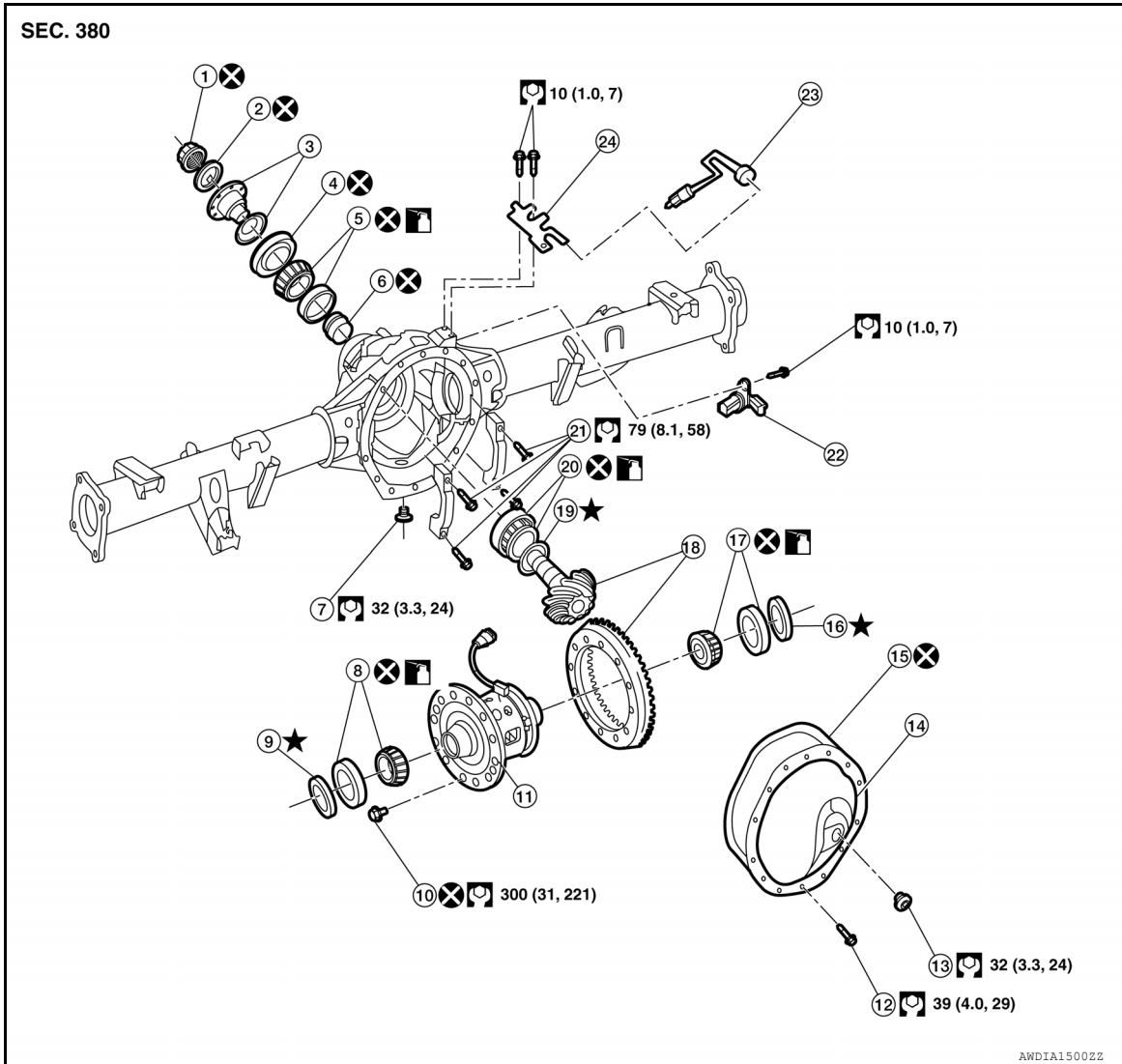
[REAR FINAL DRIVE: MA248 (ELD)]

UNIT DISASSEMBLY AND ASSEMBLY

REAR FINAL DRIVE

Exploded View

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- | | | |
|--|---------------------------------------|--|
| 1. Drive pinion lock nut | 2. Drive pinion lock nut washer | 3. Companion flange assembly |
| 4. Front oil seal | 5. Drive pinion front bearing | 6. Collapsible spacer |
| 7. Drain plug | 8. Side bearing assembly LH | 9. Side bearing adjusting shim LH |
| 10. Ring gear bolts | 11. Differential assembly | 12. Carrier cover bolts |
| 13. Filler plug | 14. Carrier cover | 15. Carrier cover gasket |
| 16. Side bearing adjusting shim RH | 17. Side bearing assembly RH | 18. Drive pinion and drive gear assembly |
| 19. Drive pinion washer | 20. Drive pinion rear bearing | 21. Bearing cap bolts |
| 22. Differential lock sensor connector | 23. Differential lock position switch | 24. Bracket |

Disassembly and Assembly

INFOID:000000012544505

DISASSEMBLY

NOTE:

If disassembly is being done on-vehicle, perform the following prior to disassembly:

REAR FINAL DRIVE

< UNIT DISASSEMBLY AND ASSEMBLY >

[REAR FINAL DRIVE: MA248 (ELD)]

- Disconnect the propeller shaft from the rear final drive and support the propeller shaft using suitable wire. Refer to [DLN-133, "Removal and Installation"](#).
- Remove the spare tire.

Differential Assembly

1. Remove the carrier cover bolts, carrier cover and gasket.

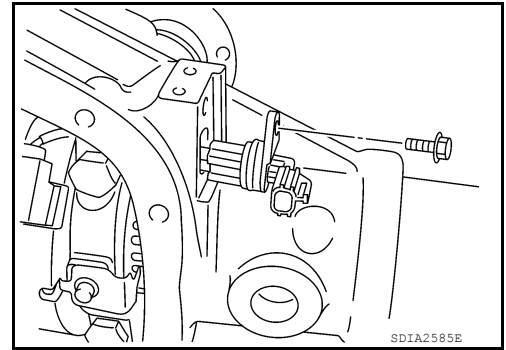
NOTE:

The carrier cover gasket is reusable. Only replace the carrier cover gasket if it is damaged.

CAUTION:

Do not damage the mating surface.

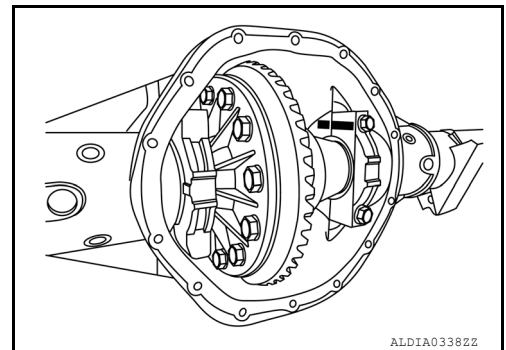
2. Remove sensor connector bolt and disconnect differential lock solenoid connector.



3. For proper reinstallation, paint matching marks on one side of side bearing cap.

CAUTION:

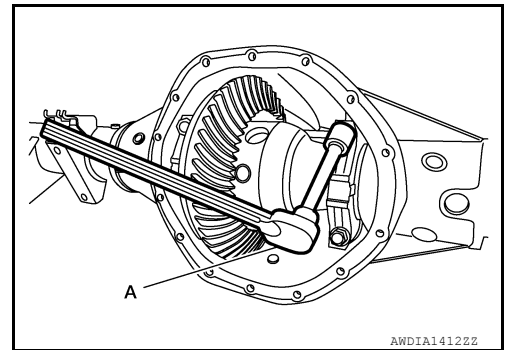
- Side bearing caps are line-board for initial assembly. The matching marks are used to reinstall them in their original positions.
- For matching mark, use paint. Do not damage side bearing cap.



4. Remove side bearing caps using suitable tool (A).

CAUTION:

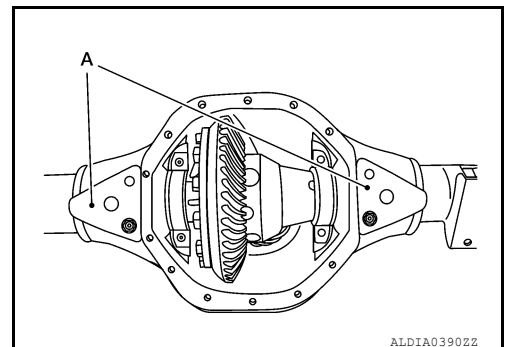
Do not use power tool to remove side bearing caps.



5. Remove differential case assembly.

- a. Attach Tool (A) to gear carrier.

Tool number (A): — (J-51043)



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REAR FINAL DRIVE

< UNIT DISASSEMBLY AND ASSEMBLY >

[REAR FINAL DRIVE: MA248 (ELD)]

- b. Attach Tool (B) to Tool (A) and position Tool (C) in the proper orientation to measure the axle housing spread.

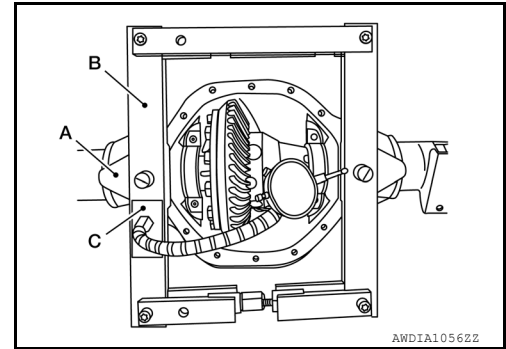
Tool number (A): — (J-51043)
(B): — (J-24385-C)
(C): — (J-45101)

WARNING:

Be cautious when using Tool (A,B), the differential case assembly is heavy and could cause serious injury.

CAUTION:

- Using a dial indicator (C) do not exceed a spread of 0.381mm (0.015 in) when using axle housing spreader.
- Remove Tool from gear carrier immediately after differential case removal, to avoid damage to gear carrier.



6. Remove side bearing outer races and side bearing adjusting shims. Keep side bearing and outer races together. Do not mix them up. Also, keep side bearing adjusting shims together with bearings.

CAUTION:

If reusing side bearing outer races and side bearing adjusting shims:

- Do not mix them up.
- Tag the side bearing outer races and the side bearing adjusting shims so they are installed in the same position they were removed from.

7. Remove side bearing using Tool (A) and suitable tool.

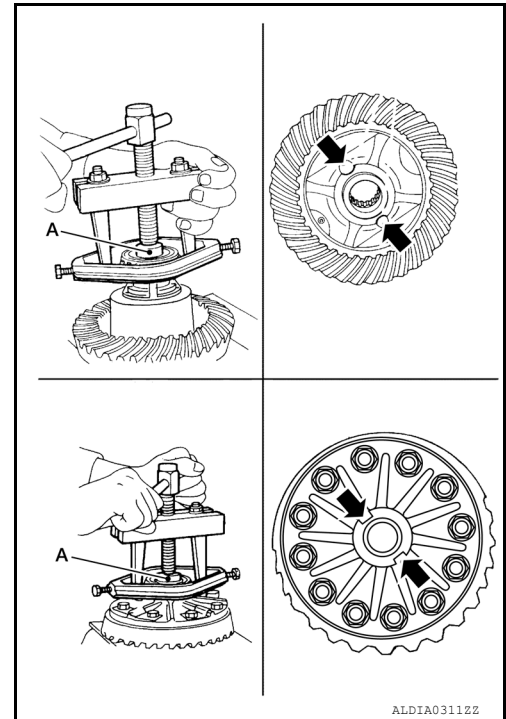
Tool (A): — (J-51047)

CAUTION:

- Engage puller jaws in groove (↔) to prevent damage.
- To prevent damage to the side bearing and drive gear, place copper plates between these parts and vise.
- Do not reuse side bearing if removed. Replace side bearing and bearing outer race as a set.

NOTE:

It is not necessary to remove side bearing except if it needs to be replaced.



8. For proper reinstallation, paint matching mark on differential case assembly and drive gear.

CAUTION:

Use paint for matching marks. Do not damage differential case or drive gear

REAR FINAL DRIVE

< UNIT DISASSEMBLY AND ASSEMBLY >

[REAR FINAL DRIVE: MA248 (ELD)]

9. Remove drive gear bolts.

Tool (A) : — (J-51044)

CAUTION:

- Secure the differential assembly in a vise using Tool (A).
- Drive gear bolts are left hand threaded.
- Do not damage drive gear by removing bolts improperly.

10. Tap the drive gear off the differential assembly uniformly using suitable tool.

CAUTION:

- Tap evenly all around to keep drive gear from binding.
- Do not pry.
- Do strike top of drive gear bolts to remove the drive gear.

NOTE:

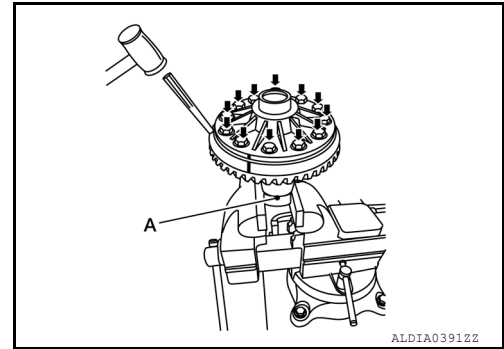
Do not disassemble the differential assembly, it is not serviceable. Replace it as an assembly if necessary.

Drive Pinion Assembly

NOTE:

If assembly is being done on-vehicle, perform the following prior to after assembly:

- Install the propeller shaft to the rear final drive. Refer to [DLN-133, "Removal and Installation"](#).
 - Install the spare tire.
1. Remove differential case assembly. Refer to [DLN-292, "Disassembly and Assembly"](#).
 2. Remove drive pinion lock nut and washer using suitable tool (A).



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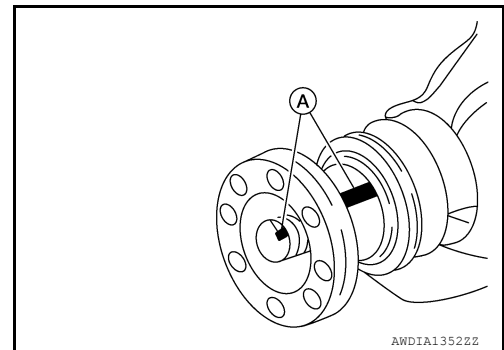
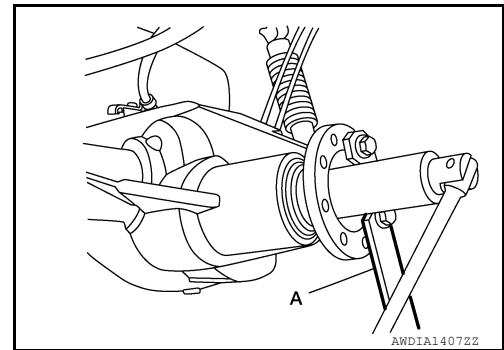
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3. Put matching marks on the companion flange at location (A) and drive pinion using paint as shown.

CAUTION:

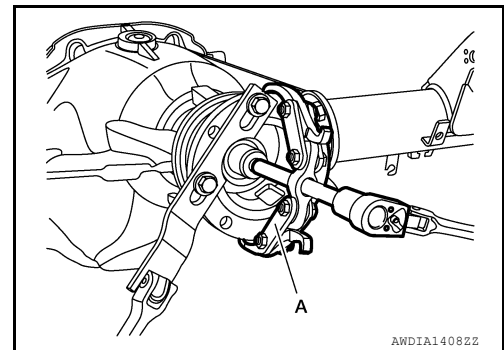
Use paint to make the matching marks. Do not damage the companion flange or drive pinion.



4. Remove companion flange using a suitable tool (A).

CAUTION:

Do not reuse the deflector.



REAR FINAL DRIVE

< UNIT DISASSEMBLY AND ASSEMBLY >

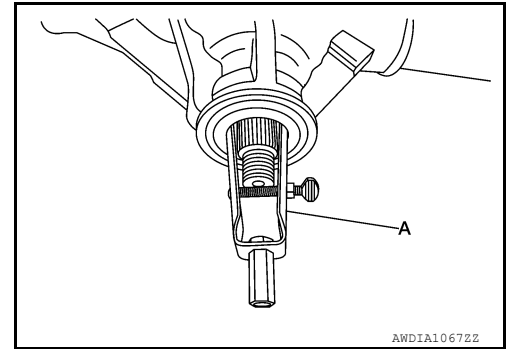
[REAR FINAL DRIVE: MA248 (ELD)]

5. Remove front oil seal using Tool (A).

Tool number : — (J-26941)

CAUTION:

Do not damage gear carrier.

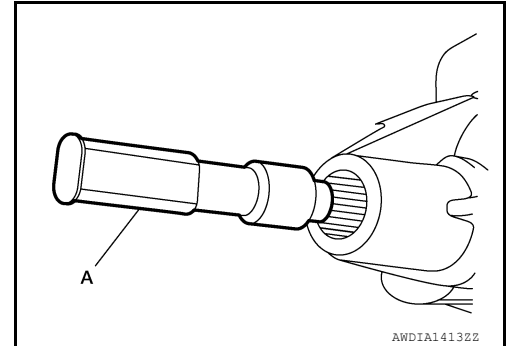


6. Remove drive pinion assembly using Tool (A).

CAUTION:

Do not drop drive pinion assembly.

Tool number : — (J-44421)



7. Remove drive pinion front bearing thrust washer.

8. Remove drive pinion front bearing.

CAUTION:

Do not reuse drive pinion front bearing.

9. Remove collapsible spacer from drive pinion assembly and discard collapsible spacer.

CAUTION:

Do not reuse the collapsible spacer.

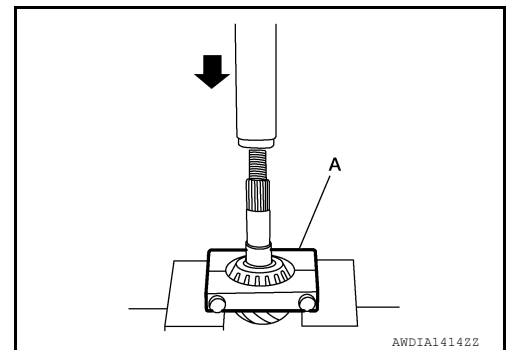
10. Remove drive pinion rear bearing and drive pinion washer using suitable tool (A).

NOTE:

- The drive pinion washer is matched to the carrier for proper drive pinion height. No drive pinion height adjustment is necessary if reusing original drive pinion washer.

CAUTION:

- Do not reuse drive pinion rear bearing.
- Do not discard drive pinion washer, reuse if not damaged.

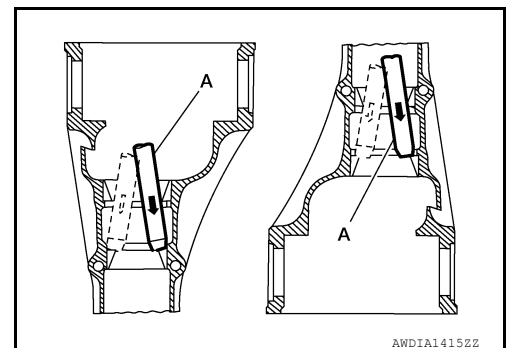


11. Clean threads and splines of the drive pinion, if reusing drive pinion.

12. Tap drive pinion front and rear bearing outer races uniformly using suitable tool (A) to remove.

CAUTION:

- Do not reuse bearing outer races. Replace bearing and outer races as a set.
- Do not damage gear carrier.



INSPECTION AFTER DISASSEMBLY

Clean and inspect the disassembled parts. If part are worn or damaged, follow the measures below.

Drive Pinion and Drive Gear

REAR FINAL DRIVE

< UNIT DISASSEMBLY AND ASSEMBLY >

[REAR FINAL DRIVE: MA248 (ELD)]

- If the drive pinion and drive gear teeth do not mesh or line-up correctly, determine the cause and adjust, repair, or replace as necessary.
- If the drive pinion or drive gear are worn, cracked, damaged, pitted or chipped (by friction) noticeably, replace with new drive pinion and drive gear.
- Drive pinion and drive gear are supplied in matched sets only. Matching numbers on both drive pinion and drive gear are etched for verification. If a new drive pinion and drive gear set are being used, verify the numbers of each drive pinion and drive gear before proceeding with assembly.

Bearing

- If bearings are chipped (by friction), pitted, worn, rusted, scratched, or unusual noise is coming from bearing, replace with new bearing assembly (as a new set).
- Bearing must be replaced with a new one whenever disassembled.

Side Gear and Pinion Mate Gear

- If any cracks or damage are found on the surface of the teeth, replace case assembly.
- If any worn or chipped marks are found on the side of the side gear and pinion mate gear which contact the thrust washer, replace case assembly.

Drive Pinion Washer

- If any chips (by friction), damage, or unusual wear are found, replace with new one. Refer to ASSEMBLY INSPECTION AND ADJUSTMENT.

Side Bearing Adjusting Shim

- If any chips (by friction), damage, or unusual wear are found, replace with new one. Refer to ASSEMBLY INSPECTION AND ADJUSTMENT.

Gear Carrier

- If any wear or cracks are found on the contact sides of gear carrier, replace with new one.

Companion Flange

- If any chips or other damage on the companion flange surface which contacts the front oil seal lips are found, replace with new one.

Differential Case Assembly

- If any wear or cracks are found on the case assembly, replace with new one.

ASSEMBLY

Drive Pinion Assembly

NOTE:

If assembly is being done on-vehicle, perform the following after assembly:

- Connect the propeller shaft to the rear final drive. Refer to [DLN-133, "Removal and Installation"](#).
- Install the spare tire.

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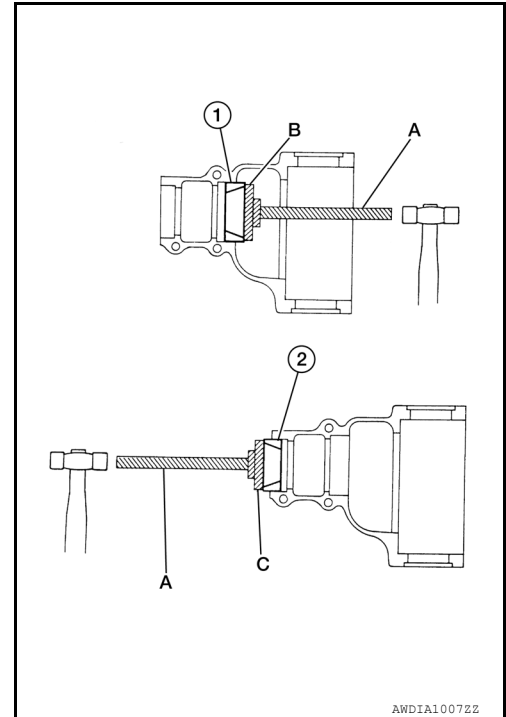
[REAR FINAL DRIVE: MA248 (ELD)]

1. Install the new drive pinion front bearing outer race (2) and the new drive pinion rear bearing outer race (1), using Tools (A, B, C).

Tool (A): — (J-8092)
Tool (B): — (J-51040)
Tool (C): — (J-51041)

CAUTION:

Do not reuse drive pinion front and rear bearing outer race. Replace with bearing as a set.

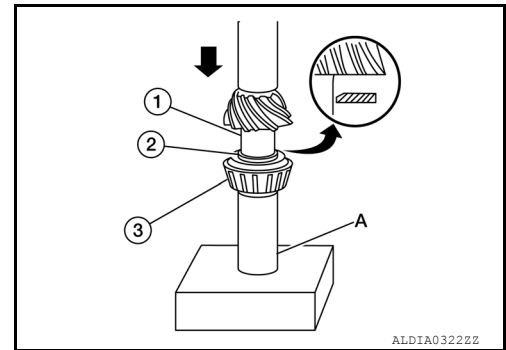


2. Install the drive pinion washer (2) to the drive pinion (1). Press on the new drive pinion rear bearing (3) using Tool (A) and suitable tool.

Tool (A): — (J-44412)

CAUTION:

- Install the drive pinion washer in the proper direction as shown.
- Do not reuse drive pinion rear bearing.
- Be sure that drive pinion rear bearing is properly seated to the drive pinion.



3. Assemble the new collapsible spacer to the drive pinion.

CAUTION:

Do not reuse collapsible spacer.

4. Apply differential gear oil to the drive pinion rear bearing, and install the drive pinion assembly into the gear carrier.
 5. Apply differential gear oil to the new drive pinion front bearing and install it onto the pinion assembly.
- CAUTION:**
Do not reuse drive pinion front bearing.
6. Install the companion flange and washer onto the drive pinion.
 7. Seat the drive pinion bearing using Tool.

Tool — (J-51048)

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< UNIT DISASSEMBLY AND ASSEMBLY >

[REAR FINAL DRIVE: MA248 (ELD)]

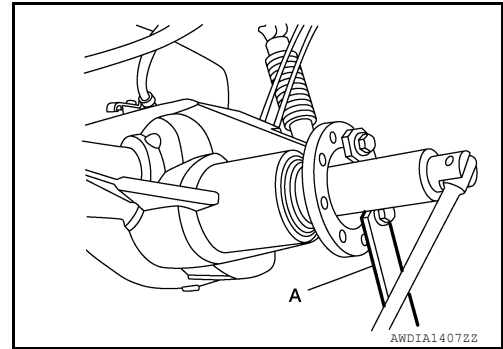
If no Tool is available to seat the drive pinion bearing, perform the following.

a. Using the old washer and drive pinion lock nut, tighten the drive pinion lock nut using suitable tool (A) until the hand-felt lash has been removed.

CAUTION:

Do not use power tool to seat the drive pinion bearing.

b. Remove the drive pinion lock nut, washer and companion flange using suitable tools.

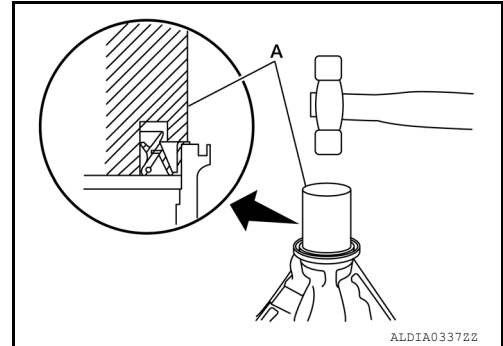


8. Install the new front oil seal in evenly until it becomes flush with the gear carrier using Tool (A).

Tool : — (J-50982)

CAUTION:

- Do not reuse front oil seal.
- Do not incline the new front oil seal when installing.
- Apply multi-purpose grease to the lips of the new front oil seal.

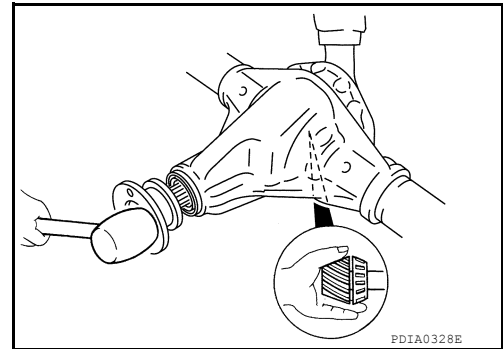


9. Apply spline sealant 1.5 mm (0.059 in) diameter bead 360 degrees around splines inside of the pinion flange and install the companion flange to the drive pinion, aligning the matching marks.

CAUTION:

Do not damage companion flange, deflector or front oil seal.

- Use Spline Sealant (Loctite 565) or equivalent. Refer to [GI-22, "Recommended Chemical Products and Sealants"](#).



10. Install the new drive pinion lock nut and washer and temporarily tighten using Tool (A).

Tool : — (J-45012)

CAUTION:

- Do not use power tool to install drive pinion lock nut.
- Do not reuse drive pinion lock nut or washer.

11. Adjust the drive pinion preload torque using suitable tool (B).

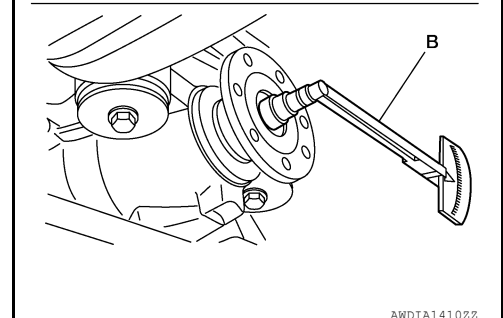
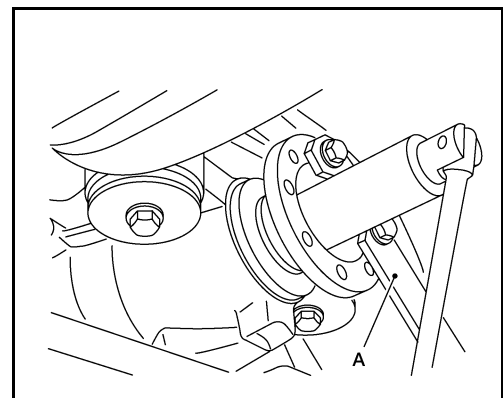
Drive pinion bearing pre-load torque : Refer to [DLN-306, "Pre-load Torque"](#)

Tool : — (J-25765-B)

- a. Tighten drive pinion lock nut in small increments and measure drive pinion bearing preload torque several times to prevent overtightening.
- b. Rotate the drive pinion several times, each time the drive pinion lock nut is tightened to seat the drive pinion bearings.

CAUTION:

- Do not loosen drive pinion lock nut to adjust the drive pinion bearing preload torque. If the drive pinion bearing preload torque exceeds specification, disassemble and



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replace the collapsible spacer and the drive pinion front bearing. Then tighten it again to adjust. Refer to [DLN-292, "Exploded View"](#).

- After adjustment, rotate drive pinion back and forth two to three times to check for unusual noise, rotation malfunction, and other malfunctions.
12. Check companion flange runout. Refer to [DLN-292, "Disassembly and Assembly"](#).
 13. Install differential case assembly. [DLN-292, "Disassembly and Assembly"](#).

Differential Assembly

NOTE:

Do not disassemble differential assembly, it is not serviceable. Replace it as an assembly.

1. Secure the differential assembly in a vice using Tool (A)

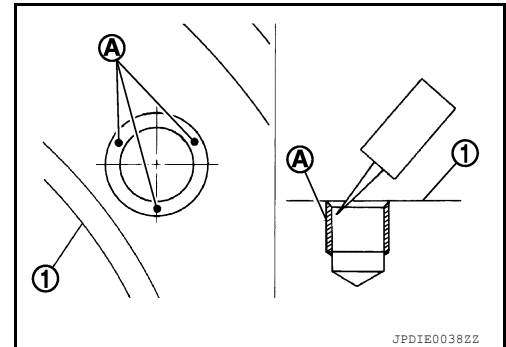
Tool : — (J-51044)

2. Apply thread locking sealant the point (A) into the thread hole for the drive gear (1).

Use Genuine High Strength thread locking Sealant or equivalent. Refer to [GI-22, "Recommended Chemical Products and Sealants"](#).

CAUTION:

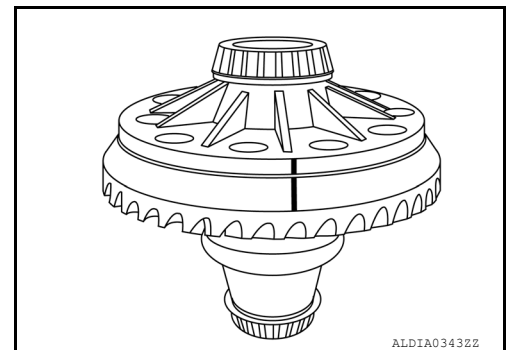
- Completely clean and degrease the drive gear back face, thread holes.
- Apply thread locking sealant onto the first and second threads under the thread hole chamfering of the drive gear on three or more different points.
- Use genuine high strength thread locking sealant or equivalent. Refer to [GI-22, "Recommended Chemical Products and Sealants"](#).



3. Align the matching mark of the differential case with the mark of the drive gear (if reusing drive gear), then hand thread all the drive gear bolts to the drive gear.

CAUTION:

- Drive gear bolts are left hand threaded.
- Do not reuse drive gear bolts.



4. Draw the gear onto the differential case by tightening drive gear in a crisscross pattern.

CAUTION:

- Do not use power tool to tighten drive gear bolts
- Drive gear bolts are left hand threaded.

5. Tighten the drive gear bolts to specification:

Drive gear torque specification : Refer to [DLN-189, "Exploded View"](#).

CAUTION:

- Do not reuse drive gear bolts.
- Tighten drive gear bolts in a crisscross pattern.
- Drive gear bolts are left hand threaded.

6. Apply sealant to threads of differential lock position switch.

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

CAUTION:

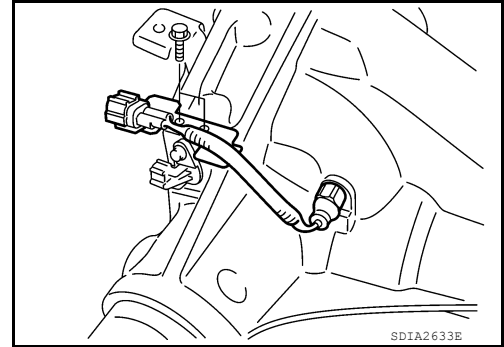
Remove old sealant adhering to gear carrier and differential lock position switch. Also remove any moisture, oil, or foreign material adhering to application and gear carrier and differential lock position switch.

REAR FINAL DRIVE

< UNIT DISASSEMBLY AND ASSEMBLY >

[REAR FINAL DRIVE: MA248 (ELD)]

7. Install differential lock position switch on gear carrier and tighten differential lock position switch bolts to the specified torque.



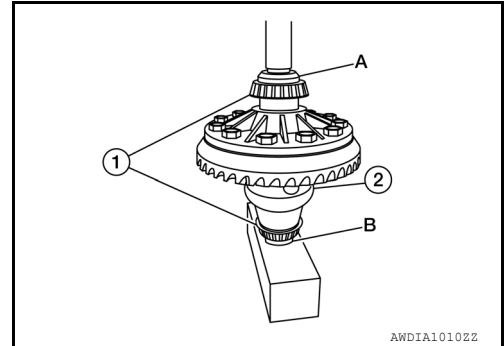
8. Press the new side bearings (1) onto the differential case (2) using Tools (A) and Tool (B).

Tool (A): — (J-51045 or J-51046)

Tool (B): — (J-51047)

CAUTION:

- Do not reuse side bearing inner race if removed.
- Be sure that the side bearings are properly seated onto the differential case.

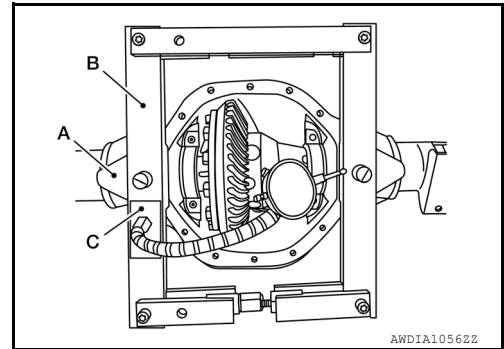


9. If Tool was removed after disassembly reinstall Tools (A, B, C).

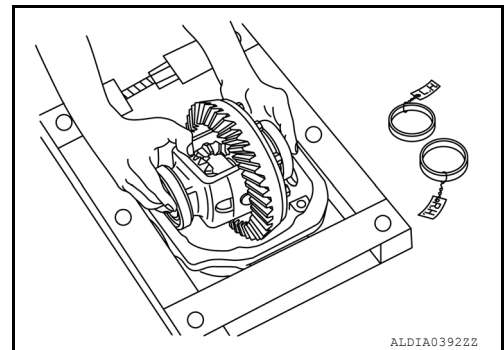
Tool number (A): — (J-51043)

(B): — (J-24385-C)

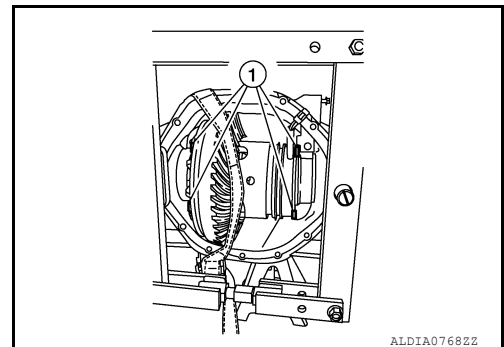
(C): — (J-45101)



10. Apply gear oil to side bearings. Install differential case assembly with side bearing outer races into gear carrier.



11. Be sure to align anti rotation tabs vertically.



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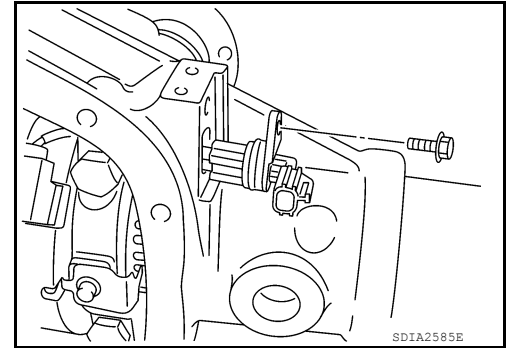
[REAR FINAL DRIVE: MA248 (ELD)]

12. Apply multi-purpose grease to new sensor connector.

CAUTION:

Do not reuse sensor connector.

13. Connect differential lock solenoid harness to new sensor connector. Then install new sensor connector to gear carrier and tighten to the specified torque.



14. Insert the left and right side bearing adjusting shims (2) in place between the side bearing outer race (3) and gear carrier (1) using Tool (A).

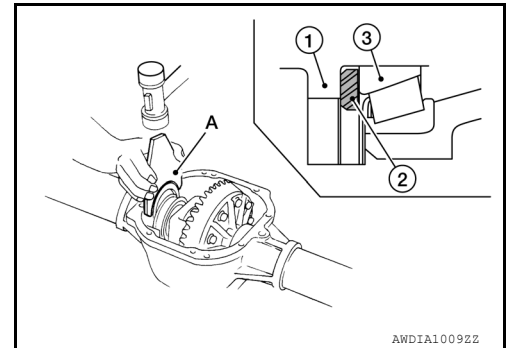
Tool (A): — (J-51042)

CAUTION:

- Install the side bearing adjusting shims in the proper direction as shown.
- Do not strike the side bearing adjusting shims with a hammer.

NOTE:

Use axle housing spreader tool if necessary.

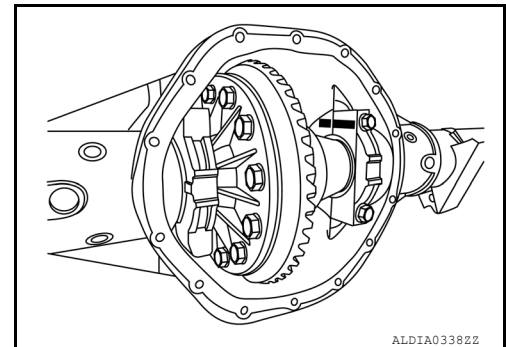


15. Align paint matching marks on side bearing caps with those on gear carrier and install side bearing caps on gear carrier.

Side bearing cap bolt torque specification : Refer to [DLN-189, "Exploded View"](#).

CAUTION:

Tighten side bearing cap bolts in a criss cross pattern.



16. Check and adjust backlash, tooth contact and total preload torque. Refer to [DLN-292, "Disassembly and Assembly"](#).

17. Install the carrier cover and gasket to the gear carrier. Refer to [DLN-289, "Removal and Installation"](#).

INSPECTION AND ADJUSTMENT

- Drain the differential gear oil before inspection and adjustment. Refer to [DLN-279, "Draining"](#).
- Remove the axle shaft assemblies (RH/LH) before inspection and adjustment.
- Disconnect the propeller shaft from the rear final drive assembly and support the propeller shaft. Refer to [DLN-132, "Exploded View"](#).
- Remove and install the carrier cover as necessary for inspection and adjustment. Refer to [DLN-289, "Removal and Installation"](#).

Total Preload Torque

1. Rotate the drive pinion back and forth 2 to 3 times to check for unusual noise and rotation malfunction.
2. Rotate the drive pinion at least 20 times to check for smooth operation of the bearings.

REAR FINAL DRIVE

< UNIT DISASSEMBLY AND ASSEMBLY >

[REAR FINAL DRIVE: MA248 (ELD)]

3. Measure total preload torque using Tool (A).

Total preload torque : Refer to [DLN-306, "Pre-load Torque"](#).

Tool : ST3127S000 (J-25765-A)

NOTE:

Total preload torque = Drive pinion bearing preload torque + Side bearing preload torque

- If the measured value is greater than specification, adjust as necessary.
- Adjust the drive pinion bearing preload torque first, then adjust the total preload torque by selecting side bearing adjusting shims.
- The differential gear case assembly must be removed to adjust the drive pinion bearing preload.

If the total preload torque is greater than specification

On drive pinion bearings : Replace collapsible spacer.

On side bearings : Use thinner side bearing adjusting washers by the same amount on each side. Refer to [DLN-202, "Preload Torque"](#).

If the total preload torque is less than specification

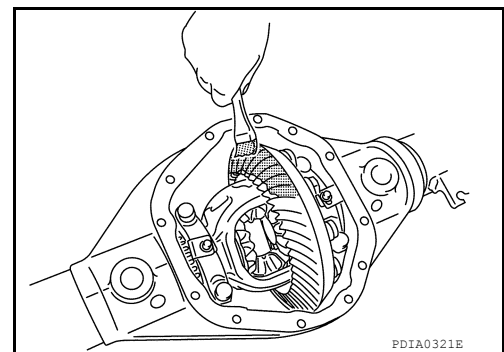
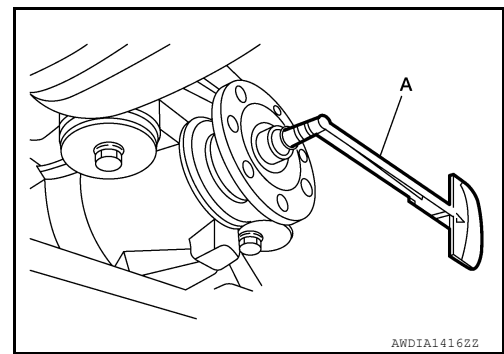
On drive pinion bearings : Tighten drive pinion lock nut.

On side bearings : Use thicker side bearing adjusting washers by the same amount on each side. Refer to [DLN-202, "Preload Torque"](#).

Tooth Contact

Checking gear tooth contact pattern is necessary to verify correct relationship between drive gear and drive pinion. Gears which are not positioned in proper arrangement may be noisy and/or have a short life. Check gear tooth contact pattern to obtain the best contact for low noise and long life.

1. Thoroughly clean drive gear and drive pinion teeth.
2. Apply red lead to the drive gear.
 - Apply red lead to both faces all gears then check all gears.



REAR FINAL DRIVE

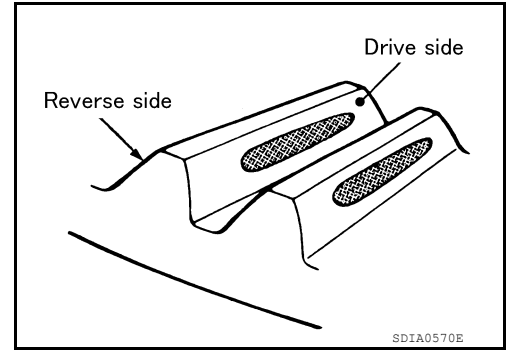
< UNIT DISASSEMBLY AND ASSEMBLY >

[REAR FINAL DRIVE: MA248 (ELD)]

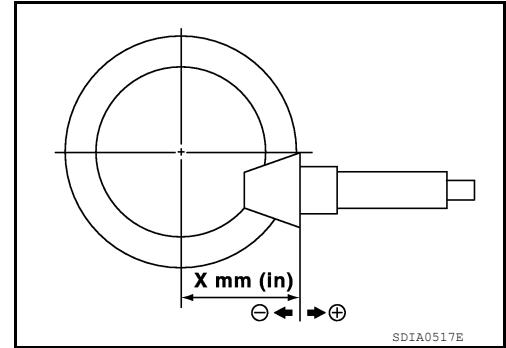
3. Rotate the drive gear back and forth several times. Then check for correct drive pinion to drive gear tooth contact as shown.

CAUTION:

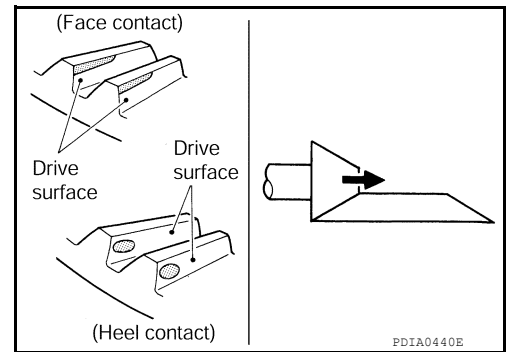
Check tooth contact on drive side and reverse side.



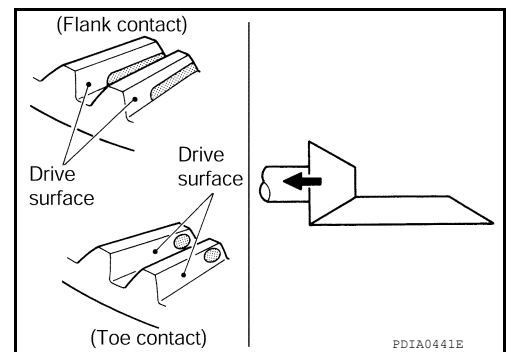
4. If the tooth contact is improperly adjusted, follow the procedure below to adjust the pinion height (dimension X).



- If the tooth contact is near the face (face contact), or near the heel (heel contact), use a thicker drive pinion height adjusting washers to move the drive pinion closer to the drive gear. Refer to [DLN-292, "Exploded View"](#).



- If the tooth contact is near the flank (flank contact), or near the toe (toe contact), use a thinner drive pinion height adjusting washers to move the drive pinion farther from the drive gear. Refer to [DLN-292, "Exploded View"](#).



Backlash

REAR FINAL DRIVE

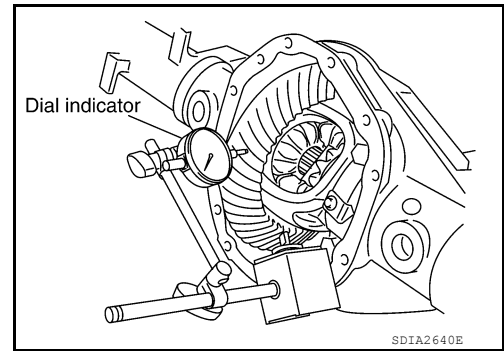
< UNIT DISASSEMBLY AND ASSEMBLY >

[REAR FINAL DRIVE: MA248 (ELD)]

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

Backlash : Refer to [DLN-306, "Backlash"](#).

- If the backlash is outside of the specification, change the thickness of each side bearing adjusting shim.



If the total preload torque is greater than specification

On drive pinion bearings : Replace collapsible spacer.

On side bearings : Use thinner side bearing adjusting washers by the same amount on each side. Refer to [DLN-306, "Preload Torque"](#).

If the total preload torque is less than specification

On drive pinion bearings : Tighten drive pinion lock nut.

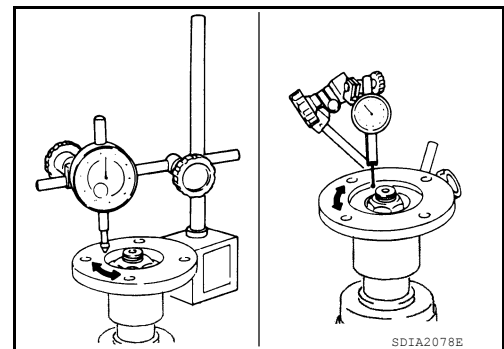
On side bearings : Use thicker side bearing adjusting washers by the same amount on each side. Refer to [DLN-306, "Preload Torque"](#).

CAUTION:

Do not change the total thickness of side bearing adjusting shims as it will change the total preload torque.

Companion Flange Runout

1. Rotate companion flange and check for runout on the companion flange face (inner side of the bolt holes) and companion flange inner side (socket diameter) using suitable tool. Refer to [DLN-307, "Companion Flange Runout"](#).
2. If the runout is outside the runout limit, follow the procedure below to adjust.
 - a. Rotate the companion flange on the drive pinion by 90°, 180° and 270° while checking for the position where the runout is minimum.
 - b. If the runout is still outside of the runout limit after the companion flange has been rotated on the drive pinion, possible cause could be an assembly malfunction of drive pinion and drive pinion bearing or a malfunctioning drive pinion bearing.
 - c. If the runout is still outside of the runout limit after replacing the companion flange. Replace the rear final drive assembly. Refer to [DLN-290, "Removal and Installation"](#).



SERVICE DATA AND SPECIFICATIONS (SDS)

< SERVICE DATA AND SPECIFICATIONS (SDS)

[REAR FINAL DRIVE: MA248 (ELD)]

SERVICE DATA AND SPECIFICATIONS (SDS)

SERVICE DATA AND SPECIFICATIONS (SDS)

General Specification

INFOID:0000000012544506

Applied model	4WD	
	VK56VD	Cummins 5.0L
	(PRO-4X)	
Final drive model	MA248 (ELD)	
Gear ratio	3.357	3.916
Number of pinion gears	4	
Number of teeth (Drive gear / drive pinion)	47/14	47/12
Oil capacity (Approx.)	2.60 ℓ (5-1/2 US pt, 4-5/8 Imp pt)	
Drive pinion adjustment spacer type	Collapsible	

Preload Torque

INFOID:0000000013407950

PRELOAD TORQUE - REMOVAL AND INSTALLATION [WITHOUT REPLACING COLLAPSIBLE SPACER]

Unit: N·m (kg·m, in·lb)

Item	Standard
Pre-measured total preload torque [measured before removal of drive pinion lock nut] Maximum	6.47 (0.66, 57)
Additional preload torque "A" [add to pre-measured total preload torque during installation of new drive pinion lock nut]	0.35 - 0.58 (0.03 - 0.06, 3 - 5)
Total preload torque "T" [after installation of new drive pinion lock nut] = pre-measured total preload torque + additional preload torque	4.05 - 6.82 (0.40 - 0.68, 35 - 59)

PRELOAD TORQUE - DISASSEMBLY AND ASSEMBLY [REPLACING COLLAPSIBLE SPACER]

Unit: N·m (kg·m, in·lb)

Item	Standard
Drive pinion bearing preload torque	3.12 - 4.42 (0.32 - 0.45, 28 - 39)
Side bearing preload torque (reference value = total preload torque - drive pinion bearing preload torque)	0.50 - 1.70 (0.05 - 0.17, 4 - 15)
Total preload torque (total preload torque = drive pinion bearing preload torque + side bearing preload torque)	3.62 - 6.12 (0.37 - 0.62, 32 - 54)

Backlash

INFOID:0000000013407951

Unit: mm (in)

Item	Standard
Drive gear to drive pinion gear	0.152 - 0.245 (0.0060 - 0.0096)

SERVICE DATA AND SPECIFICATIONS (SDS)

< SERVICE DATA AND SPECIFICATIONS (SDS)

[REAR FINAL DRIVE: MA248 (ELD)]

Companion Flange Runout

INFOID:000000013407952

Unit: mm (in)

Item	Limit
Companion flange face	0.13 (0.0051) or less
Companion flange inner side	

SELECTIVE PARTS

Drive Pinion Washer

Unit: mm (in)

Thickness	Part number*
1.09 - 1.52	38154 EZ40A

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

Side Bearing Adjusting Washer

Unit: mm (in)

Thickness	Part number*
5.59 - 6.52	38453 EZ40A

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

A
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