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SECTION
TRANSFER

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PREPARATION

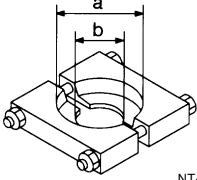
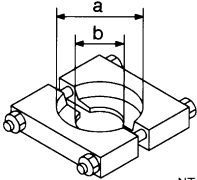
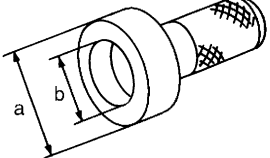
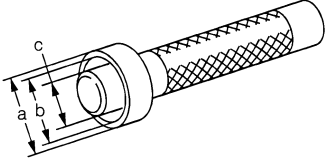
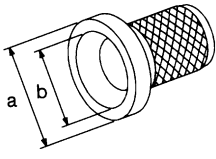
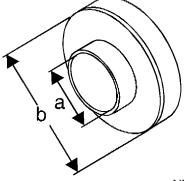
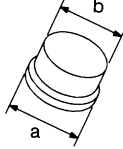
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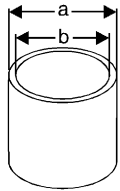
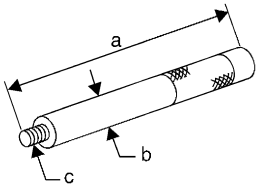
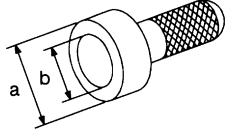
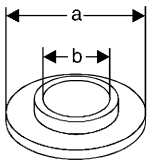
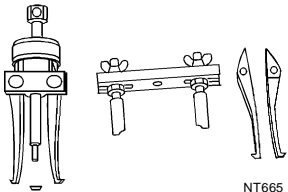
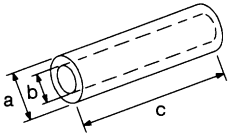
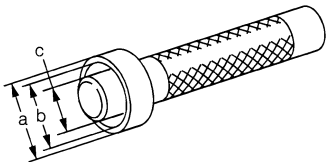
Special Service Tools

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

Tool number (Kent-Moore No.) Tool name	Description
ST30021000 (—) Puller	Removing carrier bearing a: 110 mm (4.33 in) dia. b: 68 mm (2.68 in) dia.
 <p style="text-align: right; font-size: small;">NT411</p>	
ST30031000 (—) Puller	Removing front drive shaft bearing a: 90 mm (3.54 in) dia. b: 50 mm (1.97 in) dia.
 <p style="text-align: right; font-size: small;">NT411</p>	
ST30720000 (J-25405) Drift	Installing mainshaft front bearing and oil seal a: 77 mm (3.03 in) dia. b: 55.5 mm (2.185 in) dia.
 <p style="text-align: right; font-size: small;">NT658</p>	
ST33220000 (—) Drift	Installation needle bearings a: 37 mm (1.46 in) dia. b: 31 mm (1.22 in) dia. c: 22 mm (0.87 in) dia.
 <p style="text-align: right; font-size: small;">ZZA1046D</p>	
KV40100621 (J-25273) Drift	Installing front drive shaft front and rear bearing a: 76 mm (2.99 in) dia. b: 69 mm (2.72 in) dia.
 <p style="text-align: right; font-size: small;">NT086</p>	
ST30032000 (J-26010-01) Base	Installing front drive shaft bearing a: 38 mm (1.50 in) dia. b: 80 mm (3.15 in) dia.
 <p style="text-align: right; font-size: small;">NT660</p>	
ST33052000 (—) Adapter	Removing front drive shaft bearing a: 28 mm (1.10 in) dia. b: 22 mm (0.87 in) dia.
 <p style="text-align: right; font-size: small;">NT431</p>	

PREPARATION

Tool number (Kent-Moore No.) Tool name	Description
ST33200000 (J-26082) Support ring	 <p>NT661</p> Removing mainshaft front bearing Installing planetary carrier assembly Installing oil seal a: 74.5 mm (2.933 in) dia. b: 62.5 mm (2.461 in) dia.
ST3532500 (—) Remover	 <p>NT663</p> Removing metal bushing a: 215 mm (8.46 in) b: 25 mm (0.98 in) dia. c: M 12 x P=1.5
KV38100500 (—) Drift	 <p>NT115</p> Installing front oil seal a: 80 mm (3.15 in) dia. b: 60 mm (2.36 in) dia.
ST30911000 (—) Puller	 <p>NT664</p> Removing and installing press flange snap ring Installing carrier bearing Installing mainshaft center case a: 98 mm (3.86 in) dia. b: 40.5 mm (1.594 in) dia.
ST33290001 (J-34286) Outer race puller	 <p>NT665</p> Removing metal bushing and oil seal
ST22452000 (J-34335) Drift	 <p>NT117</p> Removing and installing press flange snap ring a: 45 mm (1.77 in) dia. b: 36 mm (1.42 in) dia. c: 400 mm (15.76 in) dia.
KV38100300 (J-25523) Drift	 <p>ZZA1046D</p> Removing mainshaft rear bearing a: 54 mm (2.13 in) dia. b: 46 mm (1.81 in) dia. c: 32 mm (1.26 in) dia.

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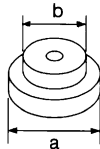
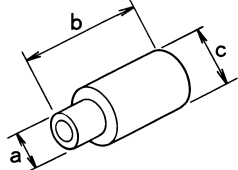
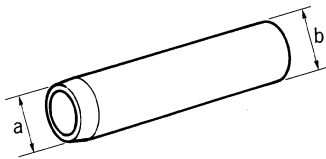
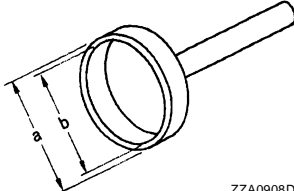
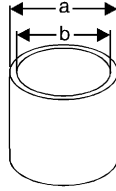
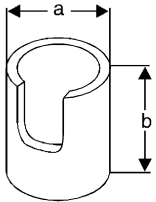
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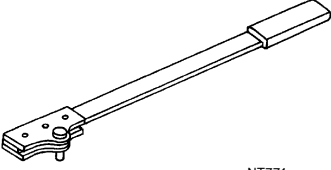
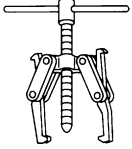
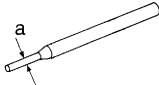
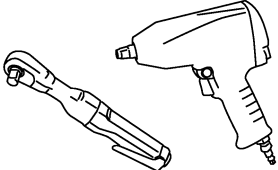
PREPARATION

Tool number (Kent-Moore No.) Tool name	Description	
ST35300000 (—) Drift	 <p style="text-align: center;">NT073</p>	Removing sun gear assembly Removing carrier bearing Installing metal bushing a: 59 mm (2.32 in) dia. b: 45 mm (1.77 in) dia.
ST33710000 (—) Drift	 <p style="text-align: center;">ZZA1057D</p>	Removing needle bearing Removing metal bushing a: 89 mm (3.5 in) b: 30 mm (1.18 in) dia. c: 24 mm (0.9 in) dia.
ST22360002 (J-25679-01) Drift	 <p style="text-align: center;">ZZA1091D</p>	Installing oil seal a: 23 mm (0.91 in) dia. b: 32 mm (1.26 in) dia.
ST15310000 (J-25640-B) Drift	 <p style="text-align: center;">ZZA0908D</p>	Installing mainshaft rear bearing a: 96 mm (3.78 in) dia. b: 84 mm (3.31 in) dia.
KV40105310 (—) Support ring	 <p style="text-align: center;">NT661</p>	Installing dust cover Installing carrier bearing a: 89.1 mm (3.508 in) dia. b: 80.7 mm (3.177 in) dia.
KV31103300 (—) Drift	 <p style="text-align: center;">NT668</p>	Removing and installing press flange snap ring a: 76.3 mm (3.004 in) dia. b: 130 mm (5.12 in)

PREPARATION

Commercial Service Tools

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Tool name	Description
Flange wrench  <p style="text-align: center;">NT771</p>	Removing and installing companion flange
Puller  <p style="text-align: center;">NT077</p>	Removing companion flange
Pin punch  <p style="text-align: center;">NT410</p>	Removing and installing retainer pin a: 6 mm (0.24 in) dia.
Power tool  <p style="text-align: center;">PBIC0190E</p>	Removing transfer case assembly

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PRECAUTIONS

PRECAUTIONS

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Precautions for Supplemental Restraint System (SRS) “AIR BAG” and “SEAT BELT PRE-TENSIONER”

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

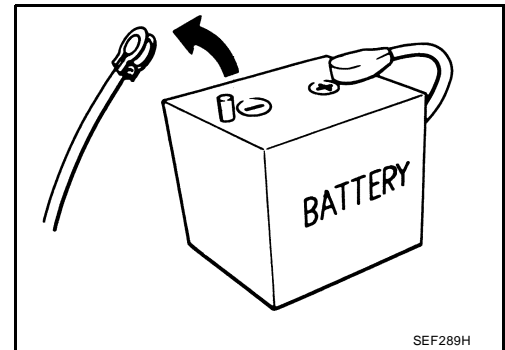
WARNING:

- To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision which would result in air bag inflation, all maintenance must be performed by an authorized NISSAN/INFINITI dealer.
- Improper maintenance, including incorrect removal and installation of the SRS, can lead to personal injury caused by unintentional activation of the system. For removal of Spiral Cable and Air Bag Module, see the SRS 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.

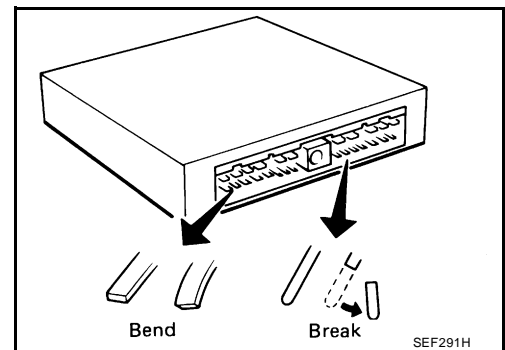
Precautions

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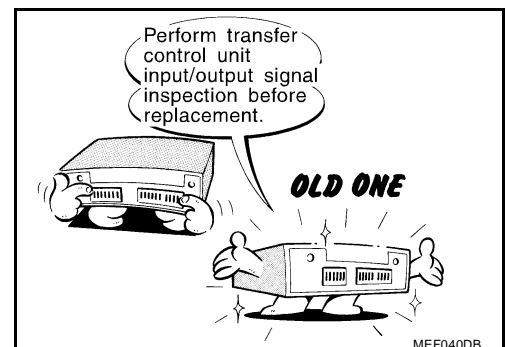
- Before connecting or disconnecting the transfer control unit harness connector, turn ignition switch OFF and disconnect negative battery terminal. Failure to do so may damage the transfer control unit. Because battery voltage is applied to transfer control unit even if ignition switch is turned off.



- When connecting or disconnecting pin connectors into or from transfer control unit, take care not to damage pin terminals (bend or break). Make sure that there are not any bends or breaks on transfer control unit pin terminal, when connecting pin connectors.



- Before replacing transfer control unit, perform transfer control unit input/output signal inspection and make sure whether transfer control unit functions properly or not. (See page [TF-55](#) .)



PRECAUTIONS

Service Notice

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1. Before proceeding with disassembly, thoroughly clean the outside of the all-mode 4WD transfer. It is important to prevent the internal parts from becoming contaminated by dirt or other foreign matter.
2. Disassembly should be done in a clean work area.
3. Use lint-free cloth or towels for wiping parts clean. Common shop rags can leave fibers that could interfere with the operation of the all-mode 4WD transfer.
4. Place disassembled parts in order for easier and proper assembly.
5. All parts should be carefully cleaned with a general purpose, non-flammable solvent before inspection or reassembly.
6. Gaskets, seals and O-rings should be replaced any time the all-mode 4WD transfer is disassembled.
7. It is very important to perform functional tests whenever they are indicated.
8. The valve body contains precision parts and requires extreme care when parts are removed and serviced. Place removed parts in a parts rack in order to replace them in correct positions and sequences. Care will also prevent springs and small parts from becoming scattered or lost.
9. Properly installed valves, sleeves, plugs, etc. will slide along bores in valve body under their own weight.
10. Before assembly, apply a coat of recommended ATF to all parts. Apply petroleum jelly to protect O-rings and seals, and to hold bearings and washers in place during assembly. Do not use grease.
11. Extreme care should be taken to avoid damage to O-rings, seals and gaskets when assembling.
12. After overhaul, refill the transfer with new ATF.
13. When the all-mode 4WD transfer drain plug is removed, only some of the fluid is drained. Old all-mode 4WD transfer fluid will remain in torque converter and ATF cooling system. Always follow the proper procedure. Refer to [MA-24, "Changing Transfer Fluid"](#) .

Wiring Diagrams and Trouble Diagnosis

EDS001CE

When you read wiring diagrams, refer to the following:

- [GI-15, "How to Read Wiring Diagrams"](#) .
- [PG-4, "POWER SUPPLY ROUTING CIRCUIT"](#) for power distribution circuit.

When you perform trouble diagnosis, refer to the following:

- [GI-11, "HOW TO FOLLOW TEST GROUPS IN TROUBLE DIAGNOSES"](#).
- [GI-27, "How to Perform Efficient Diagnosis for an Electrical Incident"](#).

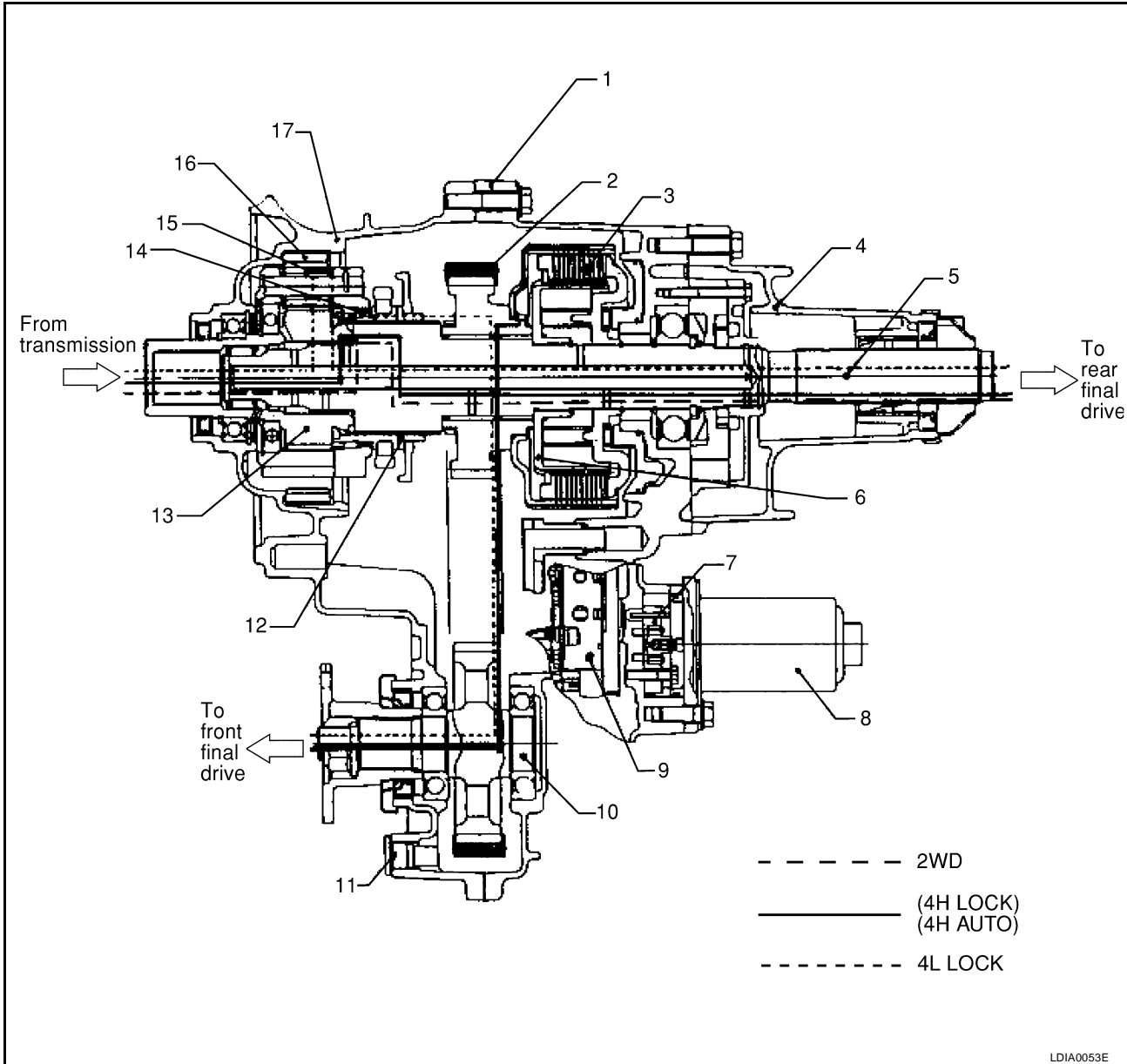
ALL-MODE 4WD SYSTEM

ALL-MODE 4WD SYSTEM

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Cross-sectional View

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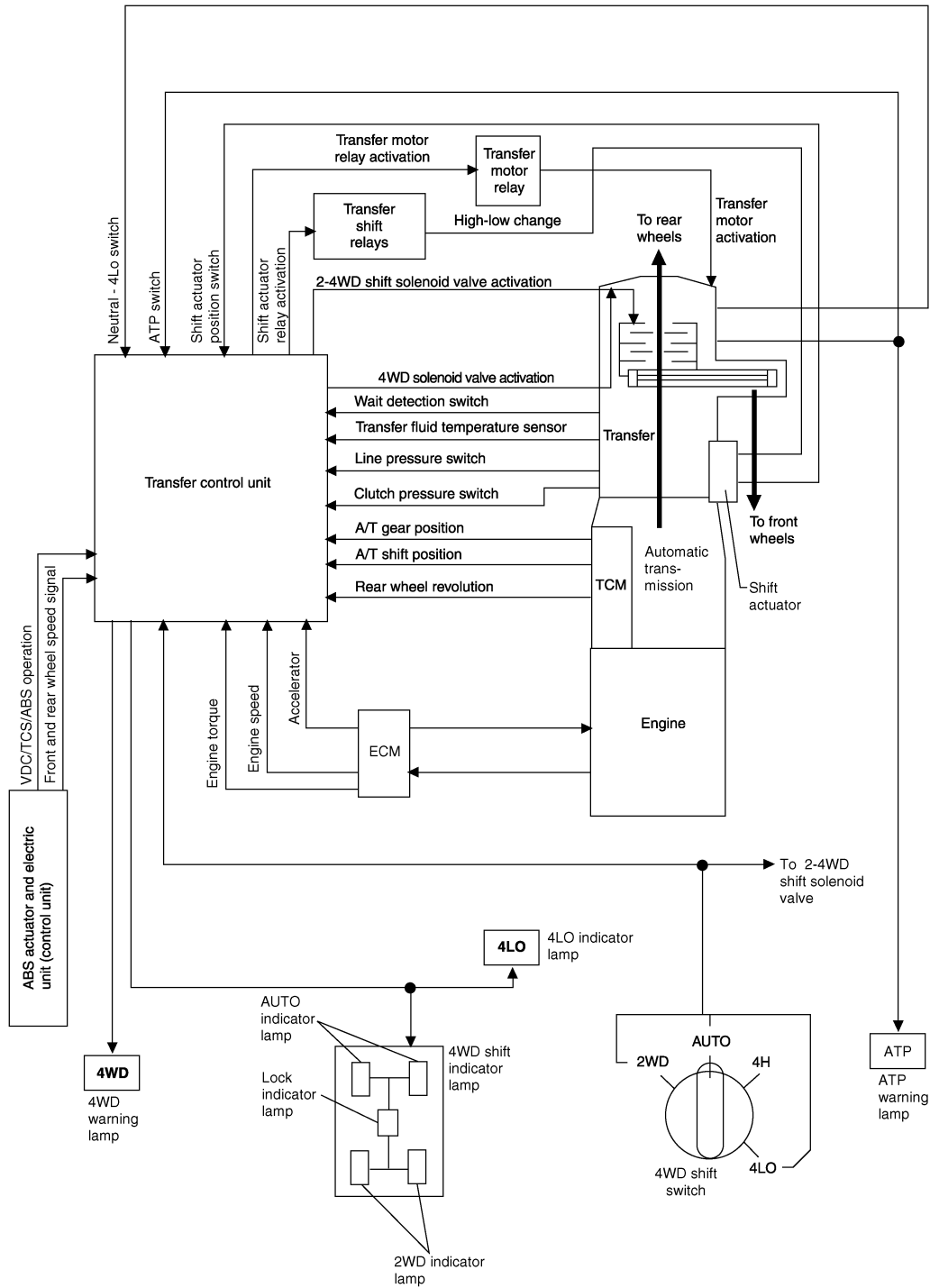
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| 1. Center case | 2. Chain | 3. Multiple disc clutch |
| 4. Rear case | 5. Main shaft | 6. Clutch hub assembly |
| 7. Sub oil pump | 8. Transfer motor | 9. Control valve |
| 10. Front drive shaft | 11. Drain plug | 12. 2-4 sleeve |
| 13. Sun gear assembly | 14. L-H sleeve | 15. Planetary carrier assembly |
| 16. Internal gear | 17. Front case | |

ALL-MODE 4WD SYSTEM

Control System

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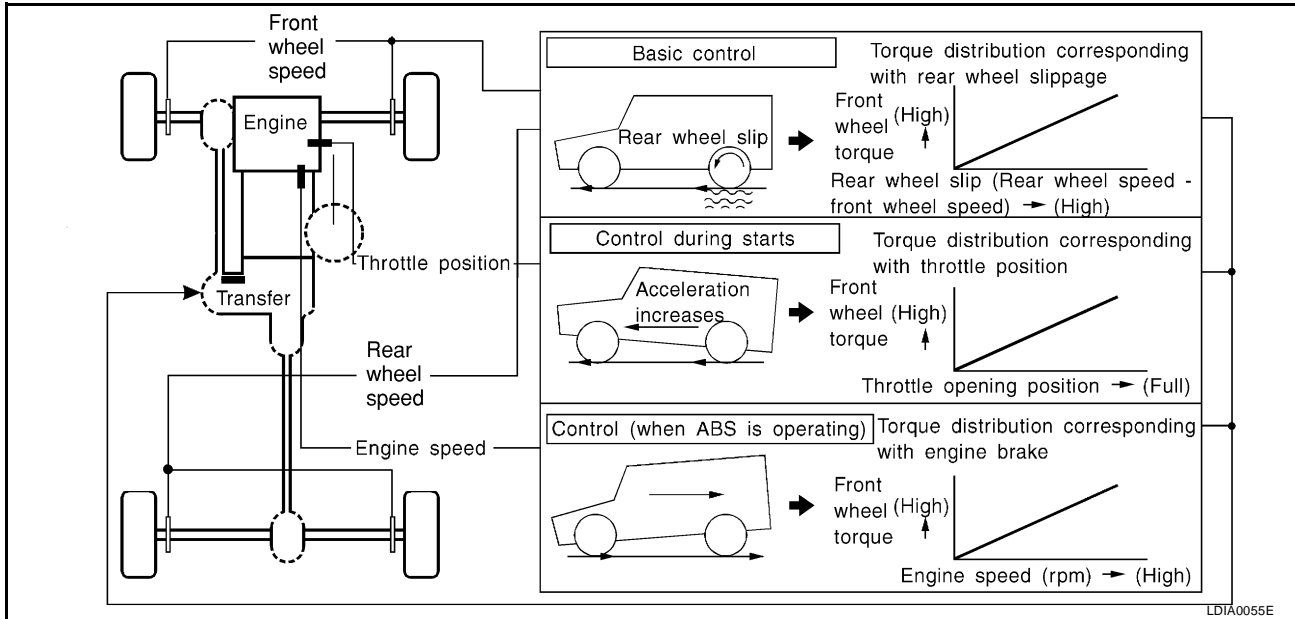
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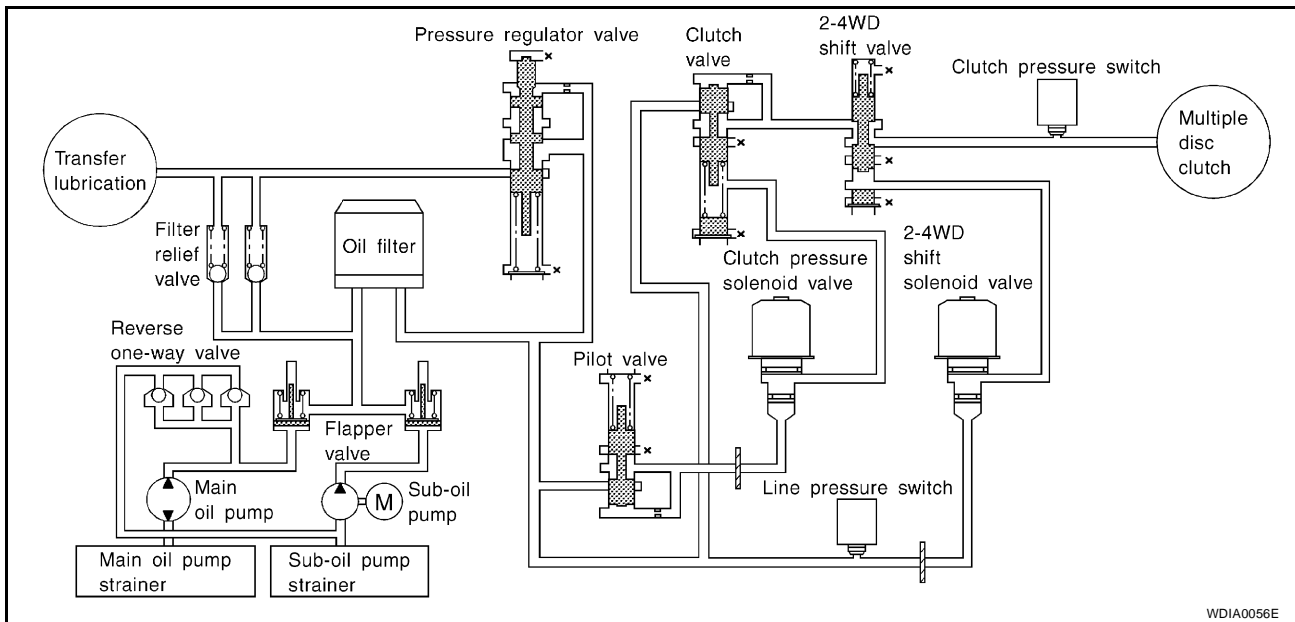
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ALL-MODE 4WD SYSTEM

ALL-MODE 4WD TRANSFER BASIC CONTROL



HYDRAULIC CONTROL CIRCUITS



OUTLINE

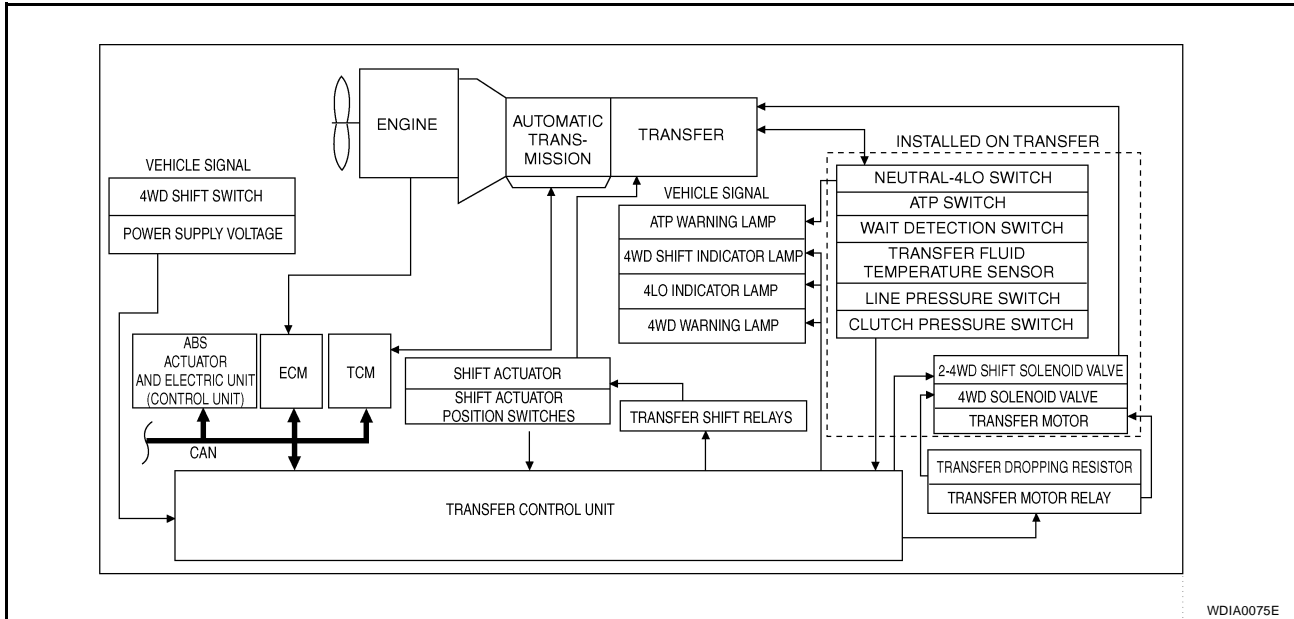
All-mode 4WD transfer is controlled by the transfer control unit and sensors.

If a malfunction occurs in the all-mode 4WD system, the 4WD warning lamp lights up to indicate the system malfunction. There are two ways to identify the cause of the malfunction.

1. Performing the self-diagnosis. (The 4WD warning lamp will indicate what kind of malfunction has occurred by flickering.)
2. Performing diagnosis using CONSULT-II.

ALL-MODE 4WD SYSTEM

CONTROL SYSTEM DIAGRAM



INDICATIONS OF 4WD WARNING LAMP

Condition	Content	4WD warning lamp
During self-diagnosis	Indicates the malfunction position by number of flickers.	Flickers at malfunction mode.
Lamp check*	Checks the lamp by turning ON during engine starting. After engine starts, it turns OFF if there are no malfunctions.	ON
Malfunction in 4WD system*	Turns ON to indicate malfunction. When ignition switch is turned to "OFF" or the malfunction is corrected, it turns OFF.	ON
When vehicle is driven with different diameters of front and rear tires	Flickers once every 2 seconds. Turns OFF when ignition switch is "OFF".	Flickers once every 2 seconds.
High fluid temperature in transfer unit	When fluid temperature is high or fluid temperature sensor circuit is shorted, it flickers twice every second. It turns OFF when fluid temperature becomes normal.	Flickers twice a second.
Other than above (System is normal.)	Lamp is OFF.	OFF

*: When 4WD warning lamp is ON, all the 4WD shift indicator lamps turn OFF.

CAN Communication SYSTEM DESCRIPTION

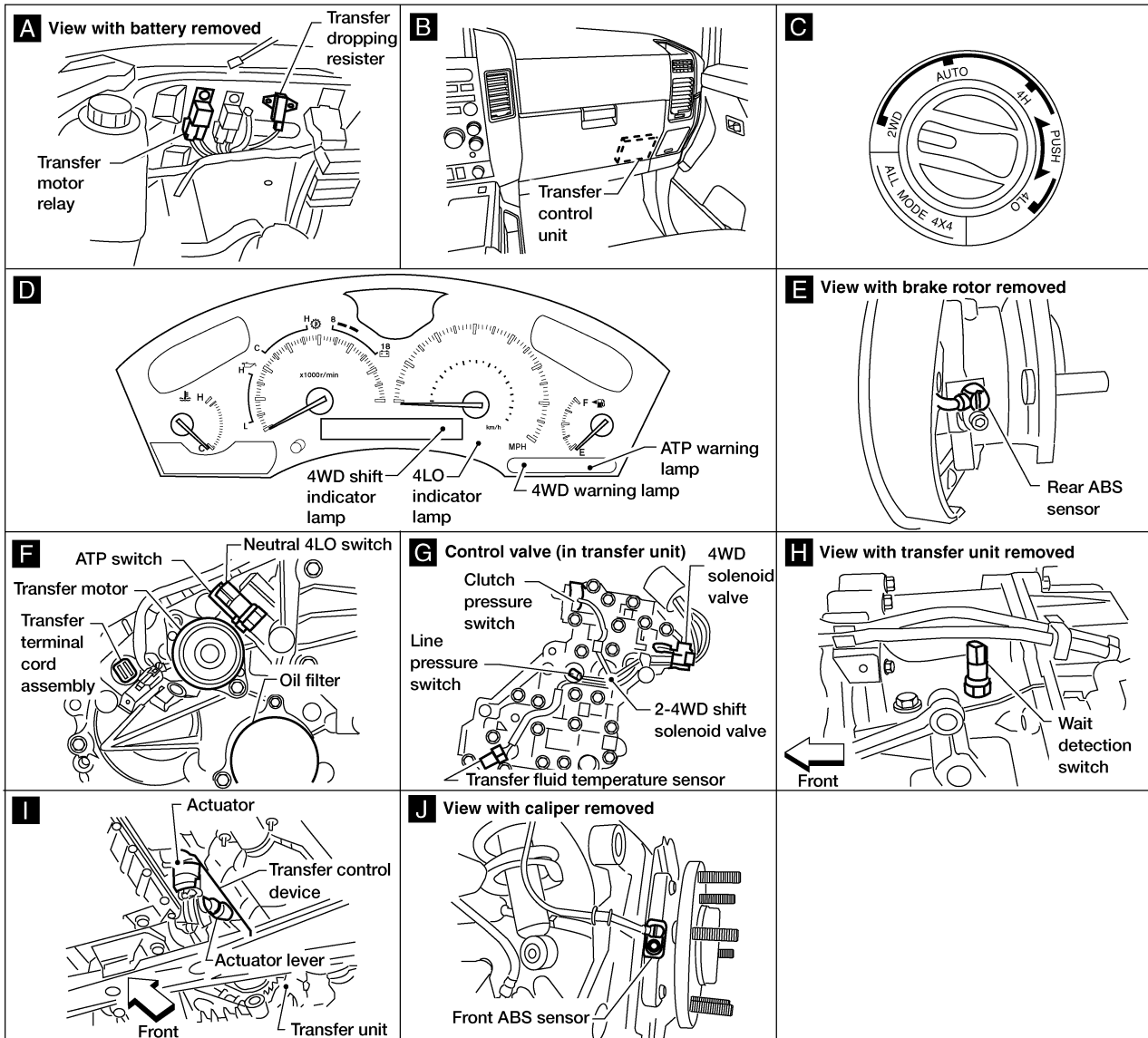
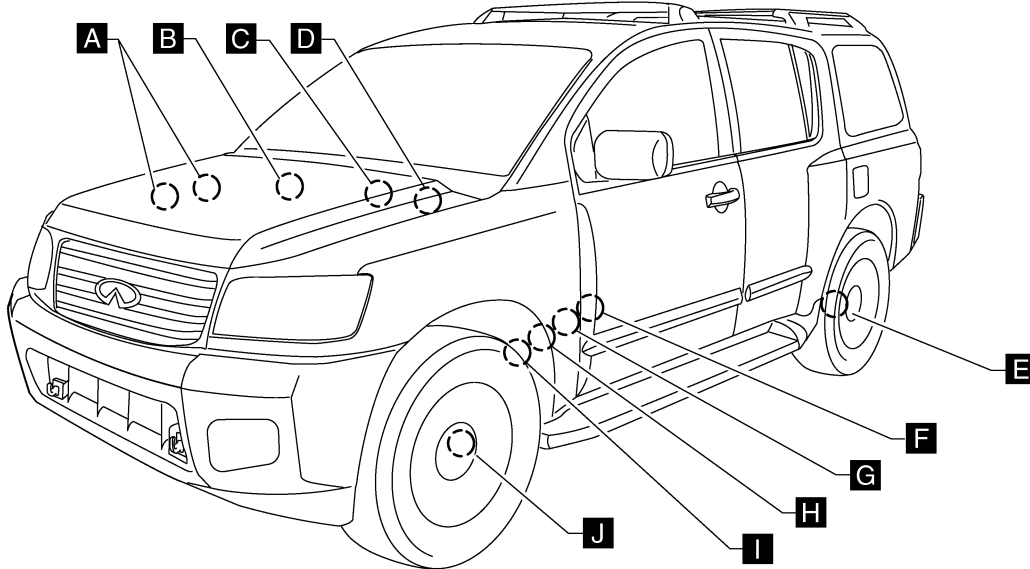
Refer to [LAN-5, "CAN COMMUNICATION"](#) .

EDS0017P

ALL-MODE 4WD SYSTEM

Location of Electrical Parts

EDS00170



WDIA0069E

ALL-MODE 4WD SYSTEM

EDS0017R

Description of Electrical Parts

TRANSFER MOTOR

- The transfer motor drives the sub-oil pump to provide proper lubrication and oil pressure control when the vehicle is at standstill, during low-speed operations or is being driven in reverse.
- The main oil pump is operated by the driving force of the mainshaft. In other words, sufficient oil pressure buildup does not occur when the vehicle is at standstill or during low-speed operations. While the vehicle is being driven in reverse, the main oil pump rotates in the reverse direction. Therefore the main oil pump does not discharge oil pressure. During any of the above vehicle operations, the transfer motor drives the sub-oil pump to compensate for insufficient oil pressure.
- The transfer motor operates as follows:
 - The motor relay turns OFF in the 2WD mode.
 - The motor relay operates as described in the table below in modes other than the 2WD mode.

Table 1

PNP switch "R" position	VFF (Vehicle speed)	A/T position	Motor relay drive command
ON	—	R	ON
OFF	0	Positions other than the "P" or "N" positions	ON
	—	"P" or "N" position (See Table 2.)	—
	$0 < VFF \leq 50 \text{ km/h (31 MPH)}$	—	ON
	$50 \text{ km/h (31 MPH)} < VFF < 55 \text{ km/h (34 MPH)}$	—	HOLD
	$55 \text{ km/h (34 MPH)} \leq VFF$	—	OFF

Table 2

A/T position	N-4L SW	4WD mode	Throttle position		
			0 - 0.07/8	0.07/8 - 1/8	1/8 - MAX
N	OFF	LOCK (4H)	ON	ON	ON
		Positions other than the LOCK position (2WD or AUTO)	See NOTE.	HOLD	ON
	ON	—	See NOTE.	HOLD	ON
P	—	—	See NOTE.	HOLD	ON

NOTE:

OFF (after 2.5 seconds have elapsed.)

- 4WD shift switch, PNP switch, Neutral-4LO switch, vehicle speed sensor and throttle position sensor are used in conjunction with the transfer motor.

WAIT DETECTION SWITCH

- The wait detection switch releases the "booming" torque produced in the propeller shaft. After the release of the "booming" torque, the wait detection switch helps provide the 4WD lock gear (clutch drum) shifts. A difference may occur between the operation ("4LO" to "4H" shift only) of the 4WD shift switch and actual drive mode. At this point, the wait detection switch senses an actual drive mode.
- The wait detection switch operates as follows:
 4WD lock gear (clutch drum) locked: ON
 4WD lock gear (clutch drum) released: OFF
- The wait detection switch senses an actual drive mode and the 4WD shift indicator lamp indicates the vehicle drive mode.

2-4WD SHIFT SOLENOID VALVE

The 2-4WD shift solenoid valve operates to apply oil pressure to the wet, multiplate clutch, depending on the drive mode. The driving force is transmitted to the front wheels through the clutch when the vehicle is set in the 4WD mode. Setting the vehicle in the 2WD mode requires no pressure buildup. In other words, pressure force applied to the wet, multiplate clutch becomes zero.

ALL-MODE 4WD SYSTEM

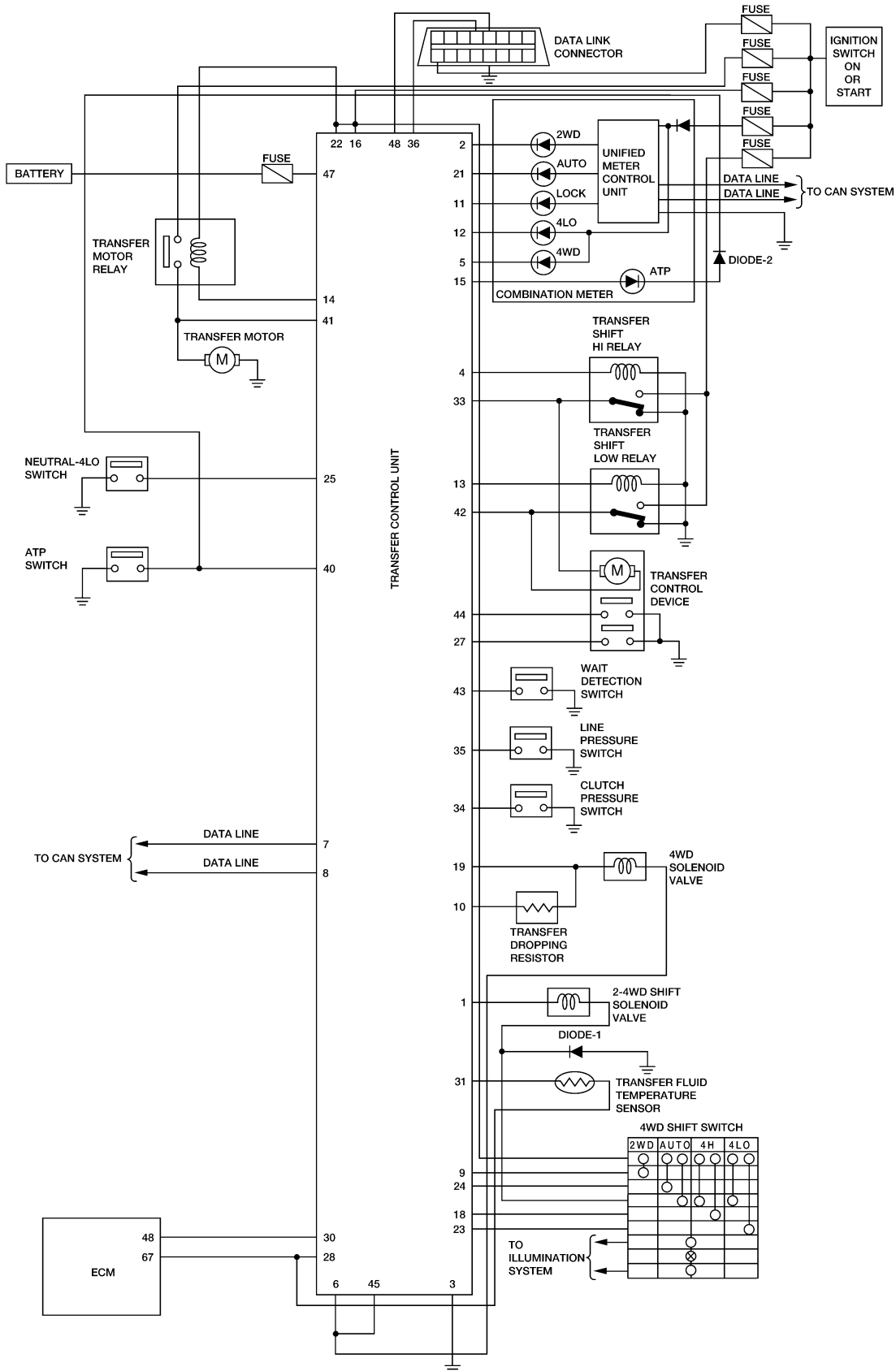
LINE PRESSURE SWITCH

1. With the transfer system design, control of the oil pressure provides the transmission of drive torque to the front wheels. The main pressure to control the oil pressure is referred to as the line pressure. The line pressure switch determines whether or not adequate line pressure has built up under different operating conditions.
2. The line pressure switch turns ON when line pressure is produced.
3. The line pressure switch senses line pressure abnormalities and turns the 4WD warning lamp ON.

ALL-MODE 4WD SYSTEM

Circuit Diagram for Quick Pinpoint Check

EDS0017S



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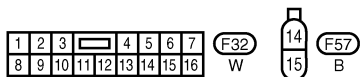
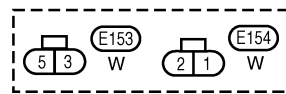
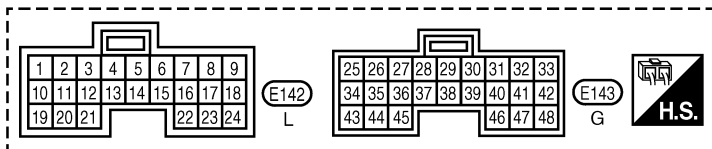
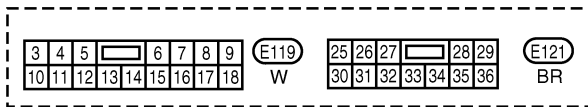
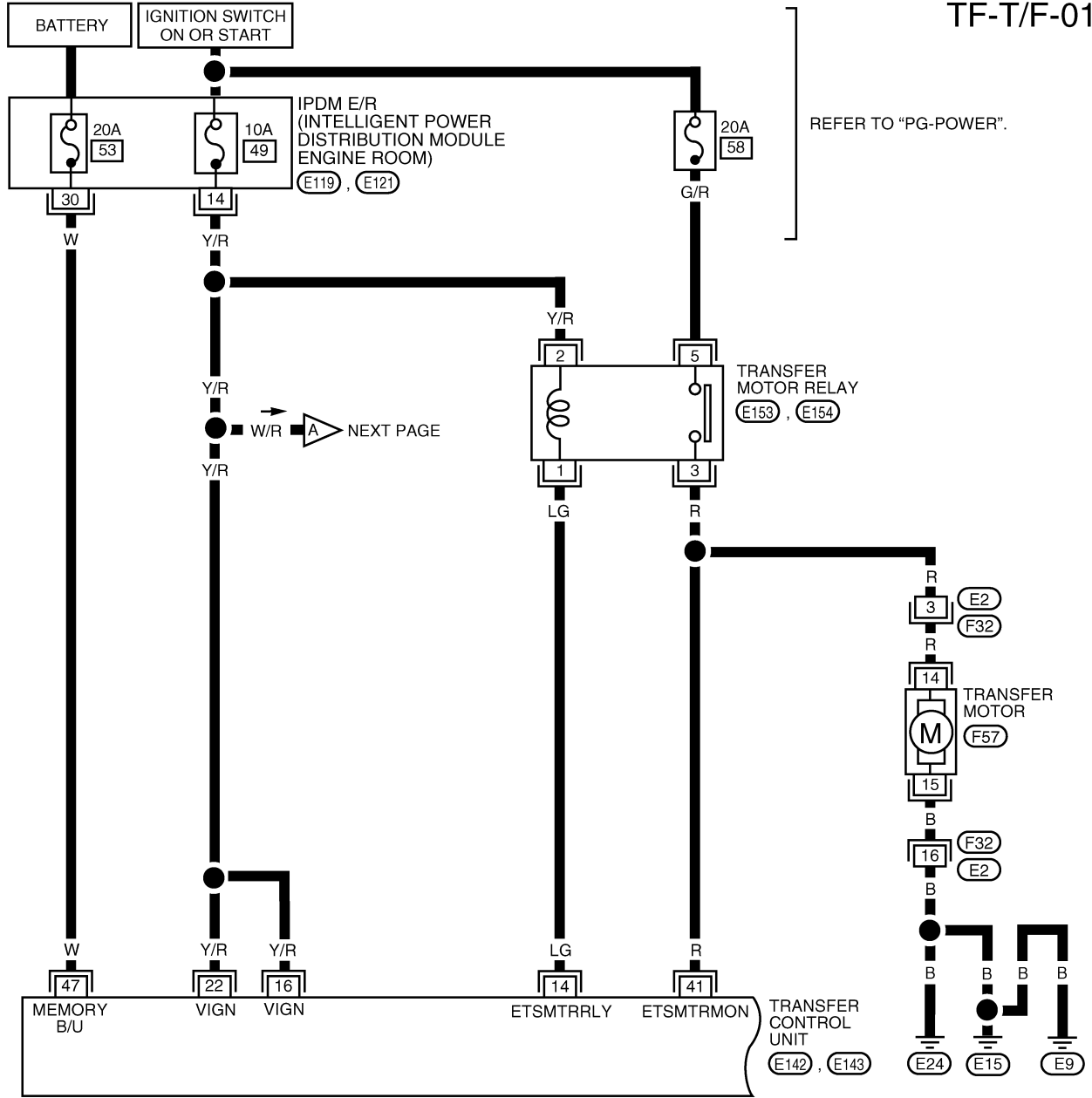
WDWA0033E

ALL-MODE 4WD SYSTEM

EDS0017T

Wiring Diagram — T/F —

TF-T/F-01

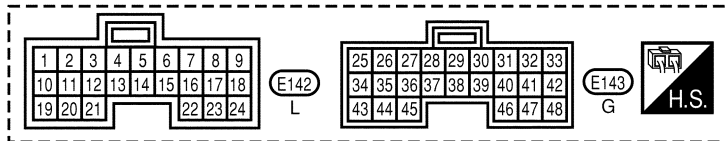
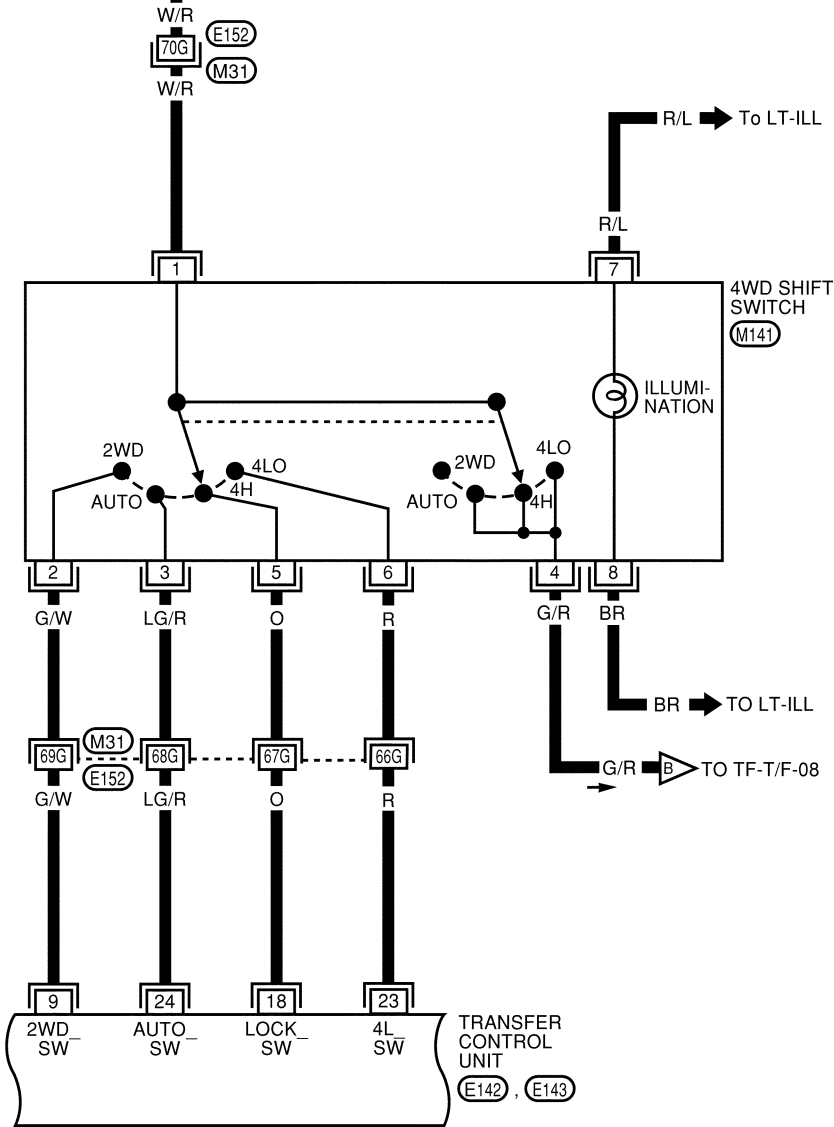


WDA0014E

ALL-MODE 4WD SYSTEM

TF-T/F-02

PRECEDING PAGE

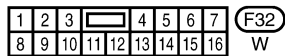
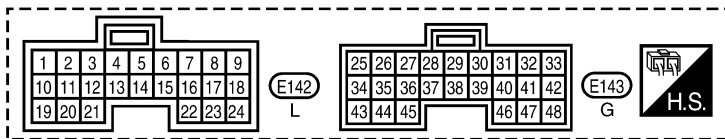
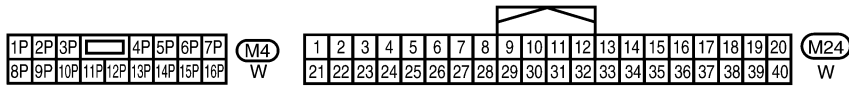
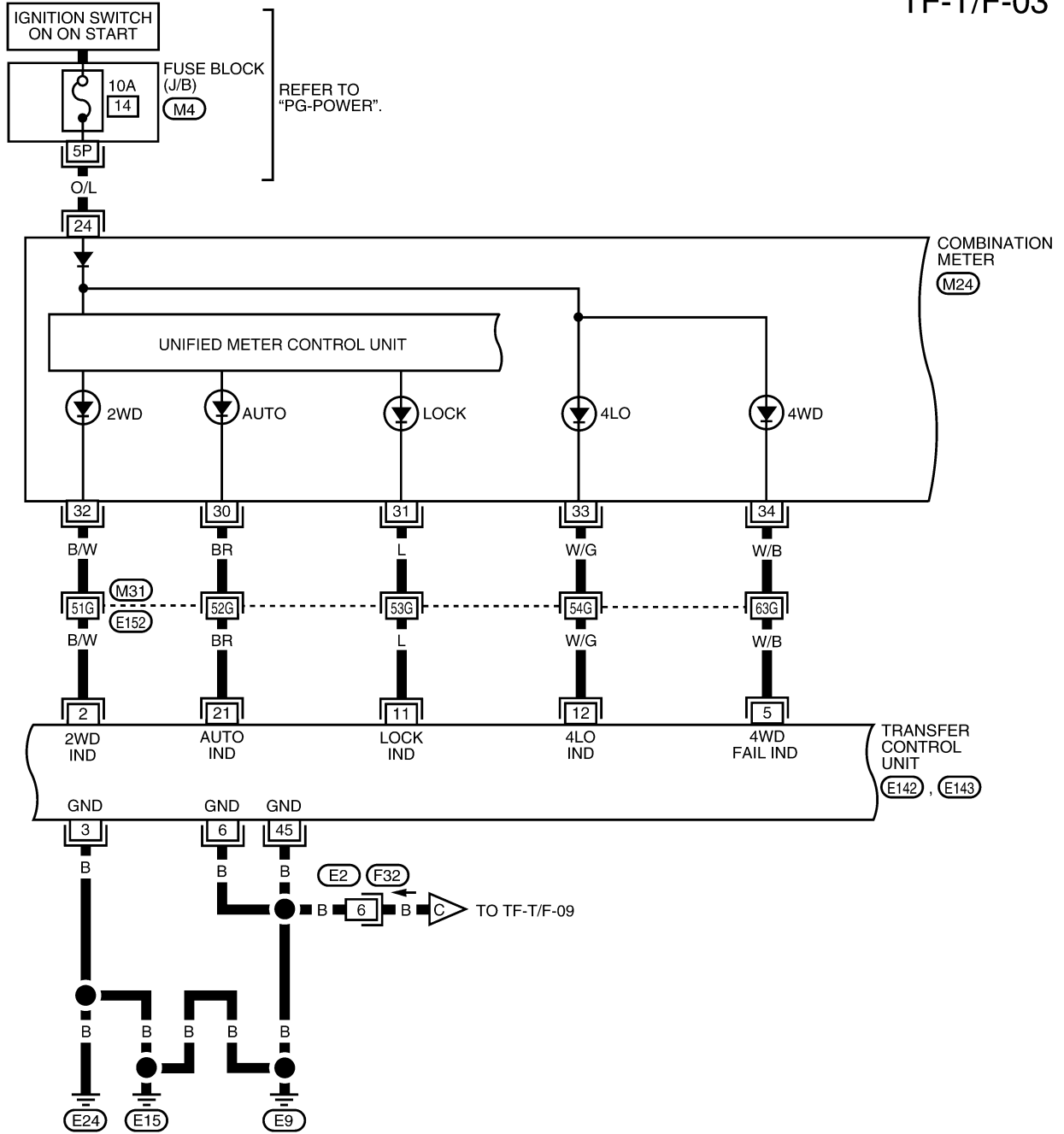


REFER TO THE FOLLOWING.
 (M31) - SUPER
 MULTIPLE JUNCTION (SMJ)

WDWA0009E

ALL-MODE 4WD SYSTEM

TF-T/F-03



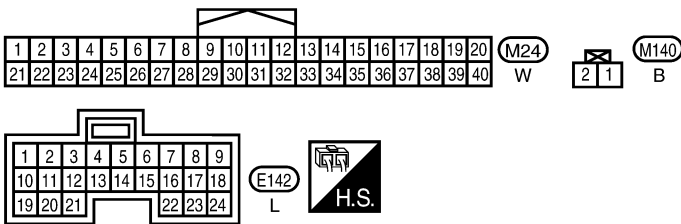
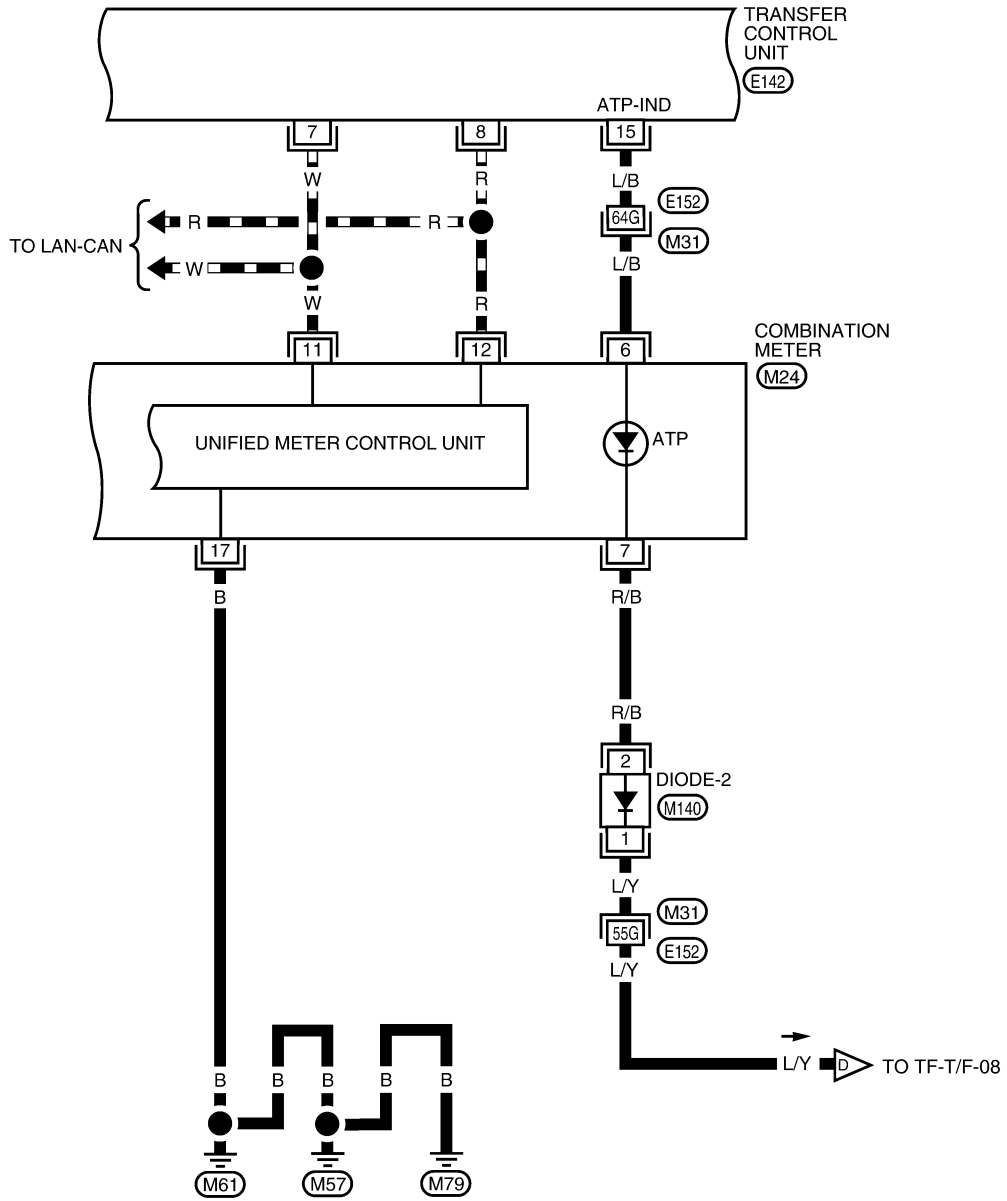
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 (M31) - SUPER MULTIPLE JUNCTION (SMJ)

WDDA0034E

ALL-MODE 4WD SYSTEM

TF-T/F-04

▬ : DATA LINE

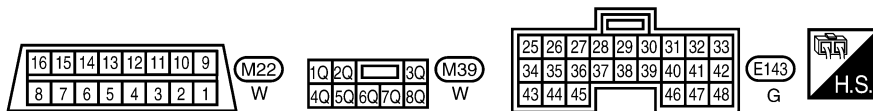
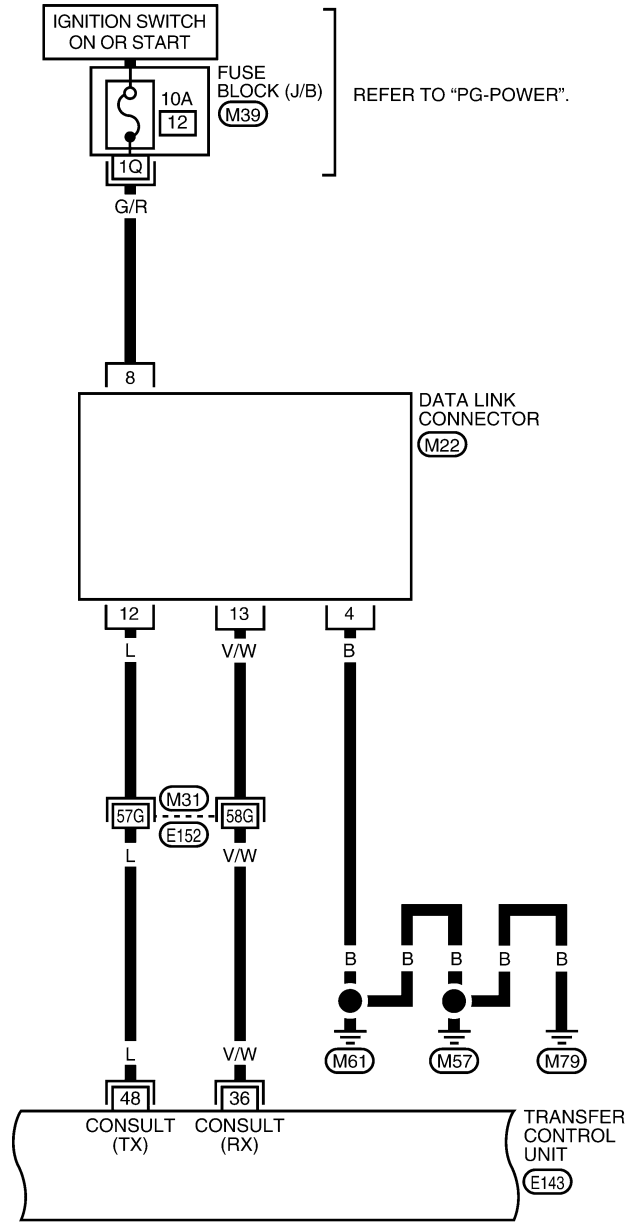


REFER TO THE FOLLOWING.
 (M31) - SUPER MULTIPLE JUNCTION (SMJ)

WDA0035E

ALL-MODE 4WD SYSTEM

TF-T/F-05



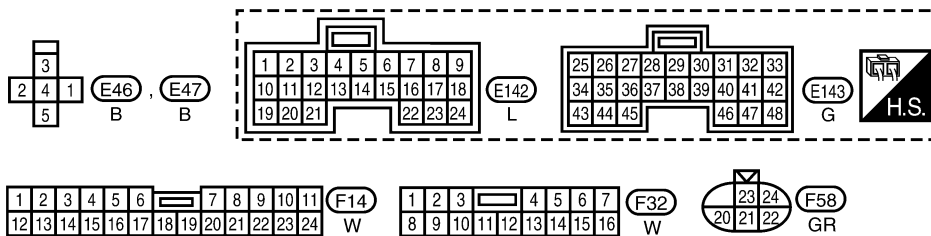
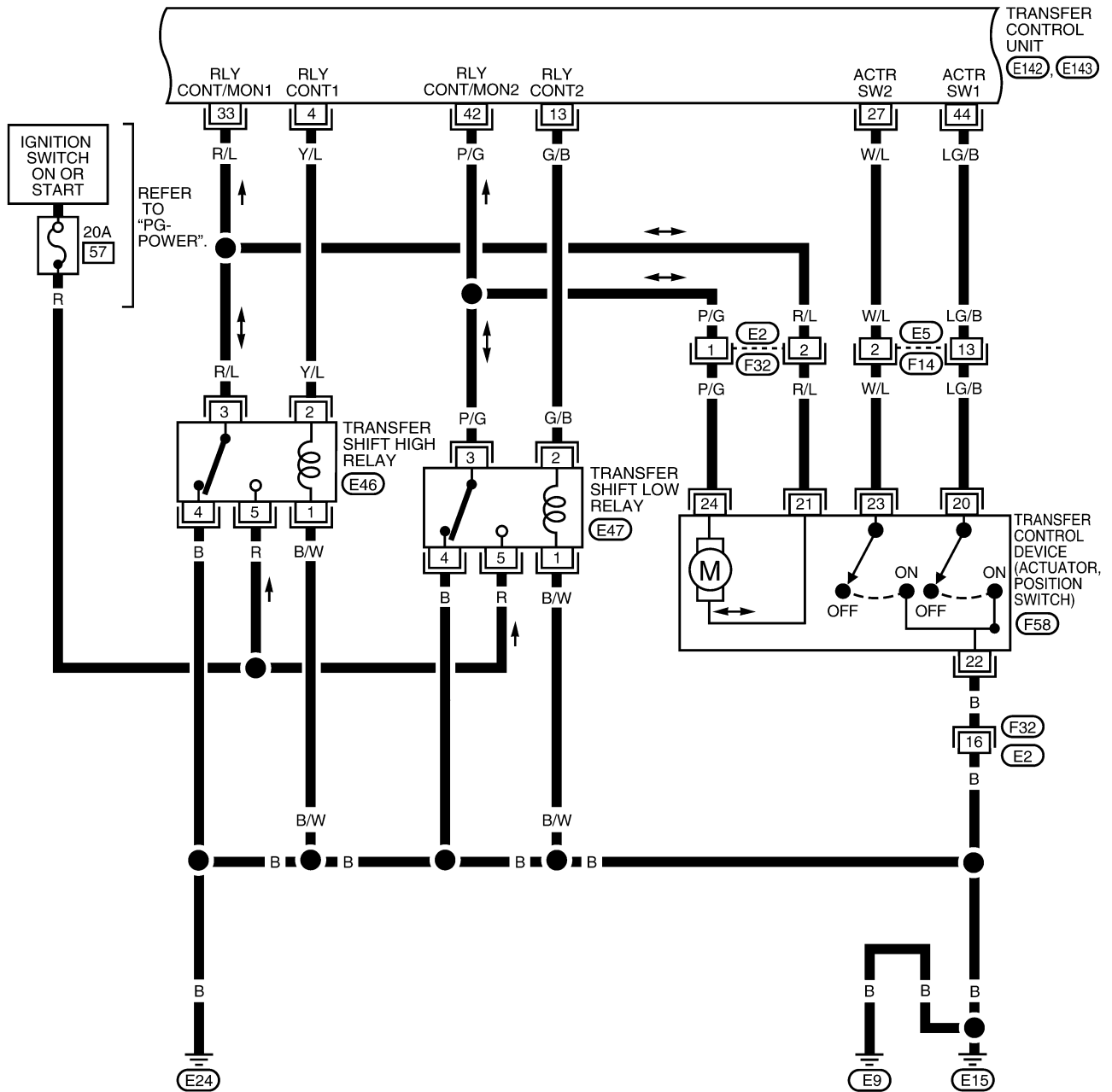
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(M31) - SUPER MULTIPLE JUNCTION (SMJ)

WDWA0004E

ALL-MODE 4WD SYSTEM

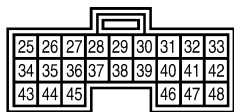
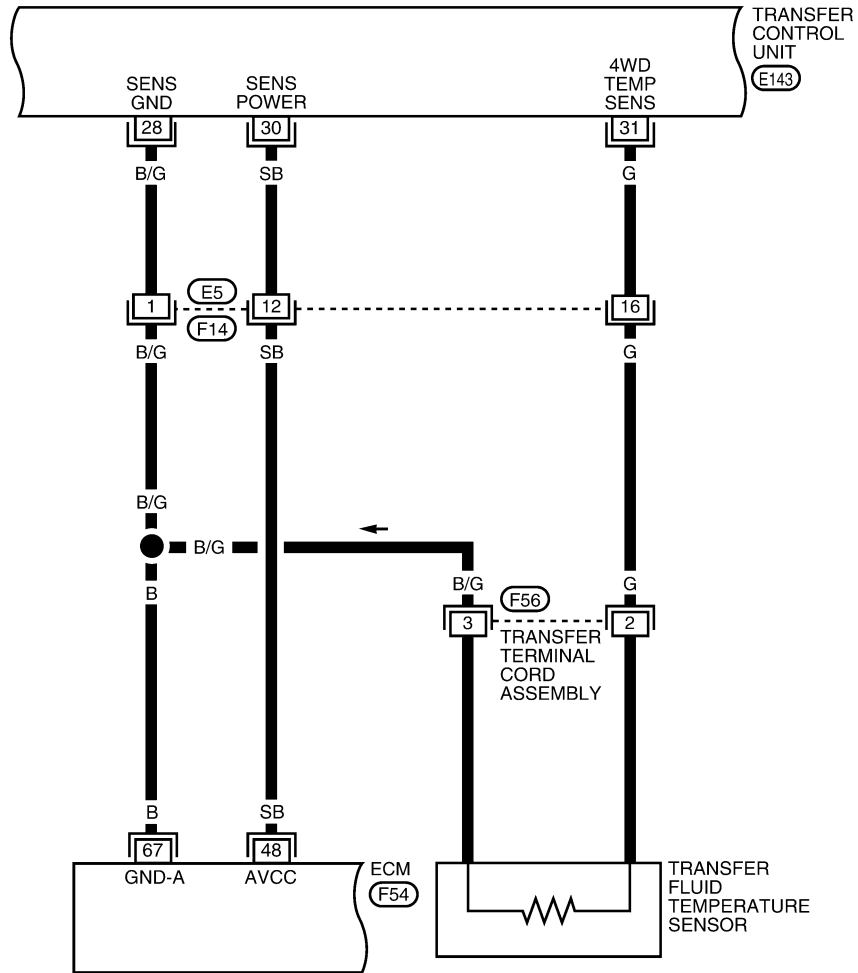
TF-T/F-06



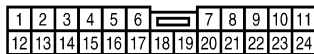
WDWA0036E

ALL-MODE 4WD SYSTEM

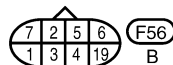
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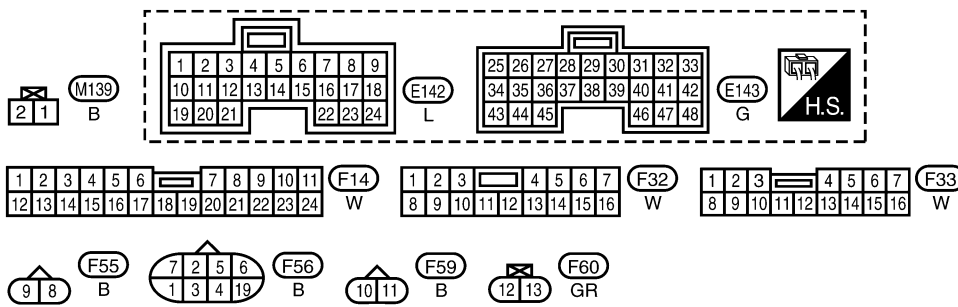
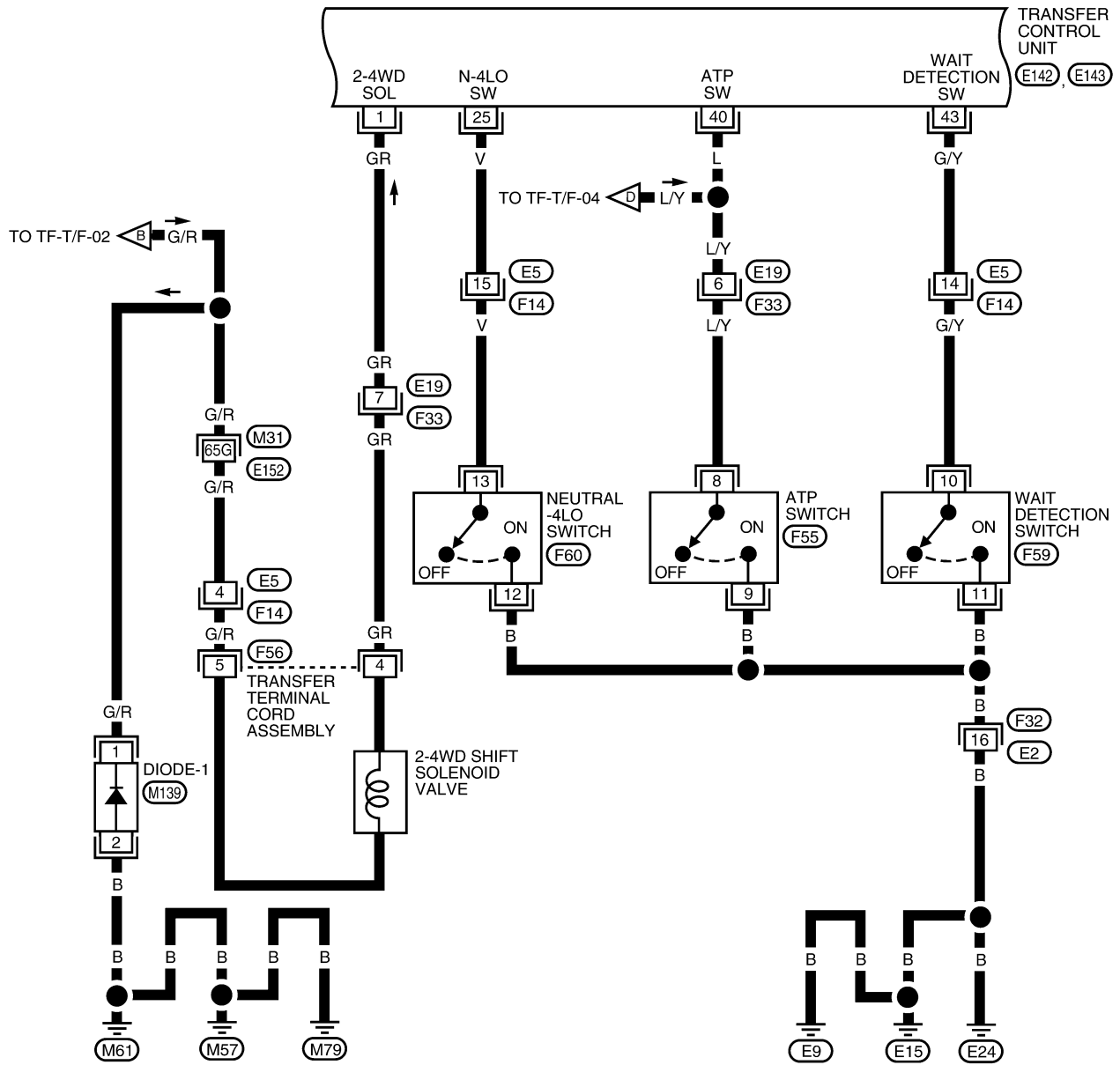
REFER TO THE FOLLOWING.

(F54) - ELECTRICAL UNITS

WDWA0005E

ALL-MODE 4WD SYSTEM

TF-T/F-08

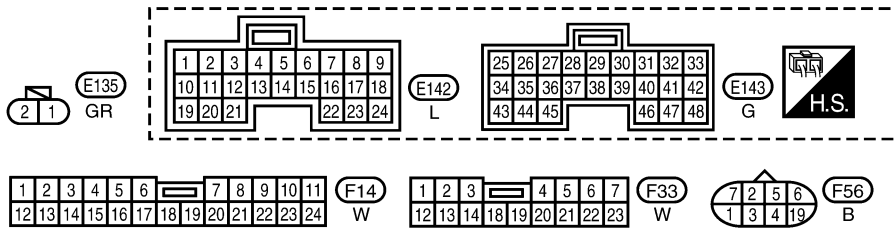
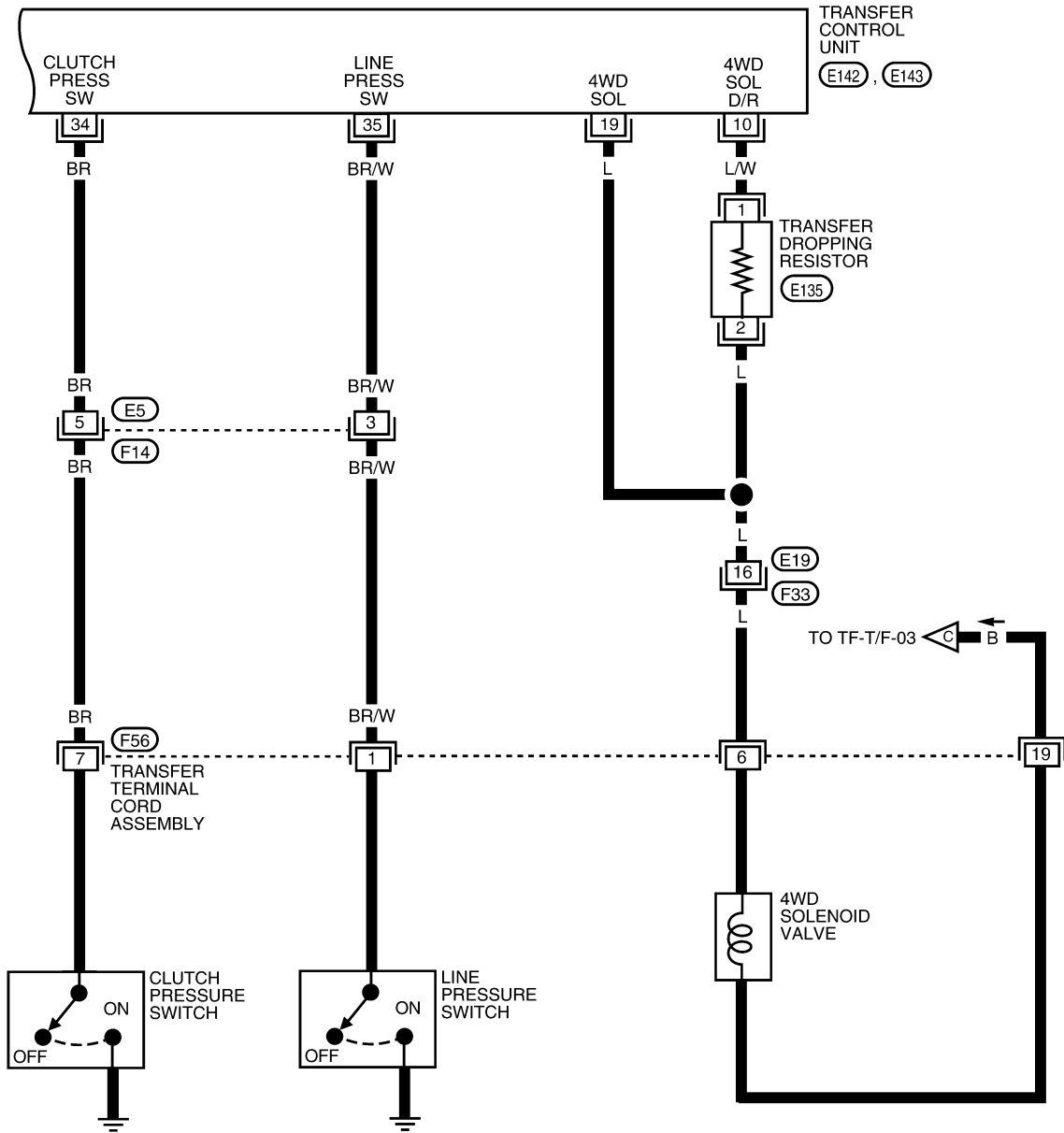


REFER TO THE FOLLOWING.
 (M31) - SUPER MULTIPLE JUNCTION (SMJ)

WDWA0037E

ALL-MODE 4WD SYSTEM

TF-T/F-09



WDWA0038E

ON BOARD DIAGNOSTIC SYSTEM DESCRIPTION

ON BOARD DIAGNOSTIC SYSTEM DESCRIPTION

PFP:00000

Trouble Diagnosis without CONSULT-II DESCRIPTION

EDS0017U

If the engine starts when there is something wrong with the all-mode 4WD system, the 4WD warning lamp turns ON or flickers in the combination meter. When the system functions properly, the warning lamp turns ON when the ignition switch is turned to ON, and it turns OFF after engine starts.

To locate the cause of a problem, start the self-diagnosis function. The 4WD warning lamp in the combination meter will indicate the problem area by flickering according to the self-diagnostic results. As for the details of the 4WD warning lamp flickering patterns, refer to [TF-28](#) .

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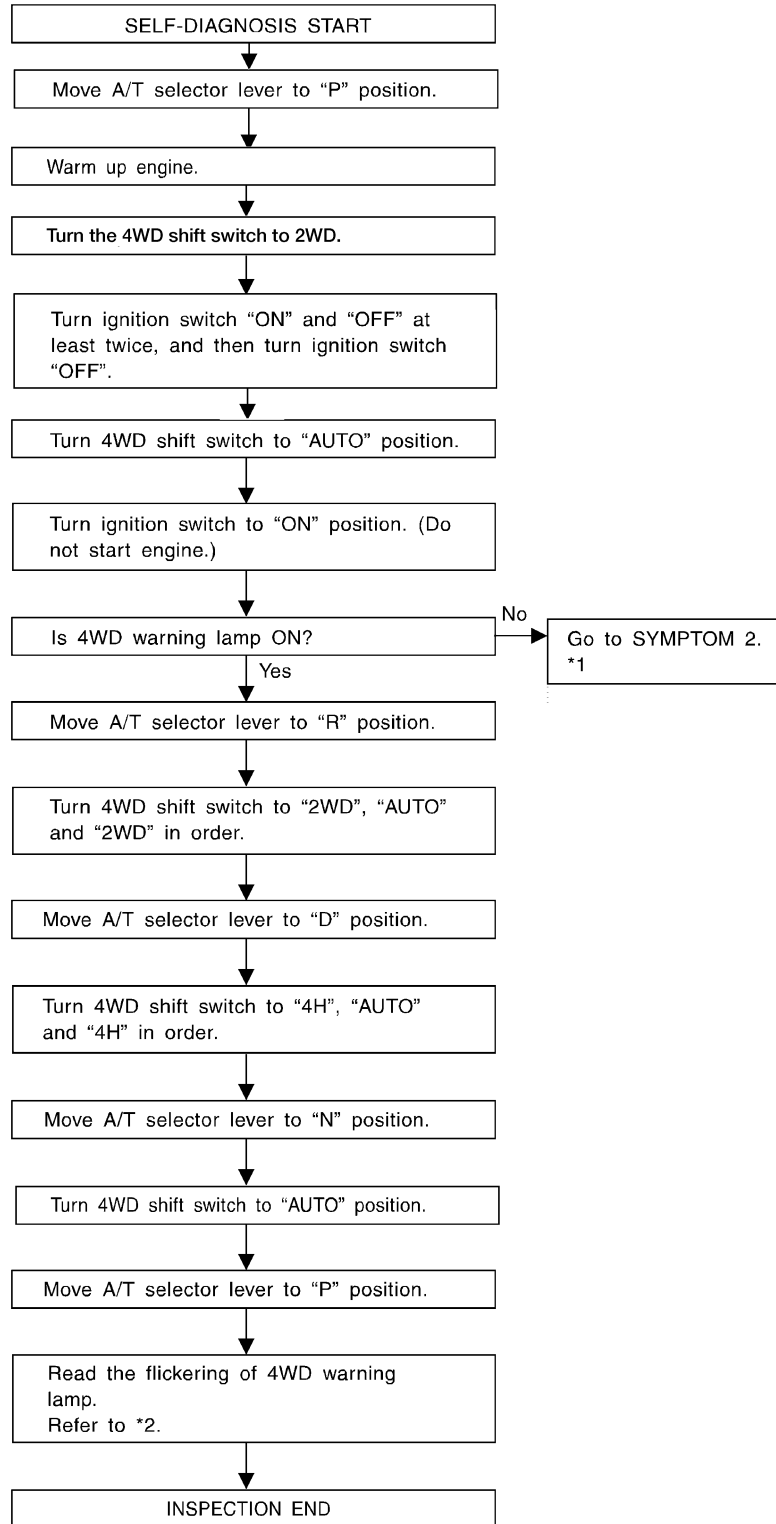
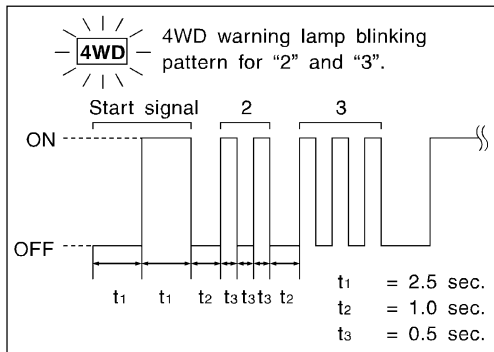
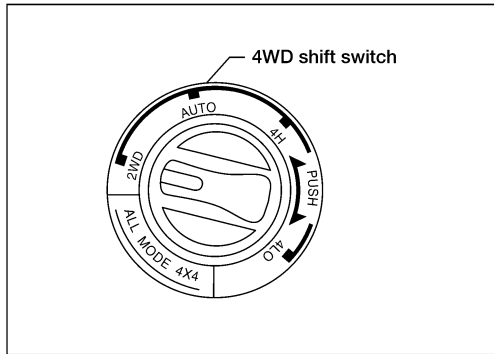
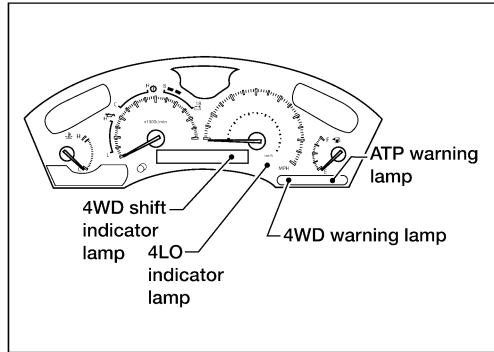
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ON BOARD DIAGNOSTIC SYSTEM DESCRIPTION

SELF-DIAGNOSTIC PROCEDURE



*1: [TF-87](#)

*2: [TF-28](#)

INDICATIONS OF 4WD WARNING LAMP

ON BOARD DIAGNOSTIC SYSTEM DESCRIPTION

Flickering pattern or flickering condition	Malfunction	Check items	A B C TF E F G H I J K L M
2	Rear revolution sensor circuit is shorted or open.	Refer to AT-112, "DTC P0720 VEHICLE SPEED SENSOR A/T (REVOLUTION SENSOR)" .	
3	4WD solenoid valve circuit is shorted or open.	Refer to TF-60, "Diagnostic Procedure" .	
4	2-4WD shift solenoid valve circuit is shorted or 2WD switch of 4WD shift switch is shorted.	Refer to TF-62, "Diagnostic Procedure" .	
5	Transfer motor relay circuit is shorted or open.	Refer to TF-64, "Diagnostic Procedure" .	
6	If unexpected signal is detected because of ABS wheel sensor malfunction or communications error within the vehicle.	Refer to BRC-38, "Wheel Sensor System Inspection" .	
7	When malfunction in CAN communication system is detected.	Refer to LAN-5, "CAN COMMUNICATION" .	
8	A/D converter of transfer control unit functions improperly.	Refer to EC-351, "DTC P0605 ECM" .	
9	Transfer fluid temperature sensor circuit is open.	Refer to TF-66, "Diagnostic Procedure" .	
10	Neutral-4LO switch circuit is shorted or open.	Refer to TF-69, "Diagnostic Procedure" .	
11	2-4WD shift solenoid valve circuit, 2WD switch of 4WD shift switch circuit or clutch pressure switch circuit is shorted or open.	Refer to TF-62, "Diagnostic Procedure" or TF-72, "Diagnostic Procedure" .	
12	Line pressure switch circuit is shorted or open.	Refer to TF-74, "Diagnostic Procedure" .	
13	Engine speed signal circuit is shorted or open.	Refer to AT-115, "DTC P0725 ENGINE SPEED SIGNAL" .	
14	Throttle position sensor circuit is shorted or open.	Refer to EC-351, "DTC P0605 ECM" .	
15	Malfunction in power supply circuit of transfer control unit.	Power supply of transfer control unit	
16	4WD shift switch circuit is shorted.	Refer to TF-62, "Diagnostic Procedure" .	
17	ABS operation signal circuit is shorted.	Refer to BRC-54, "CAN Communication System Inspection" .	
18	ATP switch, wait detection switch or neutral-4LO switch circuit is shorted or open.	Refer to TF-69, "Diagnostic Procedure" .	
19	Transfer control device actuator motor is malfunctioning. (Malfunctions are detected when actuator motor fails to operate while shifting from "4H" to "4LO" or vice versa.)	Refer to TF-77, "Diagnostic Procedure" or TF-82, "Diagnostic Procedure" .	
20	Transfer control device actuator motor arm position sensing switch is malfunctioning.	Refer to TF-80, "Diagnostic Procedure" or TF-82, "Diagnostic Procedure" .	
21	Transfer control device actuator circuit is shorted or open. (Malfunctions are detected when motor relay circuit is open/shorted or relay monitor circuit is open/shorted.)	Refer to TF-77, "Diagnostic Procedure" , TF-80, "Diagnostic Procedure" or TF-82, "Diagnostic Procedure" .	
22	If VDC operation signal is being input because of VDC malfunction or communication error within the vehicle.	Refer to BRC-40, "ABS/TCS/VDC Control Unit Inspection" .	
23	If TCS operation signal is being input because of TCS malfunction or communication error within the vehicle.	Refer to BRC-40, "ABS/TCS/VDC Control Unit Inspection" .	
24	If unexpected signal is input because of AT PNP switch circuit or communication error within the vehicle.	Refer to AT-109, "DTC P0705 PARK/NEUTRAL POSITION SWITCH" .	
Repeats flickering every 2 to 5 sec.	Circuits that the self-diagnosis covers have no malfunction.	—	

ON BOARD DIAGNOSTIC SYSTEM DESCRIPTION

Flickering pattern or flickering condition	Malfunction	Check items
Repeats flickering every 0.25 sec.	<ul style="list-style-type: none">● Power supply failure of memory back-up.● Battery is disconnected for a long time.● Battery performance is poor.	Refer to TF-76, "Diagnostic Procedure" .
No flickering	PNP switch or 4WD shift switch circuit is shorted or open.	Refer to AT-109, "DTC P0705 PARK/NEUTRAL POSITION SWITCH" or TF-62, "Diagnostic Procedure" .

ON BOARD DIAGNOSTIC SYSTEM DESCRIPTION

CONSULT-II Function (ALL MODE AWD/4WD)

EDS002G7

CONSULT-II can display each diagnostic item using the diagnostic test modes shown following.

ALL MODE AWD/4WD diagnostic mode	Description
SELF-DIAG RESULTS	Displays transfer control unit self-diagnosis results.
DATA MONITOR	Displays transfer control unit input/output data in real time.
WORK SUPPORT	Supports inspections and adjustments. Commands are transmitted to the transfer control unit for setting the status suitable for required operation, input/output signals are received from the transfer control unit and received data is displayed.
CAN DIAG SUPPORT MNTR	The results of transmit/receive diagnosis of CAN communication can be read.
ECU PART NUMBER	Transfer control unit part number can be read.

Trouble Diagnosis with CONSULT-II SELF-DIAGNOSIS

EDS0017V

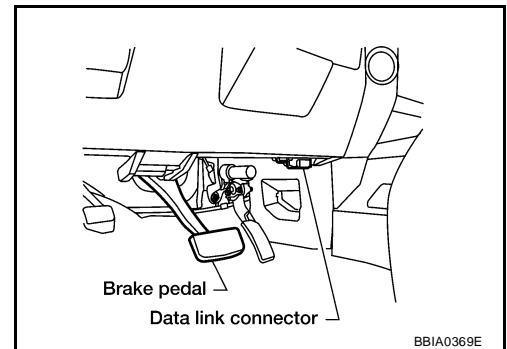
CONSULT-II Setting Procedure

1. Turn ignition switch to "OFF" position.

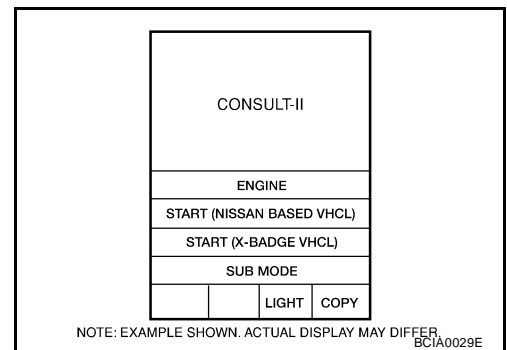
CAUTION:

If CONSULT-II is used with no connection of CONSULT-II CONVERTER, malfunctions might be detected in self-diagnosis depending on control unit which carry out CAN communication.

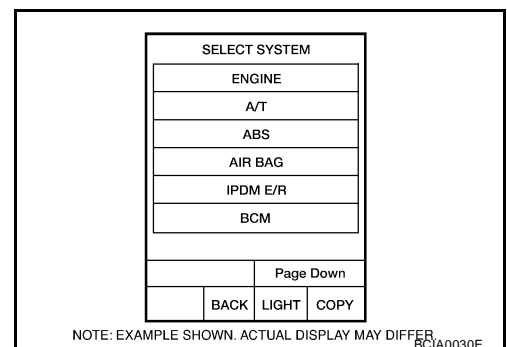
2. Connect CONSULT-II and CONSULT-II CONVERTER to data link connector.



3. Start engine.
4. On CONSULT-II screen, touch "START (NISSAN BASED VHCL)".

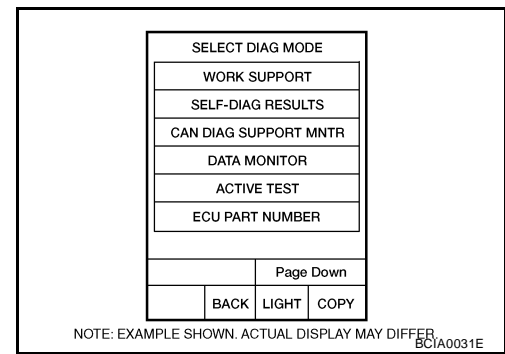


5. Touch "ALL MODE AWD/4WD" on SELECT SYSTEM screen. If "ALL MODE AWD/4WD" is not indicated, refer to [GI-39, "CONSULT-II Data Link Connector \(DLC\) Circuit"](#).



ON BOARD DIAGNOSTIC SYSTEM DESCRIPTION

6. Touch "SELF-DIAG RESULTS" on SELECT DIAG MODE screen.



7. Self-diagnostic results are displayed.

SELF-DIAGNOSTIC ITEMS

Detected items (Screen terms for CONSULT-II, "SELF-DIAG RESULT" mode)	Malfunction is detected when...	Check items
Revolution sensor (rear) (VHCL SPEED SEN-RR)	<ul style="list-style-type: none"> ● Signal from vehicle speed sensor 1 (installed on A/T) is not input due to open circuit. ● Improper signal is input while driving. 	Refer to AT-112, "DTC P0720 VEHICLE SPEED SENSOR A/T (REVOLUTION SENSOR)" .
4WD solenoid valve (DUTY SOLENOID)	<ul style="list-style-type: none"> ● Proper voltage is not applied to solenoid valve due to open or short circuit. 	Refer to TF-60, "Diagnostic Procedure" .
2-4WD shift solenoid valve (2-4WD SOLENOID)		Refer to TF-62, "Diagnostic Procedure" .
Transfer motor relay (MOTOR RELAY)	<ul style="list-style-type: none"> ● Motor does not operate properly due to open or short circuit in transfer motor or motor relay. 	Refer to TF-64, "Diagnostic Procedure" .
Transfer fluid temperature sensor (FLUID TEMP SENSOR)	<ul style="list-style-type: none"> ● Signal voltage from fluid temperature sensor is abnormally high (T/F fluid temperature is abnormally low) while driving. 	Refer to TF-66, "Diagnostic Procedure" .
Neutral-4LO switch (N POSI SW TF)	<ul style="list-style-type: none"> ● Improper signal is input while driving. 	Refer to TF-69, "Diagnostic Procedure" .
Clutch pressure (CLUTCH PRESSURE)	<ul style="list-style-type: none"> ● Improper signal is input due to open or short circuit. ● Malfunction occurs in clutch pressure hydraulic circuit. 	(*1) Refer to TF-72, "Diagnostic Procedure" .
Line pressure (LINE PRESSURE)	<ul style="list-style-type: none"> ● Improper signal is input due to open or short circuit. ● Malfunction occurs in line pressure hydraulic circuit. 	(*1) Refer to TF-74, "Diagnostic Procedure" .
Engine speed signal (Note 1) (ENGINE SPEED SIG)	<ul style="list-style-type: none"> ● Engine speed is abnormally low while driving. 	Refer to AT-115, "DTC P0725 ENGINE SPEED SIGNAL" .
Throttle position sensor (THRTL POSI SEN)	<ul style="list-style-type: none"> ● Signal voltage from throttle position sensor is abnormally high. ● Signal voltage from throttle position sensor is abnormally low when closed throttle position switch is OFF. 	Refer to EC-351, "DTC P0605 ECM" .
Transfer control unit (ADC) C/U (ADC)/THRTL SEN	<ul style="list-style-type: none"> ● Power supply voltage for A/D converter system of transfer control unit is malfunctioning. 	Refer to EC-351, "DTC P0605 ECM" .
Battery voltage (Note 1) (BATTERY VOLTAGE)	<ul style="list-style-type: none"> ● Power supply voltage for transfer control unit is abnormally low while driving. 	Refer to TF-18, "Wiring Diagram — T/F —" .
4WD shift switch (4WD MODE SW)	<ul style="list-style-type: none"> ● More than two switch inputs are simultaneously detected due to short circuit of 4WD shift switch. 	Refer to TF-62, "Diagnostic Procedure" .
ABS operation signal (Note 4) (ABS OPER SIGNAL)	<ul style="list-style-type: none"> ● When a malfunction signal due to disconnection or shorting is detected. ● When a defect signal is entered from the ABS control unit. 	Refer to BRC-54, "CAN Communication System Inspection" .
Wait detection switch (Note 2) (WAIT DETECT SWITCH)	<ul style="list-style-type: none"> ● Improper signal is input due to open or short circuit. 	(*2) Refer to TF-69, "Diagnostic Procedure" .

ON BOARD DIAGNOSTIC SYSTEM DESCRIPTION

Detected items (Screen terms for CONSULT-II, "SELF-DIAG RESULT" mode)	Malfunction is detected when...	Check items	A
Shift actuator abnormal (SHIFT ACT)	Transfer control device actuator motor is malfunctioning. (Malfunctions are detected when actuator motor fails to operate while shifting from "4H" to "4LO" or vice versa.)	Refer to TF-77, "Diagnostic Procedure" or TF-82, "Diagnostic Procedure" .	B
Shift actuator position switch abnormal (SHIFT ACT P/S)	Transfer control device actuator motor arm position sensing switch is malfunctioning.	Refer to TF-80, "Diagnostic Procedure" or TF-82, "Diagnostic Procedure" .	C
Shift actuator circuit abnormal (SHIFT ACT CIR)	Transfer control device actuator circuit is shorted or open. (Malfunctions are detected when motor relay circuit is open/shorted or relay monitor circuit is open/shorted.)	Refer to TF-77, "Diagnostic Procedure" , TF-80, "Diagnostic Procedure" TF-82, "Diagnostic Procedure" .	TF
Memory power supply stop	<ul style="list-style-type: none"> Due to removal of battery which cuts off power supply to transfer control unit, self-diagnosis memory function is suspended. 	Refer to TF-76, "Diagnostic Procedure" .	E
Transfer control unit (RAM) [CONTROL UNIT (RAM)]	<ul style="list-style-type: none"> Malfunction is detected in the memory (RAM) system of transfer control unit. 	—	F
Transfer control unit (ROM) [CONTROL UNIT (ROM)]	<ul style="list-style-type: none"> Malfunction is detected in the memory (ROM) system of transfer control unit. 	—	G
Transfer control unit (EEPROM) [CONTROL UNIT (EEPROM)]	<ul style="list-style-type: none"> Malfunction is detected in the memory (EEPROM) system of transfer control unit. 	—	H
Longitudinal G-sensor	Displayed, but do not use.	—	I
ABS VHL SPD SEN	<ul style="list-style-type: none"> ABS vehicle speed sensor signal is not input due to an open circuit. An unexpected signal is input when vehicle is being driven. 	Refer to ABS vehicle speed sensor diagnosis.	J
STEERING ANGLE SENSOR	Displayed, but do not use.	—	K
VDC OPER SIG	If VDC operation signal is being input because of VDC malfunction or communication error within the vehicle.	Refer to BRC-40, "ABS/TCS/VDC Control Unit Inspection" .	L
TCS OPER SIG	If TCS operation signal is being input because of TCS malfunction or communication error within the vehicle.	Refer to BRC-40, "ABS/TCS/VDC Control Unit Inspection" .	M
CAN COMM (Note 5)	Malfunction is detected in CAN communication.	Refer to LAN-5, "CAN COMMUNICATION" .	L
A/T POSITION SIGNAL	When AT PNP switch circuit is malfunction or communication error between the vehicles	Refer to AT-109, "DTC P0705 PARK/NEUTRAL POSITION SWITCH" .	L

Note 1: When a malfunction occurs, it is only displayed and not stored in the memory.

Note 2: When the wait detection switch has been properly fixed, malfunction information is erased from the memory.

Note 3: If 4WD shift switch is left between 4H and 4LO for a while, this indication may be displayed.

(*1): If the malfunction is detected only while driving in reverse, check the continuity of "R" position on A/T PNP switch. When there is nothing wrong with the electrical system, check the hydraulic system.

(*2): If a revolution sensor malfunction is detected at the same time, check the revolution sensor circuit first.

Note 4: When this malfunction is detected with the ABS warning lamp off, first check for disconnection or shorting in the harness between the transfer control unit and the ABS control unit.

Note 5: When several systems including CAN communication system indicate malfunctions, perform diagnosis of the CAN communication first.

ON BOARD DIAGNOSTIC SYSTEM DESCRIPTION

DATA MONITOR

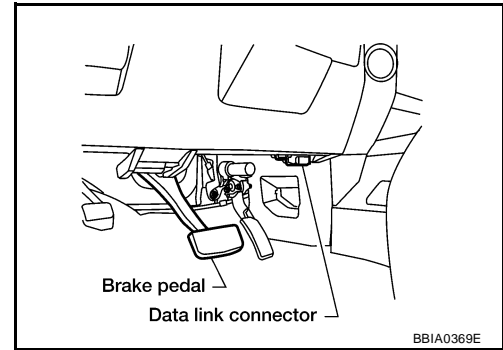
CONSULT-II Setting Procedure

1. Turn ignition switch to "OFF" position.

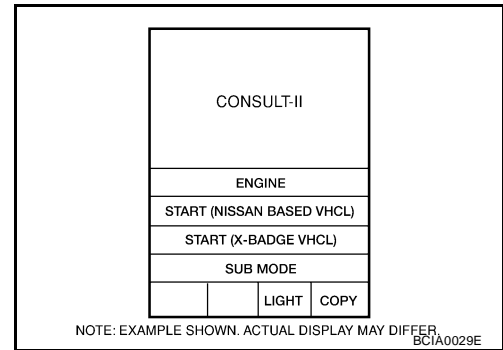
CAUTION:

If CONSULT-II is used with no connection of CONSULT-II CONVERTER, malfunctions might be detected in self-diagnosis depending on control unit which carry out CAN communication.

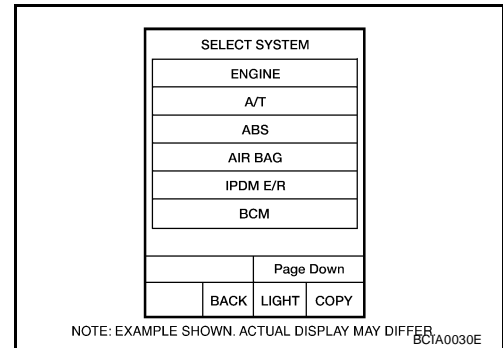
2. Connect CONSULT-II and CONSULT-II CONVERTER to data link connector.
3. Turn ignition switch to ON position.



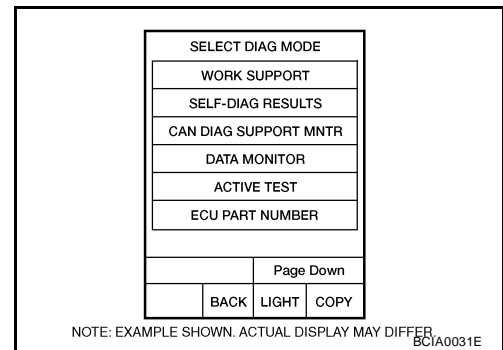
4. Touch "START (NISSAN BASED VHCL)".



5. Touch "ALL MODE AWD/4WD".
If "ALL MODE AWD/4WD" is not indicated, refer to [GI-39](#), "[CONSULT-II Data Link Connector \(DLC\) Circuit](#)".



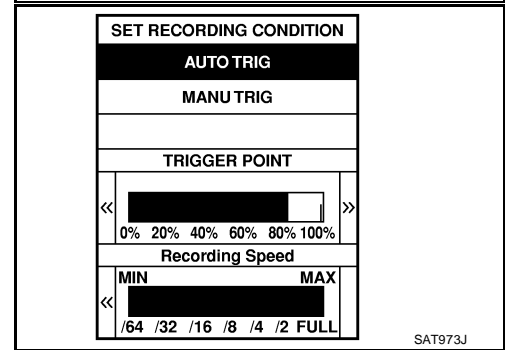
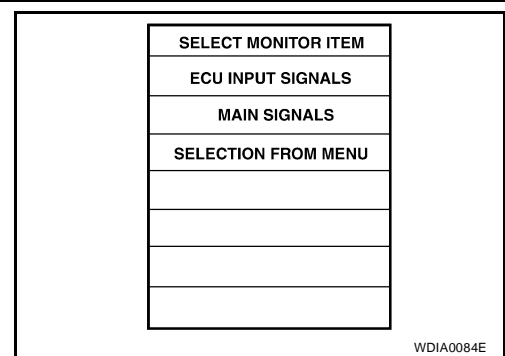
6. Touch "DATA MONITOR".



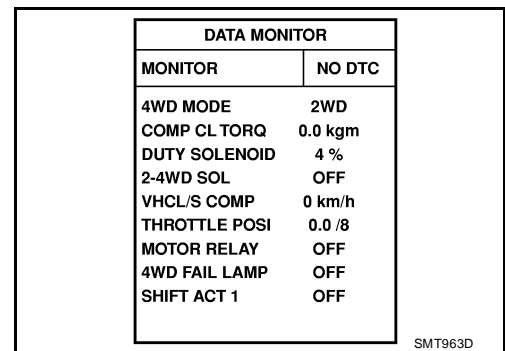
ON BOARD DIAGNOSTIC SYSTEM DESCRIPTION

7. Touch "ECU INPUT SIGNALS" or "MAIN SIGNALS".
8. Select "Numerical Display", "Bar Chart Display" or "Line Graph Display".
9. Touch "SETTING" to set record conditions.

10. Touch "AUTO TRIG" or "MANU TRIG".
11. Return to "SELECT MONITOR ITEM" on "DATA MONITOR" screen and touch "START".



12. Monitored data are displayed.



DATA MONITOR ITEMS

○ : Standard ▼ : Option

Item [Unit]	Monitor item			Remarks
	ECU INPUT SIGNALS	MAIN SIGNALS	SELECTION FROM MENU	
VHCL/SEN-FR [km/h], [MPH]	○		▼	Indicates average vehicle speed of ABS front left/right wheel.
VHCL/SEN-RR [km/h], [MPH]	○		▼	Indicates average vehicle speed of ABS rear left/right wheel.
Engine speed [rpm]	○		▼	—
Throttle position sensor	○		▼	—
Transfer fluid temperature sensor [V]	○		▼	—
Battery voltage [V]	○		▼	—
2WD switch [ON-OFF]	○		▼	2WD switch of 4WD shift switch
AUTO switch [ON-OFF]	○		▼	AUTO switch of 4WD shift switch
Lock switch [ON-OFF]	○		▼	4H switch of 4WD shift switch
4L switch [ON-OFF]	○		▼	4LO switch of 4WD shift switch

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ON BOARD DIAGNOSTIC SYSTEM DESCRIPTION

Item [Unit]	Monitor item			Remarks
	ECU INPUT SIGNALS	MAIN SIGNALS	SELECTION FROM MENU	
N position switch TF [ON-OFF]	○		▼	N position switch of transfer
Line pressure switch [ON-OFF]	○		▼	Line pressure switch
Clutch pressure switch [ON-OFF]	○		▼	Clutch pressure switch
ATP switch [ON-OFF]	○		▼	—
N position switch AT [ON-OFF]	○		▼	"N" position on A/T PNP switch
R position switch AT [ON-OFF]	○		▼	"R" position on A/T PNP switch
P position switch AT [ON-OFF]	○		▼	"P" position on A/T PNP switch
ABS operation switch [ON-OFF]	○		▼	ABS operation switch
Wait detection switch [ON-OFF]	○		▼	—
Throttle position		○	▼	Throttle opening recognized by transfer control unit
4WD-mode		○	▼	4WD-mode recognized by transfer control unit (2WD, AUTO, 4H & 4LO)
Vehicle speed comp [km/h (MPH)]		○	▼	Vehicle speed recognized by transfer control unit
*Control torque [N·m (kg·m, ft·lb.)]		○	▼	Calculated torque recognized by transfer control unit
Duty solenoid valve [%] (Transfer 4WD solenoid valve)		○	▼	—
2-4WD shift solenoid valve [ON-OFF]		○	▼	Control signal outputs of transfer control unit
Transfer motor relay [ON-OFF]		○	▼	
Shift activating 1 [ON-OFF]		○	▼	
Shift activating 2 [ON-OFF]		○	▼	
2-4WD shift solenoid valve monitor [ON-OFF]			▼	Check signal (re-input signal) of transfer control unit control signal output is displayed. If circuit is shorted or open, ON/OFF state does not change.
Transfer motor relay monitor [ON-OFF]			▼	
Shift activating monitor 1 [ON-OFF]	○		▼	
Shift activating monitor 2 [ON-OFF]	○		▼	
4WD fail lamp [ON-OFF]		○	▼	Transfer control unit control signal output for 4WD warning lamp (left)
Shift position switch 1 [ON-OFF]	○		▼	—
Shift position switch 2 [ON-OFF]	○		▼	—
2WD indicator lamp [ON-OFF]			▼	Transfer control unit control signal output for 4WD shift indicator lamp (rear)
AUTO indicator lamp [ON-OFF]			▼	Transfer control unit control signal output for 4WD shift indicator lamp (front & rear)
LOCK indicator lamp [ON-OFF]			▼	Transfer control unit control signal output for 4WD shift indicator lamp (center)
4LO indicator lamp [ON-OFF]			▼	Transfer control unit control signal output for 4WD shift indicator lamp (right)

ON BOARD DIAGNOSTIC SYSTEM DESCRIPTION

Item [Unit]	Monitor item			Remarks
	ECU INPUT SIGNALS	MAIN SIGNALS	SELECTION FROM MENU	
Clutch limit [N·m (kg·m, ft.-lb.)]			▼	Clutch force release limit value set in WORK SUPPORT
Voltage [V]			▼	Value measured by voltage probe is displayed.
Frequency [Hz]			▼	Value measured by pulse probe is displayed. If measurement is impossible, “#” sign is displayed. “#” sign is also displayed at the final data value until the measurement result is obtained.
DUTY-HI			▼	Duty cycle value for measurement probe is displayed.
DUTY-LOW			▼	
PLS WIDTH-HI			▼	Measured pulse width of measurement probe is displayed.
PLS WIDTH-LOW			▼	
FR/RR G-SEN [G]	○		▼	Displayed, but do not use.
TF F SPEED [km/h], [MPH]	○		▼	Displayed, but do not use.
AT R SPEED [km/h], [MPH]	○		▼	Indicates A/T rear vehicle speed.
A/T actual gear position	○		▼	Indicates A/T actual gear position.
VDC OPER SW [ON-OFF]	○		▼	Indicates VDC operation switch.
TCS OPER SW [ON-OFF]	○		▼	Indicates TCS operation switch.
ATP LAMP [ON-OFF]			▼	Indicates C/U control signal output of ATP lamp.

*: This item is indicated as “COMP CL TORQ”.

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ON BOARD DIAGNOSTIC SYSTEM DESCRIPTION

REFERENCE VALUE IN DATA MONITOR MODE

Indicated items (Screen terms for CONSULT-II, "DATA MONITOR" mode)	Display	Conditions			
Throttle position sensor (THRTL POS SEN)	0.0/8 - 8.0/8	Throttle valve fully closed to fully open			
Transfer fluid temperature sensor (FLUID TEMP SE)	Approx. 1.5 - 0.5V	Transfer fluid temperature approx. 20 - 80°C (68 - 176°F)			
ABS operation switch (ABS OPER SW)	OFF	ABS is not operating.			
	ON	ABS is operating.			
2WD position (2WD SWITCH)	ON	4WD shift switch is in "2WD".			
	OFF	Except the above condition			
Lock position (LOCK SWITCH)	ON	4WD shift switch is in "4H".			
	OFF	Except the above condition			
Neutral-4LO switch (N POSI SW TF) ATP switch (ATP SWITCH) Wait detection switch (WAIT DETCT SW)	4WD shift switch position	2WD, AUTO, 4H	(N)	4LO	
	ATP switch	OFF	ON		OFF
	Neutral-4LO switch/Wait detection switch See Note.	OFF		ON	
	Note: When shifting into or out of "4LO" the switches turn ON when "Wait" function is operating and they turn OFF when "Wait" function is canceled.				
Transfer motor relay (MOTOR RELAY) Transfer motor relay monitor (MOTOR RELAY MON)	Throttle valve	4WD shift switch	A/T selector lever	Motor relay/ Motor relay mon	Remarks
	Fully closed	2WD	—	OFF	—
		4LO	P, N	OFF	ON for approx. 2 sec. after shifting to "P" and "N"
			Others	ON	
		4H	P	OFF	ON for approx. 2 sec. after shifting to "P"
Others	ON				
Line pressure switch (LINE PRES SW)	OFF	The vehicle has been left at room temperature for 5 minutes and more with ignition switch in "OFF" position.			
	ON	Ignition switch in "ON", and 4WD shift switch in "AUTO" or "4H" and A/T selector lever in "D".			
Clutch pressure switch (CL PRES SW)	OFF	Ignition switch in "ON", and 4WD shift switch in "2WD". ("Wait" function is not operating.)			
	ON	Ignition switch in "ON", and 4WD shift switch in "AUTO" or "4H" and A/T selector lever in "D". ("Wait" function is not operating.)			
Vehicle speed (VHCL/S COMP)	0 km/h (0 MPH)	—			—
Control torque (COMP CL TORQ)	0 kg-m	4WD shift switch ("Wait" function is not operating.)			In "2WD" position
	39 - 1,353 N-m (4 - 138 kg-m, 29 - 998 ft.-lb.)				In "AUTO" position
	1,353 N-m (138 kg-m, 998 ft.-lb.)				In "4H" or "4LO" position
4WD solenoid (DUTY SOLENOID)	4%				In "2WD" position
	96 - 4%	In "AUTO" position			
	4%	In "4H" or "4LO" position			

ON BOARD DIAGNOSTIC SYSTEM DESCRIPTION

Indicated items (Screen terms for CONSULT-II, "DATA MONITOR" mode)	Display	Conditions	A
2-4WD shift solenoid valve (2-4WD SOL) 2-4WD shift solenoid monitor (2-4WD SOL MON)	OFF	4WD shift switch	In "2WD" position
	ON ("Wait" function is not operating.)		B
	OFF ("Wait" function is operating.)		In "AUTO" position
	ON ("Wait" function is not operating.)		C
	OFF ("Wait" function is operating.)		In "4H" position
	ON		In "4LO" position
Battery voltage (BATTERY VOLT)	Approx. 12V	Key switch "ON" and engine at rest	E
	Approx. 13 - 14V	During idling	F
AUTO switch	OFF	4WD shift switch in other than "AUTO" position	G
	ON	4WD shift switch in "AUTO" position	H
4L switch	OFF	4WD shift switch in other than "4LO" position	I
	ON	4WD shift switch in "4LO" position	J
N position switch (N POSI SW AT)	OFF	A/T selector lever in other than "N" position	K
	ON	A/T selector lever in "N" position	L
R position switch (R POSI SW AT)	OFF	A/T selector lever in other than "R" position	M
	ON	A/T selector lever in "R" position	
P position switch (P POSI SW AT)	OFF	A/T selector lever in other than "P" position	
	ON	A/T selector lever in "P" position	
Throttle opening (THROTTLE POSI)	0.0/8 - 8.0/8	Throttle fully closed (0.0/8) or throttle fully open (8.0/8)	TF

ON BOARD DIAGNOSTIC SYSTEM DESCRIPTION

Indicated items (Screen terms for CONSULT-II, "DATA MONITOR" mode)	Display	Conditions	
4WD-mode	2WD	4WD shift switch	In "2WD" position
	AUTO		In "AUTO" position
	LOCK		In "4H" position
	4L		In "4LO" position
Front wheel speed (VHCL/S SEN-FR)	0 - 255 km/h (0 - 158 MPH)	0 km/h (vehicle at standstill)	
Rear wheel speed (VHCL/S SEN-RR)	0 - 255 km/h (0 - 158 MPH)	0 km/h (vehicle at standstill)	
Shift ACTR operating 1 (SHIFT ACT 1) Shift activating monitor 1 (SHIFT AC MON 1)	OFF	During normal operation	
	ON	During shifts from "4H" to "4LO" position	
Shift ACTR operating 2 (SHIFT ACT 2) Shift activating monitor 2 (SHIFT AC MON 2)	OFF	During normal operation	
	ON	During shifts from "4LO" to "4H" position	
4WD fail lamp	OFF	During normal operation	
	ON	During 2-second period (after key switch turned to "ON") or when system is out of order	
Shift ACTR position sensing switch 1 (SHIFT POS SW 1)	OFF	4WD shift switch is in a position other than "4LO".	
	ON	4WD shift switch in "4LO" position	
Shift ACTR position sensing switch 2 (SHIFT POS SW 2)	OFF	4WD shift switch in "4LO" position	
	ON	4WD shift switch is in a position other than "4LO".	
2WD indicator lamp (2WD IND)	OFF	Engine at rest or system out of order	
	ON	Except the above condition	

ON BOARD DIAGNOSTIC SYSTEM DESCRIPTION

Indicated items (Screen terms for CONSULT-II, "DATA MONITOR" mode)	Display	Conditions	
AUTO indicator lamp (AUTO IND)	OFF	Engine at rest during 2WD-mode operation or system out of order	A
	ON	4WD shift switch in "4LO" or "4H" or "AUTO" position	B C
LOCK indicator lamp (LOCK IND)	OFF	Engine at rest and 4WD shift switch in "AUTO" position during 2WD-mode operation or system out of order	TF
	ON	4WD shift switch in "4H" or "4LO" position	E
4LO indicator lamp (4L IND)	OFF	Engine at rest and 4WD shift switch in "AUTO" position during 2WD-mode operation or system out of order	F
	ON	4WD shift switch in "4LO" position	G
Clutch force release limit (CL/F RLS LIM)	0.2, 0.3, 1.2 kgm	Indicates the clutch force release setting applied using the scan tool. 0.3 kgm is the default setting.	H
VDC operation switch (VDC OPER SW)	OFF	VDC is not operating.	I
	ON	VDC is operating.	J
TCS operation switch (TCS OPER SW)	OFF	TCS is not operating.	K
	ON	TCS is operating.	L
ATP indicator lamp (ATP IND)	OFF	Normal operation.	M
	ON	Driver is attempting to shift into or out of 4L while the AT is not in neutral.	
Transfer case F speed (T/F F SPEED)	0.0 km/h (0.0 MPH)	—	
Automatic transmission R speed (AT R SPEED)	0.0 km/h (0.0 MPH)	—	
Automatic transmission gear position (AT GEAR POSI)	1,2,3,4	Displays actual AT gear position.	

WORK SUPPORT

Purpose

When there is no problem with transfer and 4WD system, the following symptom in "AUTO" mode may be claimed by a customer.

- Vibration when accelerating on snow-covered or icy roads. (Note)

ON BOARD DIAGNOSTIC SYSTEM DESCRIPTION

It is possible to deal with these symptoms by changing “CLUTCH FORCE RELEASE LIMIT VALUE”. However, be careful when changing the values because it may adversely affect driving performance.

NOTE:

A slight shock is felt at a few hertz as if it were being pushed lightly from behind.

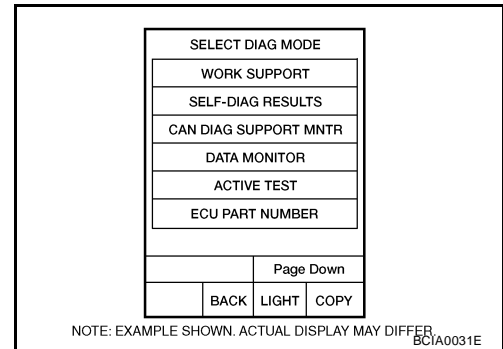
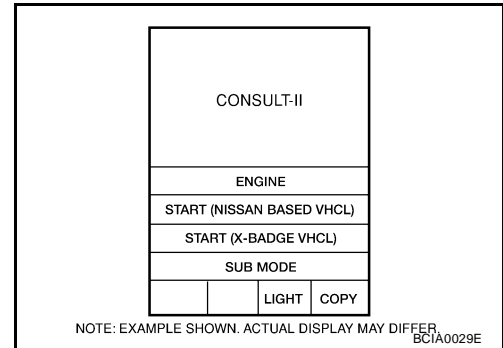
CONSULT-II Setting Procedure

1. Turn ignition switch to “OFF” position.

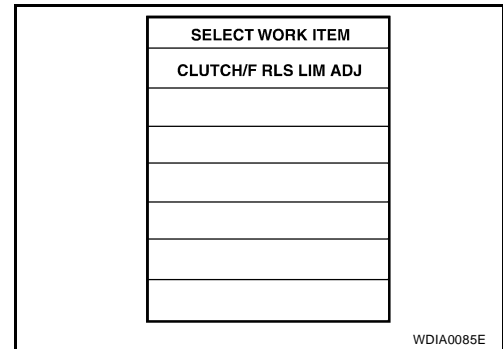
CAUTION:

If CONSULT-II is used with no connection of CONSULT-II CONVERTER, malfunctions might be detected in self-diagnosis depending on control unit which carry out CAN communication.

2. Connect CONSULT-II and CONSULT-II CONVERTER to data link connector.
3. Turn ignition switch to “ON” position.
4. Touch “START (NISSAN BASED VHCL)”.
5. Touch “ALL MODE AWD/4WD”.
If "ALL MODE AWD/4WD" is not indicated, refer to [GI-39, "CONSULT-II Data Link Connector \(DLC\) Circuit"](#) .
6. Touch “WORK SUPPORT”.



7. Select WORK ITEM by touching “CLUTCH/F RLS LIM ADJ”.



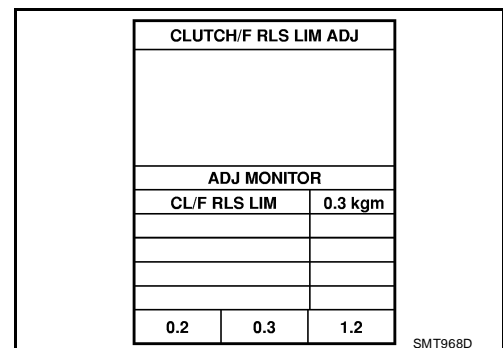
CLUTCH FORCE RELEASE LIMIT ADJUSTMENT

1.2 kg-m: Tight corner braking symptom is alleviated. However, vibration may occur when accelerating on a low μ road (icy road, etc.).

0.3 kg-m: Initial set value

0.2 kg-m: Do not set to this value because the tight corner braking symptom will get worse.

1. Current CLUTCH FORCE RELEASE LIMIT value “0.3 kgm” appears under “CONDITION SETTING” on CONSULT-II display.
2. Touch “1.2” on the display.



ON BOARD DIAGNOSTIC SYSTEM DESCRIPTION

3. Display changes to "NOW ADJUSTING" in a short time.

CLUTCH/F RLS LIM ADJ		
NOW ADJUSTING		
ADJ MONITOR		

SMT969D

4. When clutch force release limit value is set to "1.2 kgm", current value "0.3 kgm" shown on display will be replaced by "1.2 kgm" and "ADJUSTMENT COMPLETE" will appear at the same time. Clutch force release limit value setting is now complete.

CLUTCH/F RLS LIM ADJ		
ADJUSTMENT COMPLETE		
ADJ MONITOR		
CL/F RLS LIM	1.2 kgm	
0.2	0.3	1.2

SMT970D

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TROUBLE DIAGNOSIS — INTRODUCTION

PFP:00000

Introduction DESCRIPTION

EDS0017W

When a malfunction (indicated by the 4WD warning lamp illumination) occurs, collect information first from the customer about how the malfunction occurs. Then, proceed with the diagnosis presuming it is the cause. Also inspect the electrical system, paying close attention to other possibilities such as fluid level and leaks.

All-mode 4WD transfer is controlled by transfer control unit and sensors.

If a malfunction occurs in the all-mode 4WD system, the 4WD warning lamp lights up to inform of the system malfunction. There are two ways to identify the cause of the malfunction.

1. Performing the self-diagnosis. (The 4WD warning lamp will indicate what kind of malfunction has occurred by flickering.)
2. Performing diagnosis using CONSULT-II.

DIAGNOSTIC WORKSHEET

Information from Customer

KEY POINTS

- **WHAT** Vehicle model
- **WHEN**..... Date, Frequencies
- **WHERE**..... Road conditions
- **HOW**..... Operating conditions, Symptoms

Information sheet from customer		
Customer name MR/MS	Model & Year	VIN
Transfer model ATX14B	Engine	Mileage
Incident Date	Manuf. Date	In Service Date
Frequency	<input type="checkbox"/> Continuous <input type="checkbox"/> Intermittent (times a day)	
Symptoms	<input type="checkbox"/> 4WD shift indicator lamp does not turn on. <input type="checkbox"/> 4WD warning lamp does not turn on. <input type="checkbox"/> 4WD shift indicator lamp does not turn off. <input type="checkbox"/> ATP warning lamp does not turn on. <input type="checkbox"/> 4LO indicator lamp does not turn on. <input type="checkbox"/> 4WD shift indicator lamp does not indicate "4H". <input type="checkbox"/> 4WD shift indicator lamp repeats flicking. <input type="checkbox"/> Tight corner braking symptom occurs. <input type="checkbox"/> 4WD system does not operate. <input type="checkbox"/> Others.	
4WD warning lamp	<input type="checkbox"/> Continuously lit	<input type="checkbox"/> Not lit

Diagnostic Worksheet

1.	<input type="checkbox"/> Listen to customer complaints.	TF-47
2.	<input type="checkbox"/> Check transfer fluid. <input type="checkbox"/> Leakage <input type="checkbox"/> Fluid condition <input type="checkbox"/> Fluid level	TF-47
3.	<input type="checkbox"/> Road testing <input type="checkbox"/> 1. Check before engine is started. <input type="checkbox"/> 2. Check at idle. <input type="checkbox"/> 3. Cruise test	TF-47
4.	<input type="checkbox"/> Perform self-diagnosis NG items (with CONSULT-II and without CONSULT-II).	TF-31 , TF-28

TROUBLE DIAGNOSIS — INTRODUCTION

5.	<input type="checkbox"/> Check component. Repair or replace the damaged parts.	TF-109
6.	<input type="checkbox"/> Perform final check. Perform road test (1 through 3).	TF-47

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TROUBLE DIAGNOSIS — INTRODUCTION

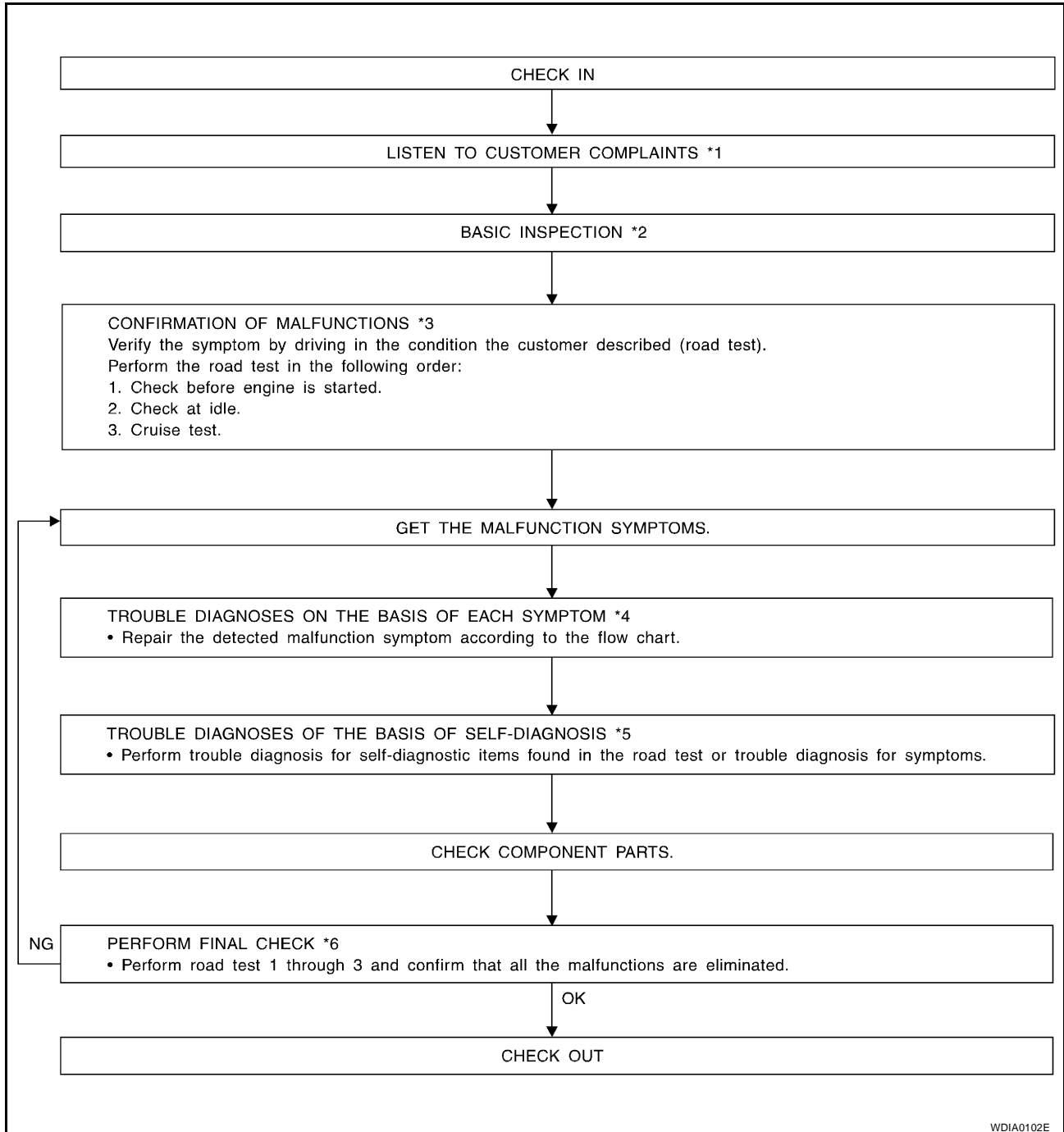
EDS0017X

Work Flow

HOW TO PERFORM TROUBLE DIAGNOSES FOR QUICK AND ACCURATE REPAIR

A good understanding of the malfunction conditions can make troubleshooting faster and more accurate. In general, each customer feels differently about a problem. It is important to fully understand the symptoms or conditions for a customer complaint.

Make good use of the two sheets provided, “Information from Customer” (Refer to [TF-44](#)) and “Diagnostic Worksheet” (Refer to [TF-44](#)), to perform the best troubleshooting possible.



WDIA0102E

*1: [TF-47](#)

*2: [TF-47](#)

*3: [TF-47](#)

*4: [TF-85](#) - [TF-94](#)

*5: [TF-60](#) - [TF-82](#)

*6: [TF-47](#)

TROUBLE DIAGNOSIS — BASIC INSPECTION

PFP:00000

Listen to Customer Complaints

EDS0017Y

- Each customer feels differently about a problem. It is important to fully understand the symptoms or conditions for a customer complaint.
- Listen to the customer about how and when the malfunction occurs, and make good use of it when performing the road test.

Transfer Fluid Check

EDS0017Z

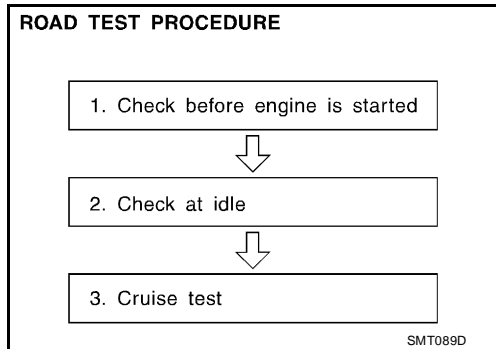
- Check fluid for leaks and fluid level. Refer to [TF-47, "Transfer Fluid Check"](#) .

Road Test

EDS00180

PREPARATION FOR ROAD TEST

- The purpose of the test is to determine overall performance of transfer and analyze causes of problems.
- When a malfunction is found in any part of transfer, perform the road test to locate the malfunction area and repair the malfunction parts.
- The road test consists of the following three parts:
 1. Check before engine is started
 2. Check at idle
 3. Cruise test
- Perform road test and place checks for NG items on the diagnostic worksheet. Refer to [TF-44, "Diagnostic Worksheet"](#) .

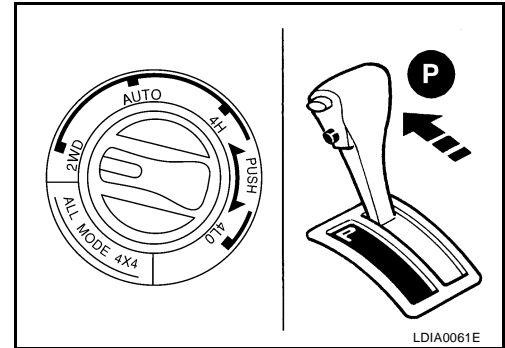


TROUBLE DIAGNOSIS — BASIC INSPECTION

1. CHECK BEFORE ENGINE IS STARTED

1. CHECK 4WD SHIFT INDICATOR LAMP

1. Park vehicle on flat surface.
2. Turn ignition switch to OFF position.
3. Move A/T selector lever to P position.
4. Set 4WD shift switch to 4H position.
5. Set 4WD shift switch to 2WD position.
6. Turn ignition switch to ON position. (Do not start engine.)

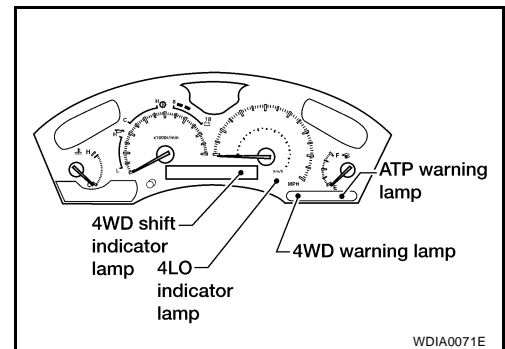


7. Does 4WD shift indicator lamp turn ON for approx. 1 second?

Yes or No

Yes >> GO TO 2.

No >> Go to Symptom 1. Refer to [TF-85, "Symptom 1. 4WD Shift Indicator Lamp Does Not Turn ON \(Although the ignition switch is turned ON, all the 4WD indicator lamps do not turn ON for 1 second\)"](#) .



2. CHECK 4WD WARNING LAMP

Is 4WD warning lamp turned ON?

Yes or No

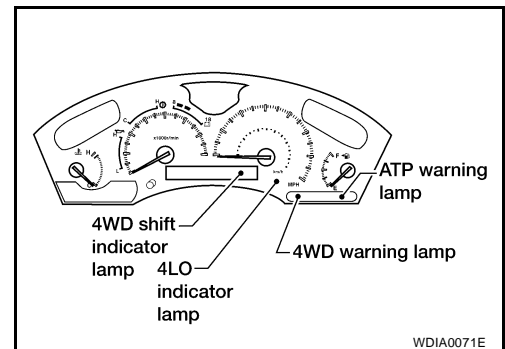
Yes >> 1. Turn ignition switch to OFF position.

2. Perform self-diagnosis.

Refer to [TF-27, "Trouble Diagnosis without CONSULT-II"](#) .

3. Go to "2. CHECK AT IDLE". Refer to [TF-49, "2. CHECK AT IDLE"](#) .

No >> Go to Symptom 2. Refer to [TF-87, "Symptom 2. 4WD Warning Lamp Does Not Turn ON \(Although the ignition switch is turned ON, the 4WD warning lamp does not turn ON\)"](#) .



TROUBLE DIAGNOSIS — BASIC INSPECTION

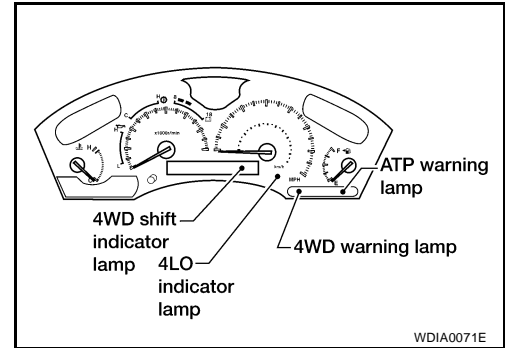
2. CHECK AT IDLE

1. CHECK 4WD SHIFT INDICATOR LAMP

1. Park vehicle on flat surface.
2. Turn ignition switch to OFF position.
3. Move A/T selector lever to P or N position.
4. Set 4WD shift switch to 4H position.
5. Set 4WD shift switch to 2WD position.
6. Start engine.
7. Is 4WD shift indicator lamp turned OFF?

Yes or No

- Yes >> Go to "ATP SWITCH, WAIT DETECTION SWITCH AND NEUTRAL-4LO SWITCH". Refer to [TF-69, "ATP SWITCH, WAIT DETECTION SWITCH AND NEUTRAL-4LO SWITCH"](#) .
- No >> GO TO 2.



2. CHECK 4WD WARNING LAMP

Is 4WD warning lamp turned OFF?

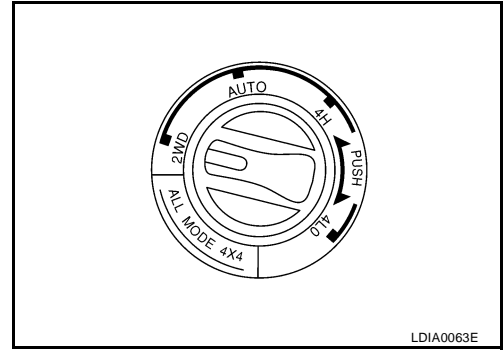
Yes or No

- Yes >> GO TO 3.
- No >> Perform self-diagnosis. Refer to [TF-27, "Trouble Diagnosis without CONSULT-II"](#) .

TROUBLE DIAGNOSIS — BASIC INSPECTION

3. CHECK 4WD SHIFT INDICATOR LAMP

- Set 4WD shift switch to 2WD, AUTO, 4H, 4LO, 4H and 2WD in order.
(Stay at each switch position for at least 1 second.)



- Does 4WD shift indicator lamp change properly and does buzzer sound?

Yes or No

Yes >> GO TO 4.

No >> Go to "2-4WD SHIFT SOLENOID VALVE AND 4WD SHIFT SWITCH". Refer to [TF-62, "2-4WD SHIFT SOLENOID VALVE AND 4WD SHIFT SWITCH"](#) .

4WD shift switch operation	4WD shift indicator lamp	4WD warning lamp	Buzzer sound
2WD		4WD OFF	
↓			"Pip"
AUTO		4WD OFF	
↓			"Pip"
4H		4WD OFF	
↓			
4LO		4WD OFF	
↓			
4H		4WD OFF	
↓			"Pip"
AUTO		4WD OFF	
↓			"Pip"
2WD		4WD OFF	

4. CHECK 4WD WARNING LAMP

Is 4WD warning lamp turned ON?

Yes or No

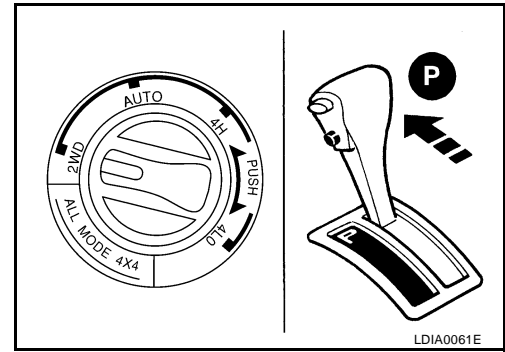
Yes >> Perform self-diagnosis. Refer to [TF-27, "Trouble Diagnosis without CONSULT-II"](#) .

No >> GO TO 5.

TROUBLE DIAGNOSIS — BASIC INSPECTION

5. CHECK 4WD SHIFT INDICATOR LAMP

1. Move A/T selector lever to P position.
2. Set 4WD shift switch from 4H to 4LO.

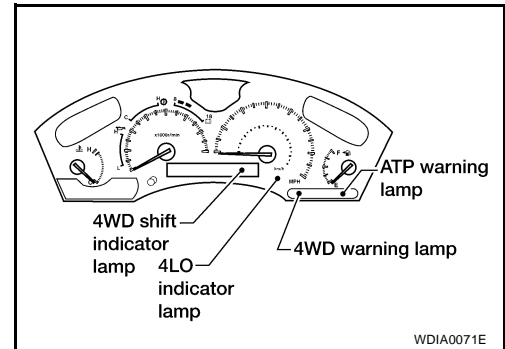


3. While shifting from 4H to 4LO, does 4WD shift indicator lamp turn OFF and ATP warning lamp turn ON?

Yes or No

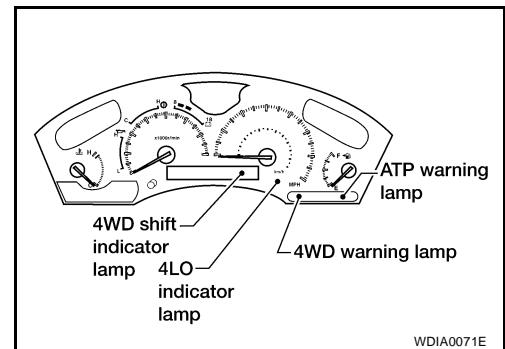
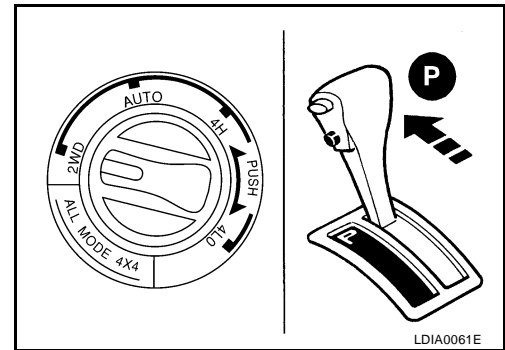
Yes >> GO TO 6.

No >> Go to Symptoms 3 and 4. Refer to [TF-88, "Symptom 3. 4WD Shift Indicator Lamp Does Not Turn OFF \(When 4WD shift switch is set from 4H to 4LO, all the 4WD shift indicator lamps do not turn off\)"](#) and [TF-89, "Symptom 4. ATP Warning Lamp Does Not Turn ON \(When 4WD shift switch is set from 4H to 4LO with the A/T selector lever in P position, the ATP warning lamp does not turn on\)"](#) .



6. CHECK 4WD SHIFT INDICATOR LAMP

Do the 4WD shift indicator lamps indicate 4LO when the 4WD shift switch is set in 4LO?



Yes or No

Yes >> GO TO 7.

No >> Go to Symptom 5. Refer to [TF-90, "Symptom 5. 4LO Indicator Lamp Does Not Turn ON \(When 4WD shift switch is set from 4H to 4LO position, 4LO indicator lamp does not turn ON\)"](#) .

TROUBLE DIAGNOSIS — BASIC INSPECTION

7. CHECK 4WD SHIFT INDICATOR LAMP (*1)

1. Set 4WD shift switch from 4LO to 4H.
2. Does 4LO indicator lamp flicker? (*1)

*1: While "Wait" function is operating, 4LO indicator lamp flashes.

Yes or No

- Yes >> Go to Symptoms 6 and 7. Refer to [TF-91, "Symptom 6. 4WD Shift Indicator Lamp Does Not Indicate "LOCK" \(When 4WD shift switch is set to "4H", 4WD shift indicator lamp does not indicate "LOCK"\)"](#) and [TF-92, "Symptom 7. 4WD Shift Indicator Lamp Repeats Flickering \(4WD Shift Indicator Lamp Keeps Flickering\)"](#) .
- No >> Go to "3. CRUISE TEST". Refer to [TF-53, "3. CRUISE TEST"](#) .

TROUBLE DIAGNOSIS — BASIC INSPECTION

3. CRUISE TEST

1. INSPECTION START

Do you have CONSULT-II?

Yes or No

Yes >> GO TO 2.

No >> GO TO 3.

2. CHECK INPUT SIGNAL

Ⓜ With CONSULT-II

1. Warm up engine to normal operating temperature.
2. Park vehicle on flat surface.
3. Set 4WD shift switch to 4H position.
4. Set 4WD shift switch to AUTO position.
5. Start engine.
6. Drive for at least 30 seconds at a speed higher than 20 km/h (12 MPH).
(Drive vehicle until "FLUID TEMP SE" exceeds 0.9V.)
7. Park vehicle on flat surface.
8. Set 4WD shift switch to 2WD position.
9. Leave vehicle for at least 80 seconds with "FLUID TEMP SE" at 0.9V or less.
10. Is 4WD warning lamp turned ON?

Yes or No

Yes >> Perform self-diagnosis. Refer to [TF-31, "Trouble Diagnosis with CONSULT-II"](#).

No >> GO TO 4.

DATA MONITOR	
MONITOR	NO DTC
VHCL/S SEN-FR	0 km/h
VHCL/S SEN-RR	0 km/h
ENGINE SPEED	775 rpm
THRTL POS SEN	0.5 V
FLUID TEMP SE	0.86 V
BATTERY VOLT	14.1 V
2WD SWITCH	ON
AUTO SWITCH	OFF
LOCK SWITCH	OFF

SMT972D

3. CHECK INPUT SIGNAL

ⓧ Without CONSULT-II

1. Warm up engine to normal operating temperature.
2. Park vehicle on flat surface.
3. Set 4WD shift switch to 4H position.
4. Set 4WD shift switch to AUTO position.
5. Start engine.
6. Drive vehicle for at least 30 seconds at a speed higher than 20 km/h (12 MPH).
7. Park vehicle on flat surface.
8. Set 4WD shift switch to 2WD position.
9. Is 4WD warning lamp turned ON?

Yes or No

Yes >> Perform self-diagnosis. Refer to [TF-27, "Trouble Diagnosis without CONSULT-II"](#).

No >> GO TO 4.

TROUBLE DIAGNOSIS — BASIC INSPECTION

4. (1) CHECK TIGHT CORNER BRAKING SYMPTOM

1. Set 4WD shift switch to AUTO position.
2. Drive vehicle at speed lower than 20 km/h (12 MPH) with steering wheel fully turned.
3. Does tight corner braking symptom occur?

Yes or No

- Yes >> GO TO 5.
No >> GO TO 6.

5. CONFIRM SYMPTOM AGAIN

Confirm symptom and self-diagnosis again.

Refer to [TF-27, "Trouble Diagnosis without CONSULT-II"](#) and [TF-31, "Trouble Diagnosis with CONSULT-II"](#) .

OK or NG

- OK >> GO TO 6.
NG >> Go to Symptoms 8 and 9. Refer to [TF-93, "Symptom 8. Tight Corner Braking Symptom \(Tight Corner Braking Symptom Occurs-Hydraulic System Failure\)"](#) and [TF-94, "Symptom 9. 4WD System Does Not Operate \(The Vehicle Cannot Be Put Into 4WD Mode-Hydraulic System Failure\)"](#) .

6. (2) CHECK TIGHT CORNER BRAKING SYMPTOM

1. Set 4WD shift switch to 4H position.
2. Drive vehicle at speed lower than 20 km/h (12 MPH) with steering wheel fully turned.
3. Does tight corner braking symptom occur?

Yes or No

- Yes >> Inspection End.
No >> GO TO 7.

7. CONFIRM SYMPTOM AGAIN

Confirm symptom and self-diagnosis again.

Refer to [TF-27, "Trouble Diagnosis without CONSULT-II"](#) and [TF-31, "Trouble Diagnosis with CONSULT-II"](#) .

OK or NG

- OK >> Inspection End.
NG >> Go to Symptoms 8 and 9. Refer to [TF-93, "Symptom 8. Tight Corner Braking Symptom \(Tight Corner Braking Symptom Occurs-Hydraulic System Failure\)"](#) and [TF-94, "Symptom 9. 4WD System Does Not Operate \(The Vehicle Cannot Be Put Into 4WD Mode-Hydraulic System Failure\)"](#) .

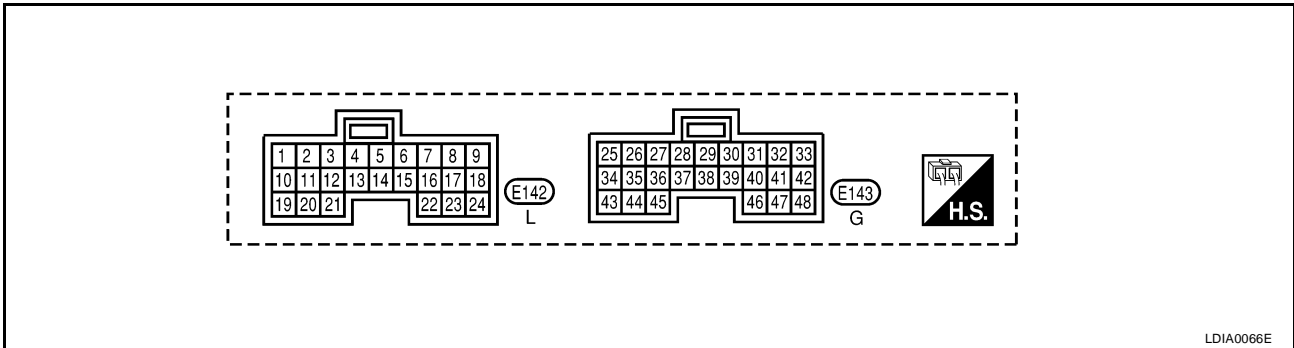
TROUBLE DIAGNOSIS — GENERAL DESCRIPTION

TROUBLE DIAGNOSIS — GENERAL DESCRIPTION














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Transfer Control Unit Terminals and Reference Value TRANSFER CONTROL UNIT HARNESS CONNECTOR LAYOUT













EDS00181























TRANSFER CONTROL UNIT INSPECTION TABLE

Terminal No.	Item	Condition	Judgement standard (Approx.)	
1	2-4WD shift solenoid valve	 ON	4WD shift switch is set to 2WD position.	Less than 1V
		 & 	4WD shift switch is set to any position other than 2WD.	Battery voltage
2	4WD shift indicator lamp (2WD)		Lamp lights while system is operating properly.	Less than 1V
			2WD indicator lamp does not come on.	Battery voltage
3	Ground	—	—	
4	Transfer shift relay (High)	 ON	While actuator is operating (4H → 4LO)	Battery voltage
			Actuator does not operate.	Less than 1V
5	4WD warning lamp	 & 	Lamp comes ON (when engine is stopped). (Fail-safe condition appears on display, engine is stopped, actuator position detection switch is inoperative, oil temperature is too high and/or tires of different size are installed.)	Less than 1V
		—	Except above	Battery voltage
6	Ground	—	—	
7	CAN-H	—	—	
8	CAN-L	—	—	
9	4WD shift switch (2WD)	 ON	4WD shift switch is set to 2WD position.	Battery voltage
			4WD shift switch is set to any position other than 2WD.	Less than 1V
10	Transfer dropping resistor	 & 	4WD shift switch is set to AUTO position.	4 - 14V
			4WD shift switch is set to any position other than 2WD.	Less than 1V

TROUBLE DIAGNOSIS — GENERAL DESCRIPTION

Terminal No.	Item	Condition	Judgement standard (Approx.)	
11	4WD shift indicator lamp (4H)		"4H" indicator lamp comes ON.	Less than 1V
			4WD shift switch is set to any position other than 4H.	Battery voltage
12	4WD shift indicator lamp (4LO)		"4LO" indicator lamp comes ON.	0V
			4WD shift switch is set to any position other than 4LO.	Battery voltage
13	Transfer shift relay (Low)		While actuator is operating (4LO → 4H)	Battery voltage
			Actuator does not operate.	0V
14	Transfer motor relay		Transfer motor relay is ON.	Battery voltage
			Transfer motor relay is OFF.	Less than 1V
15	ATP lamp		AT selector lever is set to P position.	Battery voltage
			AT selector lever is set to any position other than P.	0V
16	Power supply	—	Ignition key is set to ON position.	Battery voltage
			Ignition key is set to OFF position.	0V
18	4WD shift switch (4H)		4WD shift switch is set to 4H position.	Battery voltage
			4WD shift switch is set to any position other than 4H.	Less than 1V
19	4WD solenoid valve		4WD shift switch is set to AUTO position.	1.5 - 3V
			4WD shift switch is set to any position other than 2WD.	Less than 1V
21	4WD shift indicator lamp (AUTO)		"AUTO" indicator lamp comes ON.	0V
			4WD shift switch is set to any position other than AUTO.	Battery voltage
22	Power supply	—	Ignition key is set to ON position.	Battery voltage
			Ignition key is set to OFF position.	0V
23	4WD shift switch (4LO)		4WD shift switch is set to 4LO position.	Battery voltage
			4WD shift switch is set to any position other than 4LO.	Less than 1V
24	4WD shift switch (AUTO)		4WD shift switch is set to AUTO position.	Battery voltage
			4WD shift switch is set to any position other than AUTO.	Less than 1V
25	Neutral-4LO switch		Transfer is set to 4LO position.	0V
			Transfer is set to any position other than 4LO.	Battery voltage
27	Transfer 4H actuator switch		4WD shift switch is set to 4H position.	Less than 1V
			4WD shift switch is set to any position other than 4H.	Battery voltage
28	Sensor ground	—	Less than 1V	

TROUBLE DIAGNOSIS — GENERAL DESCRIPTION

Terminal No.	Item	Condition		Judgement standard (Approx.)	
30	Power supply for A/D converter	 & 	Ignition key is set to ON position.	4.5 - 5.5V	A
			Ignition key is set to OFF position.	0V	B
31	Transfer fluid temperature sensor	 & 	At 20°C (68°F)	1.1V	C
			At 80°C (176°F)	0.3V	TF
33	Transfer shift relay (High)	 & 	While actuator is operating from "4H" to "4LO"	Battery voltage	E
	Actuator does not operate.		0V	G	
34	Clutch pressure switch	 & 	4WD shift switch is set to AUTO or 4H, then A/T selector lever is set to D position. (wait detection system: OFF)	Battery voltage	H
			4WD shift switch is set to 2WD, AUTO or 4H, then A/T selector lever is set to D position. (wait detection system: ON)	0V	I
35	Line pressure switch	 & 	4WD shift switch is set to 2WD, AUTO or 4H, then A/T selector lever is set to D position.	Battery voltage	J
			—	0V	K
36	CONSULT-II (RX)	—	—	—	L
40	ATP switch	 & 	A/T selector lever is set to P position.	Battery voltage	M
			A/T selector lever is set to any position other than P.	Less than 1V	
41	Transfer motor relay monitor	 & 	Transfer motor relay is ON.	Battery voltage	
			Transfer motor relay is OFF.	Less than 1V	
42	Transfer shift relay (LOW)	 & 	While actuator is operating from "4LO" to "4H" position	Battery voltage	
			Actuator does not operate.	0V	
43	Wait detection switch	 & 	4WD shift switch is set to any position other than 4LO.	Battery voltage	
			4WD shift switch is set to 4LO position.*3	Less than 1V	
44	Transfer 4LO actuator switch	 & 	4WD shift switch is set to any position other than 4LO. (Actuator: High position)	Battery voltage	
			4WD shift switch is set to 4LO position. (Actuator: Low position)	Less than 1V	
45	Ground	—	—	—	

TROUBLE DIAGNOSIS — GENERAL DESCRIPTION

Terminal No.	Item	Condition		Judgement standard (Approx.)
47	Power supply (memory back up)	—	—	Battery voltage
48	CONSULT-II (TX)	—	—	—

*3: While wait detection system is operating, terminal 43 has battery voltage.

DTC U1000, U1001 CAN COMMUNICATION LINE

DTC U1000, U1001 CAN COMMUNICATION LINE

PDF:23710

CAN Communication System Inspection

EDS00182

INSPECTION PROCEDURE

1. PERFORM SELF-DIAGNOSIS

Perform transfer control unit self-diagnosis.

Is "CAN COMM CIRCUIT" displayed in the self-diagnosis display items?

- Yes >> Print out the self-diagnosis results and go to 2.
- No >> Inspection End.

2. CONNECTOR INSPECTION

1. Disconnect the transfer control unit connectors E142 and E143.
2. Check the terminals for deformation, disconnection, looseness or damage.

OK or NG

- OK >> GO TO 3.
- NG >> Repair or replace as necessary.

3. CAN COMMUNICATION SYSTEM CHECK

Check the data monitor item "CAN Diagnosis Support Monitor".

>> After printing out the monitor items, go to CAN system. Refer to [LAN-3, "Precautions When Using CONSULT-II"](#) .

A
B
C
TF
E
F
G
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K
L
M

4WD SOLENOID VALVE

PF0:0000

EDS00183

4WD SOLENOID VALVE

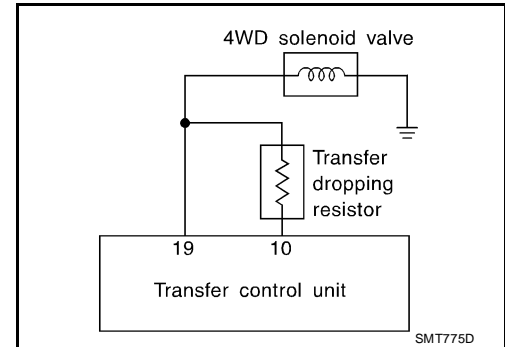
Diagnostic Procedure

1. CHECK 4WD SOLENOID VALVE

Refer to [TF-95, "4WD SOLENOID VALVE, CLUTCH PRESSURE SWITCH AND LINE PRESSURE SWITCH"](#) .

OK or NG

- OK >> GO TO 2.
- NG >> Repair or replace 4WD solenoid valve.



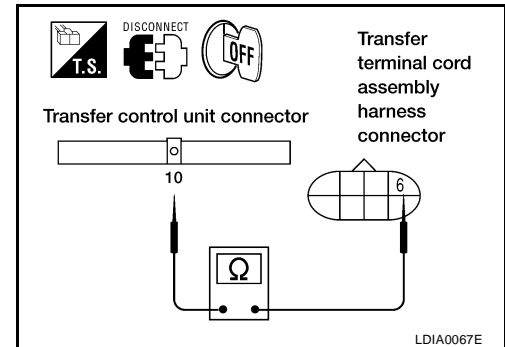
2. CHECK POWER SOURCE CIRCUIT

1. Turn ignition switch to OFF position.
2. Disconnect transfer control unit harness connector E142.
3. Check resistance between transfer terminal cord assembly harness connector F56 terminal 6 (L) and transfer control unit harness connector E142 terminal 10 (L/W).

Resistance : 11.2 - 12.8Ω

OK or NG

- OK >> GO TO 3.
- NG >> Check the following.
 - Transfer dropping resistor
Refer to [TF-96, "TRANSFER DROPPING RESISTOR"](#) .
 - Continuity between transfer terminal cord assembly harness connector F56 terminal 6 (L) and transfer dropping resistor harness connector E135 terminal 2 (L).
 - Continuity between transfer dropping resistor harness connector E135 terminal 1 (L/W) and transfer control unit harness connector E142 terminal 10 (L/W).

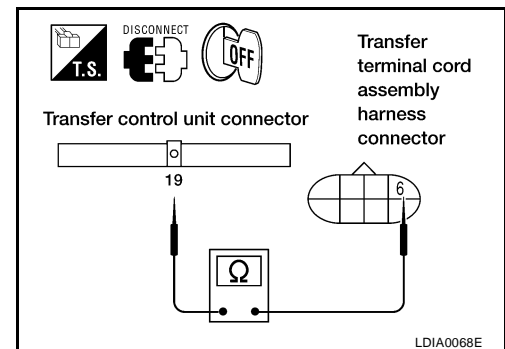


3. CHECK POWER SOURCE CIRCUIT

1. Turn ignition switch to OFF position.
2. Check continuity between transfer terminal cord assembly harness connector F56 terminal 6 (L) and transfer control unit harness connector E142 terminal 19 (L).
Continuity should exist.

OK or NG

- OK >> GO TO 4.
- NG >> Repair or replace harness between transfer terminal cord assembly harness connector F56 terminal 6 (L) and transfer control unit harness connector E142 terminal 19 (L).



4WD SOLENOID VALVE

4. PERFORM SELF-DIAGNOSIS

After driving for a while, perform self-diagnosis.

Refer to [TF-27, "Trouble Diagnosis without CONSULT-II"](#) or [TF-31, "Trouble Diagnosis with CONSULT-II"](#) .

OK or NG

OK >> Inspection End.

NG >> 1. Perform transfer control unit input/output signal inspection. Refer to [TF-55, "TRANSFER CONTROL UNIT INSPECTION TABLE"](#) .

2. If NG, recheck transfer control unit pin terminals for damage or loose connection with harness connector.

A

B

C

TF

E

F

G

H

I

J

K

L

M

2-4WD SHIFT SOLENOID VALVE AND 4WD SHIFT SWITCH

2-4WD SHIFT SOLENOID VALVE AND 4WD SHIFT SWITCH

PF0:0000

Diagnostic Procedure

EDS00184

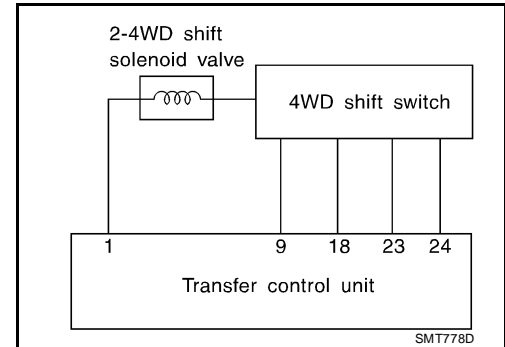
1. CHECK 2-4WD SHIFT SOLENOID VALVE AND 4WD SHIFT SWITCH

Refer to [TF-95, "2-4WD SHIFT SOLENOID VALVE AND TRANSFER FLUID TEMPERATURE SENSOR"](#) and [TF-95, "4WD SHIFT SWITCH"](#).

OK or NG

OK >> GO TO 2.

NG >> Repair or replace 2-4WD shift solenoid valve or 4WD shift switch.



2. CHECK INPUT SIGNAL

④ With CONSULT-II

1. Select "ECU INPUT SIGNALS" in Data Monitor.

2. Read out ON/OFF status of "2WD SW" and "LOCK SWITCH".

OK or NG

OK >> 1. Perform transfer control unit input/output signal inspection. Refer to [TF-55, "TRANSFER CONTROL UNIT INSPECTION TABLE"](#).

2. If NG, recheck transfer control unit pin terminals for damage or loose connection with harness connector.

NG >> GO TO 3.

The illustration shows a car with a driver, used for the Data Monitor section. The car is shown from a side profile, with the driver's seat and steering wheel visible. The car is labeled SMT974D.

DATA MONITOR	
MONITOR	NO DTC
VHCL/S SEN-FR	0 km/h
VHCL/S SEN-RR	0 km/h
ENGINE SPEED	775 rpm
THRTL POS SEN	0.5 V
FLUID TEMP SE	0.86 V
BATTERY VOLT	14.1 V
2WD SWITCH	ON
AUTO SWITCH	OFF
LOCK SWITCH	OFF

The table shows the Data Monitor results for the car. The 2WD SWITCH is ON, and the AUTO SWITCH and LOCK SWITCH are OFF. The table is labeled SMT974D.

2-4WD SHIFT SOLENOID VALVE AND 4WD SHIFT SWITCH

3. CHECK 4WD SHIFT SWITCH POWER SOURCE

1. Disconnect 4WD shift switch harness connector.
2. Turn ignition switch to ON position.
3. Check voltage between 4WD shift switch harness connector terminal 1 and body ground.

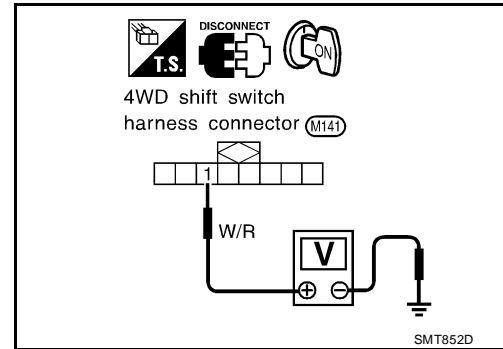
Voltage : **Battery voltage**

OK or NG

OK >> GO TO 4.

NG >> Check the following.

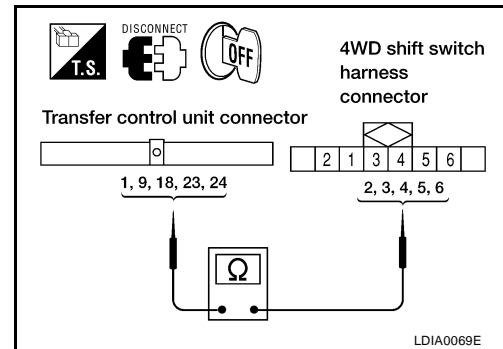
- No. 49 fuse (10A)
- Continuity between ignition switch and 4WD shift switch



4. CHECK HARNESS CONTINUITY

1. Turn ignition switch to OFF position.
2. Disconnect transfer control unit harness connector E142.
3. Check continuity between the following terminals.

Connector	Terminal (Wire color)	Connector	Terminal (Wire color)	Continuity
M141 (2WD)	2 (G/W)	E142	9 (G/W)	Yes
M141 (4H)	5 (O)		18 (O)	
M141 (AUTO)	3 (LG/R)		24 (LG/R)	
M141 (4LO)	6 (R)		23 (R)	
M141	4 (G/R)		1 (GR)	



OK or NG

OK >> GO TO 5.

NG >> Repair harness or connector.

5. PERFORM SELF-DIAGNOSIS AGAIN

After driving for a while, perform self-diagnosis again.
Refer to [TF-27, "Trouble Diagnosis without CONSULT-II"](#) .

OK or NG

OK >> Inspection End.

- NG >> 1. Perform transfer control unit input/output signal inspection. Refer to [TF-55, "TRANSFER CONTROL UNIT INSPECTION TABLE"](#) .
2. If NG, recheck transfer control unit pin terminals for damage or loose connection with harness connector.

TRANSFER MOTOR AND TRANSFER MOTOR RELAY

TRANSFER MOTOR AND TRANSFER MOTOR RELAY

PFP:00000

Diagnostic Procedure

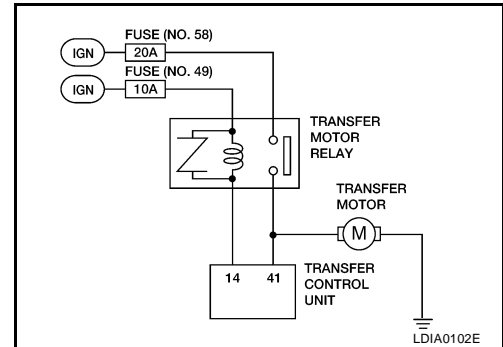
EDS00185

1. CHECK TRANSFER MOTOR AND TRANSFER MOTOR RELAY

Refer to [TF-96, "TRANSFER MOTOR"](#) and [TF-97, "TRANSFER MOTOR RELAY"](#).

OK or NG

- OK >> GO TO 2.
 NG >> Replace transfer motor or transfer motor relay.



2. CHECK INPUT SIGNAL

With CONSULT-II

- Select "MAIN SIGNALS" in Data Monitor.
 - Read out ON/OFF status of "MOTOR RELAY".
 - When the value is different from standard value although ON/OFF switching occurs, check the following items.
 - PNP switch and throttle position sensor circuits
- Refer to [AT-109, "DTC P0705 PARK/NEUTRAL POSITION SWITCH"](#), [AT-129, "DTC P1705 THROTTLE POSITION SENSOR"](#).

OK or NG

- OK >> GO TO 3.
 NG >> 1. Perform transfer control unit input/output signal inspection. Refer to [TF-55, "TRANSFER CONTROL UNIT INSPECTION TABLE"](#).
 2. If NG, recheck transfer control unit pin terminals for damage or loose connection with harness connector.

DATA MONITOR	
MONITOR	NO DTC
4WD MODE	2WD
COMP CL TORQ	0.0 kgm
DUTY SOLENOID	4 %
2-4WD SOL	OFF
VHCL/S COMP	0 km/h
THROTTLE POSI	0.0 / 8
MOTOR RELAY	OFF
4WD FAIL LAMP	OFF
SHIFT ACT 1	OFF

SMT975D

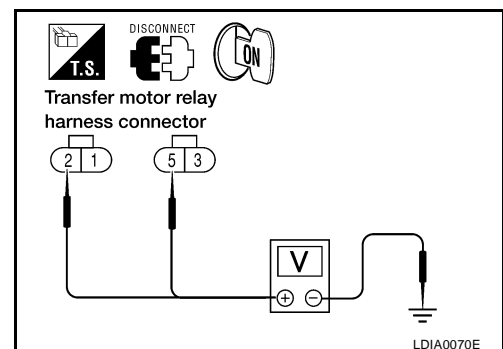
3. CHECK TRANSFER MOTOR RELAY POWER SOURCE

- Disconnect transfer motor relay harness connectors E153 and E154.
- Turn ignition switch to ON position.
- Check voltage between transfer motor relay harness connector E153 terminal 5 (G/R), E154 terminal 2 (Y/R), and ground.

Voltage : **Battery voltage**

OK or NG

- OK >> GO TO 4.
 NG >> Check the following.
- No. 58 fuse (20A)
 - No. 49 fuse (10A)
 - Harness continuity between ignition switch and No. 58 fuse (20A) and No. 49 fuse (10A).
 - Harness continuity between fuse and transfer motor relay.



TRANSFER MOTOR AND TRANSFER MOTOR RELAY

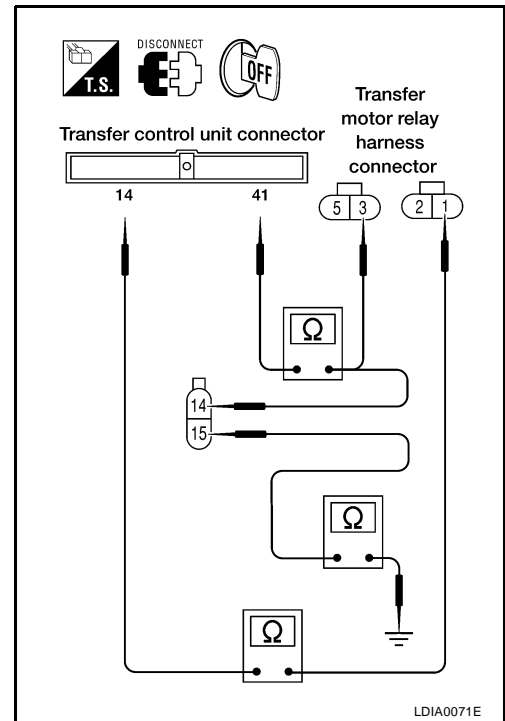
4. CHECK HARNESS CONTINUITY

1. Turn ignition switch to OFF position.
2. Disconnect transfer control unit harness connectors E142 and E143, and transfer motor harness connector F57.
3. Check continuity between the following terminals.

Connector	Terminal (Wire color)	Connector	Terminal (Wire color)	Continuity
F57	14 (R)	E143	41 (R)	Yes
E153	3 (R)			
E154	1 (LG)	E142	14 (LG)	
Ground	—	F57	15 (B)	

OK or NG

- OK >> GO TO 5.
 NG >> Repair or replace harness or connector.



LDIA0071E

5. PERFORM SELF-DIAGNOSIS AGAIN

After driving for a while, perform self-diagnosis again.

Refer to [TF-27, "Trouble Diagnosis without CONSULT-II"](#) or [TF-31, "Trouble Diagnosis with CONSULT-II"](#).

OK or NG

- OK >> Inspection End.
 NG >> 1. Perform transfer control unit input/output signal inspection. Refer to [TF-55, "TRANSFER CONTROL UNIT INSPECTION TABLE"](#).
 2. If NG, recheck transfer control unit pin terminals for damage or loose connection with harness connector.

TRANSFER FLUID TEMPERATURE SENSOR

TRANSFER FLUID TEMPERATURE SENSOR

PF:00000

Diagnostic Procedure

EDS00186

1. CHECK TRANSFER FLUID TEMPERATURE SENSOR

Refer to [TF-95, "2-4WD SHIFT SOLENOID VALVE AND TRANSFER FLUID TEMPERATURE SENSOR"](#) .

OK or NG

OK >> GO TO 2.

NG >> Repair or replace fluid temperature sensor.

2. CHECK INPUT SIGNAL

Do you have CONSULT-II?

Yes or No

Yes >> GO TO 3.

No >> GO TO 4.

TRANSFER FLUID TEMPERATURE SENSOR

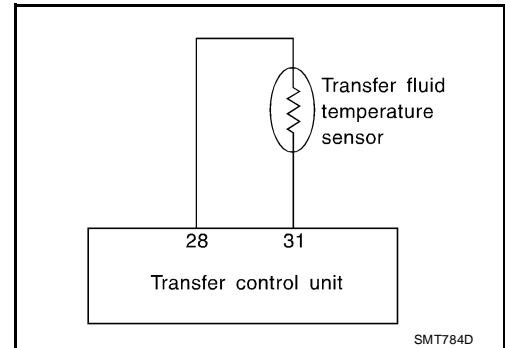
3. CHECK INPUT SIGNAL

With CONSULT-II

1. Start engine.
2. Select "ECU INPUT SIGNALS" in Data Monitor.
3. Read out the value of "FLUID TEMP SE".

20°C (68°F)
80°C (176°F)

Voltage
: **Approx. 1.1V**
: **Approx. 0.3V**



DATA MONITOR	
MONITOR	NO DTC
VHCL/S SEN-FR	0 km/h
VHCL/S SEN-RR	0 km/h
ENGINE SPEED	775 rpm
THRTL POS SEN	0.5 V
FLUID TEMP SE	0.86 V
BATTERY VOLT	14.1 V
2WD SWITCH	ON
AUTO SWITCH	OFF
LOCK SWITCH	OFF

SMT974D

OK or NG

OK >> GO TO 5.

NG >> Check the following.

- Continuity between transfer control unit and transfer terminal cord assembly harness connector

TRANSFER FLUID TEMPERATURE SENSOR

4. CHECK INPUT SIGNAL

⊗ Without CONSULT-II

1. Turn ignition switch to ON position.
2. Check voltage between transfer control unit harness connector E143 terminals 28 (B/G) and 31(G).

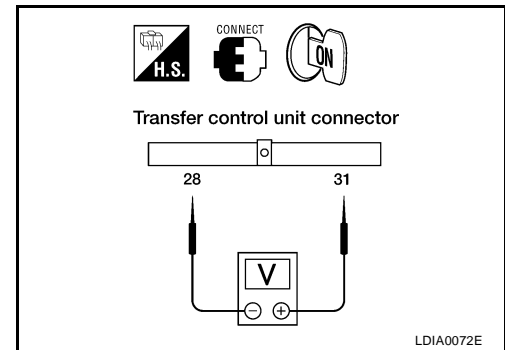
	Voltage
20°C (68°F)	: Approx. 1.1V
80°C (176°F)	: Approx. 0.3V

OK or NG

OK >> GO TO 5.

NG >> Check the following.

- Continuity between transfer control unit and transfer terminal cord assembly harness connector



5. PERFORM SELF-DIAGNOSIS AGAIN

After driving for a while, perform self-diagnosis again.

Refer to [TF-27, "Trouble Diagnosis without CONSULT-II"](#) .

OK or NG

OK >> Inspection End.

NG >> 1. Perform transfer control unit input/output signal inspection. Refer to [TF-55, "TRANSFER CONTROL UNIT INSPECTION TABLE"](#) .

2. If NG, recheck transfer control unit pin terminals for damage or loose connection with harness connector.

ATP SWITCH, WAIT DETECTION SWITCH AND NEUTRAL-4LO SWITCH

ATP SWITCH, WAIT DETECTION SWITCH AND NEUTRAL-4LO SWITCH

PDF:0000

Diagnostic Procedure

EDS00187

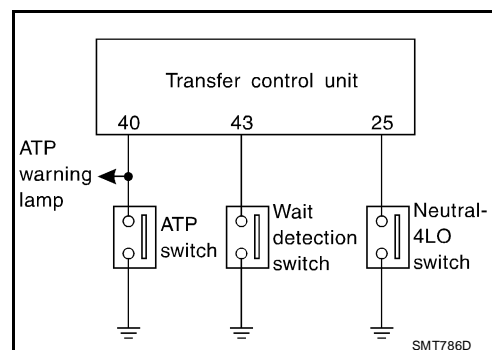
1. CHECK ATP SWITCH, WAIT DETECTION SWITCH AND NEUTRAL-4LO SWITCH

Refer to [TF-96, "ATP SWITCH, NEUTRAL-4LO SWITCH AND WAIT DETECTION SWITCH"](#) .

OK or NG

OK >> GO TO 2.

NG >> Replace ATP switch, neutral-4LO switch, or wait detection switch.



2. CHECK INPUT SIGNAL

Do you have CONSULT-II?

Yes or No

Yes >> GO TO 3.

No >> GO TO 4.

3. CHECK INPUT SIGNAL

With CONSULT-II

1. Select "SELECTIONS FROM MENU" in Data Monitor.
2. Select "ATP SWITCH", "N POSI SW TF" or "WAIT DETCT SW".
3. Read out the ON/OFF status of "ATP SWITCH", "N POSI SW TF" or "WAIT DETCT SW". Refer to [TF-38, "REFERENCE VALUE IN DATA MONITOR MODE"](#) .

OK or NG

OK >> GO TO 7.

NG >> Check the following.

- Harness continuity between neutral-4LO switch, ATP switch, wait detection switch harness connectors and transfer control unit
- Continuity between neutral-4LO switch, ATP switch, wait detection switch harness connectors and ground

DATA MONITOR	
MONITOR	NO DTC
ATP SWITCH	OFF
N POSI SW TF	OFF
WAIT DETCT SW	OFF

WDIA0086E

ATP SWITCH, WAIT DETECTION SWITCH AND NEUTRAL-4LO SWITCH

4. CHECK HARNESS GROUND CONTINUITY

⊗ Without CONSULT-II

1. Turn ignition switch to OFF position.
2. Disconnect ATP switch F55, neutral-4LO switch F60, and wait detection switch F59 harness connectors.
3. Check continuity from harness connectors to ground.

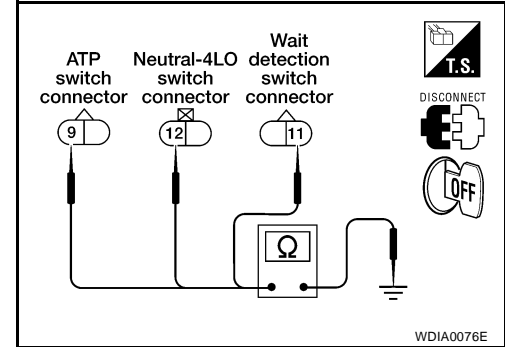
Connector	Terminal (Wire color)		Continuity
F55	9 (B)	Ground	Yes
F60	12 (B)		
F59	11 (B)		

OK or NG

OK >> GO TO 5.

NG >> Check the following.

- Circuit between neutral-4LO switch, ATP switch, wait detection switch harness connectors and ground



5. CHECK HARNESS CONTINUITY

⊗ Without CONSULT-II

1. Turn ignition switch to OFF position.
2. Disconnect transfer control unit E143, ATP switch F55, neutral-4LO switch F60, and wait detection switch F59 harness connectors.
3. Check continuity between the following terminals.

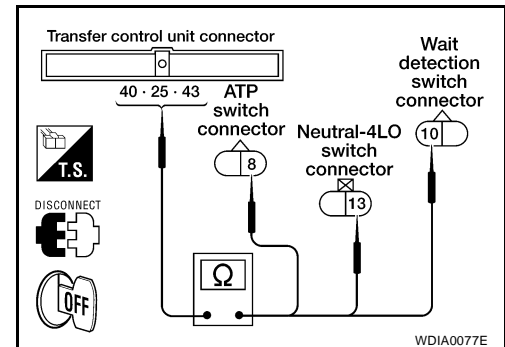
Connector	Terminal (Wire color)	Connector	Terminal (Wire color)	Continuity
F55	8 (L/Y)	E143	40 (L)	Yes
F60	13 (V)		25 (V)	
F59	10 (G/Y)		43 (G/Y)	

OK or NG

OK >> GO TO 6.

NG >> Check the following.

- Circuits between transfer control unit harness connector and neutral-4LO switch, ATP switch, and wait detection switch harness connectors.



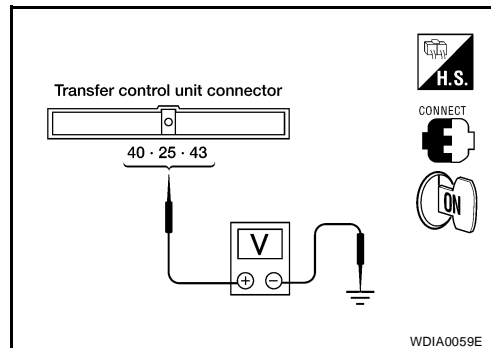
ATP SWITCH, WAIT DETECTION SWITCH AND NEUTRAL-4LO SWITCH

6. CHECK SWITCH POWER SOURCE

⊗ Without CONSULT-II

1. Turn ignition switch to ON position.
2. Disconnect ATP switch F55, neutral-4LO switch F60, and wait detection switch F59 harness connectors.
3. Check voltage between the following terminals.

Connector	Terminal (Wire color)		Battery voltage
E143	40 (L)	Ground	Yes
	25 (V)		
	43 (G/Y)		



OK or NG

- OK >> Inspection End.
 NG >> GO TO 7.

7. PERFORM SELF-DIAGNOSIS AGAIN

After driving for a while, perform self-diagnosis again.
 Refer to [TF-27, "Trouble Diagnosis without CONSULT-II"](#) .

OK or NG

- OK >> Inspection End.
 NG >> 1. Perform transfer control unit input/output signal inspection. Refer to [TF-55, "TRANSFER CONTROL UNIT INSPECTION TABLE"](#) .
 2. If NG, recheck transfer control unit pin terminals for damage or loose connection with harness connector.

CLUTCH PRESSURE SWITCH

CLUTCH PRESSURE SWITCH

PF:00000

Diagnostic Procedure

EDS00188

1. CHECK MALFUNCTION

Is this malfunction detected only while driving in reverse?

Yes or No

Yes >> Check A/T PNP switch "R" position.

- Refer to [AT-109, "DTC P0705 PARK/NEUTRAL POSITION SWITCH"](#) .

No >> GO TO 2.

2. CHECK OTHER MALFUNCTION

Are other malfunctions also detected by self-diagnosis and CONSULT-II?

Refer to [TF-27, "Trouble Diagnosis without CONSULT-II"](#) and [TF-31, "Trouble Diagnosis with CONSULT-II"](#) .

Yes or No

Yes >> Check for other malfunctions.

- (When other malfunctions are eliminated, clutch pressure switch malfunction display may disappear.)

No >> GO TO 3.

3. CHECK 2-4WD SHIFT SOLENOID VALVE AND 4WD SHIFT SWITCH CIRCUITS

Check 2-4WD shift solenoid valve and 4WD shift switch circuits.

OK or NG

OK >> GO TO 4.

NG >> Check, repair or replace faulty parts.

4. CHECK INPUT SIGNAL

Do you have CONSULT-II?

Yes or No?

Yes >> GO TO 5.

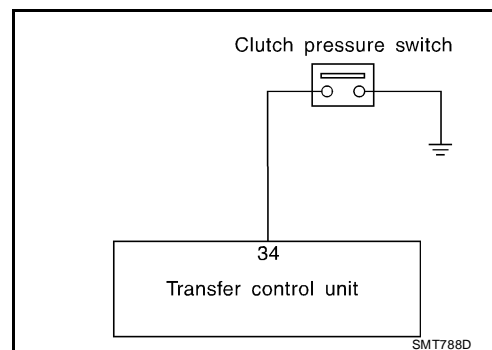
No >> GO TO 6.

CLUTCH PRESSURE SWITCH

5. CHECK INPUT SIGNAL

With CONSULT-II

1. Turn ignition switch to ON position.
2. Select "ECU INPUT SIGNALS" in Data Monitor.



3. Put A/T selector lever in D.
4. Turn 4WD shift switch to 4H and back to 2WD while reading out ON/OFF status of "CL PRES SW".

OK or NG

OK >> GO TO 7.

NG >> Check the following.

- Continuity between transfer control unit and transfer terminal cord assembly harness connector
- Clutch pressure switch.
Refer to [TF-95, "4WD SOLENOID VALVE, CLUTCH PRESSURE SWITCH AND LINE PRESSURE SWITCH"](#) .

DATA MONITOR	
MONITOR	NO DTC
4L SWITCH	OFF
N POSI SW TF	OFF
LINE PRES SW	OFF
CL PRES SW	OFF
ATP SWITCH	OFF
N POSI SW AT	OFF
R POSI SW AT	OFF
P POSI SW AT	ON

WDIA0087E

6. CHECK INPUT SIGNAL

Without CONSULT-II

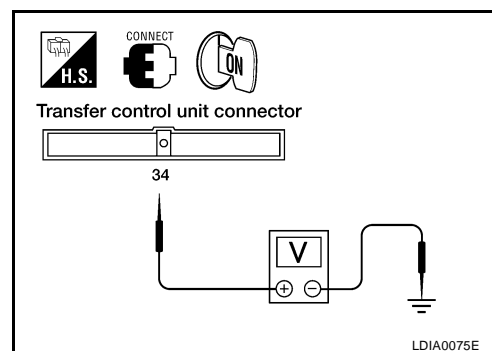
1. Turn ignition switch to ON position and set 4WD shift switch to 4H position.
2. Check voltage between transfer control unit harness connector E143 terminal 34 (BR) and ground. Refer to [TF-55, "Transfer Control Unit Terminals and Reference Value"](#)

OK or NG

OK >> GO TO 7.

NG >> Check the following.

- Continuity between transfer control unit and transfer terminal cord assembly harness connector
- Clutch pressure switch.
Refer to [TF-95, "4WD SOLENOID VALVE, CLUTCH PRESSURE SWITCH AND LINE PRESSURE SWITCH"](#) .



7. PERFORM SELF-DIAGNOSIS AGAIN

1. Check hydraulic parts.
2. After driving for a while, perform self-diagnosis again. Refer to [TF-27, "Trouble Diagnosis without CONSULT-II"](#) .

OK or NG

OK >> Inspection End.

NG >> 1. Perform transfer control unit input/output signal inspection. Refer to [TF-55, "TRANSFER CONTROL UNIT INSPECTION TABLE"](#) .

2. If NG, recheck transfer control unit pin terminals for damage or loose connection with harness connector.

LINE PRESSURE SWITCH

LINE PRESSURE SWITCH

PF0:0000

Diagnostic Procedure

EDS00189

1. CHECK MALFUNCTION

Is this malfunction detected only while driving in reverse?

Yes or No

Yes >> Check A/T PNP switch "R" position.

- Refer to [AT-109, "DTC P0705 PARK/NEUTRAL POSITION SWITCH"](#) .

No >> GO TO 2.

2. CHECK OTHER MALFUNCTIONS

Are other malfunctions also detected by self-diagnosis and CONSULT-II?

Refer to [TF-27, "Trouble Diagnosis without CONSULT-II"](#) and [TF-31, "Trouble Diagnosis with CONSULT-II"](#) .

Yes or No

Yes >> Check for other malfunctions.

- (When other malfunctions are eliminated, line pressure switch malfunction display may disappear.)

No >> GO TO 3.

3. CHECK INPUT SIGNAL

Do you have CONSULT-II?

Yes or NO

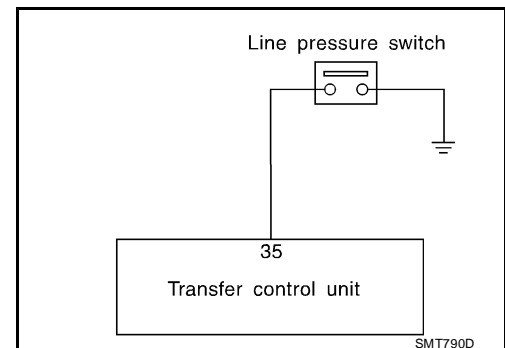
Yes >> GO TO 4.

No >> GO TO 5.

4. CHECK INPUT SIGNAL

Ⓜ With CONSULT-II

1. Select "ECU INPUT SIGNALS" in Data Monitor.



2. Put A/T selector lever in D.

3. Turn the 4WD shift switch to 4H and back to 2WD while reading out ON/OFF status of "LINE PRES SW".

OK or NG

OK >> GO TO 6.

NG >> Check the following.

- Continuity between transfer control unit and transfer terminal cord assembly harness connector
- Line pressure switch
Refer to [TF-95, "4WD SOLENOID VALVE, CLUTCH PRESSURE SWITCH AND LINE PRESSURE SWITCH"](#) .

DATA MONITOR	
MONITOR	NO DTC
4L SWITCH	OFF
N POSI SW TF	OFF
LINE PRES SW	OFF
CL PRES SW	OFF
ATP SWITCH	OFF
N POSI SW AT	OFF
R POSI SW AT	OFF
P POSI SW AT	ON

WDIA0087E

LINE PRESSURE SWITCH

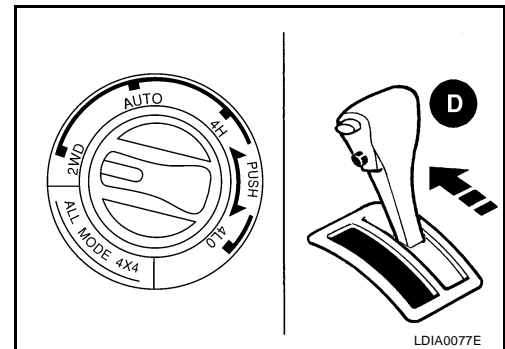
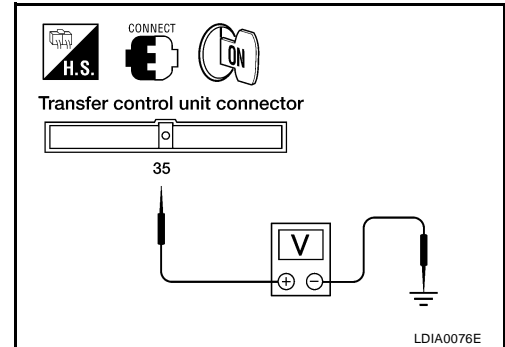
5. CHECK INPUT SIGNAL

⊗ Without CONSULT-II

1. Turn ignition switch to ON position.
2. Check voltage between transfer control unit harness connector E143 terminal 35 (BR/W) and ground.

After the vehicle has been left for at least 5 minutes at room temperature with ignition switch OFF : **Approx. 0 volts should exist.**

With ignition switch in ON, 4WD shift switch in AUTO or 4H and A/T selector lever in D : **Battery voltage should exist.**



OK or NG

OK >> GO TO 6.

NG >> Check the following.

- Continuity between transfer control unit and transfer terminal cord assembly harness connector
- Line pressure switch
Refer to [TF-95, "4WD SOLENOID VALVE, CLUTCH PRESSURE SWITCH AND LINE PRESSURE SWITCH"](#) .

6. PERFORM SELF-DIAGNOSIS AGAIN

1. Check hydraulic parts.
2. After driving for a while, perform self-diagnosis again. Refer to [TF-27, "Trouble Diagnosis without CONSULT-II"](#) .

OK or NG

OK >> Inspection End.

NG >> 1. Perform transfer control unit input/output signal inspection. Refer to [TF-55, "TRANSFER CONTROL UNIT INSPECTION TABLE"](#) .

2. If NG, recheck transfer control unit pin terminals for damage or loose connection with harness connector.

DATA ERASE/DISPLAY

Diagnostic Procedure

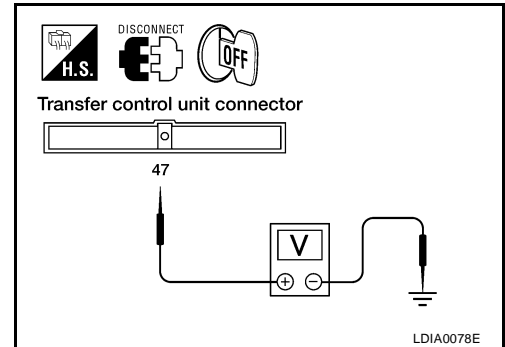
1. CHECK TRANSFER CONTROL UNIT POWER SOURCE

1. Turn ignition switch to OFF position and perform self-diagnosis again.
Refer to [TF-27, "Trouble Diagnosis without CONSULT-II"](#) and [TF-31, "Trouble Diagnosis with CONSULT-II"](#) .
2. Turn ignition switch to OFF position.
3. Disconnect transfer control unit harness connector E143.
4. Check voltage between transfer control unit harness connector E143 terminal 47 (W) and ground.

Voltage : **Battery voltage**

OK or NG

- OK >> GO TO 2.
NG >> Check the following.
- No. 53 fuse (20A)
 - Harness continuity between fuse and transfer control unit



2. PERFORM SELF-DIAGNOSIS AGAIN

After driving for a while, perform self-diagnosis again.

Refer to [TF-27, "Trouble Diagnosis without CONSULT-II"](#) and [TF-31, "Trouble Diagnosis with CONSULT-II"](#) .

OK or NG

- OK >> Inspection End.
NG >> 1. Perform transfer control unit input/output signal inspection. Refer to [TF-55, "TRANSFER CONTROL UNIT INSPECTION TABLE"](#) .
2. If NG, recheck transfer control unit pin terminals for damage or loose connection with harness connector.

SHIFT ACTUATOR

PFP:00000

SHIFT ACTUATOR

Diagnostic Procedure

EDS0018B

1. SHIFT ACTUATOR

Refer to [TF-97, "ACTUATOR AND ACTUATOR POSITION SWITCH"](#).

OK or NG

- OK >> GO TO 3.
- NG >> GO TO 2.

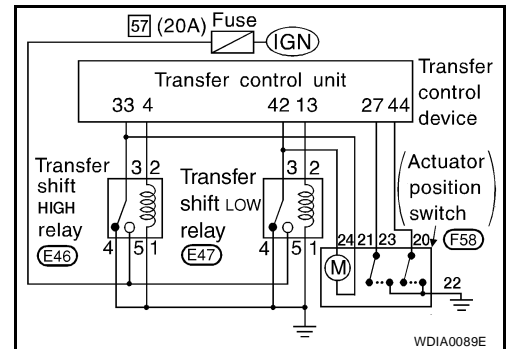
2. CHECK POWER SOURCE

1. Disconnect transfer control device harness connector F58.
2. Turn ignition switch to ON. (Do not start engine)
3. Check voltage between transfer control device harness connector F58 terminal 21 (R/L) [or 24 (P/G)] and ground while 4WD shift switch is set from 4H to 4LO (or from 4LO to 4H).

Voltage : **Battery voltage**

OK or NG

- OK >> Repair or replace actuator.
- NG >> 1. Recheck the following.
 - Continuity between ignition switch and transfer shift HIGH & LOW relays
 - Ignition switch and No. 57 fuse (20A)
 - Continuity between transfer shift HIGH & LOW relays and transfer control device
- 2. If NG, repair or replace damaged part.



3. CHECK INPUT SIGNAL

Do you have CONSULT-II?

Yes or No

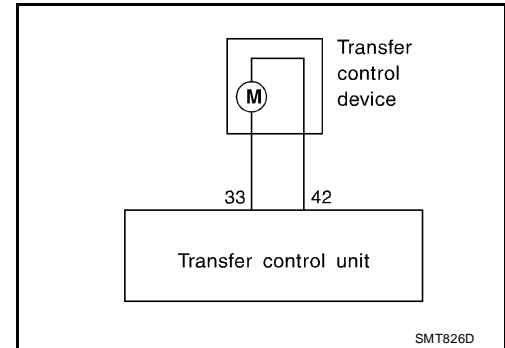
- Yes >> GO TO 4.
- No >> GO TO 5.

SHIFT ACTUATOR

4. CHECK INPUT SIGNAL

With CONSULT-II

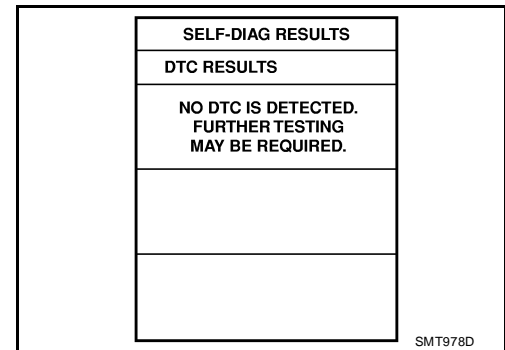
1. Start engine (idling).
2. Select "SELF-DIAG RESULTS" in Select Diag Mode.



3. Read out self-diagnostic result.

OK or NG

- OK >> GO TO 7.
 NG >> GO TO 6.



5. CHECK INPUT SIGNAL

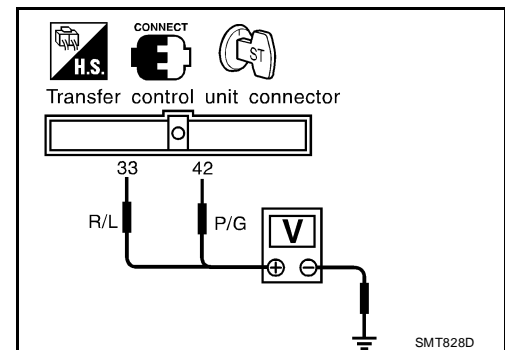
Without CONSULT-II

1. Start engine (idling).
2. Check voltage between transfer control unit harness connector E143 terminal 33 (R/L) [or 42 (P/G)] and ground while 4WD shift switch is set from 4H to 4LO (or from 4LO to 4H).
3. Result

Terminal	Condition	Voltage (Approx.)
33	While actuator is operating for 4H to 4LO	Battery voltage
	Actuator does not operate	0V
42	While actuator is operating for 4LO to 4H	Battery voltage
	Actuator does not operate	0V

OK or NG

- OK >> GO TO 7.
 NG >> GO TO 6.



SHIFT ACTUATOR

6. CHECK HARNESS CONTINUITY BETWEEN TRANSFER CONTROL UNIT AND TRANSFER CONTROL DEVICE

OK or NG

OK >> GO TO 7.

NG >> Repair and replace harness connector between transfer control unit and transfer control device.

7. PERFORM SELF-DIAGNOSIS AGAIN

After driving for a while, perform self-diagnosis again.

Refer to [TF-27, "Trouble Diagnosis without CONSULT-II"](#) .

OK or NG

OK >> Inspection End.

NG >> 1. Perform transfer control unit/output signal inspection. Refer to [TF-55, "TRANSFER CONTROL UNIT INSPECTION TABLE"](#) .

2. If NG, recheck transfer control unit pin terminals for damage or loose connection with harness connector.

A

B

C

TF

E

F

G

H

I

J

K

L

M

SHIFT ACTUATOR POSITION SWITCH

SHIFT ACTUATOR POSITION SWITCH

PF0:0000

Diagnostic Procedure

EDS0018C

1. SHIFT ACTUATOR POSITION SWITCH

Refer to [TF-97, "ACTUATOR AND ACTUATOR POSITION SWITCH"](#) .

OK or NG

- OK >> GO TO 3.
- NG >> GO TO 2.

2. CHECK POSITION SWITCH

Recheck continuity of shift actuator position switch.

Refer to [TF-97, "ACTUATOR AND ACTUATOR POSITION SWITCH"](#) .

Continuity should exist.

OK or NG

- OK >> GO TO 3.
- NG >> Repair or replace position switch.

3. CHECK INPUT SIGNAL

Do you have CONSULT-II?

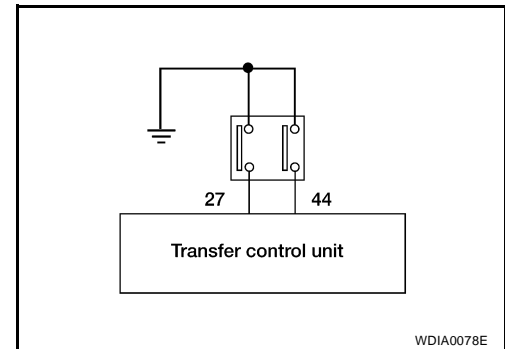
Yes or No

- Yes >> GO TO 4.
- No >> GO TO 5.

4. CHECK INPUT SIGNAL

Ⓜ With CONSULT-II

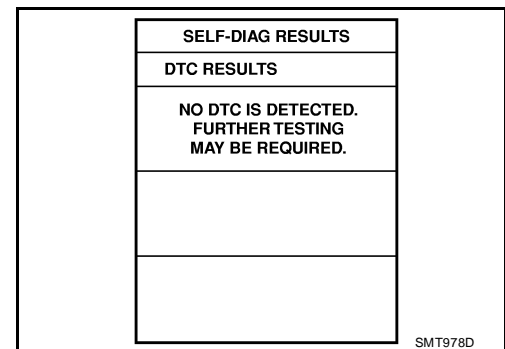
1. Start engine (idling).
2. Select "SELF-DIAG RESULTS" in Select Diag Mode.



3. Read out self-diagnostic result.

OK or NG

- OK >> GO TO 6.
- NG >> Check the following.
 - Continuity between transfer control unit and transfer control device.
 - Check ground circuit between transfer control device and ground.

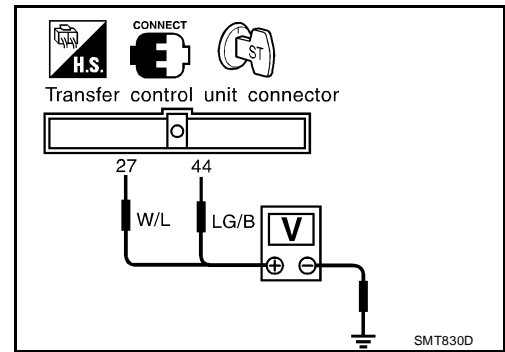


SHIFT ACTUATOR POSITION SWITCH

5. CHECK INPUT SIGNAL

⊗ Without CONSULT-II

1. Start engine (idling).
2. Check voltage transfer control unit harness connector E143 terminal 27 (W/L) [or 44 (LG/B)] and ground while 4WD shift switch is set from 4H to 4LO (or from 4LO to 4H).



3. Result

Terminal	Condition	Voltage (Approx.)
27	4WD shift switch is set to 4H	Less than 1V
	4WD shift switch is set except 4H	Battery voltage
44	4WD shift switch is set to 4LO	Less than 1V
	4WD shift switch is set except 4LO	Battery voltage

OK or NG

OK >> GO TO 6.

NG >> Check the following.

- Continuity between transfer control unit and transfer control device.
- Check ground circuit between transfer control device and ground.

6. PERFORM SELF-DIAGNOSIS AGAIN

After driving for a while, perform self-diagnosis again.

Refer to [TF-27, "Trouble Diagnosis without CONSULT-II"](#) .

OK or NG

OK >> Inspection End.

NG >> 1. Perform transfer control unit/output signal inspection. Refer to [TF-55, "TRANSFER CONTROL UNIT INSPECTION TABLE"](#) .

2. If NG, recheck transfer control unit pin terminals for damage or loose connection with harness connector.

SHIFT ACTUATOR CIRCUIT

PF0:0000

EDS0018D

SHIFT ACTUATOR CIRCUIT

Diagnostic Procedure

1. SHIFT ACTUATOR CIRCUIT

Refer to [TF-97, "TRANSFER SHIFT RELAY \(HIGH & LOW\)"](#) and [TF-97, "ACTUATOR AND ACTUATOR POSITION SWITCH"](#).

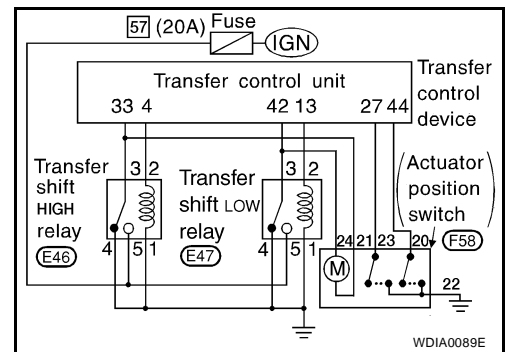
OK or NG

OK >> GO TO 2.

NG >> Repair or replace transfer shift relay and actuator and actuator position switch.

2. CHECK POWER SOURCE OF TRANSFER SHIFT (HI & LOW) RELAY

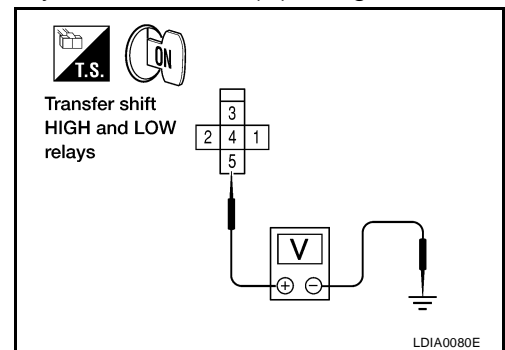
1. Disconnect transfer control device harness connector F58.
2. Turn ignition switch to ON (Do not start engine).



3. Check voltage between transfer shift HIGH relay E46 and LOW relay E47 terminal 5 (R) and ground.

Voltage

: Battery voltage



OK or NG

OK >> GO TO 3.

NG >> Check the following.

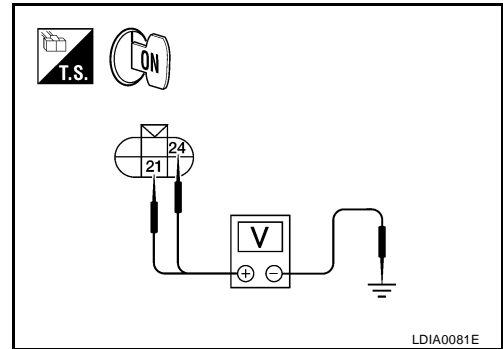
- Continuity between ignition switch and transfer shift HIGH & LOW relays
- Ignition switch and No. 57 fuse (20A)

SHIFT ACTUATOR CIRCUIT

3. CHECK POWER SOURCE OF TRANSFER CONTROL DEVICE

1. Disconnect transfer control device harness connector F58.
2. Turn ignition switch to ON. (Do not start engine)
3. Turn 4WD shift switch from 4H to 4LO (or from 4LO to 4H).
4. Check voltage between transfer control device harness connector F58 terminal 21 (R/L) [or 24 (P/G)] and ground.

Voltage : **Battery voltage**



OK or NG

OK >> GO TO 4.

NG >> Check the following.

- Harness and connector from transfer shift HIGH and LOW relays to transfer control device harness terminal
- Ground circuit between transfer control device and ground.

4. CHECK INPUT SIGNAL

Do you have CONSULT-II?

Yes or No

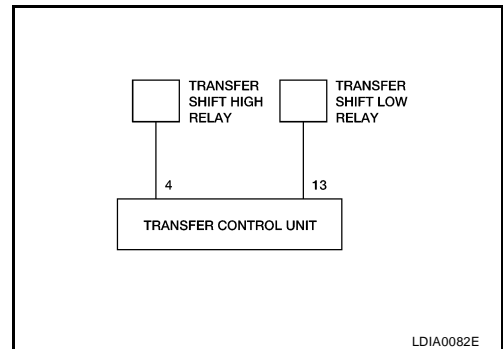
Yes >> GO TO 5.

No >> GO TO 6.

5. CHECK INPUT SIGNAL

With CONSULT-II

1. Start engine (idling).

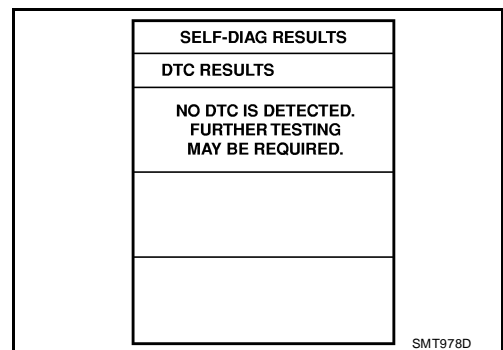


2. Select "SELF-DIAG RESULTS" in Select Diag Mode.
3. Read out self-diagnostic result.

OK or NG

OK >> GO TO 8.

NG >> GO TO 7.

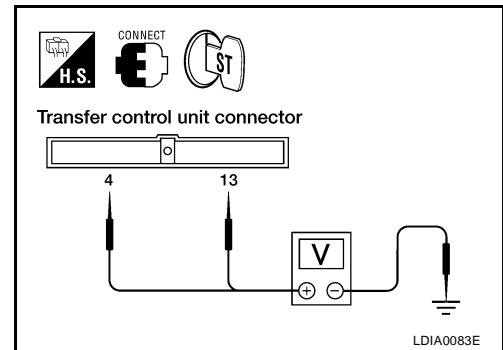


SHIFT ACTUATOR CIRCUIT

6. CHECK INPUT SIGNAL

⊗ Without CONSULT-II

1. Start engine (idling).
2. Check voltage between transfer control unit harness connector E142 terminal 4 (Y/L) [or 13 (G/B)] and ground while 4WD shift switch is set from 4H to 4LO (or from 4LO to 4H).



3. Result

Terminal	Condition	Voltage (Approx.)
4	While actuator is operating for 4H to 4LO	Battery voltage
	Actuator does not operate	0V
13	While actuator is operating for 4LO to 4H	Battery voltage
	Actuator does not operate	0V

OK or NG

- OK >> GO TO 8.
 NG >> GO TO 7.

7. CHECK HARNESS CONTINUITY BETWEEN TRANSFER CONTROL UNIT AND TRANSFER SHIFT HIGH AND LOW RELAYS

OK or NG

- OK >> GO TO 8.
 NG >> Repair and replace harness connector between transfer control unit and transfer shift HIGH or LOW relay.

8. PERFORM SELF-DIAGNOSIS AGAIN

After driving for a while, perform self-diagnosis again.
 Refer to [TF-27, "Trouble Diagnosis without CONSULT-II"](#) .

OK or NG

- OK >> Inspection End.
 NG >> 1. Perform transfer control unit/output signal inspection. Refer to [TF-55, "TRANSFER CONTROL UNIT INSPECTION TABLE"](#) .
 2. If NG, recheck transfer control unit pin terminals for damage or loose connection with harness connector.

TROUBLE DIAGNOSES FOR SYMPTOMS

TROUBLE DIAGNOSES FOR SYMPTOMS

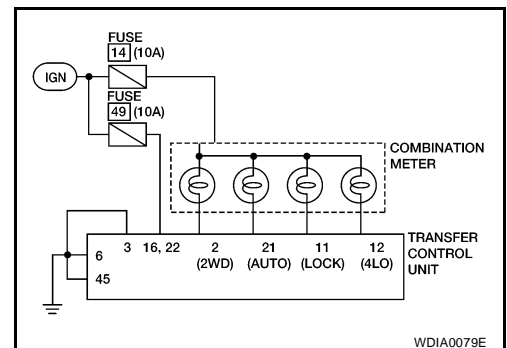
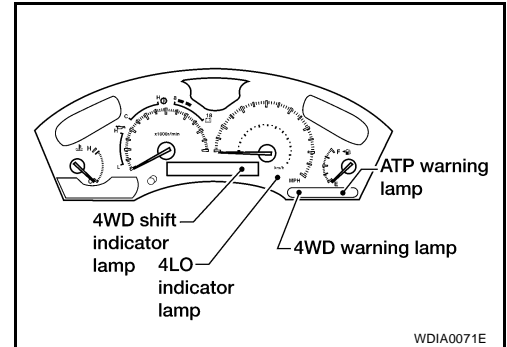
PFP:00007

Symptom 1. 4WD Shift Indicator Lamp Does Not Turn ON (Although the ignition switch is turned ON, all the 4WD indicator lamps do not turn ON for 1 second)

EDS0018E

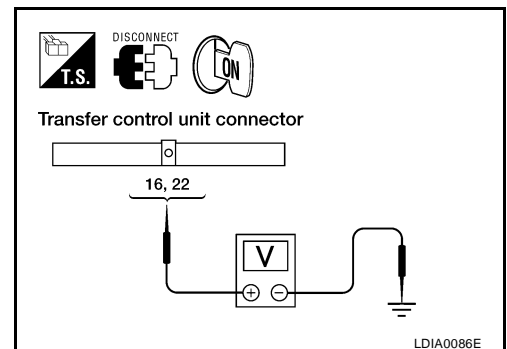
1. CHECK TRANSFER CONTROL UNIT POWER SOURCE

1. Turn ignition switch to OFF position and disconnect transfer control unit harness connector E142.
2. Turn ignition switch to ON position. (Do not start engine.)



3. Check voltage between transfer control unit harness connector E142 terminals 16 (Y/R), 22 (Y/R) and ground.

Voltage : Battery voltage



OK or NG

OK >> GO TO 2.

NG >> Check the following.

- Continuity between ignition switch and transfer control unit
- Ignition switch and No. 49 fuse (10A)

TROUBLE DIAGNOSES FOR SYMPTOMS

2. CHECK TRANSFER CONTROL UNIT GROUND CIRCUIT

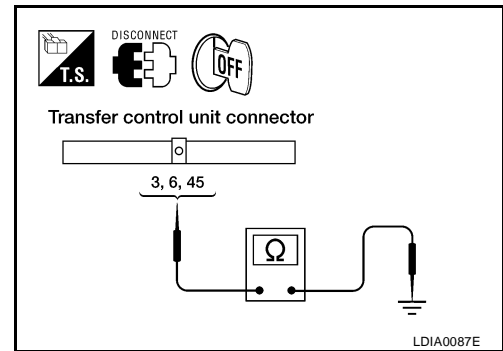
1. Turn ignition switch to OFF position.
2. Disconnect transfer control unit harness connectors E142 and E143.
3. Measure resistance between transfer control unit harness connectors E142 and E143 terminals 3(B), 6(B), 45(B) and ground.

Resistance : **Continuity should exist.**

OK or NG

OK >> GO TO 3.

NG >> Check continuity between transfer control unit and ground.



3. CHECK PROCEDURES FROM THE BEGINNING AGAIN

Check again.

OK or NG

OK >> Inspection End.

NG >> 1. Perform transfer control unit input/output signal inspection. Refer to [TF-55, "TRANSFER CONTROL UNIT INSPECTION TABLE"](#) .

2. If NG, recheck transfer control unit pin terminals for damage or loose connection with harness connector.

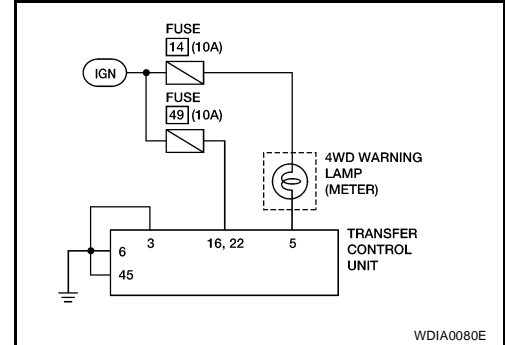
TROUBLE DIAGNOSES FOR SYMPTOMS

Symptom 2. 4WD Warning Lamp Does Not Turn ON (Although the ignition switch is turned ON, the 4WD warning lamp does not turn ON)

EDS0018F

1. CHECK TRANSFER CONTROL UNIT POWER SOURCE

1. Turn ignition switch to OFF position and disconnect transfer control unit harness connector E142.
2. Turn ignition switch to ON position (do not start engine).



3. Check voltage between transfer control unit harness connector E142 terminals 16 (Y/R), 22 (Y/R) and ground.

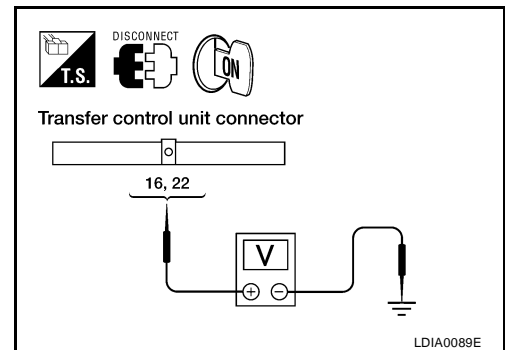
Voltage : **Battery voltage**

OK or NG

OK >> GO TO 2.

NG >> Check the following.

- Continuity between ignition switch and transfer control unit
- Ignition switch and No. 49 fuse (10A)



2. CHECK TRANSFER CONTROL UNIT GROUND CIRCUIT

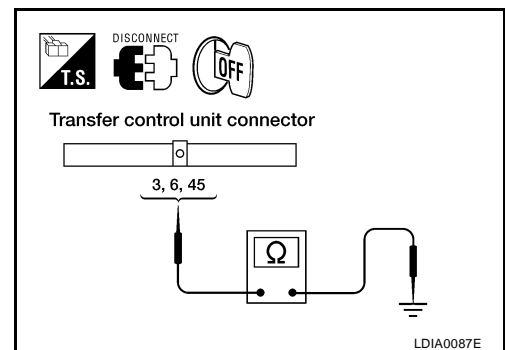
1. Turn ignition switch to OFF position.
2. Disconnect transfer control unit harness connectors E142 and E143.
3. Measure resistance between transfer control unit harness connectors E142 and E143 terminals 3 (B), 6 (B), 45 (B) and ground.

Resistance : **Continuity should exist.**

OK or NG

OK >> GO TO 3.

NG >> Check continuity between transfer control unit and ground.



3. CHECK 4WD WARNING LAMP CIRCUIT AND COMBINATION METER

Check the following.

- Combination meter. Refer to [DI-17, "How to Proceed With Trouble Diagnosis"](#) .
- Continuity between ignition switch and combination meter
- Continuity between combination meter and transfer control unit

OK or NG

OK >> Replace transfer control unit. Refer to [TF-98, "Removal and Installation"](#) .

NG >> • Repair or replace harness or connector.

- Replace combination meter. Refer to [DI-25, "Removal and Installation of Combination Meter"](#) .

TROUBLE DIAGNOSES FOR SYMPTOMS

Symptom 3. 4WD Shift Indicator Lamp Does Not Turn OFF (When 4WD shift switch is set from 4H to 4LO, all the 4WD shift indicator lamps do not turn off)

EDS0018G

1. CHECK ATP SWITCH CIRCUIT

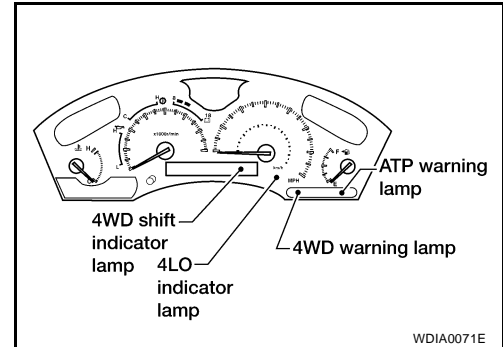
Check ATP switch circuit.

Refer to [TF-69, "Diagnostic Procedure"](#) .

OK or NG

OK >> GO TO 2.

NG >> Check, repair or replace faulty parts.



2. CHECK PROCEDURE FROM THE BEGINNING AGAIN

Check again.

OK or NG

OK >> Inspection End.

NG >> Recheck each connector pin terminals for damage or loose connection.

TROUBLE DIAGNOSES FOR SYMPTOMS

Symptom 4. ATP Warning Lamp Does Not Turn ON (When 4WD shift switch is set from 4H to 4LO with the A/T selector lever in P position, the ATP warning lamp does not turn on)

EDS0018H

1. CHECK ATP SWITCH CIRCUIT

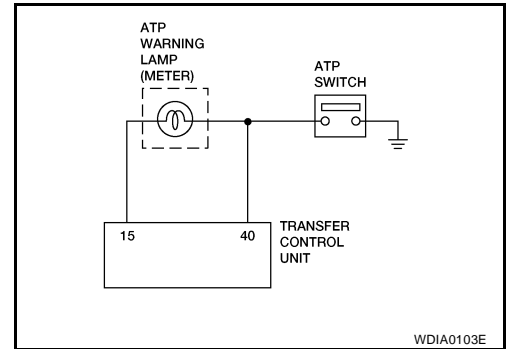
Check ATP switch circuit.

Refer to [TF-69, "ATP SWITCH, WAIT DETECTION SWITCH AND NEUTRAL-4LO SWITCH"](#) .

OK or NG

OK >> GO TO 2.

NG >> Check, repair or replace faulty parts.



2. CHECK COMBINATION METER

Check the combination meter. Refer to [DI-17, "How to Proceed With Trouble Diagnosis"](#)

OK or NG

OK >> Replace transfer control unit. Refer to [TF-98, "Removal and Installation"](#) .

NG >> Replace combination meter. Refer to [DI-25, "Removal and Installation of Combination Meter"](#) .

TROUBLE DIAGNOSES FOR SYMPTOMS

Symptom 5. 4LO Indicator Lamp Does Not Turn ON (When 4WD shift switch is set from 4H to 4LO position, 4LO indicator lamp does not turn ON)

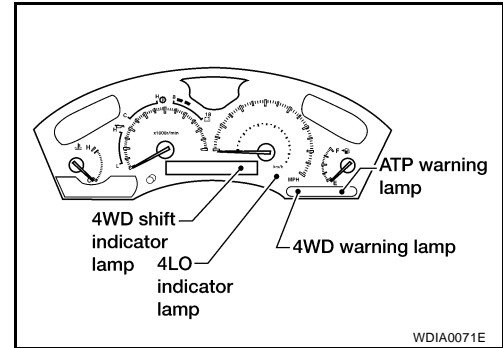
EDS0018I

1. CHECK TRANSFER CONTROL UNIT POWER SUPPLY CIRCUIT

1. Disconnect battery negative terminal, then transfer control unit connectors.
2. Connect battery negative terminal and turn ignition switch ON (with engine stopped).
3. Check voltage across transfer control unit connector E142 and E143 terminals 16 (Y/R), 47 (W) and ground.

Voltage

: Battery voltage



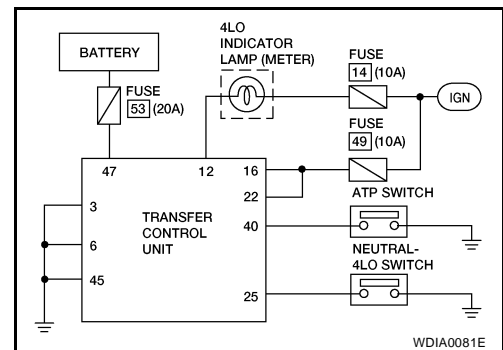
WDIA0071E

OK or NG

OK >> GO TO 2.

NG >> Check the following.

- Continuity between battery, ignition switch and transfer control unit
- Ignition switch. Refer to [PG-4, "POWER SUPPLY ROUTING CIRCUIT"](#).
- No. 53 fuse (20A) and No. 49 fuse (10A)



WDIA0081E

2. CHECK TRANSFER CONTROL UNIT GROUND CIRCUIT

1. Turn ignition switch to OFF position.
2. Disconnect transfer control unit harness connectors E142 and E143.
3. Measure resistance between transfer control unit harness connectors E142 and E143 terminals 3 (B), 6 (B), 45 (B) and ground.

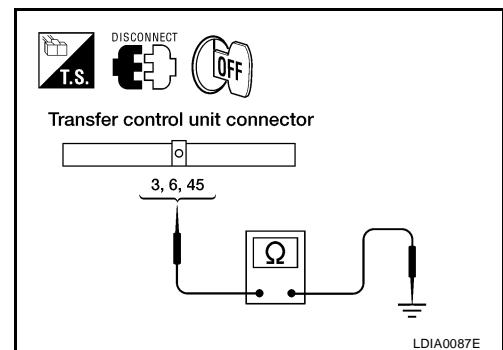
Resistance

: Continuity should exist.

OK or NG

OK >> GO TO 3.

NG >> Check continuity between transfer control unit and ground.



LDIA0087E

TROUBLE DIAGNOSES FOR SYMPTOMS

3. CHECK 4LO INDICATOR LAMP CIRCUIT AND COMBINATION METER

Check the following.

- Combination meter. Refer to [DI-17, "How to Proceed With Trouble Diagnosis"](#) .
- Continuity between ignition switch and combination meter
- Continuity between combination meter and transfer control unit
- Condition of ATP and neutral-4LO switch circuit. Refer to [TF-69, "ATP SWITCH, WAIT DETECTION SWITCH AND NEUTRAL-4LO SWITCH"](#) .

OK or NG

- OK >> Replace transfer control unit. Refer to [TF-98, "Removal and Installation"](#) .
- NG >> ● Repair or replace harness or connector.
 - Replace combination meter. Refer to [DI-25, "Removal and Installation of Combination Meter"](#) .
 - Replace ATP or neutral-4LO switch.

Symptom 6. 4WD Shift Indicator Lamp Does Not Indicate "LOCK" (When 4WD shift switch is set to "4H", 4WD shift indicator lamp does not indicate "LOCK")

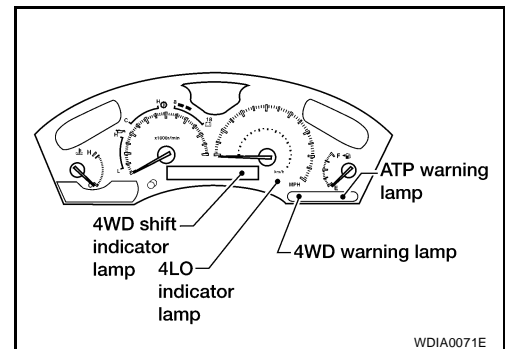
EDS0018J

1. CHECK 4WD WARNING LAMP

Is 4WD warning lamp turned ON?

Yes or No

- Yes >> Refer to [TF-27, "Trouble Diagnosis without CONSULT-II"](#) .
- No >> GO TO 2.



2. CHECK NEUTRAL-4LO, WAIT DETECTION AND ATP SWITCH CIRCUITS

Check neutral-4LO, wait detection and ATP switch circuits. Refer to [TF-69, "ATP SWITCH, WAIT DETECTION SWITCH AND NEUTRAL-4LO SWITCH"](#) .

OK or NG

- OK >> GO TO 3.
- NG >> Check, repair or replace faulty parts.

3. CHECK PROCEDURES FROM THE BEGINNING AGAIN

Check again.

OK or NG

- OK >> Inspection End.
- NG >> Recheck each connector pin terminals for damage or loose connection.

TROUBLE DIAGNOSES FOR SYMPTOMS

Symptom 7. 4WD Shift Indicator Lamp Repeats Flickering (4WD Shift Indicator Lamp Keeps Flickering)

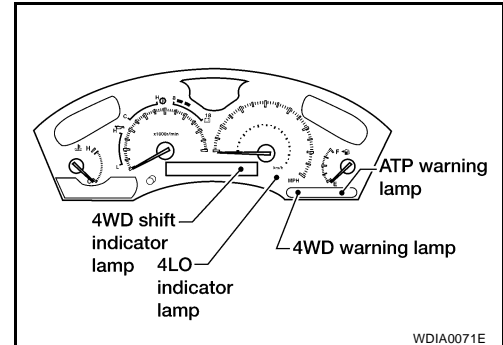
EDS0018K

1. CHECK 4WD SHIFT INDICATOR LAMP

1. Set 4WD shift switch to 2WD position.
2. Move vehicle forward and backward. Or drive straight increasing or decreasing speed under 20 km/h (12 MPH).
3. Does 4WD shift indicator lamp keep flickering?

Yes or No

- Yes >> GO TO 2.
No >> Inspection End.



2. CHECK TIGHT CORNER BRAKING SYMPTOM

Drive vehicle at speed under 20 km/h (12 MPH), turning steering wheel to the limit. Does tight corner braking symptom occur?

Yes or No

- Yes >> GO TO 3.
No >> GO TO 4.

3. CHECK 4WD SHIFT INDICATOR LAMP

Does the 4WD shift indicator lamp keep flickering when the front wheels are jacked up?

Yes or No

- Yes >> Check transfer unit operating system.
No >> Check tires.

4. CHECK 4WD WARNING LAMP

Does 4WD warning lamp flicker? (4WD shift indicator lamp is turned OFF.)

Yes or No

- Yes >> Perform self-diagnosis. Refer to [TF-27, "Trouble Diagnosis without CONSULT-II"](#) .
No >> GO TO 5.

5. CHECK 4WD SHIFT INDICATOR LAMP

Does 4WD shift indicator lamp keep flickering?

Yes or No

- Yes >> Check again.
No >> Inspection End.

TROUBLE DIAGNOSES FOR SYMPTOMS

Symptom 8. Tight Corner Braking Symptom (Tight Corner Braking Symptom Occurs-Hydraulic System Failure)

EDS0018L

1. CHECK INPUT SIGNAL

Ⓜ With CONSULT-II

1. Select "ECU INPUT SIGNALS" in Data Monitor.
2. Put A/T selector lever in D.
3. Turn 4WD shift switch to 4H and back to 2WD while reading out ON/OFF status of "CL PRES SW".

ⓧ Without CONSULT-II

Check voltage between transfer control unit harness connector E143 terminal 34 (BR) and ground.

Refer to [TF-55, "TRANSFER CONTROL UNIT INSPECTION TABLE"](#).

OK or NG

OK >> Disassemble transfer unit and check the following.

- Control valve assembly
- 4WD solenoid valve
- 2-4WD shift solenoid valve
- Clutch piston
- Clutch assembly

NG >> GO TO 2.

2. CHECK CLUTCH PRESSURE SWITCH CIRCUIT

Check clutch pressure switch circuit.

Refer to [TF-72, "Diagnostic Procedure"](#).

OK or NG

OK >> GO TO 3.

NG >> Check, repair or replace faulty parts.

3. CHECK PROCEDURES FROM THE BEGINNING AGAIN

Check again.

OK or NG

OK >> Inspection End.

NG >> Recheck each connector pin terminals for damage or loose connection.

DATA MONITOR	
MONITOR	NO DTC
4L SWITCH	OFF
N POSI SW TF	OFF
LINE PRES SW	OFF
CL PRES SW	OFF
ATP SWITCH	OFF
N POSI SW AT	OFF
R POSI SW AT	OFF
P POSI SW AT	ON

WDIA0087E

TROUBLE DIAGNOSES FOR SYMPTOMS

Symptom 9. 4WD System Does Not Operate (The Vehicle Cannot Be Put Into 4WD Mode-Hydraulic System Failure)

EDS0018M

1. CHECK INPUT SIGNAL

④ With CONSULT-II

1. Select "ECU INPUT SIGNALS" in Data Monitor.
2. Put A/T selector lever in D.
3. Turn 4WD shift switch to 4H and back to 2WD while reading out ON/OFF status of "CL PRES SW".

⊗ Without CONSULT-II

Check voltage between transfer control unit harness connector E143 terminal 34 (BR) and ground.

Refer to [TF-55, "TRANSFER CONTROL UNIT INSPECTION TABLE"](#) .

OK or NG

- OK >> 1. Check transfer fluid level.
2. Disassemble transfer unit and check the following.
- Transfer motor
 - Main oil pump assembly
 - Sub-oil pump assembly
 - Oil strainer
 - Control valve assembly
 - 2-4WD shift solenoid valve
 - Oil filter element
 - Lip seal
 - Strainer O-ring
 - Main oil pump drive gear
 - Seal ring
 - D-ring
 - Clutch piston
 - Clutch assembly

NG >> GO TO 2.

2. CHECK CLUTCH PRESSURE CIRCUIT

Check clutch pressure switch circuit.

Refer to [TF-72, "Diagnostic Procedure"](#) .

OK or NG

- OK >> GO TO 3.
NG >> Check, repair or replace faulty parts.

3. CHECK PROCEDURES FROM THE BEGINNING

Check again.

OK or NG

- OK >> Inspection End.
NG >> Recheck each connector pin terminals for damage or loose connection.

DATA MONITOR	
MONITOR	NO DTC
4L SWITCH	OFF
N POSI SW TF	OFF
LINE PRES SW	OFF
CL PRES SW	OFF
ATP SWITCH	OFF
N POSI SW AT	OFF
R POSI SW AT	OFF
P POSI SW AT	ON

WDIA0087E

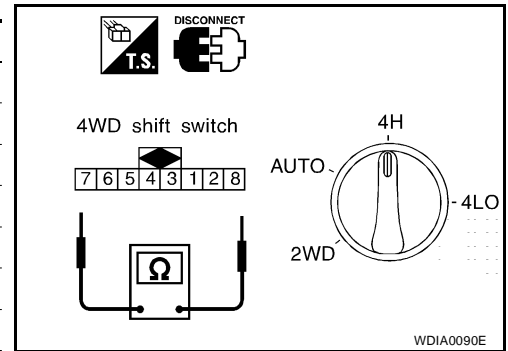
TROUBLE DIAGNOSES FOR SYMPTOMS

EDS0018N

Component Inspection 4WD SHIFT SWITCH

Check continuity between each terminal.

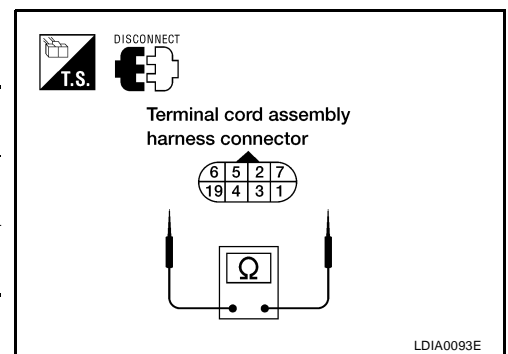
Terminals	Switch position	Continuity
1 - 2	2WD	Yes
	Except 2WD	No
1 - 3, 1 - 4	AUTO	Yes
	Except AUTO	No
1 - 4, 1 - 5	4H	Yes
	Except 4H	No
1 - 4, 1 - 6	4LO	Yes
	Except 4LO	No



2-4WD SHIFT SOLENOID VALVE AND TRANSFER FLUID TEMPERATURE SENSOR

Measure resistance between terminals of transfer terminal cord assembly harness connector F56.

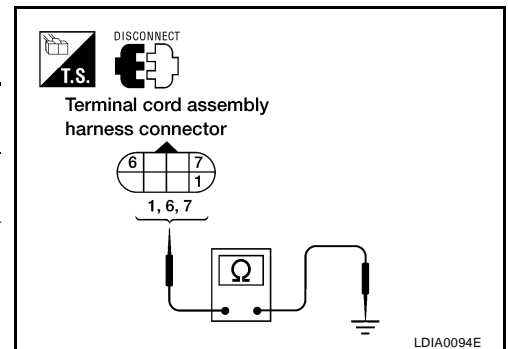
Component parts	Terminals	Resistance (Approx.)
2-4WD shift solenoid valve	4 - 5	20°C (68°F): 22.8 - 25.2Ω
Transfer fluid temperature sensor	2 - 3	20°C (68°F): 2.5 kΩ 80°C (176°F): 0.3 kΩ



4WD SOLENOID VALVE, CLUTCH PRESSURE SWITCH AND LINE PRESSURE SWITCH

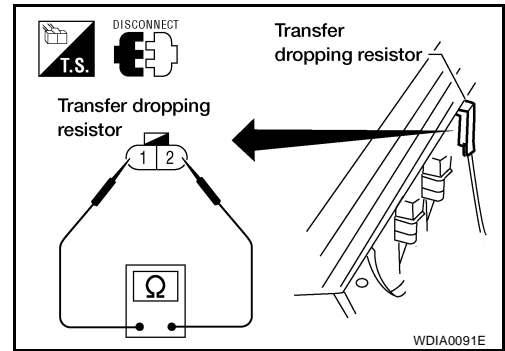
Measure resistance between terminals of transfer terminal cord assembly harness connector F56.

Component parts	Terminals	Remarks
4WD solenoid valve	6	Approx. 20°C (68°F): Approx. 3.0 - 3.4Ω
Clutch pressure switch	7	In room temperature
		<ul style="list-style-type: none"> ● 2-4WD shift solenoid valve "OFF": No continuity ● 2-4WD shift solenoid valve and transfer motor "ON": Continuity exists
Line pressure switch	1	In room temperature
		<ul style="list-style-type: none"> ● Turn ignition switch to "OFF" position and leave vehicle for more than 5 minutes. (OFF): No continuity ● Transfer motor "ON": Continuity exists



TROUBLE DIAGNOSES FOR SYMPTOMS

TRANSFER DROPPING RESISTOR



Check resistance between terminals.

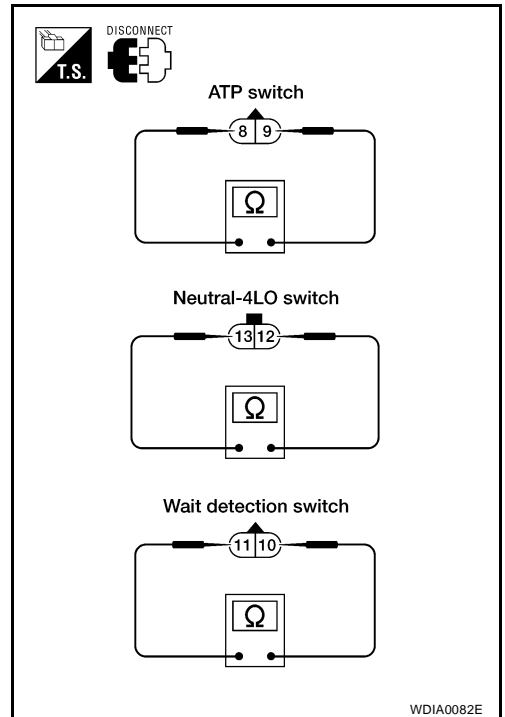
Resistance : 11.2 - 12.8 Ω

ATP SWITCH, NEUTRAL-4LO SWITCH AND WAIT DETECTION SWITCH

1. Remove the ATP switch, neutral-4LO switch and the wait detection switch.
2. Measure the resistance between terminals of ATP switch F55, neutral-4LO switch F60, and wait detection switch F59.

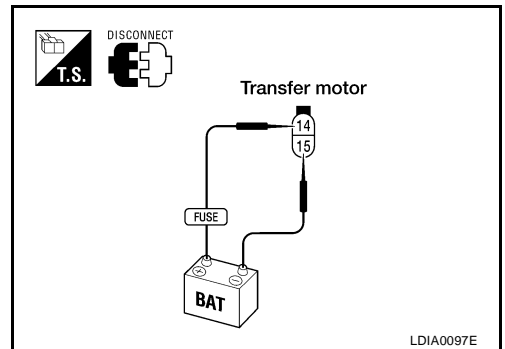
Switch released state : Continuity should not exist

Switch pushed state : Continuity should exist



TRANSFER MOTOR

Apply battery voltage directly to transfer motor harness connector F57. (Positive: Terminal 14, Negative: Terminal 15)
Transfer motor should operate.

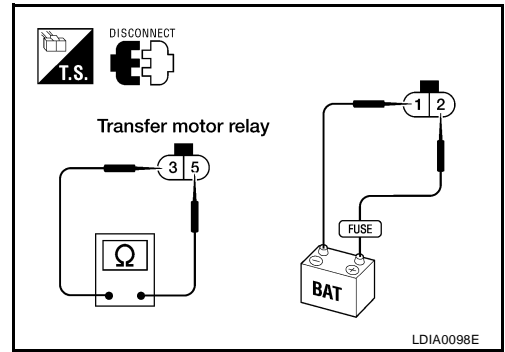


TROUBLE DIAGNOSES FOR SYMPTOMS

TRANSFER MOTOR RELAY

1. Apply battery voltage and ground directly to transfer motor relay E154 terminals 1 and 2.
2. Check continuity between transfer motor relay E153 terminals 3 and 5.

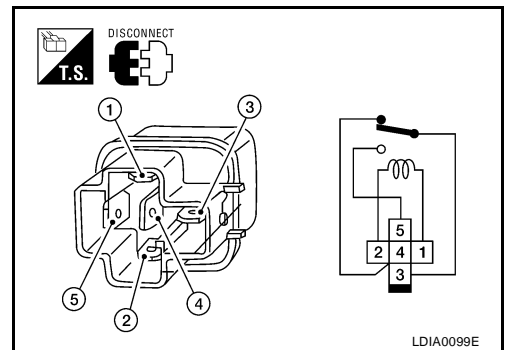
Condition	Continuity (3-5)
Battery voltage is applied	Yes
No voltage is applied	No



TRANSFER SHIFT RELAY (HIGH & LOW)

Check continuity between transfer shift high relay E46 and low relay E47 terminals 3 and 4.

Condition	Continuity
12V direct current supply between terminals 1 and 2	No
No current supply	Yes



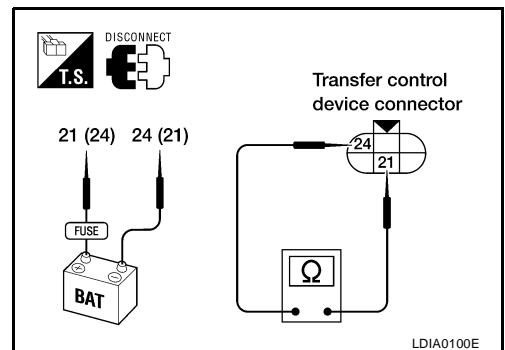
ACTUATOR AND ACTUATOR POSITION SWITCH

Actuator

Operation and resistance check

- Apply battery voltage directly to actuator assembly.

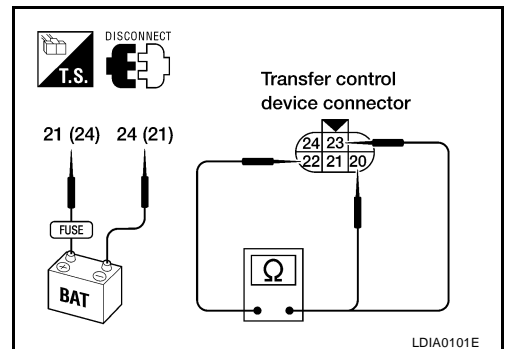
Operating check	Battery positive terminal	Battery negative terminal
1	21	24
2	24	21
Check	Approx. 0.2Ω (When the motor is not operated.)	



Actuator Position Switch

Continuity check

Continuity check	Battery positive terminal	Battery negative terminal	Continuity
1	21	24	20 - 22
2	24	21	23 - 22



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TRANSFER CONTROL UNIT

TRANSFER CONTROL UNIT

PF3:33084

Removal and Installation

EDS00314

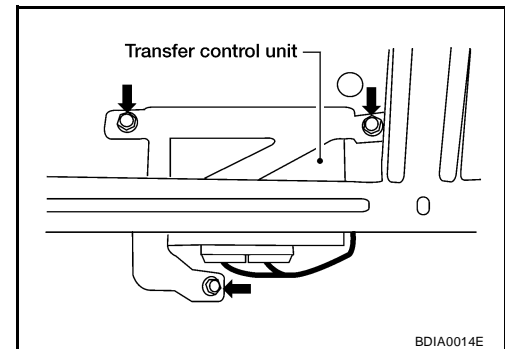
REMOVAL

1. Set transfer state as 2WD when 4WD shift switch is at 2WD, or as AUTO when 4WD shift switch is at AUTO.

CAUTION:

When removing transfer control unit, transfer state must be at 2WD or AUTO.

2. Turn the ignition switch OFF and disconnect negative battery terminal.
3. Remove the glove box assembly. Refer to [IP-14, "Instrument Lower Cover RH and Glove Box"](#) .
4. Disconnect the two transfer control unit connectors.
5. Remove the transfer control unit bolts.
6. Remove the transfer control unit.



INSTALLATION

Installation is in the reverse order of removal.

- When installing the transfer control unit, tighten bolts to the specified torque.

Transfer control unit bolts : 5.1 N·m (0.52 kg·m, 45 in·lb)

CAUTION:

- **Do not connect harness connector to transfer control unit when 4WD shift switch is at 4LO.**
- After the installation, check perform self-diagnosis. Refer to [TF-28, "SELF-DIAGNOSTIC PROCEDURE"](#) . If NG, adjust position between transfer assembly and transfer control unit.

FRONT OIL SEAL

FRONT OIL SEAL

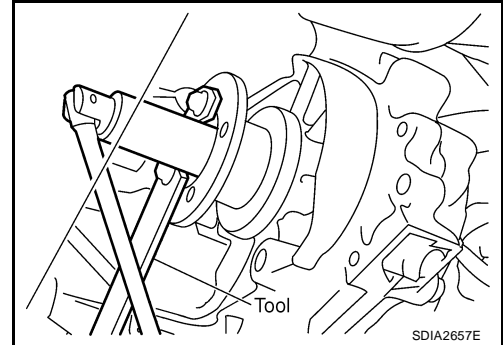
PFP:38189

EDS00315

Removal and Installation REMOVAL

1. Partially drain the transfer fluid. Refer to [MA-24, "Changing Transfer Fluid"](#) .
2. Remove the front propeller shaft. Refer to [PR-4, "Removal and Installation"](#) .
3. Remove the companion flange self-lock nut, using Tool.

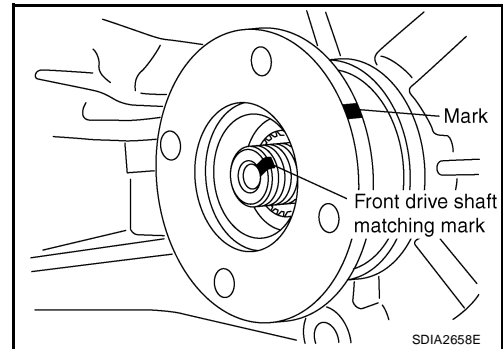
Tool number : KV40104000 (—)



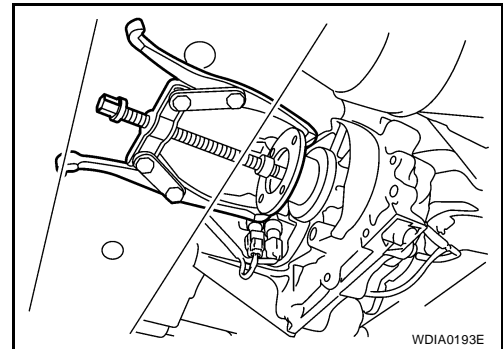
4. Put a matching mark on top of the front drive shaft in line with the mark on the companion flange.

CAUTION:

Use paint to make the matching mark on the front drive shaft. Do not damage the front drive shaft.



5. Remove the companion flange, using suitable tool.

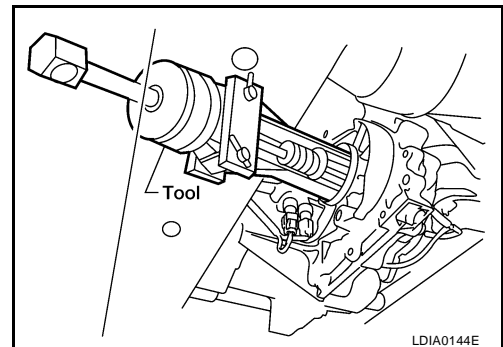


6. Remove the oil seal from the front case, using Tool.

Tool number : ST33290001 (J-34286)

CAUTION:

Do not damage front case.



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FRONT OIL SEAL

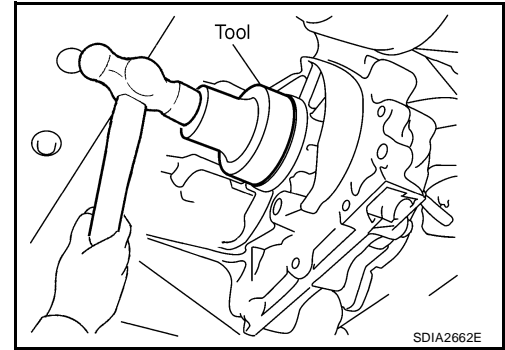
INSTALLATION

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

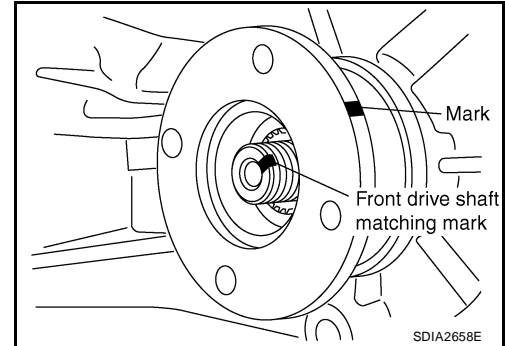
Tool number : KV38100500 (—)

CAUTION:

- Do not reuse oil seal.
- Apply petroleum jelly to oil seal.



2. Align the matching mark of the front drive shaft with the matching mark of the companion flange, then install the companion flange.



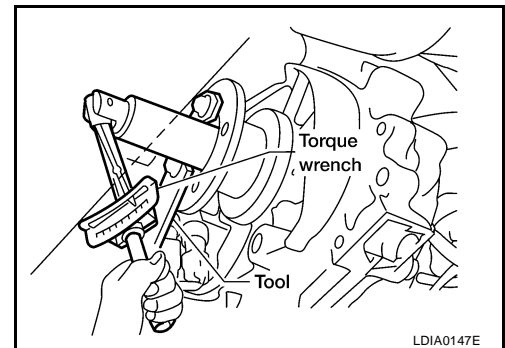
3. Install the self-lock nut. Tighten to the specified torque, using Tool. Refer to [TF-110, "Transfer Components"](#) .

Tool number : KV40104000 (—)

CAUTION:

Do not reuse self-lock nut.

4. Install the front propeller shaft. Refer to [PR-4, "Removal and Installation"](#) .
5. Refill the transfer with fluid and check fluid level. Refer to [MA-24, "Changing Transfer Fluid"](#) .
6. Check the transfer for fluid leakage. Refer to [MA-24, "Checking Transfer Fluid"](#) .



REAR OIL SEAL

PFP:33140

EDS00316

REAR OIL SEAL

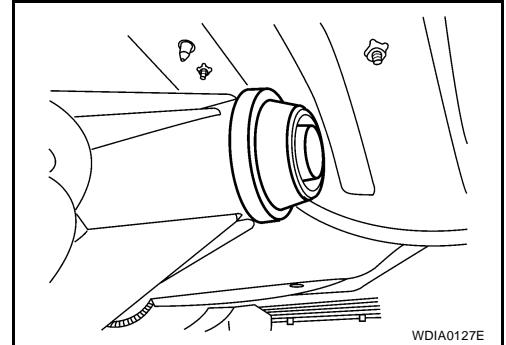
Removal and Installation

REMOVAL

1. Partially drain the transfer fluid. Refer to [MA-24, "Changing Transfer Fluid"](#) .
2. Remove the rear propeller shaft. Refer to [PR-8, "Removal and Installation"](#) .
3. Remove the dust cover from the rear case.

CAUTION:

Do not damage the rear case.

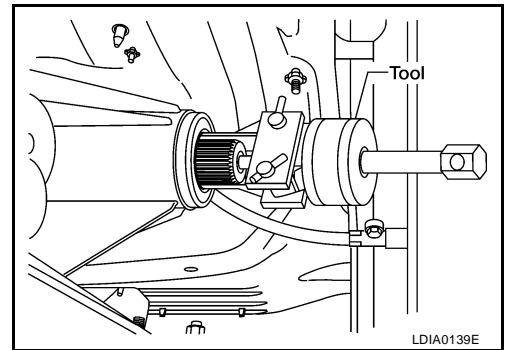


4. Remove the rear oil seal from the rear case, using Tool.

CAUTION:

Do not damage the rear case.

Tool number : ST33290001 (J-34286)



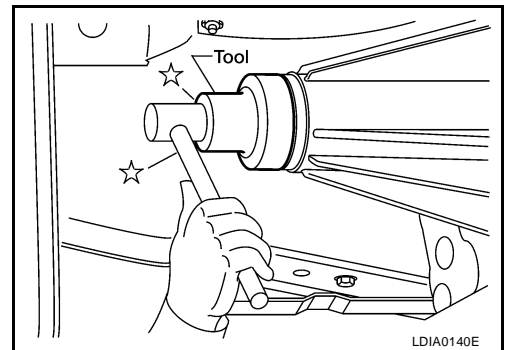
INSTALLATION

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

Tool number : ST30720000 (J-25405)

CAUTION:

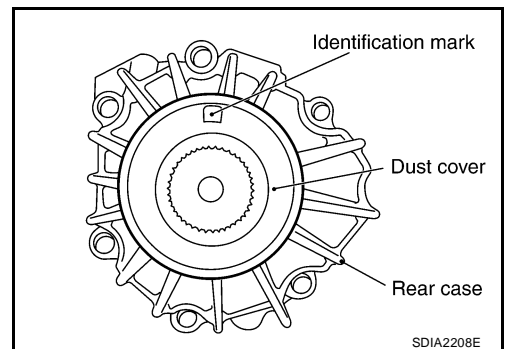
- Do not reuse oil seal.
- Apply petroleum jelly to oil seal.



2. Apply petroleum jelly to the circumference of the new dust cover. Position the dust cover using the identification mark as shown.

CAUTION:

- Do not reuse dust cover.
- Position the identification mark at the position shown.



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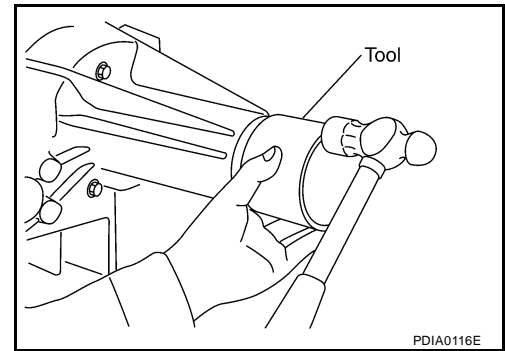
REAR OIL SEAL

3. Install the dust cover to the rear case, using Tool.

Tool number : KV40105310 (—)

CAUTION:

- Do not reuse dust cover.
 - Apply petroleum jelly to dust cover.
4. Install the rear propeller shaft. Refer to [PR-8, "Removal and Installation"](#) .
 5. Refill the transfer with fluid and check fluid level. Refer to [MA-24, "Changing Transfer Fluid"](#) .
 6. Check the transfer for fluid leakage. Refer to [MA-24, "Checking Transfer Fluid"](#) .



SIDE OIL SEAL

SIDE OIL SEAL

PDF:33142

EDS00317

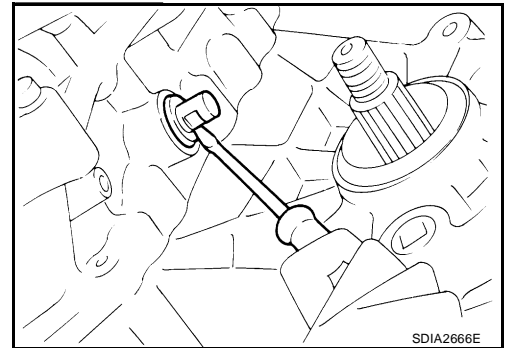
Removal and Installation

REMOVAL

1. Remove the front propeller shaft. Refer to [PR-4, "Removal and Installation"](#) .
2. Remove the companion flange. Refer to [TF-99, "Removal and Installation"](#) .
3. Remove the transfer control device from the transfer assembly. Refer to [TF-104, "Removal and Installation"](#) .
4. Remove the side oil seal.

CAUTION:

Do not damage shift cross.



INSTALLATION

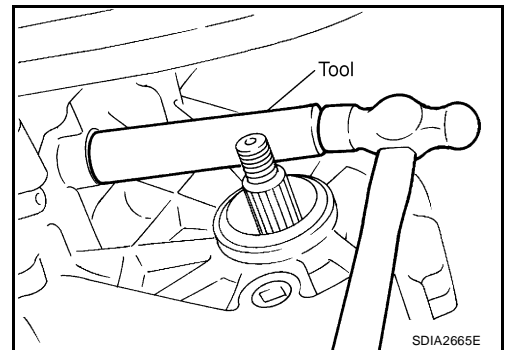
1. Install the side oil seal until it is flush with the end face of case, using Tool.

Tool number : **ST22360002 (J-25679-01)**

CAUTION:

- Do not reuse oil seal.
- Apply petroleum jelly to oil seal.

2. Install the transfer control device to the transfer assembly. Refer to [TF-104, "Removal and Installation"](#) .
3. Install the companion flange. Refer to [TF-99, "Removal and Installation"](#) .
4. Install the front propeller shaft. Refer to [PR-4, "Removal and Installation"](#) .



TRANSFER CONTROL DEVICE

TRANSFER CONTROL DEVICE

PFP:33251

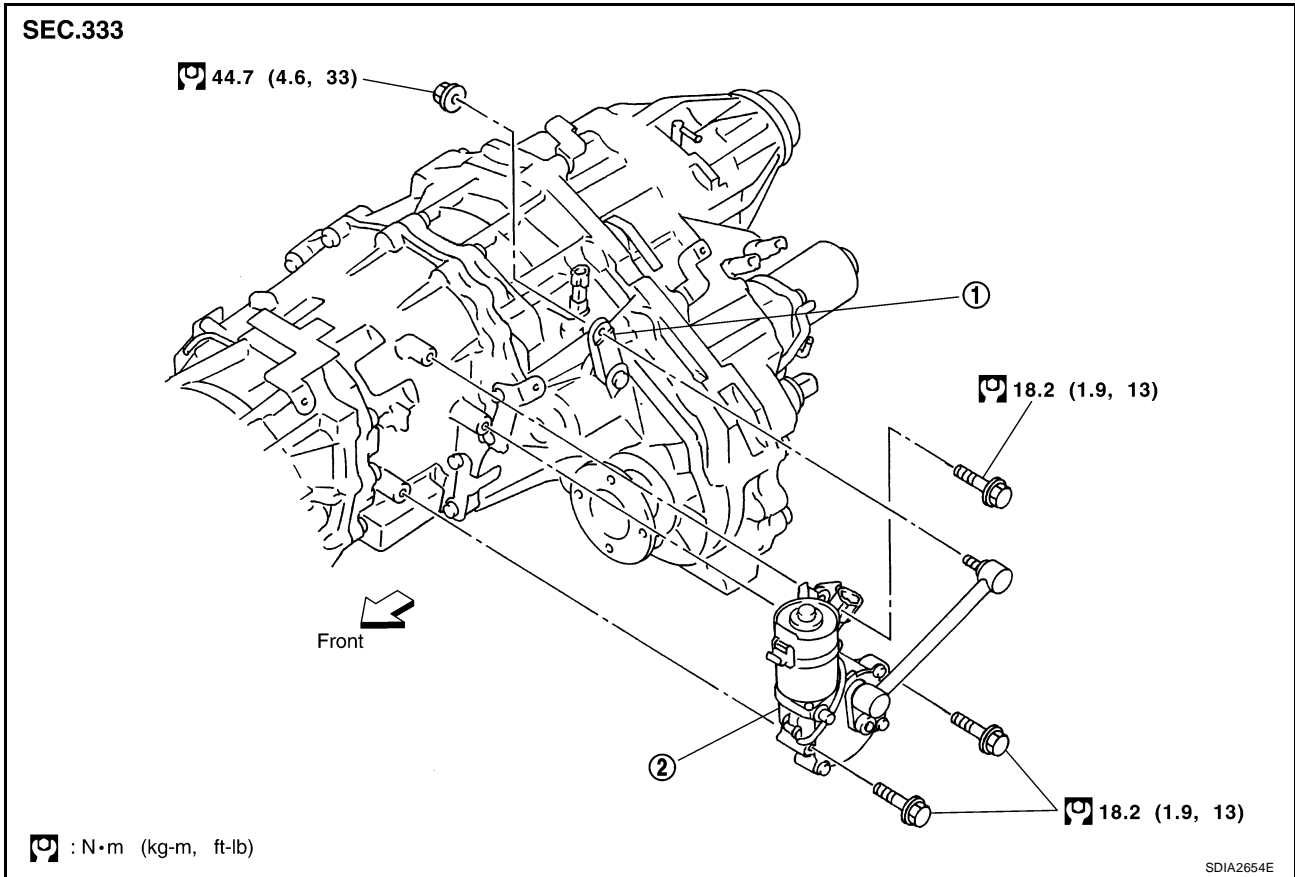
Removal and Installation

EDS00318

Refer to the figure for transfer control device removal and installation information.

CAUTION:

- Change vehicle state to 2WD or AUTO, and then remove and install transfer control device.
- Check 4WD shift indicator after installation.



1. Shift lever

2. Actuator

AIR BREATHER HOSE

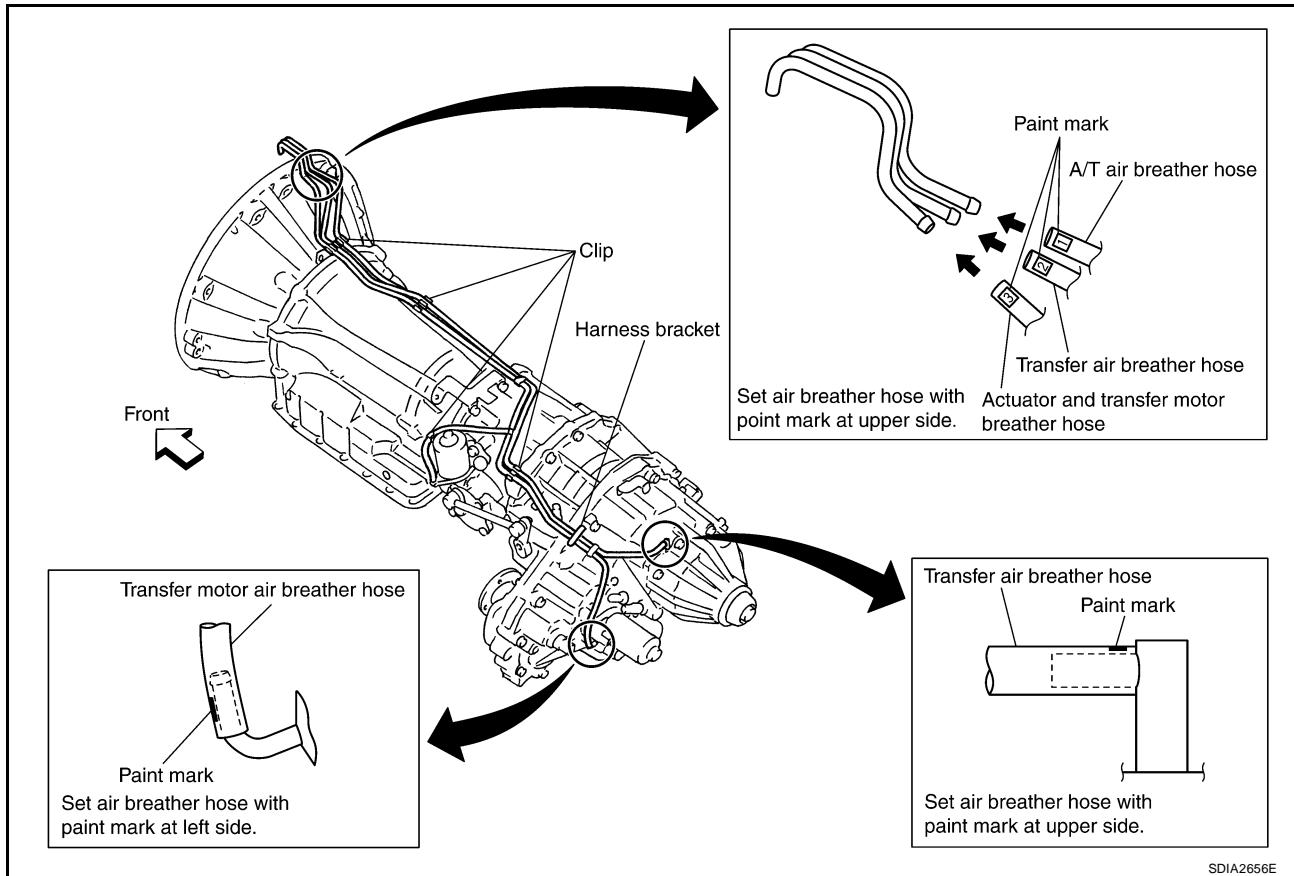
AIR BREATHER HOSE

PF3:31098

Removal and Installation

EDS00319

Refer to the figure for air breather hose removal and installation information.



CAUTION:

- Make sure there are no pinched or restricted areas on the air breather hose caused by bending or winding when installing it.
- Install the air breather hose into the air breather (metal connector) and actuator (case connector) until the hose end reaches the base of the tube.
- Install the air breather hose into the breather tube (metal connector) and transfer motor (case connector) until the hose end reaches the end of the curved section.

TRANSFER MOTOR

TRANSFER MOTOR

PFP:00000

Removal and Installation

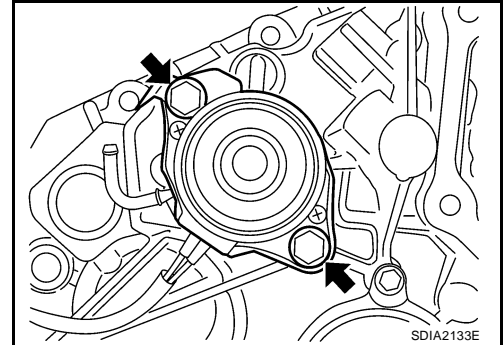
EDS0018R

REMOVAL

1. Disconnect transfer motor harness connector.
2. Remove breather pipe from transfer motor.
3. Remove bolts to detach transfer motor.

NOTE:

After removing transfer motor, be sure to replace O-ring with new one.



INSTALLATION

EDS0018S

1. Apply ATF or petroleum jelly to new O-ring.

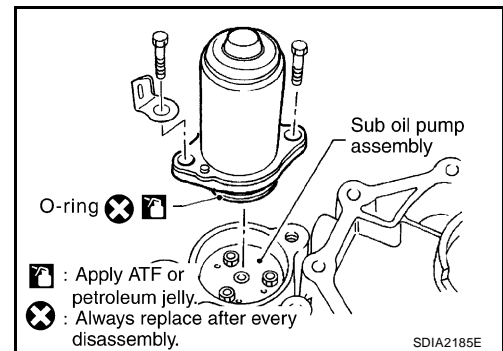
NOTE:

Do not reuse O-ring.

2. Align width across flat-notch with oil pump groove, and install transfer motor.
3. Tighten bolts.

Transfer motor bolts : 45 N-m (4.6 kg-m, 33 ft-lb)

4. Install breather pipe to transfer motor.
5. Connect transfer motor harness connector.



TRANSFER OIL FILTER

PFP:00000

EDS0031A

TRANSFER OIL FILTER

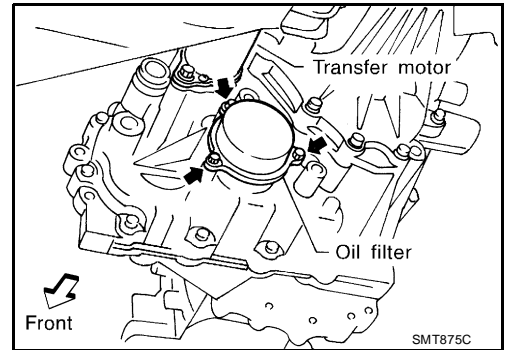
Removal and Installation

REMOVAL

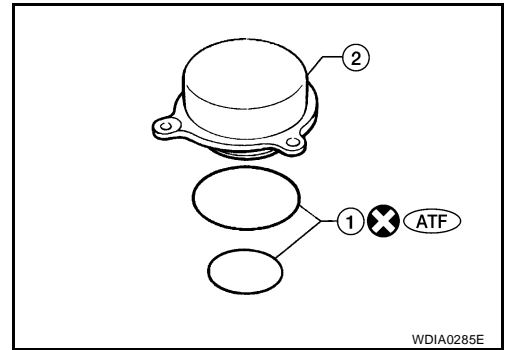
1. Remove the oil filter bolts and oil filter.

CAUTION:

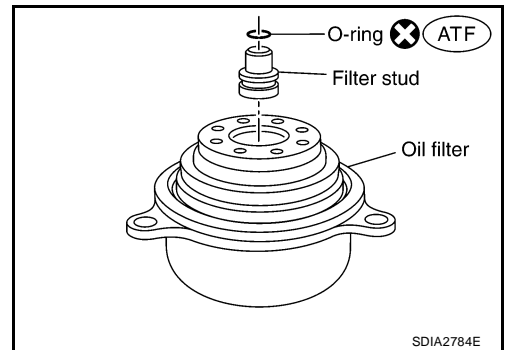
- Do not damage center case and oil filter.
- Loosen bolts and detach oil filter evenly.



2. Remove the O-rings (1) from the oil filter (2).



3. Remove the oil filter stud from the oil filter.
4. Remove the O-ring from the oil filter stud.



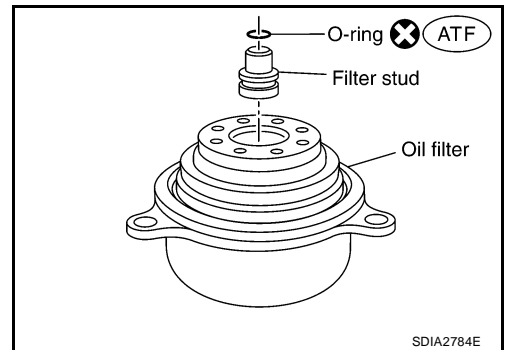
INSTALLATION

1. Apply ATF to the O-ring, and install it on the oil filter stud.

CAUTION:

Do not reuse O-ring.

2. Install the oil filter stud to the oil filter.



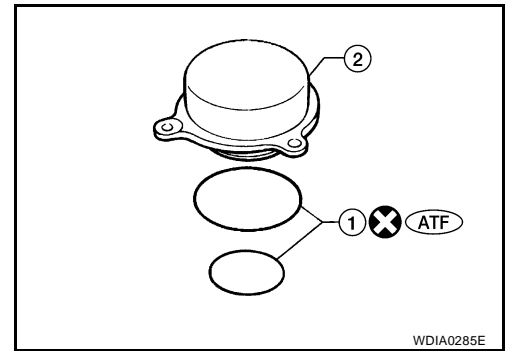
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TRANSFER OIL FILTER

3. Apply ATF to the two new O-rings (1), and install them on the oil filter (2).

CAUTION:

Do not reuse O-rings.

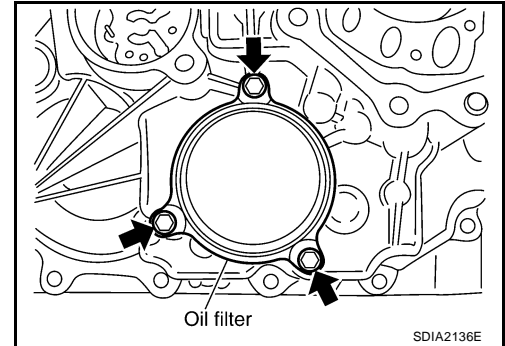


4. Install the oil filter to the transfer assembly. Tighten the bolts to the specified torque. Refer to [TF-110, "Transfer Components"](#) .

CAUTION:

- Do not damage oil filter.
- Attach oil filter and tighten bolts evenly.

5. Check the transfer fluid. Refer to [MA-24, "Checking Transfer Fluid"](#) .
6. Start the engine for one minute. Then stop the engine and recheck the transfer fluid.



REMOVAL AND INSTALLATION

REMOVAL AND INSTALLATION

PFP:00000

EDS0018V

Removal

1. Remove A/T undercover using power tools.
2. Remove center exhaust tube and muffler. Refer to [EX-3, "EXHAUST SYSTEM"](#) .
3. Remove front and rear propeller shafts. Refer to [PR-5, "REMOVAL"](#) (front) and [PR-9, "REMOVAL"](#) (rear).

CAUTION:

Be careful not to damage spline, sleeve yoke and rear oil seal when removing the rear propeller shaft

NOTE:

Insert a plug into rear oil seal after removing rear propeller shaft.

4. Remove A/T mount bolts. Refer to [AT-255, "TRANSMISSION ASSEMBLY"](#) .
5. Position two suitable jacks under A/T and transfer assembly.
6. Remove crossmember. Refer to [TF-109, "REMOVAL AND INSTALLATION"](#) .

WARNING:

Support A/T and transfer assembly using two suitable jacks while removing crossmember.

7. Disconnect the ATP switch, neutral 4LO switch, wait detection switch, transfer motor and transfer control device electrical connectors.
8. Remove breather hoses from the actuator, transfer rear case and transfer motor.
9. Remove the shift actuator from the extension housing.
10. Remove transfer to A/T bolts.

WARNING:

Support transfer assembly with suitable jack while removing it.

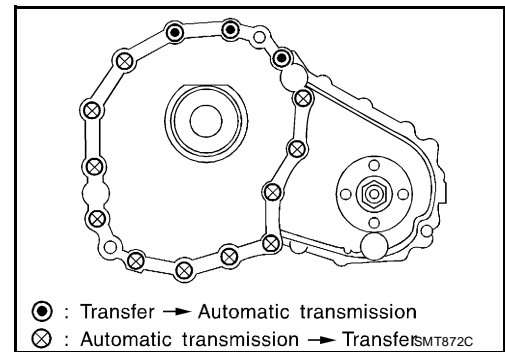
11. Remove transfer assembly.

Installation

EDS0018W

1. Installation is in the reverse order of removal.

Bolt length : 45 mm (1.77 in)
Transfer bolt torque : 36 N·m (3.7 kg-m, 26 ft-lb)



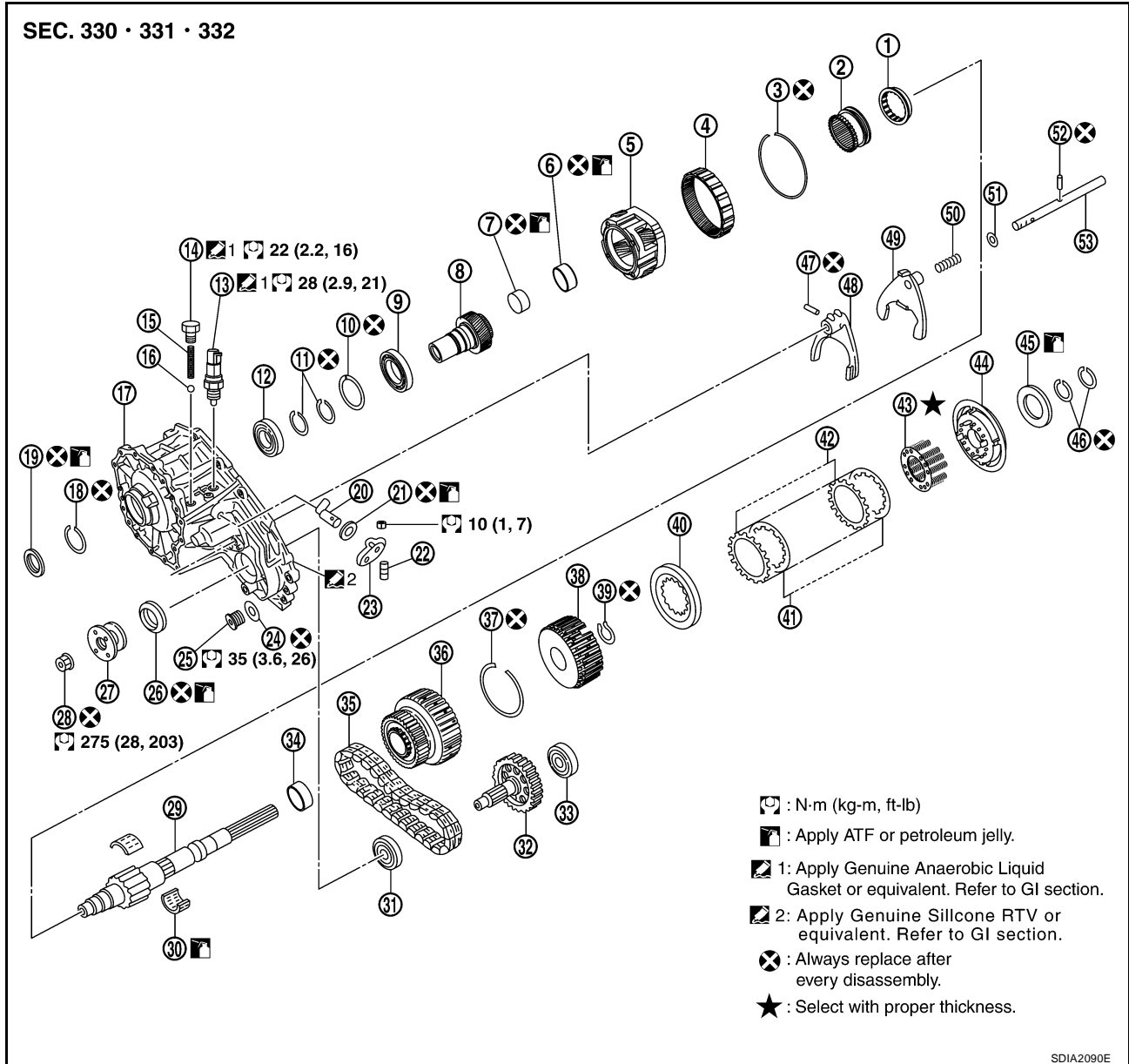
OVERHAUL

OVERHAUL

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Transfer Components

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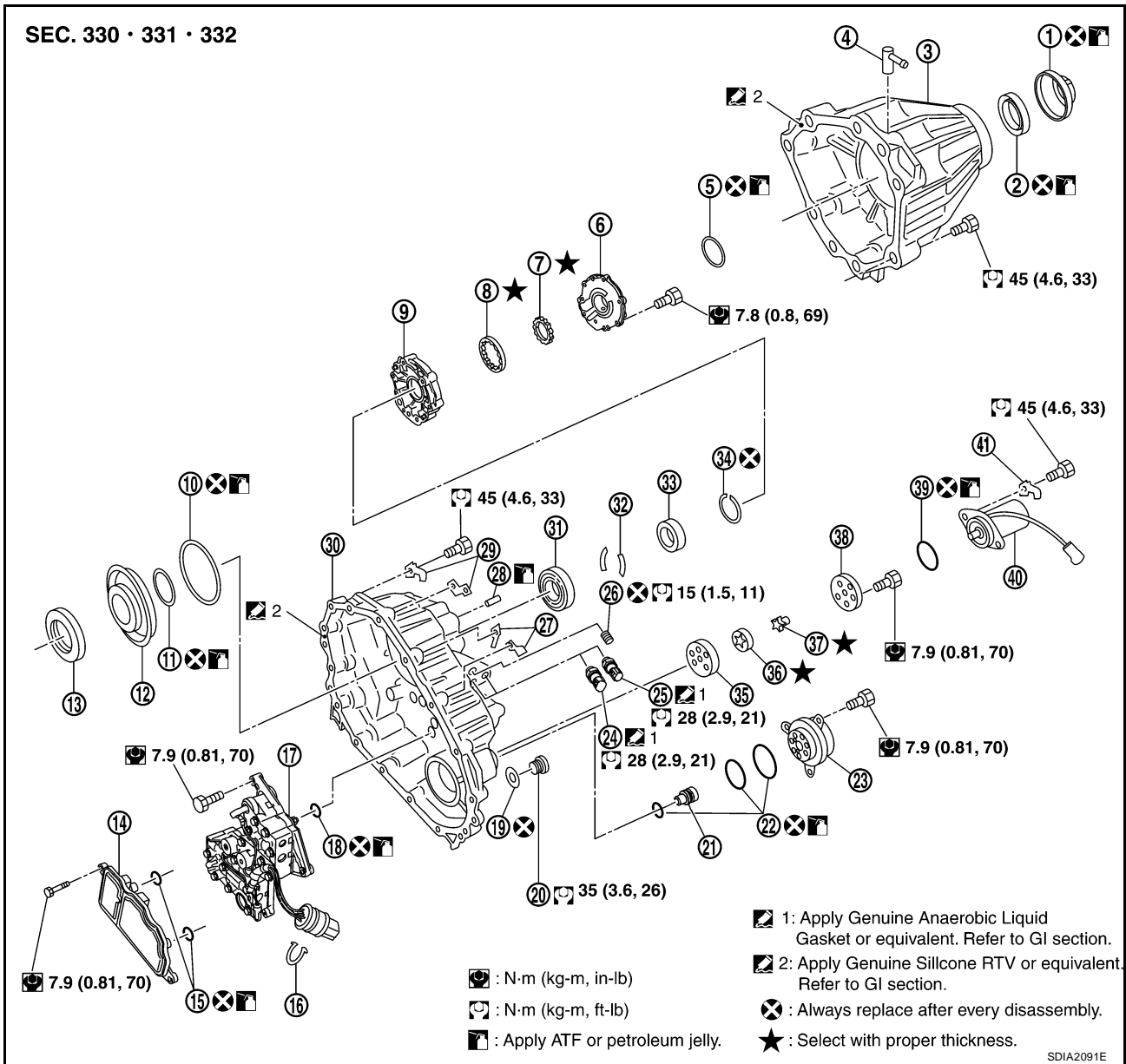


SDIA2090E

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|----------------------------|-------------------------------|-----------------------------|
| 1. 2-4 sleeve | 2. L-H sleeve | 3. Snap ring |
| 4. Internal gear | 5. Planetary carrier assembly | 6. Metal bushing |
| 7. Needle bearing | 8. Sun gear | 9. Carrier bearing |
| 10. Snap ring | 11. Snap ring | 12. Mainshaft front bearing |
| 13. Wait detection switch | 14. Check plug | 15. Check spring |
| 16. Check ball | 17. Front case | 18. Snap ring |
| 19. Oil seal | 20. Shift cross | 21. Oil seal |
| 22. Lock pin | 23. Shift lever | 24. Washer |
| 25. Drain plug | 26. Oil seal | 27. Companion flange |
| 28. Self-lock nut | 29. Main shaft | 30. Needle bearing |
| 31. Front bearing | 32. Front drive shaft | 33. Rear bearing |
| 34. Spacer | 35. Drive chain | 36. Clutch drum |
| 37. Snap ring | 38. Clutch hub | 39. Snap ring |
| 40. Retaining plate | 41. Driven plate (10 sheet) | 42. Drive plate (10 sheet) |
| 43. Return spring assembly | 44. Press flange | 45. Thrust needle bearing |

OVERHAUL

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|------------------|-----------------------|----------------|
| 46. Snap ring | 47. Retaining pin | 48. L-H fork |
| 49. 2-4 fork | 50. Shift fork spring | 51. Fork guide |
| 52. Retainer pin | 53. Shift rod | |



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|--------------------------------|-----------------------------|--------------------------|
| 1. Dust cover | 2. Oil seal | 3. Rear case |
| 4. Air breather | 5. Seal ring | 6. Main oil pump cover |
| 7. Inner gear | 8. Outer gear | 9. Main oil pump housing |
| 10. D-ring | 11. D-ring | 12. Clutch piston |
| 13. Thrust needle bearing race | 14. Oil strainer | 15. O-ring |
| 16. Snap ring | 17. Control valve assembly | 18. Lip seal (7 pieces) |
| 19. Washer | 20. Filler plug | 21. Filler stud |
| 22. O-ring | 23. Oil filter | 24. ATP switch |
| 25. Neutral-4LO switch | 26. Oil pressure check plug | 27. Harness bracket |
| 28. Stem bleeder | 29. Harness bracket | 30. Center case |
| 31. Mainshaft rear bearing | 32. C-ring | 33. Washer holder |
| 34. Snap ring | 35. Sub oil pump housing | 36. Outer gear |
| 37. Inner gear | 38. Sub oil pump cover | 39. O-ring |
| 40. Transfer motor | 41. Connector bracket | |

REAR CASE

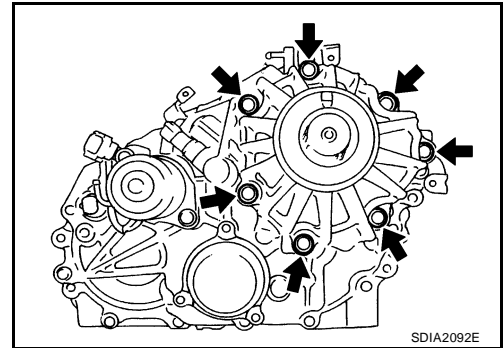
PF3:33102

EDS0018Y

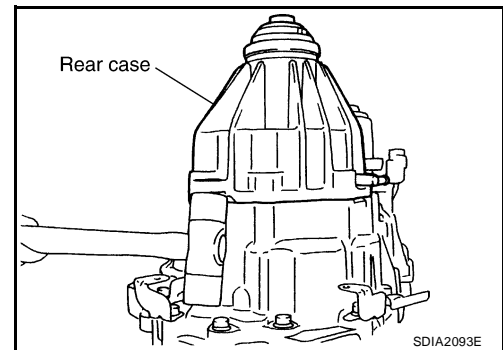
REAR CASE

Disassembly

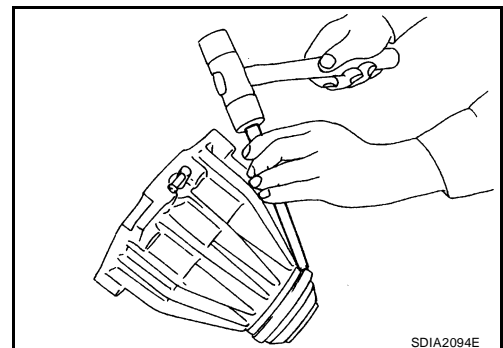
1. Remove rear case bolts.



2. Remove rear case from center case, using suitable tool.



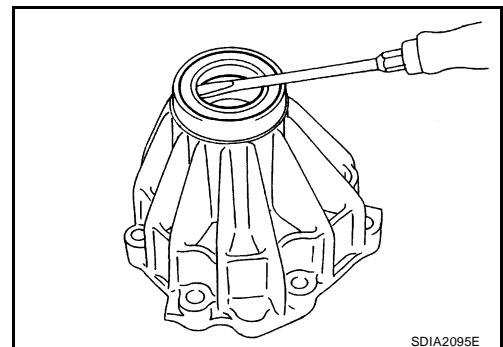
3. Remove the dust cover, using suitable tool.



4. Remove the oil seal, using suitable tool.

CAUTION:

Be careful not to damage the rear case.



5. Remove the air breather.

CENTER CASE

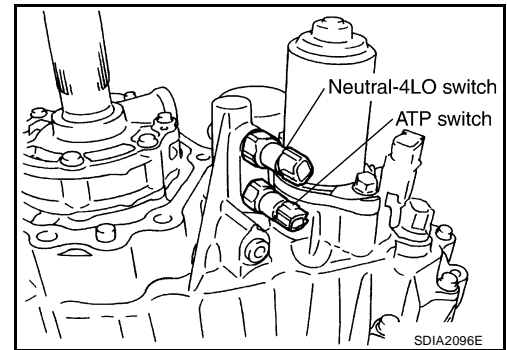
CENTER CASE

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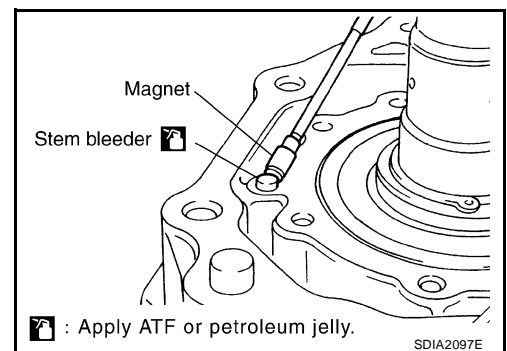
EDS0018Z

Disassembly

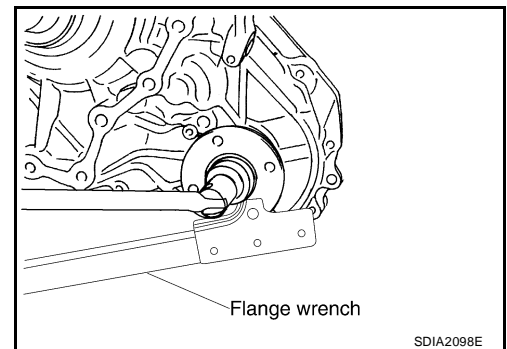
1. Remove the rear case. Refer to [TF-112, "Disassembly"](#) .
 - a. Remove neutral-4LO and ATP switches.
 - b. Remove main oil pump from the center case. Refer to [TF-122, "MAIN OIL PUMP"](#) .



2. Remove the stem bleeder from the bleed hole.



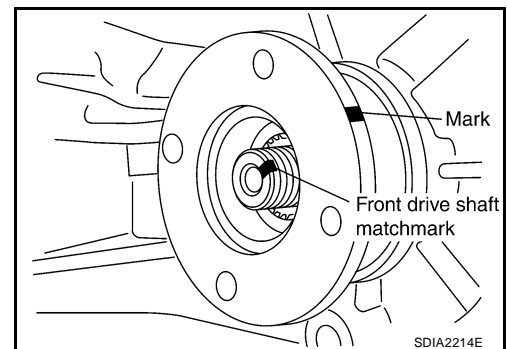
3. Remove self-lock nut from companion flange.



4. Put a matchmark on top of front drive shaft thread. The matchmark should be in line with the mark on the companion flange.

CAUTION:

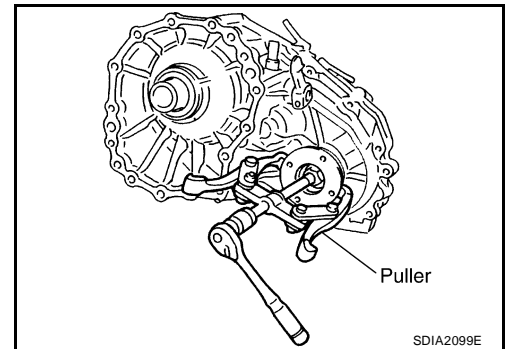
Always match to the top of the front drive shaft thread using paint.



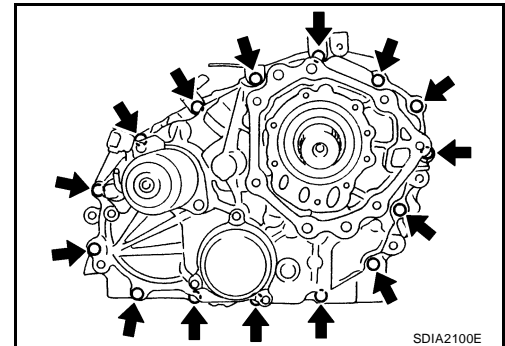
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CENTER CASE

5. Remove companion flange, using suitable tool.

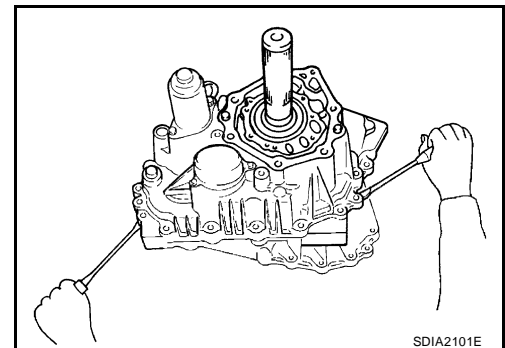


6. Remove the center case bolts.

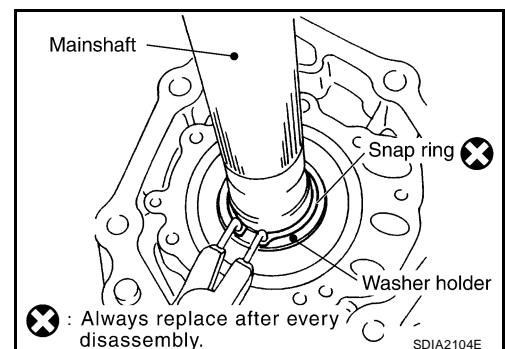


7. Remove harness bracket.
8. Remove filler plug and washer.
9. Separate center case from front case, using suitable tool, then remove center case by prying it up.

CAUTION:
Be careful not to damage the mating surface.

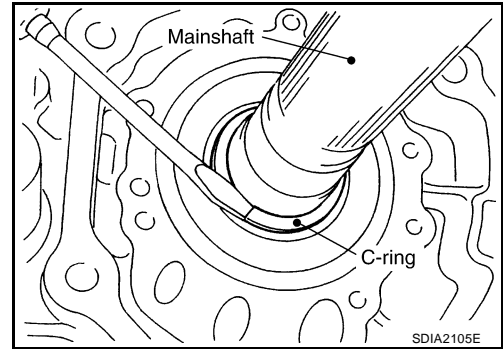


10. Remove snap ring and washer holder from the mainshaft.



CENTER CASE

11. Remove C-rings from mainshaft bearing, using suitable tool.

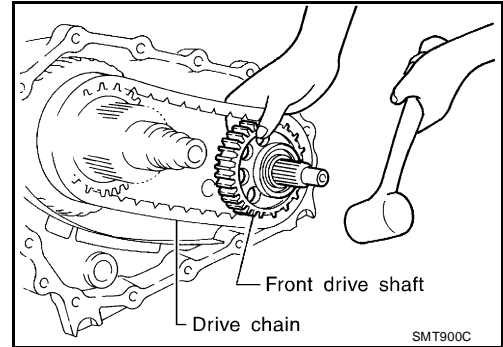


FRONT DRIVE SHAFT AND DRIVE CHAIN

1. With front drive shaft held by one hand as shown, remove using a suitable tool, remove front drive shaft with drive chain.

CAUTION:

Do not tap drive chain with a plastic hammer.

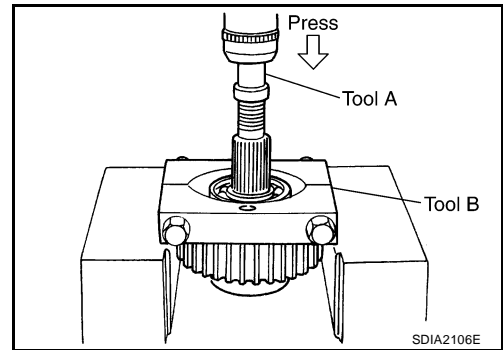


2. Remove the front drive shaft front bearing using Tool.

Tool number

A : ST33052000 (—)

B : ST30031000 (—)

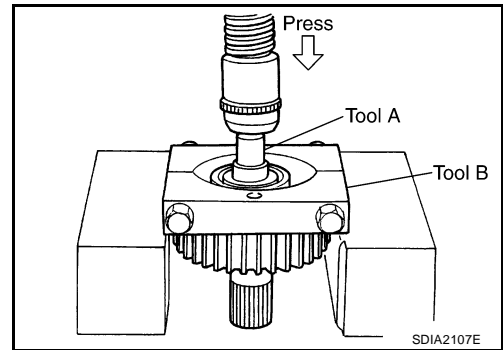


3. Remove the front drive shaft rear bearing using Tool.

Tool number

A : ST33052000 (—)

B : ST30031000 (—)



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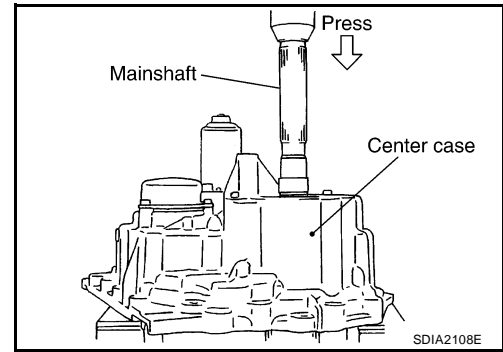
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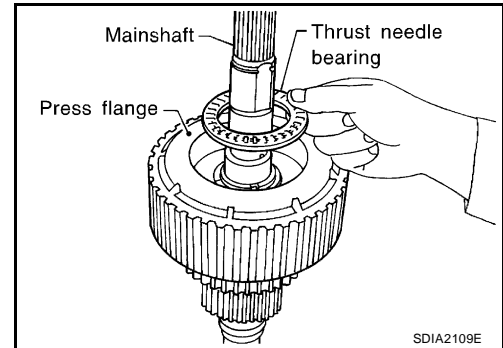
CENTER CASE

MAINSHAFT AND CLUTCH DRUM

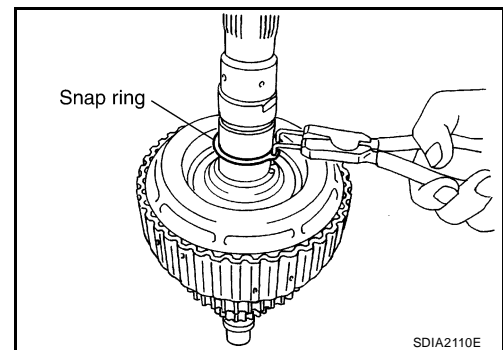
1. Set center case on press stand. Remove mainshaft from center case.



2. Remove thrust needle bearing from press flange.



3. Remove snap ring from mainshaft, using suitable tool.



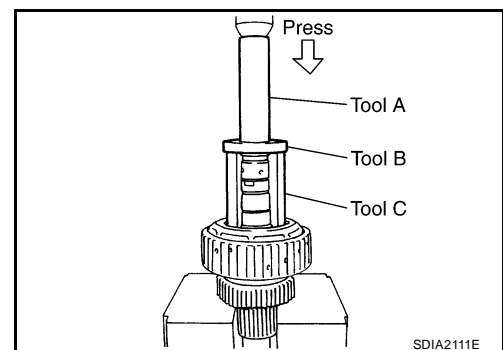
4. Press flange as shown, using Tool. Press drift until snap ring is out of place.

Tool number

A : ST22452000 (J-34335)

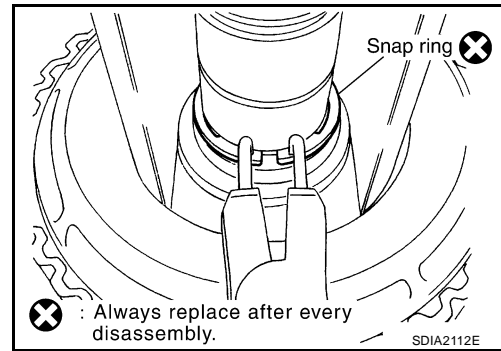
B : ST30911000 (—)

C : KV31103300 (—)

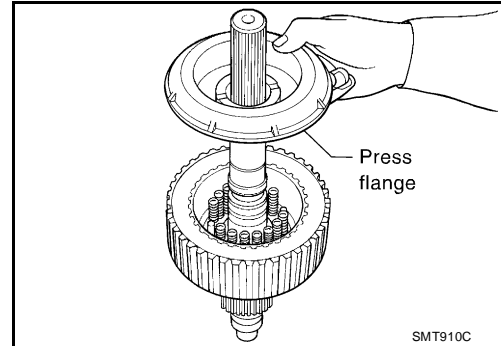


CENTER CASE

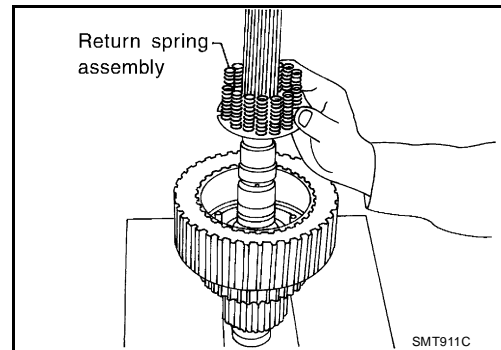
5. Remove snap ring from mainshaft, using suitable tool.



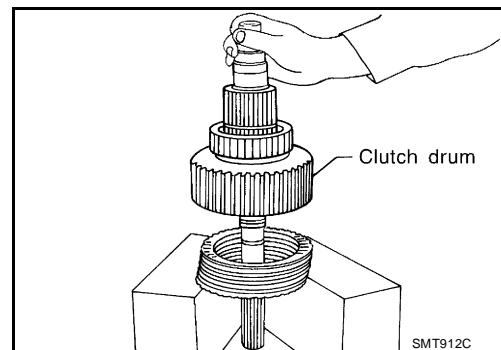
6. Remove press flange from mainshaft.



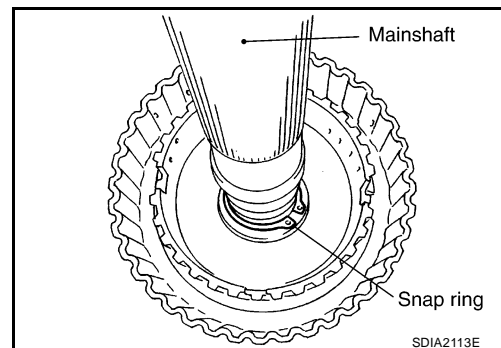
7. Remove return spring assembly from clutch hub.



8. Remove each plate from clutch drum.



9. Remove snap ring from mainshaft.

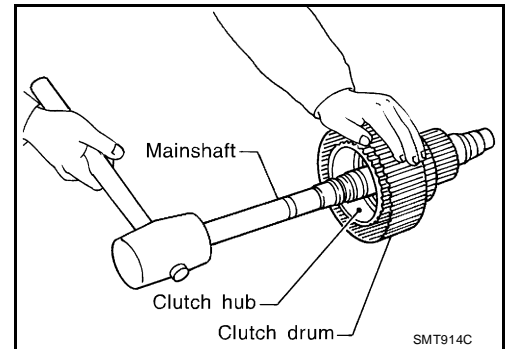


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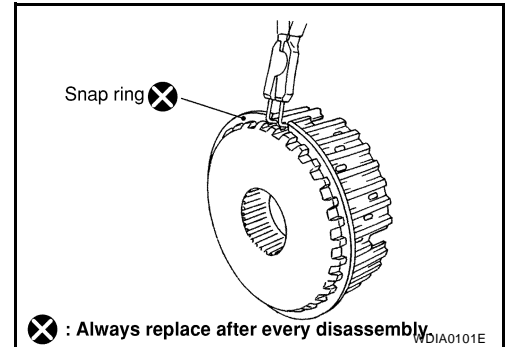
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CENTER CASE

10. Tap mainshaft, using suitable tool to remove it from clutch drum and clutch hub.
11. Remove needle bearing and spacer from the mainshaft.

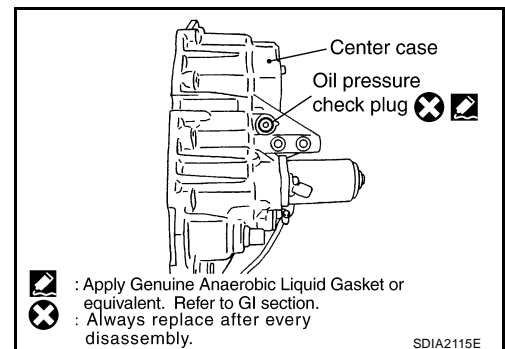


12. Remove the snap ring from the clutch hub.

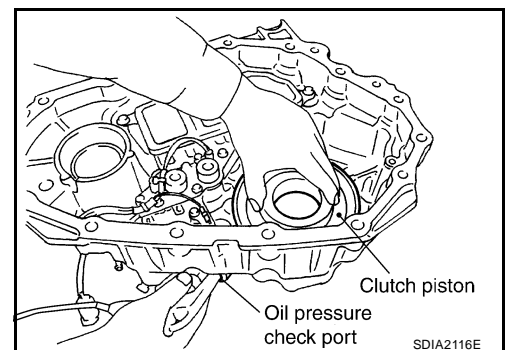


CLUTCH PISTON

1. Remove oil pressure check plug from oil pressure check port.

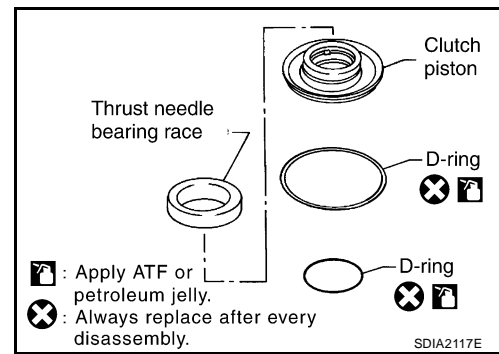


2. Apply air gradually from oil pressure check port, and remove clutch piston from center case.



CENTER CASE

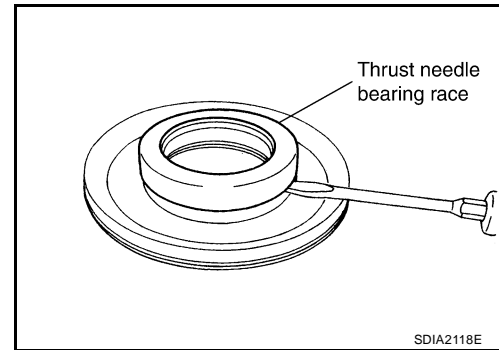
3. Remove the two D-rings from clutch piston.



4. Remove thrust needle bearing race from clutch piston, using suitable tool by hooking a edge into 3 notches of thrust needle bearing race.

CAUTION:

Be careful not to damage the clutch piston.

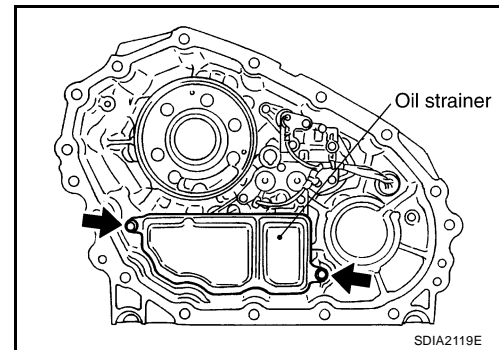


CONTROL VALVE

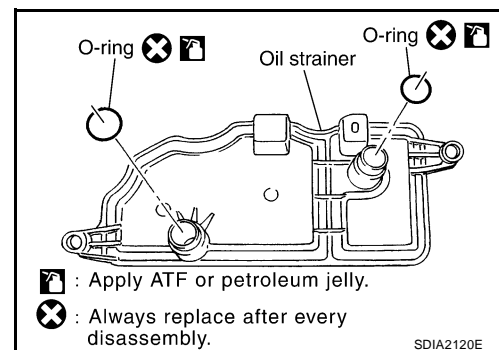
CAUTION:

- Do not reuse any part that has been dropped or damaged.
- Make sure valve is assembled in the proper direction.
- Do not use a magnet because residual magnetism stays during disassembly.

1. Remove two bolts, and remove oil strainer.



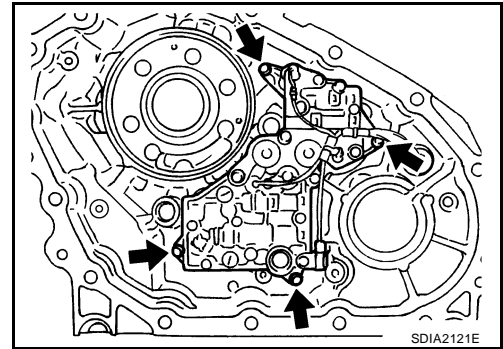
2. Remove two O-rings from oil strainer.



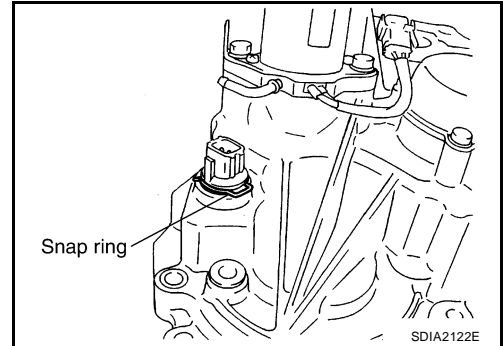
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CENTER CASE

3. Remove control valve assembly bolts.

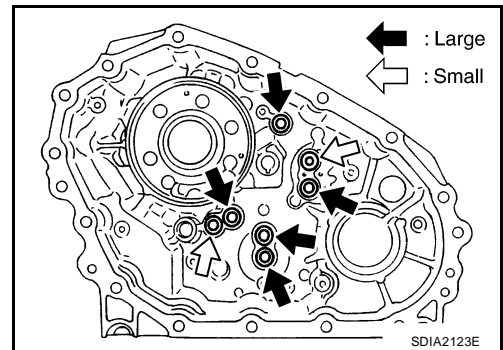


4. Remove snap ring. Then push connector assembly into center case to remove control valve assembly.

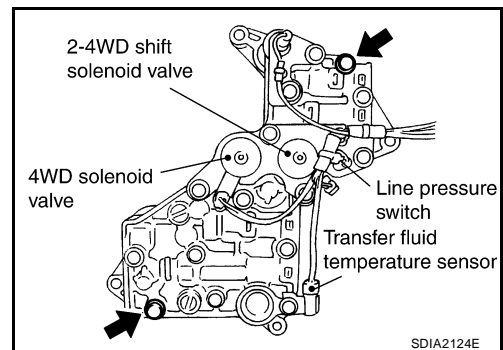


5. Remove lip seals from center case.

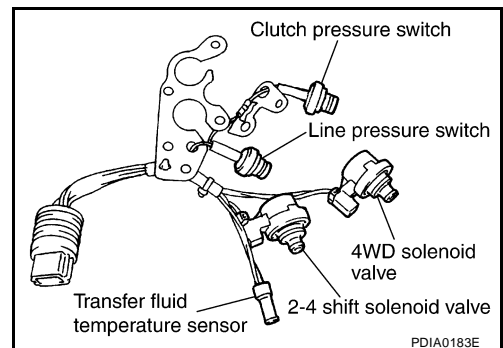
CAUTION:
There are two kinds of lip seals (lip seal of large inner diameter: 5 pieces, lip seal of small inner diameter: 2 pieces). Confirm the position before disassembly.



6. Remove all bolts except for the two as shown.



7. Remove 4WD solenoid valve, clutch pressure switch, 2-4WD shift solenoid valve, line pressure switch, and transfer fluid temperature sensor from control valve assembly.

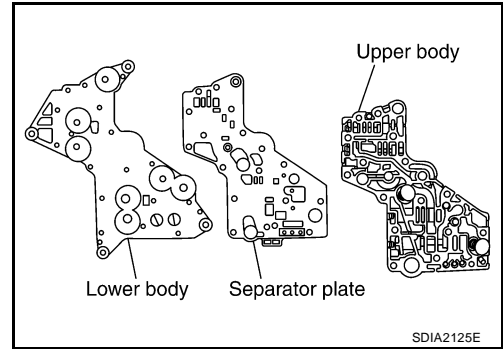


CENTER CASE

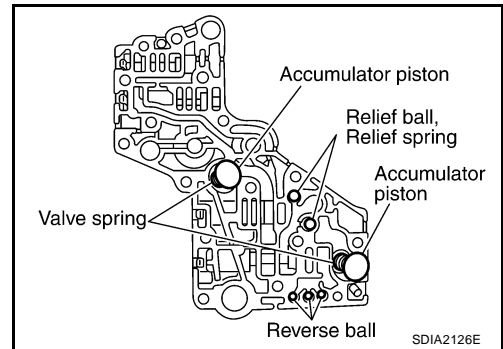
- Remove O-rings from each solenoid valve, switch and terminal body.
- Place control valve with lower body facing up, remove two mounting bolts, and then remove lower body and separator plate from upper body.

CAUTION:

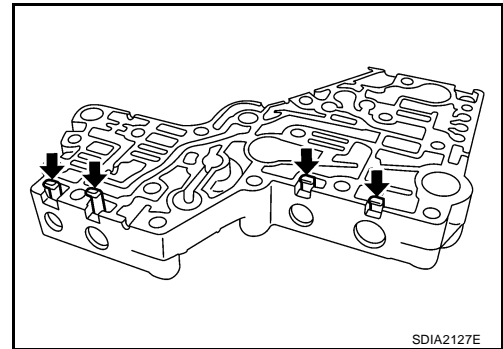
Be careful not to drop relief balls. Detach lower body carefully.



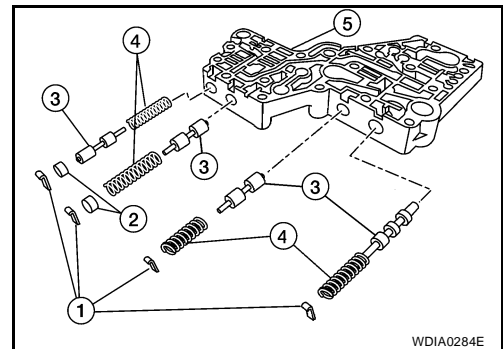
- Make sure reverse balls, relief balls and relief springs, accumulator pistons and valve springs are securely installed as shown, and remove them.



- Remove retainer plates.



- Remove each plug (2), control valve (3) and spring (4) from the upper body (5).



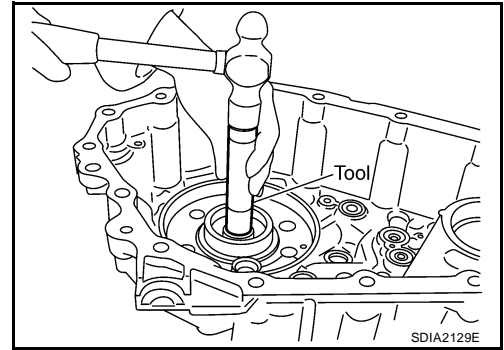
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CENTER CASE

MAINSHAFT REAR BEARING

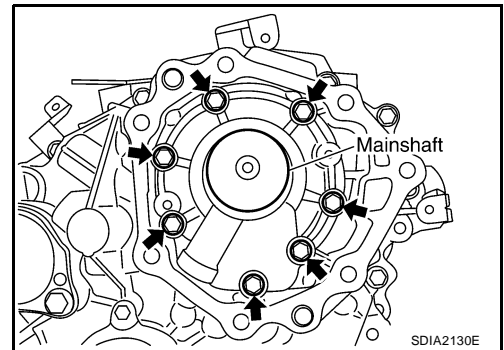
1. Remove mainshaft rear bearing from center case, using Tool

Tool number : KV38100300 (J-25523)

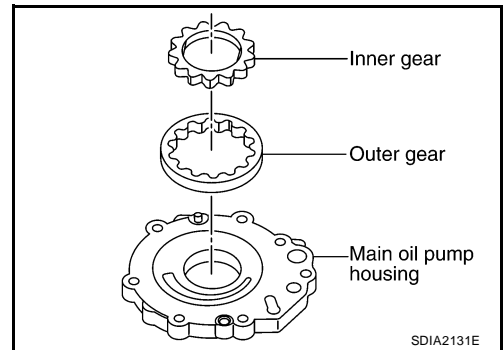


MAIN OIL PUMP

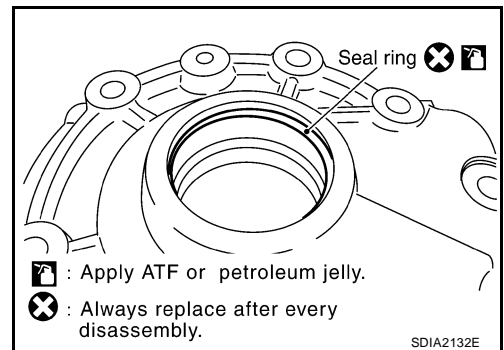
1. Remove bolts as shown to detach main oil pump.



2. Remove outer gear, inner gear, and main oil pump cover from main oil pump housing.



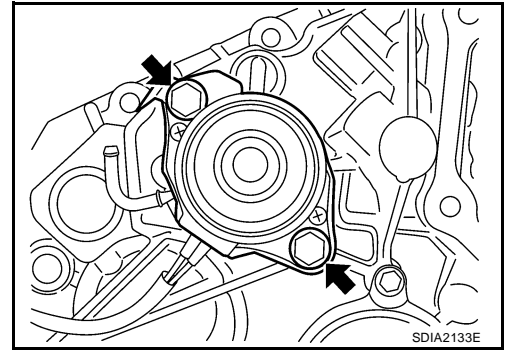
3. Remove seal ring from the main oil pump cover.



CENTER CASE

SUB OIL PUMP

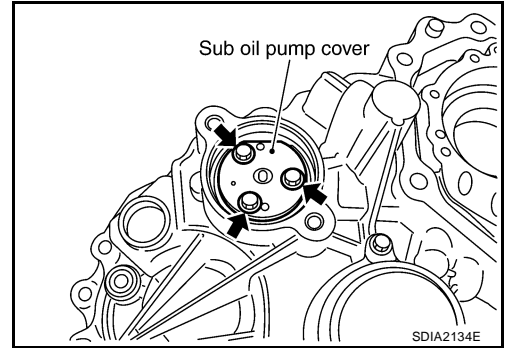
1. Remove bolts to detach transfer motor from center case. Then remove O-ring from the transfer motor.



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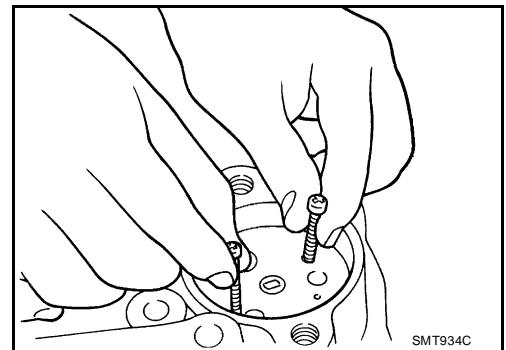
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2. Remove sub oil pump cover bolts.



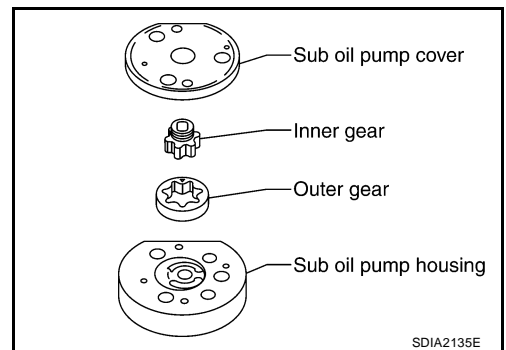
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3. Thread two bolts (M4 x 0.8) into the holes of sub oil pump cover as shown, and pull out to remove sub oil pump assembly.



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4. Remove sub oil pump cover, outer gear, inner gear, and O-ring from sub oil pump housing.

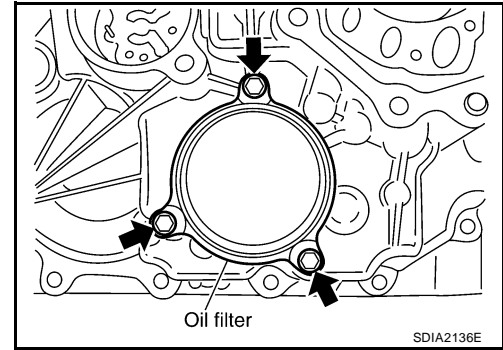


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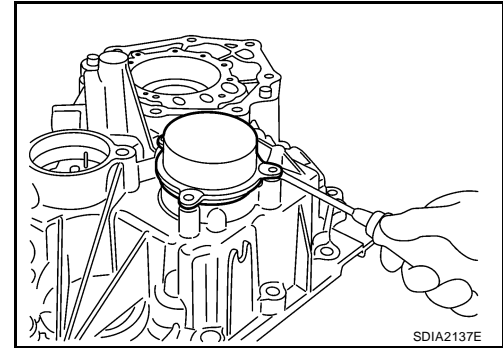
CENTER CASE

OIL FILTER

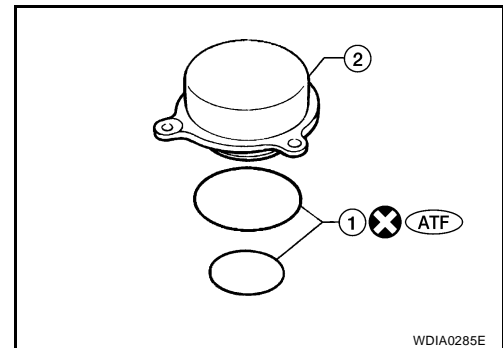
1. Remove bolts for oil filter.



2. Remove the oil filter using suitable tool as shown.

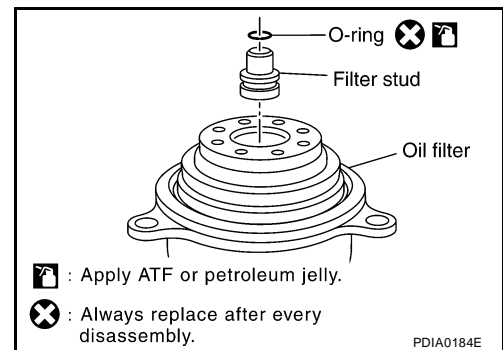


3. Remove the O-rings (1) from the oil filter (2).



4. Remove the filter stud from oil filter.

5. Remove O-ring from the filter stud.



FRONT CASE

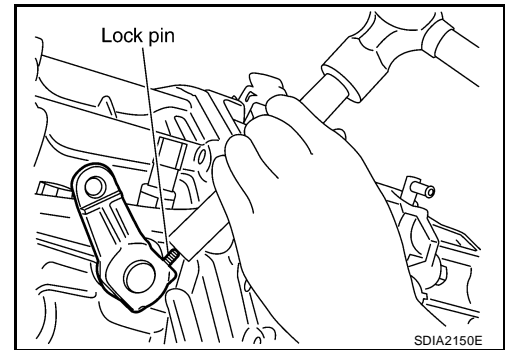
FRONT CASE

PFP:33107

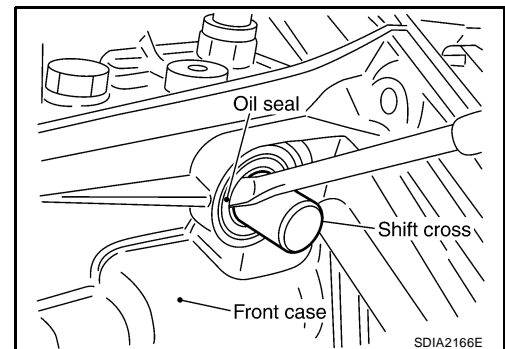
Disassembly

EDS00190

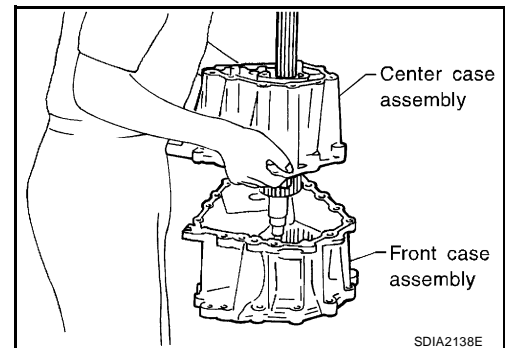
1. Remove rear case from center case. Refer to [TF-112. "Disassembly"](#) .
2. Remove the lock pin nut from the lock pin, using suitable tool.
- a. Remove the lock pin.



3. Remove the oil seal from the front case, using suitable tool.
CAUTION:
Be careful not to damage the front case and shift cross.

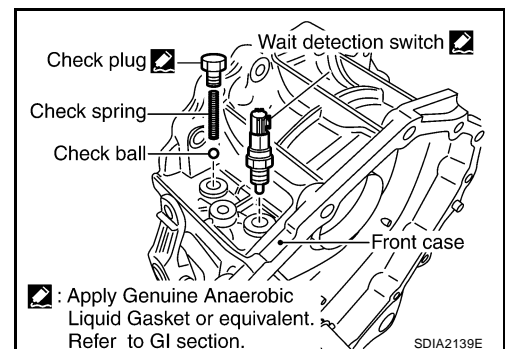


4. Remove front case from center case.



SHIFT ROD COMPONENTS

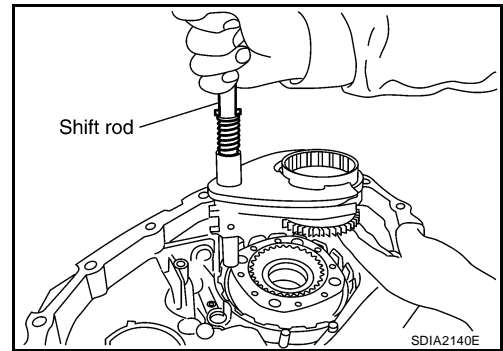
1. Remove check plug, then check spring and check ball.
- a. Remove wait detection switch.



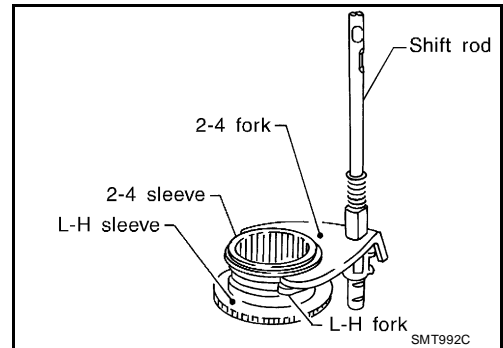
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FRONT CASE

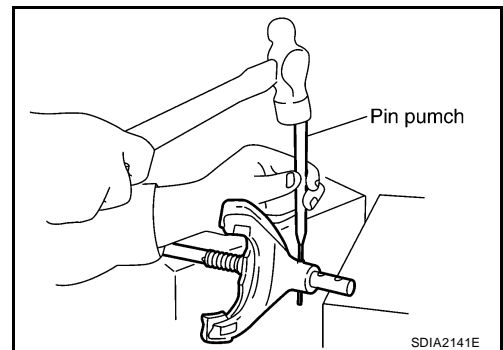
2. Remove shift rod components together with 2-4 sleeve and L-H sleeve.



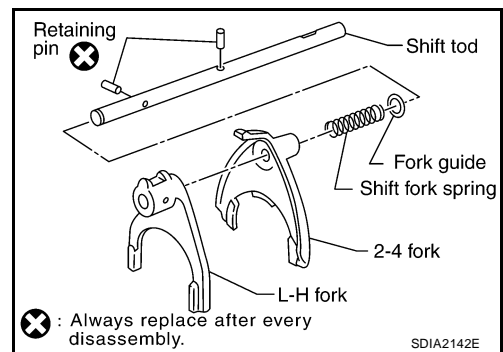
3. Remove the shift cross from the front case.
4. Remove 2-4 sleeve and L-H sleeve from 2-4 fork and L-H fork respectively.



5. Drive out retaining pin from shift rod, using suitable pin punch.



6. Remove L-H fork, 2-4 fork, shift fork spring and fork guide from shift rod.



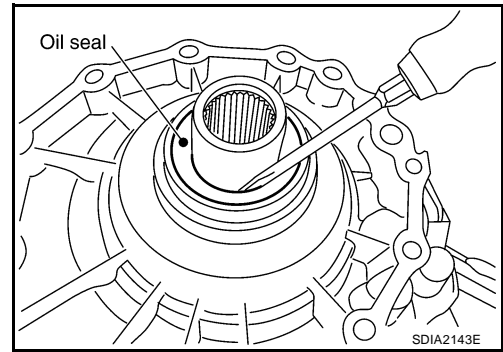
FRONT CASE

PLANETARY CARRIER, SUN GEAR AND INTERNAL GEAR

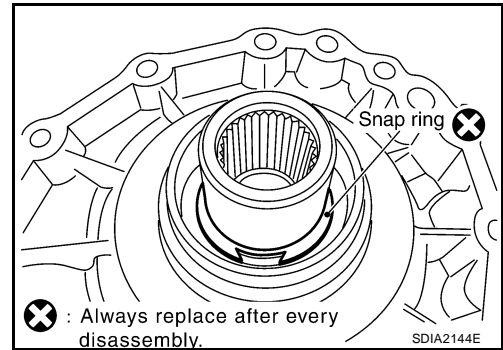
1. Remove oil seal from the front case, using suitable tool.

CAUTION:

Be careful not to damage the front case and sun gear.

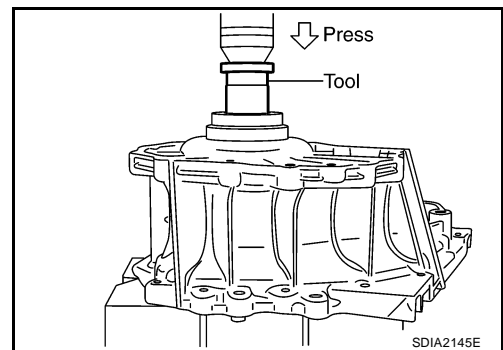


2. Remove the snap ring from the sun gear.

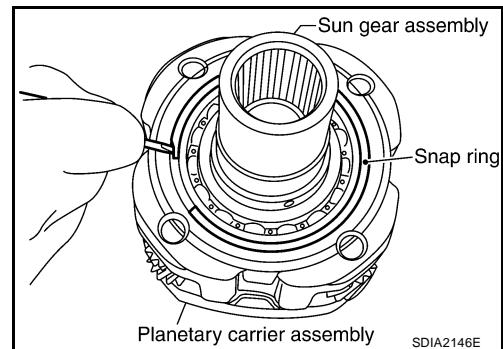


3. Remove the sun gear assembly from the front case, using Tool.

Tool number : ST35300000 (—)



4. Remove snap ring from the planetary carrier assembly, using suitable tool.



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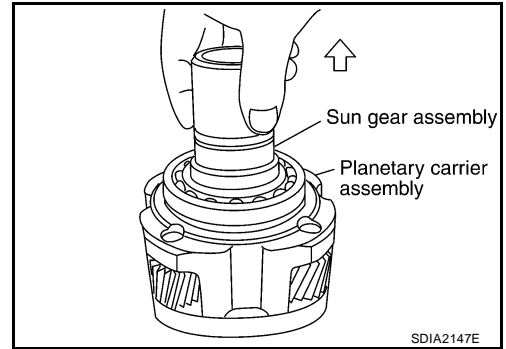
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FRONT CASE

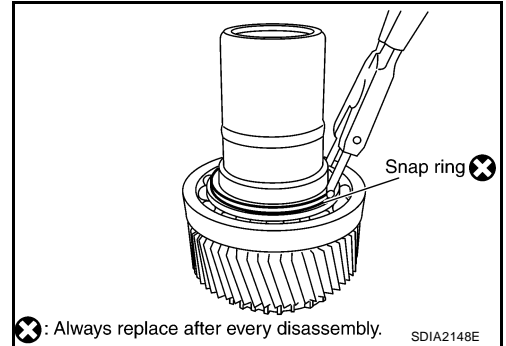
5. Remove the sun gear assembly from the planetary carrier assembly.



6. Remove the snap ring from the sun gear assembly, using suitable tool.

NOTE:

Do not reuse snap ring.

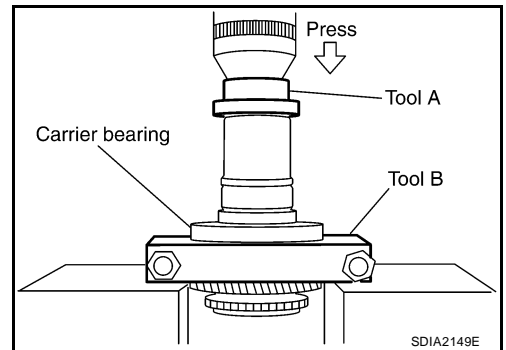


7. Remove the carrier bearing from the sun gear, using Tool.

Tool number

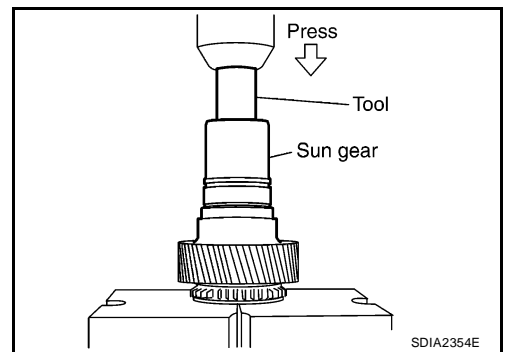
A : ST35300000 (—)

B : ST30021000 (—)



8. Remove the needle bearing from the sun gear, using Tool.

Tool number : ST33710000 (—)

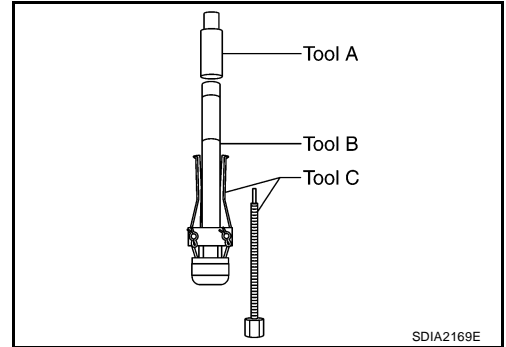
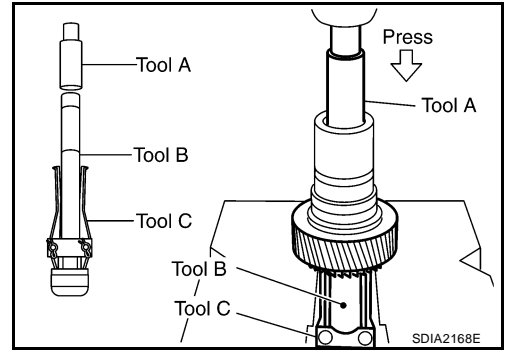


FRONT CASE

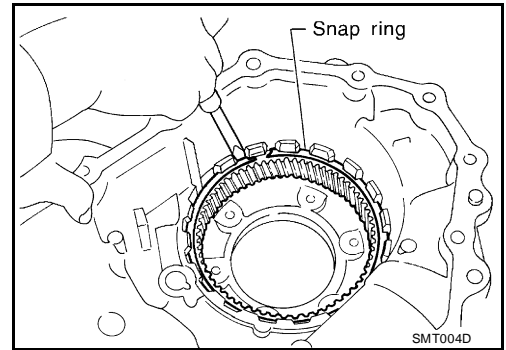
9. Remove the metal bushing from the sun gear, using suitable Tool.

Tool number

- A** : ST33710000 (—)
B : ST35325000 (—)
C : ST33290001 (J-34286)

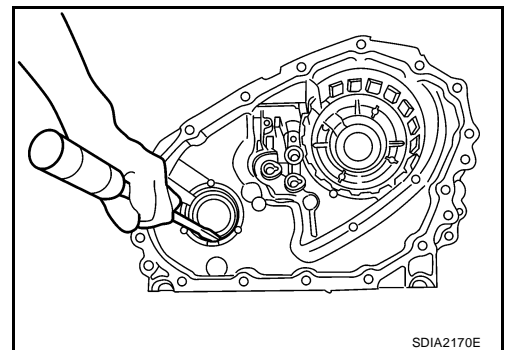


10. Remove snap ring, and remove internal gear.



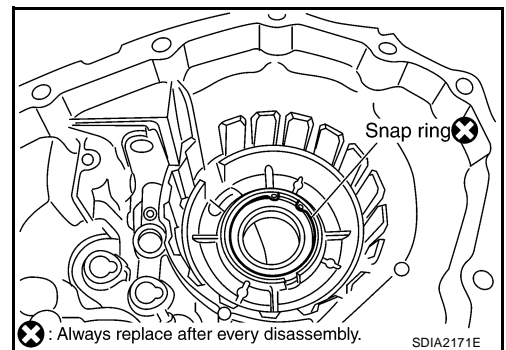
11. Remove front oil seal, using suitable tool.

CAUTION:
Be careful not to damage the front case.



12. Remove snap ring from the front case.

NOTE:
 Do not reuse snap ring.

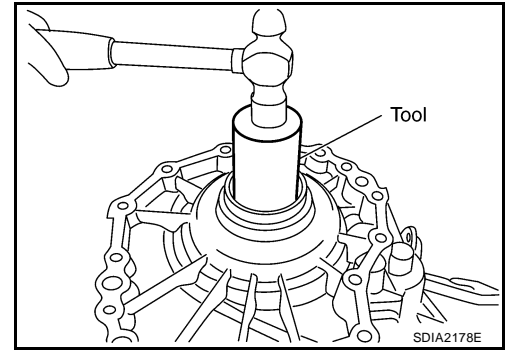


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FRONT CASE

13. Remove the mainshaft front bearing from the front case, using Tool.

Tool number : ST33200000 (J-26082)



FRONT CASE

FRONT CASE

PFP:33107

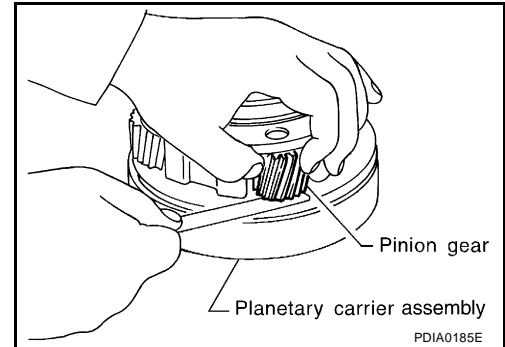
Inspection PLANETARY CARRIER

EDS00191

- Measure end play of each pinion gear, and make sure the measurement is within specification shown below. If out of specification, replace planetary carrier assembly with new one.

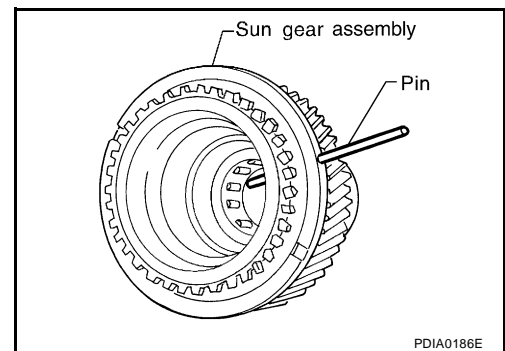
Pinion gear end play : 0.1 - 0.7 mm (0.004 - 0.028 in)

- Check working face of each gear, bearing and others for damage, burrs, partial wear, dents and other abnormality. If any is found, replace planetary carrier assembly with new one.



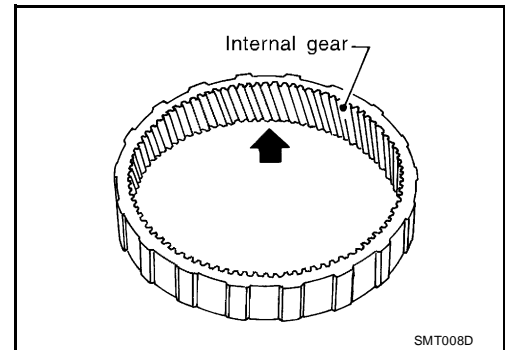
SUN GEAR

- Check if oil passage of sun gear assembly is clogged. For this, try to pass a 3.6 mm (0.142 in) dia. wire through oil passage as shown.
- Check sliding/contact surface of each gear, bearing and others for damage, burrs, partial wear, dents, and other abnormality. If any is found, replace sun gear assembly with new one.



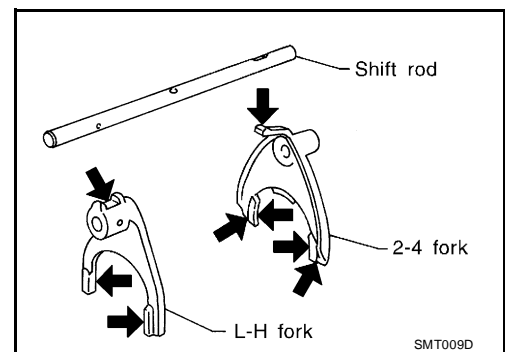
INTERNAL GEAR

- Check internal gear teeth for damage, partial wear, dents and other abnormality. If any is found, replace internal gear with new one.



SHIFT ROD COMPONENTS

- Check working face of shift rod and fork for wear, partial wear, bending and other abnormality. If any is found, replace with new one.

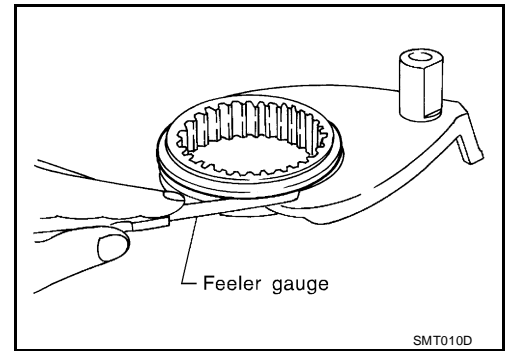


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FRONT CASE

- Measure clearance between shift fork and sleeve. If it is out of specification, replace it with new one.

Standard value : Less than 0.36 mm (0.0142 in)



CENTER CASE

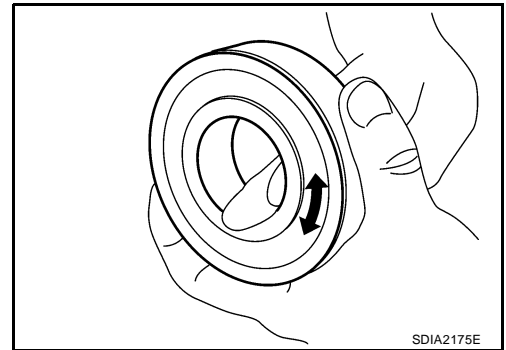
CENTER CASE

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Inspection BEARINGS

EDS00192

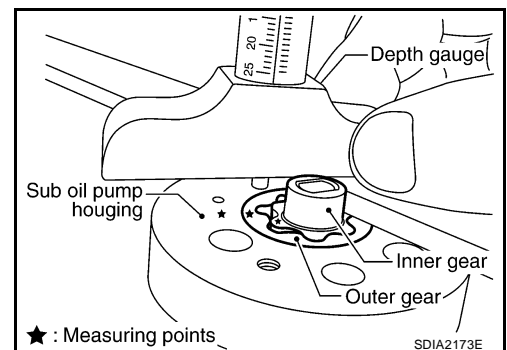
1. Make sure bearings roll freely and are free from noise, pitting and cracks.



SUB-OIL PUMP

1. Check inner and outer circumference, tooth face, and side-face of inner and outer gears for damage or abnormal wear.
2. Measure side clearance between sub oil pump housing edge and inner gear/outer gear.
3. Make sure side clearance is within specification. If the measurement is out of specification, replace inner and outer gears together with new ones as a set.

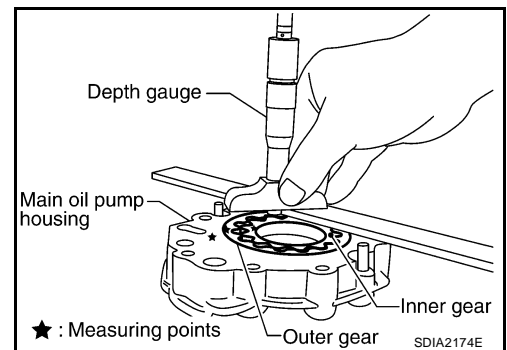
Specification : 0.015 - 0.035 mm (0.0006 - 0.0014 in)



MAIN OIL PUMP

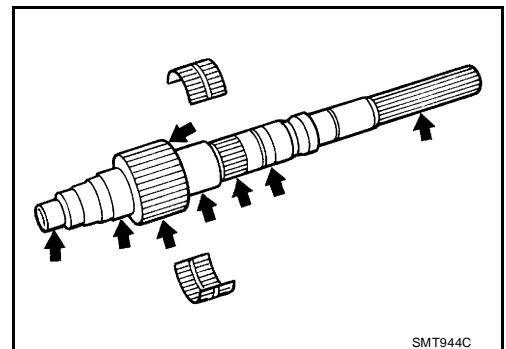
1. Check inner and outer circumference, tooth face, and side-face of inner and outer gears for damage or abnormal wear.
2. Measure side clearance between main oil pump housing edge and inner gear/outer gear.
3. Make sure side clearance is within specification. If the measurement is out of specification, replace inner and outer gears with new ones as a set.

Specification : 0.015 - 0.035 mm (0.0006 - 0.0014 in)



MAINSHAFT

- Check surfaces which contact sun gear, clutch drum, clutch hub, press flange, clutch piston, each bearing, etc. for damage, peel, partial wear, dents, bending, or other abnormal damage. If any is found, replace with new one.

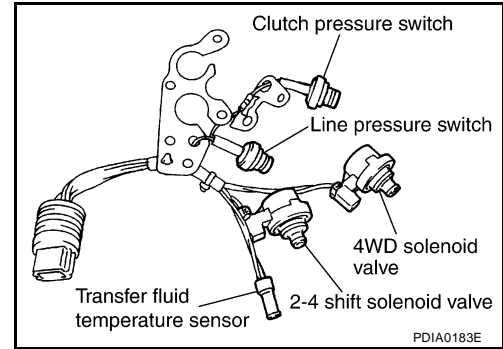


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CENTER CASE

CONTROL VALVE

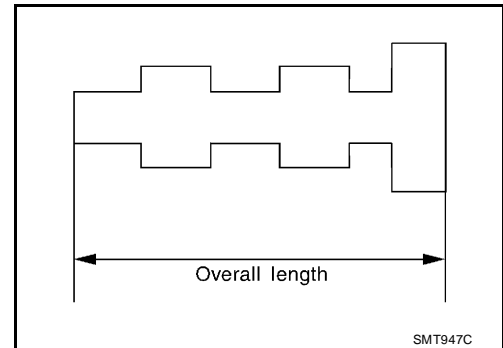
- Check resistance between terminals of 4WD solenoid valve, 2-4WD shift solenoid valve and transfer fluid temperature sensor. Refer to [TF-95, "Component Inspection"](#) .



- Check sliding faces of control valves and plugs for abnormality. If any is found, replace the control valve assembly with new one. Refer to [TF-154, "Control Valve"](#) .

CAUTION:

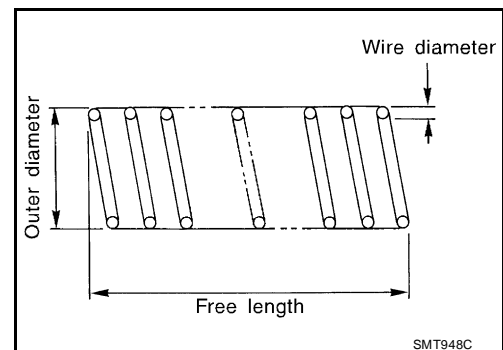
Replace control valve body together with clutch return spring as a set.



- Check each control valve spring for damage or distortion, and also check its free length, outer diameter and wire diameter. If any damage or fatigue is found, replace control valve body with new one. Refer to [TF-154, "Control Valve"](#) .

CAUTION:

Replace control valve body together with clutch return spring as a set.

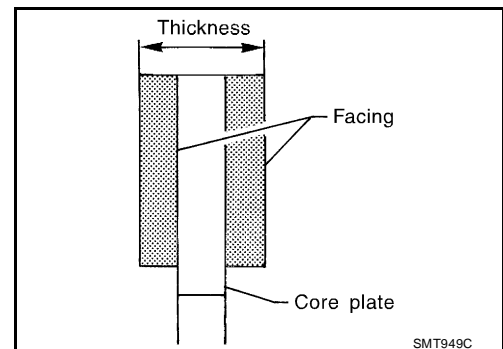


CLUTCH

- Check drive plate facings and driven plate for damage, cracks or other abnormality. If any abnormalities are found, replace with new one.
- Check the thickness of drive plate facings and driven plate. Refer to [TF-153, "CLUTCH"](#) .

CAUTION:

- Measure facing thickness at 3 points to take an average.
- Check all the drive and driven plates.
- Check return spring for damage or deformation.
- Do not remove spring from the plate

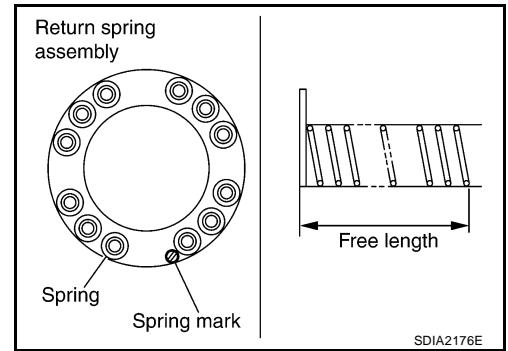


CENTER CASE

- Check stamped mark shown in the figure. Then, check that free length, (include thickness of plate) are within specifications. If any abnormality is found, replace with new return spring assembly of the same stamped number.

NOTE:

Specifications, refer to [TF-153, "CLUTCH"](#) .



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FRONT CASE

FRONT CASE

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Assembly PLANETARY CARRIER, SUN GEAR AND INTERNAL GEAR

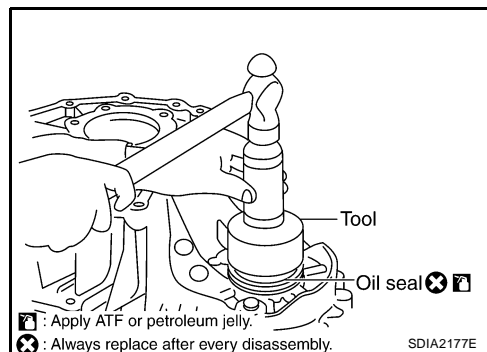
EDS00193

1. Install new oil seal until it is seated flush with end face of the front case, using Tool.

Tool number : KV38100500 (—)

NOTE:

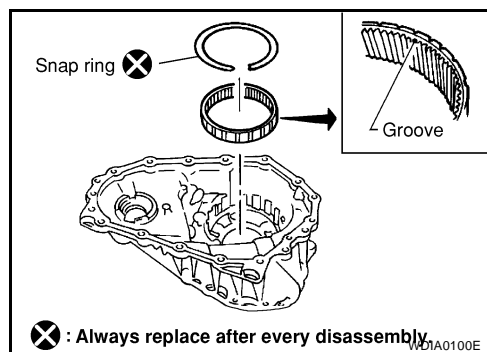
- Before installing, apply ATF or petroleum jelly to new oil seal lip.
- Do not reuse oil seal.



2. Install internal gear with its groove facing snap ring into front case. Then secure it with new snap ring.

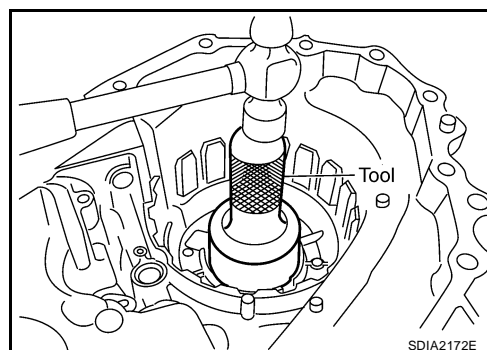
NOTE:

Do not reuse snap ring.



3. Set mainshaft front bearing into front case and install, using Tool.

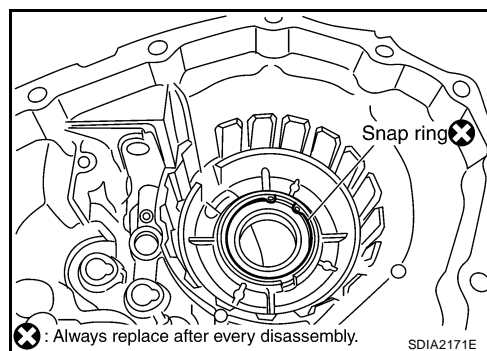
Tool number : ST30720000 (J-25405)



4. Install new snap ring into front case.

NOTE:

Do not reuse snap ring.



5. Install shift cross to front case.

FRONT CASE

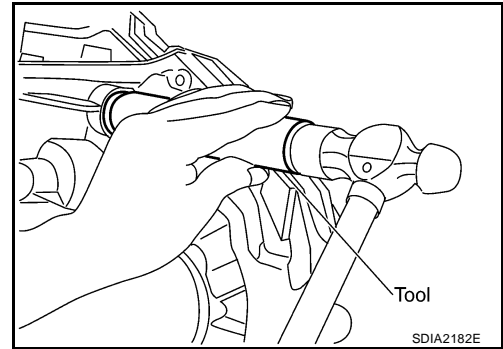
6. Install oil new seal in front case, using Tool.

Tool number : ST22360002 (J25679-01)

NOTE:

- Before installing, apply ATF or petroleum jelly to seal lip.
- Do not reuse oil seal.

7. Install the shift lever to the shift cross, and lock pin and tighten to specified torque. Refer to [TF-110, "Transfer Components"](#) .

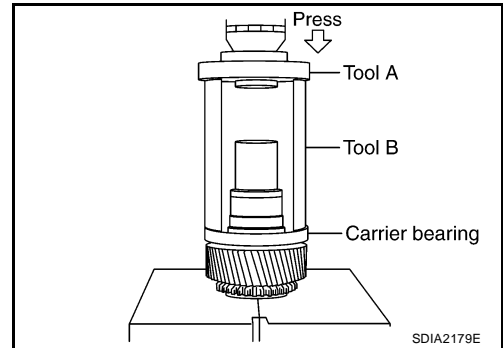


8. Install the carrier bearing to the sun gear assembly, using Tool.

Tool number

A : ST30911000 (—)

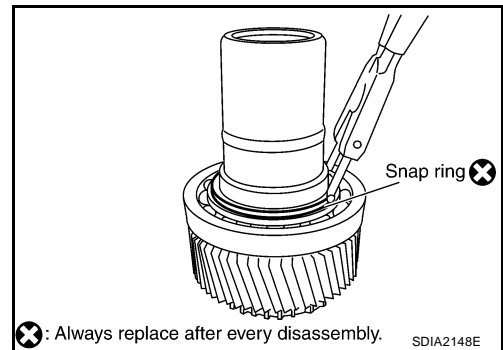
B : KV31103300 (—)



9. Install new snap ring to sun gear assembly, using suitable tool.

NOTE:

Do not reuse snap ring.



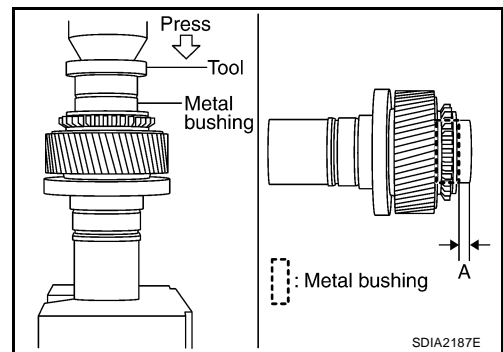
10. Apply ATF to the circumference of the new metal busing prior to installing it to the sun gear assembly, using Tool.

Dimension A : 7.7 - 8.3 mm (0.303 - 0.327 in)

Tool number : ST35300000 (—)

NOTE:

Do not reuse old metal busing.



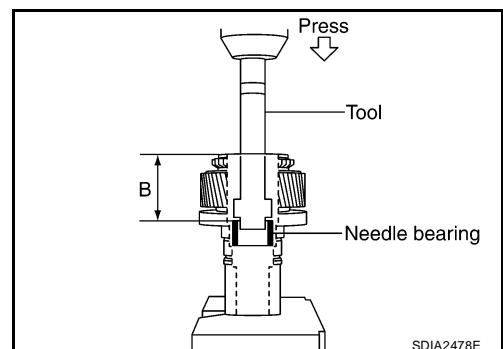
11. Install the needle bearing to the sun gear assembly, using Tool.

Dimension B : 62.5 - 63.1 mm (2.461 - 2.484 in)

Tool number : ST33220000 (—)

NOTE:

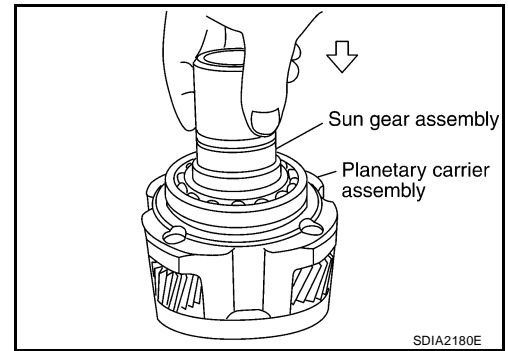
- Before installing, apply ATF to needle bearing.
- Do not reuse old needle bearing.



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FRONT CASE

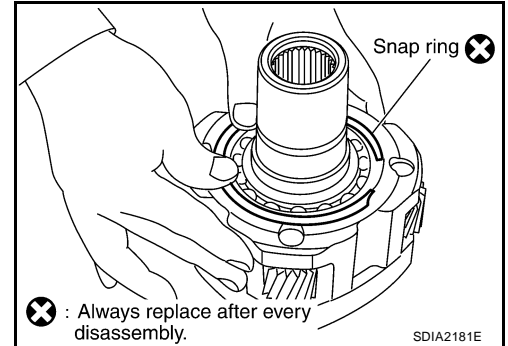
12. Install the sun gear assembly to the planetary carrier assembly.



13. Install new snap ring to planetary carrier assembly.

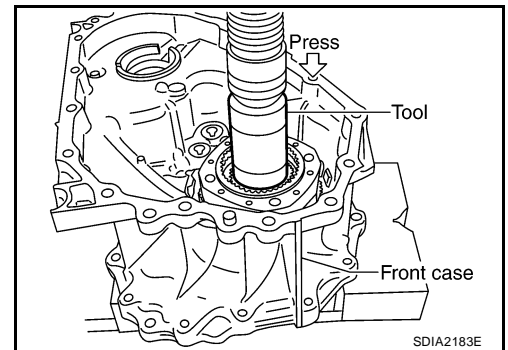
NOTE:

Do not reuse snap ring.



14. Install front case to planetary carrier assembly, using Tool.

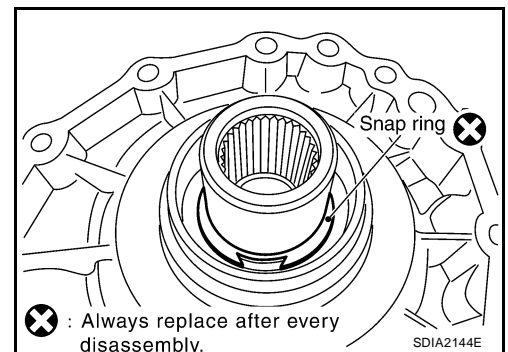
Tool number : ST33200000 (J-26082)



15. Install new snap ring to the sun gear assembly.

NOTE:

Do not reuse snap ring.



16. Apply ATF or petroleum jelly to the circumference of the new oil seal, and install it to the front case using Tool.

NOTE:

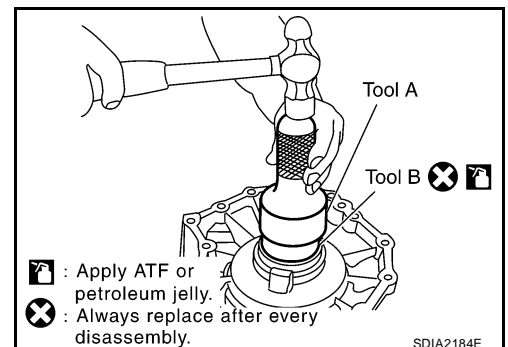
Do not reuse oil seal.

Tool number

A : ST30720000 (J-25405)

B : ST33200000 (J-26082)

Dimension : 4.0 - 4.6 mm (0.157 - 0.181 mm)



FRONT CASE

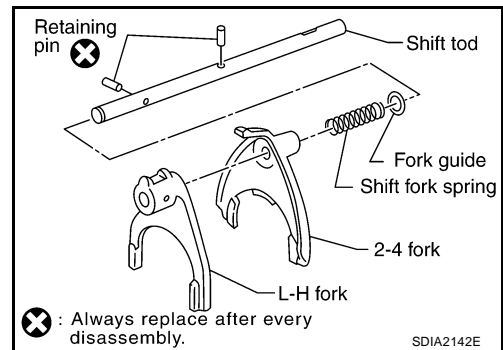
17. Install shift rod assembly to front case assembly. Refer to [TF-139, "SHIFT ROD ASSEMBLY"](#) .

SHIFT ROD ASSEMBLY

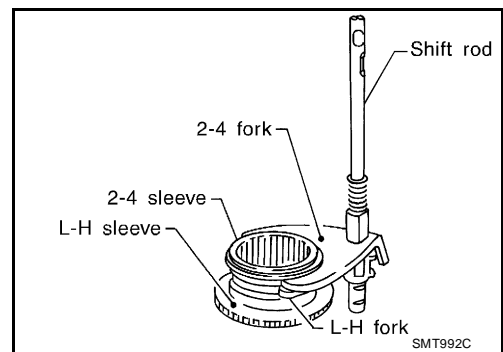
1. Install fork guide, shift fork spring, 2-4 fork, and L-H fork to shift rod, and secure them with new retaining pins.

NOTE:

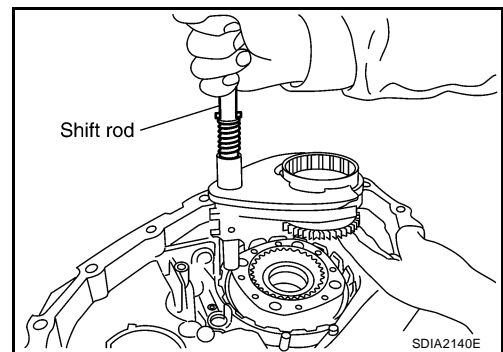
Do not reuse retaining pins.



2. Install 2-4 sleeve and L-H sleeve to each fork.



3. While aligning L-H sleeve with planetary carrier, install shift rod assembly to front case.

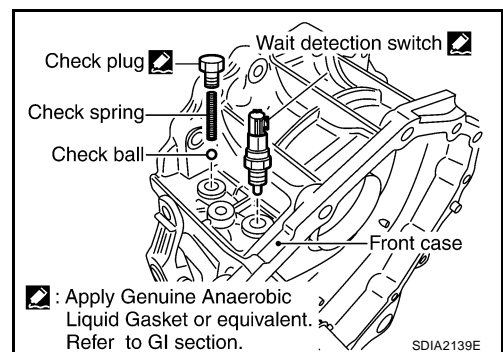


4. Remove all the liquid gasket on check plug and front case, and install check ball and check spring to front case. Apply specified sealant or equivalent, to check plug. Install it to front case, and tighten to specified torque. Refer to [GI-45, "Recommended Chemical Products and Sealants"](#) .

Front case check plug : 22 N·m (2.2 kg·m, 16 ft·lb)

5. Remove all the liquid gasket on the switch fitting and inner side of front case, and with wait detection switch threaded one pitch into the hole. Apply specified sealant or equivalent, to the thread. Install it, and tighten to specified torque. Refer to [GI-45, "Recommended Chemical Products and Sealants"](#) .

Wait detection switch : 28 N·m (2.9 kg·m, 21 ft·lb)



NOTE:

Wait detection switch harness connector is black.

6. Install center case assembly to front case assembly. Refer to [TF-149, "Final Assembly"](#) .

7. Install rear case assembly to center case. Refer to [TF-149, "Final Assembly"](#) .

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CENTER CASE

CENTER CASE

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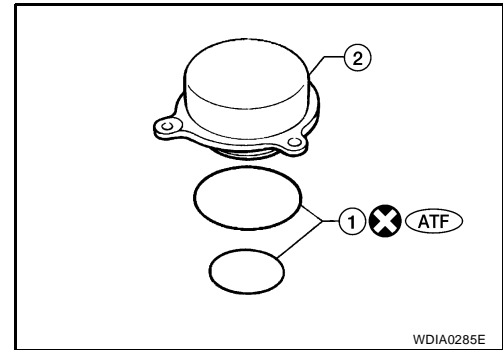
EDS00194

Assembly OIL FILTER

1. Apply ATF to the two new O-rings (1), and install them on the oil filter (2).

NOTE:

Do not reuse O-rings.

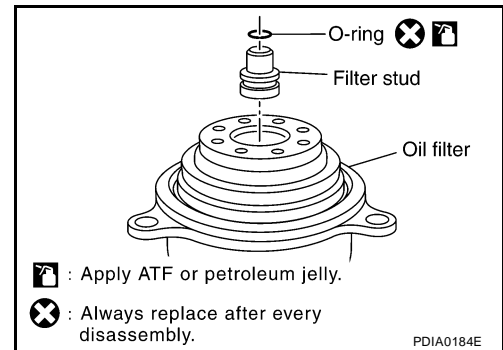


2. Apply ATF or petroleum jelly to the new O-ring, and install them on filter stud.

NOTE:

Do not reuse O-rings.

3. Install filter stud to oil filter.



4. Install oil filter to center case and tighten bolts to specifications.

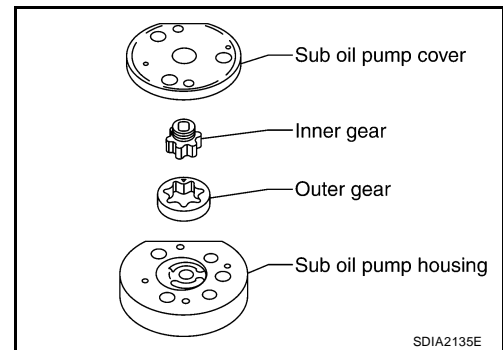
Oil filter bolts : 7.9 N·m (0.81 kg·m, 70 in·lb)

CAUTION:

Do not knock oil filter with a tool such as a hammer.

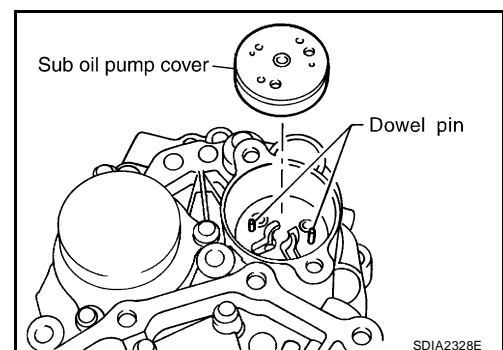
SUB OIL PUMP

1. Install outer gear and inner gear in to sub oil pump housing, and measure side clearance. Refer to [TF-133, "SUB-OIL PUMP"](#) .



2. Align dowel pin hole and mounting bolt hole of sub oil pump assembly with center case. Install sub oil pump cover then tighten bolts.

Sub oil pump bolts : 7.9 N·m (0.81 kg·m, 70 in·lb)



CENTER CASE

3. Apply ATF or petroleum jelly to new O-ring and install it to transfer motor.

NOTE:

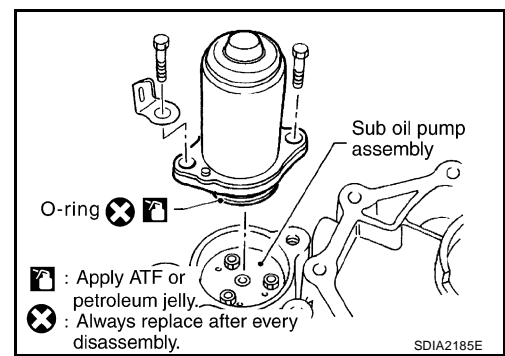
Do not reuse O-rings.

4. Fit double-flat end of transfer motor shaft into slot of sub-oil pump assembly. Then tighten bolts.

Transfer motor bolts : 45 N-m (4.6 kg-m, 33 ft-lb)

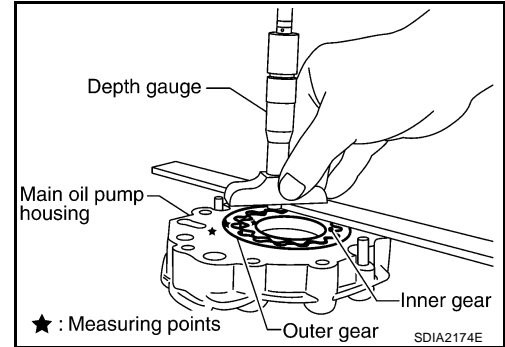
CAUTION:

Be sure to install connector bracket.



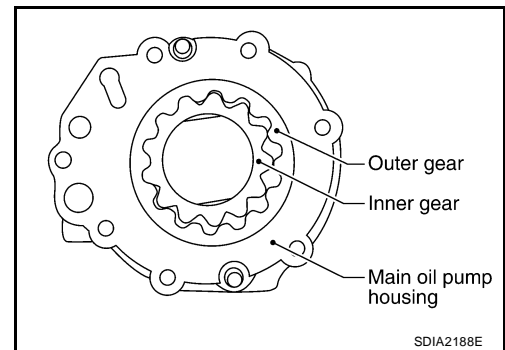
MAIN OIL PUMP

1. Install inner gear and outer gear in the main oil pump housing. Then, measure the side clearance. Refer to [TF-133, "MAIN OIL PUMP"](#).



2. Install main oil pump housing, outer gear and inner gear to center case.

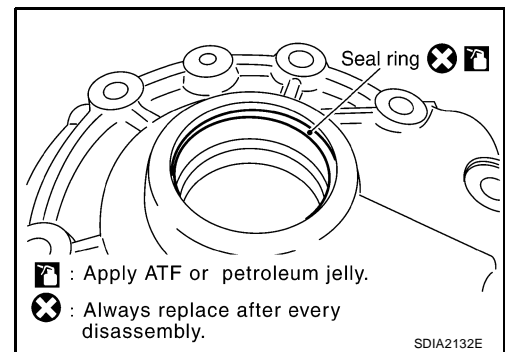
Main oil pump bolts : 7.8 N-m (0.8 kg-m, 69 in-lb)



3. Apply ATF or petroleum jelly to the new seal ring and install it to main oil pump cover.

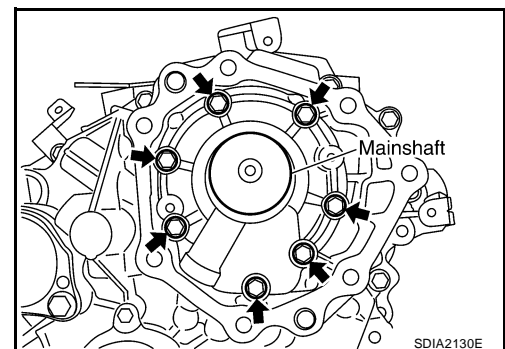
NOTE:

Do not reuse seal ring.



4. Install main oil pump cover to the center case, and install bolts.

Main oil pump cover bolts : 7.8 N-m (0.8 kg-m, 69 in-lb)



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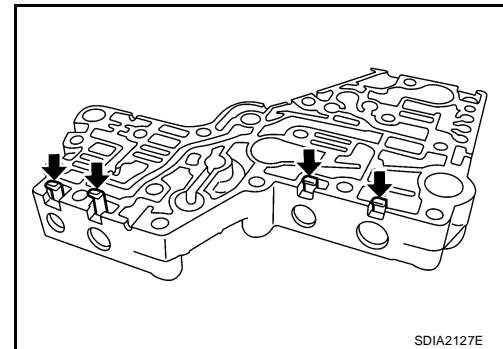
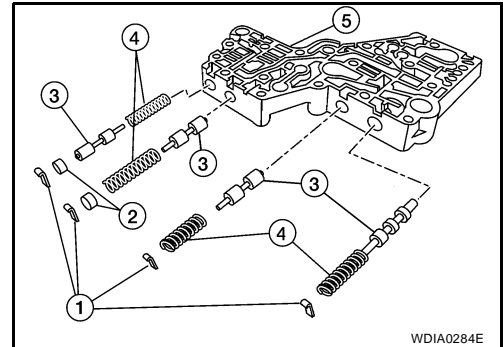
CENTER CASE

CONTROL VALVE

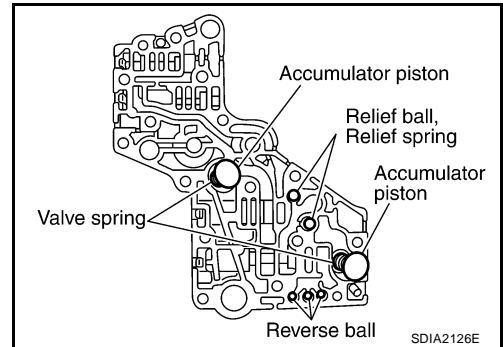
1. Clean upper body, control valves and springs with cleaning agent, and dry with compressed air.
2. Dip control valves in ATF, and apply ATF to the valve-mounting area of upper body.
3. Install each control valve (3), spring (4) and plug (2) to upper body (5), and install retainer plates (1) to hold them in place.

CAUTION:

- To insert control valves into upper body, place upper body on a level surface in order to prevent flaw or damage.
- Make sure each control valve is smoothly inserted.



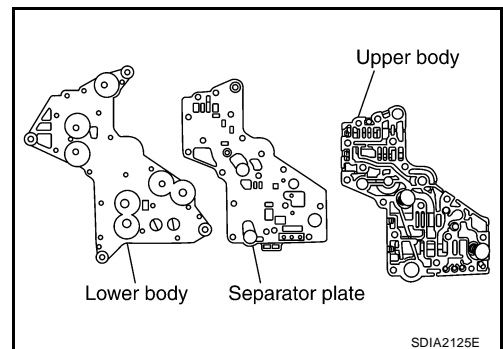
4. Install reverse balls, relief balls and relief springs, accumulator pistons and valve springs to upper body.



5. Install lower body and separator plate to upper body.

NOTE:

Do not reuse separator plates.

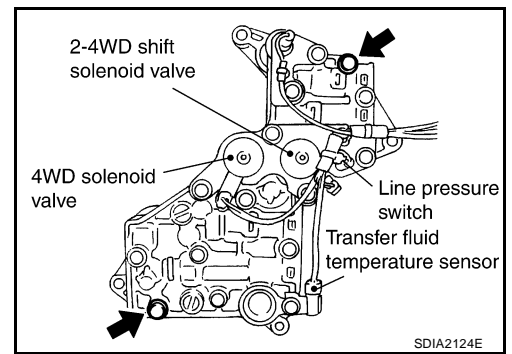


CENTER CASE

6. With lower body down, tighten two bolts in the position shown.
7. Apply ATF or petroleum jelly to new O-ring, and install it to 2-4WD shift solenoid valve, line pressure switch and 4WD solenoid valve. Install them to control valve assembly.

NOTE:

Do not reuse O-rings.



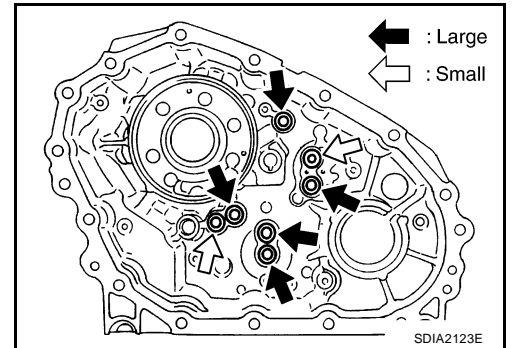
8. Apply ATF or petroleum jelly to lip seals, and install them to center case.

CAUTION:

There are 2 kinds of lip seals (lip seal of large inner diameter: 5 pieces, lip seal of small inner diameter: 2 pieces). Confirm their position for installation.

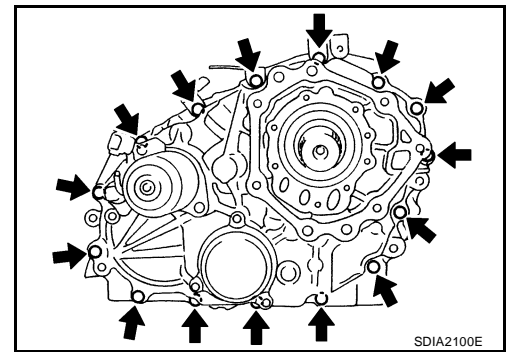
NOTE:

Do not reuse lip seals.



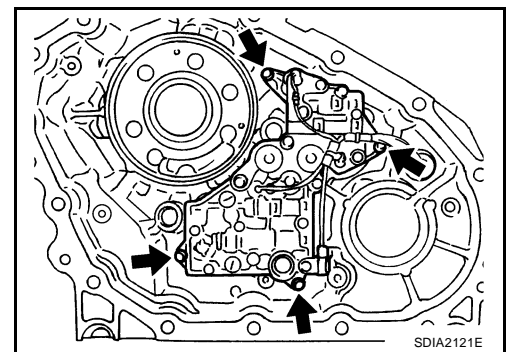
9. Install the other 13 bolts and tighten them to specified torque.

Control valve case bolts : 7.9 N·m (0.81 kg-m, 70 in-lb)

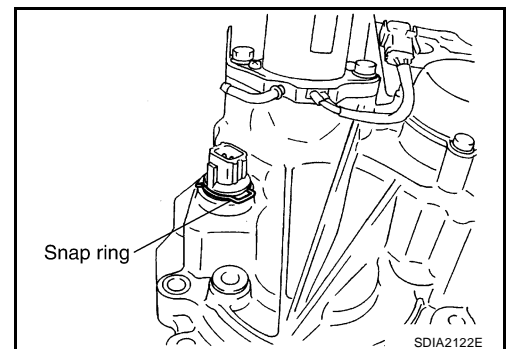


10. Install control valve assembly to center case, and tighten bolts.

Control valve bolts : 7.9 N·m (0.81 kg-m, 70 in-lb)



11. Install connector assembly into center case installation hole, and secure terminal body with snap ring.



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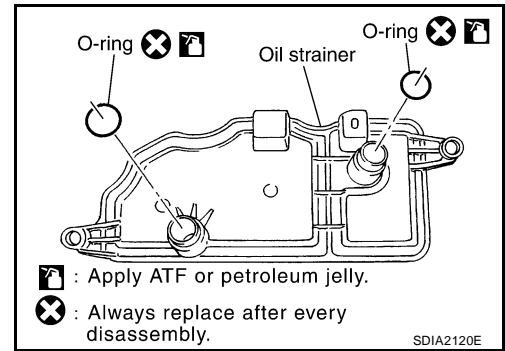
CENTER CASE

12. Apply ATF or petroleum jelly to new O-rings, and install them on oil strainer.

NOTE:

Do not reuse O-rings.

13. Install oil strainer to control valve assembly.

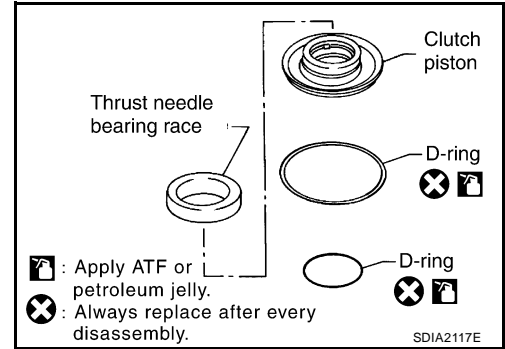


CLUTCH PISTON

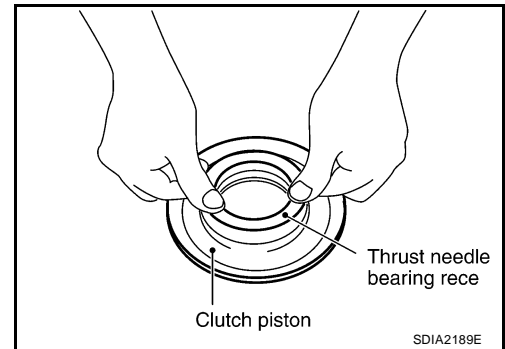
1. Apply ATF or petroleum jelly to new D-rings, and install them to clutch piston.

NOTE:

Do not reuse D-rings.



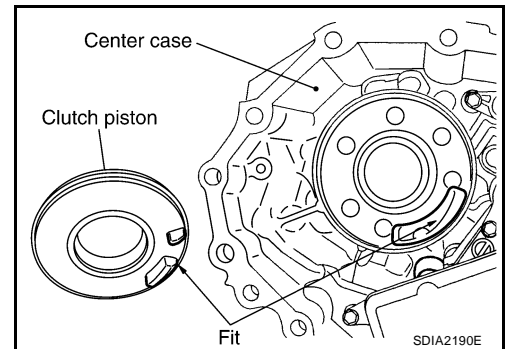
2. Install thrust needle bearing race to clutch piston.



3. Install clutch piston to the center case as shown.

CAUTION:

Install so the fitting protrusion of the clutch piston with aligns the dent of the center case.



CENTER CASE

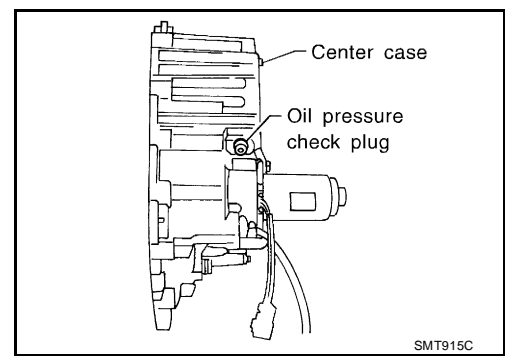
- Remove all the liquid gasket from oil pressure check port and inside center case. With the new oil pressure check plug threaded in 1 or 2 pitches, apply specified sealant or equivalent, to the oil pressure check plug thread of plug, and tighten. Refer to [GI-45, "Recommended Chemical Products and Sealants"](#) .

Oil pressure check plug : 15 N·m (1.5 kg-m, 11 in-lb)

NOTE:

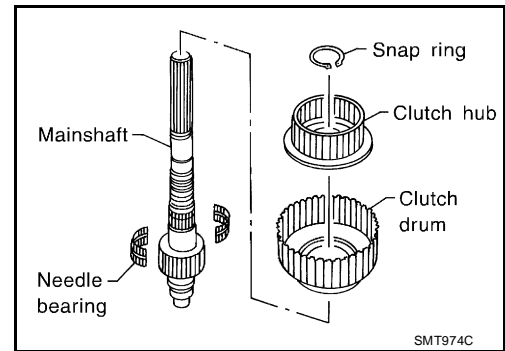
Do not reuse oil pressure check plug.

- Install mainshaft and clutch drum. Refer to [TF-145, "MAIN-SHAFT AND CLUTCH DRUM"](#) .



MAINSHAFT AND CLUTCH DRUM

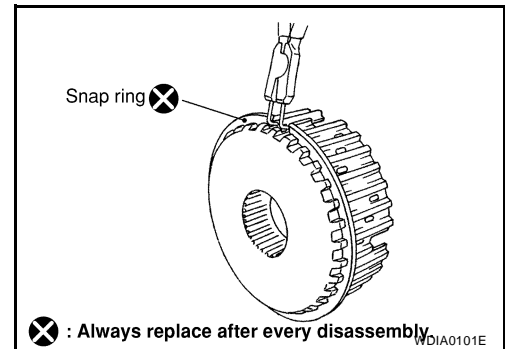
- Apply ATF or petroleum jelly to needle bearing, and install needle bearing, clutch drum, clutch hub and new snap ring to mainshaft.



- Install new snap ring to the clutch hub, using suitable tool.

NOTE:

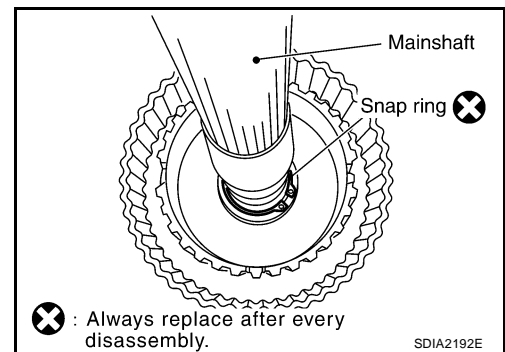
Do not reuse snap ring.



- Install new snap ring to clutch hub from clutch hub to mainshaft, and secure them with snap rings.

NOTE:

Do not reuse snap rings.

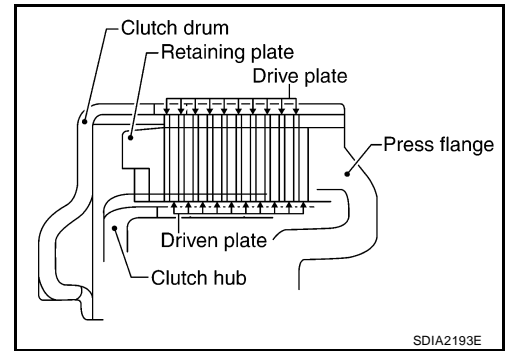


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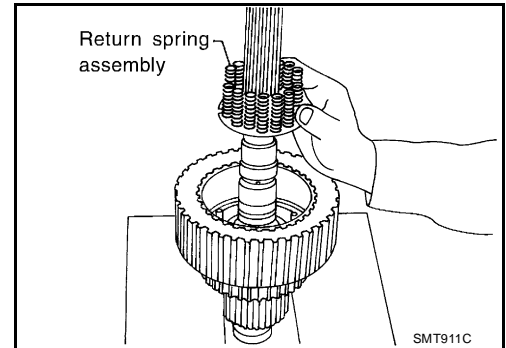
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CENTER CASE

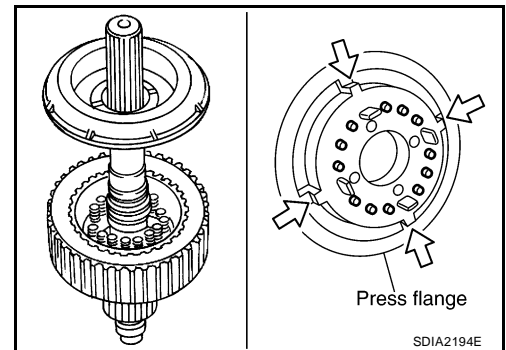
4. Install each plate into clutch drum as shown.



5. Install the return spring assembly into clutch hub.



6. Install press flange by aligning notches to the clutch hub as shown.



7. Install the snap ring to the main shaft snap ring groove on main shaft, using Tool.

Tool number

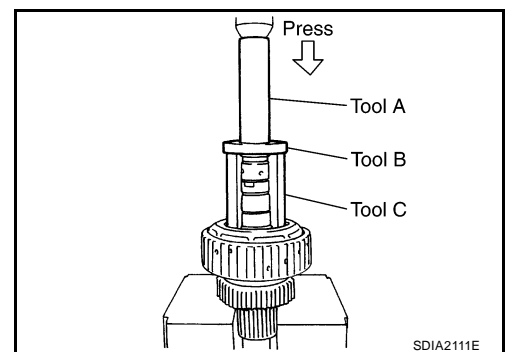
A : ST22452000 (J-34335)

B : ST30911000 (—)

C : KV31103300 (—)

NOTE:

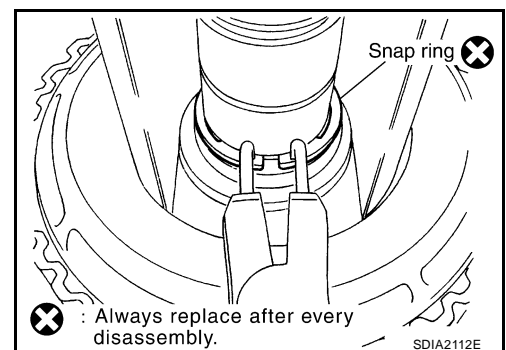
Do not reuse snap ring.



8. Install new snap rings to mainshaft.

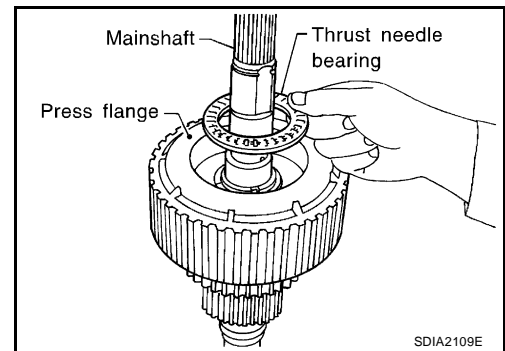
NOTE:

Do not reuse snap ring.



CENTER CASE

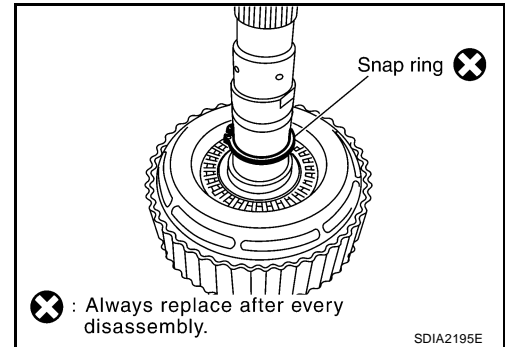
9. Apply ATF or petroleum jelly to thrust needle bearing and install it on press flange.



10. Install the new snap ring to main shaft.

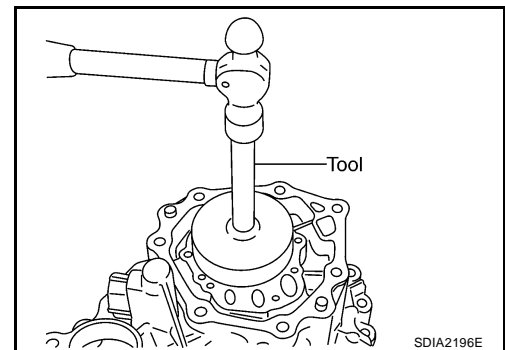
NOTE:

Do not reuse snap ring.



11. Install mainshaft rear bearing to center case, using Tool.

Tool number : ST1531000 (J-25640-B)



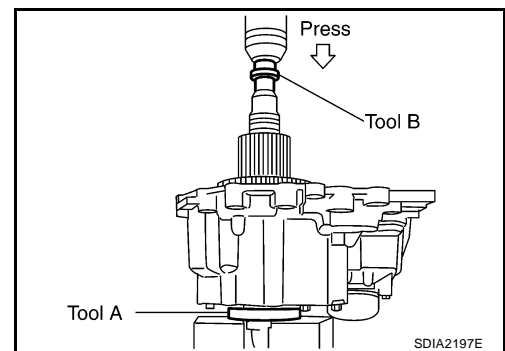
12. Install mainshaft assembly, and set it to press stand.

- Place to the tip of mainshaft, and press mainshaft into center case, using Tool.

Tool number

A : ST30911000 (—)

B : ST33052000 (—)



13. Install front drive shaft and drive chain. Refer to [TF-148, "FRONT DRIVE SHAFT AND DRIVE CHAIN"](#) .
14. Install front case assembly and rear case assembly.
Refer to [TF-149, "Final Assembly"](#) .

CENTER CASE

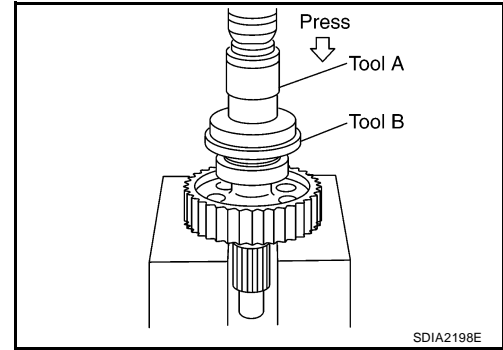
FRONT DRIVE SHAFT AND DRIVE CHAIN

1. Install front drive shaft rear bearing, using Tool.

Tool number

A : KV40100621 (J-25273)

B : ST30032000 (J-26010-01)

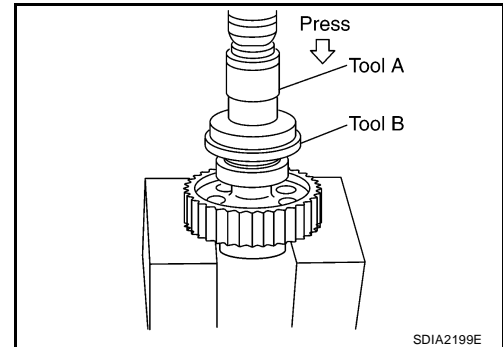


- a. Install front drive shaft to front bearing, using Tool.

Tool number

A : KV40100621 (J-25273)

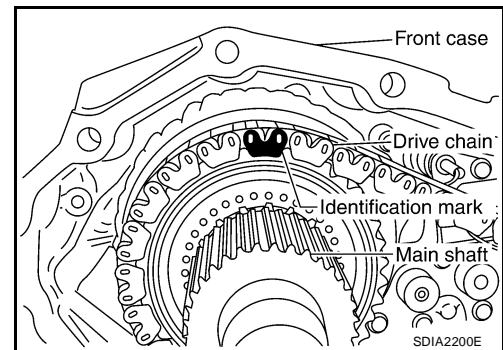
B : ST30032000 (J-26010-01)



2. Install drive chain temporarily to front drive shaft and clutch drum.

CAUTION:

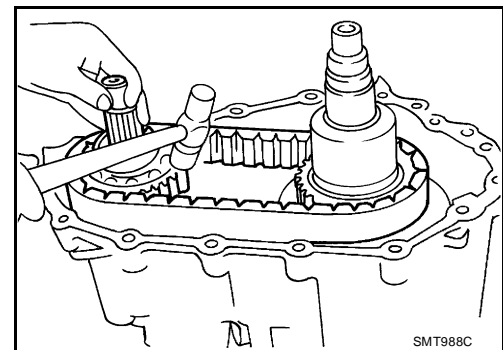
Install drive chain by aligning identification marks to the rear as shown.



3. Tap front drive shaft while keeping it upright and press-fit front drive shaft rear bearing, using suitable tool.

CAUTION:

Be careful not to tap drive chain with tool.



4. Install front case assembly and rear case assembly. Refer to [TF-149, "Final Assembly"](#) .

ASSEMBLY

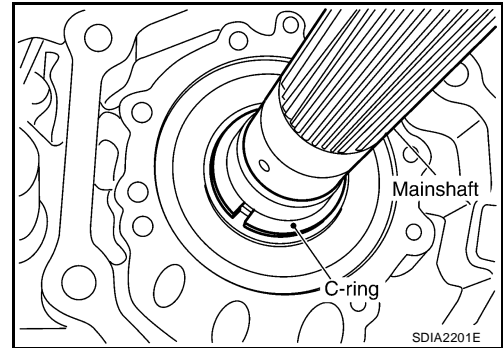
ASSEMBLY

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Final Assembly

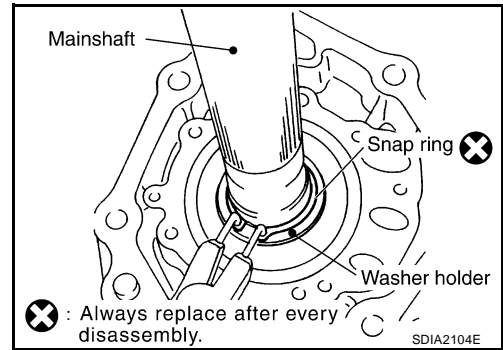
1. Install C-rings to mainshaft.



2. Set washer holder on mainshaft, and secure it with new snap ring.

NOTE:

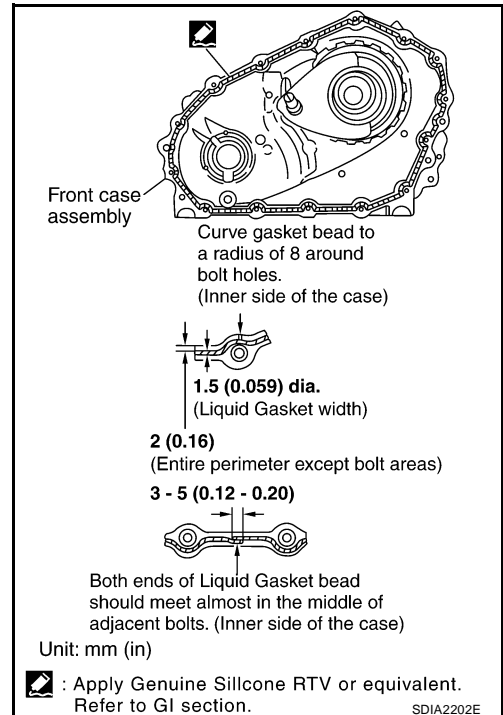
Do not reuse snap ring.



3. Apply specified Anaerobic Liquid Gasket or equivalent to the entire center case mounting surface of front case assembly as shown. Refer to [GI-45, "Recommended Chemical Products and Sealants"](#) .

NOTE:

Remove all foreign materials such as water, oil and grease from center case and front case mating surfaces.



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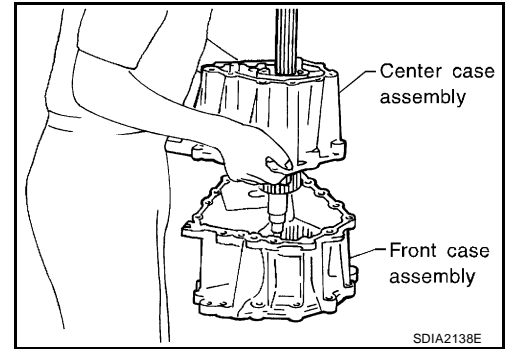
ASSEMBLY

4. Install center case assembly to front case assembly.

CAUTION:

Pay careful attention so that mainshaft end is not damaged.

5. Tap center case lightly press-fit front drive shaft bearing into front case, using suitable tool.

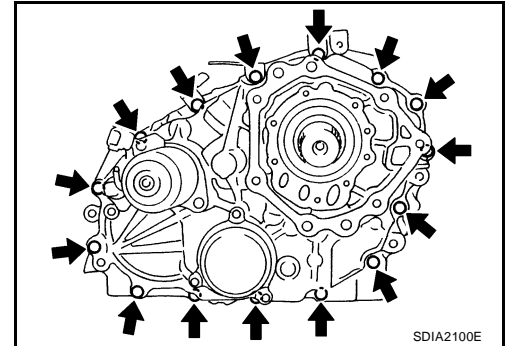


6. Tighten front case bolts to specified torque.

Front case bolts : 45 N-m (4.6 kg-m, 33 ft-lb)

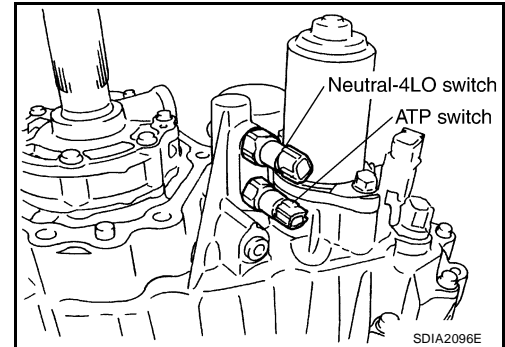
NOTE:

Be sure to install air breather hose clamp, connector bracket and harness clip.

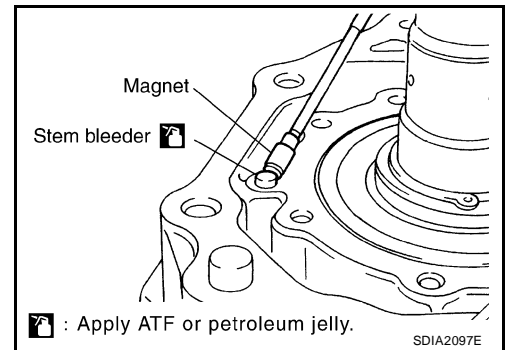


7. Remove all the gasket fluid from switch mounting area and inside center case. With ATP switch and neutral-4LO switch threaded in 1 to 2 pitches, apply specified sealant or equivalent to the thread of the switches and tighten to specified torque. Refer to [GI-45, "Recommended Chemical Products and Sealants"](#).

ATP and Neutral- 4LO switches : 28 N-m (2.9 kg-m, 21 ft-lb)



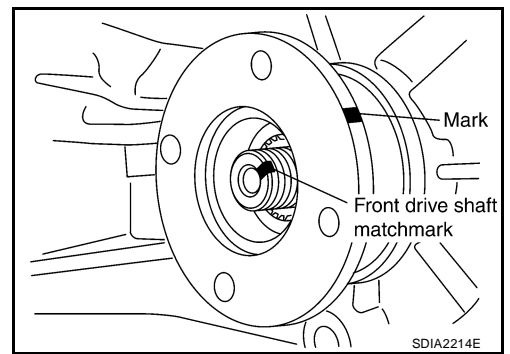
8. Apply ATF or petroleum jelly to stem bleeder and install to center case.



9. Install main oil pump assembly to the center case assembly and tighten bolts. Refer to [TF-110, "Transfer Components"](#).

ASSEMBLY

10. Align the matchmark on front drive shaft with the mark on the companion flange, then install the companion flange.

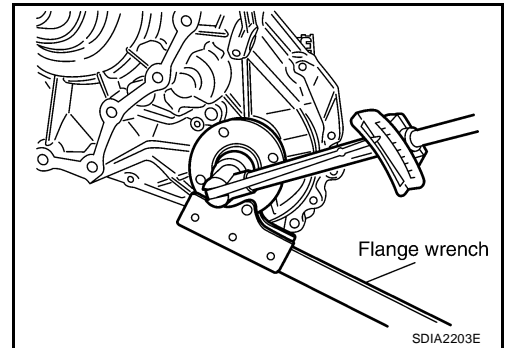


11. Install new companion flange self-lock nut, and tighten to specification using suitable tool.

Companion flange self-lock nut : 275 N·m (28 kg·m, 203 ft·lb)

NOTE:

Do not reuse self-lock nut.

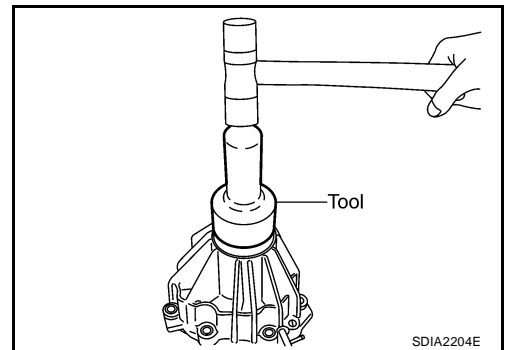


12. Apply ATF or petroleum jelly to the circumference of new rear oil seal, and install using Tool as shown so that it is flush with case tip face.

Tool number : ST30720000 (J-25405)

NOTE:

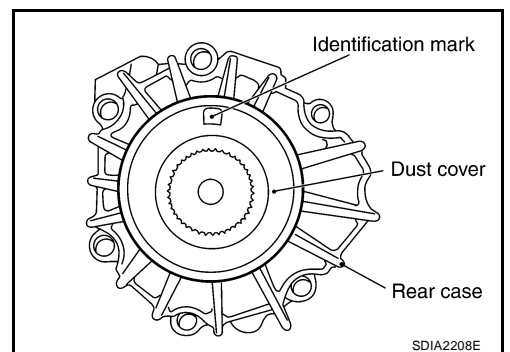
- Apply multi-purpose grease to oil seal lip.
- Do not reuse oil seal.



13. Apply ATF or petroleum jelly to the circumference of the new dust cover. Position the dust cover using the identification mark as shown.

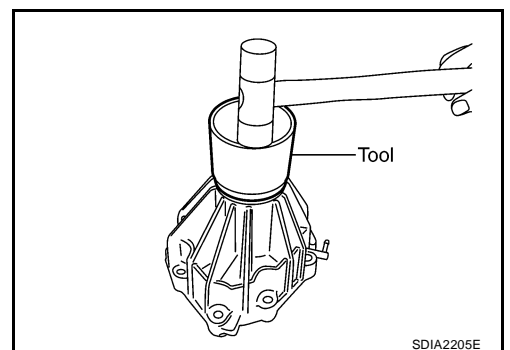
NOTE:

- Do not reuse the dust cover.
- Identification mark should be set at the position shown.



14. Install new dust cover seal using Tool.

Tool number : KV40105310 (—)



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ASSEMBLY

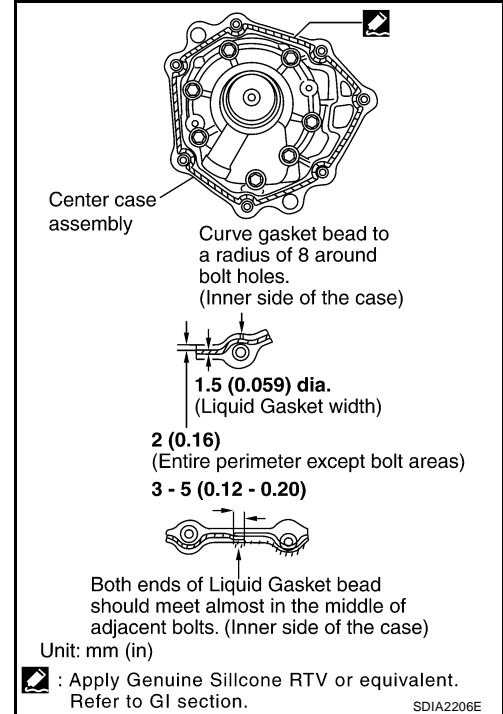
15. Install air breather into rear case.
16. Apply specified Anaerobic Liquid Gasket or equivalent to entire rear case mounting surface of center case as shown. Refer to [GI-45, "Recommended Chemical Products and Sealants"](#) .

CAUTION:

Be careful not to allow Liquid Gasket to the stem bleeder hole.

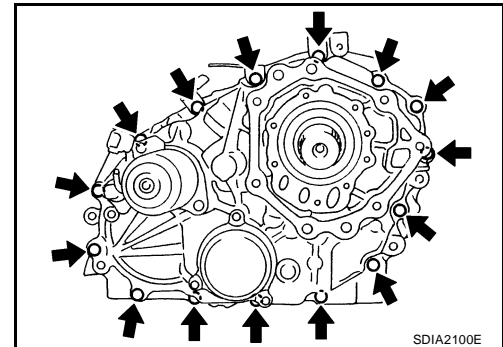
NOTE:

Remove all foreign materials such as water, oil, and grease from center case and rear case mating surfaces.



17. Install rear case to center case, and tighten bolts to specified torque.

Center case bolts : 45 N·m 4.6 kg-m, 33 ft-lb)



18. Installation of the remaining components is in the reverse order of removal.

SERVICE DATA AND SPECIFICATIONS (SDS)

SERVICE DATA AND SPECIFICATIONS (SDS)

PF0:00030

General Specifications

EDS0031B

Applied model		VK56DE	
Transfer model		ATX14B	
Fluid capacity (Approx.)		ℓ (US qt, Imp qt)	
		3.0 (3-1/8, 2-5/8)	
Gear ratio	High	1.000	
	Low	2.596	
Number of teeth	Planetary gear	Sun gear	57
		Internal gear	91
	Front drive sprocket		38
	Front drive shaft		38

Inspection and Adjustment

EDS0031C

CLEARANCE BETWEEN INNER GEAR AND OUTER GEAR

Unit: mm (in)

Item	Specification
Sub-oil pump	0.015 - 0.035 (0.0006 - 0.0014)
Main oil pump	0.015 - 0.035 (0.0006 - 0.0014)

CLUTCH

Unit: mm (in)

Item	Limit value
Drive plate	1.4 (0.055)

PINION GEAR END PLAY

Unit: mm (in)

Item	Standard
Pinion gear end play	0.1 - 0.7 (0.004 - 0.028)

CLEARANCE BETWEEN SHIFT FORK AND SLEEVE

Unit: mm (in)

Item	Standard
Shift fork and sleeve	Less than 0.36 (0.0142)

SELECTIVE PARTS

Sub-oil Pump

Unit: mm (in)

Gear thickness	Part number*	
	Inner gear	Outer gear
9.27 - 9.28 (0.3650 - 0.3654)	31346 0W462	31347 0W462
9.28 - 9.29 (0.3654 - 0.3657)	31346 0W461	31347 0W461
9.29 - 9.30 (0.3657 - 0.3661)	31346 0W460	31347 0W460

*: Always check with the Parts Department for the latest parts information.

Main Oil Pump

Unit: mm (in)

Gear thickness	Part number*	
	Inner gear	Outer gear
8.27 - 8.28 (0.3256 - 0.3260)	31346 7S112	31347 7S112
8.28 - 8.29 (0.3260 - 0.3264)	31346 7S111	31347 7S111
8.29 - 8.30 (0.3264 - 0.3268)	31346 7S110	31347 7S110

SERVICE DATA AND SPECIFICATIONS (SDS)

*: Always check with the Parts Department for the latest parts information.

Control Valve

Unit: mm (in)

Mounting position (Part name)	Part number*	Outer dia.	Overall length
L1 (2-4 shift valve)	31772 21X00	8.0 (0.315)	38.5 (1.516)
L2 (Clutch valve)	31772 80X11	10.0 (0.394)	40.0 (1.575)
L4 (Pilot valve)	31772 80X11	10.0 (0.394)	40.0 (1.575)
L5 (Regulator valve)	31741 0W410	12.0 (0.472)	68.0 (2.677)

*: Always check with the Parts Department for the latest parts information.

Control Valve Spring

Unit: mm (in)

Mounting position (Part name)	Part number*	Free length	Outer dia.	Overall length
L1 (2-4 shift valve spring)	31742 2W500	31.85 (1.2539)	7.0 (0.276)	0.6 (0.024)
L2 (Clutch valve spring)	31742 2W505	40.6 (1.598)	8.9 (0.350)	0.7 (0.028)
L4 (Pilot valve spring)	31742 0W410	28.1 (1.106)	9.0 (0.354)	1.2 (0.047)
L5 (Regulator valve spring)	31742 2W515	39.7 (1.563)	11.0 (0.433)	1.3 (0.051)

*: Always check with the Parts Department for the latest parts information.

Return Spring

Unit: mm (in)

Stamped mark	Part number*	Free length
1	31521 7S111	42.7 (1.168)
2	31521 7S112	43.1 (1.697)
3	31521 7S113	43.6 (1.717)
4	31521 7S114	44.0 (1.731)

*: Always check with the Parts Department for the latest parts information.

Unit: mm (in)

Stamped mark	Part number*	Free length	Outer dia.	Overall length
L1 (2-4 shift valve spring)	31742 2W500	31.85 (1.2539)	7.0 (0.276)	0.6 (0.024)
L2 (Clutch valve spring)	31742 2W505	40.6 (1.598)	8.9 (0.350)	0.7 (0.028)
L4 (Pilot valve spring)	31742 0W410	28.1 (1.106)	9.0 (0.354)	1.2 (0.047)
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*: Always check with the Parts Department for the latest parts information.