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PRECAUTIONS

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

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

NBTF0001

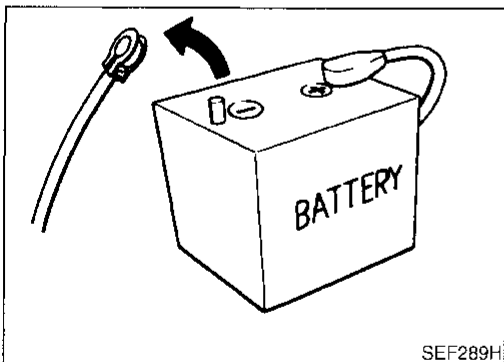
The supplemental Restraint System such as "AIR BAG" and "SEAT BELT PRE-TENSIONER" used along with a seat belt, helps to reduce the risk or severity of injury to the driver and front passenger for certain types of collision. The SRS system composition which is available to INFINITI QX4 is as follows:

- For a frontal collision
The Supplemental Restraint System consists of driver air bag module (located in the center of the steering wheel), front passenger air bag module (located on the instrument panel on passenger side), seat belt pre-tensioners, a diagnosis sensor unit, warning lamp, wiring harness and spiral cable.
- For a side collision
The Supplemental Restraint System consists of side air bag module (located in the outer side of front seat), satellite sensor, diagnosis sensor unit (one of components of air bags for a frontal collision), wiring harness, warning lamp (one of components of air bags for a frontal collision).

Information necessary to service the system safely is included in the RS section of this Service Manual.

WARNING:

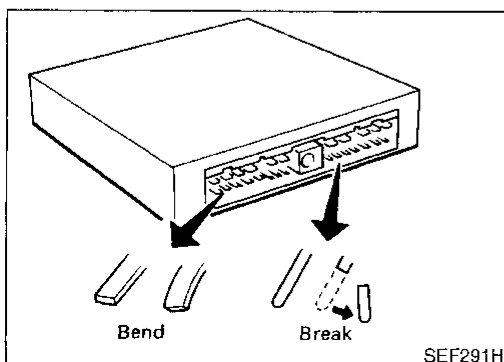
- To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision which would result in air bag inflation, all maintenance must be performed by an authorized INFINITI dealer.
- Improper maintenance, including incorrect removal and installation 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 RS section.
- Do not use electrical test equipment on any circuit related to the SRS unless instructed to in this Service Manual. Spiral cable and wiring harnesses (except "SEAT BELT PRE-TENSIONER") covered with yellow insulation either just before the harness connectors or for the complete harness are related to the SRS.



Precautions

NBTF0092

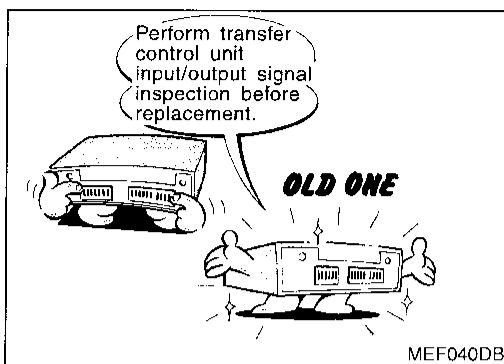
- Before connecting or disconnecting the Transfer control unit harness connector, turn ignition switch OFF and disconnect negative battery terminal. Failure to do so may damage the Transfer control unit. Because battery voltage is applied to Transfer control unit even if ignition switch is turned off.



- 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.

PRECAUTIONS

Precautions (Cont'd)



- 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-50.)

GI

MA

EM

LC

Service Notice

- 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 procedures under "Changing All-mode 4WD Transfer Fluid" in the MA section when changing all-mode 4WD transfer fluid.

NBTF0002

EC

FE

AT

TF

PD

AX

SU

BR

ST

Wiring Diagrams and Trouble Diagnosis

When you read wiring diagrams, refer to the followings:

- "HOW TO READ WIRING DIAGRAMS" in GI section
- "POWER SUPPLY ROUTING" for power distribution circuit in EL section

When you perform trouble diagnosis, refer to the followings:

- "HOW TO FOLLOW TEST GROUP IN TROUBLE DIAGNOSIS" in GI section
- "HOW TO PERFORM EFFICIENT DIAGNOSIS FOR AN ELECTRICAL INCIDENT" in GI section

NBTF0003

RS

BT

HA

SC

EL

IDX

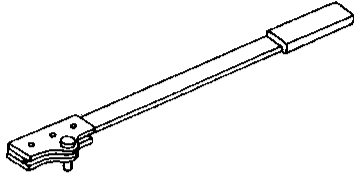
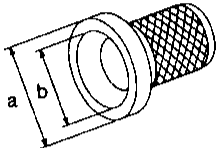
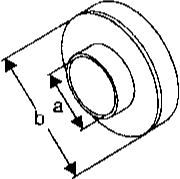
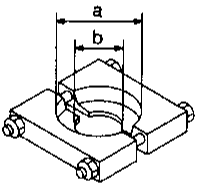
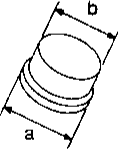
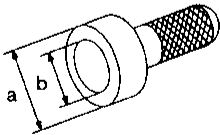
PREPARATION

Special Service Tools

Special Service Tools

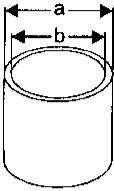
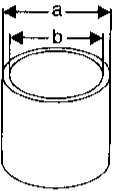
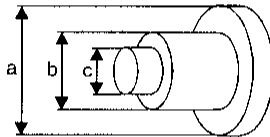
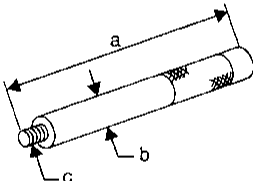
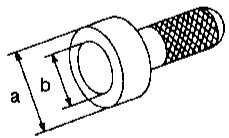
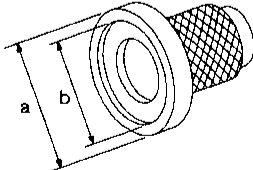
NBFT0004

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
KV38108300 (—) Companion flange wrench	 <p style="text-align: center;">NT771</p> Removing companion flange nut Installing companion flange nut
KV40100621 (J26091) Drift	 <p style="text-align: center;">NT086</p> Installing front drive shaft bearing a: 76 mm (2.99 in) dia. b: 69 mm (2.72 in) dia.
ST30032000 (—) Base	 <p style="text-align: center;">NT660</p> Installing front drive shaft bearing a: 38 mm (1.50 in) dia. b: 80 mm (3.15 in) dia.
ST30031000 (J22912-01) Puller	 <p style="text-align: center;">NT411</p> Removing front drive shaft bearing a: 110 mm (4.33 in) dia. b: 68 mm (2.68 in) dia.
ST33052000 (—) Adapter	 <p style="text-align: center;">NT431</p> Removing front drive shaft bearing a: 28 mm (1.10 in) dia. b: 22 mm (0.87 in) dia.
ST35271000 (J26091) Drift	 <p style="text-align: center;">NT115</p> Installing rear oil seal Removing and installing press flange snap ring a: 72 mm (2.83 in) dia. b: 63 mm (2.48 in) dia.


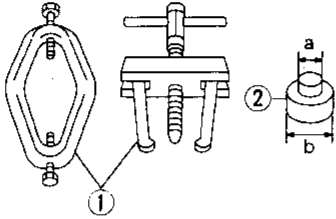
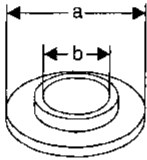
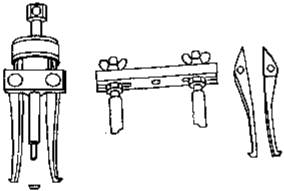
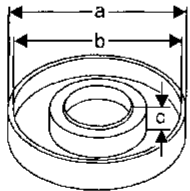
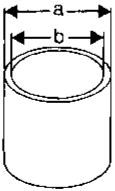
PREPARATION

Special Service Tools (Cont'd)

Tool number (Kent-Moore No.) Tool name	Description		
ST27863000 (—) Support ring		Removing and installing press flange snap ring a: 74.5 mm (2.933 in) dia. b: 62.5 mm (2.461 in) dia.	GI MA EM LC
	NT661		
KV40104710 (—) Support ring		Removing and installing press flange snap ring a: 76.3 mm (3.004 in) dia. b: 67.9 mm (2.673 in) dia.	EC FE AT
	NT661		
ST35291000 (—) Remover		Removing mainshaft rear bearing a: 40 mm (1.57 in) dia. b: 29.5 mm (1.161 in) dia. c: 22.5 mm (0.886 in) dia.	TF PD AX
	NT662		
ST30090010 (—) Remover		Removing mainshaft rear bearing a: 165 mm (6.50 in) b: 25 mm (0.98 in) dia. c: M16 x P2.0	SU BR ST
	NT663		
KV38100500 (—) Drift		Installing front drive shaft oil seal a: 80 mm (3.15 in) dia. b: 60 mm (2.36 in) dia.	RS BT HA
	NT115		
KV40100621 (J25273) Drift		Installing mainshaft rear bearing a: 76 mm (2.99 in) dia. b: 69 mm (2.72 in) dia.	SC EL IDX
	NT104		

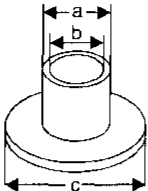
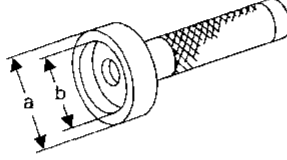
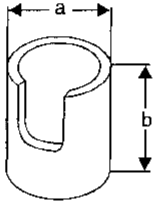
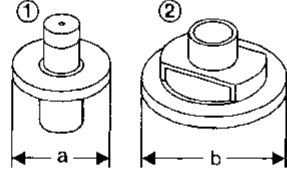
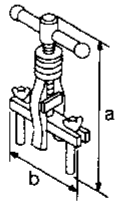
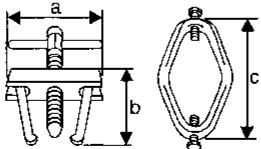
PREPARATION

Special Service Tools (Cont'd)

Tool number (Kent-Moore No.) Tool name	Description
KV32101100 (—) Pin punch	Removing and installing L-H fork, 2-4 fork a: 6 mm (0.24 in) dia.  NT410
ST3306S001 (J22888-D) Differential side bearing puller set 1 ST33051001 (—) Puller 2 ST33061000 (J8107-2) Adapter	Installing mainshaft rear bearing Removing sun gear assembly a: 28.5 mm (1.122 in) dia. b: 38 mm (1.50 in) dia.  NT072
ST30911000 (—) Puller	Installing mainshaft and planetary carrier assembly a: 98 mm (3.86 in) dia. b: 40.5 mm (1.594 in) dia.  NT664
KV381054S0 (—) Outer race puller	Removing rear oil seal  NT665
KV40105230 (—) Adapter	Installing planetary carrier assembly a: 92 mm (3.62 in) dia. b: 86 mm (3.39 in) dia. c: 12 mm (0.47 in)  NT666
KV40105310 (—) Support ring	Installing planetary carrier assembly a: 89.1 mm (3.508 in) dia. b: 80.7 mm (3.177 in) dia.  NT661

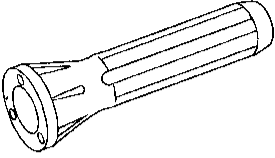
PREPARATION

Special Service Tools (Cont'd)

Tool number (Kent-Moore No.) Tool name	Description	
KV40105500 (—) Support	 <p style="text-align: right;">Installing planetary carrier assembly a: 69 mm (2.72 in) dia. b: 52 mm (2.05 in) dia. c: 120 mm (4.72 in) dia.</p> <p style="text-align: left;">NT667</p>	GI MA EM LC
KV38100200 (—) Drift	 <p style="text-align: right;">Installing transfer cover oil seal a: 65 mm (2.56 in) dia. b: 49 mm (1.93 in) dia.</p> <p style="text-align: left;">NT673</p>	EC FE AT
KV31103300 (—) Drift	 <p style="text-align: right;">Removing and installing press flange snap ring a: 76.3 mm (3.004 in) dia. b: 130 mm (5.12 in)</p> <p style="text-align: left;">NT668</p>	<div style="background-color: black; color: white; padding: 2px; text-align: center; font-weight: bold;">TF</div> PD AX
KV31103400 (—) Clutch piston attachment 1 Shaft-drift 2 Guide-cylinder	 <p style="text-align: right;">Installing clutch piston a: 88.5 mm (3.484 in) dia. b: 158 mm (6.22 in) dia.</p> <p style="text-align: left;">NT669</p>	SU BR ST
ST33290001 (J25810-A) Puller	 <p style="text-align: right;">Removing center case oil seal Removing rear oil seal a: 250 mm (9.84 in) b: 160 mm (6.30 in)</p> <p style="text-align: left;">NT414</p>	RS BT HA
ST33051001 (J22888) Puller	 <p style="text-align: right;">Removing companion flange a: 135 mm (5.31 in) b: 100 mm (3.94 in) c: 170 mm (6.69 in)</p> <p style="text-align: left;">NT670</p>	SC EL IDX

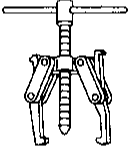
PREPARATION

Special Service Tools (Cont'd)

Tool number (Kent-Moore No.) Tool name	Description
(J35864) Drift	<div style="text-align: right;">Installing oil seal</div> <div style="text-align: center;">  </div> <div style="text-align: left;">NT671</div>

Commercial Service Tools

NBTF0005

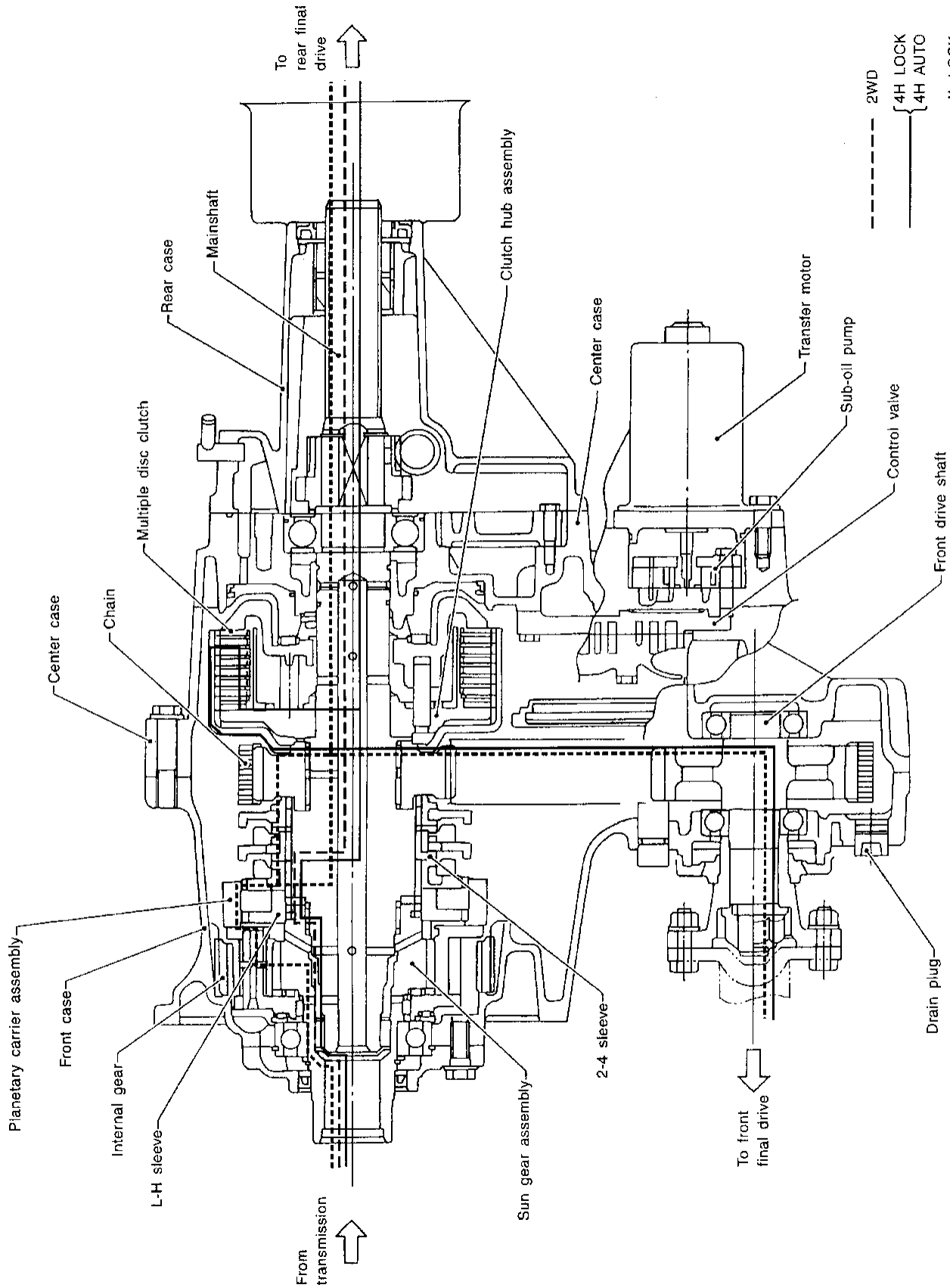
Tool name	Description
Puller	<div style="text-align: right;">Removing companion flange, clutch gear and mainshaft gear bearing</div> <div style="text-align: center;">  </div> <div style="text-align: left;">NT077</div>

ALL-MODE 4WD SYSTEM

Cross-sectional View

Cross-sectional View

NBTF0006

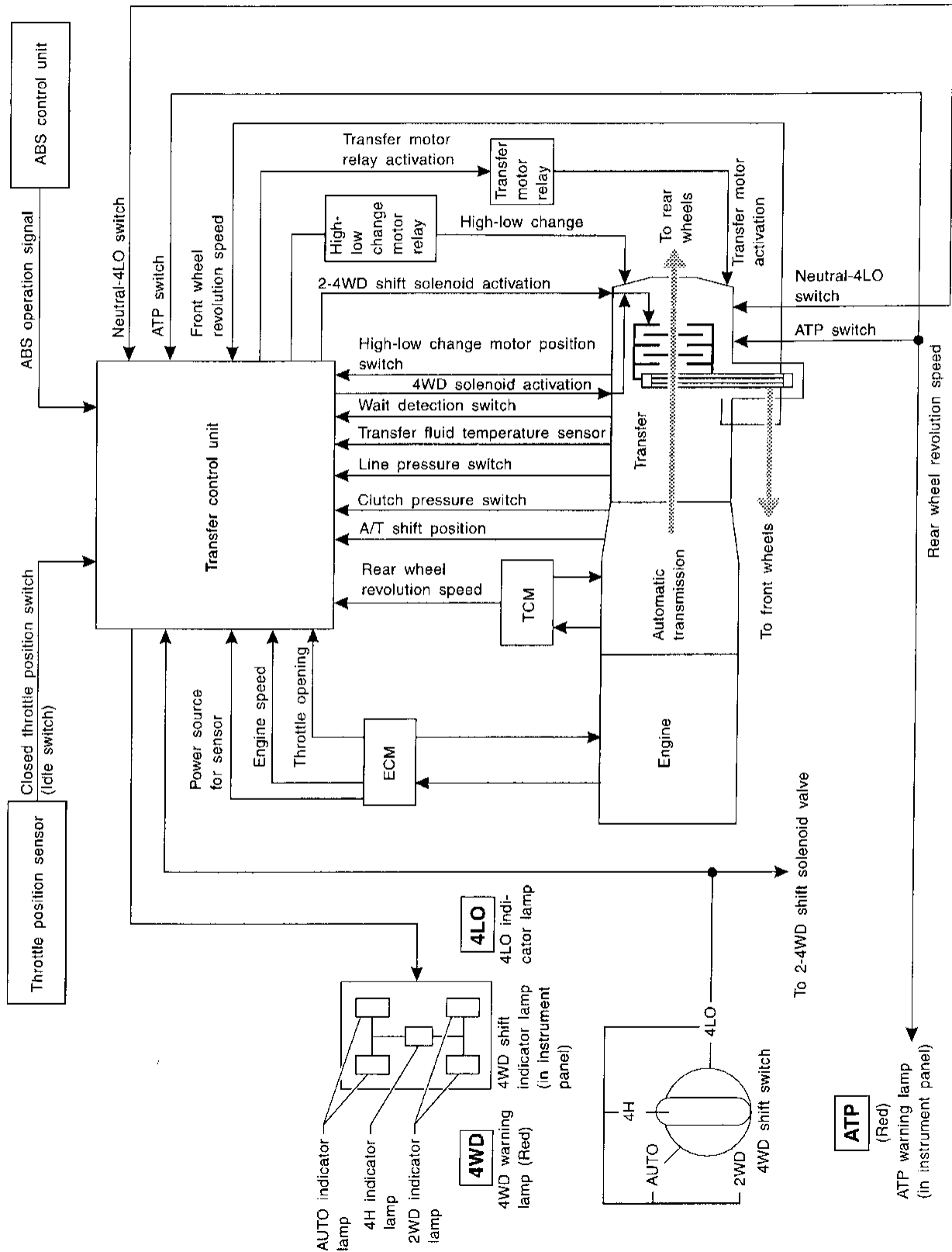


- GI
- MA
- EM
- LC
- EC
- FE
- AT
- TF**
- PD
- AX
- SU
- BR
- ST
- RS
- BT
- HA
- SC
- EL
- IDX

SMT953CA

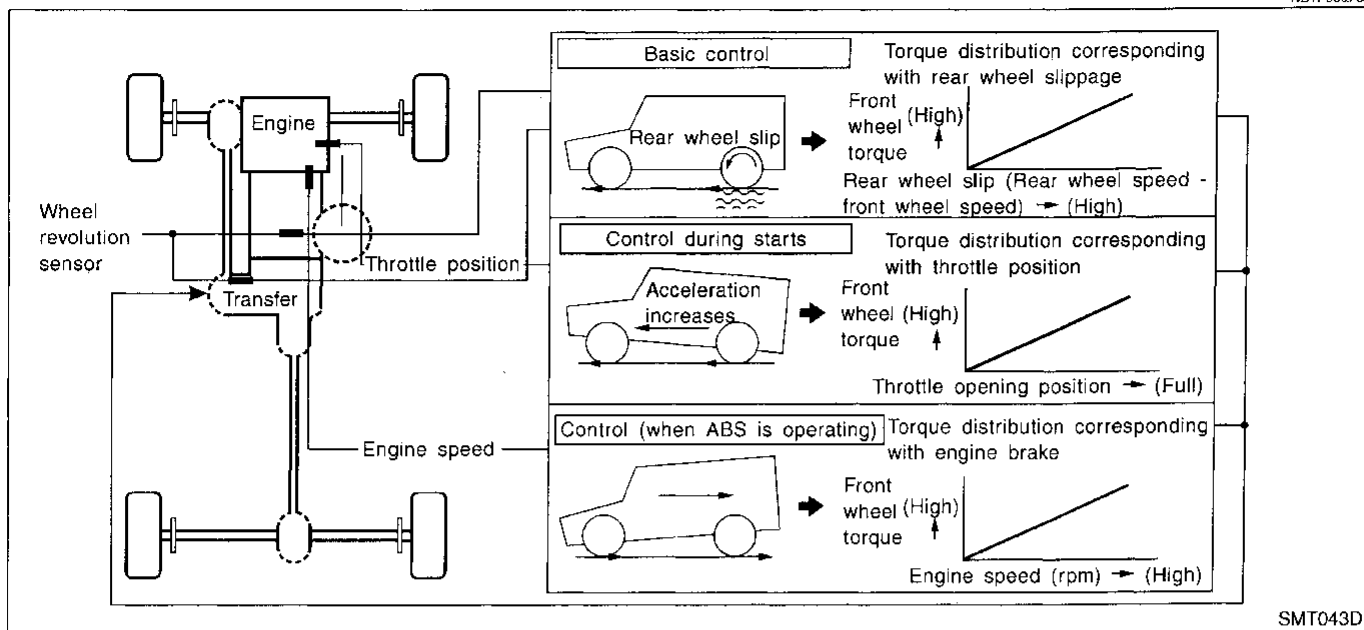
ALL-MODE 4WD SYSTEM

Control System



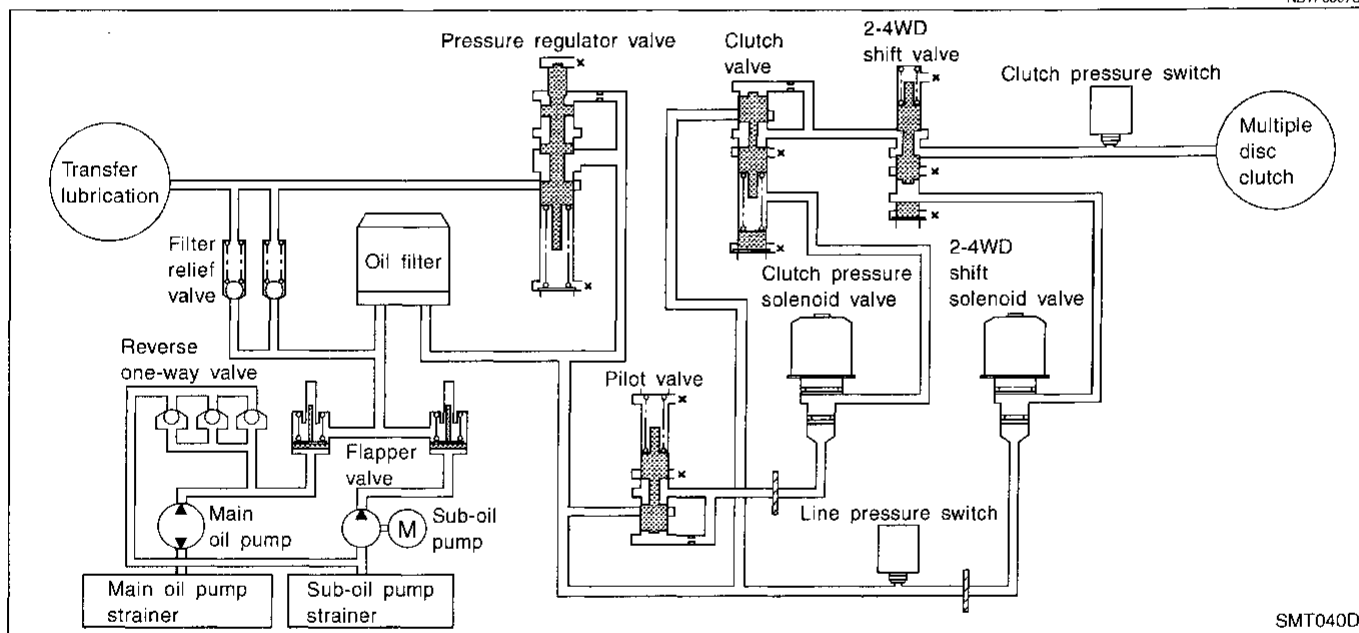
ALL-MODE 4WD TRANSFER BASIC CONTROL

NBTF0007S01



HYDRAULIC CONTROL CIRCUITS

NBTF0007S02



OUTLINE

NBTF0007S03

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.

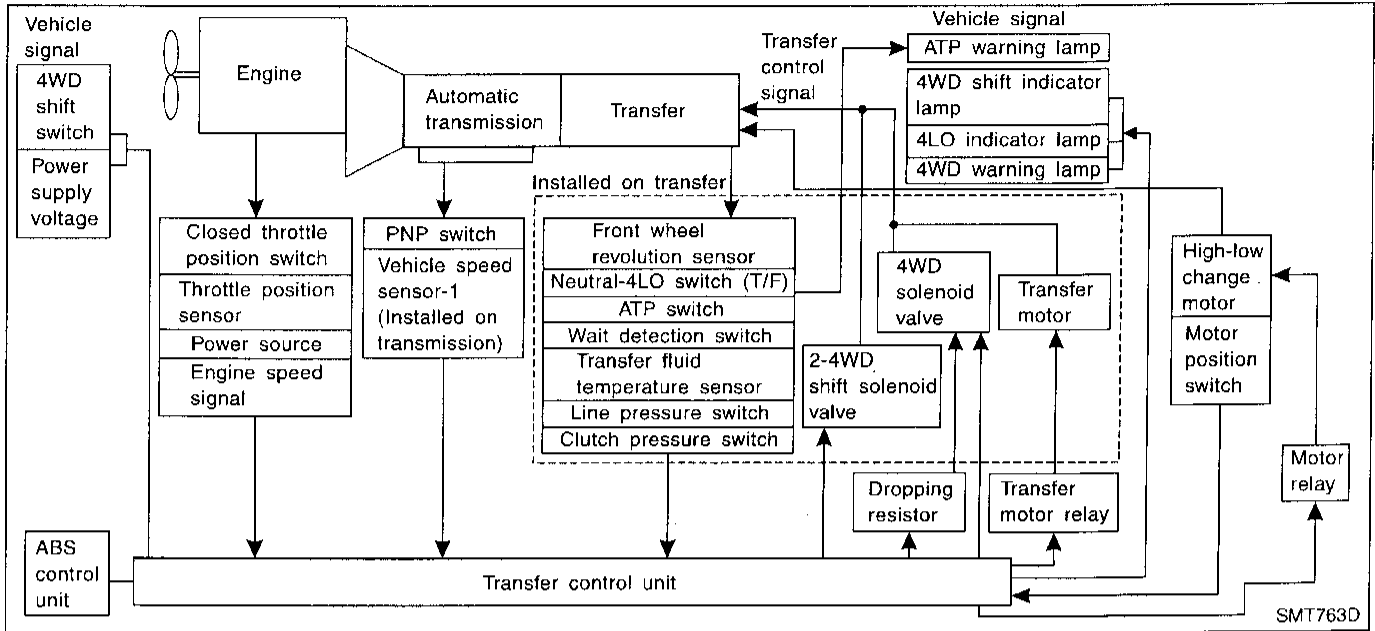
- 1) Performing the self-diagnosis. (The 4WD warning lamp will indicate what kind of malfunction has occurred by flickering.)
- 2) Performing diagnosis using CONSULT.

ALL-MODE 4WD SYSTEM

Control System (Cont'd)

CONTROL SYSTEM DIAGRAM

NBTF0007S04



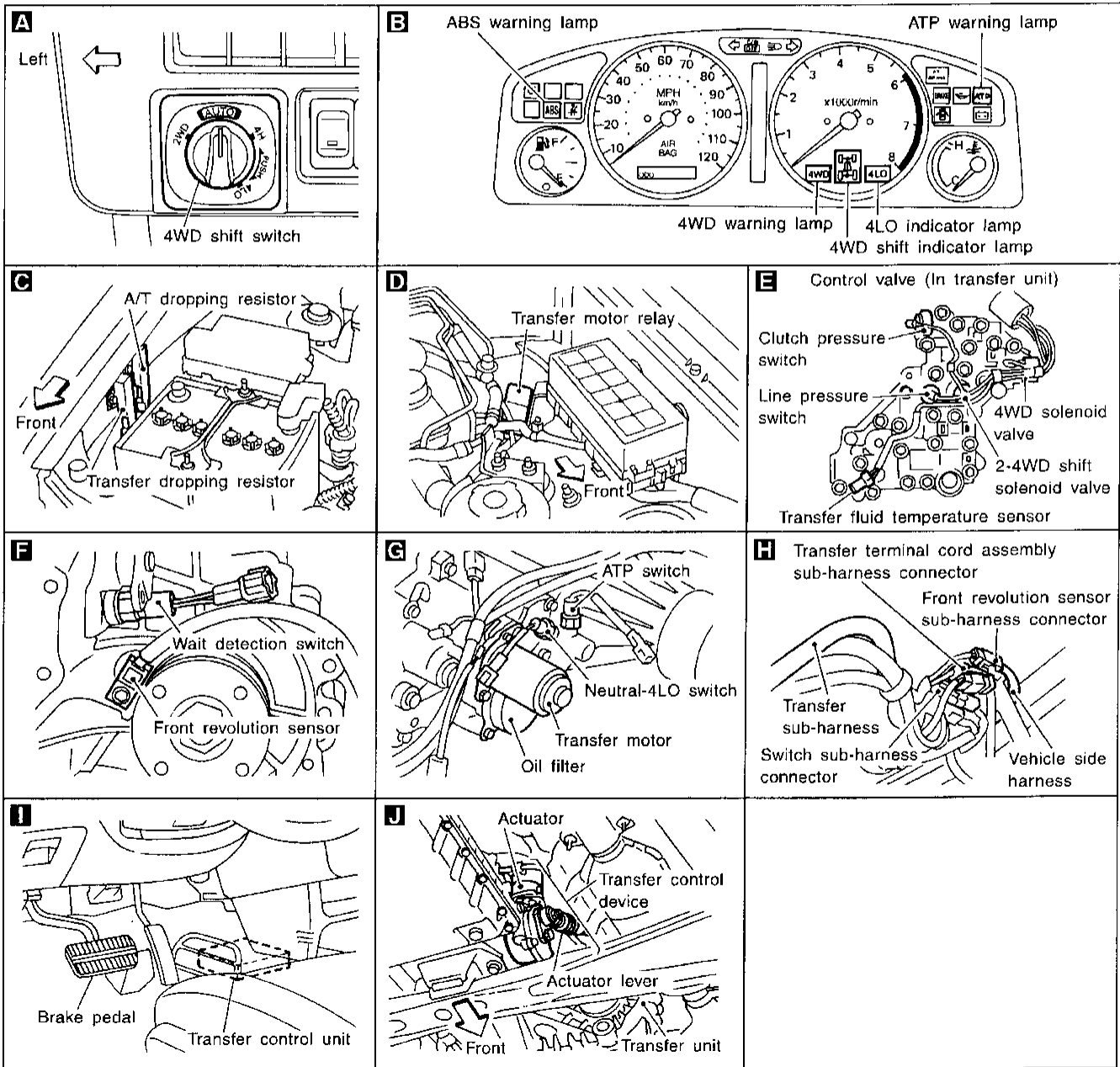
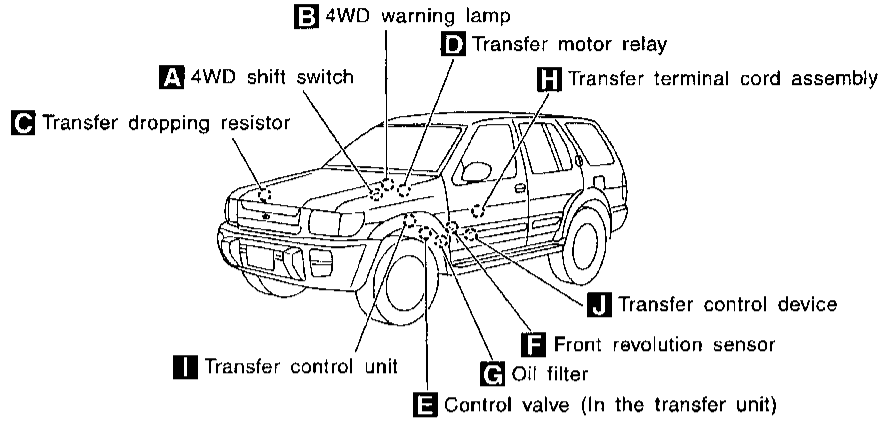
INDICATIONS OF 4WD WARNING LAMP

NBTF0007S05

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.

Location of Electrical Parts



GI
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IDX

ALL-MODE 4WD SYSTEM

Description of Electrical Parts

Description of Electrical Parts

NBTF0067

TRANSFER MOTOR

NBTF0067S01

1. 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.
2. 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.
3. The transfer motor operates as follows:
 - 1) The motor relay turns OFF in the 2WD mode.
 - 2) 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 km/h	Positions other than the "P" or "N" positions	ON
	—	"P" or "N" position (See Table 2.)	—
	$0 < VFF \leq 30$ km/h	—	ON
	$30 < VFF < 35$ km/h	—	HOLD
	35 km/h \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.)

4. 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

NBTF0067S02

1. 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.
2. The wait detection switch operates as follows:
 - 4WD lock gear (clutch drum) locked: ON
 - 4WD lock gear (clutch drum) released: OFF
3. The wait detection switch senses an actual drive mode and the 4WD shift indicator lamp indicates the vehicle drive mode.

ALL-MODE 4WD SYSTEM

Description of Electrical Parts (Cont'd)

2-4WD SHIFT SOLENOID VALVE

NBTF0067S03

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 so 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.

GI

MA

LINE PRESSURE SWITCH

NBTF0067S04

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.

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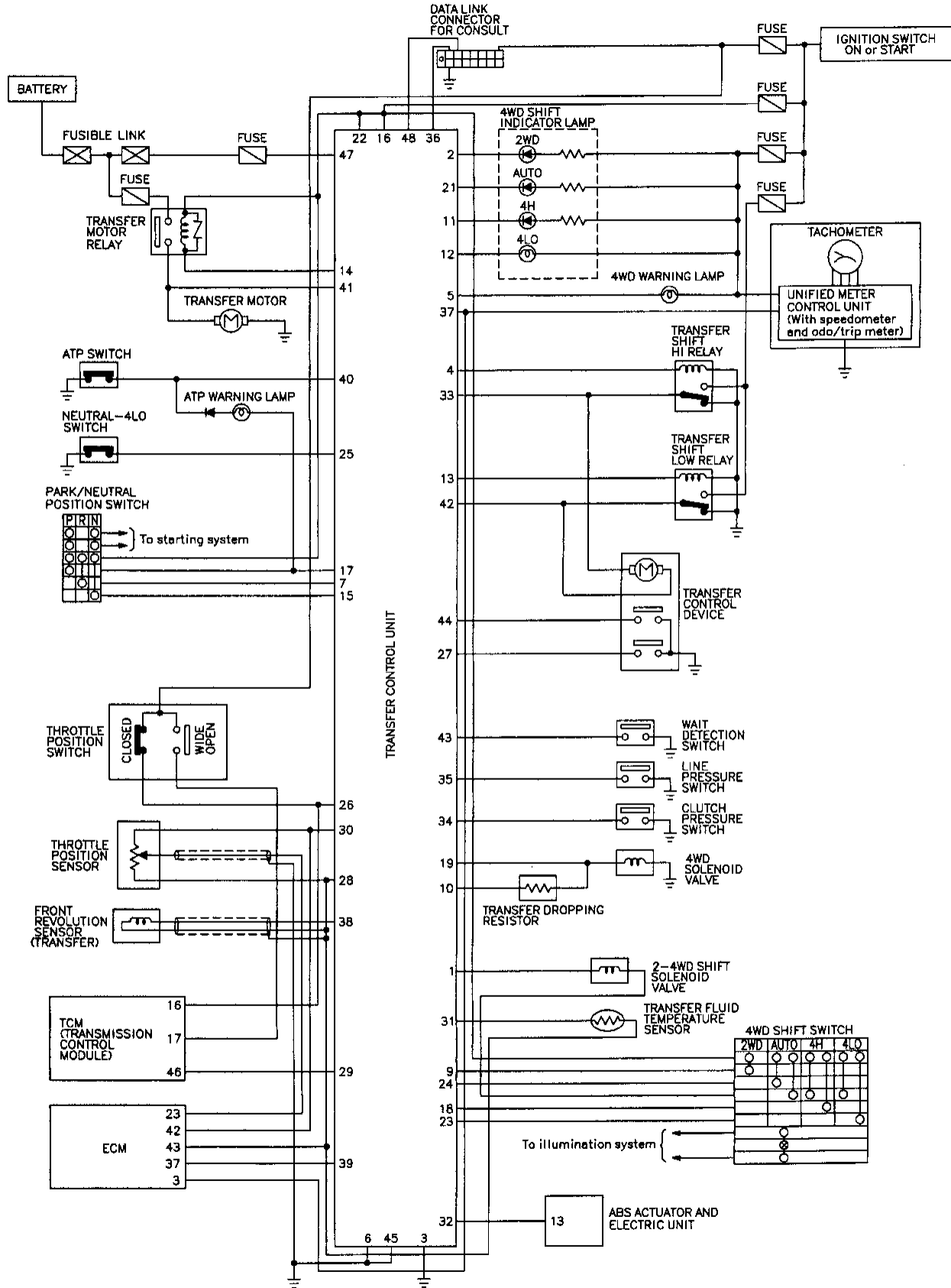
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ALL-MODE 4WD SYSTEM

Circuit Diagram for Quick Pinpoint Check

Circuit Diagram for Quick Pinpoint Check

NBTF009



MTF036A

ALL-MODE 4WD SYSTEM

Wiring Diagram — TF —

Wiring Diagram — TF —

NBTF0010

TF-T/F-01 **GI**

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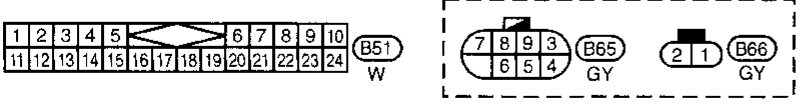
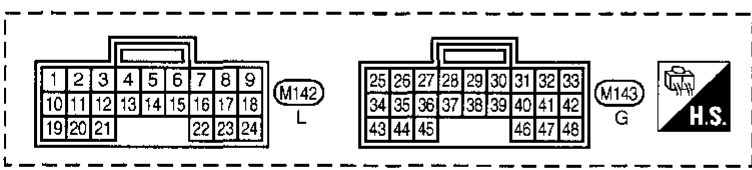
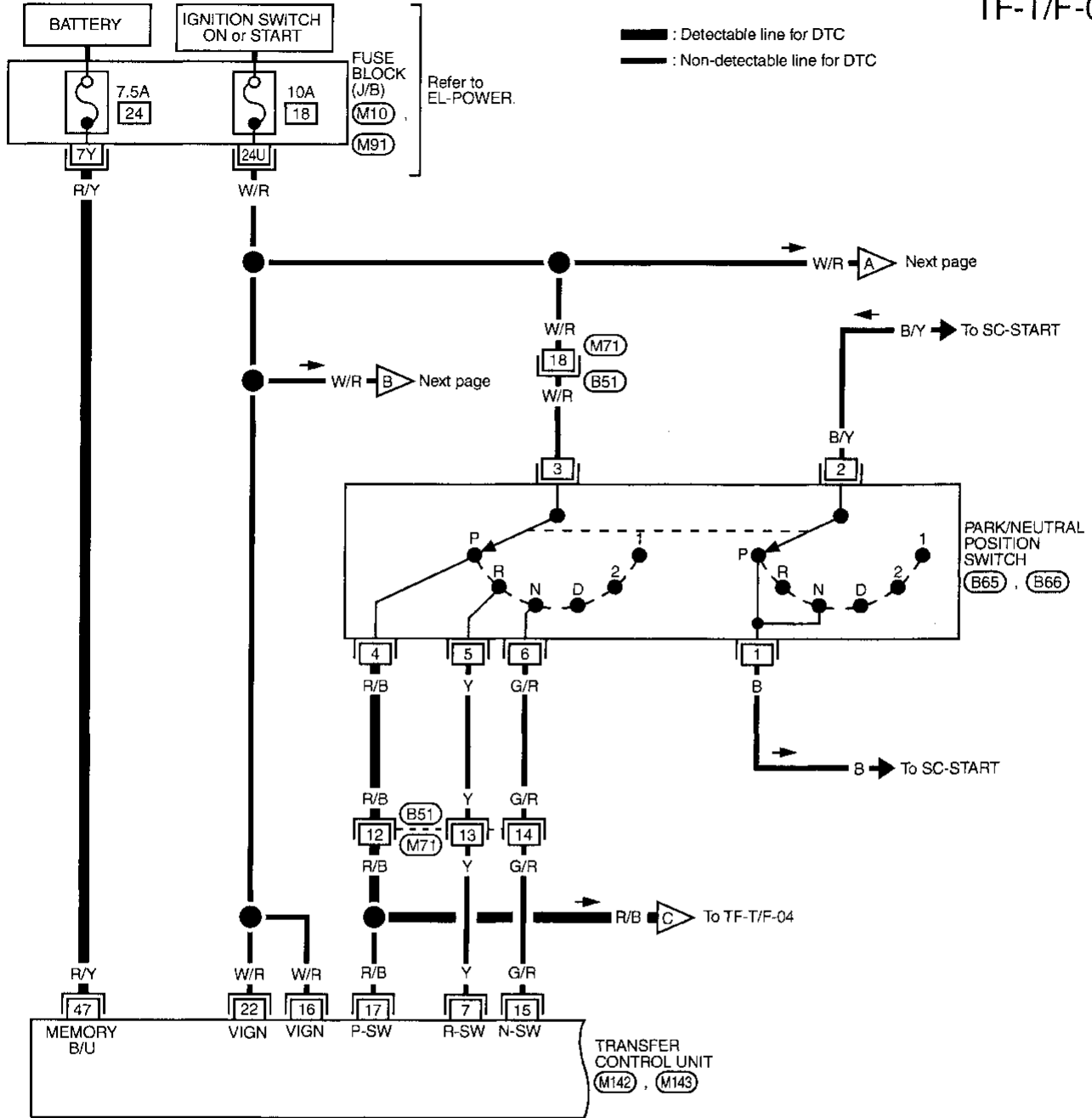
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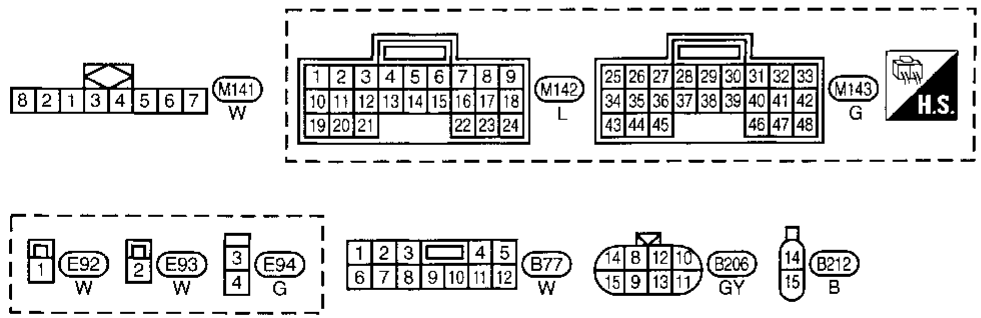
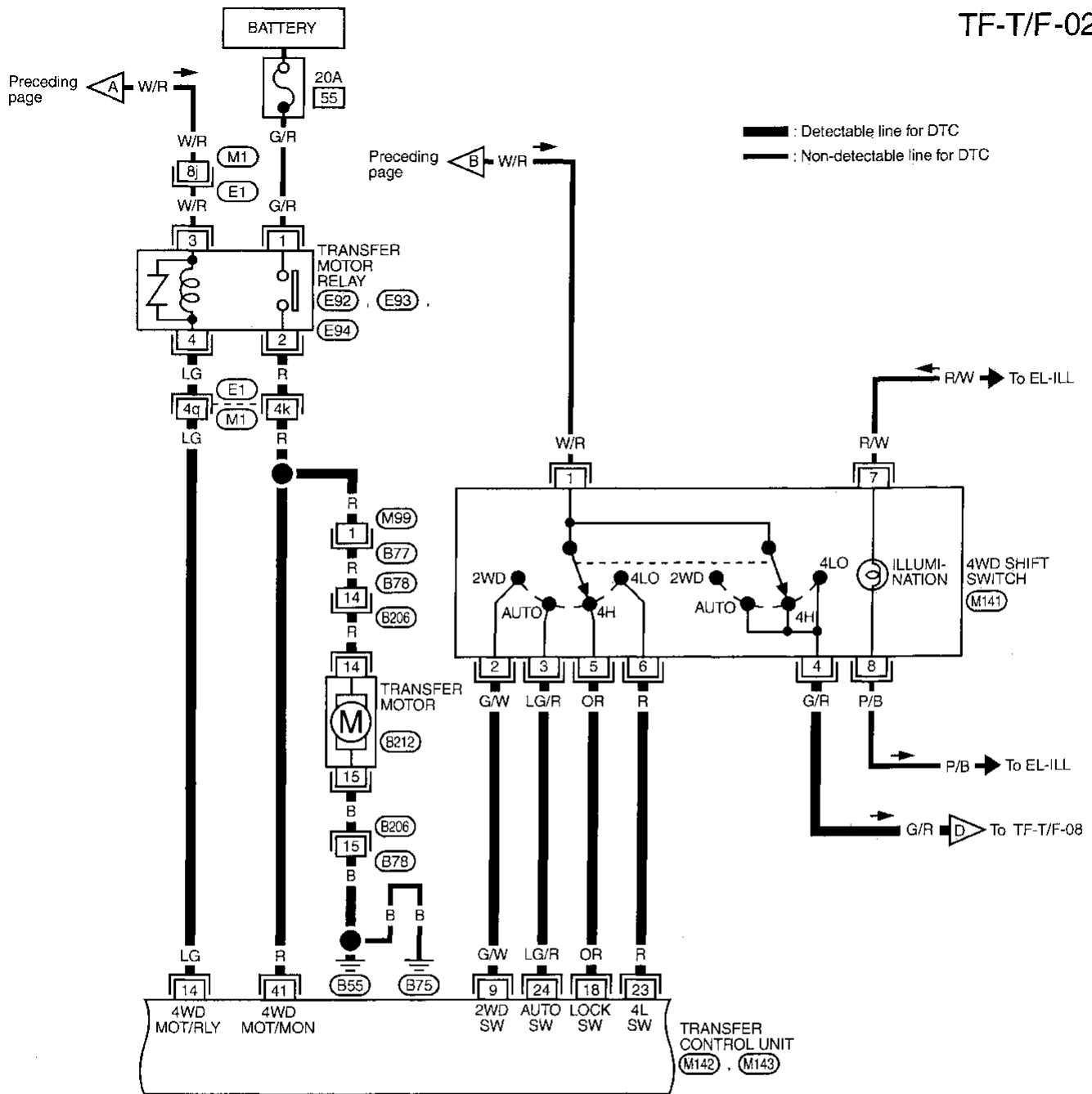
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ALL-MODE 4WD SYSTEM

Wiring Diagram — TF — (Cont'd)

TF-T/F-02



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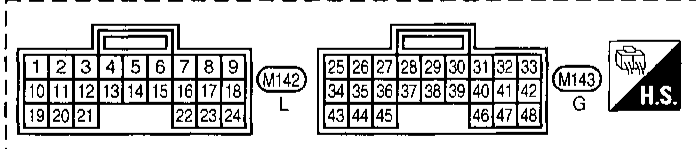
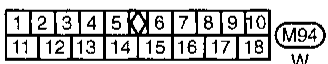
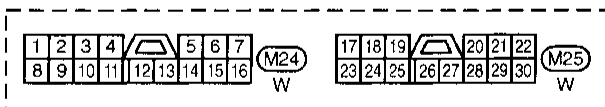
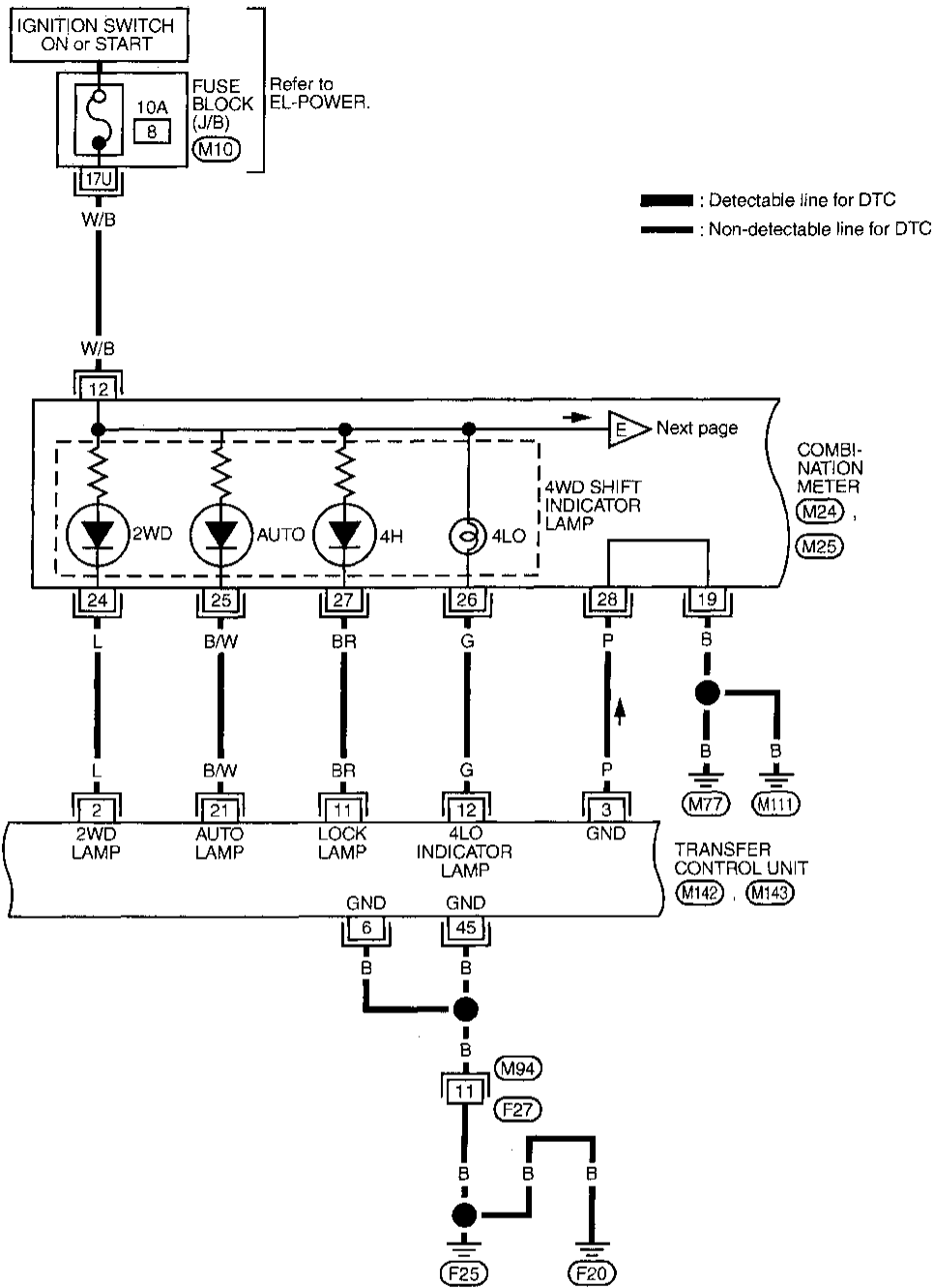
(M1) , (E1)

MTF038A

ALL-MODE 4WD SYSTEM

Wiring Diagram — TF — (Cont'd)

TF-T/F-03



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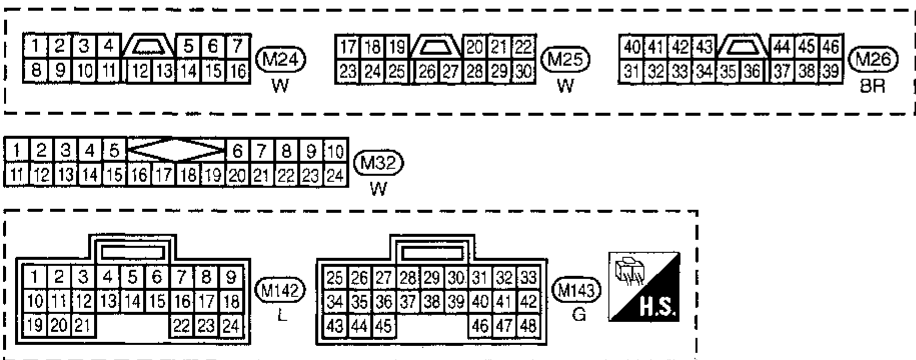
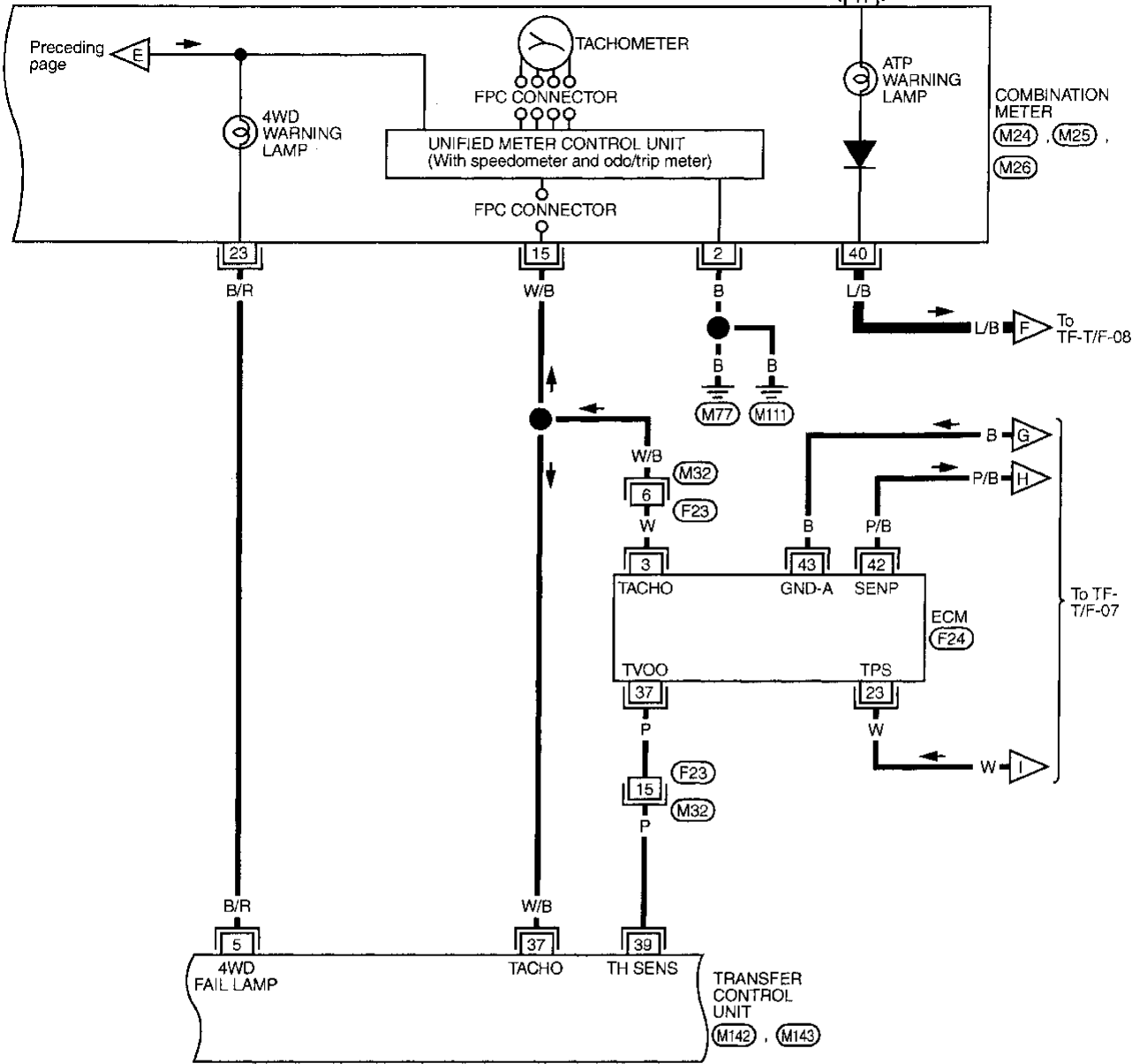
MTF039A

ALL-MODE 4WD SYSTEM

Wiring Diagram — TF — (Cont'd)

TF-T/F-04

: Detectable line for DTC
 : Non-detectable line for DTC



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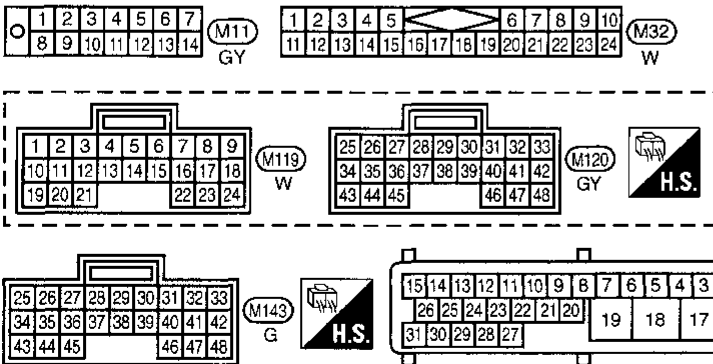
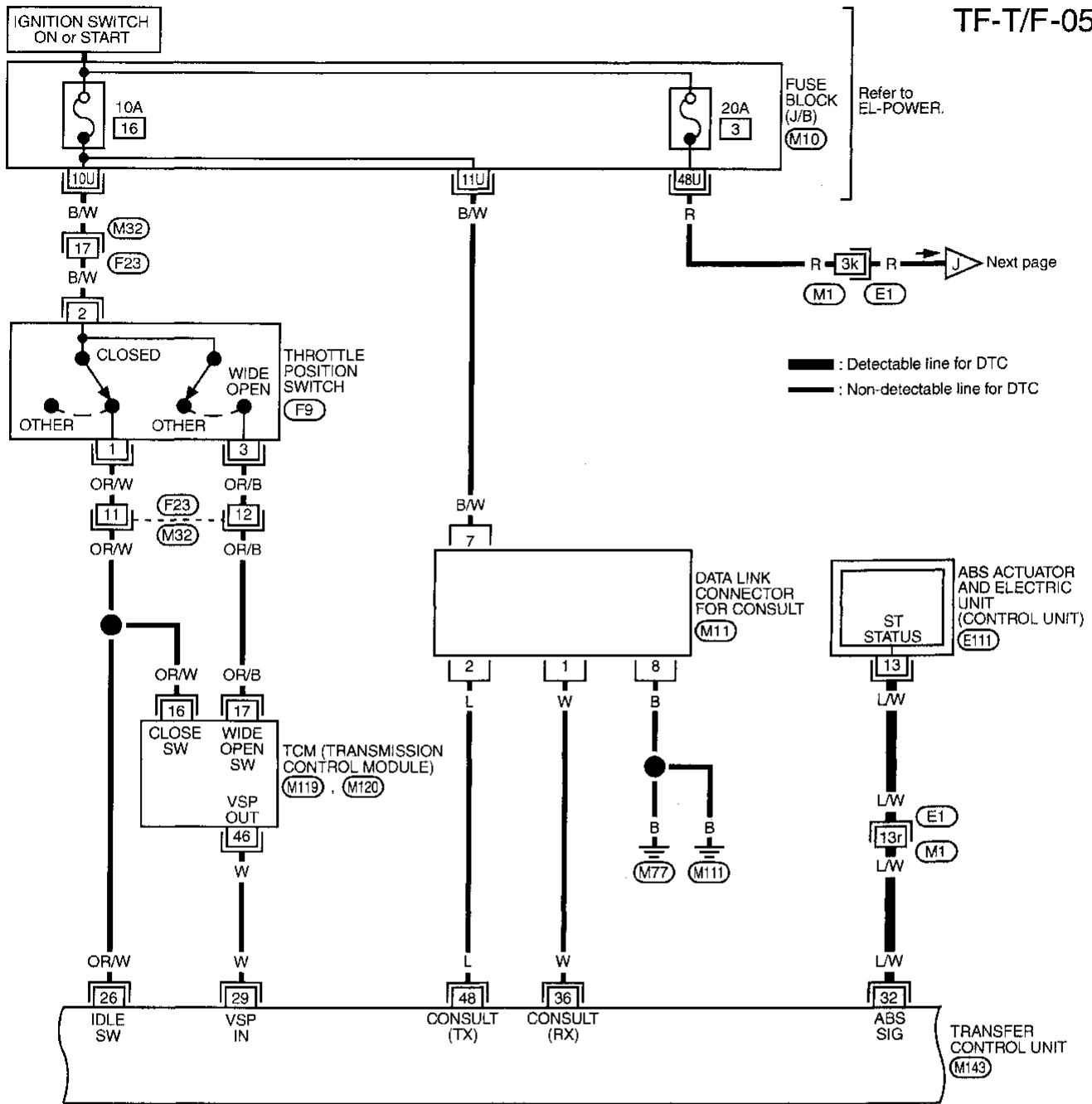
F24

MTF040A

ALL-MODE 4WD SYSTEM

Wiring Diagram — TF — (Cont'd)

TF-T/F-05



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(M1) (E1)
(M10)

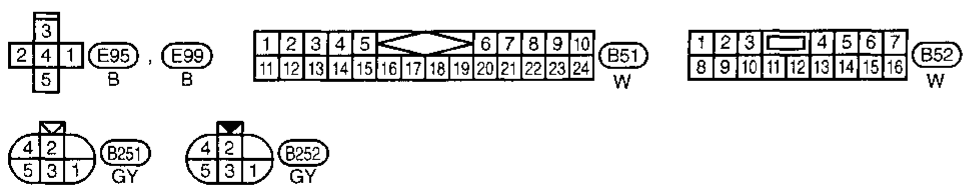
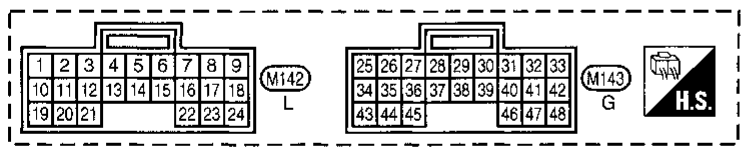
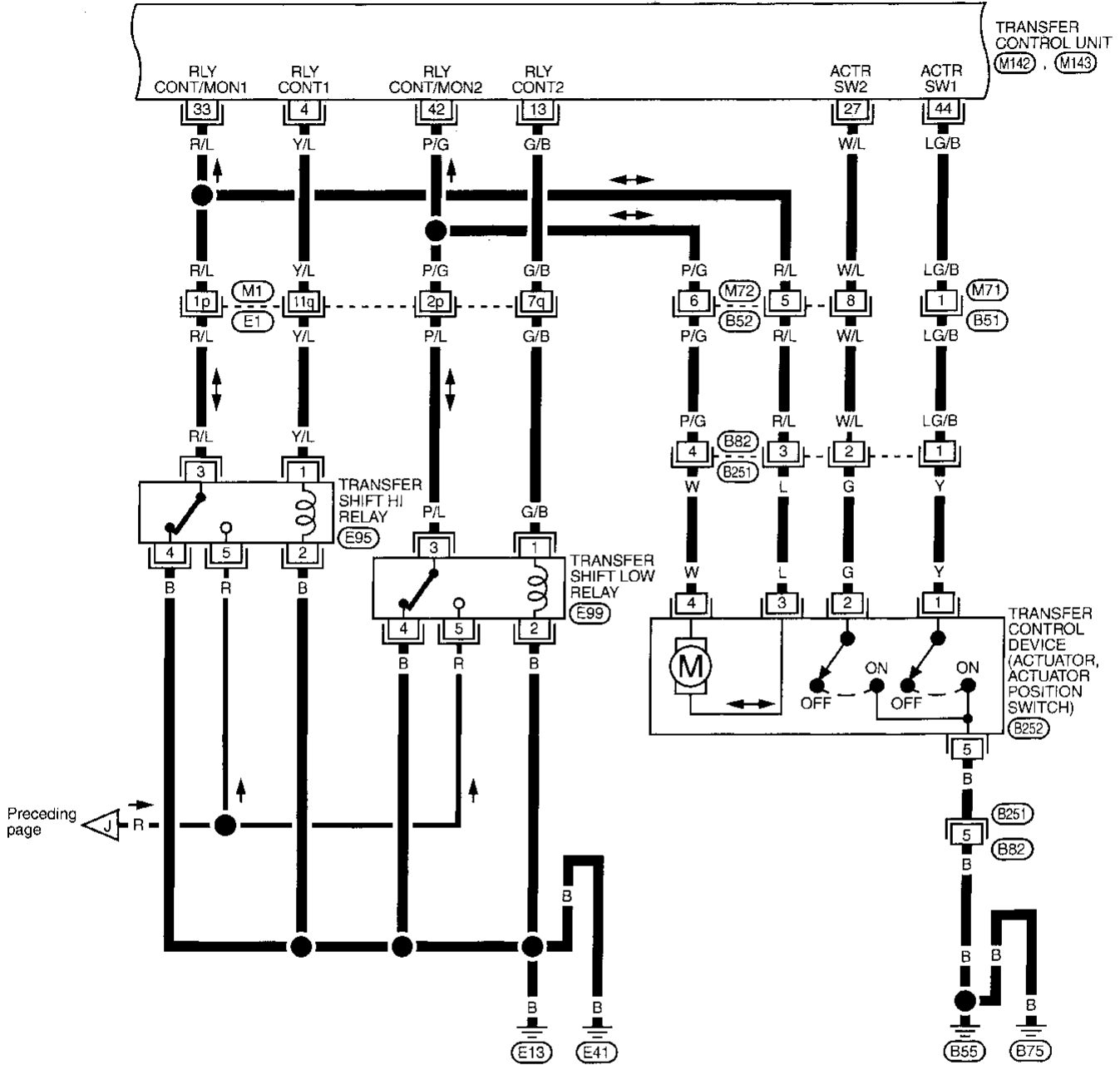
MTF041A

ALL-MODE 4WD SYSTEM

Wiring Diagram — TF — (Cont'd)

TF-T/F-06

: Detectable line for DTC
 : Non-detectable line for DTC



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(M1) (E1)

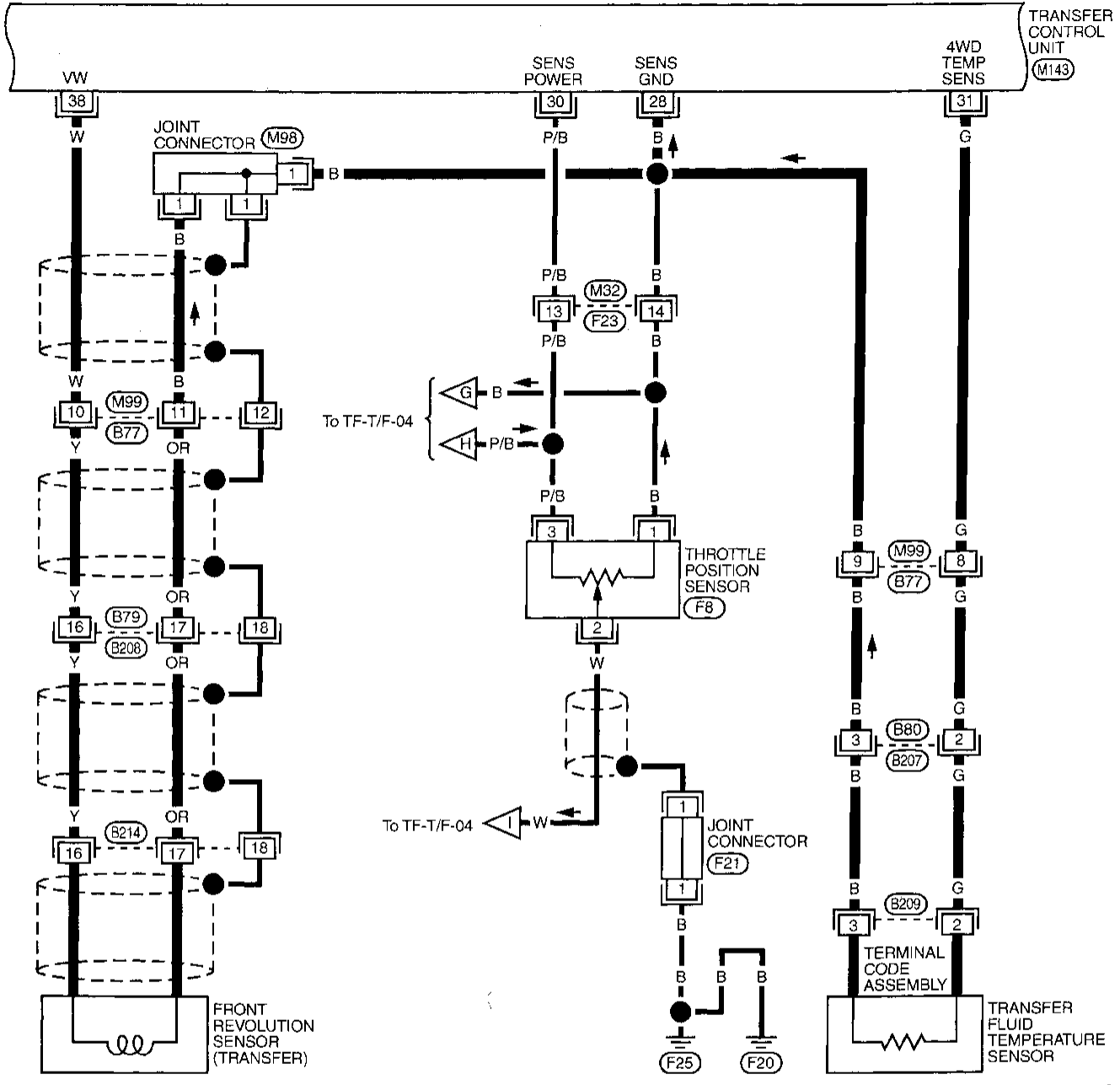
MTF042A

ALL-MODE 4WD SYSTEM

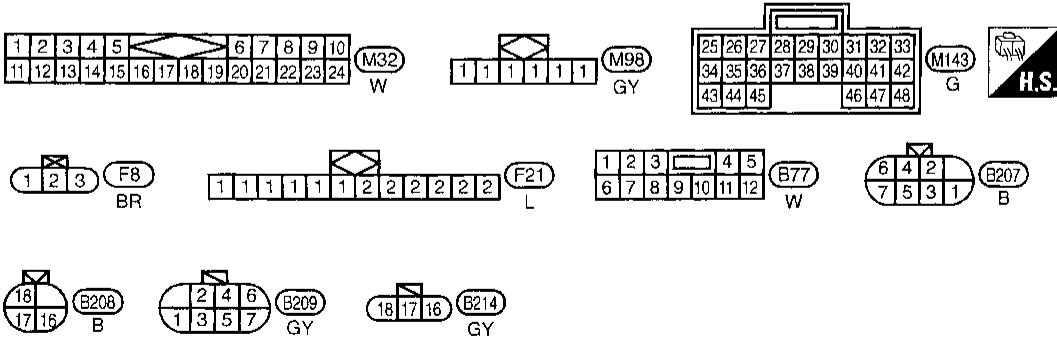
Wiring Diagram — TF — (Cont'd)

TF-T/F-07

— : Detectable line for DTC
 — : Non-detectable line for DTC



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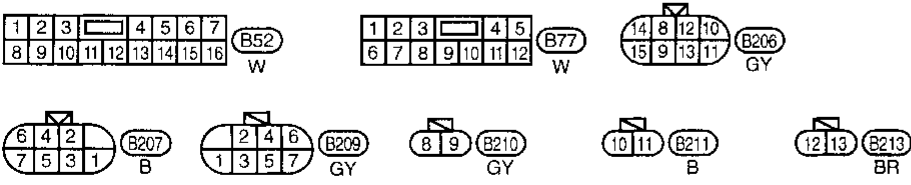
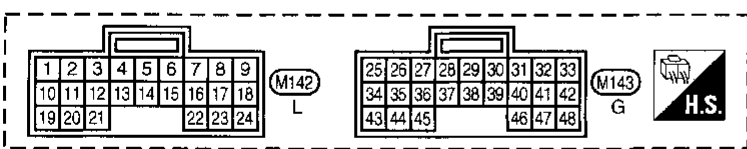
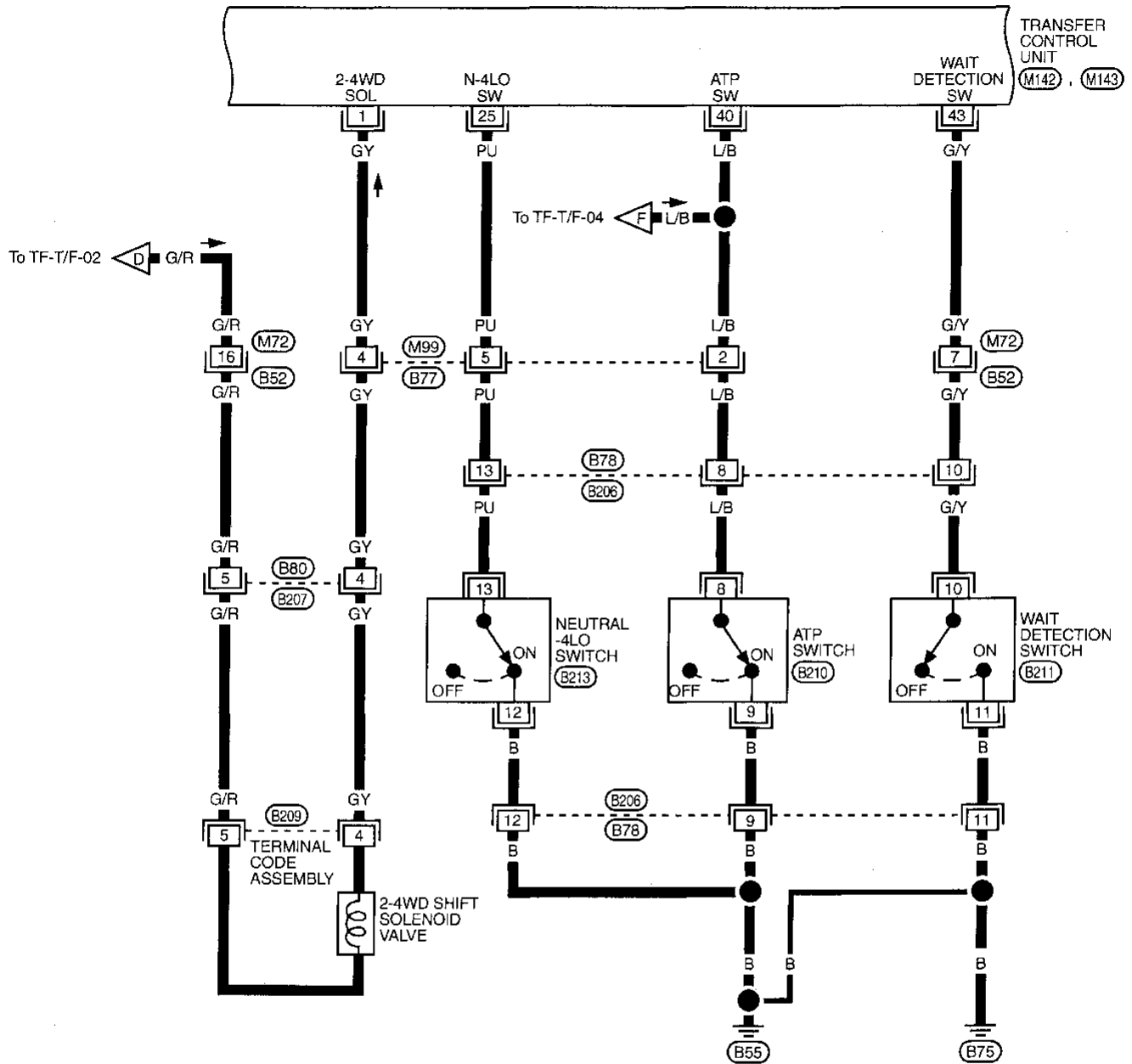
MTF043A

ALL-MODE 4WD SYSTEM

Wiring Diagram — TF — (Cont'd)

TF-T/F-08

: Detectable line for DTC
 : Non-detectable line for DTC

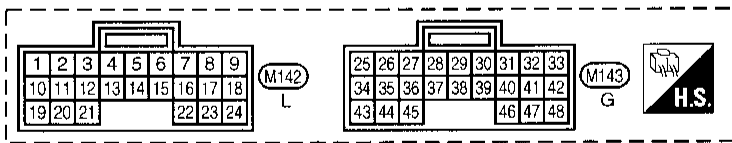
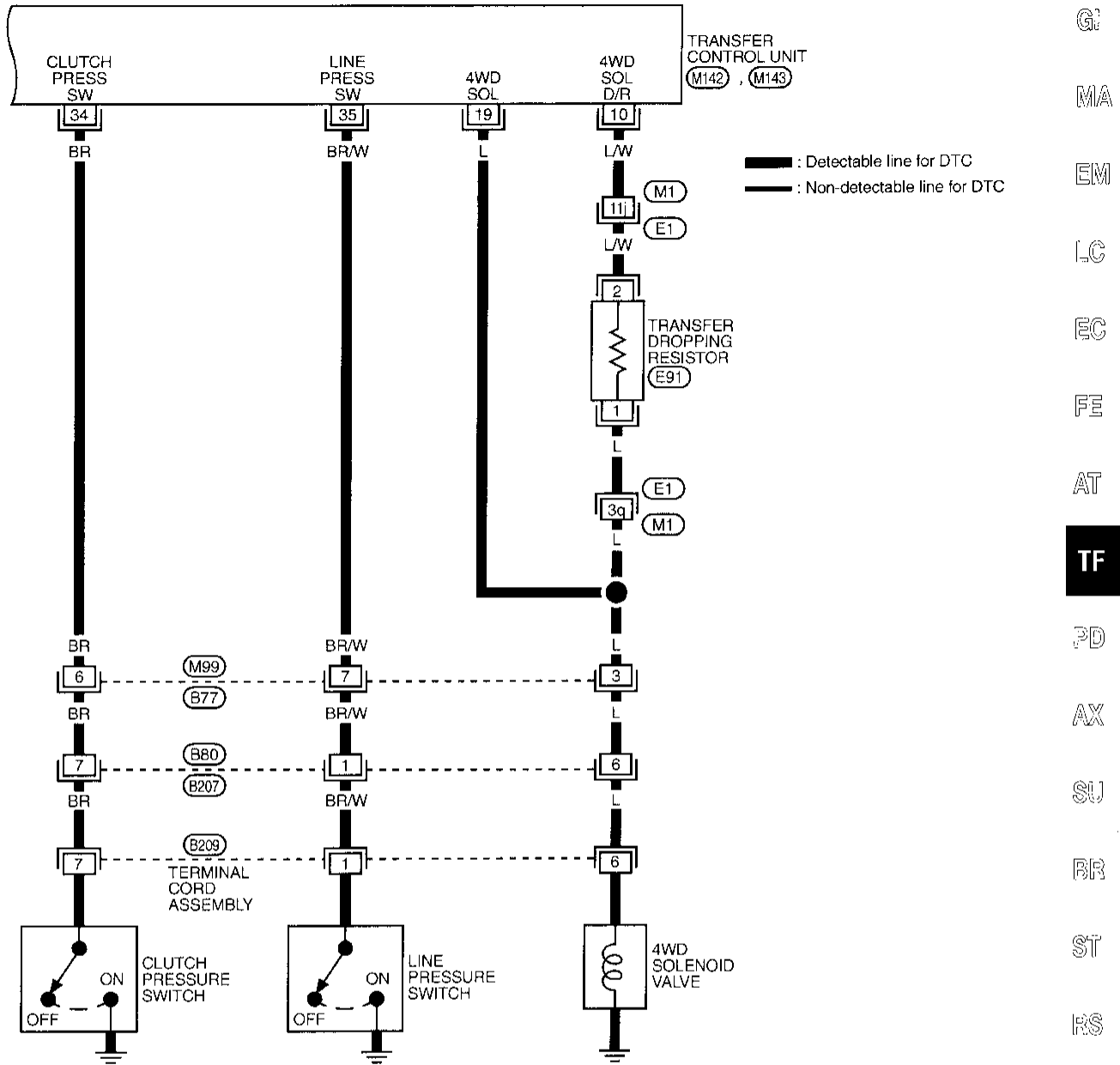


MTF044A

ALL-MODE 4WD SYSTEM

Wiring Diagram — TF — (Cont'd)

TF-T/F-09



Refer to last page (Foldout page).

(M1), (E1)

MTF045A

ON BOARD DIAGNOSTIC SYSTEM DESCRIPTION

Trouble Diagnosis without CONSULT

Trouble Diagnosis without CONSULT

NBTF0011

DESCRIPTION

NBTF0011S01

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.

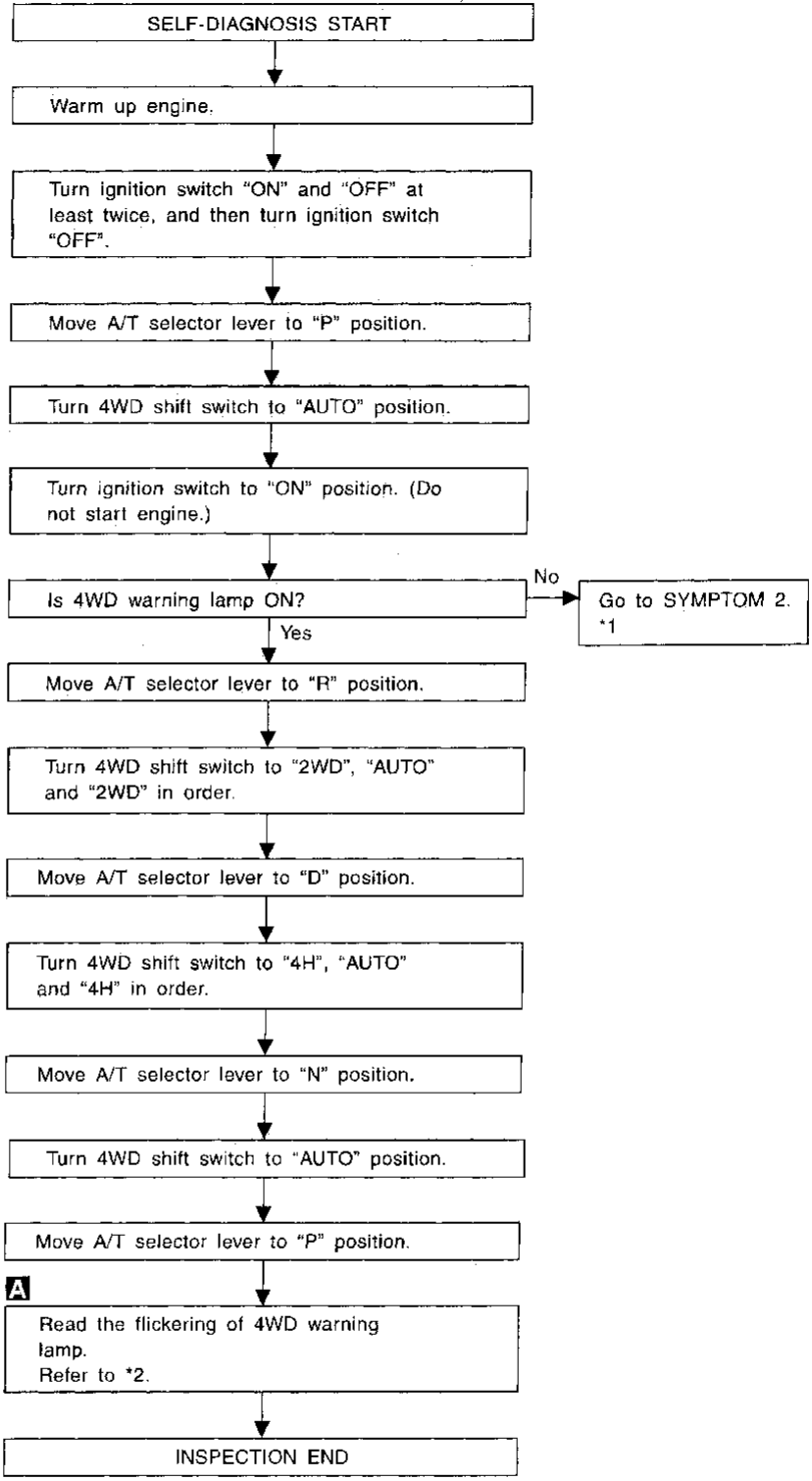
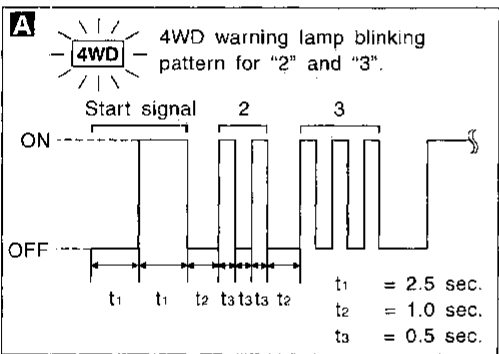
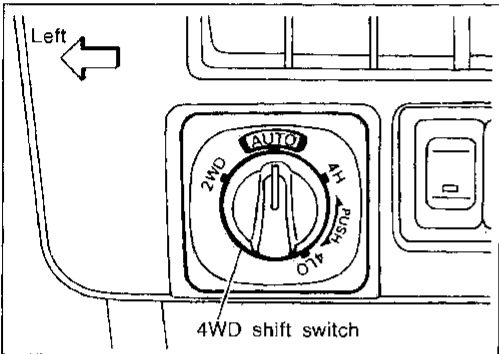
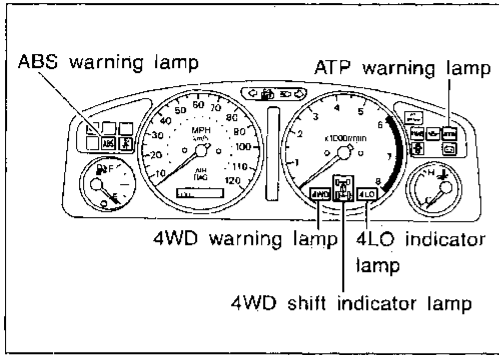
To locate the cause of a problem, start the self-diagnosis function. The 4WD warning lamp in the combination meter will indicate the problem area by flickering according to the self-diagnostic results. As for the details of the 4WD warning lamp flickering patterns, refer to TF-28.

ON BOARD DIAGNOSTIC SYSTEM DESCRIPTION

Trouble Diagnosis without CONSULT (Cont'd)

SELF-DIAGNOSTIC PROCEDURE

NBTF0011S02



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*1: TF-79

*2: TF-28

ON BOARD DIAGNOSTIC SYSTEM DESCRIPTION

Trouble Diagnosis without CONSULT (Cont'd)

INDICATIONS OF 4WD WARNING LAMP

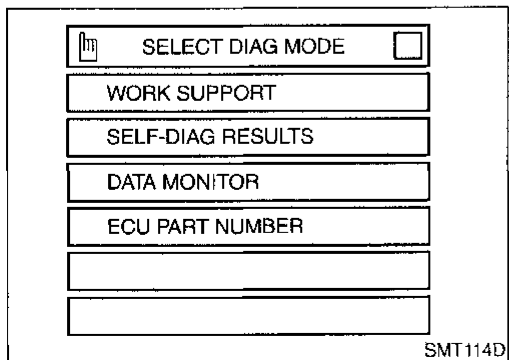
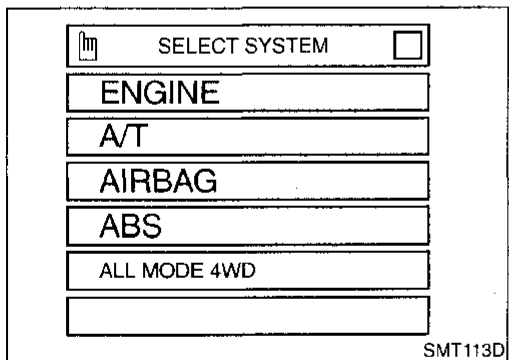
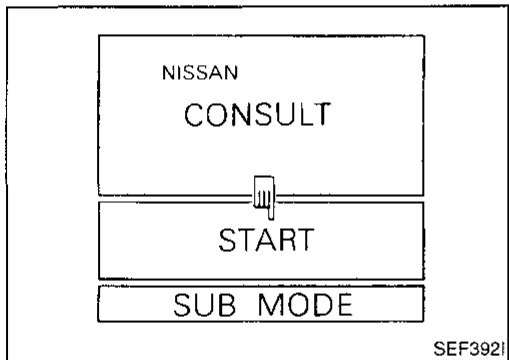
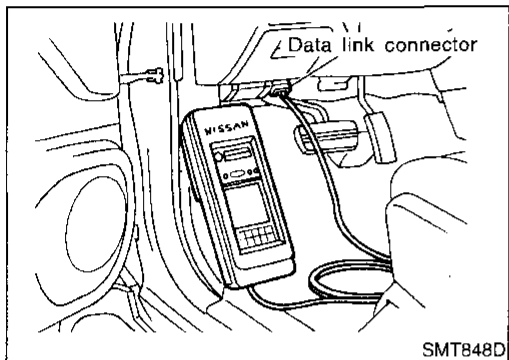
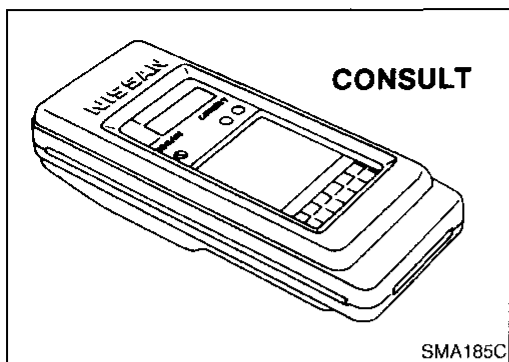
NBTF0011S03

Flickering pattern or flickering condition	Malfunction	Check items
1	Front revolution sensor circuit is shorted or open.	Revolution sensor (front) circuit, TF-54.
2	Rear revolution sensor circuit is shorted or open.	Revolution sensor (rear) (For vehicle speed sensor-A/T, refer to AT section.)
3	4WD solenoid valve circuit is shorted or open.	4WD solenoid valve circuit, TF-56.
4	2-4WD shift solenoid valve circuit is shorted or 2WD switch of 4WD shift switch is shorted.	2-4WD shift solenoid valve circuit or 4WD shift switch circuit, TF-57.
5	Transfer motor relay circuit is shorted or open.	Transfer motor relay circuit, TF-59.
8	Power supply voltage of throttle position sensor is improper. Or A/D converter of transfer control unit functions improperly.	Throttle position sensor (Refer to AT section.)
9	Transfer fluid temperature sensor circuit is open.	Transfer fluid temperature sensor circuit, TF-61.
10	Neutral-4LO switch circuit is shorted or open.	Neutral-4LO switch circuit, TF-63.
11	2-4WD shift solenoid valve circuit, 2WD switch of 4WD shift switch circuit or clutch pressure switch circuit is shorted or open.	2-4WD shift solenoid valve circuit, 4WD shift switch circuit or clutch pressure switch circuit, TF-57, 65.
12	Line pressure switch circuit is shorted or open.	Line pressure switch circuit, TF-67.
13	Engine speed signal circuit is shorted or open.	Engine speed signal (Refer to AT section.)
14	Throttle position sensor circuit is shorted or open.	Throttle position sensor (Refer to AT section.)
15	Failure in power supply circuit of transfer control unit.	Power supply of transfer control unit
16	4WD shift switch circuit is shorted.	4WD shift switch circuit, TF-57.
17	ABS operation signal circuit is shorted.	ABS operation signal circuit, TF-69.
18	ATP switch, wait detection switch or neutral-4LO switch circuit is shorted or open.	ATP switch, wait detection switch or neutral-4LO switch circuit*, TF-63.
19	Transfer control device actuator motor is faulty. (Abnormalities are detected when actuator motor fails to operate while shifting from "4H" to "4LO" or vice versa.)	Actuator motor and motor circuit, TF-91, 72.
20	Transfer control device actuator motor arm position sensing switch is faulty.	Actuator motor arm position sensing switch and sensing switch circuit, TF-91, 74.
21	Transfer control device actuator circuit is faulty (Abnormalities are detected when motor relay circuit is open/shorted or relay monitor circuit is open/shorted.)	Actuator motor, actuator motor arm position sensing switch and their associated circuits, TF-90, 91 and 76.
Repeats flickering every 2 to 5 sec.	Circuits that the self-diagnosis covers have no malfunction.	—
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. 	Data erase/display circuit, TF-71.
No flickering	PNP switch or 4WD shift switch circuit is shorted or open.	PNP switch (Refer to AT section.) or 4WD shift switch circuit, TF-57.

*: If revolution sensor malfunction is simultaneously detected, check revolution sensor first.

ON BOARD DIAGNOSTIC SYSTEM DESCRIPTION

Trouble Diagnosis with CONSULT



Trouble Diagnosis with CONSULT SELF-DIAGNOSIS CONSULT Setting Procedure

=NBTF0012

NBTF0012S01

NBTF0012S0101

1. Turn ignition switch to "OFF" position.
2. Connect CONSULT to data link connector for CONSULT. Data link connector for CONSULT is located in instrument lower panel on driver side.
3. Start engine.
4. On CONSULT screen, touch "START".
5. Touch "ALL MODE 4WD" on SELECT SYSTEM screen.
6. Touch "SELF-DIAG RESULTS" on SELECT DIAG MODE screen.

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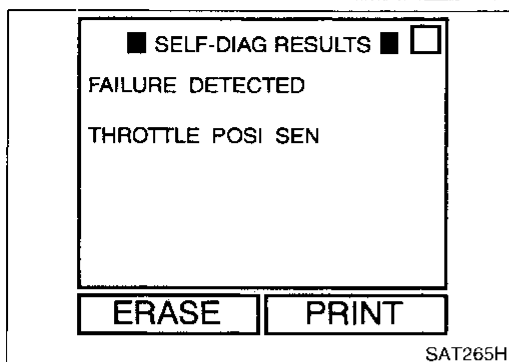
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ON BOARD DIAGNOSTIC SYSTEM DESCRIPTION

Trouble Diagnosis with CONSULT (Cont'd)



7. Self-diagnostic results are displayed.

SELF-DIAGNOSTIC ITEMS

NBTF0012S02

Detected items (Screen terms for CONSULT, "SELF-DIAG RESULT" mode)	Malfunction is detected when...	Check items
Revolution sensor (front) (Note 3) (VHCL SPEED SEN-FR)	<ul style="list-style-type: none"> ● Front revolution sensor (installed on T/F) signal is not input due to open circuit. ● Improper signal is input while driving. 	Revolution sensor (front) circuit, TF-54.
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. 	Revolution sensor (rear) (For vehicle speed sensor-A/T, refer to AT section.)
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. 	4WD solenoid valve, TF-56.
2-4WD shift solenoid valve (2-4WD SOLENOID)		2-4WD shift solenoid valve or 4WD shift switch circuit, TF-57.
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. 	Transfer motor relay circuit, TF-59.
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. 	Transfer fluid temperature sensor circuit, TF-61.
Neutral-4LO switch (N POSI SW TF)	<ul style="list-style-type: none"> ● Improper signal is input while driving. 	Neutral-4LO switch, TF-63.
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. 	Clutch pressure switch circuit (*1), TF-65.
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. 	Line pressure switch circuit (*1), TF-67.
Engine speed signal (Note 1) (ENGINE SPEED SIG)	<ul style="list-style-type: none"> ● Engine speed is abnormally low while driving. 	Engine speed signal (Refer to AT section.)
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. 	Throttle position sensor (Refer to AT section.)
Transfer control unit (ADC) C/U (ADC)/THRTL SEN	<ul style="list-style-type: none"> ● Power supply voltage for throttle position sensor is improper or A/D converter system of transfer control unit is faulty. 	Throttle position sensor (Refer to AT section.)
Battery voltage (Note 1) (BATTERY VOLTAGE)	<ul style="list-style-type: none"> ● Power supply voltage for transfer control unit is abnormally low while driving. 	Power supply circuit (Refer to AT section.)
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. 	4WD shift switch circuit, TF-57.
ABS operation signal (ABS OPER SIGNAL)	<ul style="list-style-type: none"> ● ABS operation signal is continuously input due to short circuit in ABS operation signal line. 	ABS operation signal circuit, TF-69.

ON BOARD DIAGNOSTIC SYSTEM DESCRIPTION

Trouble Diagnosis with CONSULT (Cont'd)

Detected items (Screen terms for CONSULT, "SELF-DIAG RESULT" mode)	Malfunction is detected when...	Check items	
Wait detection switch (Note 2) (WAIT DETECT SWITCH)	<ul style="list-style-type: none"> Improper signal is input due to open or short circuit. 	ATP switch, wait detection switch and neutral-4LO switch circuits (*2), TF-63.	GI MA
Shift actuator abnormal (SHIFT ACT)	Transfer control device actuator motor is faulty. (Abnormalities are detected when actuator motor fails to operate while shifting from "4H" to "4LO" or vice versa.)	Actuator motor and motor circuit, TF-91, 72.	EM
Shift actuator position switch abnormal (SHIFT ACT P/S)	Transfer control device actuator motor arm position sensing switch is faulty.	Actuator motor arm position sensing switch and sensing switch circuit, TF-91, 74.	LC
Shift actuator circuit abnormal (SHIFT ACT CIR)	Transfer control device actuator circuit is faulty (Abnormalities are detected when motor relay circuit is open/shorted or relay monitor circuit is open/shorted.)	Actuator motor, actuator motor arm position sensing switch and their associated circuits, TF-90, 91 and 76.	EC FE
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. 	Data erase/display circuit, TF-71.	AT
Transfer control unit (RAM) [CONTROL UNIT (RAM)]	<ul style="list-style-type: none"> Failure is detected in the memory (RAM) system of transfer control unit. 		TF
Transfer control unit (ROM) [CONTROL UNIT (ROM)]	<ul style="list-style-type: none"> Failure is detected in the memory (ROM) system of transfer control unit. 		PD
Transfer control unit (EEPROM) [CONTROL UNIT (EEPROM)]	<ul style="list-style-type: none"> Failure is detected in the memory (EEPROM) system of transfer control unit. 		AX

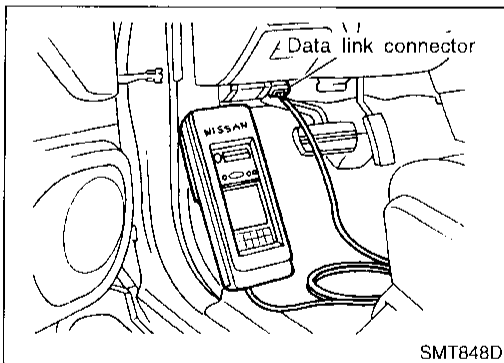
Note 1: When a malfunction occurs, it is only displayed and not stored in the memory.

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.

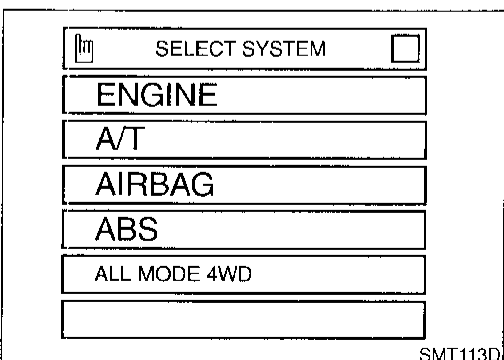


DATA MONITOR CONSULT Setting Procedure

NBTF0012S03

NBTF0012S0301

- Turn ignition switch to "OFF" position.
- Connect CONSULT to data link connector for CONSULT. Data link connector for CONSULT is located in instrument lower panel on driver side.
- Turn ignition switch to "ON" position.
- Touch "START".
- Touch "ALL MODE 4WD".



ON BOARD DIAGNOSTIC SYSTEM DESCRIPTION

Trouble Diagnosis with CONSULT (Cont'd)

SAT671C

6. Touch "DATA MONITOR".

SAT902H

7. Touch "SETTING" to set record conditions.

SAT297C

8. Touch "LONG TIME" and then "ENTER" key.

9. Return to SELECT MONITOR ITEM screen and touch "MAIN SIGNALS".

10. Touch "START".

SMT047D

11. Monitored data are displayed.

DATA MONITOR ITEMS

○: Standard ▼: Option NBTF0012S04

Item [Unit]	Monitor item			Remarks
	ECU input signals	Main signals	Item menu selection	
Revolution sensor-front [km/h (MPH)]	○		▼	Revolution sensor installed on T/F
Revolution sensor-rear [km/h (MPH)]	○		▼	Vehicle speed sensor-A/T
Engine speed [rpm]	○		▼	

ON BOARD DIAGNOSTIC SYSTEM DESCRIPTION

Trouble Diagnosis with CONSULT (Cont'd)

Item [Unit]	Monitor item			Remarks	
	ECU input signals	Main signals	Item menu selection		
Throttle position sensor [V]	○		▼		GI
Transfer fluid temperature sensor [V]	○		▼		MA
Battery voltage [V]	○		▼		EM
2WD switch [ON-OFF]	○		▼	2WD switch of 4WD shift switch	
AUTO switch [ON-OFF]	○		▼	AUTO switch of 4WD shift switch	LC
Lock switch [ON-OFF]	○		▼	4H switch of 4WD shift switch	
4L switch [ON-OFF]	○		▼	4LO switch of 4WD shift switch	EC
N position switch TF [ON-OFF]	○		▼	N position switch of transfer	
Line pressure switch [ON-OFF]	○		▼	Line pressure switch	FE
Clutch pressure switch [ON-OFF]	○		▼	Clutch pressure switch	
ATP switch [ON-OFF]	○		▼		AT
N position switch [ON-OFF]	○		▼	"N" position on A/T PNP switch	
R position switch [ON-OFF]	○		▼	"R" position on A/T PNP switch	TF
P position switch [ON-OFF]	○		▼	"P" position on A/T PNP switch	
Closed throttle position switch [ON/OFF]	○		▼	Idle contact of throttle position switch	PD
ABS operation switch [ON-OFF]	○		▼	ABS operation switch	AX
Wait detection switch [ON-OFF]	○		▼		
Throttle opening		○	▼	Throttle opening recognized by transfer control unit	SU
4WD-mode		○	▼	4WD-mode recognized by transfer control unit (2W, AUTO, 4H & 4LO)	BR
Vehicle speed [km/h (MPH)]		○	▼	Vehicle speed recognized by transfer control unit	ST
*Control torque [N·m (kg·m, ft·lb)]		○	▼	Calculated torque recognized by transfer control unit	RS
Duty solenoid valve [%] (Transfer 4WD solenoid valve)		○	▼		
2-4WD shift solenoid valve [ON-OFF]		○	▼	Control signal outputs of transfer control unit	BT
Transfer motor relay [ON-OFF]		○	▼		HA
Shift activating 1 [ON-OFF]		○	▼		
Shift activating 2 [ON-OFF]		○	▼		SC
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]			▼		EL
Shift activating monitor 1 [ON-OFF]			▼		
Shift activating monitor 2 [ON-OFF]			▼		IDX
4WD fail lamp [ON-OFF]		○	▼	Transfer control unit control signal output for 4WD warning lamp (left)	
Shift position switch 1 [ON-OFF]	○		▼		

ON BOARD DIAGNOSTIC SYSTEM DESCRIPTION

Trouble Diagnosis with CONSULT (Cont'd)

Item [Unit]	Monitor item			Remarks
	ECU input signals	Main signals	Item menu selection	
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)
Offset at starting			▼	Starting torque offset value set in WORK SUPPORT
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.
Pulse [ms, Hz or %]			▼	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.

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

REFERENCE VALUE IN DATA MONITOR MODE

NBTF0012509

Indicated items (Screen terms for CONSULT, “DATA MONITOR” mode)	Display	Conditions
Throttle position sensor (THRTL POS SEN)	Approx. 0.5 - 4.0V	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)
Closed throttle position switch (CLOSED THL/SW)	ON	After engine warm-up, accelerator pedal is released.
	OFF	After engine warm-up, accelerator pedal is depressed.
ABS operation switch (ABS OPER SW)	OFF	ABS is not operating.
	ON	ABS is operating.
ABS control operation (ABS CONT OPER)	ON	ABS OPER SW is “ON”. Control operation is accomplished in combination with ABS.
	OFF	ABS is not operating. When a message such as “improper ABS operation signal” appears on the display and ABS OPER SW is “ON”, control operation is not accomplished in combination with ABS.
2WD position (2WD SW)	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

ON BOARD DIAGNOSTIC SYSTEM DESCRIPTION

Trouble Diagnosis with CONSULT (Cont'd)

Indicated items (Screen terms for CONSULT, "DATA MONITOR" mode)	Display	Conditions			
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	OFF		ON	
	Wait detection switch	OFF		ON	
	See Note.				
Note: When shifting from "4LO" to "2WD", "AUTO", "4H", it turns ON when "Wait" function is operating (and it turns OFF when "Wait" function is canceled).					
Transfer motor relay (MOTOR RELAY)	Throttle valve	4WD shift switch	A/T selector lever	Motor relay	Remarks
	Fully closed	2WD	—	OFF	ON for approx. 2 sec. after shifting to "P" and "N"
		AUTO, 4LO	P, N	OFF	
			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.)			
Control torque (COMP CL TORQ)	0 kg-m	4WD shift switch (“Wait” function is not operating.)		In "2WD" position	
	39 - 1,079 N·m (4 - 110 kg-m, 29 - 796 ft-lb)			In "AUTO" position	
	1,079 N·m (110 kg-m, 796 ft-lb)			In "4H" or "4LO" position	
4WD solenoid (DUTY SOLENOID)	4%	4WD shift switch		In "2WD" position	
	94 - 4%			In "AUTO" position	
	4%			In "4H" or "4LO" position	
2-4WD shift solenoid valve (2-4WD SOL)	OFF	4WD shift switch		In "2WD" position	
	ON ("Wait" function is not operating.)			In "AUTO" position	
	OFF ("Wait" function is operating.)			In "4H" position	
	ON ("Wait" function is not operating.)				
	OFF ("Wait" function is operating.)				
ON	In "4LO" position				

ON BOARD DIAGNOSTIC SYSTEM DESCRIPTION

Trouble Diagnosis with CONSULT (Cont'd)

Indicated items	Display	Conditions	
Battery voltage	Approx. 12V	Key switch "ON" and engine at rest	
	Approx. 13 - 14V	During idling	
AUTO switch	OFF	4WD shift switch in other than "AUTO" position	
	ON	4WD shift switch in "AUTO" position	
4L switch	OFF	4WD shift switch in other than "4LO" position	
	ON	4WD shift switch in "4LO" position	
N position switch	OFF	A/T selector lever in other than "N" position	
	ON	A/T selector lever in "N" position	
R position switch	OFF	A/T selector lever in other than "R" position	
	ON	A/T selector lever in "R" position	
P position switch	OFF	A/T selector lever in other than "P" position	
	ON	A/T selector lever in "P" position	
Throttle opening	0.0/8 - 8.0/8	Throttle fully closed (0.0/8) or throttle fully open (8.0/8)	
4WD-mode	2WD	4WD shift switch	In "2WD" position
	AUTO		In "AUTO" position
	LOCK		In "4H" position
	4L		In "4LO" position
Front wheel speed	0 - 255 km/h (0 - 158 MPH)	0 km/h (vehicle at standstill)	
Rear wheel speed	0 - 255 km/h (0 - 158 MPH)	0 km/h (vehicle at standstill)	
Shift ACTR operating 1, Shift activating monitor 1	OFF	During normal operation	
	ON	During shifts from "4H" to "4LO" position	
Shift ACTR operating 2, Shift activating monitor 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	OFF	4WD shift switch in "4H" position and A/T selector lever in "AUTO" position during 2WD-mode operation	
	ON	4WD shift switch in "4LO" position	
Shift ACTR position sensing switch 2	OFF	4WD shift switch in "4LO" position	
	ON	4WD shift switch in "4H" position and A/T selector lever in "AUTO" position during 2WD-mode operation	
2WD indicator lamp	OFF	Engine at rest or system out of order	
	ON	Except the above condition	
AUTO indicator lamp	OFF	Engine at rest during 2WD-mode operation or system out of order	
	ON	4WD shift switch in "4LO" or "4H" position and A/T selector lever in "AUTO" position	

ON BOARD DIAGNOSTIC SYSTEM DESCRIPTION

Trouble Diagnosis with CONSULT (Cont'd)

Indicated items	Display	Conditions
LOCK indicator lamp	OFF	Engine at rest and A/T selector lever in "AUTO" position during 2WD-mode operation or system out of order
	ON	4WD shift switch in "4H" or "4LO" position
4L indicator lamp	OFF	Engine at rest and A/T selector lever in "AUTO" position during 2WD-mode operation or system out of order
	ON	4WD shift switch in "4LO" position

WORK SUPPORT

Purpose

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

- Tight corner braking symptom after accelerator (throttle) opening (Note 1)
- Vibration when accelerating on a low μ road (snow-covered or icy road) (Note 2)

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

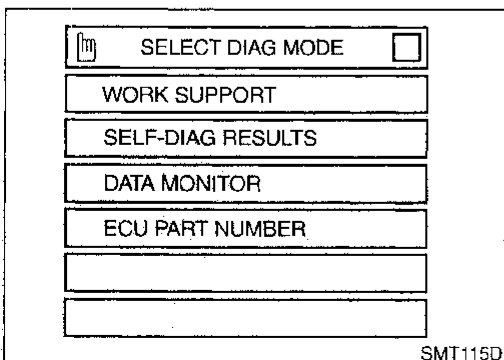
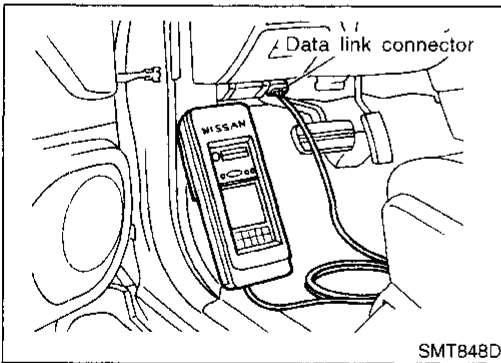
(Priority of change is placed first on "CLUTCH FORCE RELEASE LIMIT VALUE", and then "STARTING TORQUE OFFSET VALUE".)

NOTE:

- 1) When the accelerator is slightly open (approx. 1/8) or fully closed after being opened. The tight corner braking symptom during idle creep driving with accelerator fully closed cannot be solved by this method. Refer to SYMPTOM 8, TF-84.
- 2) A slight shock is felt at a few hertz as if it were being pushed lightly from behind.

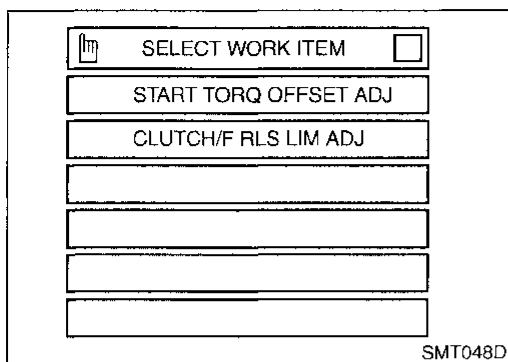
CONSULT Setting Procedure

1. Turn ignition switch to "OFF" position.
2. Connect CONSULT to data link connector for CONSULT. Data link connector for CONSULT is located in instrument lower panel on driver side.
3. Turn ignition switch to "ON" position.
4. Touch "START".
5. Touch "ALL MODE 4WD".
6. Touch "WORK SUPPORT".



ON BOARD DIAGNOSTIC SYSTEM DESCRIPTION

Trouble Diagnosis with CONSULT (Cont'd)



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

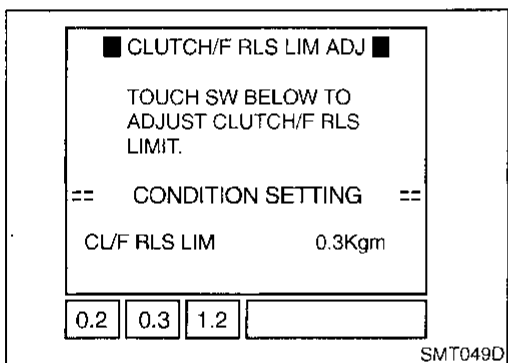
CLUTCH FORCE RELEASE LIMIT ADJUSTMENT

NBTF0012S07

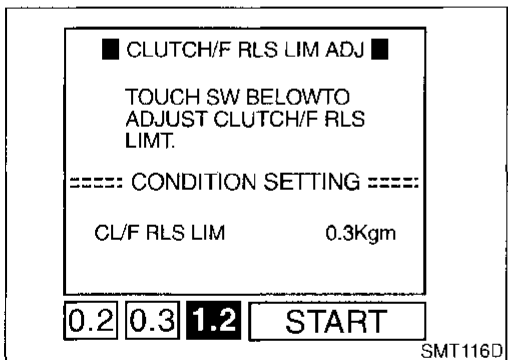
1.2 kg-m: Tight corner braking symptom is alleviated. However, vibration may occur when accelerating on a low μ road (icy road, etc.).

0.3 kg-m: Initial set value

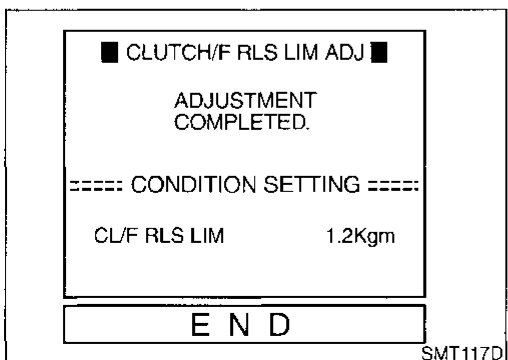
0.2 kg-m: Do not set to this value because the tight corner braking symptom will get worse.



1. Current CLUTCH FORCE RELEASE LIMIT value "0.3 kg-m" appears under "CONDITION SETTING" on CONSULT display.



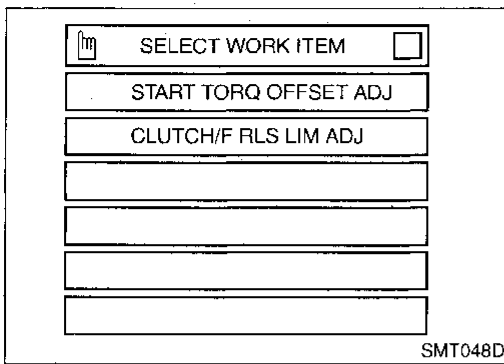
2. Touch "1.2", then "START".



3. When clutch force release limit value is set to "1.2 kg-m", current value "0.3 kg-m" shown on display will be replaced by "1.2 kg-m" and "END" will appear at the same time. Clutch force release limit value setting is now complete.

ON BOARD DIAGNOSTIC SYSTEM DESCRIPTION

Trouble Diagnosis with CONSULT (Cont'd)



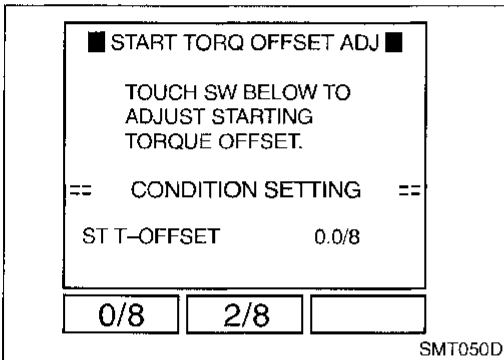
STARTING TORQUE OFFSET ADJUSTMENT

NBTF0012S08

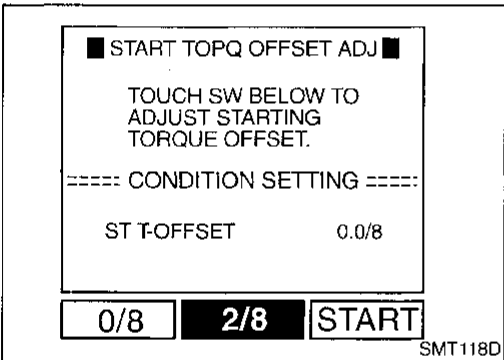
0.0/8: Initial set value

2/8: Tight corner braking symptom is alleviated. However, vehicle acceleration performance from standstill will get worse on a low μ road (snow-covered or icy road).

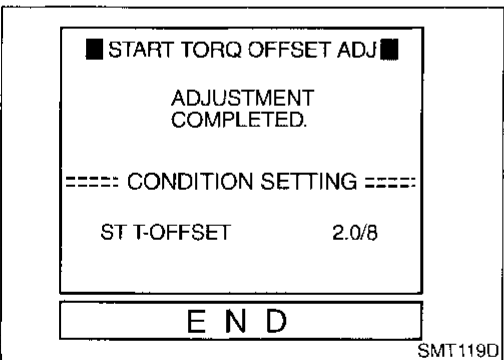
1. Return to "SELECT WORK ITEM" on CONSULT display. Touch "START TORQ OFFSET ADJ".



2. Current START TORQUE OFFSET value "0.0/8" appears under "CONDITION SETTING" on display.



3. Touch "2/8" to adjust the starting torque offset from "0.0/8" to "2.0/8".



4. When start torque offset value is set to "2.0/8", current value "0.0/8" will be replaced by "2.0/8" and "END" will appear at the same time. Start torque offset value setting is now complete.

CI
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TROUBLE DIAGNOSIS — INTRODUCTION

Introduction

Introduction

NBTF0013

DESCRIPTION

NBTF0013S01

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.

DIAGNOSTIC WORKSHEET

NBTF0013S02

Information from Customer

NBTF0013S0201

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 ATX14A	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 "LOCK".	
	<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

TROUBLE DIAGNOSIS — INTRODUCTION

Introduction (Cont'd)

Diagnostic Worksheet

NBTF0013S0202

1.	<input type="checkbox"/> Listen to customer complaints.	TF-43	GI	
2.	<input type="checkbox"/> Check transfer fluid.	TF-43	MA	
	<input type="checkbox"/> Leakage <input type="checkbox"/> Fluid condition <input type="checkbox"/> Fluid level			
3.	<input type="checkbox"/> Road testing	TF-43	EM	
	<input type="checkbox"/> 1. Check before engine is started.			LC
	<input type="checkbox"/> 2. Check at idle. <input type="checkbox"/> 3. Cruise test			
4.	<input type="checkbox"/> Perform self-diagnosis NG items (with CONSULT and without CONSULT).	TF-29, TF-26	EC	
5.	<input type="checkbox"/> Check component. Repair or replace the damaged parts.	TF-87		
6.	<input type="checkbox"/> Perform final check. Perform road test (1 through 3).	TF-43	FE	

AT

TF

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BR

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RS

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SC

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IDX

TROUBLE DIAGNOSIS — INTRODUCTION

Work Flow

Work Flow

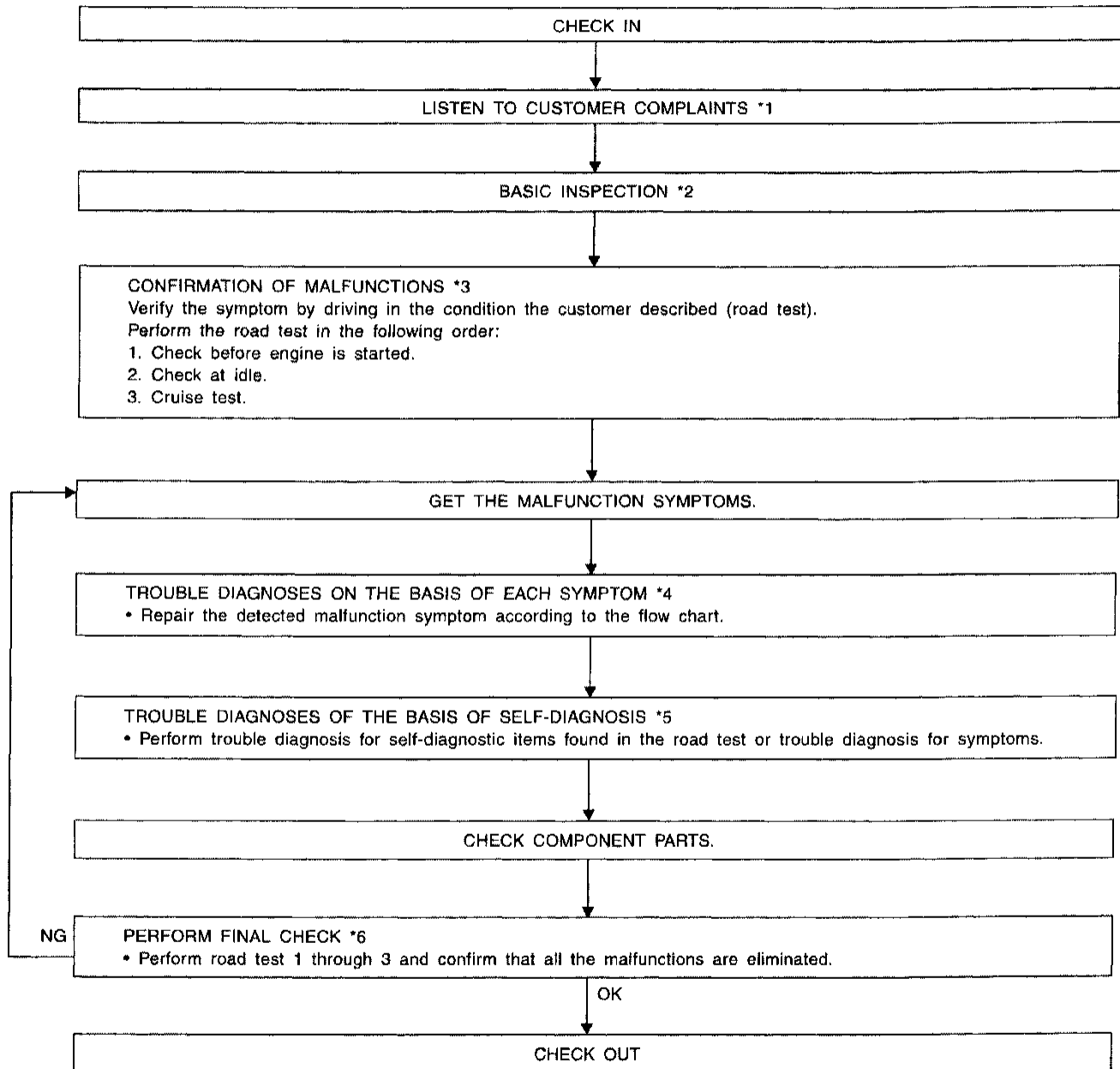
=NBTF0014

HOW TO PERFORM TROUBLE DIAGNOSES FOR QUICK AND ACCURATE REPAIR

NBTF0014S01

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-40.) and "Diagnostic Worksheet" (Refer to TF-41.), to perform the best troubleshooting possible.



MTF013A

*1: TF-43

*3: TF-43

*5: TF-54 - TF-71

*2: TF-43

*4: TF-78 - TF-85

*6: TF-43

Listen to Customer Complaints

NBTF0015

- 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.

GI

MA

EM

LC

Transfer Fluid Check

NBTF0016

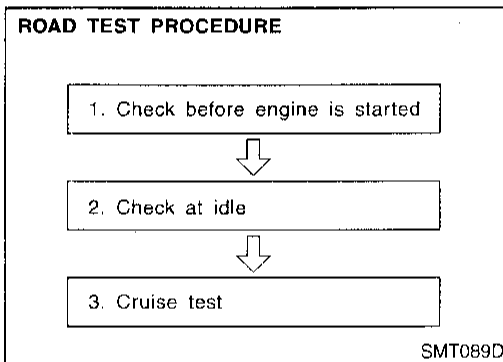
- Check fluid for leaks and fluid level. Refer to MA section ("CHASSIS AND BODY MAINTENANCE").

EC

FE

AT

TF



Road Test

NBTF0017

PREPARATION FOR ROAD TEST

NBTF001/S01

- The purpose of the test is to determine overall performance of transfer and analyze causes of problems.
- The road test consists of the following three parts:
- When a malfunction is found in any part of transfer, perform the road test to locate the malfunction area and repair the malfunction 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-41.

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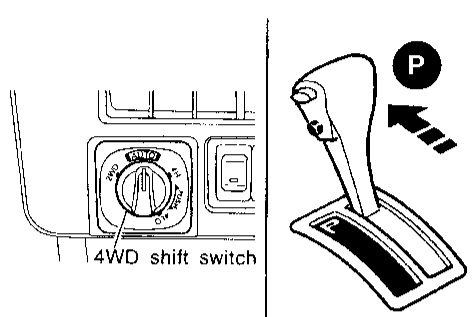
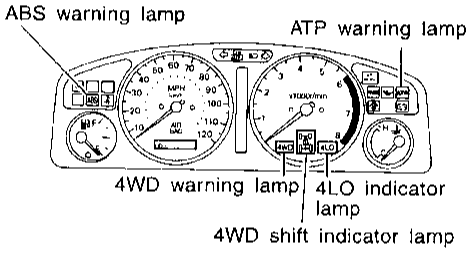
IDX

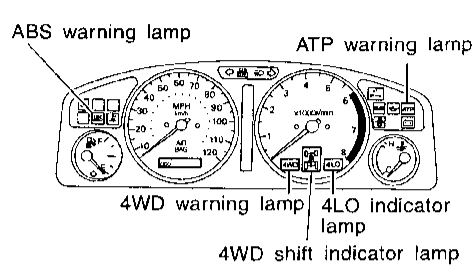
TROUBLE DIAGNOSIS — BASIC INSPECTION

Road Test (Cont'd)

1. CHECK BEFORE ENGINE IS STARTED

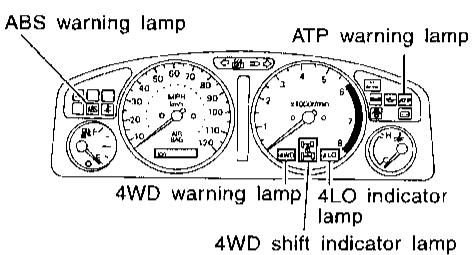
=NBTF0017S02

1	CHECK 4WD SHIFT INDICATOR LAMP
<ol style="list-style-type: none"> 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. 	
 <p style="text-align: center;">4WD shift switch</p> <p style="text-align: center;">P</p>	
SMT849D	
<ol style="list-style-type: none"> 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? 	
 <p style="text-align: center;">ABS warning lamp ATP warning lamp</p> <p style="text-align: center;">4WD warning lamp 4LO indicator lamp</p> <p style="text-align: center;">4WD shift indicator lamp</p>	
SMT850D	
Yes or No	
Yes	▶ GO TO 2.
No	▶ Go to Symptom 1. Refer to TF-78.

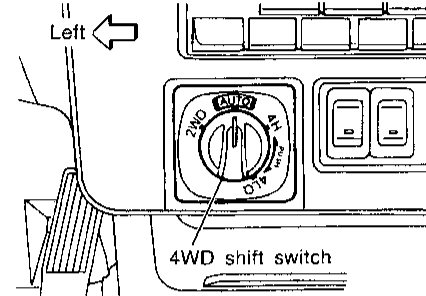










































2	CHECK 4WD WARNING LAMP
Is 4WD warning lamp turned ON?	
 <p style="text-align: center;">ABS warning lamp ATP warning lamp</p> <p style="text-align: center;">4WD warning lamp 4LO indicator lamp</p> <p style="text-align: center;">4WD shift indicator lamp</p>	
SMT850D	
Yes or No	
Yes	▶ <ol style="list-style-type: none"> 1. Turn ignition switch to "OFF" position. 2. Perform self-diagnosis. Refer to "Trouble Diagnosis without CONSULT", TF-26. 3. Go to "2. CHECK AT IDLE". Refer to TF-45.
No	▶ Go to Symptom 2. Refer to TF-79.

2. CHECK AT IDLE

=NBT0017503

1	CHECK 4WD SHIFT INDICATOR LAMP
<ol style="list-style-type: none"> 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? 	
	
SMT850D	
Yes or No	
Yes	▶ Go to "ATP SWITCH, WAIT DETECTION SWITCH AND NEUTRAL-4LO SWITCH". Refer to TF-63.
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 "Trouble Diagnosis without CONSULT", TF-26.

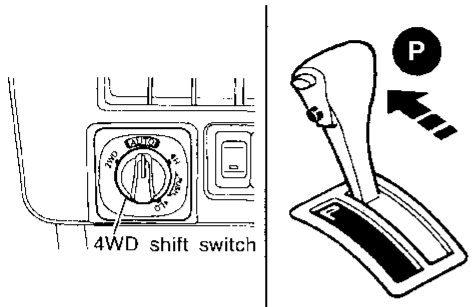
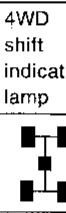
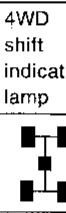
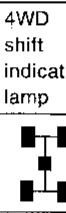
3	CHECK 4WD SHIFT INDICATOR LAMP																																		
<ol style="list-style-type: none"> 1. Set 4WD shift switch to "2WD", "AUTO", "4H", "4LO", "4H" and "2WD" in order. (Stay at each switch position for at least 1 second.) 2. Does 4WD shift indicator lamp change properly and does buzzer sound? 																																			
																																			
SMT851D																																			
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 15%;">4WD shift switch operation</th> <th style="width: 15%;">4WD shift indicator lamp</th> <th style="width: 15%;">4WD warning lamp</th> <th style="width: 15%;">Buzzer sound</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">2WD</td> <td style="text-align: center;"></td> <td style="text-align: center;"></td> <td style="text-align: center;">"Pip"</td> </tr> <tr> <td style="text-align: center;">AUTO</td> <td style="text-align: center;"></td> <td style="text-align: center;"></td> <td style="text-align: center;">"Pip"</td> </tr> <tr> <td style="text-align: center;">4H</td> <td style="text-align: center;"></td> <td style="text-align: center;"></td> <td style="text-align: center;"></td> </tr> <tr> <td style="text-align: center;">4LO</td> <td style="text-align: center;"></td> <td style="text-align: center;"></td> <td style="text-align: center;"></td> </tr> <tr> <td style="text-align: center;">4H</td> <td style="text-align: center;"></td> <td style="text-align: center;"></td> <td style="text-align: center;">"Pip"</td> </tr> <tr> <td style="text-align: center;">AUTO</td> <td style="text-align: center;"></td> <td style="text-align: center;"></td> <td style="text-align: center;">"Pip"</td> </tr> <tr> <td style="text-align: center;">2WD</td> <td style="text-align: center;"></td> <td style="text-align: center;"></td> <td style="text-align: center;"></td> </tr> </tbody> </table>				4WD shift switch operation	4WD shift indicator lamp	4WD warning lamp	Buzzer sound	2WD			"Pip"	AUTO			"Pip"	4H				4LO				4H			"Pip"	AUTO			"Pip"	2WD			
4WD shift switch operation	4WD shift indicator lamp	4WD warning lamp	Buzzer sound																																
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AUTO			"Pip"																																
2WD																																			
SMT769D																																			
Yes or No																																			
Yes	▶ GO TO 4.																																		
No	▶ Go to "2-4WD SHIFT SOLENOID VALVE AND 4WD SHIFT SWITCH". Refer to TF-57.																																		

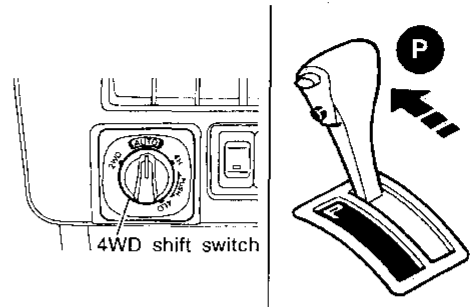
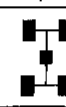
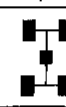
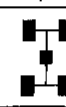
4	CHECK 4WD WARNING LAMP
Is 4WD warning lamp turned ON?	
Yes or No	
Yes	▶ Perform self-diagnosis. (Refer to "Trouble Diagnosis without CONSULT", TF-26.)
No	▶ GO TO 5.

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TROUBLE DIAGNOSIS — BASIC INSPECTION

Road Test (Cont'd)

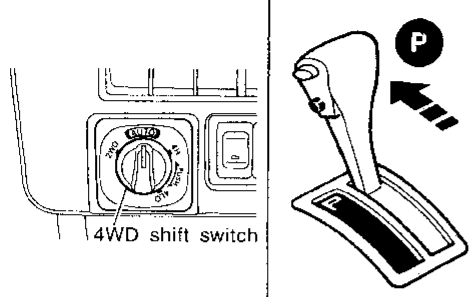
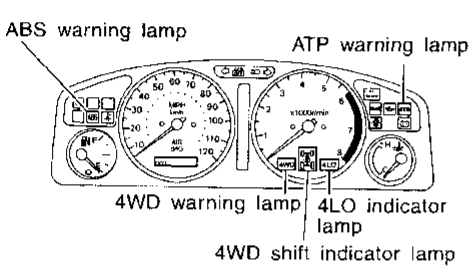
5	CHECK 4WD SHIFT INDICATOR LAMP						
<p>1. Move A/T selector lever to "P" position. 2. Set 4WD shift switch from "4H" to "4LO".</p>							
							
SMT849D							
<p>3. While shifting from "4H" to "4LO", does 4WD shift indicator lamp turn OFF and ATP warning lamp turn ON? (*1) *1: After ATP warning lamp is turned ON when it is hard to shift to "4LO", move A/T selector lever to "N" position.</p>							
<table border="1" style="margin: auto;"> <tr> <td style="padding: 5px;">4WD shift switch operation</td> <td style="padding: 5px;">4WD shift indicator lamp</td> <td style="padding: 5px;">4WD warning lamp</td> </tr> <tr> <td style="text-align: center; padding: 5px;">4LO</td> <td style="text-align: center; padding: 5px;">  </td> <td style="text-align: center; padding: 5px;"> <div style="border: 1px solid black; padding: 2px; display: inline-block;">4WD</div> OFF </td> </tr> </table> <p style="text-align: center;">↳ 4LO indicator lamp</p>		4WD shift switch operation	4WD shift indicator lamp	4WD warning lamp	4LO		<div style="border: 1px solid black; padding: 2px; display: inline-block;">4WD</div> OFF
4WD shift switch operation	4WD shift indicator lamp	4WD warning lamp					
4LO		<div style="border: 1px solid black; padding: 2px; display: inline-block;">4WD</div> OFF					
SMT770D							
Yes or No							
Yes ▶	GO TO 6.						
No ▶	Go to Symptoms 3 and 4. Refer to TF-80.						

6	CHECK 4WD SHIFT INDICATOR LAMP						
<p>Does 4WD shift indicator lamp indicate "LOCK" and 4LO indicator lamp turn ON when 4WD shift switch is set in "4LO"?</p>							
							
SMT849D							
<table border="1" style="margin: auto;"> <tr> <td style="padding: 5px;">4WD shift switch operation</td> <td style="padding: 5px;">4WD shift indicator lamp</td> <td style="padding: 5px;">4WD warning lamp</td> </tr> <tr> <td style="text-align: center; padding: 5px;">4LO</td> <td style="text-align: center; padding: 5px;">  </td> <td style="text-align: center; padding: 5px;"> <div style="border: 1px solid black; padding: 2px; display: inline-block;">4WD</div> OFF </td> </tr> </table> <p style="text-align: center;">↳ 4LO indicator lamp</p>		4WD shift switch operation	4WD shift indicator lamp	4WD warning lamp	4LO		<div style="border: 1px solid black; padding: 2px; display: inline-block;">4WD</div> OFF
4WD shift switch operation	4WD shift indicator lamp	4WD warning lamp					
4LO		<div style="border: 1px solid black; padding: 2px; display: inline-block;">4WD</div> OFF					
SMT770D							
Yes or No							
Yes ▶	GO TO 7.						
No ▶	Go to "3. CRUISE TEST". Refer to TF-47.						

7	CHECK 4WD SHIFT INDICATOR LAMP (*2)
<p>1. Set 4WD shift switch from "4LO" to "4H". 2. Does 4WD shift indicator lamp flicker? (*2) *2: While "Wait" function is operating, 4WD shift indicator lamp flashes.</p>	
Yes or No	
Yes ▶	Go to Symptom 7. Refer to TF-84.
No ▶	Go to "3. CRUISE TEST". Refer to TF-47.

3. CRUISE TEST

#NBTFO017S04

1	INSPECTION START
 <p style="text-align: center;">SMT849D</p>	
 <p style="text-align: center;">SMT850D</p>	
WITH CONSULT	▶ GO TO 2.
WITHOUT CONSULT	▶ GO TO 3.

2	CHECK INPUT SIGNAL																				
<p>Ⓔ With CONSULT</p> <ol style="list-style-type: none"> 1. Warm up engine to normal operating temperature. 2. Park vehicle on flat surface. 3. Move A/T selector lever to "P" position. 4. Set 4WD shift switch to "4H" position. 5. Set 4WD shift switch to "AUTO" position. 6. Start engine. 7. 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.) 8. Park vehicle on flat surface. 9. Move A/T selector lever to "P" position. 10. Set 4WD shift switch to "2WD" position. 11. Leave vehicle for at least 80 seconds with "FLUID TEMP SE" at 0.9V or less. 																					
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="text-align: center;">☆ MONITOR</td> <td style="text-align: center;">☆ NO FAIL <input type="checkbox"/></td> </tr> <tr> <td>VHCL/S SEN*FR</td> <td style="text-align: right;">0Km/h</td> </tr> <tr> <td>VHCL/S SEN*RR</td> <td style="text-align: right;">0Km/h</td> </tr> <tr> <td>ENGINE SPEED</td> <td style="text-align: right;">0rpm</td> </tr> <tr> <td>THRTL POS SEN</td> <td style="text-align: right;">0.5V</td> </tr> <tr> <td>FLUID TEMP SE</td> <td style="text-align: right;">1.0V</td> </tr> <tr> <td>BATTERY VOLT</td> <td style="text-align: right;">12.2V</td> </tr> <tr> <td>2WD SW</td> <td style="text-align: right;">ON</td> </tr> <tr> <td>LOCK SWITCH</td> <td style="text-align: right;">OFF</td> </tr> <tr> <td>N POSI SW TF</td> <td style="text-align: right;">OFF</td> </tr> </table>		☆ MONITOR	☆ NO FAIL <input type="checkbox"/>	VHCL/S SEN*FR	0Km/h	VHCL/S SEN*RR	0Km/h	ENGINE SPEED	0rpm	THRTL POS SEN	0.5V	FLUID TEMP SE	1.0V	BATTERY VOLT	12.2V	2WD SW	ON	LOCK SWITCH	OFF	N POSI SW TF	OFF
☆ MONITOR	☆ NO FAIL <input type="checkbox"/>																				
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<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td colspan="2" style="text-align: center;">RECORD</td> </tr> </table> <p style="text-align: right;">SMT106D</p>		RECORD																			
RECORD																					
<p>12. Is 4WD warning lamp turned ON?</p> <p style="text-align: center;">Yes or No</p>																					
Yes	▶ Perform self-diagnosis. Refer to "Trouble Diagnosis with CONSULT", TF-29.																				
No	▶ GO TO 4.																				

3	CHECK INPUT SIGNAL
<p>Ⓕ Without CONSULT</p> <ol style="list-style-type: none"> 1. Warm up engine to normal operating temperature. 2. Park vehicle on flat surface. 3. Move A/T selector lever to "P" position. 4. Set 4WD shift switch to "4H" position. 5. Set 4WD shift switch to "AUTO" position. 6. Start engine. 7. Drive vehicle for at least 30 seconds at a speed higher than 20 km/h (12 MPH). 8. Park vehicle on flat surface. 9. Move A/T selector lever to "P" position. 10. Set 4WD shift switch to "2WD" position. 11. Is 4WD warning lamp turned ON? 	
<p style="text-align: center;">Yes or No</p>	
Yes	▶ Perform self-diagnosis. Refer to "Trouble Diagnosis without CONSULT", TF-26.
No	▶ GO TO 4.

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TF
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 AX
 SU
 BR
 ST
 RS
 BT
 HA
 SC
 EL
 DX

TROUBLE DIAGNOSIS — BASIC INSPECTION

Road Test (Cont'd)

4	(1) CHECK TIGHT CORNER BRAKING SYMPTOM
<p>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?</p> <p style="text-align: center;">Yes or No</p>	
Yes	▶ GO TO 5.
No	▶ GO TO 6.

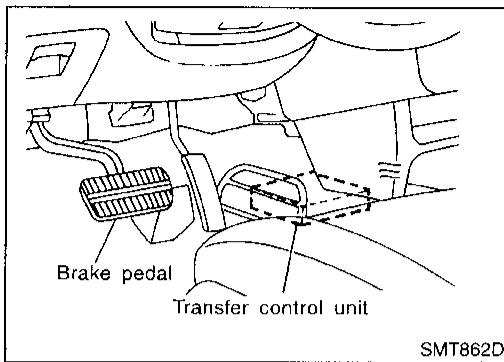
5	CONFIRM SYMPTOM AGAIN
<p>Confirm symptom and self-diagnosis again. Refer to "Trouble Diagnosis without CONSULT", TF-26 and "Trouble Diagnosis with CONSULT", TF-29.</p> <p style="text-align: center;">OK or NG</p>	
OK	▶ GO TO 6.
NG	▶ Go to Symptoms 8 and 9. Refer to TF-84, 85.

6	(2) CHECK TIGHT CORNER BRAKING SYMPTOM
<p>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?</p> <p style="text-align: center;">Yes or No</p>	
Yes	▶ INSPECTION END
No	▶ GO TO 7.

7	CONFIRM SYMPTOM AGAIN
<p>Confirm symptom and self-diagnosis again. Refer to "Trouble Diagnosis without CONSULT", TF-26 and "Trouble Diagnosis with CONSULT", TF-29.</p> <p style="text-align: center;">OK or NG</p>	
OK	▶ INSPECTION END
NG	▶ Go to Symptoms 8 and 9. Refer to TF-84, 85.

TROUBLE DIAGNOSIS — GENERAL DESCRIPTION

Transfer Control Unit Terminals and Reference Value



Transfer Control Unit Terminals and Reference Value

REMOVAL AND INSTALLATION OF TRANSFER CONTROL UNIT

NBTF0018

GI

Removal

NBTF0018S03

MA

NBTF0018S0301

1. Turn ignition switch OFF and disconnect negative battery terminal.
 2. Remove console box.
 3. Remove cluster lid C.
 4. Remove audio assembly and A/C control unit.
 5. Remove instrument lower panel on driver side.
 6. Remove glove box.
 7. Remove instrument lower panel on passenger side.
 8. Remove instrument lower center panel.
 9. Remove transfer control unit.
- For steps 2 through 8 above, refer to BT section ("Instrument Panel Assembly").

EM

LC

EC

FE

AT

Installation

NBTF0018S0302

- Installation is in the reverse order of removal.

When installing transfer control unit, tighten transfer control unit lock nut.

TF

Tightening torque:

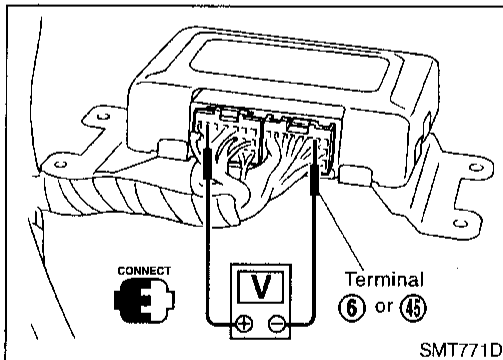
: 4.3 - 5.8 N·m (0.44 - 0.59 kg·m, 38 - 51 in·lb)

PD

AX

SU

BR



INSPECTION OF TRANSFER CONTROL UNIT

NBTF0018S01

ST

- Measure voltage between each terminal and terminal 6 or 45 by following "TRANSFER CONTROL UNIT INSPECTION TABLE".

RS

BT

HA

- Pin connector terminal layout

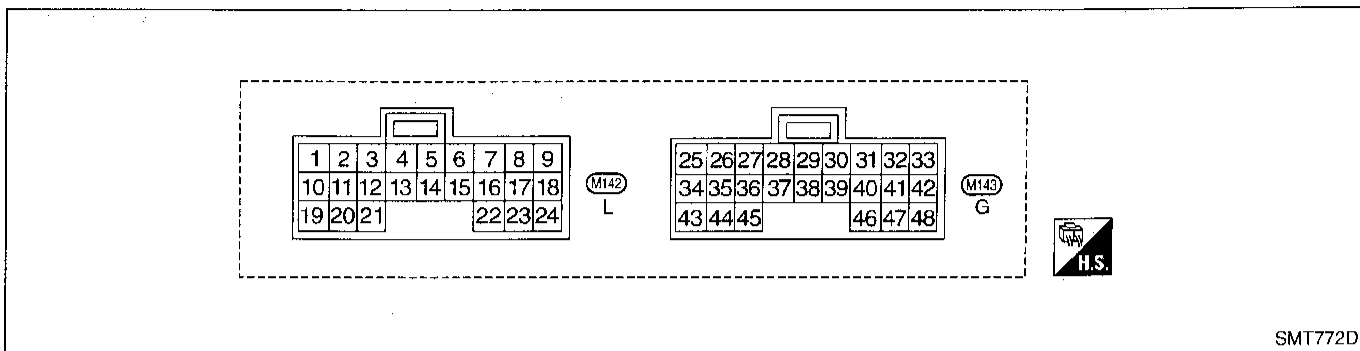
SC

EL

IDX

TROUBLE DIAGNOSIS — GENERAL DESCRIPTION

Transfer Control Unit Terminals and Reference Value (Cont'd)















SMT772D

TRANSFER CONTROL UNIT INSPECTION TABLE












(Data are reference values.)

NBTF0018S02

Terminal No.	Item	Condition	Judgement standard	
1	2-4WD shift solenoid valve	 & 	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)		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	PNP switch (R position)		A/T selector lever is set to "reverse" position.	Battery voltage
			A/T selector lever is set to any position other than "reverse".	Less than 1V
8	—	—	—	






TROUBLE DIAGNOSIS — GENERAL DESCRIPTION

Transfer Control Unit Terminals and Reference Value (Cont'd)

Terminal No.	Item	Condition	Judgement standard		
9	4WD shift switch (2WD)		4WD shift switch is set to "2WD" position.	Battery voltage	GI
			4WD shift switch is set to any position other than "2WD".	Less than 1V	MA
10	Transfer dropping resistor		4WD shift switch is set to "AUTO" position.	Approx. 4 - 14V	EM
			4WD shift switch is set to any position other than "2WD".	Less than 1V	LC
11	4WD shift indicator lamp (4H)		"4H" indicator lamp comes ON.	Less than 1V	EC
			4WD shift switch is set to any position other than "4H".	Battery voltage	FE
12	4WD shift indicator lamp (4LO)		"4LO" indicator lamp comes ON.	Approx. 0V	AT
			4WD shift switch is set to any position other than "4LO".	Battery voltage	TF
13	Transfer shift relay (Low)		While actuator is operating (4LO → 4H)	Battery voltage	PD
			Actuator does not operate.	Approx. 0V	AX
14	Transfer motor relay		Transfer motor relay is ON.	Battery voltage	SU
			Transfer motor relay is OFF.	Less than 1V	BR
15	PNP switch (N position)		A/T selector lever is set to "N" position.	Battery voltage	ST
			A/T selector lever is set to any position other than "N" position.	Less than 1V	RS
16	Power supply	—	Ignition key is set to "ON" position.	Battery voltage	BT
			Ignition key is set to "OFF" position.	Approx. 0V	HA
17	PNP switch (P position)		A/T selector lever is set to "P" position.	Battery voltage	SC
			A/T selector lever is set to any position other than "P".	Less than 1V	EL
18	4WD shift switch (4H)		4WD shift switch is set to "4H" position.	Battery voltage	IDX
			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.	Approx. 1.5 - 3V	
			4WD shift switch is set to any position other than "2WD".	Less than 1V	
20	—	—	—	—	
21	4WD shift indicator lamp (AUTO)		"AUTO" indicator lamp comes ON.	Approx. 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.	Approx. 0V	



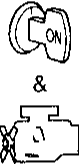

TROUBLE DIAGNOSIS — GENERAL DESCRIPTION

Transfer Control Unit Terminals and Reference Value (Cont'd)

Terminal No.	Item	Condition	Judgement standard
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.	Approx. 0V
		Transfer is set to any position other than "4LO".	Power supply
26	Throttle position switch (closed)	 Throttle valve is closed.	Power supply
		 Throttle valve is in any position other than "closed".	Approx. 0V
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	Throttle position sensor (Ground)	Throttle valve is closed.	Less than 1V
		Throttle valve is fully open.	
29	Transfer control unit signal (Vehicle speed signal)	—	More than 1V
30	Throttle position sensor (Power supply for throttle position sensor)	Ignition key is set to "ON" position.	Approx. 4.5 - 5.5V
		Ignition key is set to "OFF" position.	Approx. 0V
31	Transfer fluid temperature sensor	At 20°C (68°F)	Approx. 1.5V
		At 80°C (176°F)	Approx. 0.5V
32	ABS signal	ABS operates.	Less than 1V
		ABS does not operate.	Approx. 4.0V
33	Transfer shift relay (High)	While actuator is operating from "4H" to "4LO"	Battery voltage
		Actuator does not operate.	Approx. 0V
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
		 4WD shift switch is set to "2WD", "AUTO" or "4H", then A/T selector lever is set to "D" position. (wait detection system: ON)	Approx. 0V
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
		—	Approx. 0V
36	CONSULT (RX)	—	—

TROUBLE DIAGNOSIS — GENERAL DESCRIPTION

Transfer Control Unit Terminals and Reference Value (Cont'd)

Terminal No.	Item	Condition	Judgement standard		
37	Tachometer		—	Refer to EC section.	GI
38	Front revolution sensor		4WD shift switch is set to "4H" position. A/T selector lever is set to "D" position.	Approx. 1V [30 km/h (19 MPH)] Voltage rises in response to vehicle speed.	MA EM
39	ECM (Throttle position sensor)		Throttle valve is fully open.	Approx. 0.5V	LC
			Throttle valve is closed.	Approx. 4.2V	EC
40	ATP switch		A/T selector lever is set to "P" position.	Battery voltage	FE
			A/T selector lever is set to any position other than "P".	Less than 1V	FE
41	Transfer motor relay monitor		Transfer motor relay is ON.	Battery voltage	AT
			Transfer motor relay is OFF.	Less than 1V	AT
42	Transfer shift relay (LOW)		While actuator is operating from "4LO" to "4H" position	Battery voltage	TF
			Actuator does not operate.	Approx. 0V	PD
43	Wait detection switch		4WD shift switch is set to any position other than "4LO".	Battery voltage	AX
			4WD shift switch is set to "4LO" position.*	Less than 1V	AX
44	Transfer 4LO actuator switch		4WD shift switch is set to any position other than "4LO". (Actuator: High position)	Battery voltage	SU
			4WD shift switch is set to "4LO" position. (Actuator: Low position)	Less than 1V	BR
45	Ground	—	—	—	ST
46	—	—	—	—	ST
47	Power supply (memory back up)		—	Battery voltage	RS BT
			—	Battery voltage	BT
48	CONSULT (TX)	—	—	—	HA

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

GI
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VEHICLE SPEED SENSOR (FRONT REVOLUTION SENSOR)

Diagnostic Procedure

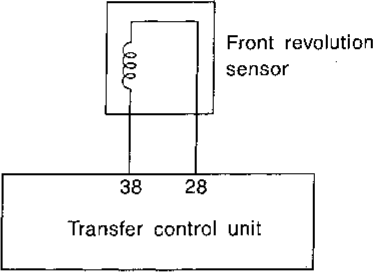

Diagnostic Procedure

NBTFO013

1	FRONT REVOLUTION SENSOR	
Refer to "Front Revolution Sensor", "COMPONENT INSPECTION", TF-88.		
OK or NG		
OK	▶	GO TO 3.
NG	▶	GO TO 2.


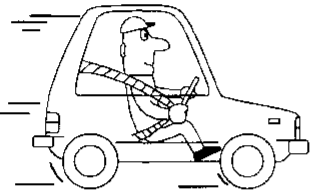
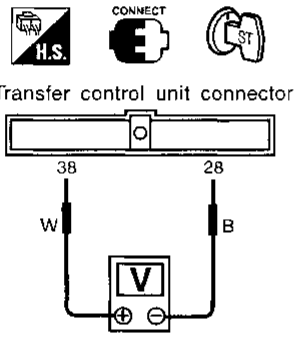
2	CHECK CONTINUITY	
Check the following.		
<ul style="list-style-type: none"> Continuity of transfer sub-harness Refer to "Transfer Sub-harness", "COMPONENT INSPECTION", TF-89. 		
OK or NG		
OK	▶	Repair or replace front revolution sensor.
NG	▶	Repair or replace front revolution sensor and transfer sub-harness.

3	CHECK INPUT SIGNAL	
WITH CONSULT	▶	GO TO 4.
WITHOUT CONSULT	▶	GO TO 5.

4	CHECK INPUT SIGNAL																																		
<p>Ⓟ With CONSULT</p> <ol style="list-style-type: none"> Start engine. Select "ECU INPUT SIGNALS" in Data Monitor. Read out the value of "VEHICLE SPEED SENSOR (FRONT)" while driving. 																																			
																																			
SMT773D																																			
																																			
<table border="1" style="width: 100%;"> <tr> <td>☆ MONITOR</td> <td>☆ NO FAIL</td> <td><input type="checkbox"/></td> </tr> <tr> <td>VHCL/S SEN • FR</td> <td>0Km/h</td> <td></td> </tr> <tr> <td>VHCL/S SEN • RR</td> <td>0Km/h</td> <td></td> </tr> <tr> <td>ENGINE SPEED</td> <td>0rpm</td> <td></td> </tr> <tr> <td>THRTL POS SEN</td> <td>0.4V</td> <td></td> </tr> <tr> <td>FLUID TEMP SE</td> <td>0.9V</td> <td></td> </tr> <tr> <td>BATTERY VOLT</td> <td>12.2V</td> <td></td> </tr> <tr> <td>2WD SW</td> <td>OFF</td> <td></td> </tr> <tr> <td>LOCK SWITCH</td> <td>OFF</td> <td></td> </tr> <tr> <td>N POSI SW TF</td> <td>OFF</td> <td></td> </tr> <tr> <td colspan="3" style="text-align: center;">RECORD</td> </tr> </table>			☆ MONITOR	☆ NO FAIL	<input type="checkbox"/>	VHCL/S SEN • FR	0Km/h		VHCL/S SEN • RR	0Km/h		ENGINE SPEED	0rpm		THRTL POS SEN	0.4V		FLUID TEMP SE	0.9V		BATTERY VOLT	12.2V		2WD SW	OFF		LOCK SWITCH	OFF		N POSI SW TF	OFF		RECORD		
☆ MONITOR	☆ NO FAIL	<input type="checkbox"/>																																	
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2WD SW	OFF																																		
LOCK SWITCH	OFF																																		
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SMT053D																																			
4. Check if the value changes according to accelerating and decelerating the vehicle.																																			
OK or NG																																			
OK	▶	GO TO 6.																																	
NG	▶	GO TO 7.																																	

VEHICLE SPEED SENSOR (FRONT REVOLUTION SENSOR)

Diagnostic Procedure (Cont'd)

5	CHECK INPUT SIGNAL
<p> Without CONSULT</p> <ol style="list-style-type: none"> Start engine. Check voltage between transfer control unit harness connector terminals 38 and 28. (Measure it in AC range.) <p>Voltage: 0 km/h (0 MPH): 0V 30 km/h (19 MPH): More than 1V (Voltage rises gradually in response to vehicle speed.)</p>	
	
 <p style="text-align: center;">SMT774D</p>	
OK or NG	
OK	▶ GO TO 6.
NG	▶ GO TO 7.

7	CHECK HARNESS CONTINUITY BETWEEN TRANSFER CONTROL UNIT AND FRONT REVOLUTION SENSOR SUB-HARNESS CONNECTOR	
OK or NG		
OK	▶	GO TO 6.
NG	▶	Repair or replace sub-harness connector between transfer control unit and front revolution sensor.

6	PERFORM SELF-DIAGNOSIS AGAIN
<p>After driving for a while, perform self-diagnosis again. Refer to "Trouble Diagnosis without CONSULT", TF-26.</p>	
OK or NG	
OK	▶ INSPECTION END
NG	▶ <ol style="list-style-type: none"> Perform transfer control unit input/output signal inspection. Refer to "TRANSFER CONTROL UNIT INSPECTION TABLE", "TROUBLE DIAGNOSIS — GENERAL DESCRIPTION", TF-50. If NG, recheck transfer control unit pin terminals for damage or loose connection with harness connector.

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4WD SOLENOID VALVE

Diagnostic Procedure

Diagnostic Procedure

NETF0020

1	CHECK 4WD SOLENOID VALVE
<p style="text-align: right;">SMT775D</p>	
Refer to "4WD Solenoid Valve, Clutch Pressure Switch and Line Pressure Switch", "COMPONENT INSPECTION", TF-87.	
OK or NG	
OK	▶ GO TO 2.
NG	<p>▶ Check the following. If OK, repair or replace 4WD solenoid valve.</p> <ul style="list-style-type: none"> Continuity of transfer sub-harness Refer to "TRANSFER TERMINAL CORD ASSEMBLY SUB-HARNESS CONNECTOR", "COMPONENT INSPECTION", TF-90.

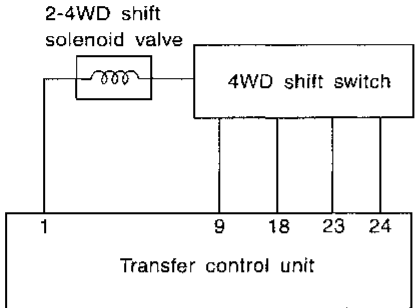
2	CHECK POWER SOURCE CIRCUIT
<p>1. Turn ignition switch to "OFF" position. 2. Disconnect transfer control unit harness connector. 3. Check resistance between transfer terminal cord assembly sub-harness connector terminal 6 and transfer control unit harness connector terminal 10.</p> <p>Resistance: 11.2 - 12.8Ω</p>	
<p style="text-align: right;">SMT776D</p>	
OK or NG	
OK	▶ GO TO 3.
NG	<p>▶ Check the following.</p> <ul style="list-style-type: none"> Transfer dropping resistor Refer to "Transfer Dropping Resistor", "COMPONENT INSPECTION", TF-88. Continuity between transfer terminal cord assembly sub-harness connector terminal 6 and transfer control unit harness connector terminal 10.

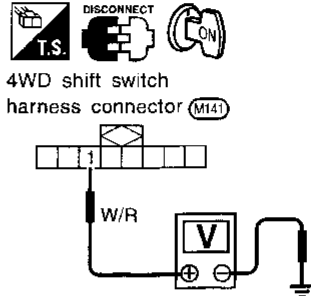
3	CHECK POWER SOURCE CIRCUIT
<p>1. Turn ignition switch to "OFF" position. 2. Check continuity between transfer terminal cord assembly sub-harness connector terminal 6 and transfer control unit harness connector terminal 19.</p> <p>Continuity should exist.</p>	
<p style="text-align: right;">SMT777D</p>	
OK or NG	
OK	▶ GO TO 4.
NG	▶ Repair or replace harness between transfer terminal cord assembly sub-harness connector terminal 6 and transfer control unit harness connector terminal 19.

4	PERFORM SELF-DIAGNOSIS
<p>After driving for a while, perform self-diagnosis. Refer to "Trouble Diagnosis without CONSULT", TF-26 and "Trouble Diagnosis with CONSULT", TF-29.</p>	
OK or NG	
OK	▶ INSPECTION END
NG	<p>▶ 1. Perform transfer control unit input/output signal inspection. Refer to "TRANSFER CONTROL UNIT INSPECTION TABLE", TF-50.</p> <p>▶ 2. If NG, recheck transfer control unit pin terminals for damage or loose connection with harness connector.</p>

Diagnostic Procedure

NBT0021

1	CHECK 2-4WD SHIFT SOLENOID VALVE AND 4WD SHIFT SWITCH
<p>Refer to "2-4WD Shift Solenoid Valve and Transfer Fluid Temperature Sensor", "COMPONENT INSPECTION", TF-87.</p>	
 <p style="text-align: right;">SMT778D</p>	
OK or NG	
OK	▶ GO TO 2.
NG	▶ Check the following. If OK, repair or replace 2-4WD shift solenoid valve and 4WD shift switch. <ul style="list-style-type: none"> ● Continuity of transfer sub-harness <p>Refer to "TRANSFER TERMINAL CORD ASSEMBLY SUB-HARNESS CONNECTOR", "COMPONENT INSPECTION", TF-90.</p>

3	CHECK 4WD SHIFT SWITCH POWER SOURCE
<ol style="list-style-type: none"> 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. <p style="text-align: center;">Voltage: Battery voltage</p>	
 <p style="text-align: right;">SMT852D</p>	
OK or NG	
OK	▶ GO TO 4.
NG	▶ Check the following. <ul style="list-style-type: none"> ● No. 18 fuse (10A) ● Continuity between ignition switch and 4WD shift switch

2	CHECK INPUT SIGNAL																						
<p>Ⓟ With CONSULT</p> <ol style="list-style-type: none"> 1. Select "ECU INPUT SIGNALS" in Data Monitor. 2. Read out ON/OFF status of "2WD SW" and "LOCK SWITCH". 																							
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td>☆ MONITOR</td> <td>☆ NO FAIL <input type="checkbox"/></td> </tr> <tr> <td>VHCL/S SEN • FR</td> <td>0Km/h</td> </tr> <tr> <td>VHCL/S SEN • RR</td> <td>0Km/h</td> </tr> <tr> <td>ENGINE SPEED</td> <td>0rpm</td> </tr> <tr> <td>THRTL POS SEN</td> <td>0.4V</td> </tr> <tr> <td>FLUID TEMP SE</td> <td>0.9V</td> </tr> <tr> <td>BATTERY VOLT</td> <td>12.2V</td> </tr> <tr> <td>2WD SW</td> <td>OFF</td> </tr> <tr> <td>LOCK SWITCH</td> <td>OFF</td> </tr> <tr> <td>N POSI SW TF</td> <td>OFF</td> </tr> <tr> <td colspan="2" style="text-align: center;">RECORD</td> </tr> </table> <p style="text-align: right;">SMT059D</p>		☆ MONITOR	☆ NO FAIL <input type="checkbox"/>	VHCL/S SEN • FR	0Km/h	VHCL/S SEN • RR	0Km/h	ENGINE SPEED	0rpm	THRTL POS SEN	0.4V	FLUID TEMP SE	0.9V	BATTERY VOLT	12.2V	2WD SW	OFF	LOCK SWITCH	OFF	N POSI SW TF	OFF	RECORD	
☆ MONITOR	☆ NO FAIL <input type="checkbox"/>																						
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2WD SW	OFF																						
LOCK SWITCH	OFF																						
N POSI SW TF	OFF																						
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OK or NG																							
OK	▶ <ol style="list-style-type: none"> 1. Perform transfer control unit input/output signal inspection. Refer to "TRANSFER CONTROL UNIT INSPECTION TABLE", "TROUBLE DIAGNOSIS — GENERAL DESCRIPTION", TF-50. 2. If NG, recheck transfer control unit pin terminals for damage or loose connection with harness connector. 																						
NG	▶ GO TO 3.																						

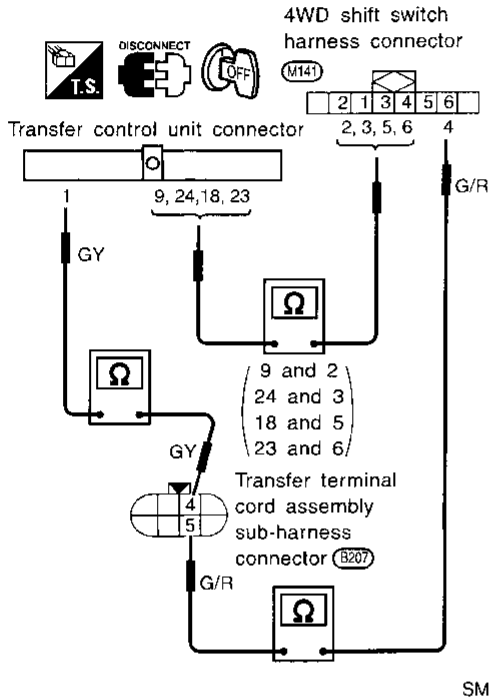
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2-4WD SHIFT SOLENOID VALVE AND 4WD SHIFT SWITCH

Diagnostic Procedure (Cont'd)

4 CHECK HARNESS CONTINUITY

- Turn ignition switch to "OFF" position.
- Check continuity between the following terminals:
 - Transfer control unit 9 and 4WD shift switch 2 (2WD)
 - Transfer control unit 18 and 4WD shift switch 5 (4H)
 - Transfer control unit 24 and 4WD shift switch 3 (AUTO)
 - Transfer control unit 23 and 4WD shift switch 6 (4LO)
 - Transfer control unit 1 and Transfer terminal cord assembly sub-harness connector 4
 - 4WD shift switch 4 and Transfer terminal cord assembly sub-harness connector 5
 Continuity should exist.



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 "Trouble Diagnosis without CONSULT", TF-26.

OK or NG

OK	▶	INSPECTION END
NG	▶	<ol style="list-style-type: none"> Perform transfer control unit input/output signal inspection. Refer to "TRANSFER CONTROL UNIT INSPECTION TABLE", "TROUBLE DIAGNOSIS — GENERAL DESCRIPTION", TF-50. If NG, recheck transfer control unit pin terminals for damage or loose connection with harness connector.

Diagnostic Procedure

NBTFO022

1	CHECK TRANSFER MOTOR AND TRANSFER MOTOR RELAY
<p style="text-align: right;">SMT782D</p>	
Refer to "Transfer Motor" and "Transfer Motor Relay", "COMPONENT INSPECTION", TF-89.	
OK or NG	
OK	▶ GO TO 3.
NG	▶ GO TO 2.

2	CHECK CONTINUITY
Check the following.	
<ul style="list-style-type: none"> ● Continuity of transfer sub-harness Refer to "TRANSFER SWITCH ASSEMBLY SUB-HARNESS CONNECTOR", "COMPONENT INSPECTION", TF-90. 	
OK or NG	
OK	▶ Repair or replace transfer motor and transfer motor relay.
NG	▶ Repair or replace transfer sub-harness.

3	CHECK INPUT SIGNAL																				
<p>Ⓟ With CONSULT</p> <ol style="list-style-type: none"> 1. Select "ECU INPUT SIGNALS" in Data Monitor. 2. Read out ON/OFF status of "MOTOR RELAY". 																					
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="text-align: center;">☆ MONITOR</td> <td style="text-align: center;">☆ NO FAIL <input type="checkbox"/></td> </tr> <tr> <td>4WD MODE</td> <td style="text-align: center;">AUTO</td> </tr> <tr> <td>COMP CL TORQ</td> <td style="text-align: center;">4.0Kg/m</td> </tr> <tr> <td>DUTY SOLENOID</td> <td style="text-align: center;">94%</td> </tr> <tr> <td>2-4WD SOL</td> <td style="text-align: center;">O N</td> </tr> <tr> <td>VHCL/S COMP</td> <td style="text-align: center;">0Km/h</td> </tr> <tr> <td>THROTTLE POSI</td> <td style="text-align: center;">0.0/8</td> </tr> <tr> <td>MOTOR RELAY</td> <td style="text-align: center;">OFF</td> </tr> <tr> <td>4WD FAIL LAMP</td> <td style="text-align: center;">O N</td> </tr> <tr> <td colspan="2" style="text-align: center;">RECORD</td> </tr> </table> <p style="text-align: right;">SMT047D</p>		☆ MONITOR	☆ NO FAIL <input type="checkbox"/>	4WD MODE	AUTO	COMP CL TORQ	4.0Kg/m	DUTY SOLENOID	94%	2-4WD SOL	O N	VHCL/S COMP	0Km/h	THROTTLE POSI	0.0/8	MOTOR RELAY	OFF	4WD FAIL LAMP	O N	RECORD	
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MOTOR RELAY	OFF																				
4WD FAIL LAMP	O N																				
RECORD																					
<ol style="list-style-type: none"> 3. When the value is different from standard value although ON/OFF switching occurs, check the following items. <ul style="list-style-type: none"> ● PNP switch, throttle position sensor, closed throttle position switch circuits Refer to AT section ("TROUBLE DIAGNOSES"). 																					
OK or NG																					
OK	▶ GO TO 4.																				
NG	▶ <ol style="list-style-type: none"> 1. Perform transfer control unit input/output signal inspection. Refer to "TRANSFER CONTROL UNIT INSPECTION TABLE", "TROUBLE DIAGNOSIS — GENERAL DESCRIPTION", TF-50. 2. If NG, recheck transfer control unit pin terminals for damage or loose connection with harness connector. 																				

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TRANSFER MOTOR AND TRANSFER MOTOR RELAY

Diagnostic Procedure (Cont'd)

4	CHECK TRANSFER MOTOR RELAY POWER SOURCE
<ol style="list-style-type: none"> 1. Disconnect transfer motor relay harness connector. 2. Turn ignition switch to "ON" position. 3. Check voltage between transfer motor relay harness connector terminals 1, 3 and body ground. <p>Voltage: Battery voltage</p> <p style="text-align: right;">SMT854D</p>	
OK or NG	
OK	▶ GO TO 5.
NG	▶ Check the following. <ul style="list-style-type: none"> • No. 55 fuse (20A) • No. 18 fuse (10A) • Harness continuity between fuse and transfer motor relay

5	CHECK HARNESS CONTINUITY
<ol style="list-style-type: none"> 1. Turn ignition switch to "OFF" position. 2. Check continuity between the following terminals. <ul style="list-style-type: none"> • Transfer control unit 41 and Transfer motor 14 • Transfer control unit 41 and Transfer motor relay 2 • Transfer control unit 14 and Transfer motor relay 4 • Transfer motor 15 and body ground <p>Continuity should exist.</p> <p style="text-align: right;">SMT855D</p>	
OK or NG	
OK	▶ GO TO 6.
NG	▶ Repair or replace harness or connector.

6	PERFORM SELF-DIAGNOSIS AGAIN
<p>After driving for a while, perform self-diagnosis again. Refer to "Trouble Diagnosis without CONSULT", TF-26 and "Trouble Diagnosis with CONSULT", TF-29.</p>	
OK or NG	
OK	▶ INSPECTION END
NG	▶ <ol style="list-style-type: none"> 1. Perform transfer control unit input/output signal inspection. Refer to "TRANSFER CONTROL UNIT INSPECTION TABLE", "TROUBLE DIAGNOSIS — GENERAL DESCRIPTION", TF-50. 2. If NG, recheck transfer control unit pin terminals for damage or loose connection with harness connector.

TRANSFER FLUID TEMPERATURE SENSOR

Diagnostic Procedure

Diagnostic Procedure

NBTF0023

1	CHECK TRANSFER FLUID TEMPERATURE SENSOR
Refer to "2-4WD Shift Solenoid Valve and Transfer Fluid Temperature Sensor", "COMPONENT INSPECTION", TF-87.	
OK or NG	
OK	▶ GO TO 3.
NG	▶ GO TO 2.

2	CHECK CONTINUITY
Check the following.	
<ul style="list-style-type: none"> Continuity of transfer sub-harness Refer to "TRANSFER TERMINAL CORD ASSEMBLY SUB-HARNESS CONNECTOR", "COMPONENT INSPECTION", TF-90.	
OK or NG	
OK	▶ Repair or replace fluid temperature sensor.
NG	▶ Repair or replace transfer sub-harness.

3	CHECK INPUT SIGNAL
WITH CONSULT	▶ GO TO 4.
WITHOUT CONSULT	▶ GO TO 5.

4	CHECK INPUT SIGNAL																														
<p style="text-align: center;">Transfer fluid temperature sensor</p> <p style="text-align: center;">28 31</p> <p style="text-align: center;">Transfer control unit</p>																															
SMT784D																															
<p>Ⓜ With CONSULT</p> <ol style="list-style-type: none"> Start engine. Select "ECU INPUT SIGNALS" in Data Monitor. Read out the value of "FLUID TEMP SE". <p>Voltage:</p> <p>20°C (68°F): Approx. 1.5V</p> <p>80°C (176°F): Approx. 0.5V</p>																															
<table border="1" style="width: 100%;"> <tr> <td>☆ MONITOR</td> <td>☆ NO FAIL</td> <td>▼</td> </tr> <tr> <td>VHCL/S SEN • FR</td> <td>0Km/h</td> <td></td> </tr> <tr> <td>VHCL/S SEN • RR</td> <td>0Km/h</td> <td></td> </tr> <tr> <td>ENGINE SPEED</td> <td>0rpm</td> <td></td> </tr> <tr> <td>THRTL POS SEN</td> <td>0.4V</td> <td></td> </tr> <tr> <td>FLUID TEMP SE</td> <td>0.9V</td> <td></td> </tr> <tr> <td>BATTERY VOLT</td> <td>12.2V</td> <td></td> </tr> <tr> <td>2WD SW</td> <td>OFF</td> <td></td> </tr> <tr> <td>LOCK SWITCH</td> <td>OFF</td> <td></td> </tr> <tr> <td>N POSI SW TF</td> <td>OFF</td> <td></td> </tr> </table>		☆ MONITOR	☆ NO FAIL	▼	VHCL/S SEN • FR	0Km/h		VHCL/S SEN • RR	0Km/h		ENGINE SPEED	0rpm		THRTL POS SEN	0.4V		FLUID TEMP SE	0.9V		BATTERY VOLT	12.2V		2WD SW	OFF		LOCK SWITCH	OFF		N POSI SW TF	OFF	
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RECORD																															
SMT059D																															
OK or NG																															
OK	▶ GO TO 6.																														
NG	▶ Check the following.																														
<ul style="list-style-type: none"> Continuity between transfer control unit and transfer terminal cord assembly sub-harness connector 																															

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TRANSFER FLUID TEMPERATURE SENSOR

Diagnostic Procedure (Cont'd)

5		CHECK INPUT SIGNAL
<p>⊗ Without CONSULT</p> <ol style="list-style-type: none"> Turn ignition switch to "ON" position. Check voltage between transfer control unit harness connector terminals 28 and 31. <p>Voltage: 20°C (68°F): Approx. 1.5V 80°C (176°F): Approx. 0.5V</p> <p>Transfer control unit connector</p> <p style="text-align: right;">SMT785D</p> <p style="text-align: center;">OK or NG</p>		
OK	▶	GO TO 6.
NG	▶	<p>Check the following.</p> <ul style="list-style-type: none"> Continuity between transfer control unit and transfer terminal cord assembly sub-harness connector

6		PERFORM SELF-DIAGNOSIS AGAIN
<p>After driving for a while, perform self-diagnosis again. Refer to "Trouble Diagnosis without CONSULT", TF-26.</p> <p style="text-align: center;">OK or NG</p>		
OK	▶	INSPECTION END
NG	▶	<ol style="list-style-type: none"> Perform transfer control unit input/output signal inspection. Refer to "TRANSFER CONTROL UNIT INSPECTION TABLE", "TROUBLE DIAGNOSIS — GENERAL DESCRIPTION", TF-50. If NG, recheck transfer control unit pin terminals for damage or loose connection with harness connector.

Diagnostic Procedure

NBTFO024

1	CHECK ATP SWITCH, WAIT DETECTION SWITCH AND NEUTRAL-4LO SWITCH
<p style="text-align: right;">SMT786D</p>	
Refer to "ATP Switch, Neutral-4LO Switch and Wait Detection Switch", "COMPONENT INSPECTION", TF-88.	
OK or NG	
OK	▶ GO TO 3.
NG	▶ GO TO 2.

2	CHECK CONTINUITY OF TRANSFER SUB-HARNESS
Check the following. • Continuity of transfer sub-harness Refer to "TRANSFER SWITCH ASSEMBLY SUB-HARNESS CONNECTOR", "COMPONENT INSPECTION", TF-90.	
OK or NG	
OK	▶ Repair or replace ATP switch, wait detection switch or neutral-4LO switch.
NG	▶ Repair or replace transfer sub-harness.



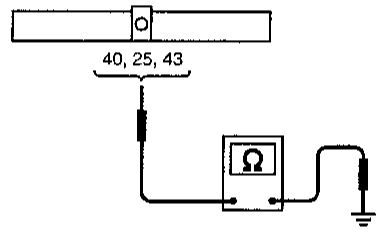
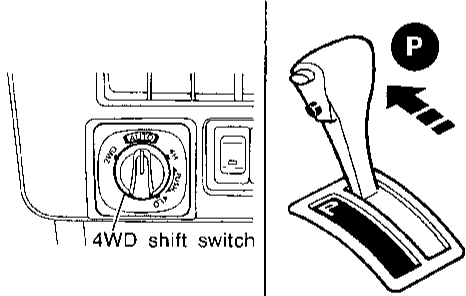
3	CHECK INPUT SIGNAL
WITH CONSULT	
▶	GO TO 4.
WITHOUT CONSULT	
▶	GO TO 5.

4	CHECK INPUT SIGNAL																																	
Ⓟ With CONSULT 1. Select "ECU INPUT SIGNALS" in Data Monitor. 2. Read out the ON/OFF status of "ATP SW", "WAIT DETCT SW" and "NEUTRAL SW".																																		
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OK or NG																																		
OK	▶ GO TO 6.																																	
NG	▶ Check the following. • Harness continuity between transfer switch assembly sub-harness connector and transfer control unit • Continuity between transfer switch assembly sub-harness connector and body ground																																	

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

Diagnostic Procedure (Cont'd)

5	CHECK INPUT SIGNAL
<p> Without CONSULT</p> <p>1. Turn ignition switch to "OFF" position.</p> <p>2. Operate 4WD shift switch and check continuity between the following terminals.</p> <p>Continuity:</p> <p>Terminal 40 (ATP switch) and body ground "4H" position: No continuity should exist. Between "4H" and "4LO": Continuity should exist. "4LO" position: No continuity should exist.</p> <p>Terminal 25 (Neutral-4LO switch) and body ground "4H" position: No continuity should exist. "4LO" position: Continuity should exist.</p> <p>Terminal 43 (Wait detection switch) and body ground "4H" position: No continuity should exist. (*1) "4LO" position: Continuity should exist.</p> <p>*1: After setting from "4LO" to "4H", continuity exists while "Wait" function is operating in "4H" position. (No continuity exists when "Wait" function is canceled.)</p> <div style="text-align: center;">  <p>Transfer control unit connector</p>  <p>SMT787D</p> </div> <div style="text-align: center;">  <p>4WD shift switch</p> <p>SMT849D</p> </div>	
OK or NG	
OK	▶ GO TO 6.
NG	<p>▶ Check the following.</p> <ul style="list-style-type: none"> ● Harness continuity between transfer switch assembly sub-harness connector and transfer control unit ● Continuity between transfer switch assembly sub-harness connector and body ground

6	PERFORM SELF-DIAGNOSIS AGAIN
<p>After driving for a while, perform self-diagnosis again. Refer to "Trouble Diagnosis without CONSULT", TF-26.</p> <p style="text-align: center;">OK or NG</p>	
OK	▶ INSPECTION END
NG	<p>▶</p> <ol style="list-style-type: none"> 1. Perform transfer control unit input/output signal inspection. Refer to "TRANSFER CONTROL UNIT INSPECTION TABLE", "TROUBLE DIAGNOSIS — GENERAL DESCRIPTION", TF-50. 2. If NG, recheck transfer control unit pin terminals for damage or loose connection with harness connector.

CLUTCH PRESSURE SWITCH

Diagnostic Procedure

NBTF0025

Diagnostic Procedure

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 section ("TROUBLE DIAGNOSES").
No	▶ GO TO 2.

2	CHECK OTHER MALFUNCTION
Are other malfunctions also detected by self-diagnosis and CONSULT?	
Refer to "Trouble Diagnosis without CONSULT", TF-26 and "Trouble Diagnosis with CONSULT", TF-29.	
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
WITH CONSULT	▶ GO TO 5.
WITHOUT CONSULT	▶ GO TO 6.

5	CHECK INPUT SIGNAL																														
<p>Ⓟ With CONSULT</p> <ol style="list-style-type: none"> Turn ignition switch to "ON" position. Select "ECU INPUT SIGNALS" in Data Monitor. Read out ON/OFF status of "CL PRES SW". 																															
SMT788D																															
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OK or NG																															
OK	▶ GO TO 7.																														
NG	▶ Check the following. <ul style="list-style-type: none"> Continuity between transfer control unit and transfer terminal cord assembly sub-harness connector Transfer sub-harness Clutch pressure switch Refer to "4WD Solenoid Valve, Clutch Pressure Switch and Line Pressure Switch", "COMPONENT INSPECTION", TF-87. 																														

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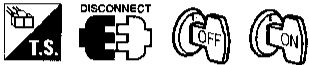
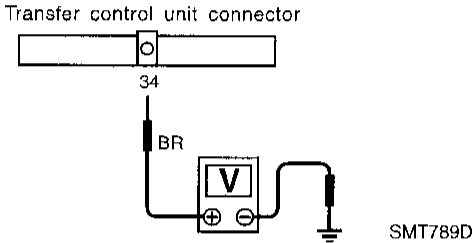
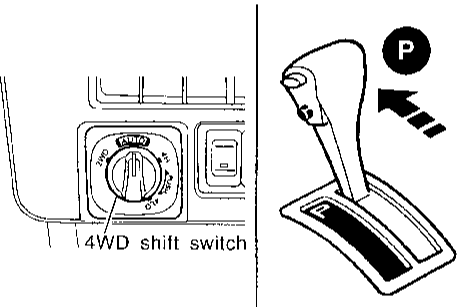
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CLUTCH PRESSURE SWITCH

Diagnostic Procedure (Cont'd)

6	CHECK INPUT SIGNAL
	<p> Without CONSULT</p> <ol style="list-style-type: none"> Turn ignition switch to "ON" position and set 4WD shift switch to "4H" position. Check voltage between transfer control unit harness connector terminal 34 and body ground. <p>When 4WD shift switch is in "2WD": Battery voltage should exist.</p> <p>When 4WD shift switch is in "AUTO" or "4H" and A/T selector lever is in "D": "Wait" operating: Battery voltage should exist. "Wait" not operating: Approx. 0 volts should exist.</p> <div data-bbox="277 514 584 577">  </div> <div data-bbox="284 588 755 829">  <p>Transfer control unit connector</p> <p>34</p> <p>BR</p> <p>V</p> <p>SMT789D</p> </div> <div data-bbox="219 861 673 1165">  <p>4WD shift switch</p> <p>P</p> <p>SMT849D</p> </div> <p style="text-align: center;">OK or NG</p>
OK	▶ GO TO 7.
NG	<p>▶ Check the following.</p> <ul style="list-style-type: none"> Continuity between transfer control unit and transfer terminal cord assembly sub-harness connector Transfer sub-harness Clutch pressure switch <p>Refer to "4WD Solenoid Valve, Clutch Pressure Switch and Line Pressure Switch", "COMPONENT INSPECTION", TF-87.</p>

7	PERFORM SELF-DIAGNOSIS AGAIN	
	<ol style="list-style-type: none"> Check hydraulic parts. After driving for a while, perform self-diagnosis again. Refer to "Trouble Diagnosis without CONSULT", TF-26. <p style="text-align: center;">OK or NG</p>	
OK	▶	INSPECTION END
NG	▶	<ol style="list-style-type: none"> Perform transfer control unit input/output signal inspection. Refer to "TRANSFER CONTROL UNIT INSPECTION TABLE", TF-50. If NG, recheck transfer control unit pin terminals for damage or loose connection with harness connector.

LINE PRESSURE SWITCH

Diagnostic Procedure

Diagnostic Procedure

NBTF0026

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 section ("TROUBLE DIAGNOSES").
No	▶ GO TO 2.

2 CHECK OTHER MALFUNCTIONS	
Are other malfunctions also detected by self-diagnosis and CONSULT?	
Refer to "Trouble Diagnosis without CONSULT", TF-26 and "Trouble Diagnosis with CONSULT", TF-29.	
Yes or No	
Yes	▶ CHECK FOR OTHER MALFUNCTIONS. (When other malfunctions are eliminated, line pressure switch malfunction display may disappear.)
No	▶ GO TO 3.





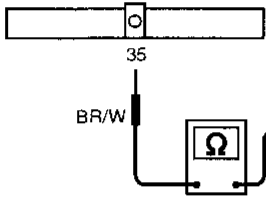
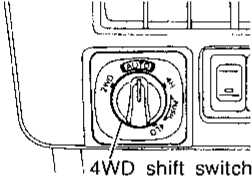

3 CHECK INPUT SIGNAL	
WITH CONSULT	▶ GO TO 4.
WITHOUT CONSULT	▶ GO TO 5.

4 CHECK INPUT SIGNAL																															
<p style="text-align: center;">Line pressure switch</p> <p style="text-align: center;">35</p> <p style="text-align: center;">Transfer control unit</p>																															
SMT790D																															
<p>Ⓜ With CONSULT</p> <p>1. Select "ECU INPUT SIGNALS" in Data Monitor.</p> <p>2. Read out the ON/OFF status of "LINE PRES SW".</p>																															
<table border="1"> <tr> <td>☆ MONITOR</td> <td>☆ NO FAIL</td> <td>▲</td> </tr> <tr> <td>LINE PRES SW</td> <td>OFF</td> <td></td> </tr> <tr> <td>CL PRES SW</td> <td>OFF</td> <td></td> </tr> <tr> <td>ATP SWITCH</td> <td>OFF</td> <td></td> </tr> <tr> <td>N POSI SW AT</td> <td>OFF</td> <td></td> </tr> <tr> <td>R POSI SW AT</td> <td>OFF</td> <td></td> </tr> <tr> <td>P POSI SW AT</td> <td>O N</td> <td></td> </tr> <tr> <td>CLOSED THL/SW</td> <td>O N</td> <td></td> </tr> <tr> <td>ABS OPER SW</td> <td>OFF</td> <td></td> </tr> <tr> <td>WAIT DETCT SW</td> <td>OFF</td> <td></td> </tr> </table>		☆ MONITOR	☆ NO FAIL	▲	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	O N		CLOSED THL/SW	O N		ABS OPER SW	OFF		WAIT DETCT SW	OFF	
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SMT068D																															
OK or NG																															
OK	▶ GO TO 6.																														
NG	▶ Check the following. <ul style="list-style-type: none"> ● Continuity between transfer control unit and transfer terminal cord assembly sub-harness connector ● Transfer sub-harness ● Line pressure switch Refer to "4WD Solenoid Valve, Clutch Pressure Switch and Line Pressure Switch", "COMPONENT INSPECTION", TF-87.																														

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LINE PRESSURE SWITCH

Diagnostic Procedure (Cont'd)

5	CHECK INPUT SIGNAL
<p> Without CONSULT</p> <ol style="list-style-type: none"> Turn ignition switch to "OFF" position. Disconnect transfer control unit harness connector. Check continuity between transfer control unit harness connector terminal 35 and body ground. <p>After the vehicle has been left for at least 5 minutes in a room temperature with ignition switch "OFF": No continuity should exist.</p> <p>With ignition switch in "ON", 4WD shift switch in "AUTO" or "4H" and A/T selector lever in "D": Continuity should exist.</p> <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;">  <p>T.S.</p> </div> <div style="text-align: center;">  <p>DISCONNECT</p> </div> <div style="text-align: center;">  <p>OFF</p> </div> </div> <p style="text-align: center;">Transfer control unit connector</p> <div style="text-align: center;">  <p>35 BR/W</p> <p style="text-align: right;">SMT791D</p> </div> <div style="display: flex; justify-content: space-around; align-items: center; margin-top: 20px;"> <div style="text-align: center;">  <p>4WD shift switch</p> </div> <div style="text-align: center;">  <p>P</p> </div> </div> <p style="text-align: right;">SMT849D</p> <p style="text-align: center;">OK or NG</p>	
OK	▶ GO TO 6.
NG	<p style="text-align: center;">▶ Check the following.</p> <ul style="list-style-type: none"> ● Continuity between transfer control unit and transfer terminal cord assembly sub-harness connector ● Transfer sub-harness ● Line pressure switch <p>Refer to "4WD Solenoid Valve, Clutch Pressure Switch and Line Pressure Switch", "COMPONENT INSPECTION", TF-87.</p>

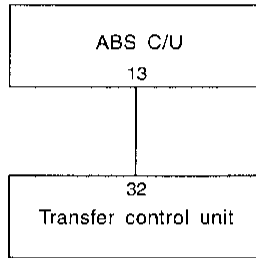
6	PERFORM SELF-DIAGNOSIS AGAIN
<ol style="list-style-type: none"> Check hydraulic parts. After driving for a while, perform self-diagnosis again. Refer to "Trouble Diagnosis without CONSULT", TF-26. <p style="text-align: center;">OK or NG</p>	
OK	▶ INSPECTION END
NG	<p style="text-align: center;">▶</p> <ol style="list-style-type: none"> Perform transfer control unit input/output signal inspection. Refer to TF-50. If NG, recheck transfer control unit pin terminals for damage or loose connection with harness connector.

Diagnostic Procedure

NBTF0027

1	CHECK INPUT SIGNAL	
WITH CONSULT	▶	GO TO 2.
WITHOUT CONSULT	▶	GO TO 3.

2	CHECK INPUT SIGNAL (WITH CONSULT)	
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SMT792D

1. Turn ignition switch to "OFF" position.
 2. Disconnect ABS control unit harness connector.
 3. Turn ignition switch to "ON" position.
 4. Set 4WD shift switch to "4H" position.
 5. Set 4WD shift switch to "AUTO" position.
 6. Read out the status of "ABS OPER SW" and "ABS CONTROL OPERATION".
- ABS operation switch: OFF**
ABS control operation: OFF
7. Connect ABS control unit harness connector terminal 13 to ground and confirm the displayed status.
- ABS operation switch: ON**
ABS control operation: ON

☆ MONITOR	☆ NO FAIL <input type="checkbox"/>
ABS OPER SW	OFF
ABS CONT OPER	OFF

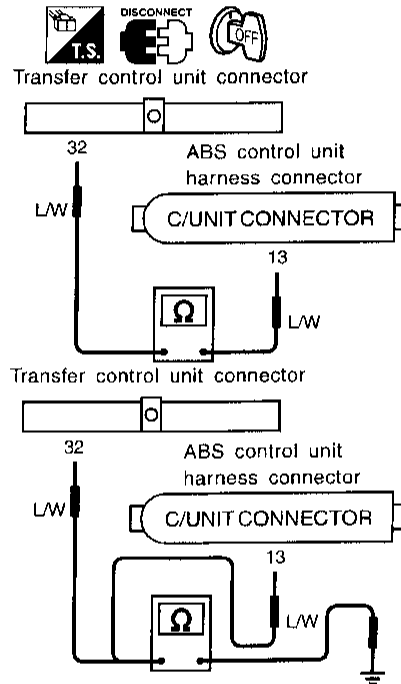
RECORD

SMT075D

OK or NG		
OK	▶	GO TO 4.
NG	▶	Repair or replace harness or connector between ABS control unit and transfer control unit.

3	CHECK INPUT SIGNAL	
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- ⊗ **Without CONSULT**
1. Turn ignition switch to "OFF" position.
 2. Disconnect ABS control unit harness connector.
 3. Turn ignition switch to "OFF" position.
 4. Disconnect ABS control unit and transfer control unit harness connectors.
 5. Check continuity between transfer control unit harness connector terminal 32 and ABS control unit harness connector terminal 13.
Continuity should exist.
 6. Check continuity between transfer control unit harness connector terminal 32, ABS control unit harness connector terminal 13 and body ground.
No continuity should exist.



OK or NG

OK	▶	GO TO 4.
NG	▶	Repair or replace harness or connector between ABS control unit and transfer control unit.

4	CHECK COMMUNICATION LINE	
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Check communication line between ABS control unit and transfer control unit.
 (Refer to "Diagnostic Procedure 14", "TROUBLE DIAGNOSES FOR SYMPTOMS" in BR section.)

OK or NG

OK	▶	GO TO 5.
NG	▶	Check, repair or replace faulty parts.

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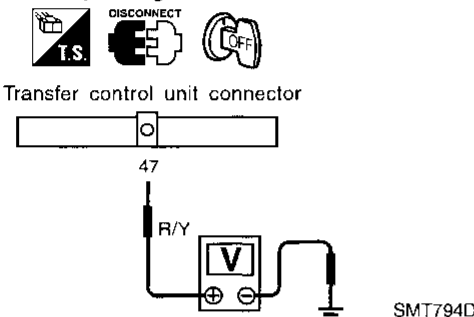
ABS OPERATION SIGNAL

Diagnostic Procedure (Cont'd)

5	PERFORM SELF-DIAGNOSIS AGAIN
After driving for a while, perform self-diagnosis again. Refer to "Trouble Diagnosis without CONSULT", TF-26 and "Trouble Diagnosis with CONSULT", TF-29.	
OK or NG	
OK	▶ INSPECTION END
NG	▶ 1. Perform transfer control unit input/ output signal inspection. Refer to "TRANSFER CONTROL UNIT INSPECTION TABLE", "TROUBLE DIAGNOSIS — GENERAL DESCRIPTION", TF-50. 2. If NG, recheck transfer control unit pin terminals for damage or loose connection with harness connector.

Diagnostic Procedure

NBTFO028

1	CHECK TRANSFER CONTROL UNIT POWER SOURCE
<p>1. Turn ignition switch to "OFF" position and perform self-diagnosis again. Refer to "Trouble Diagnosis without CONSULT", TF-26 and "Trouble Diagnosis with CONSULT", TF-29.</p> <p>2. Turn ignition switch to "OFF" position.</p> <p>3. Disconnect transfer control unit harness connector.</p> <p>4. Check voltage between transfer control unit harness connector terminal 47 and body ground.</p> <p>Voltage: Battery voltage</p>  <p style="text-align: center;">Transfer control unit connector</p> <p style="text-align: center;">47</p> <p style="text-align: center;">R/Y</p> <p style="text-align: center;">V</p> <p style="text-align: center;">SMT794D</p> <p style="text-align: center;">OK or NG</p>	
OK	▶ GO TO 2.
NG	▶ Check the following. <ul style="list-style-type: none"> ● No. 24 fuse (7.5A) ● Harness continuity between fuse and transfer control unit

2	PERFORM SELF-DIAGNOSIS AGAIN
<p>After driving for a while, perform self-diagnosis again. Refer to "Trouble Diagnosis without CONSULT", TF-26 and "Trouble Diagnosis with CONSULT", TF-29.</p> <p style="text-align: center;">OK or NG</p>	
OK	▶ INSPECTION END
NG	▶ <ol style="list-style-type: none"> 1. Perform transfer control unit input/output signal inspection. Refer to "TRANSFER CONTROL UNIT INSPECTION TABLE", "TROUBLE DIAGNOSIS — GENERAL DESCRIPTION", TF-50. 2. If NG, recheck transfer control unit pin terminals for damage or loose connection with harness connector.

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SHIFT ACTUATOR

Diagnostic Procedure

1	SHIFT ACTUATOR
Refer to "Actuator & Actuator Position Switch", "COMPONENT INSPECTION", TF-91.	
OK or NG	
OK	▶ GO TO 3.
NG	▶ GO TO 2.

2	CHECK POWER SOURCE
<p style="text-align: right;">SMT825DA</p>	
<ol style="list-style-type: none"> 1. Disconnect transfer control device terminal. 2. Turn ignition switch to "ON". (Do not start engine.) 3. Check voltage between transfer control device harness connector 3 (or 4) and body ground while 4WD shift switch is set from 4H to 4LO (or from 4LO to 4H). <p style="text-align: center;">Voltage: Battery voltage</p>	
OK or NG	
OK	▶ Repair or replace actuator.
NG	▶ <ol style="list-style-type: none"> 1. Recheck the following. <ul style="list-style-type: none"> • Continuity between ignition switch and transfer HI & LOW relays • Ignition switch and No. 3 fuse (20A) • Continuity between transfer shift HI & LOW relays and transfer control device 2. If NG, repair or replace damaged part.

3	CHECK INPUT SIGNAL
WITH CONSULT	▶ GO TO 4.
WITHOUT CONSULT	▶ GO TO 5.

4	CHECK INPUT SIGNAL
<p>Ⓟ With CONSULT</p> <ol style="list-style-type: none"> 1. Start engine (idling). 2. Select "SELF-DIAG RESULTS" in Select Diag Mode. 3. Read out self-diagnostic result. 	
SMT826D	
<div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 0 auto;"> <p style="text-align: center;">■ SELF-DIAG RESULTS ■ <input type="checkbox"/></p> <p>FAILURE DETECTED</p> <p>* NO SELF DIAGNOSTIC FAILURE INDICATED.</p> <p>FURTHER TESTING MAY BE REQUIRED. **</p> <p style="text-align: center;">ERASE PRINT</p> </div>	
SMT827D	
OK or NG	
OK	▶ GO TO 7.
NG	▶ GO TO 6.

5 CHECK INPUT SIGNAL

Without CONSULT

- Start engine (idling).
- Check voltage between transfer control unit harness connector terminal 33 (or 42) and body ground while 4WD shift switch is set from 4H to 4LO (or from 4LO to 4H).

Transfer control unit connector

SMT828D

3. Result

Terminal No.	Condition	Voltage
33	While actuator is operating from 4H to 4LO.	Battery voltage
	Actuator does not operate.	Approx. 0V
42	While actuator is operating from 4LO to 4H.	Battery voltage
	Actuator does not operate.	Approx. 0V

MTBL0202

OK or NG

OK	▶	GO TO 7.
NG	▶	GO TO 6.

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 "Trouble Diagnosis without CONSULT", TF-26.

OK or NG

OK	▶	INSPECTION END
NG	▶	<ol style="list-style-type: none"> Perform transfer control unit/output signal inspection. Refer to "TRANSFER CONTROL UNIT INSPECTION TABLE", "TROUBLE DIAGNOSIS — GENERAL DESCRIPTION", TF-50. If NG, recheck transfer control unit pin terminals for damage or loose connection with harness connector.

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SHIFT ACTUATOR POSITION SWITCH

Diagnostic Procedure


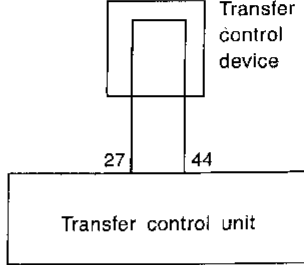
Diagnostic Procedure

NBTF0065

1	SHIFT ACTUATOR POSITION SWITCH	
Refer to "Actuator & Actuator Position Switch", "COMPONENT INSPECTION", TF-91.		
OK or NG		
OK	▶	GO TO 3.
NG	▶	GO TO 2.

2	CHECK POSITION SWITCH	
1. Recheck continuity of shift actuator position switch. Refer to "Actuator & Actuator Position Switch", "COMPONENT INSPECTION", TF-91 Continuity should exist.		
OK or NG		
OK	▶	GO TO 3.
NG	▶	Repair or replace position switch.

3	CHECK INPUT SIGNAL	
WITH CONSULT	▶	GO TO 4.
WITHOUT CONSULT	▶	GO TO 5.

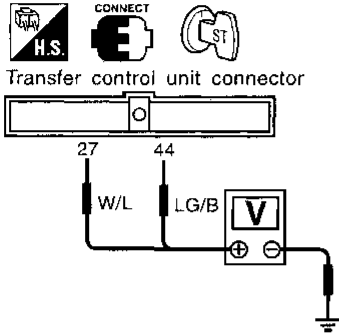
4	CHECK INPUT SIGNAL													
<p> With CONSULT</p> <ol style="list-style-type: none"> 1. Start engine (idling). 2. Select "SELF-DIAG RESULTS" in Select Diag Mode. 3. Read out self-diagnostic result. 														
														
SMT829DA														
<table border="1" style="margin: auto;"> <tr> <td style="text-align: center;">■ SELF-DIAG RESULTS ■</td> <td style="text-align: center;"><input type="checkbox"/></td> </tr> <tr> <td colspan="2">FAILURE DETECTED</td> </tr> <tr> <td colspan="2">* NO SELF DIAGNOSTIC FAILURE INDICATED.</td> </tr> <tr> <td colspan="2">FURTHER TESTING MAY BE REQUIRED. **</td> </tr> <tr> <td colspan="2" style="text-align: center;"> <table border="1" style="margin: auto;"> <tr> <td>ERASE</td> <td>PRINT</td> </tr> </table> </td> </tr> </table>			■ SELF-DIAG RESULTS ■	<input type="checkbox"/>	FAILURE DETECTED		* NO SELF DIAGNOSTIC FAILURE INDICATED.		FURTHER TESTING MAY BE REQUIRED. **		<table border="1" style="margin: auto;"> <tr> <td>ERASE</td> <td>PRINT</td> </tr> </table>		ERASE	PRINT
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SMT827D														
OK or NG														
OK	▶	GO TO 7.												
NG	▶	GO TO 6.												

SHIFT ACTUATOR POSITION SWITCH

Diagnostic Procedure (Cont'd)

5 CHECK INPUT SIGNAL

- Without CONSULT**
- Start engine (idling).
 - Check voltage transfer control unit harness connector terminal 27 (or 44) and body ground while 4WD shift switch is set from 4H to 4LO (or from 4LO to 4H).



3. Result

Terminal No.	Condition	Voltage
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

SMT830D

MTBL0203

OK or NG

OK	▶	GO TO 7.
NG	▶	GO TO 6.

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 "Trouble Diagnosis without CONSULT", TF-26.

OK or NG

OK	▶	INSPECTION END
NG	▶	<ol style="list-style-type: none"> Perform transfer control unit/output signal inspection. Refer to "TRANSFER CONTROL UNIT INSPECTION TABLE", "TROUBLE DIAGNOSIS — GENERAL DESCRIPTION", TF-50. If NG, recheck transfer control unit pin terminals for damage or loose connection with harness connector.

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SHIFT ACTUATOR CIRCUIT

Diagnostic Procedure

Diagnostic Procedure

NBTFO066

1	SHIFT ACTUATOR CIRCUIT	
Refer to "Transfer Shift Relay (High & Low)", "COMPONENT INSPECTION" and "Actuator & Actuator Position Switch", "COMPONENT INSPECTION", TF-90, 91.		
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	
<p style="text-align: right;">SMT825DA</p>		
<ol style="list-style-type: none"> 1. Disconnect transfer control device terminal. 2. Turn ignition switch to "ON" (Do not start engine). 3. Check voltage between transfer shift HI and LOW relay terminal 5 and body ground. <p>Voltage: Battery voltage</p>		
<p>Transfer shift HI & LOW relays (E93) (E94)</p> <p style="text-align: right;">SMT831D</p>		
OK or NG		
OK	▶	GO TO 3.
NG	▶	Check the following. <ul style="list-style-type: none"> • Continuity between ignition switch and transfer shift HI & LOW relays • Check ground circuit between transfer shift HI & LOW relays and body ground. • Ignition switch and No. 3 fuse (20A)

3	CHECK POWER SOURCE OF TRANSFER CONTROL DEVICE	
<ol style="list-style-type: none"> 1. Disconnect transfer control device terminal. 2. Turn ignition switch to "ON". (Do not start engine.) 3. Turn 4WD shift switch from "4H" to "4LOW" (or from "4LO" to "4H"). 4. Check voltage between transfer control device terminal 3 (or 4) and body ground. <p>Voltage: Battery voltage</p>		
<p style="text-align: right;">SMT832D</p>		
OK or NG		
OK	▶	GO TO 4.
NG	▶	Check the following. <ul style="list-style-type: none"> • Harness and connector from transfer shift HI and LOW relays to transfer control device harness terminal • Ground circuit between transfer control device and body ground.

4	CHECK INPUT SIGNAL	
WITH CONSULT	▶	GO TO 5.
WITHOUT CONSULT	▶	GO TO 6.

SHIFT ACTUATOR CIRCUIT

Diagnostic Procedure (Cont'd)

5 CHECK INPUT SIGNAL

With CONSULT

- Start engine (idling).
- Select "SELF-DIAG RESULTS" in Select Diag Mode.
- Read out self-diagnostic result.

SMT835D

■ SELF-DIAG RESULTS ■

FAILURE DETECTED
* NO SELF DIAGNOSTIC FAILURE INDICATED.
FURTHER TESTING MAY BE REQUIRED. **

ERASE PRINT

SMT827D

OK or NG

OK	▶	GO TO 8.
NG	▶	GO TO 7.

6 CHECK INPUT SIGNAL

Without CONSULT

- Start engine (idling).
- Check voltage between transfer control unit harness connector terminal 4 (or 13) and body ground while 4WD shift switch is set from 4H to 4LO (or from 4LO to 4H).

SMT836D

3. Result

Terminal No.	Condition	Voltage
4	While actuator is operating from 4H to 4LO.	Battery voltage
	Actuator does not operate.	Less than 1V
13	While actuator is operating from 4LO to 4H.	Battery voltage
	Actuator does not operate.	Less than 1V

MTBL0204

OK or NG

OK	▶	GO TO 8.
NG	▶	GO TO 7.

7 CHECK HARNESS CONTINUITY BETWEEN TRANSFER CONTROL UNIT AND TRANSFER CONTROL DEVICE

OK or NG

OK	▶	GO TO 8.
NG	▶	Repair and replace harness connector between transfer control unit and transfer control device.

8 PERFORM SELF-DIAGNOSIS AGAIN

After driving for a while, perform self-diagnosis again. Refer to "Trouble Diagnosis without CONSULT", TF-26.

OK or NG

OK	▶	INSPECTION END
NG	▶	<ol style="list-style-type: none"> Perform transfer control unit/output signal inspection. Refer to "TRANSFER CONTROL UNIT INSPECTION TABLE", "TROUBLE DIAGNOSIS — GENERAL DESCRIPTION", TF-50. If NG, recheck transfer control unit pin terminals for damage or loose connection with harness connector.

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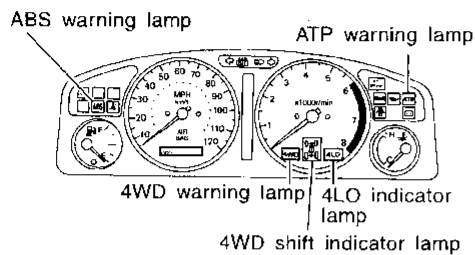
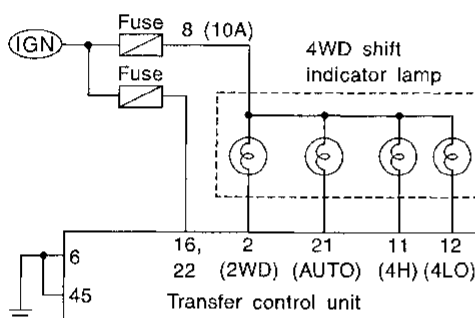
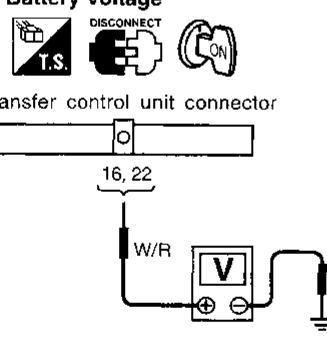
TROUBLE DIAGNOSES FOR SYMPTOMS

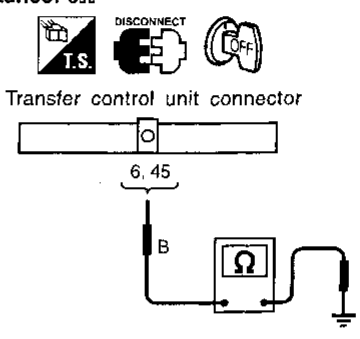
Symptom 1. 4WD Shift Indicator Lamp Does Not Turn ON

Symptom 1. 4WD Shift Indicator Lamp Does Not Turn ON

NBTF0029

SYMPTOM: Although ignition switch is turned "ON", all the 4WD shift indicator lamps do not turn ON for 1 second.

1	CHECK TRANSFER CONTROL UNIT POWER SOURCE						
 <p style="text-align: center;">SMT850D</p>  <p style="text-align: center;">SMT860D</p> <ol style="list-style-type: none"> 1. Turn ignition switch to "OFF" position and disconnect transfer control unit harness connector. 2. Turn ignition switch to "ON" position. (Do not start engine.) 3. Check voltage between transfer control unit harness connector terminals 16, 22 and body ground. <p>Voltage: Battery voltage</p>  <p style="text-align: center;">SMT796D</p> <p style="text-align: center;">OK or NG</p> <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 10px;"> <tr> <td style="width: 30px; text-align: center;">OK</td> <td style="text-align: center;">▶</td> <td>GO TO 2.</td> </tr> <tr> <td style="text-align: center;">NG</td> <td style="text-align: center;">▶</td> <td> Check the following. <ul style="list-style-type: none"> • Continuity between ignition switch and transfer control unit • Ignition switch and No. 8 fuse (10A) </td> </tr> </table>		OK	▶	GO TO 2.	NG	▶	Check the following. <ul style="list-style-type: none"> • Continuity between ignition switch and transfer control unit • Ignition switch and No. 8 fuse (10A)
OK	▶	GO TO 2.					
NG	▶	Check the following. <ul style="list-style-type: none"> • Continuity between ignition switch and transfer control unit • Ignition switch and No. 8 fuse (10A) 					

2	CHECK TRANSFER CONTROL UNIT GROUND CIRCUIT						
<ol style="list-style-type: none"> 1. Turn ignition switch to "OFF" position. 2. Disconnect transfer control unit harness connector. 3. Measure resistance between transfer control unit harness connector terminals 6, 45 and body ground. <p>Resistance: 0Ω</p>  <p style="text-align: center;">SMT797D</p> <p style="text-align: center;">OK or NG</p> <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 10px;"> <tr> <td style="width: 30px; text-align: center;">OK</td> <td style="text-align: center;">▶</td> <td>GO TO 3.</td> </tr> <tr> <td style="text-align: center;">NG</td> <td style="text-align: center;">▶</td> <td>Check continuity between transfer control unit and body ground.</td> </tr> </table>		OK	▶	GO TO 3.	NG	▶	Check continuity between transfer control unit and body ground.
OK	▶	GO TO 3.					
NG	▶	Check continuity between transfer control unit and body ground.					

3	CHECK PROCEDURES FROM THE BEGINNING AGAIN						
<p>Check again.</p> <p style="text-align: center;">OK or NG</p> <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 10px;"> <tr> <td style="width: 30px; text-align: center;">OK</td> <td style="text-align: center;">▶</td> <td>INSPECTION END</td> </tr> <tr> <td style="text-align: center;">NG</td> <td style="text-align: center;">▶</td> <td> <ol style="list-style-type: none"> 1. Perform transfer control unit input/output signal inspection. Refer to "TRANSFER CONTROL UNIT INSPECTION TABLE", "TROUBLE DIAGNOSIS — GENERAL DESCRIPTION", TF-50. 2. If NG, recheck transfer control unit pin terminals for damage or loose connection with harness connector. </td> </tr> </table>		OK	▶	INSPECTION END	NG	▶	<ol style="list-style-type: none"> 1. Perform transfer control unit input/output signal inspection. Refer to "TRANSFER CONTROL UNIT INSPECTION TABLE", "TROUBLE DIAGNOSIS — GENERAL DESCRIPTION", TF-50. 2. If NG, recheck transfer control unit pin terminals for damage or loose connection with harness connector.
OK	▶	INSPECTION END					
NG	▶	<ol style="list-style-type: none"> 1. Perform transfer control unit input/output signal inspection. Refer to "TRANSFER CONTROL UNIT INSPECTION TABLE", "TROUBLE DIAGNOSIS — GENERAL DESCRIPTION", TF-50. 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

Symptom 2. 4WD Warning Lamp Does Not Turn ON

SYMPTOM: Although ignition switch is turned "ON", 4WD warning lamp does not turn ON.

#NBTFO030

1	CHECK TRANSFER CONTROL UNIT POWER SOURCE
<p style="text-align: right;">SMT799D</p>	
<ol style="list-style-type: none"> Turn ignition switch to "OFF" position and disconnect transfer control unit harness connector. Turn ignition switch to "ON" position. (Do not start engine.) Check voltage between transfer control unit harness connector terminals 16, 22 and body ground. <p>Voltage: Battery voltage</p> <p style="text-align: right;">SMT800D</p>	
OK or NG	
OK	▶ GO TO 2.
NG	▶ Check the following. <ul style="list-style-type: none"> Continuity between ignition switch and transfer control unit Ignition switch and No. 18 fuse (10A)

2	CHECK TRANSFER CONTROL UNIT GROUND CIRCUIT
<ol style="list-style-type: none"> Turn ignition switch to "OFF" position. Disconnect transfer control unit harness connector. Measure resistance between transfer control unit harness connector terminals 6, 45 and body ground. <p>Resistance: 0Ω</p> <p style="text-align: right;">SMT803D</p>	
OK or NG	
OK	▶ GO TO 3.
NG	▶ Check continuity between transfer control unit and body ground.

3	CHECK 4WD WARNING LAMP CIRCUIT
<p>Check the following.</p> <ul style="list-style-type: none"> 4WD warning lamp Continuity between ignition switch and 4WD warning lamp Continuity between 4WD warning lamp and transfer control unit <p style="text-align: center;">OK or NG</p>	
OK	▶ GO TO 4.
NG	▶ <ul style="list-style-type: none"> Repair or replace harness or connector. Replace 4WD warning lamp.

4	CHECK PROCEDURES FROM THE BEGINNING AGAIN
Check again.	
OK or NG	
OK	▶ INSPECTION END
NG	▶ <ol style="list-style-type: none"> Perform transfer control unit input/output signal inspection. Refer to "TRANSFER CONTROL UNIT INSPECTION TABLE", "TROUBLE DIAGNOSIS — GENERAL DESCRIPTION", TF-50. If NG, recheck transfer control unit pin terminals for damage or loose connection with harness connector.

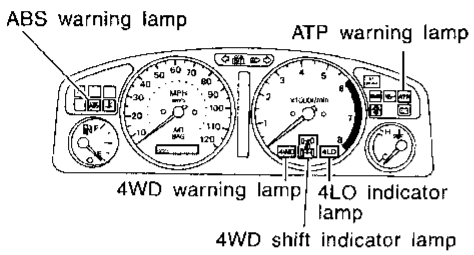
TROUBLE DIAGNOSES FOR SYMPTOMS

Symptom 3. 4WD Shift Indicator Lamp Does Not Turn OFF

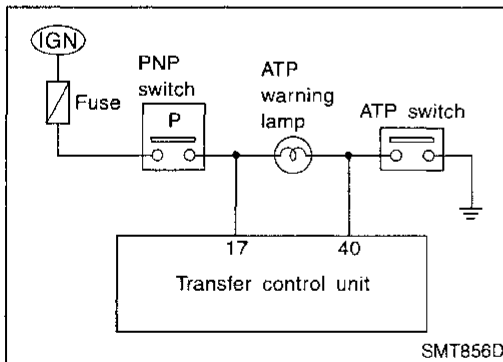
Symptom 3. 4WD Shift Indicator Lamp Does Not Turn OFF

NBTF0031

SYMPTOM: When 4WD shift switch is set from "4H" to "4LO", all the 4WD shift indicator lamps do not turn OFF.

1	CHECK ATP SWITCH CIRCUIT
 <p style="text-align: right;">SMT850D</p>	
<p>Check ATP switch circuit. Refer to "Diagnostic Procedure", "ATP SWITCH, WAIT DETECTION SWITCH AND NEUTRAL-4LO SWITCH", TF-88.</p> <p style="text-align: center;">OK or NG</p>	
OK	▶ GO TO 2.
NG	▶ Check, repair or replace faulty parts.

2	CHECK PROCEDURE FROM THE BEGINNING AGAIN
<p>Check again.</p> <p style="text-align: center;">OK or NG</p>	
OK	▶ INSPECTION END
NG	▶ Recheck each connector's pin terminals for damage or loose connection.



Symptom 4. ATP Warning Lamp Does Not Turn ON

NBTF0032

SYMPTOM: When 4WD shift switch is set from "4H" to "4LO" with A/T selector lever in "P" position, ATP warning lamp does not turn ON.

1	CHECK ATP SWITCH CIRCUIT
<p>Check ATP switch circuit. Refer to "Diagnostic Procedure", "ATP SWITCH, WAIT DETECTION SWITCH AND NEUTRAL-4LO SWITCH", TF-88.</p> <p style="text-align: center;">OK or NG</p>	
OK	▶ GO TO 2.
NG	▶ Check, repair or replace faulty parts.

TROUBLE DIAGNOSES FOR SYMPTOMS

Symptom 4. ATP Warning Lamp Does Not Turn ON (Cont'd)

2	CHECK FOLLOWING ITEMS	
Check the following. <ul style="list-style-type: none"> ● ATP warning lamp ● Continuity between PNP ("P" position) switch terminal 4 and ATP warning lamp ● Continuity between ATP warning lamp and ATP switch 		
OK or NG		
OK	▶	GO TO 3.
NG	▶	Repair or replace ATP warning lamp, harness or connector.

3	CHECK PNP SWITCH CIRCUIT	
Check PNP switch circuit. Refer to AT section ("DTC P0705 PNP SWITCH").		
OK or NG		
OK	▶	GO TO 4.
NG	▶	Check, repair or replace faulty parts.

4	CHECK PROCEDURES FROM THE BEGINNING AGAIN	
Check again.		
OK or NG		
OK	▶	INSPECTION END
NG	▶	Recheck each connector's pin terminals for damage or loose connection.

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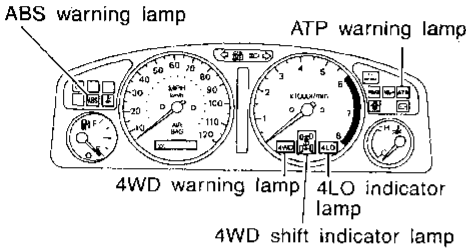
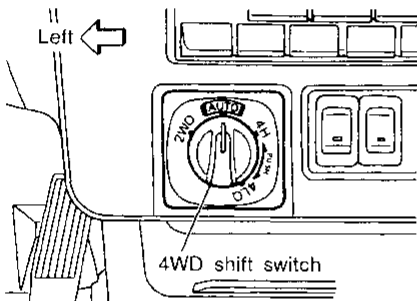
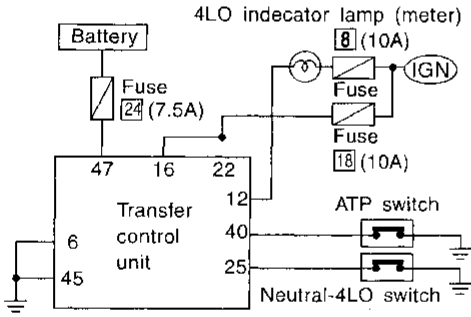
TROUBLE DIAGNOSES FOR SYMPTOMS

Symptom 5. 4LO Indicator Lamp Does Not Turn ON

Symptom 5. 4LO Indicator Lamp Does Not Turn ON

=NBT0033

SYMPTOM: When 4WD shift switch is set from "4H" to "4LO" position, 4LO indicator lamp does not turn ON.

1	CHECK TRANSFER CONTROL UNIT POWER SUPPLY CIRCUIT
 <p style="text-align: center;">SMT850D</p>  <p style="text-align: center;">SMT851D</p>  <p style="text-align: center;">SMT857D</p>	
<ol style="list-style-type: none"> 1. Disconnect battery negative terminal (-), then transfer control unit connector. 2. Connect battery negative terminal (-) and turn ignition switch "ON" (with engine stopped). 3. Check voltage across transfer control unit body-side connector terminals 47, 22, 16 and body ground. Voltage: Battery voltage <p style="text-align: center;">OK or NG</p>	
OK	▶ GO TO 2.
NG	▶ Check the following. <ul style="list-style-type: none"> • Continuity between battery and transfer control unit • Ignition switch (Refer to EL section.) • No. 24 fuse (7.5A), No. 8 fuse (10A) and No. 18 fuse (10A)

2	CHECK TRANSFER CONTROL UNIT GROUND CIRCUIT
<ol style="list-style-type: none"> 1. Turn ignition switch "OFF", and disconnect transfer control unit connector. 2. Check for continuity between transfer control unit body-side connector terminals 6, 45 and body ground. Continuity should exist. <p style="text-align: center;">OK or NG</p>	
OK	▶ GO TO 3.
NG	▶ Check the following. <ul style="list-style-type: none"> • Continuity between transfer control unit and body ground

3	CHECK 4LO INDICATOR LAMP CIRCUIT
<p>Disconnect battery negative terminal (-) and check the following items:</p> <ol style="list-style-type: none"> 1. Check condition of 4LO indicator lamp. 2. Check continuity between battery and 4LO indicator lamp. 3. Check continuity between 4LO indicator lamp and transfer control unit connector terminal 12. 4. Check condition of ATP switch. 5. Check condition of neutral-4LO switch. 6. Check continuity between neutral-4LO switch ground terminal 6 and body ground. <p style="text-align: center;">OK or NG</p>	
OK	▶ GO TO 4.
NG	▶ Check the following. <ul style="list-style-type: none"> • 4LO indicator lamp • Neutral-4LO switch <p>Refer to "ATP Switch, Neutral-4LO Switch and Wait Detection Switch", "COMPONENT INSPECTION", TF-88.</p>

4	CHECK PROCEDURES FROM THE BEGINNING
Check again.	
OK or NG	
OK	▶ INSPECTION END
NG	▶ <ol style="list-style-type: none"> 1. Perform transfer control unit input/output signal inspection. Refer to "TRANSFER CONTROL UNIT INSPECTION TABLE", "TROUBLE DIAGNOSIS — GENERAL DESCRIPTION", TF-50. 2. If NG, recheck transfer control unit pin terminals for damage or loose connection with harness connector.

TROUBLE DIAGNOSES FOR SYMPTOMS

Symptom 6. 4WD Shift Indicator Lamp Does Not Indicate "4H"

Symptom 6. 4WD Shift Indicator Lamp Does Not Indicate "4H"

NBTF0034

SYMPTOM: When 4WD shift switch is set to "4H", 4WD shift indicator lamp does not indicate "4H".

1	CHECK 4WD WARNING LAMP
SMT850D	
Is 4WD warning lamp turned ON?	
Yes or No	
Yes	▶ Refer to "Trouble Diagnosis without CONSULT", TF-26.
No	▶ GO TO 2.

2	CHECK FOLLOWING ITEMS
Check the following.	
<ul style="list-style-type: none"> • Neutral-4LO switch circuit. Refer to TF-63. • Wait detection switch circuit. Refer to TF-63. • ATP switch circuit. Refer to TF-63. 	
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's pin terminals for damage or loose connection.

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TROUBLE DIAGNOSES FOR SYMPTOMS

Symptom 7. 4WD Shift Indicator Lamp Repeats Flickering

Symptom 7. 4WD Shift Indicator Lamp Repeats Flickering

=NBTFO035

SYMPTOM: 4WD shift indicator lamp keeps flickering.

1	CHECK 4WD SHIFT INDICATOR LAMP
<p>ABS warning lamp ATP warning lamp</p> <p>4WD warning lamp 4LO indicator lamp</p> <p>4WD shift indicator lamp</p>	
SMT850D	
<p>1. Set 4WD shift switch to "2WD" position.</p> <p>2. Move vehicle forward and backward. Or drive straight increasing or decreasing speed under 20 km/h (12 MPH).</p> <p>3. Does 4WD shift indicator lamp keep flickering?</p>	
Yes or No	
Yes	▶ GO TO 2.
No	▶ INSPECTION END

2	CHECK TIGHT CORNER BRAKING SYMPTOM
<p>Drive vehicle at speed under 20 km/h (12 MPH), turning steering wheel to the limit. Does tight corner braking symptom occur?</p>	
Yes or No	
Yes	▶ GO TO 3.
No	▶ GO TO 4.

3	CHECK 4WD SHIFT INDICATOR LAMP
<p>Does the 4WD shift indicator lamp keep flickering when the front wheels are jacked up?</p>	
Yes or No	
Yes	▶ Check transfer unit operating system.
No	▶ Check tires.

4	CHECK 4WD WARNING LAMP
<p>Does 4WD warning lamp flicker? (4WD shift indicator lamp is turned OFF.)</p>	
Yes or No	
Yes	▶ Perform self-diagnoses. Refer to "Trouble Diagnosis without CONSULT", TF-26.
No	▶ GO TO 5.

5	CHECK 4WD SHIFT INDICATOR LAMP
<p>Does 4WD shift indicator lamp keep flickering?</p>	
Yes or No	
Yes	▶ Check again.
No	▶ INSPECTION END

☆ MONITOR	☆ NO FAIL	<input type="checkbox"/>
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	
CLOSED THL/SW	OFF	
ABS OPER SW	OFF	
WAIT DETCT SW	OFF	
RECORD		
SMT122D		

Symptom 8. Tight Corner Braking Symptom

NBTFO036

SYMPTOM: Tight corner braking symptom occurs. (Hydraulic system failure)

TROUBLE DIAGNOSES FOR SYMPTOMS

Symptom 8. Tight Corner Braking Symptom (Cont'd)

1 CHECK INPUT SIGNAL	
<p>Ⓐ With CONSULT 1. Select "ECU INPUT SIGNALS" in Data Monitor. 2. Read out the ON/OFF status of "CLUTCH PRES SW".</p>	
<p>Ⓑ Without CONSULT Check voltage between transfer control unit harness connector terminal 34 and body ground. Refer to "TRANSFER CONTROL UNIT INSPECTION TABLE", "TROUBLE DIAGNOSIS — GENERAL DESCRIPTION", TF-50.</p>	
OK or NG	
OK	<p>▶ Disassemble transfer unit and check the following.</p> <ul style="list-style-type: none"> ● 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	
<p>Check clutch pressure switch circuit. Refer to "Diagnostic Procedure", "CLUTCH PRESSURE SWITCH", TF-65.</p>	
OK or NG	
OK	▶ GO TO 3.
NG	▶ Check, repair or replace faulty parts.

3 CHECK PROCEDURES FROM THE BEGINNING AGAIN	
<p>Check again.</p>	
OK or NG	
OK	▶ INSPECTION END
NG	▶ Recheck each connector's pin terminals for damage or loose connection.

☆ MONITOR	☆ NO FAIL	<input type="checkbox"/>
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	
CLOSED THL/SW	OFF	
ABS OPER SW	OFF	
WAIT DETCT SW	OFF	
RECORD		

SMT122D

Symptom 9. 4WD System Does Not Operate

SYMPTOM: The vehicle cannot be put into 4WD mode. (Hydraulic system failure)

NBTF0037

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TROUBLE DIAGNOSES FOR SYMPTOMS

Symptom 9. 4WD System Does Not Operate (Cont'd)

1	CHECK INPUT SIGNAL	
<p><input checked="" type="checkbox"/> With CONSULT</p> <p>1. Select "ECU INPUT SIGNALS" in Data Monitor. 2. Read out the ON/OFF status of "CLUTCH PRES SW".</p>		
<p><input checked="" type="checkbox"/> Without CONSULT</p> <p>Check voltage between transfer control unit harness connector terminal 34 and body ground. Refer to "TRANSFER CONTROL UNIT INSPECTION TABLE", "TROUBLE DIAGNOSIS — GENERAL DESCRIPTION", TF-50.</p>		
OK or NG		
OK	▶	<p>1. Check transfer fluid level. 2. Disassemble transfer unit and check the following.</p> <ul style="list-style-type: none"> ● 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.

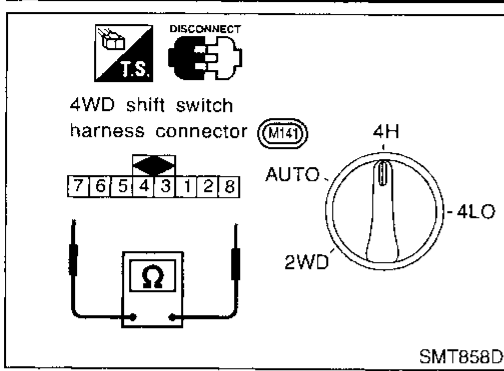
2	CHECK CLUTCH PRESSURE CIRCUIT	
<p>Check clutch pressure switch circuit. Refer to "Diagnostic Procedure", "CLUTCH PRESSURE SWITCH", TF-65.</p>		
OK or NG		
OK	▶	GO TO 3.
NG	▶	Check, repair or replace faulty parts.

3	CHECK PROCEDURES FROM THE BEGINNING	
<p>Check again.</p>		
OK or NG		
OK	▶	INSPECTION END
NG	▶	Recheck each connector's pin terminals for damage or loose connection.

COMPONENT INSPECTION

4WD Shift Switch

NBTF0038S01



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

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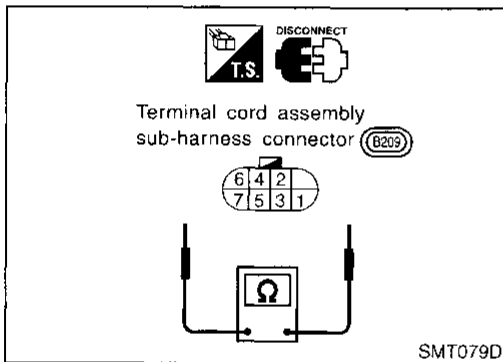
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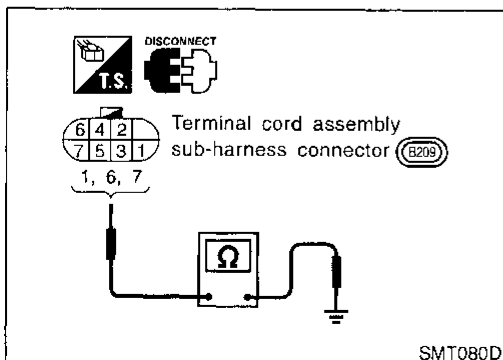


2-4WD Shift Solenoid Valve and Transfer Fluid Temperature Sensor

NBTF0038S02

Measure resistance between terminals of transfer terminal cord assembly sub-harness connector located on rear-right of transfer unit.

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



4WD Solenoid Valve, Clutch Pressure Switch and Line Pressure Switch

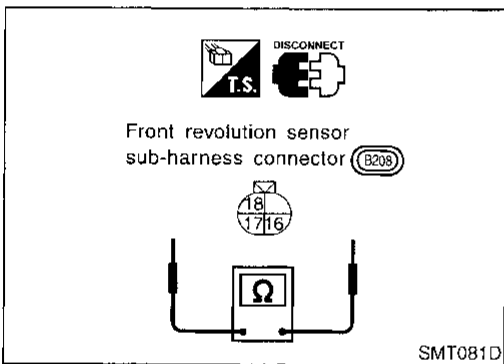
NBTF0038S03

Measure resistance between terminals of transfer terminal cord assembly sub-harness connector located on rear-right of transfer unit.

COMPONENT INSPECTION

4WD Solenoid Valve, Clutch Pressure Switch and Line Pressure Switch (Cont'd)

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

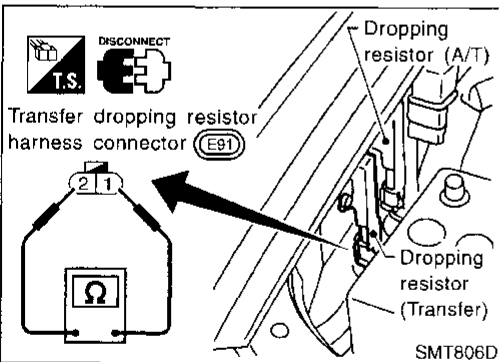


Front Revolution Sensor

NBTF0038S04

Measure resistance between terminals of front revolution sensor sub-harness connector located on rear-right of transfer unit.

Terminals	Resistance
16 - 17	500 - 650Ω
18 - 17	No continuity
18 - 16	No continuity

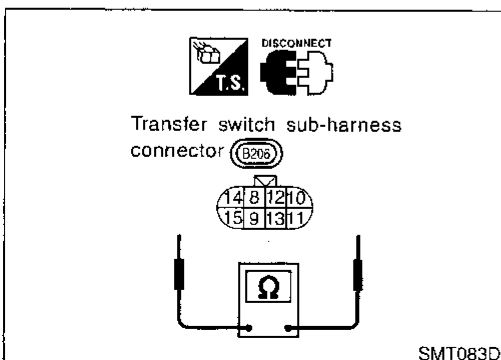


Transfer Dropping Resistor

NBTF0038S07

Check resistance between terminals.

Resistance: 11.2 - 12.8 Ω



ATP Switch, Neutral-4LO Switch and Wait Detection Switch

NBTF0038S06

Measure resistance between terminals of transfer switch assembly sub-harness connector located on rear-right of transfer unit.

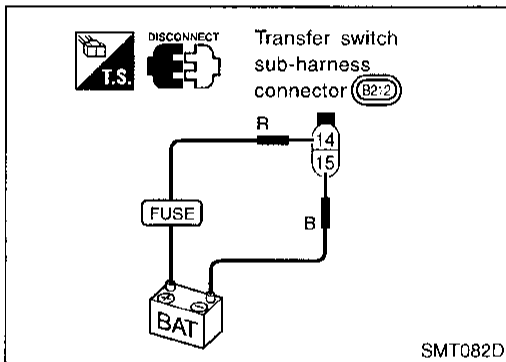
COMPONENT INSPECTION

ATP Switch, Neutral-4LO Switch and Wait Detection Switch (Cont'd)

Switch	Terminals	4WD shift switch position		
		4H	(N)	4LO
ATP switch	8 - 9	No continuity	Continuity	No continuity
Neutral-4LO switch	12 - 13	No continuity		Continuity
Wait detection switch	10 - 11	No continuity		Continuity
		(Note) ←-----		

NOTE:

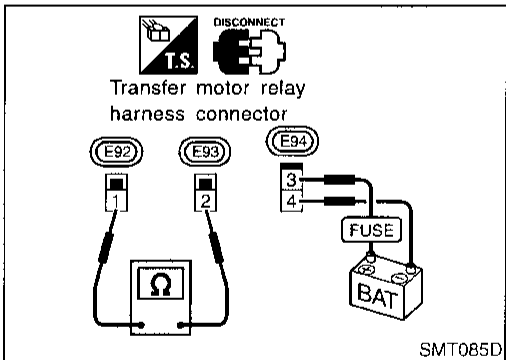
When shifting from "4LO" to "4H", continuity exists while "Wait" function is operating. (No continuity exists when "Wait" function is canceled.)



Transfer Motor

Apply battery voltage directly to transfer motor assembly sub-harness connector located on rear-right of transfer unit. (Positive: Terminal 14, Negative: Terminal 15)

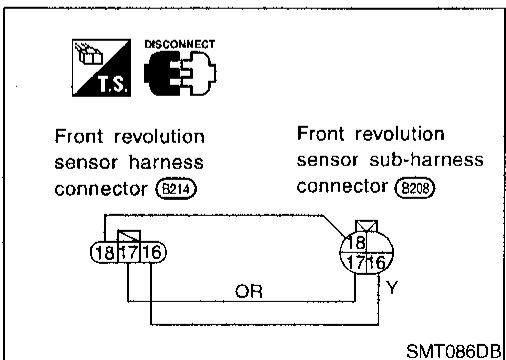
Transfer motor should operate.



Transfer Motor Relay

1. Apply battery voltage directly to terminals 3 and 4.
2. Check continuity between terminals 1 and 2.

Condition	Continuity (1 - 2)
Battery voltage is applied	Yes
No voltage is applied	No



Transfer Sub-harness

FRONT REVOLUTION SENSOR SUB-HARNESS CONNECTOR

Check continuity between terminals shown in the figure.

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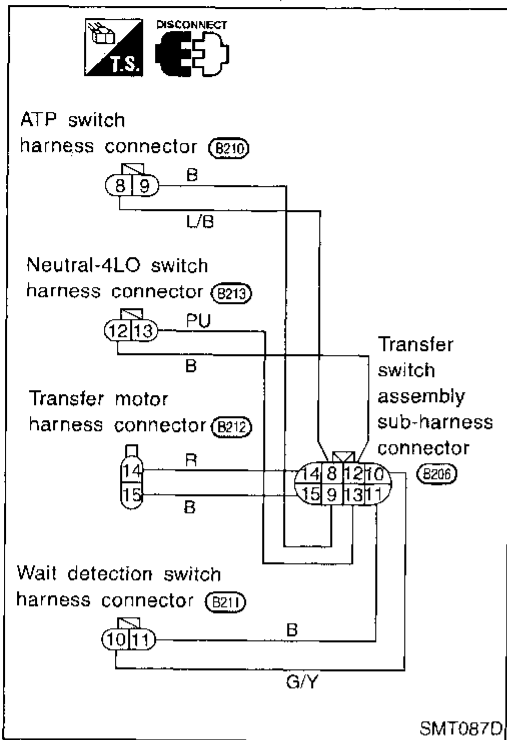
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COMPONENT INSPECTION

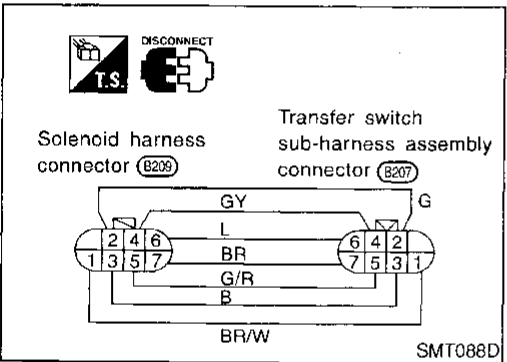
Transfer Sub-harness (Cont'd)



TRANSFER SWITCH ASSEMBLY SUB-HARNESS CONNECTOR

NBTF0038S0902

Check continuity between terminals shown in the figure.



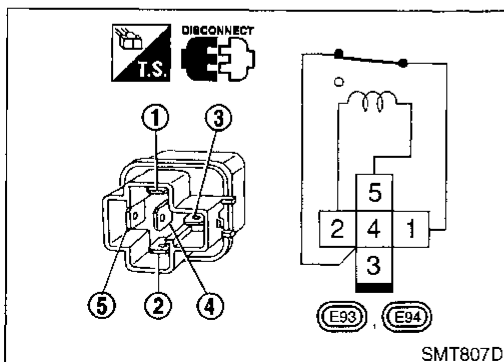
TRANSFER TERMINAL CORD ASSEMBLY SUB-HARNESS CONNECTOR

NBTF0038S0903

Check continuity between terminals shown in the figure.

Terminals on solenoid valve

Terminals	Components
6	4WD solenoid valve
4, 5	2-4WD shift solenoid valve
2, 3	Transfer fluid temperature sensor
7	Clutch pressure switch
1	Line pressure switch



Transfer Shift Relay (High & low)

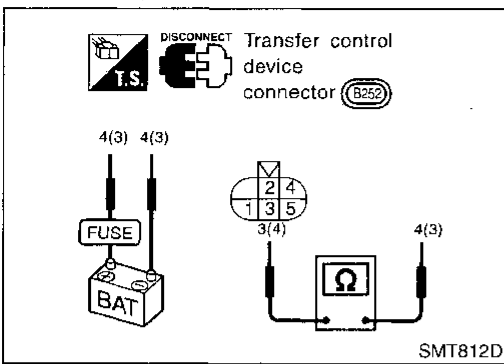
NB1F0038S10

Check continuity between terminals 3 and 4.

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

COMPONENT INSPECTION

Actuator & Actuator Position Switch



Actuator & Actuator Position Switch

NBTF0038S11

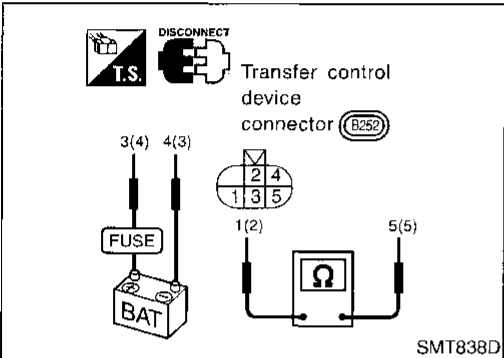
ACTUATOR

NBTF0038S1101

Operation & resistance check

- Apply battery voltage directly to actuator assembly.

Operating check	Battery positive terminal	Battery negative terminal
1	4	3
2	3	4
Check	Approx. 0.2Ω (When the motor is not operated.)	



ACTUATOR POSITION SWITCH

NBTF0038S1102

Continuity check

Continuity check	Battery positive terminal	Battery negative terminal	Continuity
1	4	3	1 - 5
2	3	4	2 - 5

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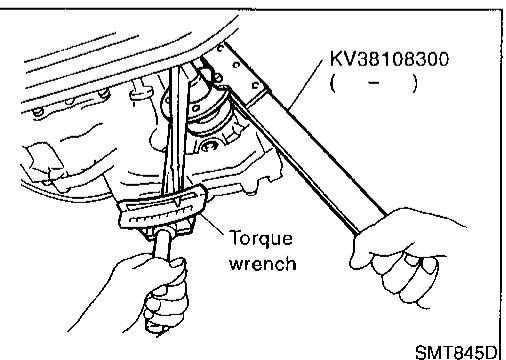
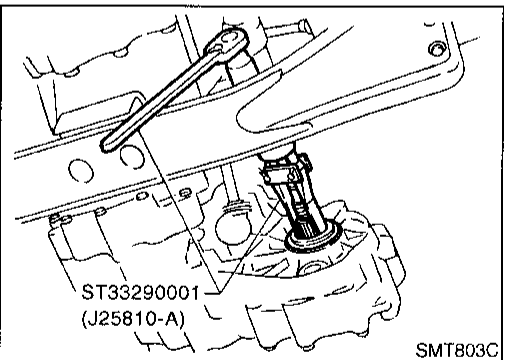
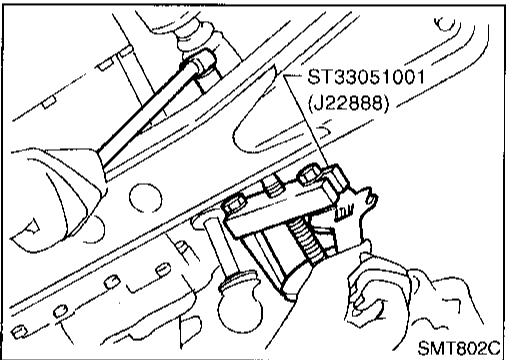
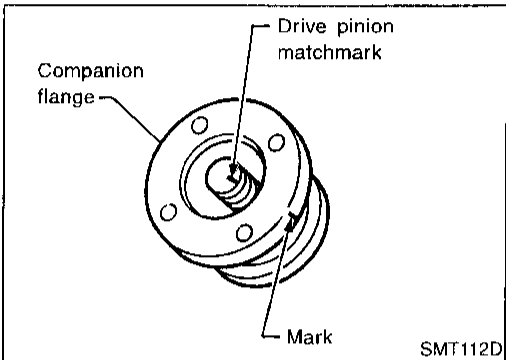
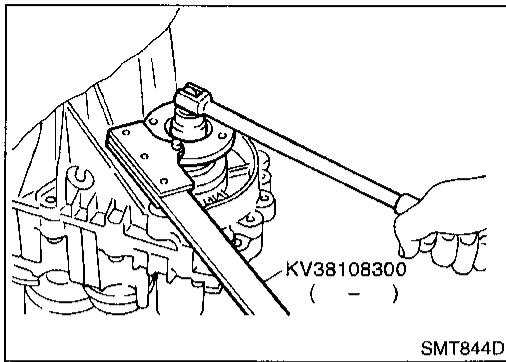
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ON-VEHICLE SERVICE

Replacing Oil Seal

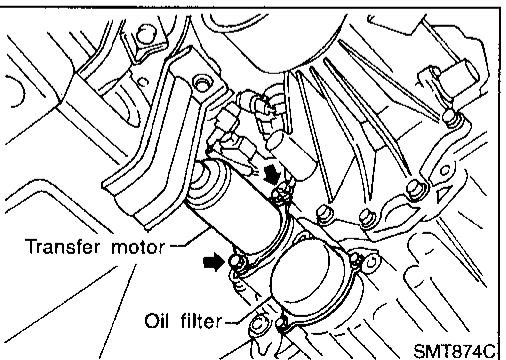
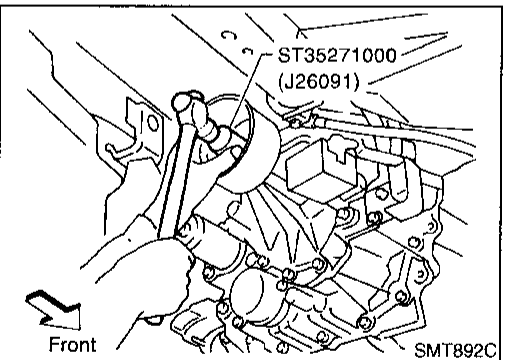
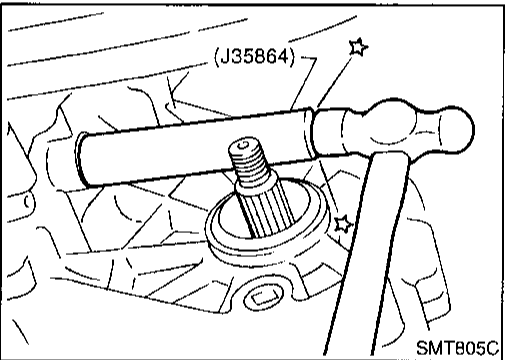
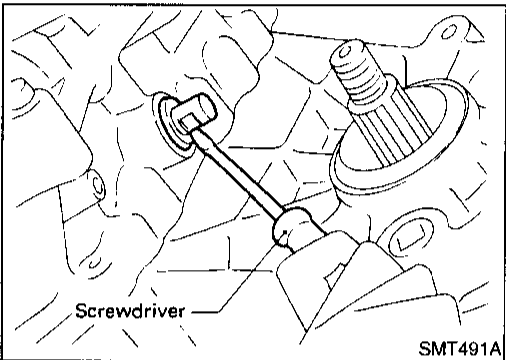
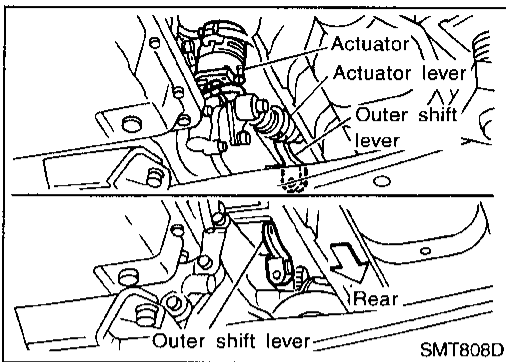


Replacing Oil Seal FRONT CASE OIL SEAL

NBTF0068

NBTF0068S01

1. Drain transfer fluid.
2. Remove exhaust front tube and heat insulator. Refer to "Removal", TF-95.
3. Remove front propeller shaft. Refer to PD section ("Removal and Installation", "PROPELLER SHAFT").
4. Remove companion flange lock nut.
 - **Do not reuse lock nut.**
5. Put a matchmark on top of drive pinion thread. The mark should be in line with the mark on the companion flange.
 - **Always mark top of drive pinion screw using paint.**
6. Remove companion flange.
7. Remove front case oil seal.
8. Install front case oil seal.
 - **Before installing, apply multi-purpose grease to seal lip.**
9. Install companion flange.
10. Tighten nut to the specified torque. Refer to TF-97.
11. Install front propeller shaft.



SHIFT SHAFT OIL SEAL

NBTF0068502

1. Remove front propeller shaft. Refer to PD section ("Removal and Installation", "PROPELLER SHAFT").
2. Remove companion flange. Refer to "FRONT CASE OIL SEAL", TF-92.
3. Remove actuator lever from transfer outer shift lever. Then remove outer shift lever.

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4. Remove shift shaft oil seal.
 - Be careful not to damage cross shaft.

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5. Install shift shaft oil seal.
 - Before installing, apply multi-purpose grease to seal lip.
6. Install transfer control linkage.
7. Install companion flange. Refer to "FRONT CASE OIL SEAL", TF-92.
8. Install front propeller shaft.

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REAR OIL SEAL

NBTF0068503

1. Remove rear propeller shaft. Refer to PD section ("Removal and Installation", "PROPELLER SHAFT").
2. Remove rear oil seal.
3. Install rear oil seal.
 - Before installing, apply multi-purpose grease to seal lip.
4. Install rear propeller shaft.

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Transfer Motor

REMOVAL

NBTF0069

1. Disconnect transfer motor harness connector.
2. Remove breather pipe from transfer motor.
3. Remove bolts to detach transfer motor.
 - After removing transfer motor, be sure to replace O-ring with new one.

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INSTALLATION

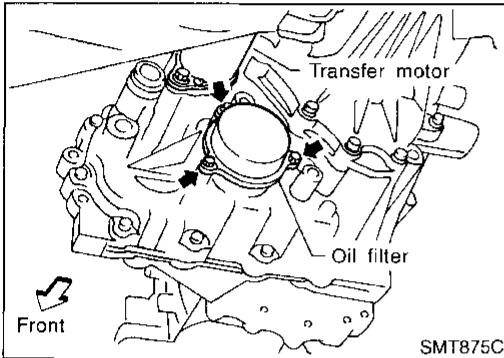
NBTF0070

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

ON-VEHICLE SERVICE

Transfer Motor (Cont'd)

2. Align width across flat-notch with oil pump groove, and install transfer motor.
3. Tighten bolts.
Ⓜ : 41 - 48 N·m (4.2 - 4.9 kg-m, 30 - 35 ft-lb)
4. Install breather pipe to transfer motor.
5. Connect transfer motor harness connector.



Transfer Oil Filter

REMOVAL

NBTF0071

- Remove bolts to detach oil filter.
- **When removing oil filter from transfer, avoid damaging it. Be sure to loosen bolts evenly.**
- **When removing oil filter, be sure to replace O-ring with new one.**

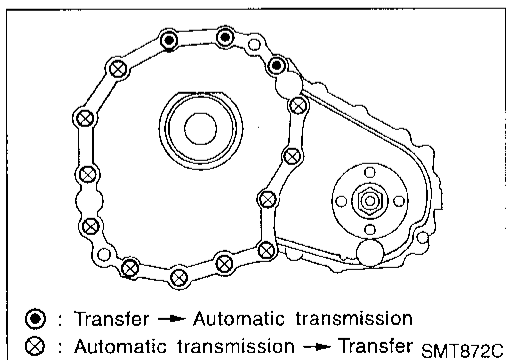
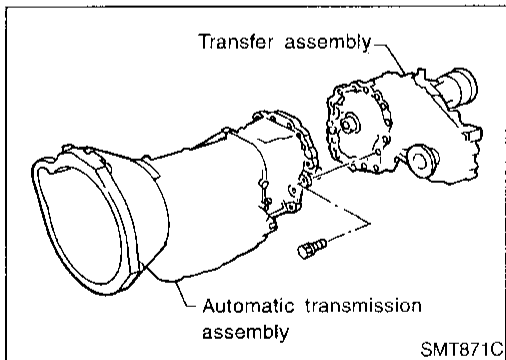
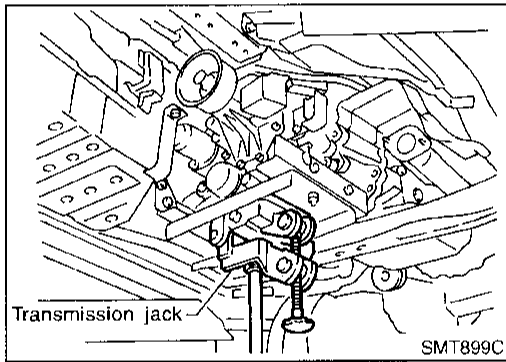
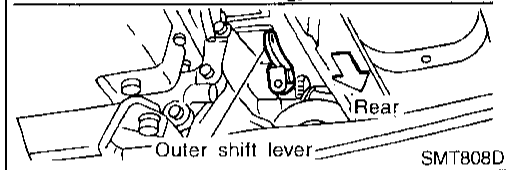
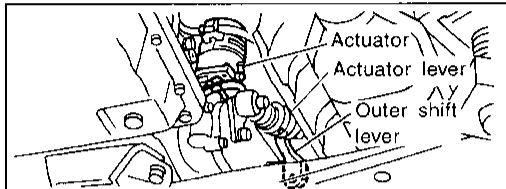
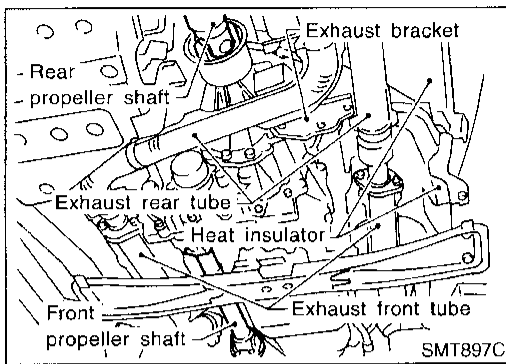
INSTALLATION

NBTF0072

1. Apply petroleum jelly or ATF to O-ring.
 2. Tighten bolts evenly to install oil filter.
Ⓜ : 7 - 9 N·m (0.7 - 0.9 kg-m, 61 - 78 in-lb)
- **Be sure not to damage oil filter.**

REMOVAL AND INSTALLATION

Removal



Removal

NBTF0073

1. Remove exhaust front and rear tubes. Refer to FE section ("EXHAUST SYSTEM").
2. Remove front and rear propeller shaft. Refer to PD section ("Removal and Installation", "PROPELLER SHAFT").
3. Insert plug into rear oil seal after removing propeller shaft.
 - **Be careful not to damage spline, sleeve yoke and rear oil seal, when removing propeller shaft.**
4. Disconnect neutral-4LO switch, front revolution sensor, ATP switch, transfer motor and 4WD shift switch harness connectors.
5. Remove actuator lever from transfer outer shift lever.

6. Remove transfer from transmission.

WARNING:
Support transfer while removing it.

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Installation

- Tighten bolts securing transfer.

Bolt length:

45 mm (1.77 in)

Tightening torque:

⊙ : 31 - 42 N·m (3.2 - 4.3 kg·m, 23 - 31 ft·lb)

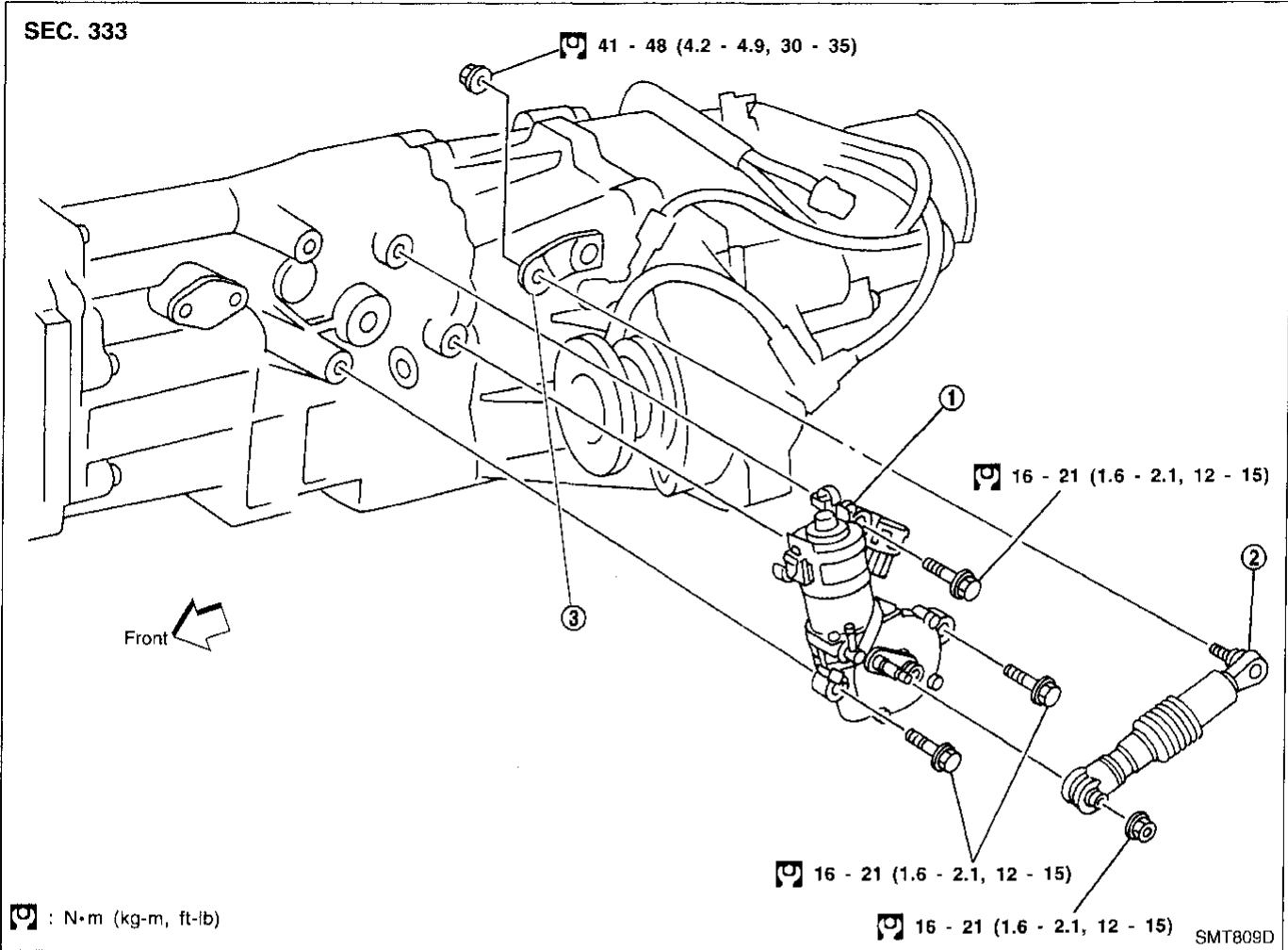
OVERHAUL

Transfer Gear Control

Transfer Gear Control

NBTFO075

SEC. 333



1. Actuator

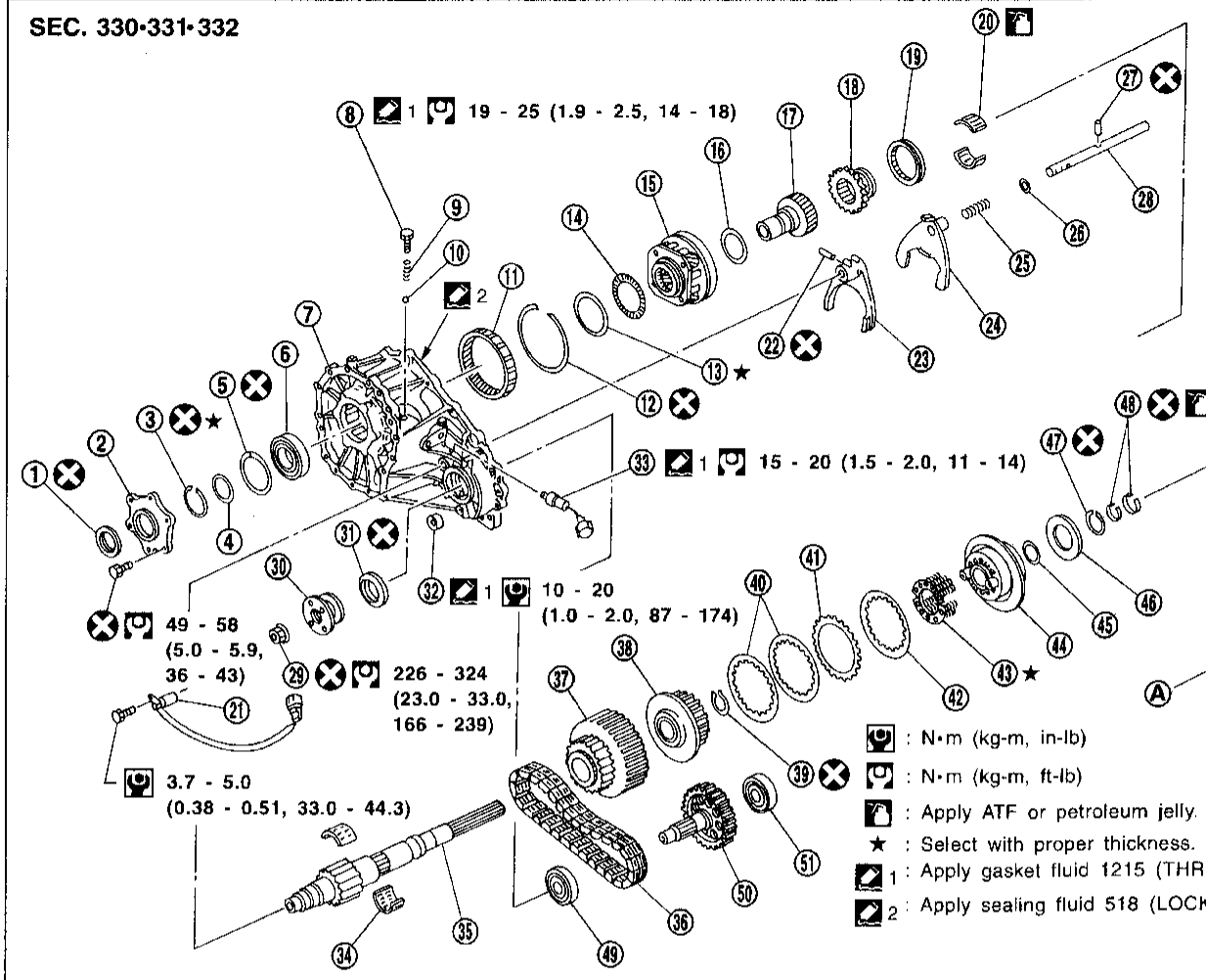
2. Actuator lever

3. Outer shift lever

Transfer Components

NBT0076

SEC. 330-331-332



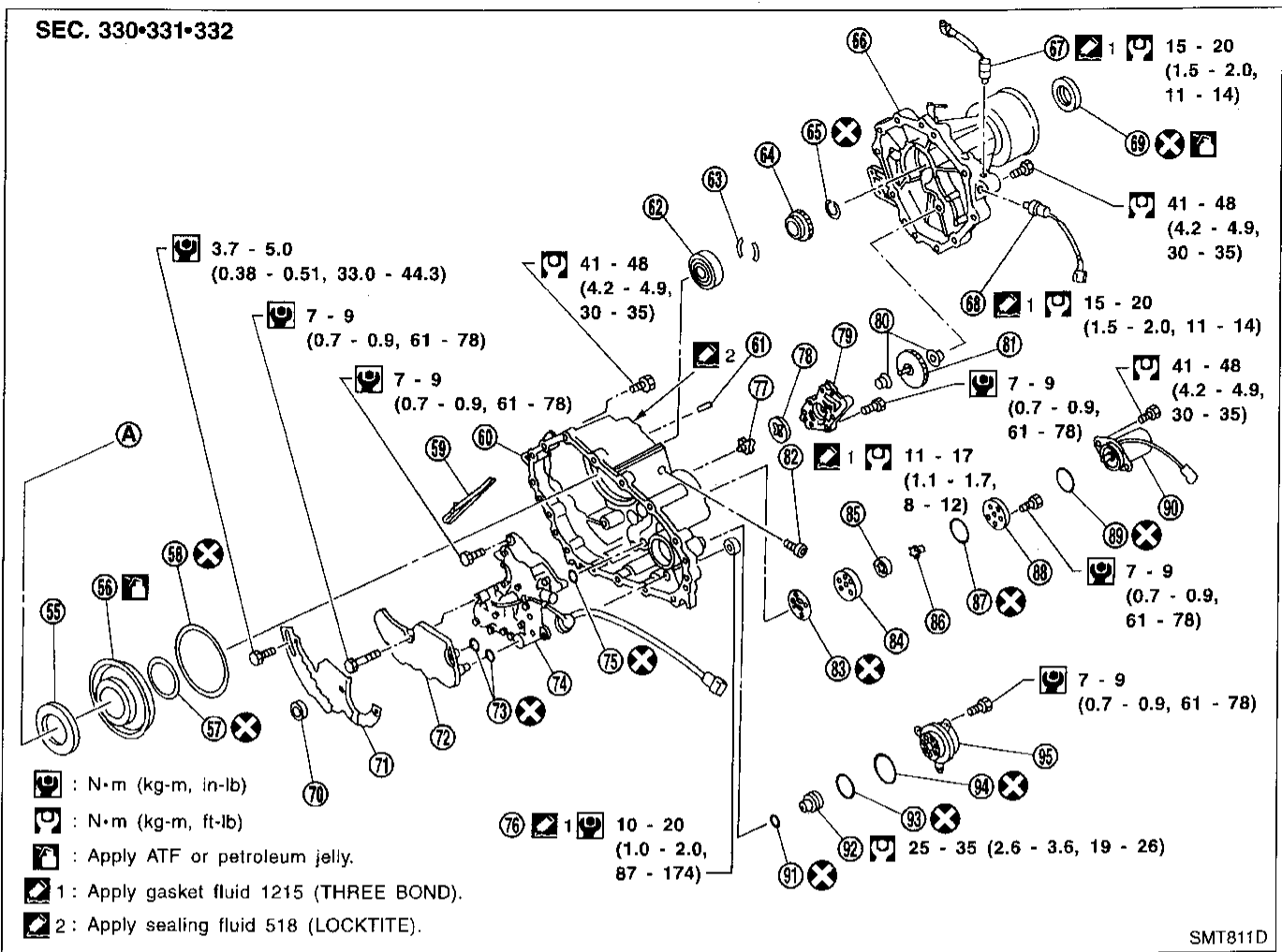
SMT810D

- | | | |
|---------------------------|-----------------------------|----------------------------|
| 1. Oil seal | 18. L-H sleeve | 35. Mainshaft |
| 2. Transfer cover | 19. 2-4 sleeve | 36. Drive chain |
| 3. Snap ring | 20. Radial needle bearing | 37. Clutch drum |
| 4. Washer | 21. Front revolution sensor | 38. Clutch hub |
| 5. Snap ring | 22. Roll pin | 39. Snap ring |
| 6. Main gear bearing | 23. L-H fork | 40. Driven plate |
| 7. Front case | 24. 2-4 fork | 41. Drive plate |
| 8. Check plug | 25. Shift fork spring | 42. Retaining plate |
| 9. Check spring | 26. Fork guide | 43. Return spring assembly |
| 10. Check ball | 27. Roll pin | 44. Press flange |
| 11. Internal gear | 28. Shift rod | 45. Washer |
| 12. Snap ring | 29. Self-lock nut | 46. Thrust needle bearing |
| 13. Bearing race | 30. Companion flange | 47. Snap ring |
| 14. Thrust needle bearing | 31. Oil seal | 48. Seal ring |
| 15. Planetary carrier | 32. Drain plug | 49. Front bearing |
| 16. Thrust needle bearing | 33. Wait detection switch | 50. Front drive shaft |
| 17. Sun gear | 34. Needle bearing | 51. Rear bearing |

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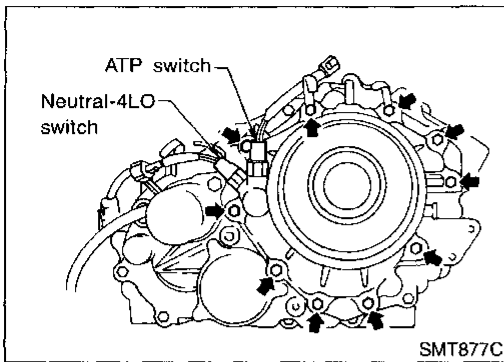
OVERHAUL

Transfer Components (Cont'd)



SMT811D

- | | | |
|--------------------------------|-----------------------------|--------------------------|
| 55. Thrust needle bearing race | 69. Oil seal | 83. Oil pump gasket |
| 56. Clutch piston | 70. Magnet | 84. Sub-oil pump housing |
| 57. D-ring | 71. Baffle plate | 85. Outer gear |
| 58. Lip seal | 72. Oil strainer | 86. Inner gear |
| 59. Oil gutter | 73. O-ring | 87. O-ring |
| 60. Center case | 74. Control valve assembly | 88. Sub-oil pump cover |
| 61. Stem bleeder | 75. Lip seal (7 pieces) | 89. O-ring |
| 62. Mainshaft rear bearing | 76. Filler plug | 90. Transfer motor |
| 63. Thrust washer | 77. Inner gear | 91. O-ring |
| 64. Speedometer drive gear | 78. Outer gear | 92. Oil filter stud |
| 65. Snap ring | 79. Oil pump housing | 93. O-ring |
| 66. Rear case | 80. Bushing | 94. O-ring |
| 67. ATP switch | 81. Oil pump shaft | 95. Oil filter |
| 68. Neutral-4LO switch | 82. Oil pressure check plug | |



Rear Case DISASSEMBLY

NBTF0077

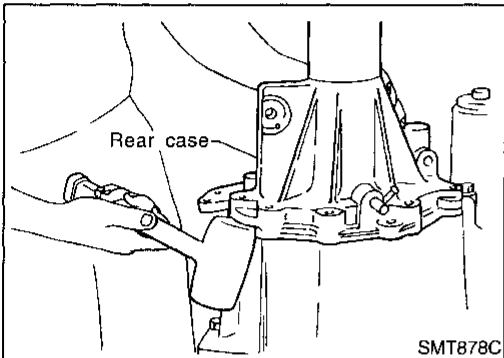
1. Remove neutral-4LO switch and ATP switch.
2. Remove bolts.

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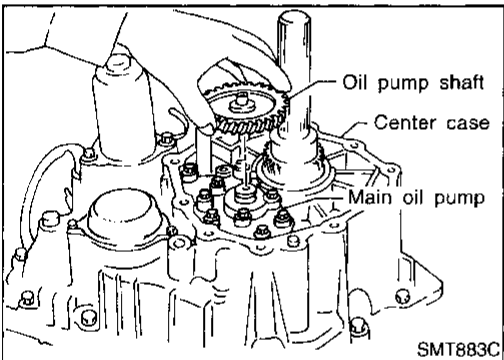
3. Remove rear case from center case by tapping it lightly with a plastic hammer.

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Center Case DISASSEMBLY

NBTF0078

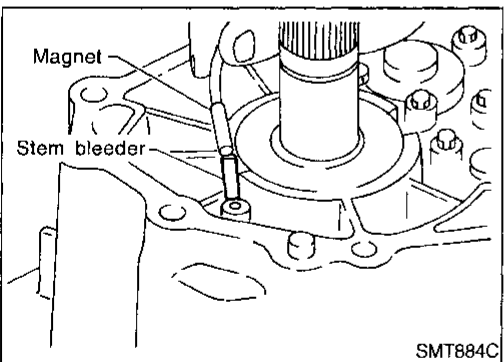
1. Remove oil pump shaft from main oil pump.

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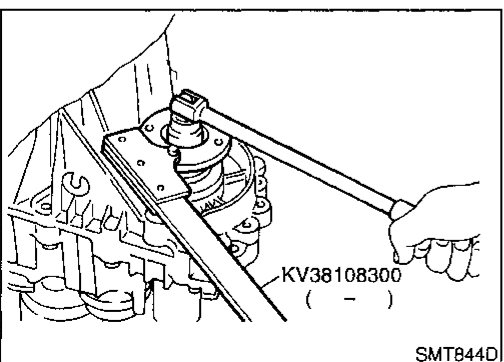
2. Remove stem bleeder from bleeder hole.

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3. Remove lock nut from companion flange.
 - Do not reuse lock nut.

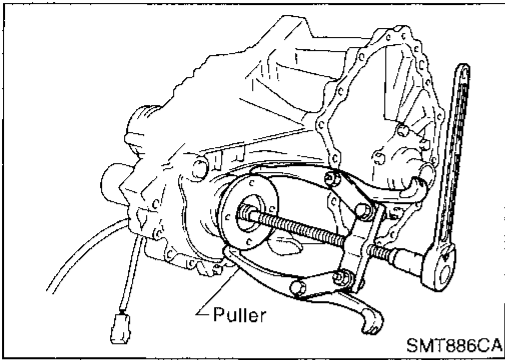
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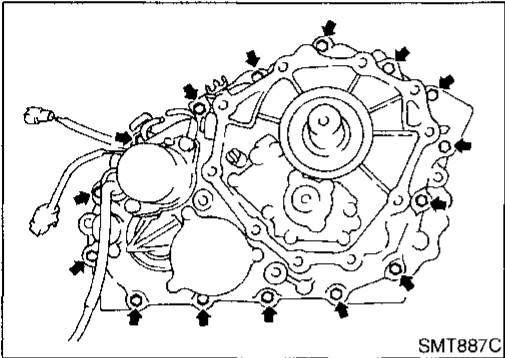
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DISASSEMBLY

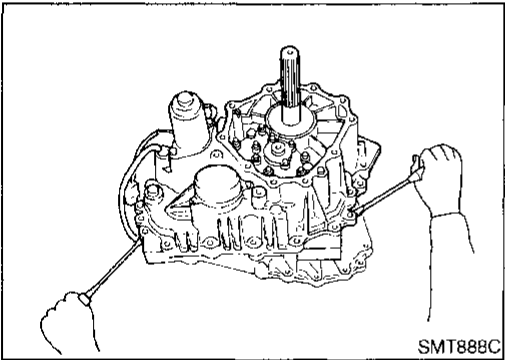
Center Case (Cont'd)



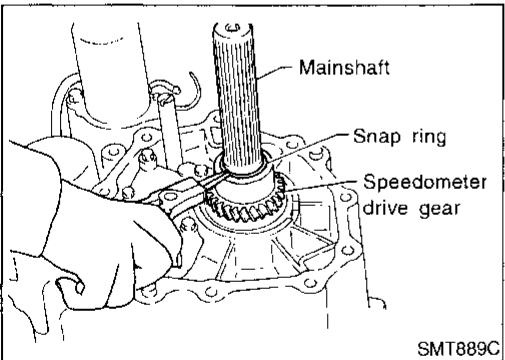
4. Remove companion flange.



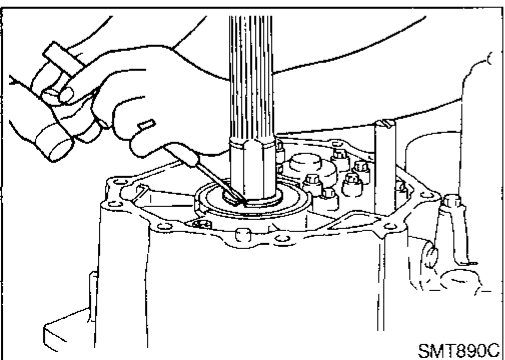
5. Remove bolts.



6. Insert screwdrivers as shown in the figure, and separate center case from front case. Then, remove center case by levering it up with a tire lever or the like.



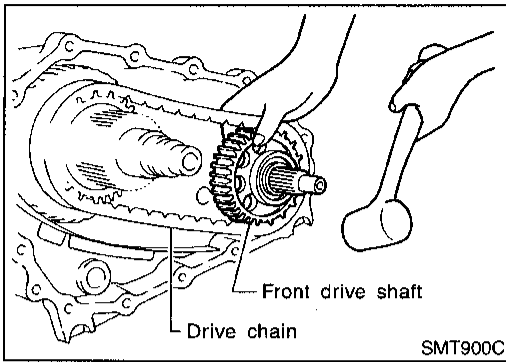
7. Remove snap ring from mainshaft.
● **Do not reuse snap ring.**



8. Remove C-rings from mainshaft bearing.

DISASSEMBLY

Center Case (Cont'd)



Front Drive Shaft and Drive Chain

NBTF0078S01

1. Remove oil gutter from center case.
2. With front drive shaft held by one hand as shown in the figure, tap center case with a plastic hammer to remove it with drive chain.

- Do not tap drive chain with a plastic hammer.

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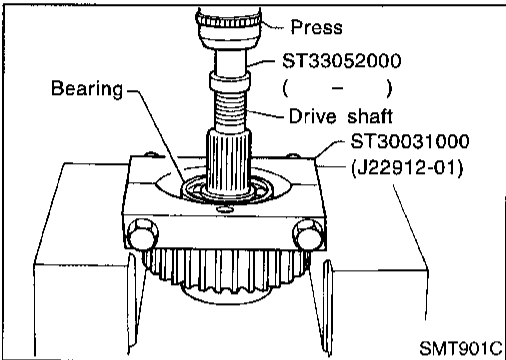
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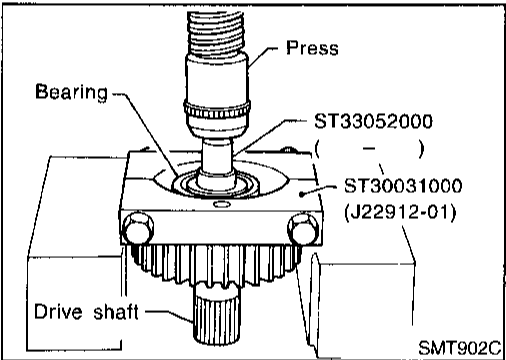
FE

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3. Set a puller (ST30031000) and an adapter (ST33052000). Remove front drive shaft front bearing.



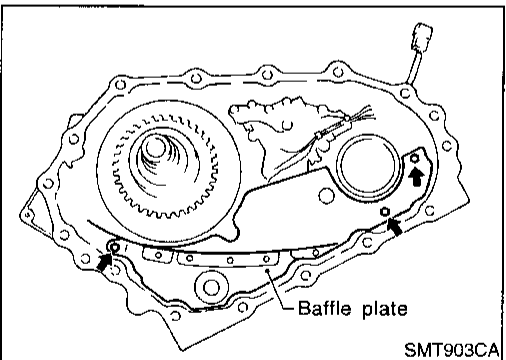
4. Set the puller (ST30031000) and the adapter (ST33052000). Remove front drive shaft rear bearing.

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Mainshaft and Clutch Drum

NBTF0078S02

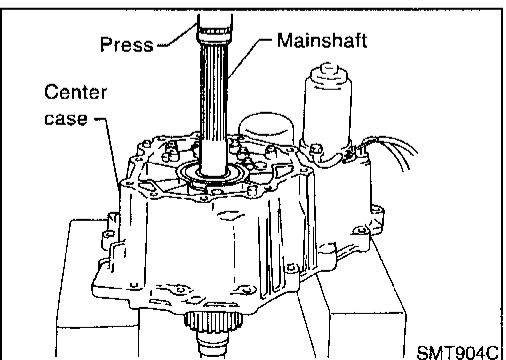
1. Remove mounting bolts to detach baffle plate.

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2. Set center case to press stand. Remove mainshaft from center case.

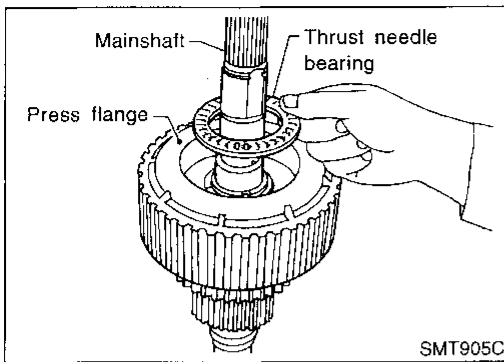
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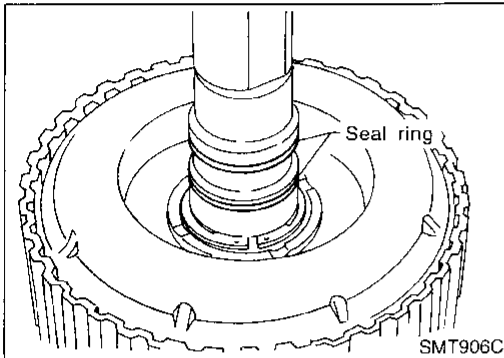
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DISASSEMBLY

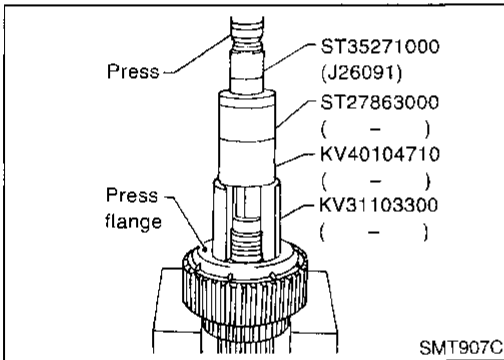
Center Case (Cont'd)



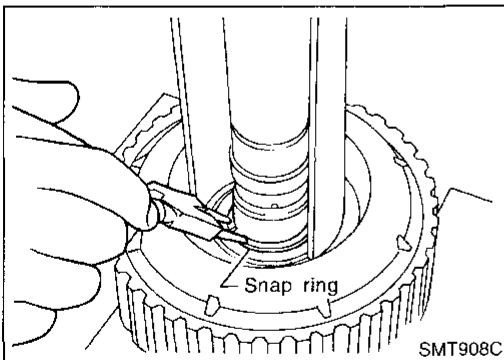
3. Remove thrust needle bearing from press flange.



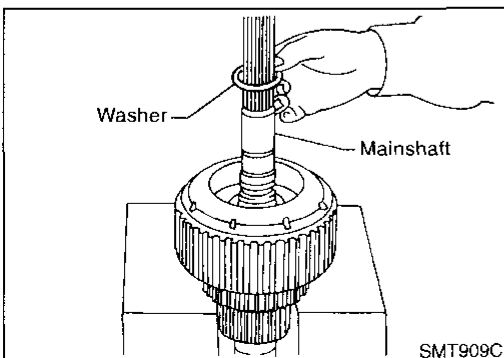
4. Remove seal ring from mainshaft.
● Do not reuse seal ring.



5. Set a drift (KV31103300), a support ring (KV40104710), a support ring (ST27863000) and a drift (ST35271000) to press flange as shown in the figure. Press drift until snap ring is out of place.



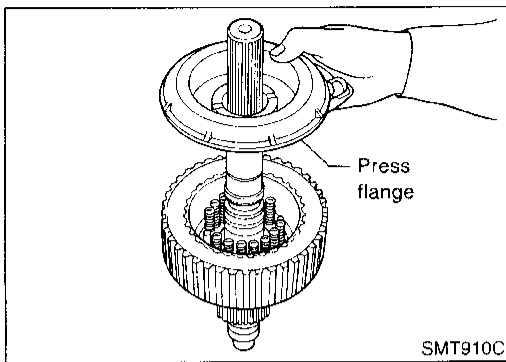
6. Remove snap ring from mainshaft.
● Do not reuse snap ring.



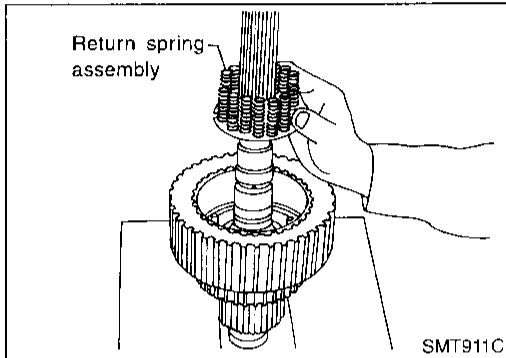
7. Remove washer.

DISASSEMBLY

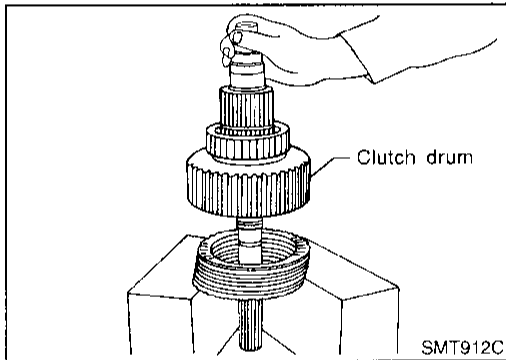
Center Case (Cont'd)



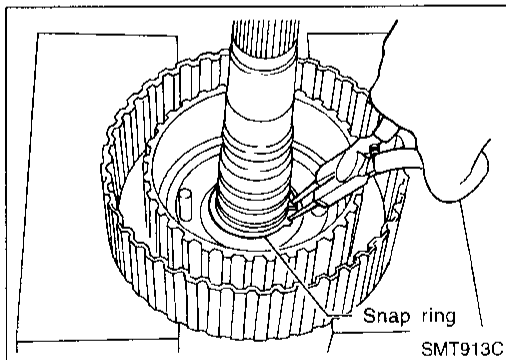
8. Remove press flange from mainshaft.



9. Remove return spring assembly from clutch hub.

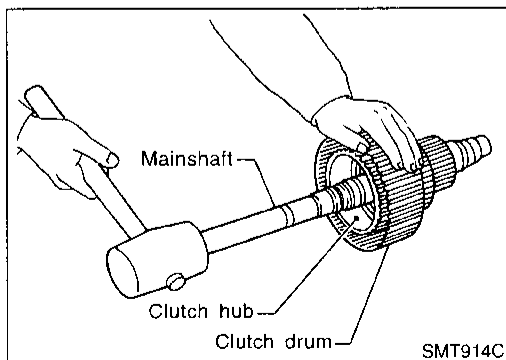


10. Remove each plate from clutch drum.



11. Remove snap ring from mainshaft.

- Do not reuse snap ring.



12. Tap mainshaft with a plastic hammer to remove it from clutch drum and clutch hub.

13. Remove needle bearing from mainshaft.

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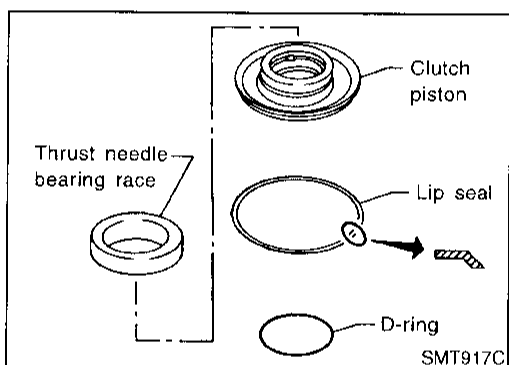
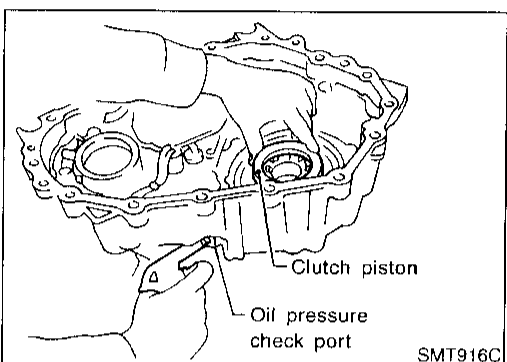
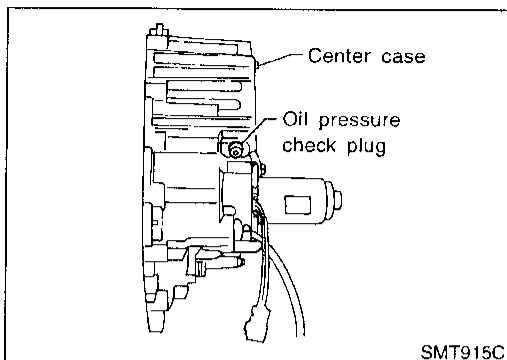
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DISASSEMBLY

Center Case (Cont'd)



Clutch Piston

NBTF0078503

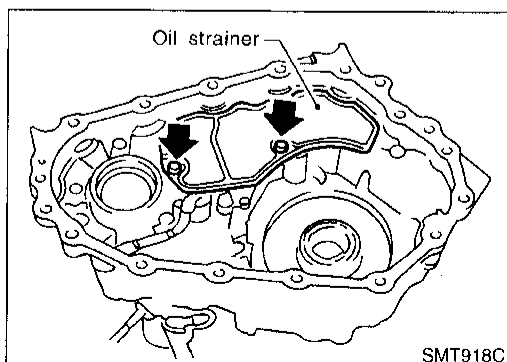
1. Remove oil pressure check plug from oil pressure check port.
2. Apply air gradually from oil pressure check port, and remove clutch piston from center case.
3. Remove lip seal and D-ring from clutch piston.
 - Do not reuse lip seal and D-ring.
4. Remove thrust needle bearing race from clutch piston by hooking a screwdriver edge into 4 notches of thrust needle bearing race.

Control Valve

NBTF0078504

CAUTION:

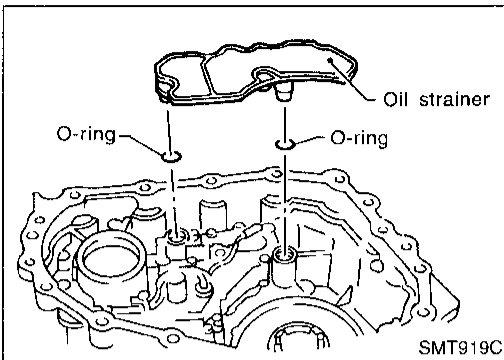
- Do not reuse any part that has been dropped or damaged.
- Make sure valve is assembled in the proper direction.
- Do not use a magnet because residual magnetism stays during disassembly.



1. Remove bolts, and detach oil strainer.

DISASSEMBLY

Center Case (Cont'd)



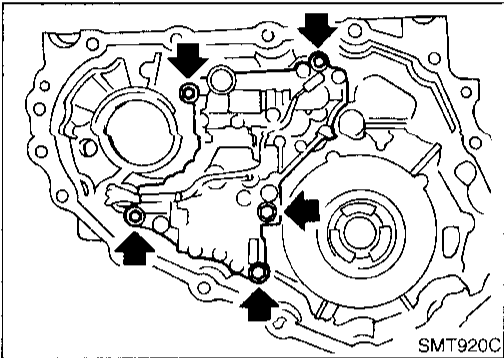
2. Remove O-rings from oil strainer.
 - Do not reuse O-rings.

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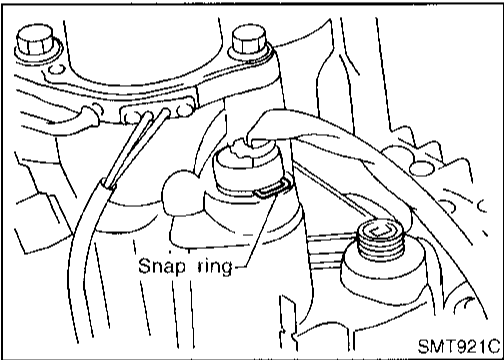
3. Remove bolts for control valve.

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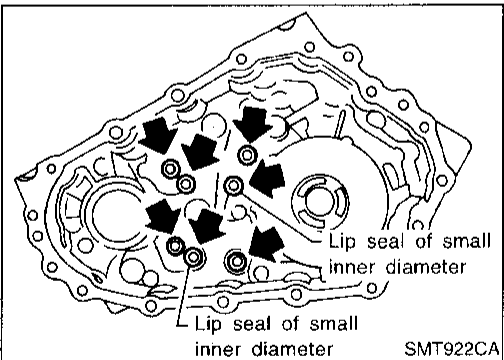
4. Remove snap ring. Then push terminal assembly into center case to remove control valve assembly.

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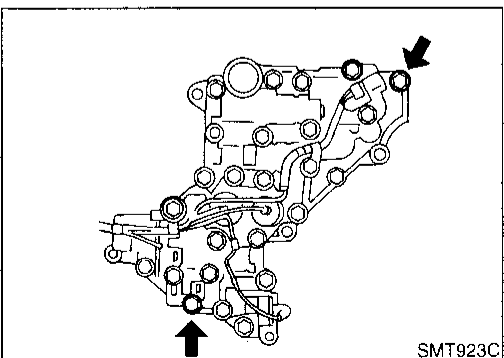
5. Remove lip seals from center case.
 - Do not reuse lip seals.
 - There are two kinds of lip seals (lip seal of large inner diameter: 5 pieces, lip seal of small inner diameter: 2 pieces). Confirm the position before disassembly.

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6. Remove all bolts except for two.

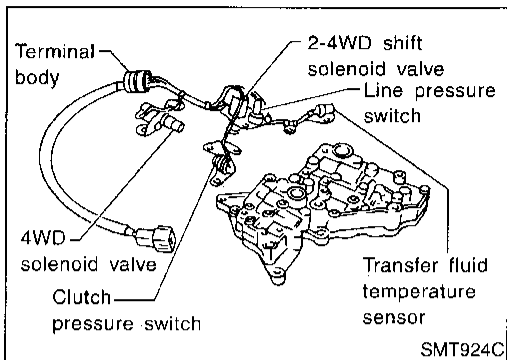
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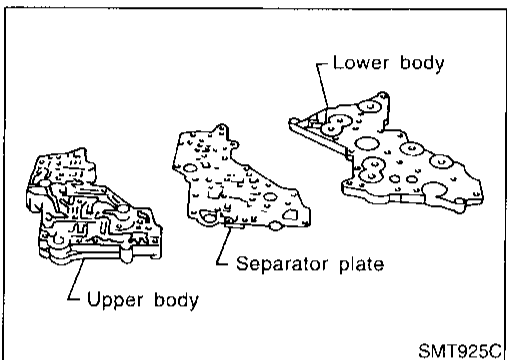
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DISASSEMBLY

Center Case (Cont'd)



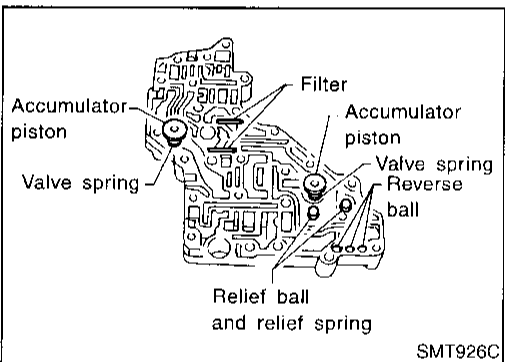
7. Remove 4WD solenoid valve, clutch pressure switch, 2-4WD shift solenoid valve, line pressure switch, and transfer fluid temperature sensor from control valve assembly.
8. Remove O-rings from each solenoid valve, switch and terminal body.
 - Do not reuse O-rings.



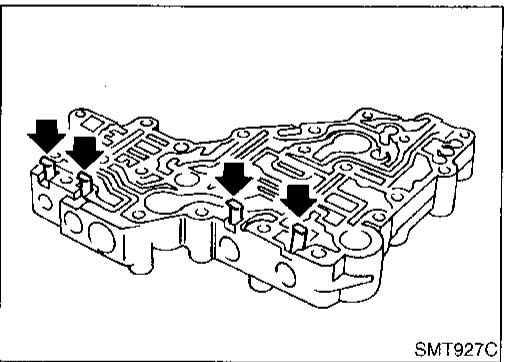
9. Place control valve with lower body facing up, remove two mounting bolts, and then remove lower body and separator plate from upper body.

CAUTION:

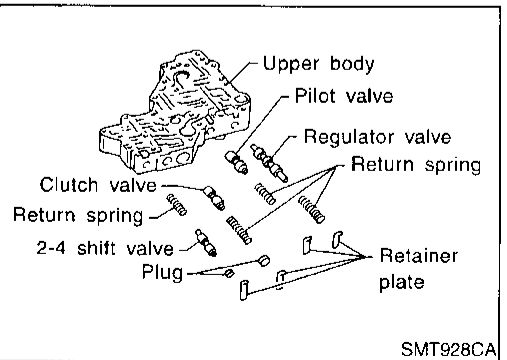
- Be careful not to drop relief balls. Detach lower body carefully.
- Do not reuse separator plate.



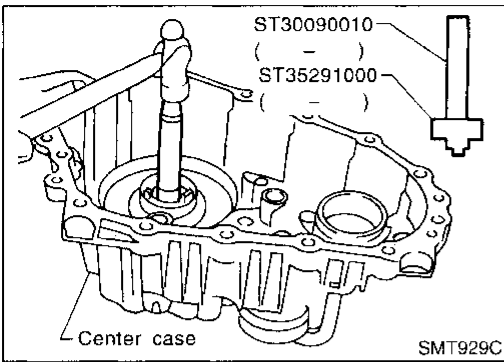
10. Make sure reverse balls, relief balls and relief springs, accumulator pistons, valve springs, and filters are securely installed as shown in the figure, and remove them.



11. Remove retainer plates.



12. Remove each control valve, spring and plug.



Mainshaft Rear Bearing

NBTF0078S05

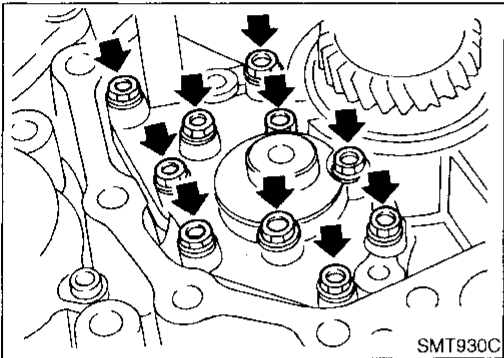
1. Remove mainshaft rear bearing from center case using a remover (ST35291000) and a remover (ST30090010).

GI

MA

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LC



Main Oil Pump

NBTF0078S06

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

EC

FE

AT

TF

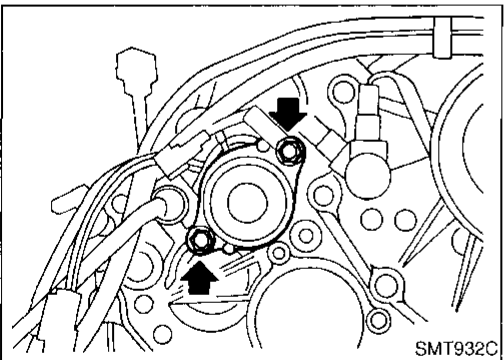
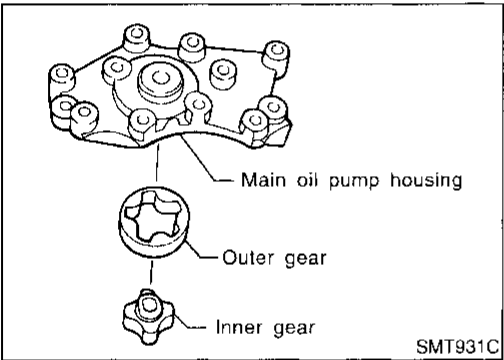
2. Remove outer gear and inner gear.

PD

AX

SU

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Sub-oil Pump

NBTF0078S07

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

- Do not reuse O-ring.

ST

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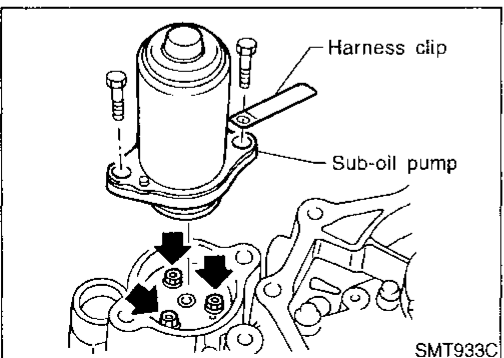
HA

2. Remove sub-oil pump mounting bolts.

SC

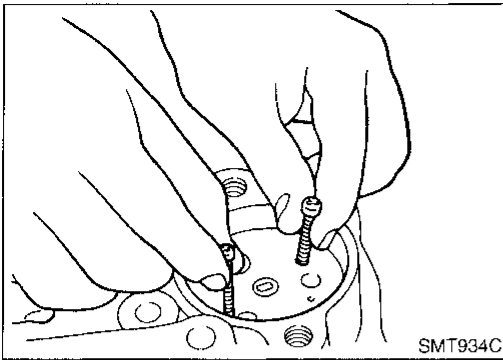
EL

IDX

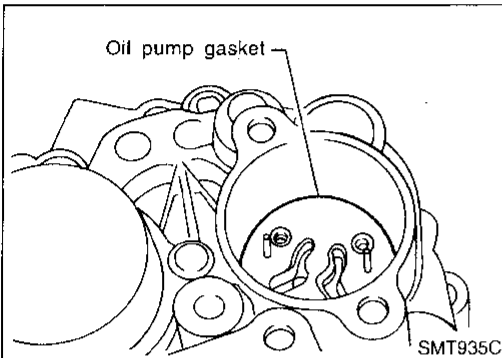


DISASSEMBLY

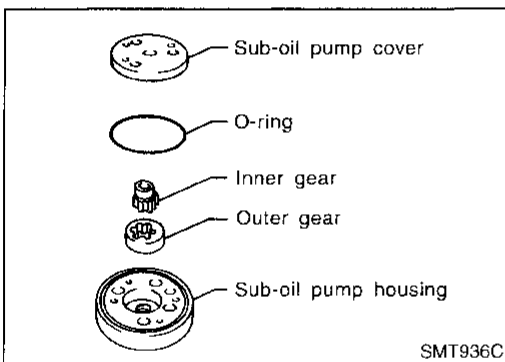
Center Case (Cont'd)



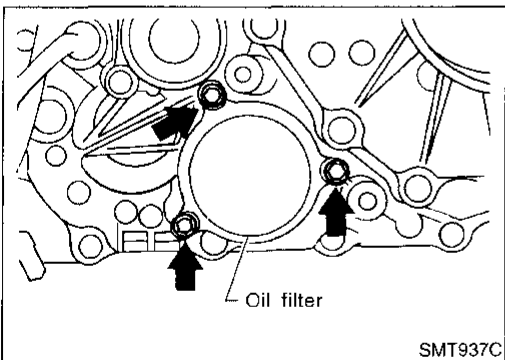
3. Thread two bolts (M4 x 0.8) into the holes of sub-oil pump as shown in the figure, and pull out to remove sub-oil pump.



4. Remove oil pump gasket.
 - Do not reuse gasket.



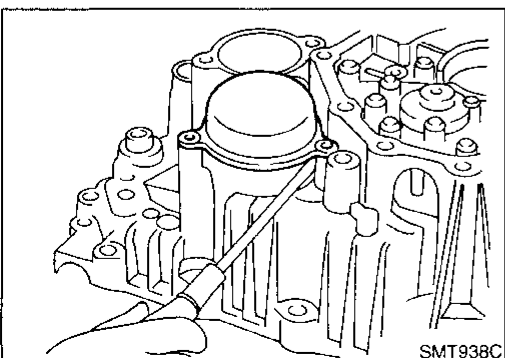
5. Remove sub-oil pump cover, outer gear, inner gear and O-ring from sub-oil pump housing.
 - Do not reuse O-ring.



Oil Filter

NBTf0078S06

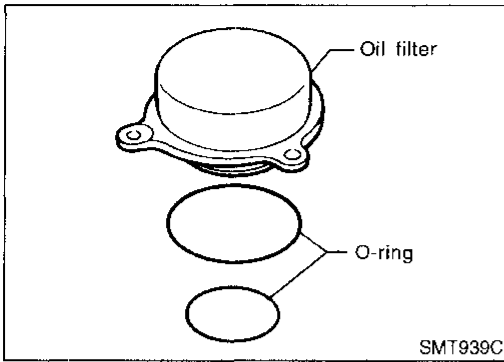
1. Remove bolts for oil filter.



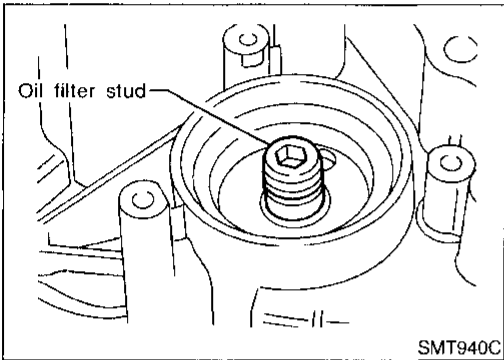
2. Insert a screwdriver as shown in the figure to remove oil filter.

DISASSEMBLY

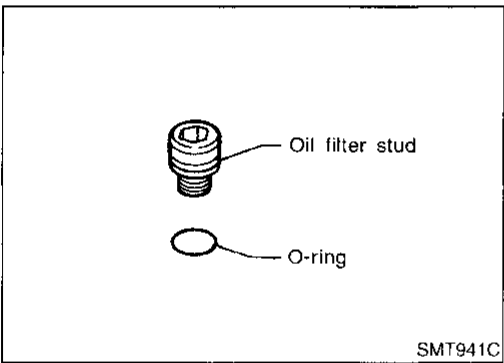
Center Case (Cont'd)



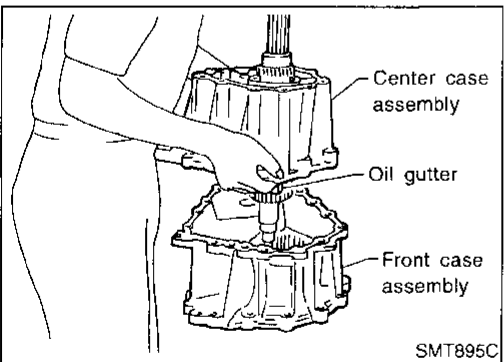
3. Remove O-rings from oil filter.
 - Do not reuse O-rings.



4. Remove oil filter stud.



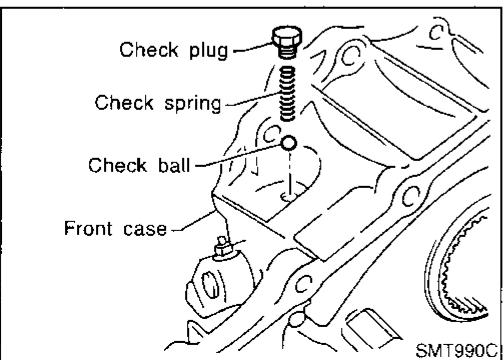
5. Remove O-ring from oil filter stud.
 - Do not reuse O-ring.



Front Case DISASSEMBLY

1. Remove rear case from center case. Refer to TF-99.
2. Remove front case from center case.

NBTF0079



Shift Rod Components

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

NBTF0079S01

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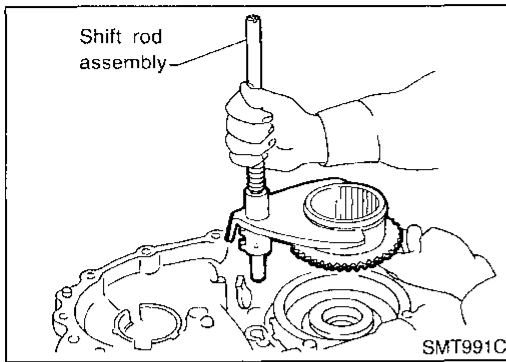
SC

EL

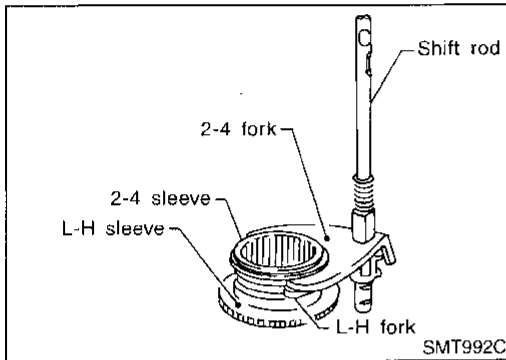
IDX

DISASSEMBLY

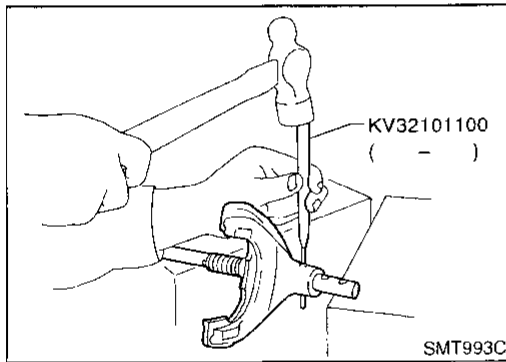
Front Case (Cont'd)



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

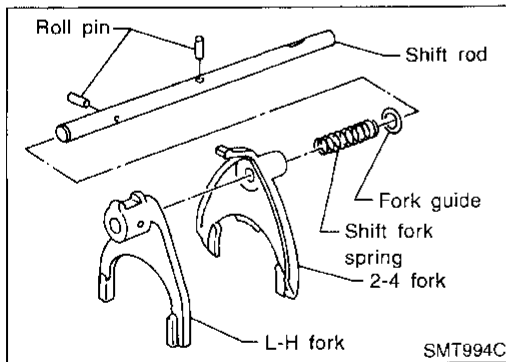


4. Remove 2-4 sleeve and L-H sleeve from 2-4 fork and L-H fork respectively.

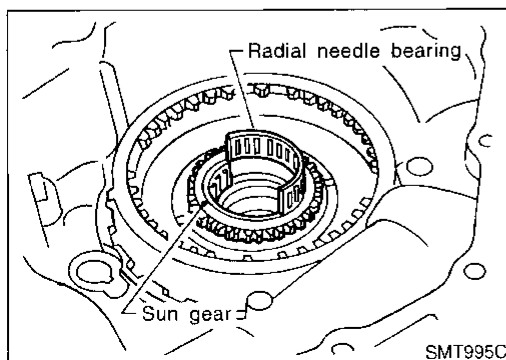


5. Drive out roll pin from shift rod.

● **Do not reuse roll pin.**



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



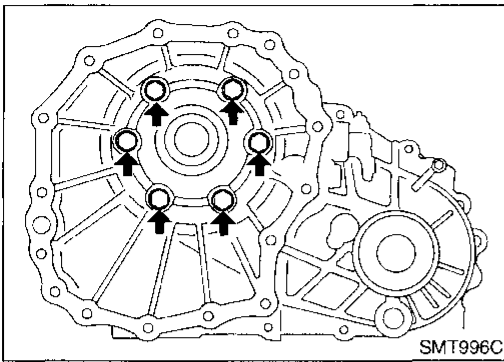
Planetary Carrier, Sun Gear and Internal Gear

1. Remove radial needle bearing from sun gear.

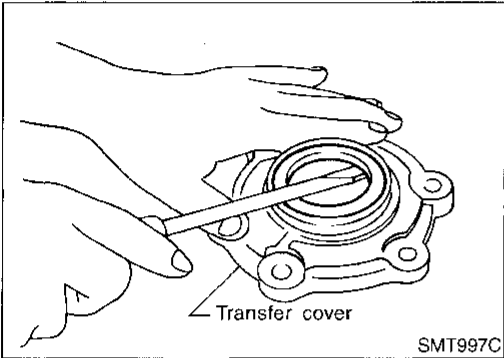
NBTF0079S02

DISASSEMBLY

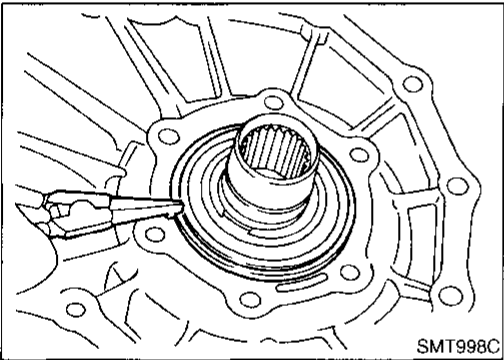
Front Case (Cont'd)



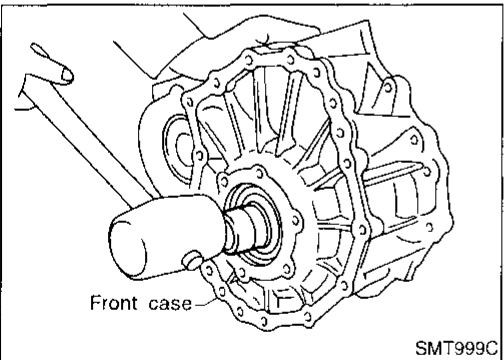
2. Remove bolts to detach transfer cover.
 - Do not reuse bolts.



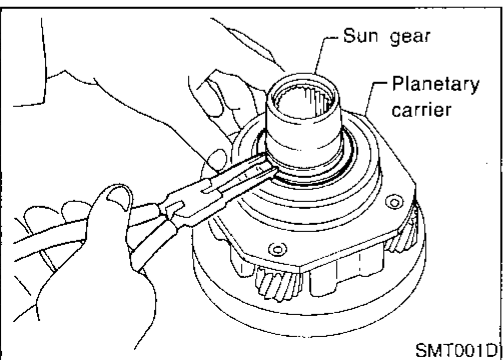
3. Remove oil seal from transfer cover.
 - Do not reuse oil seal.



4. Remove snap ring from main gear bearing.
 - Do not reuse snap ring.



5. Remove sun gear by tapping it lightly.



6. Remove snap ring from sun gear.
 - Do not reuse snap ring as it is a selective part.
7. Remove washer from sun gear.

GI

MA

EM

LC

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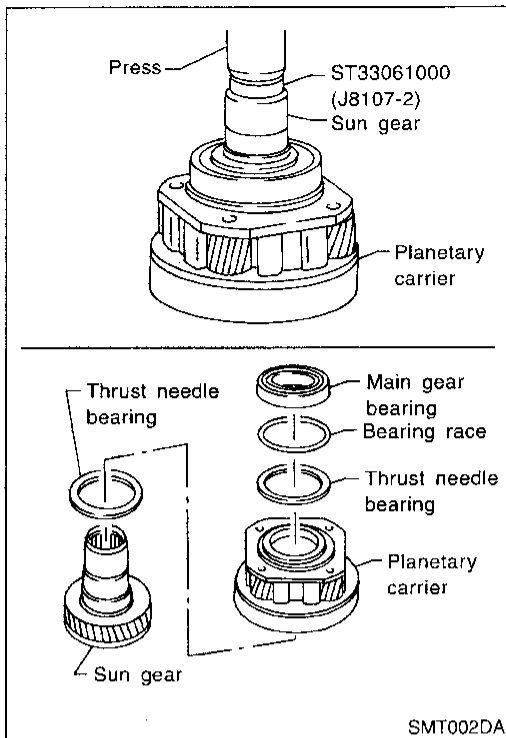
SC

EL

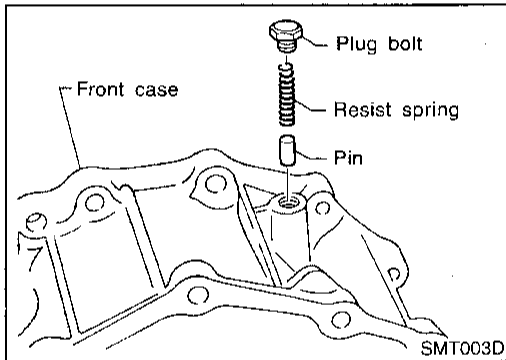
IDX

DISASSEMBLY

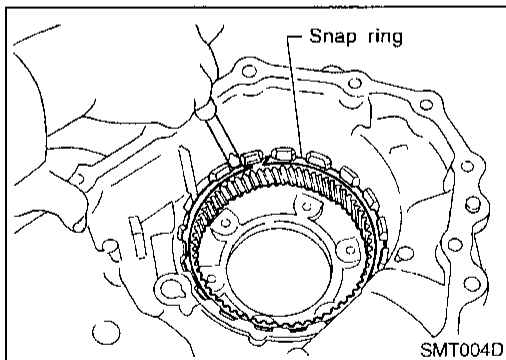
Front Case (Cont'd)



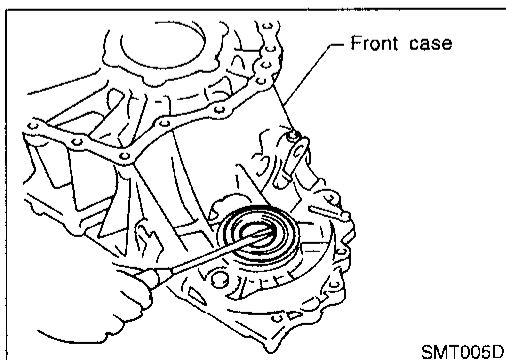
8. Set an adapter to sun gear as shown in the figure. Remove sun gear from planetary carrier. Remove main gear bearing, bearing race and thrust needle bearing (front and rear of planetary carrier) from sun gear.



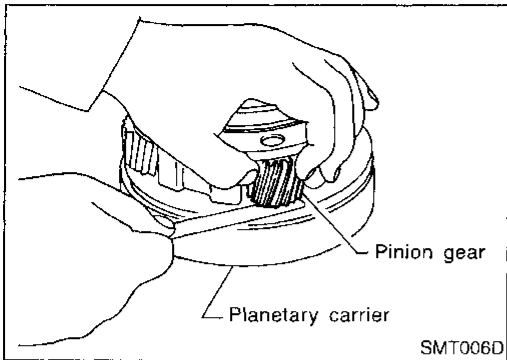
9. Remove plug bolt, then remove resist spring and pin.



10. Remove snap ring, and remove internal gear.
 - **Do not reuse snap ring.**



11. Remove front oil seal.
 - **Do not reuse oil seal.**
12. Loosen nut of outer lever assembly to pull out cotter pin, and remove outer lever.
13. Remove inner lever assembly.



Front Case

INSPECTION

Planetary Carrier

NBTF0080

GI

NBTF0080S01

MA

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

Pinion gear end play:

0.1 - 0.7 mm (0.004 - 0.028 in)

EM

- 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 with new one.

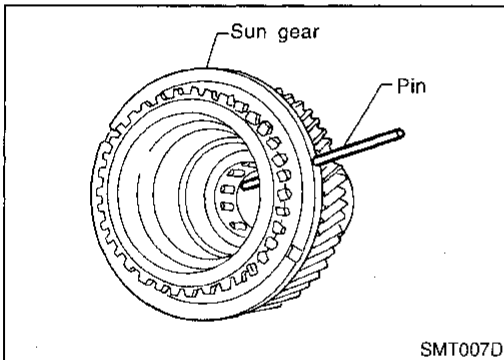
LC

EC

FE

AT

TF



Sun Gear

NBTF0080S02

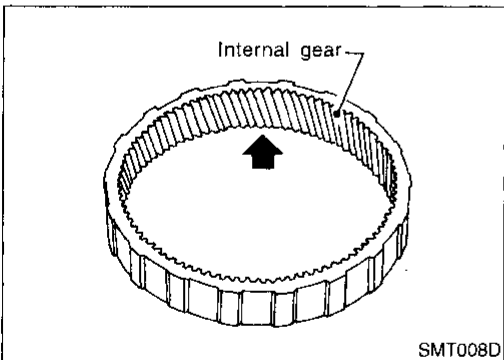
PD

- Check if oil passage of sun gear is clogged. For this, try to pass a 3.6 mm (0.142 in) dia. wire through oil passage as shown in the figure.
- 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 with new one.

AX

SU

BR



Internal Gear

NBTF0080S03

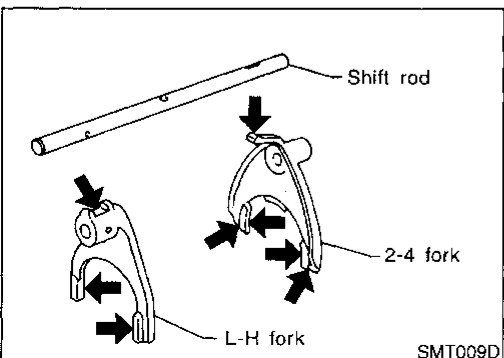
ST

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

RS

BT

HA



Shift Rod Components

NBTF0080S04

SC

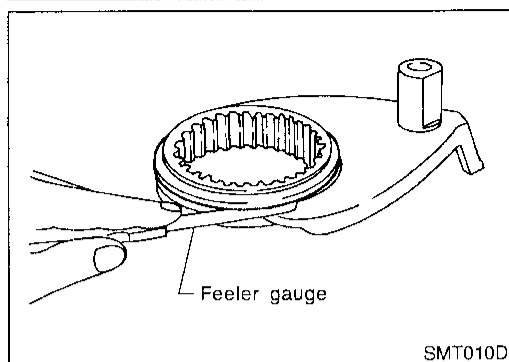
- Check working face of shift rod and fork for wear, partial wear, bending and other abnormality. If any is found, replace with new one.

EL

IDX

REPAIR FOR COMPONENT PARTS

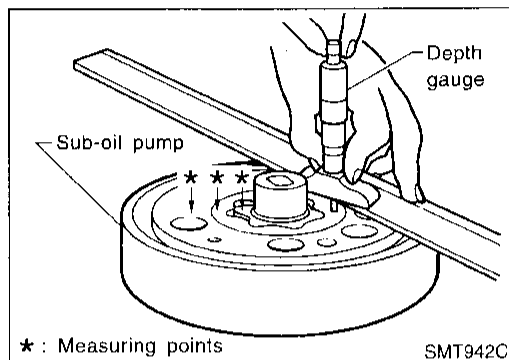
Front Case (Cont'd)



- 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

INSPECTION

Sub-oil Pump

NBTF0081

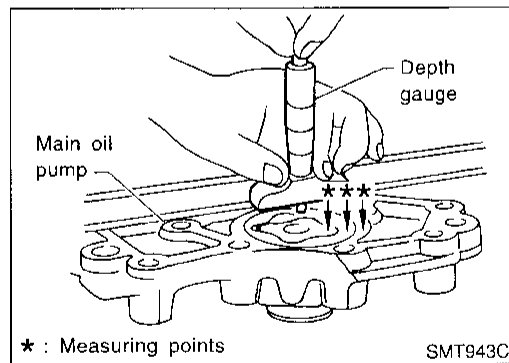
NBTF0081S01

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 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:

0.15 - 0.35 mm (0.0059 - 0.0138 in)

For inner gear and outer gear, refer to SDS, TF-133.



Main Oil Pump

NBTF0081S02

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 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:

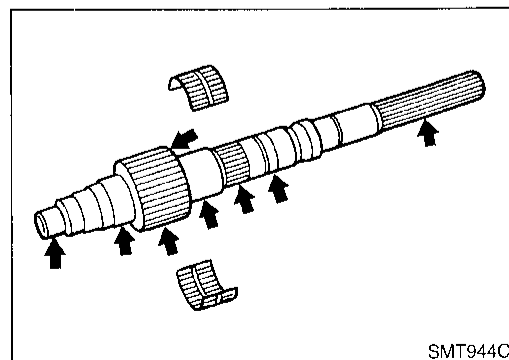
0.15 - 0.35 mm (0.0059 - 0.0138 in)

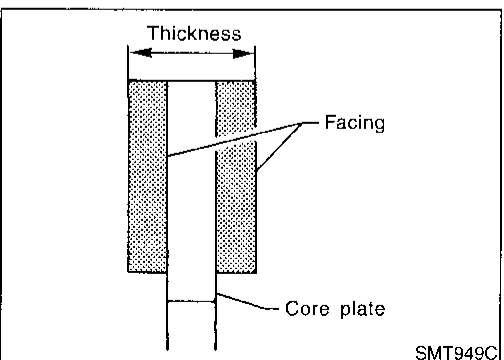
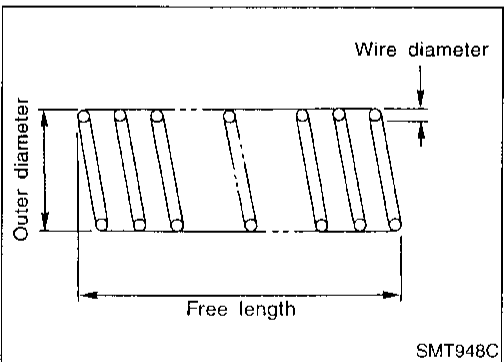
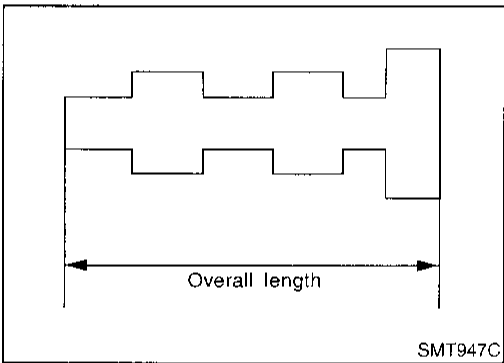
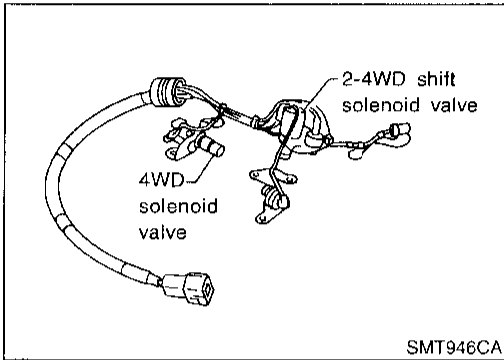
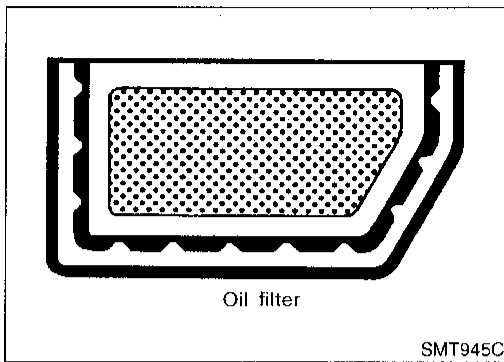
For inner gear and outer gear, refer to SDS, TF-133.

Mainshaft

NBTF0081S03

- 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.





Control Valve

- Check oil filter screen for damage. If any is found, replace with new one. NBTF0081504

- Check resistance between terminals of 4WD solenoid valve, 2-4WD shift solenoid valve and transfer fluid temperature sensor.

Resistance:

Refer to "COMPONENT INSPECTION", TF-87.

- Check sliding faces of control valves and plugs for abnormality. If any is found, replace the control valve assembly with new one.

CAUTION:

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

Control valve:

Refer to SDS, TF-133.

- 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.

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

Inspection standard:

Refer to SDS, TF-133.

Clutch

- Check drive plate facing for damage, cracks or other abnormality. If any, replace with new one. NBTF0081505
- Check the thickness of drive plate facing.

Inspection standard:

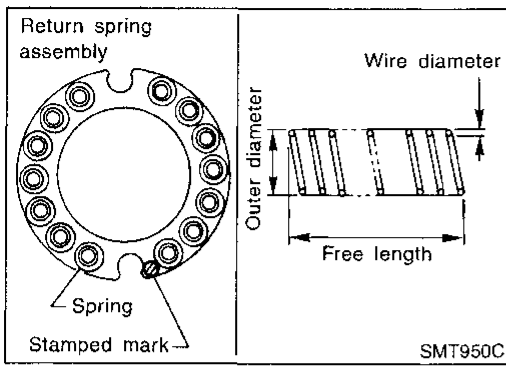
Refer to SDS, TF-134.

CAUTION:

- Measure facing thickness at 3 points to take an average.
- Check all the drive plates.
- Check return spring for damage or deformation.

REPAIR FOR COMPONENT PARTS

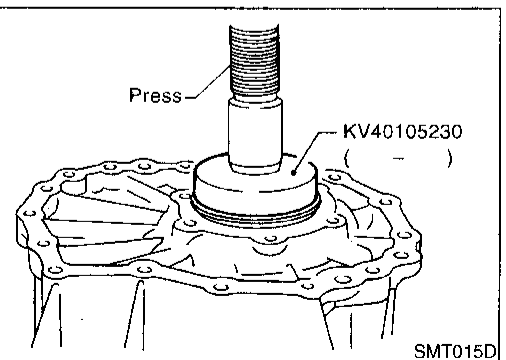
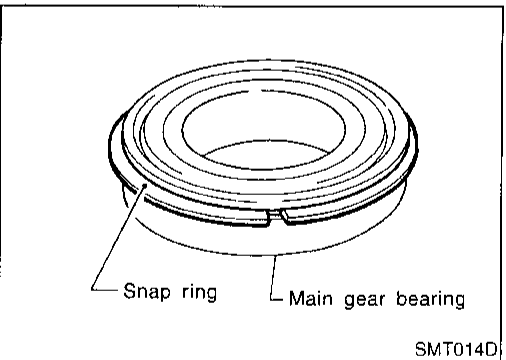
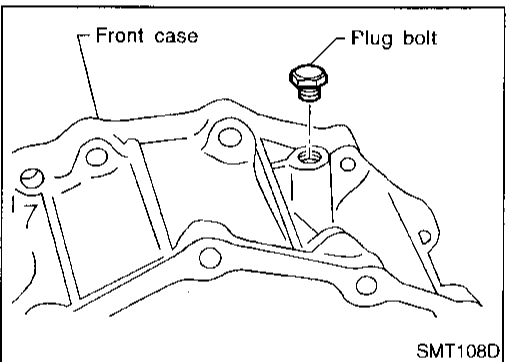
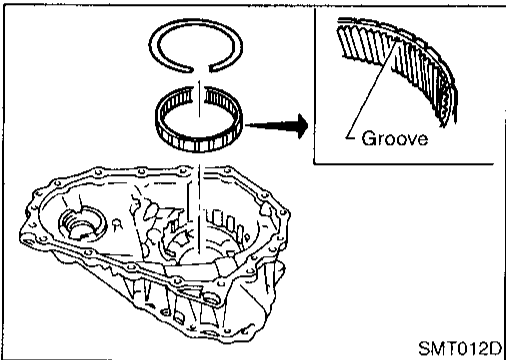
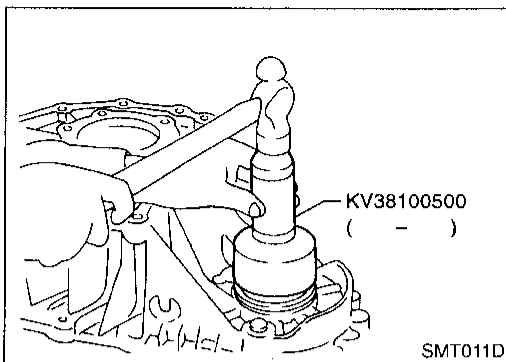
Center Case (Cont'd)



- Check stamped mark shown in the figure. Then, check that free length, outer diameter and wire diameter are within specifications. If any abnormality is found, replace with new return spring assembly of the same stamped number.

Inspection standard:

Refer to SDS, TF-134.



Front Case

ASSEMBLY

Planetary Carrier, Sun Gear and Internal Gear

NBTF0082

GI

NBTF0082S01

MA

EM

LC

EC

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IDX

1. Apply ATF to oil seal periphery, and install oil seal so that it is flush with the end face of front case.

- Do not reuse oil seal.

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

- Do not reuse snap ring.

3. Remove all the liquid gasket on plug bolt and front case. Apply locking sealant to plug bolt, install it to front case and tighten it to specified torque.

- With one crest of plug bolt inserted in the hole, apply liquid gasket 1215 to the thread.

: 19 - 25 N·m (1.9 - 2.5 kg·m, 14 - 18 ft·lb)

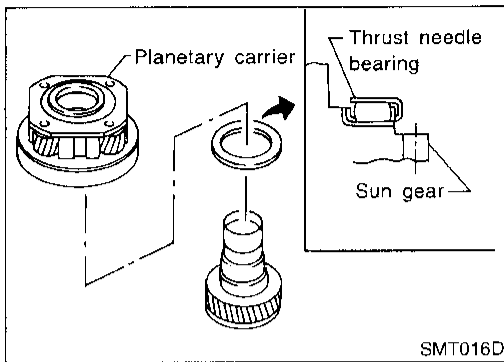
4. Install snap ring to main gear bearing.

- Do not reuse snap rings.

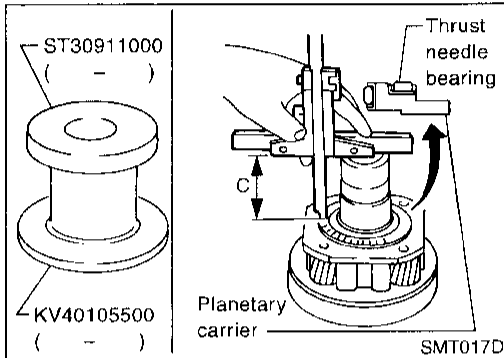
5. Set main gear bearing to front case, then press it.

ASSEMBLY

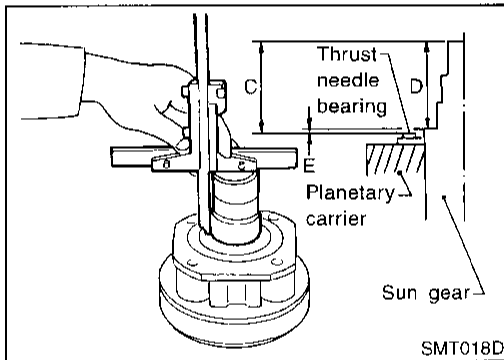
Front Case (Cont'd)



6. Install thrust needle bearing to sun gear.
7. Install sun gear to planetary carrier.



8. Set a support (KV40105500) to bushing replacer puller (ST30911000) as shown in the figure, and place planetary carrier on it.
9. Install thrust needle bearing to planetary carrier with its roller facing front case.
10. Measure "C" from the end of sun gear to the roller surface of thrust needle bearing.



11. Measure "D" from the end of sun gear to the main gear bearing contact surface.
12. Calculate end play "E" using "C" and "D" obtained in steps 10 and 11. Select bearing race so that the end play becomes the standard value.

Calculation formula:

$$\text{End play "E"} = \text{"C"} - \text{"D"}$$

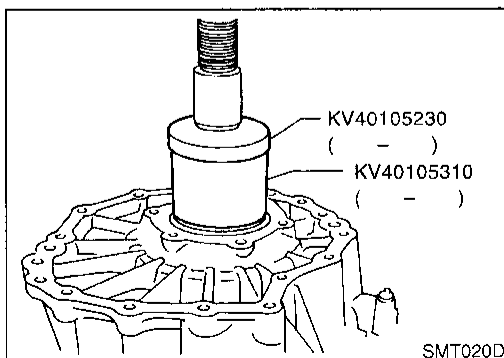
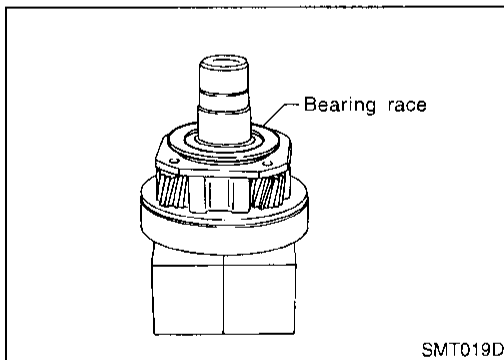
Standard end play:

$$0.1 - 0.25 \text{ mm (0.0039 - 0.0098 in)}$$

Bearing race:

Refer to SDS, TF-135.

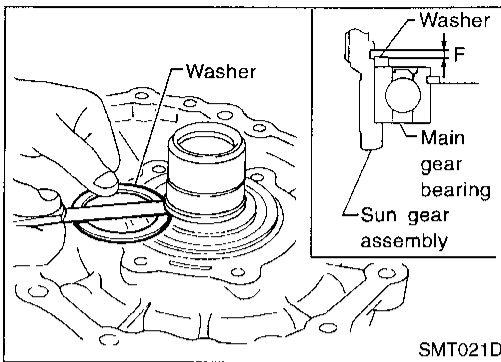
13. Set planetary carrier to press in the status described in step 8. Then install the selected bearing race to planetary carrier.



14. Install front case to planetary carrier. Set a support ring (KV40105310) and an adapter B (KV40105230) to main gear bearing inner race, then press it.

ASSEMBLY

Front Case (Cont'd)



15. Install washer to sun gear assembly, and select proper snap ring so that end play "F" of sun gear is within specifications.

Standard end play "F":

0 - 0.15 mm (0 - 0.0059 in)

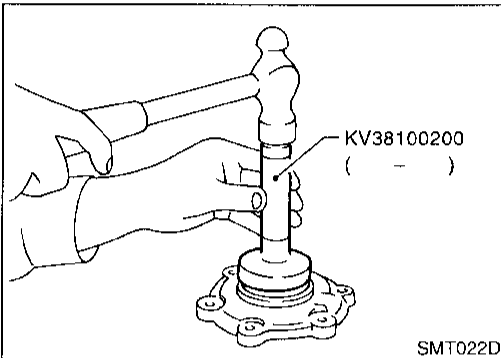
Snap ring: Refer to SDS, TF-135.

GI

MA

EM

LC



16. Install the selected snap ring.

- **Do not reuse snap rings.**

17. Apply ATF to the periphery of new transfer cover oil seal, and attach it at 1.5 mm (0.059 in) from the transfer cover and face.

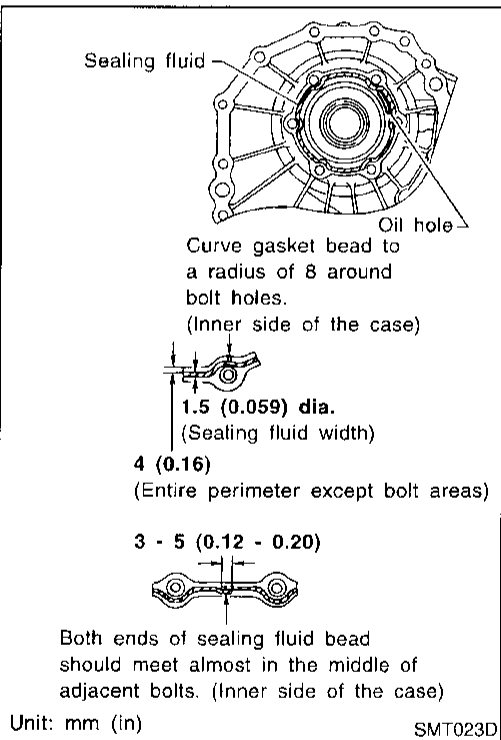
- **Do not reuse oil seal.**

EC

FE

AT

TF



18. Apply sealing fluid (Loctite 518-C1335 x 25) to transfer cover mounting surface of front case as shown in the figure.

CAUTION:

- **Remove all foreign materials such as water, oil, and grease from mating surfaces of front case and transfer cover.**

- **Prevent sealing fluid from entering into oil holes of front case.**

PD

AX

SU

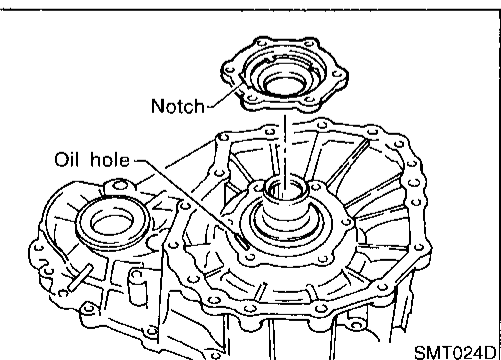
BR

ST

RS

BT

HA



19. Align oil hole of front case with notch of transfer cover, and tighten bolts.

Ⓜ : 49 - 58 N·m (5.0 - 5.9 kg·m, 36 - 43 ft·lb)

- **Do not reuse bolts.**

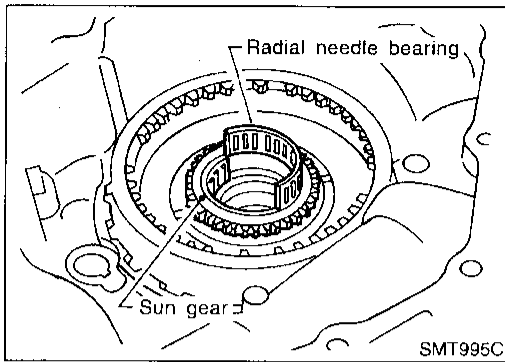
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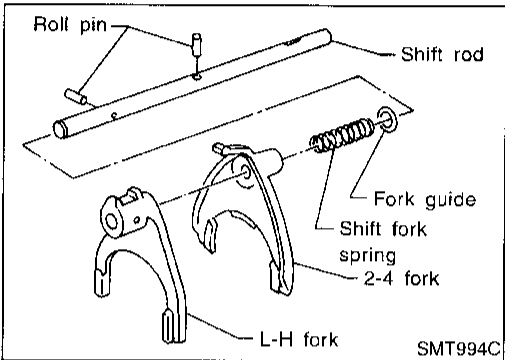
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ASSEMBLY

Front Case (Cont'd)



20. Apply petroleum jelly to radial needle bearing, and install it inside sun gear.
21. Install shift rod assembly to front case assembly. Refer to "Shift Rod Assembly", TF-120.
22. Install center case assembly to front case assembly. Refer to "Final Assembly", TF-129.
23. Install rear case assembly to center case. Refer to "Final Assembly", TF-129.

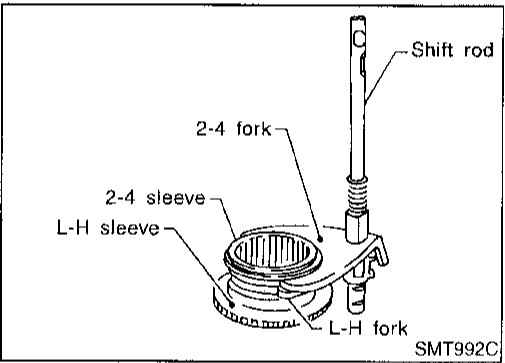


Shift Rod Assembly

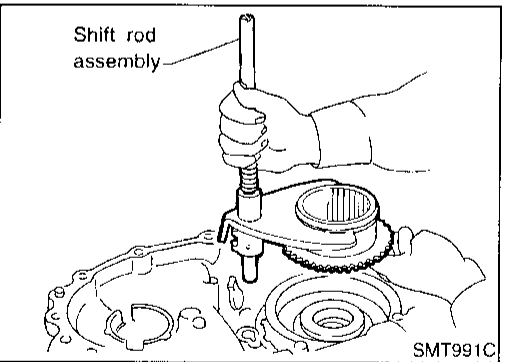
NBTF0082502

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

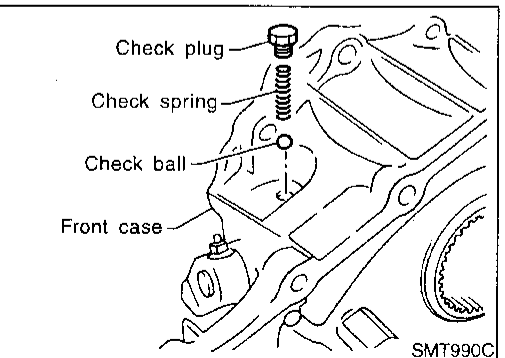
- Do not reuse roll pins.



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 gasket fluid 1215 (Three Bond) to check plug, install it to front case, and tighten it to specified torque.

- With plug bolt threaded one pitch into the hole, apply gasket fluid 1215 (Three Bond) to the thread.

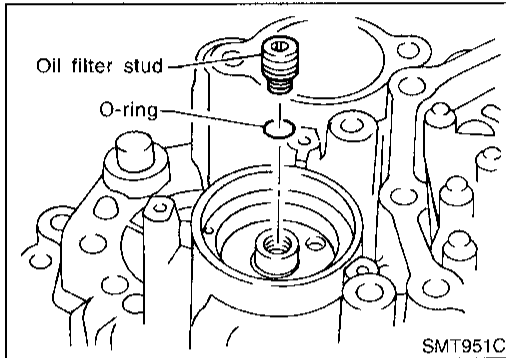
 : 19 - 25 N·m (1.9 - 2.5 kg·m, 14 - 18 ft·lb)

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 gasket fluid 1215 (Three Bond) to the thread, install it, and tighten it to specified torque.

 : 15 - 20 N·m (1.5 - 2.0 kg-m, 11 - 14 ft-lb)

- Wait detection switch harness connector is black.
- 6. Install center case assembly to front case assembly. Refer to "Final Assembly", TF-129.
- 7. Install rear case assembly to center case. Refer to "Final Assembly", TF-129.


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Center Case ASSEMBLY

Oil Filter


1. Apply ATF or petroleum jelly to new O-ring, and install it to oil filter stud.
- Do not reuse O-rings.
2. Install oil filter stud to center case, and tighten it.

 : 25 - 35 N·m (2.6 - 3.6 kg-m, 19 - 26 ft-lb)

3. Apply ATF or petroleum jelly to two new O-rings, and install them to oil filter.

● Do not reuse O-rings.

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

 : 7 - 9 N·m (0.7 - 0.9 kg-m, 61 - 78 in-lb)

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

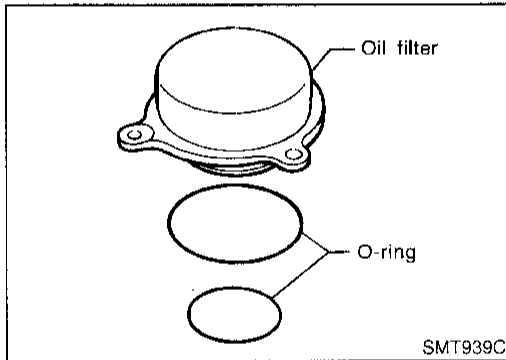
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Sub-oil Pump

1. Install new oil pump gasket to center case by aligning it with dowel pin inside the center case.

● Do not reuse gaskets.

2. Install outer gear* and inner gear to sub-oil pump housing, and measure side clearance. Refer to "Sub-oil Pump", "INSPECTION", TF-114.

3. Set new O-ring to sub-oil pump housing, and install sub-oil pump cover.

● Do not reuse O-rings.

* Identification mark "▼" is placed on the side of sub-oil pump cover.

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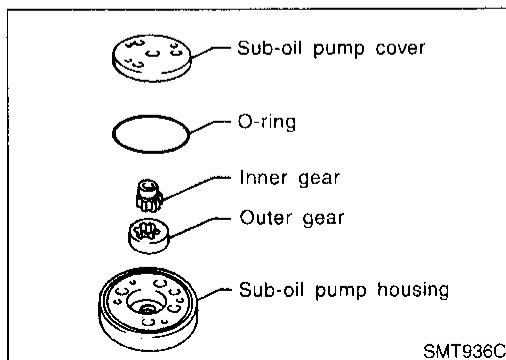
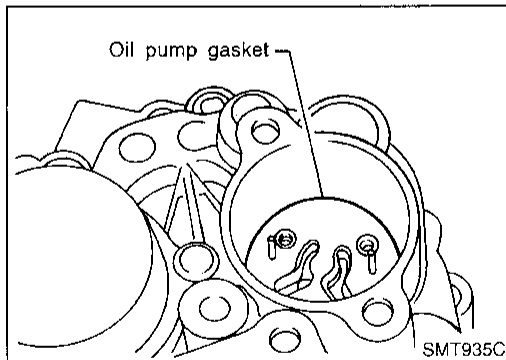
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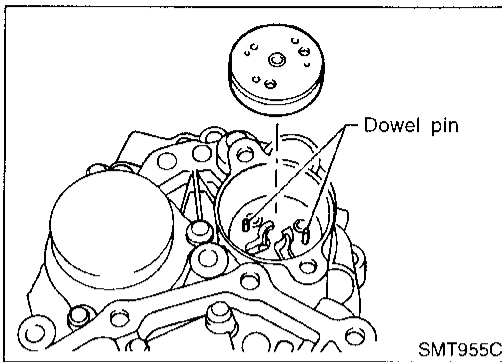
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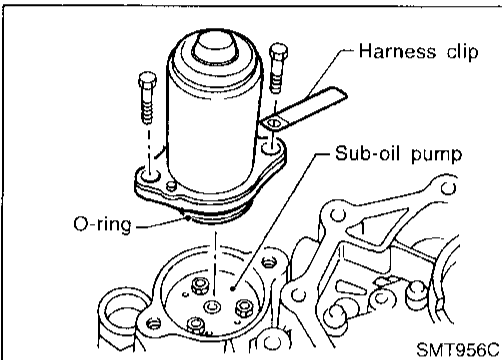
ASSEMBLY

Center Case (Cont'd)




4. Align dowel pin hole and mounting bolt hole of sub-oil pump assembly with center case. Then tighten bolts.

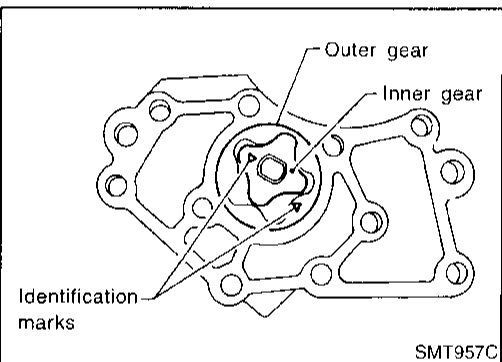
 : 7 - 9 N·m (0.7 - 0.9 kg-m, 61 - 78 in-lb)



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

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

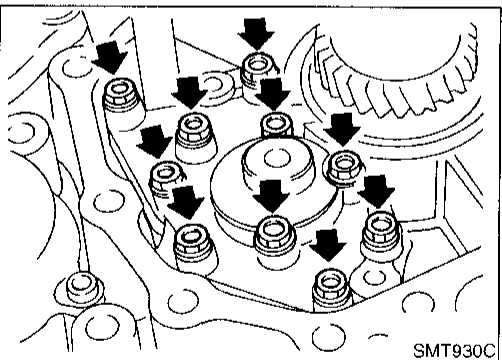
 : 41 - 48 N·m (4.2 - 4.9 kg-m, 30 - 35 ft-lb)




Main Oil Pump

NBTF0083503

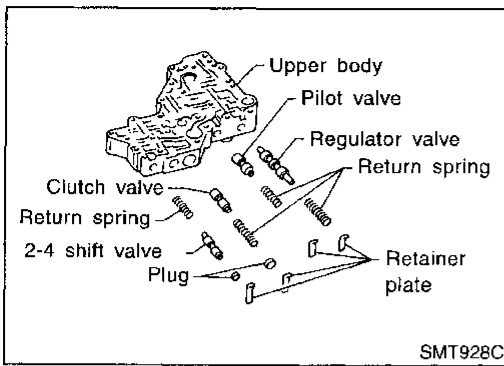
1. Install inner gear and outer gear in the main oil pump housing with their identification marks facing toward center case mounting surface side. Then, measure the side clearance. Refer to "Main Oil Pump", "Center Case", TF-114.



2. Install main oil pump assembly to center case assembly, and tighten bolts.

 : 7 - 9 N·m (0.7 - 0.9 kg-m, 61 - 78 in-lb)

3. Install oil pump shaft to main oil pump, then install rear case assembly to center case. Refer to "Final Assembly", TF-129.



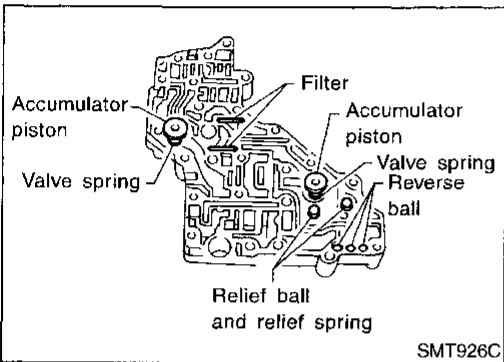
Control Valve

NBT0083S04

1. Clean upper body, control valves and springs with cleaning agent, and apply air blow.
2. Dip control valves in ATF, and apply ATF to the valve-mounting area of upper body.
3. Install each control valve, spring, and plug to upper body, and fix it with retainer plates.

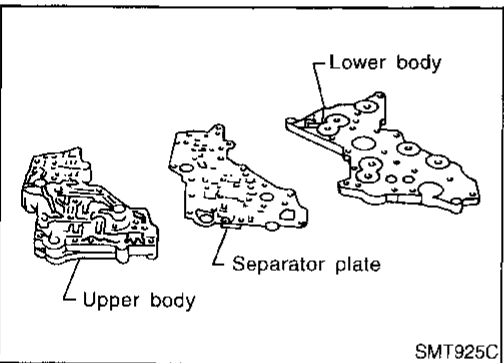
CAUTION:

- 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, valve springs and two filters to upper body.



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

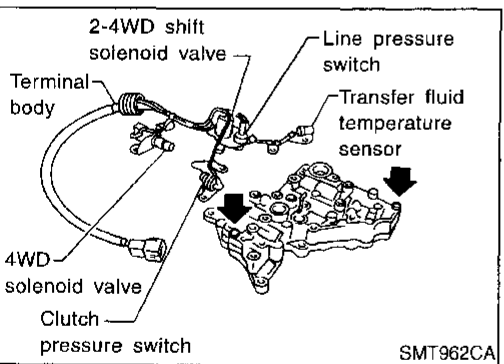
- Do not reuse separator plates.



6. With lower body down, tighten two bolts in the position shown in the figure.

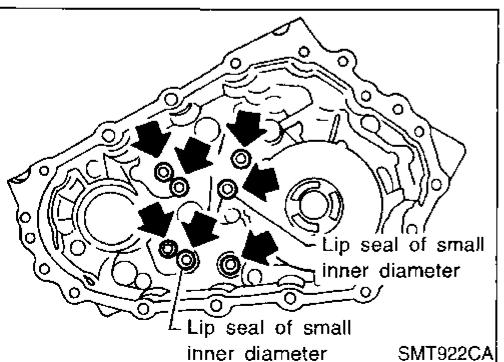
7. Apply ATF or petroleum jelly to new O-ring, and install it to 2-4WD shift solenoid valve, terminal body, line pressure switch and 4WD solenoid valve. Install them to control valve assembly.

- Do not reuse O-rings.



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

- Do not reuse lip seals.
- There are 2 kinds of lip seals (lip seal of large inner diameter: 5 pieces, lip seal of small inner diameter: 2 pieces). Confirm the position before installation.



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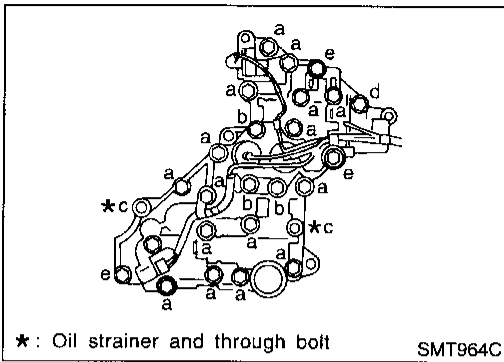
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ASSEMBLY

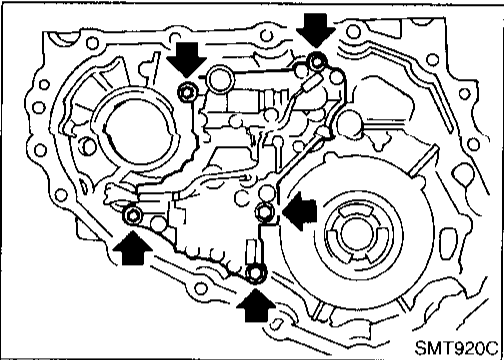
Center Case (Cont'd)




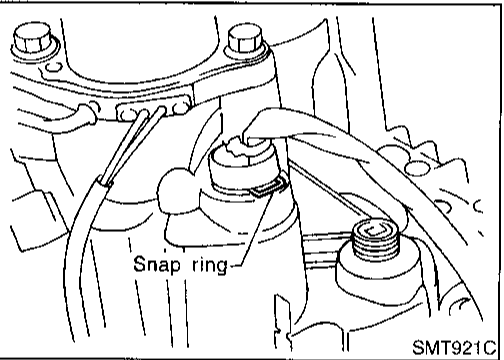
9. Install bolts as shown in the figure, and tighten them to specified torque.

Bolt symbol	a	b	*c	d	e
Length under head mm (in)	38 (1.50)	43.5 (1.713)	62 (2.44)	19 (0.75)	52 (2.05)
Q'ty	17	3	2	1	1
Tightening torque N·m (kg·m, in·lb)	6.9 - 8.8 (0.70 - 0.90, 61.1 - 77.9)				

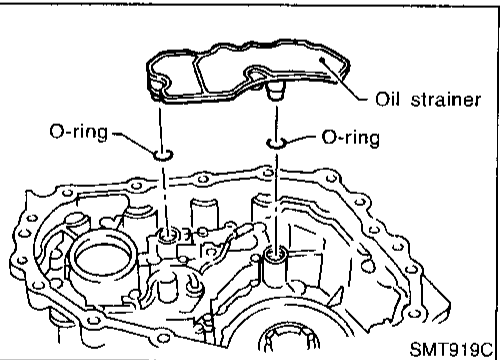
*: Tighten with oil strainer.



10. Install control valve assembly to center case, and tighten bolts.
 : 6.9 - 8.8 N·m (0.70 - 0.90 kg·m, 61.1 - 77.9 in·lb)



11. Secure terminal body with snap ring.



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

CAUTION:

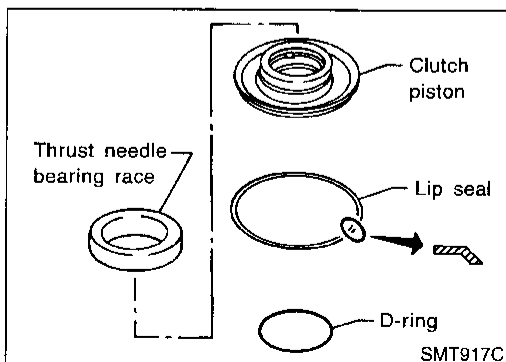
Do not reuse snap ring.

13. Install oil strainer to control valve assembly.
 14. Install mainshaft and clutch drum to center case. Refer to "Mainshaft and Clutch Drum", TF-125.
 15. Install front case assembly and rear case assembly. Refer to "Final Assembly", TF-129.

Clutch Piston

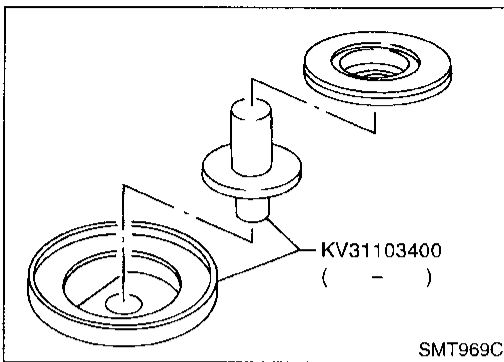
NBTF0083905

1. Apply ATF to D-ring and lip seal, and install them to clutch piston.

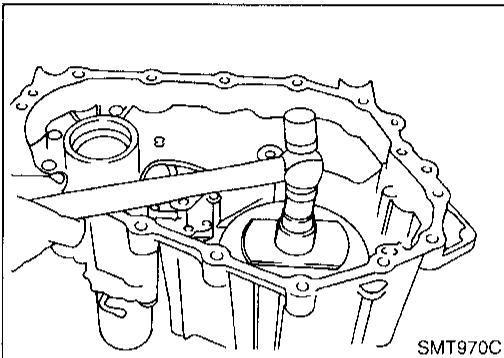


ASSEMBLY

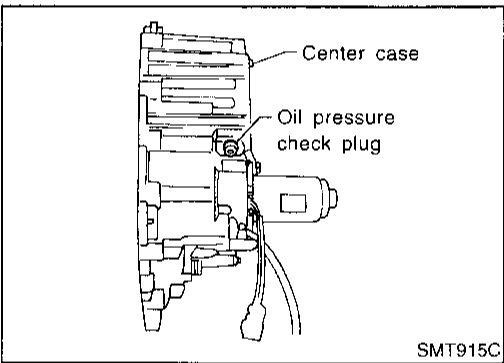
Center Case (Cont'd)



- Set clutch piston to a clutch piston attachment (KV31103400).



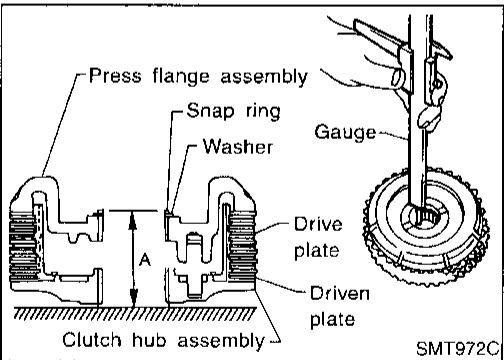
- Set the clutch piston attachment to center case, and install clutch piston, tap it lightly.
- Install slide needle bearing race to clutch piston.



- Remove all the liquid gasket from oil pressure check port and inside center case. With oil pressure check plug threaded in 1 or 2 pitches, apply gasket fluid 1215 (Three Bond) to the thread of plug, and tighten.

: 10 - 17 N·m (1.0 - 1.7 kg·m, 87 - 148 in·lb)

- Install mainshaft and clutch drum. Refer to "Mainshaft and Clutch Drum", TF-125.



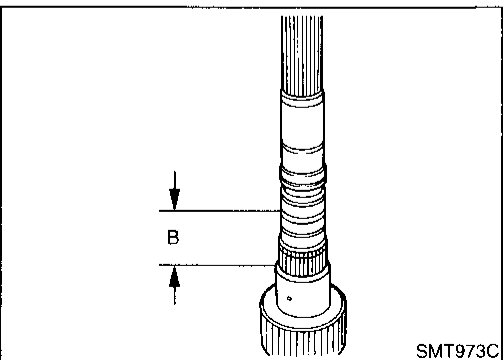
Mainshaft and Clutch Drum

NBTF-0083506

- Install drive plates, driven plates and press flange to clutch hub.
- Place clutch hub on a surface plate and measure dimension "A" between snap ring mounting surface of press flange and clutch drum sliding face of clutch hub.

CAUTION:

Measure at least 2 points, and take an average.



- Measure dimension "B" between the gear end of mainshaft and the snap ring mounting portion.
- Calculate end play using dimension "A" and dimension "B" (obtained in steps 2 and 3), and select proper retaining plate so that the end play is within specifications.

Calculation formula:

End play = B - A - Retaining plate thickness

Standard end play:

0.2 - 0.5 mm (0.008 - 0.020 in)

Retaining plate:

Refer to SDS, TF-134.

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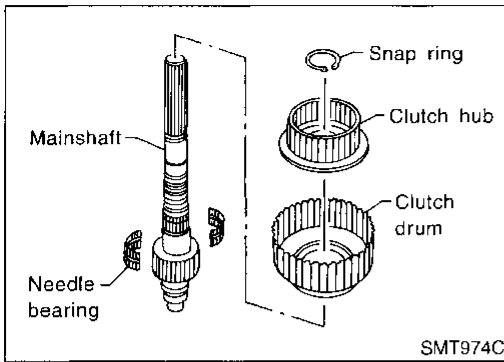
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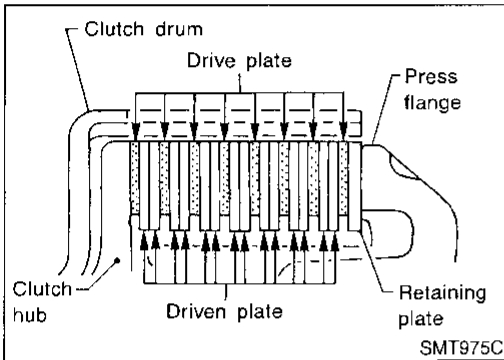
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ASSEMBLY

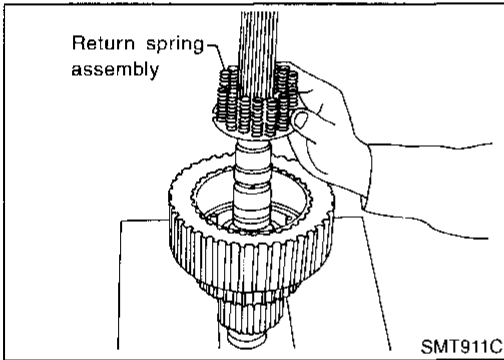
Center Case (Cont'd)



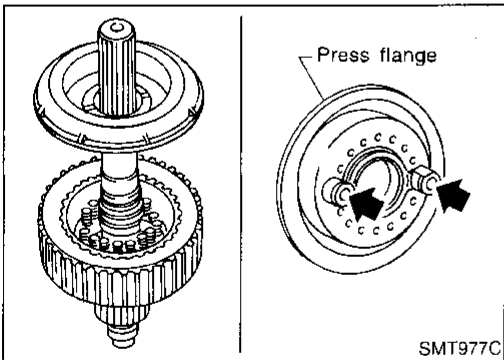
5. Install clutch drum, needle bearing and clutch hub to mainshaft, and secure them with snap ring.
 - Do not reuse snap ring.



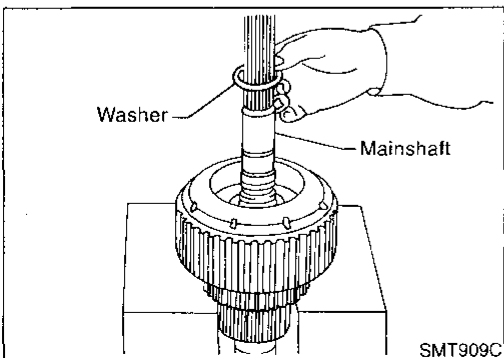
6. Install each clutch to clutch drum.



7. Align the notch of return spring assembly with the pin of clutch hub, and install it.



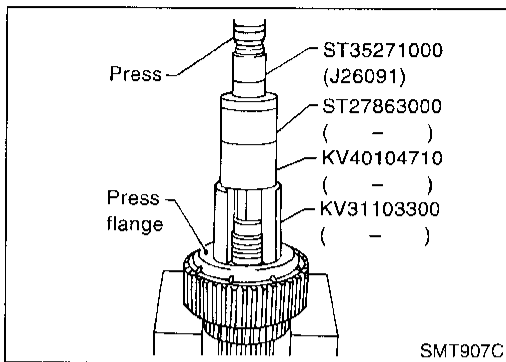
8. Install press flange (with the holes indicated by arrows aligned with pins of clutch hub).



9. Install washer.

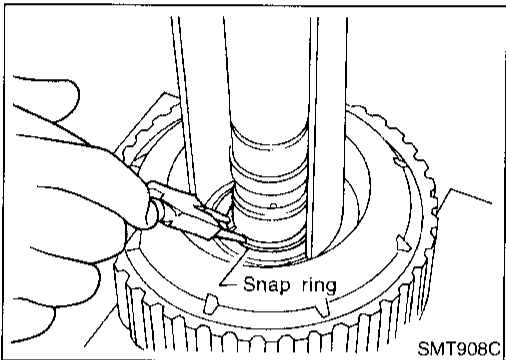
ASSEMBLY

Center Case (Cont'd)

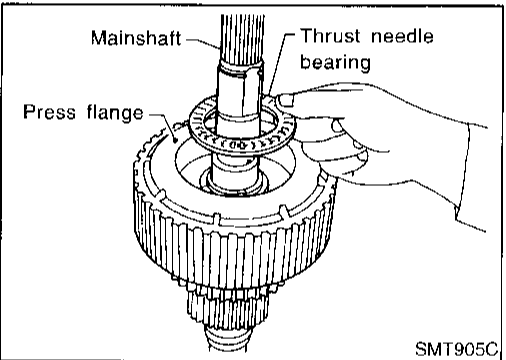


10. Pass mainshaft through snap ring. Set a drift (KV31103300), a support ring (KV40104710), a support ring (ST27863000) and a drift (ST35271000) to press flange at the position shown in the figure, and press snap ring until it fits into snap ring groove on mainshaft.

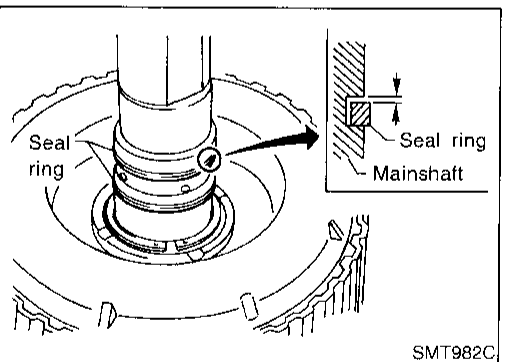
- Do not reuse snap ring.



11. Fix snap ring to mainshaft.



12. Install thrust needle bearing to press flange.



13. Apply petroleum jelly to new seal rings, and install them to mainshaft. Measure clearance between seal ring and groove using feeler gauge.

Standard clearance:

0.05 - 0.30 mm (0.0020 - 0.0118 in)

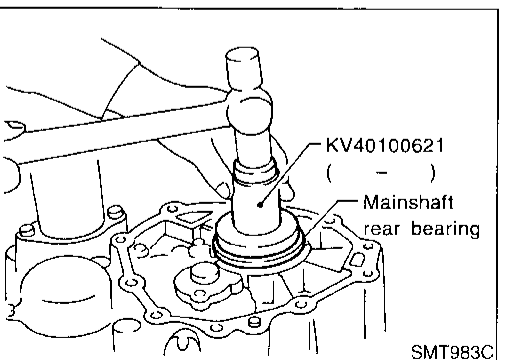
Limit clearance:

0.30 mm (0.0118 in)

- Pass seal ring from mainshaft rear end to install it.

Seal ring dimension:

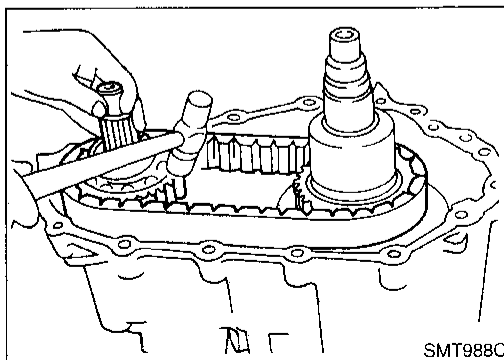
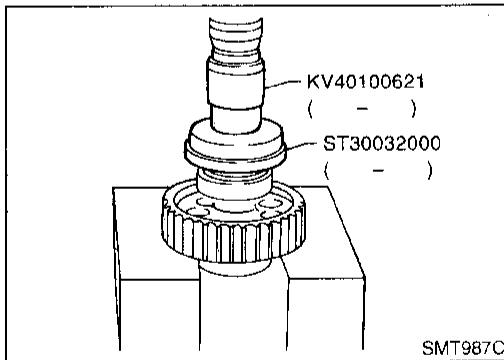
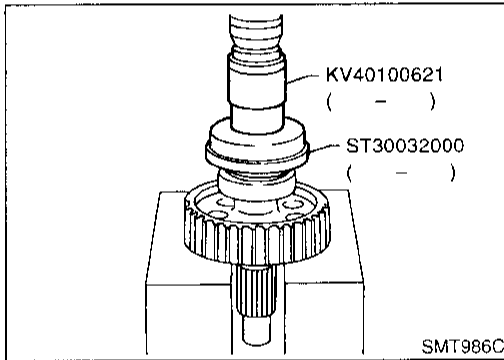
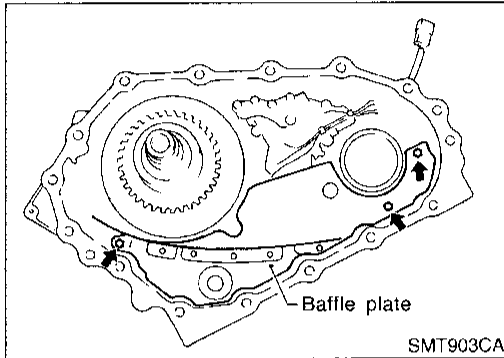
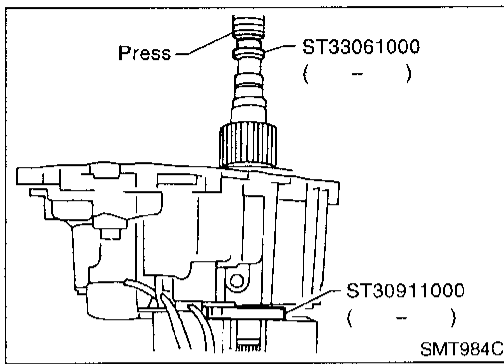
Refer to SDS, TF-134.



14. Install mainshaft rear bearing to center case.

ASSEMBLY

Center Case (Cont'd)



15. Place puller (ST30911000) to mainshaft rear bearing inner race, and set it to press stand.
16. Place adapter (ST33061000) to the tip of mainshaft, and press mainshaft into center case.
17. Install baffle plate to center case, and tighten bolts.
ⓘ : 3.7 - 5.0 N·m (0.38 - 0.51 kg-m, 33.0 - 44.3 in-lb)
18. Install front drive shaft and drive chain. Refer to "Front Drive Shaft and Drive Chain" below.
19. Install front case assembly and rear case assembly. Refer to "Final Assembly", TF-129.

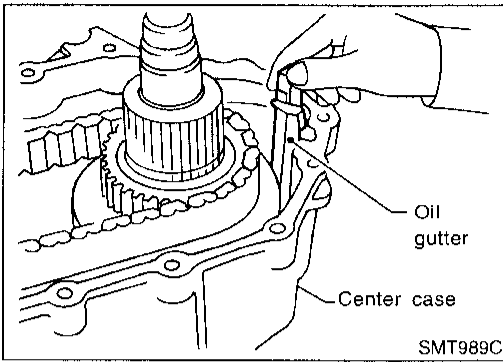
Front Drive Shaft and Drive Chain

NBTF0083S07

1. Place a base (ST30032000) to front drive shaft rear bearing inner race, and press it using a drift (KV40100621).
2. Place base (ST30032000) to front drive shaft front bearing inner race, and press it using the drift (KV40100621).
3. Install drive chain temporarily to front drive shaft and drive gear of clutch drum.
4. Tap front drive shaft with a plastic hammer while keeping it upright and press-fit front drive shaft rear bearing.
 - Be careful not to tap drive chain with a hammer.

ASSEMBLY

Center Case (Cont'd)



5. Align claw of oil gutter with center case, and install it.
6. Install front case assembly and rear case assembly. Refer to "Final Assembly", TF-129.

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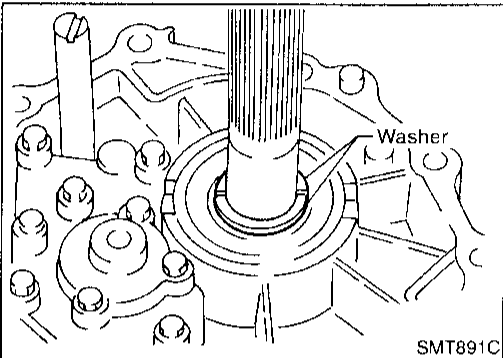
LC

Final Assembly

NBTF0084

1. Install C-rings to mainshaft rear bearing.

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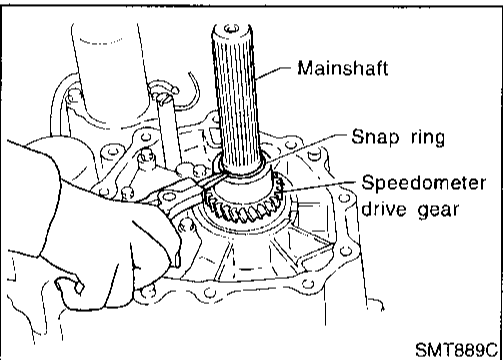
TF

2. Check speedometer drive gear teeth for abnormal wear. Set speedometer drive gear properly on mainshaft, and secure it with snap ring.

PD

- Do not reuse snap ring.

AX



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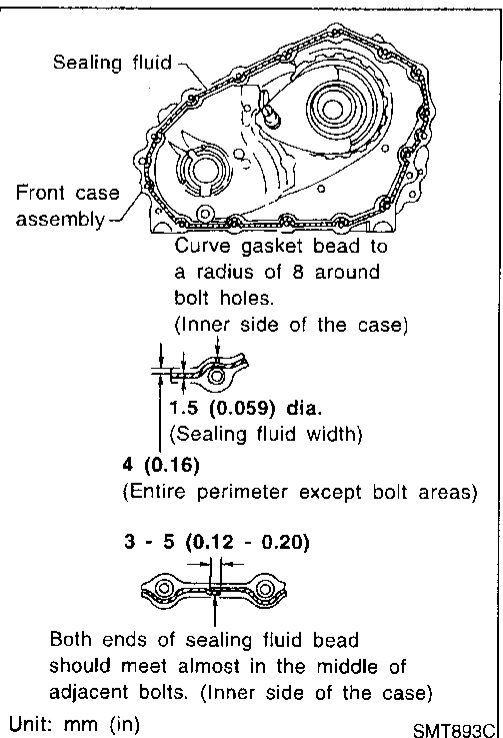
BR

3. Apply sealing fluid 518 (Loctite) to the entire center case mounting surface of front case as shown in the figure.

ST

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

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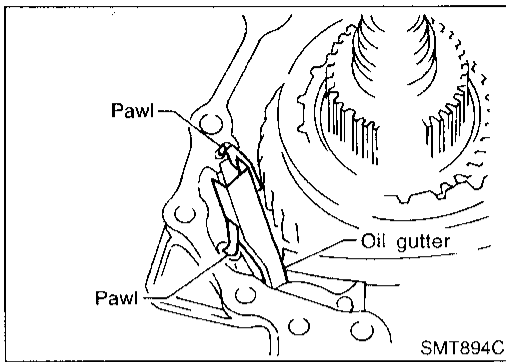
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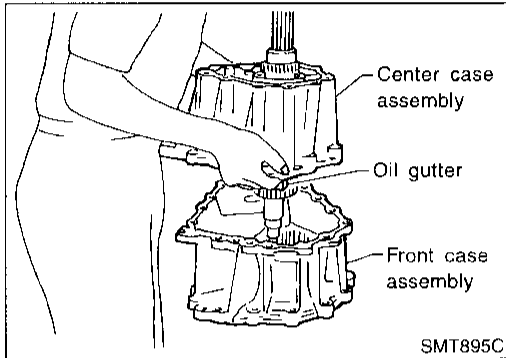
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ASSEMBLY

Final Assembly (Cont'd)



4. Make sure the two claws of oil gutter are securely attached to slots in center case.

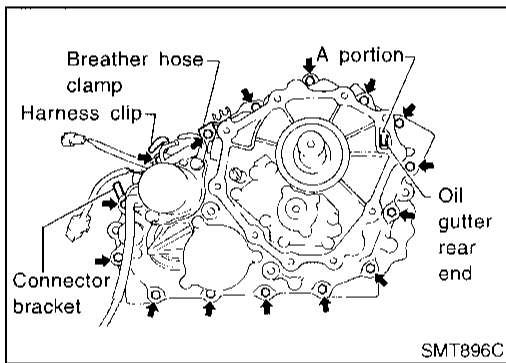


5. With the claws of oil gutter held by a finger, install center case assembly to front case assembly.

CAUTION:

Pay careful attention so that mainshaft end does not damage radial needle bearing in sun gear assembly.

6. Tap center case lightly with a rubber hammer or the like and press-fit front drive shaft bearing into front case.

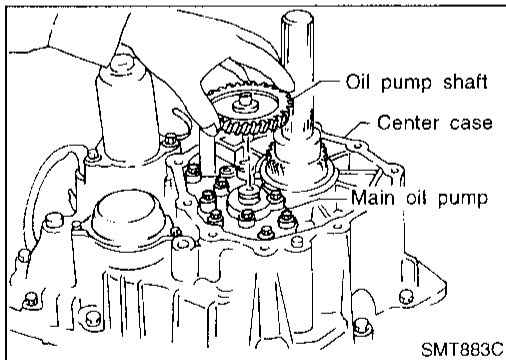


7. Make sure oil gutter rear end protrudes from point "A" in the figure.

8. Tighten bolts to specified torque.

: 41 - 48 N·m (4.2 - 4.9 kg·m, 30 - 35 ft·lb)

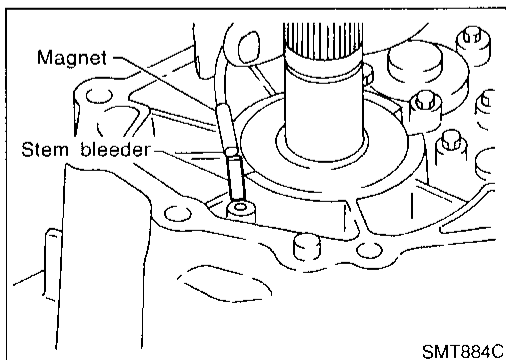
- Be sure to install air breather hose clamp, connector bracket and harness clip.



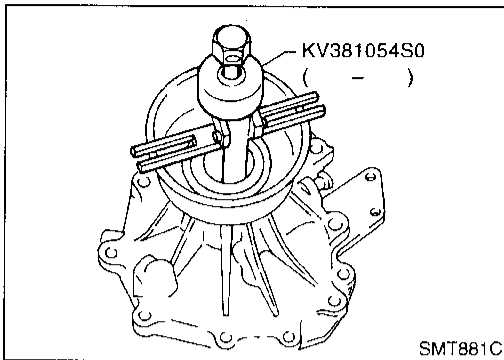
9. Fit double-flat end of oil pump shaft into slot of main oil pump and install it.

NOTE:

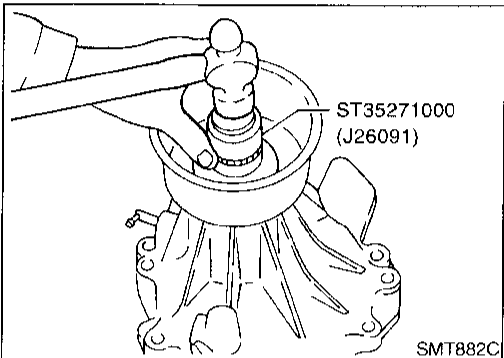
When oil pump shaft is rotated slightly, it drops into position where both parts fit.



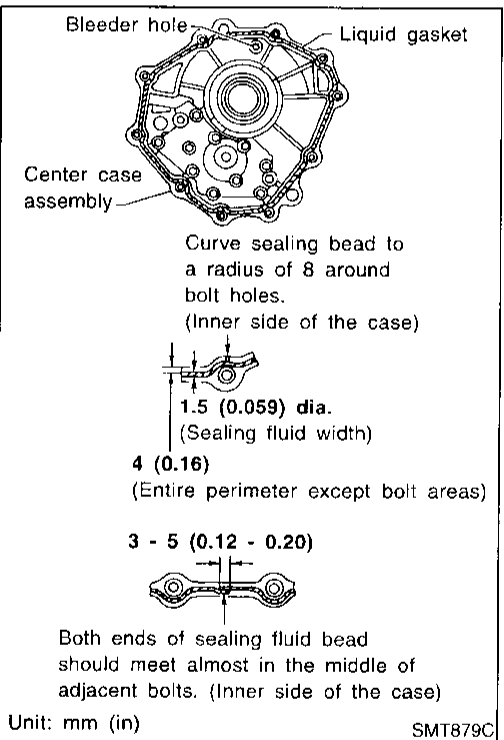
10. Install stem bleeder to center case.



11. Remove rear oil seal.
 - Do not reuse oil seal.



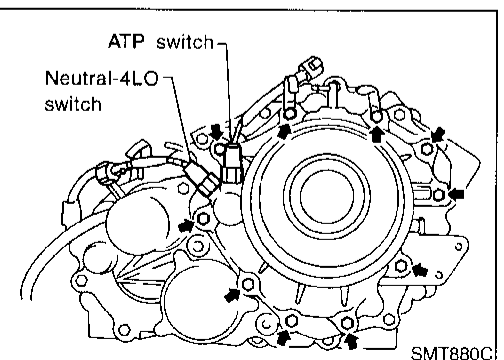
12. Apply ATF to the circumference of new rear oil seal, and tap it using a drift as shown in the figure so that it is aligned with case tip face.
 - Apply multi-purpose grease to oil seal lip.



13. Apply sealing fluid 518 (Loctite) to entire rear case mounting surface of center case as shown in the figure.

CAUTION:

- Remove all foreign materials such as water, oil, and grease from center case and rear case mating surfaces.
 - Be careful not to allow sealing fluid to clog bleeder hole.
14. Install rear case to center case, and tighten bolts to specified torque.
 - ☑ : 41 - 48 N·m (4.2 - 4.9 kg·m, 30 - 35 ft·lb)
 - Be sure to attach harness clips.



15. Remove all the gasket fluid 1215 (Three Bond) from switch mounting area and inside rear case, with ATP switch and neutral-4LO switch threaded in 1 to 2 pitches, apply gasket fluid 1215 (Three Bond) to the thread of the switches and tighten it to specified torque.
 - ☑ : 15 - 20 N·m (1.5 - 2.0 kg·m, 11 - 14 ft·lb)

16. Install rear case assembly to center case assembly.

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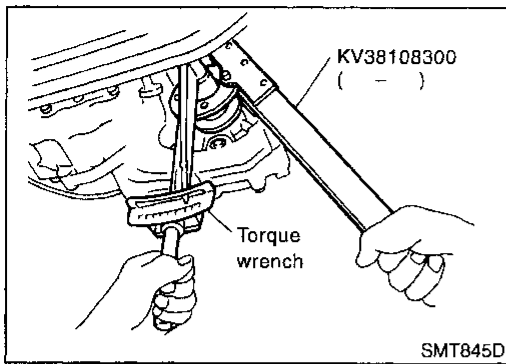
SC

EL


IDX

ASSEMBLY

Final Assembly (Cont'd)



17. Install companion flange to front drive shaft, and tighten mounting nut.

 : 226 - 324 N·m (23.0 - 33.0 kg-m, 166 - 239 ft-lb)

SERVICE DATA AND SPECIFICATIONS (SDS)

General Specifications

General Specifications

NBTF0085

Transfer model	ATX14A		
Gear ratio	High	1.000	
	Low	2.596	
Number of teeth	Planetary gear	Sun gear	57
		Internal gear	91
	Front drive sprocket		35
	Front drive shaft		35
Oil capacity ℓ (US qt, Imp qt)	3.0 (3-1/8, 2-5/8)		

Inner Gear and Outer Gear

NBTF0086

SUB-OIL PUMP

NBTF0086S01

Allowable clearance	0.015 - 0.035 mm (0.0006 - 0.0014 in)	
Gear thickness mm (in)	Part No.*	
	Inner gear	Outer gear
9.27 - 9.28 (0.3650 - 0.3654)	31346 0W422	31347 0W422
9.28 - 9.29 (0.3654 - 0.3657)	31346 0W421	31347 0W421
9.29 - 9.30 (0.3657 - 0.3661)	31346 0W420	31347 0W420

MAIN OIL PUMP

NBTF0086S02

Allowable clearance	0.015 - 0.035 mm (0.0006 - 0.0014 in)	
Gear thickness mm (in)	Part No.*	
	Inner gear	Outer gear
14.67 - 14.68 (0.5776 - 0.5780)	31346 0W412	31347 0W412
14.68 - 14.69 (0.5780 - 0.5783)	31346 0W411	31347 0W411
14.69 - 14.70 (0.5783 - 0.5787)	31346 0W410	31347 0W410

Control Valve

NBTF0087

VALVE

NBTF0087S01

Mounting position	Part name	Part No.*	Outer dia. mm (in)	Overall length mm (in)
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)

SPRING

NBTF0087S02

Mounting position	Part name	Part No.*	Free length mm (in)	Outer dia. mm (in)	Wire dia. mm (in)	Winding direction
L1	2-4 shift valve spring	31742 0W400	31.85 (1.2539)	7.0 (0.276)	0.6 (0.024)	Clockwise
L2	Clutch valve spring	31742 0W405	40.6 (1.598)	9.0 (0.354)	0.8 (0.031)	Clockwise
L4	Pilot valve spring	31742 0W410	28.1 (1.106)	9.0 (0.354)	1.2 (0.047)	Clockwise
L5	Regulator valve spring	31742 0W415	39.7 (1.563)	11.0 (0.433)	1.3 (0.051)	Clockwise

SERVICE DATA AND SPECIFICATIONS (SDS)

Clutch

Clutch

NBTF0088

DRIVE PLATE

NBTF0088S01

Part No.*	Initial thickness mm (in)	Limit value mm (in)
31532 0W410	2.0 (0.079)	1.8 (0.071)

RETURN SPRING

NBTF0088S02

Stamped mark	Part No.*	Free length mm (in)	Outer dia. mm (in)	Wire dia. mm (in)	Winding direction
1	31521 0W401	37.3 (1.496)	12.0 (0.472)	1.8 (0.071)	Clockwise
2	31521 0W402	37.8 (1.488)			
3	31521 0W403	38.4 (1.512)			
4	31521 0W404	38.9 (1.531)			
5	31521 0W405	39.4 (1.551)			
6	31521 0W406	40.0 (1.575)			
7	31521 0W407	36.8 (1.449)			
8	31521 0W408	40.5 (1.594)			

RETAINING PLATE

NBTF0088S03

Standard end play	0.2 - 0.5 mm (0.008 - 0.020 in)	
Measured value mm (in)	Part No.*	Thickness mm (in)
2.30 - 2.50 (0.0906 - 0.0984)	31537 0W410	2.1 (0.083)
2.50 - 2.70 (0.0984 - 0.1063)	31537 0W411	2.3 (0.091)
2.70 - 2.90 (0.1063 - 0.1142)	31537 0W412	2.5 (0.098)
2.90 - 3.10 (0.1142 - 0.1220)	31537 0W413	2.7 (0.106)
3.10 - 3.30 (0.1220 - 0.1299)	31537 0W414	2.9 (0.114)
3.30 - 3.50 (0.1299 - 0.1378)	31537 0W415	3.1 (0.122)
3.50 - 3.70 (0.1378 - 0.1457)	31537 0W416	3.3 (0.130)
3.70 - 3.90 (0.1457 - 0.1535)	31537 0W417	3.5 (0.138)
3.90 - 4.10 (0.1535 - 0.1614)	31537 0W418	3.7 (0.146)
4.10 - 4.30 (0.1614 - 0.1693)	31537 0W419	3.9 (0.154)
4.30 - 4.50 (0.1693 - 0.1772)	31537 0W420	4.1 (0.161)
4.50 - 4.70 (0.1772 - 0.1850)	31537 0W421	4.3 (0.169)
4.70 - 4.90 (0.1850 - 0.1929)	31537 0W422	4.5 (0.177)
4.90 - 5.10 (0.1929 - 0.2008)	31537 0W423	4.7 (0.185)

Seal Ring (Mainshaft side)

NBTF0089

Standard clearance Limit clearance	0.05 - 0.30 mm (0.0020 - 0.0118 in) 0.30 mm (0.0118 in)		
Part No.*	Outer dia. mm (in)	Inner dia. mm (in)	Thickness mm (in)
31525 0W410	40.8 (1.606)	36.9 (1.453)	1.97 (0.471)

SERVICE DATA AND SPECIFICATIONS (SDS)

Bearing Race (Thrust needle bearing side)

Bearing Race (Thrust needle bearing side)

NBTF0090

Standard end play	0.1 - 0.25 mm (0.0039 - 0.0098 in)	
End play (Dimension "E") mm (in)	Part No.*	Thickness mm (in)
1,785 - 1,800 (0.0703 - 0.0709)	31439 0W410	1.6 (0.063)
1,800 - 1,900 (0.0709 - 0.0748)	31439 0W411	1.7 (0.067)
1,900 - 2,000 (0.0748 - 0.0787)	31439 0W412	1.8 (0.071)
2,000 - 2,100 (0.0787 - 0.0827)	31439 0W413	1.9 (0.075)
2,100 - 2,200 (0.0827 - 0.0866)	31439 0W414	2.0 (0.079)
2,200 - 2,270 (0.0866 - 0.0894)	31439 0W415	2.1 (0.083)

Snap Ring (Sun gear side)

NBTF0091

Standard end play	0 - 0.15 mm (0 - 0.0059 in)	
End play (Dimension "F") mm (in)	Part No.*	Thickness mm (in)
2.40 - 2.50 (0.0945 - 0.0984)	33112 0W411	2.4 (0.094)
2.50 - 2.60 (0.0984 - 0.1024)	33112 0W412	2.5 (0.098)
2.60 - 2.70 (0.1024 - 0.1063)	33112 0W413	2.6 (0.102)

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

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