SECTION TF
TRANSFER

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PRECAUTIONS

PFP:00001

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

UDS0008W

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

WARNING:

- **To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision which would result in air bag inflation, all maintenance must be performed by an authorized NISSAN/INFINITI dealer.**
- **Improper maintenance, including incorrect removal and installation of the SRS, can lead to personal injury caused by unintentional activation of the system. For removal of Spiral Cable and Air Bag Module, see the SRS section.**
- **Do not use electrical test equipment on any circuit related to the SRS unless instructed to in this Service Manual. SRS wiring harnesses can be identified by yellow and/or orange harnesses or harness connectors.**

Precautions for Transfer Assembly and Transfer Control Unit Replacement

UDS000DE

- When replacing transfer assembly or transfer control unit, check the 4WD shift indicator pattern and adjustment of the position between transfer assembly and transfer control unit if necessary.

CHECK 4WD SHIFT INDICATOR PATTERN

1. Set 4WD shift switch to “2WD”, “4H”, “4LO”, “4H” and “2WD” in order. (Stay at each switch position for at least 2 seconds.)
2. Confirm 4WD shift indicator lamp and 4LO indicator lamp are changed properly as follows.

4WD shift switch	Indicator lamp		Operation of 4WD shift switch
	4WD shift	4LO	
2WD		OFF	2WD ⇔ 4H switching can be done while driving. The indicator lamp will change when the driving mode is changed. Gear shifting between 2WD ⇔ 4H position must be performed at speeds below 100km/h (60 MPH).
4H			
		Flashing	To shift between 4H ⇔ 4LO, stop the vehicle and select the A/T selector lever to the “N” position with the brake pedal depressed. Depress and turn the 4WD shift switch. The 4WD shift switch will not shift to the desired mode if the transmission is not in “N” or the vehicle is moving with the brake pedal depressed. The 4LO indicator lamp will be lit when the 4LO is engaged.
4LO		ON	

SDIA2481E

- If OK, the position between transfer assembly and transfer control unit is correct.
- If NG, the position is different between transfer assembly and transfer control unit.
  Adjust the position between transfer assembly and transfer control unit. Refer to pattern table below.

Transfer position adjustment pattern

4WD shift switch condition	Refer procedure
4WD shift switch is under “2WD” condition when engine is being stopped.	TF-5, "METHOD FOR ADJUSTMENT WITH 4WD SHIFT SWITCH AT “2WD”"
4WD shift switch is under “4H” or “4LO” condition when engine is being stopped.	TF-5, "METHOD FOR ADJUSTMENT WITH 4WD SHIFT SWITCH AT “4H” OR “4LO”"

NOTE:
Method of adjustment can be chosen voluntarily, according to location of 4WD shift switch.

METHOD FOR ADJUSTMENT WITH 4WD SHIFT SWITCH AT “2WD”

Select adjustment pattern

1. Start engine. (Stay for at least 10 seconds.)
2. Check 4WD shift indicator lamp and 4LO indicator lamp.

Indicator lamp condition	Refer procedure
When 4WD shift indicator lamp or 4LO indicator lamp is flashing.	TF-5, "Pattern A"
Except for above.	TF-5, "Pattern B"

Pattern A

1. Stop vehicle and move A/T selector lever to “N” position with brake pedal depressed. (Stay for at least 2 seconds.)
2. Turn 4WD shift switch to “4LO” position. (Stay for at least 2 seconds.)
3. Turn ignition switch “OFF”.
4. Start engine.
5. Erase self-diagnosis. Refer to TF-34, "How to erase self-diagnostic results" (with CONSULT-II) or TF-37, "ERASE SELF-DIAGNOSIS" (without CONSULT-II).
6. Check 4WD shift indicator lamp and 4LO indicator lamp again. Refer to TF-4, "CHECK 4WD SHIFT INDICATOR PATTERN" .
   If 4WD shift indicator lamp and 4LO indicator lamp do not indicate proper pattern, install new transfer control unit and retry the above check.

Pattern B

1. Stop vehicle and move A/T selector lever to “N” position with brake pedal depressed. (Stay for at least 2 seconds.)
2. Turn ignition switch “OFF”.
3. Start engine.
4. Erase self-diagnosis. Refer to TF-34, "How to erase self-diagnostic results" (with CONSULT-II) or TF-37, "ERASE SELF-DIAGNOSIS" (without CONSULT-II).
5. Check 4WD shift indicator lamp and 4LO indicator lamp again. Refer to TF-4, "CHECK 4WD SHIFT INDICATOR PATTERN" .
   If 4WD shift indicator lamp and 4LO indicator lamp do not indicate proper pattern, install new transfer control unit and retry the above check.

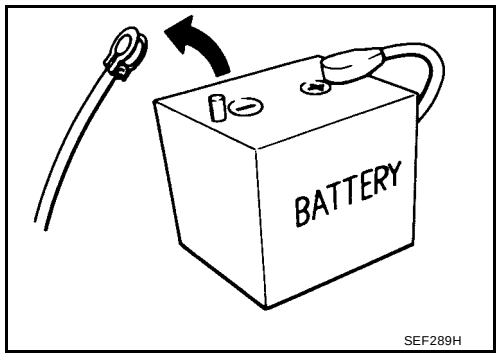
METHOD FOR ADJUSTMENT WITH 4WD SHIFT SWITCH AT “4H” OR “4LO”

1. Start engine. (Stay for at least 10 second.)
2. Stop vehicle and move A/T selector lever to “N” position with brake pedal depressed. (Stay for at least 2 seconds.)
3. Turn 4WD shift switch to “2WD” position. (Stay for at least 2 seconds.)
4. Turn ignition switch “OFF”.
5. Start engine.
6. Erase self-diagnosis. Refer to TF-34, "How to erase self-diagnostic results" (with CONSULT-II) or TF-37, "ERASE SELF-DIAGNOSIS" (without CONSULT-II).
7. Check 4WD shift indicator lamp and 4LO indicator lamp again. Refer to TF-4, "CHECK 4WD SHIFT INDICATOR PATTERN" .
   If 4WD shift indicator lamp and 4LO indicator lamp do not indicate proper pattern, install new transfer control unit and retry the above check.

Precautions

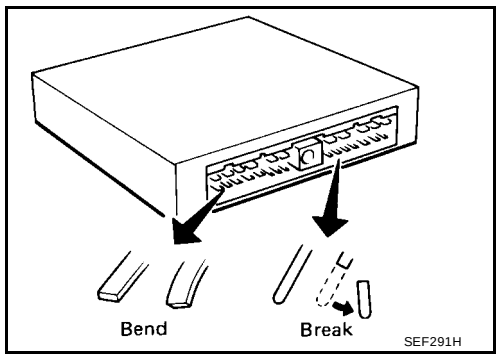
UDS0008X

- **Before connecting or disconnecting the transfer control unit harness connector, turn ignition switch “OFF” and disconnect battery ground cable. Because battery voltage is applied to transfer control unit even if ignition switch is turned “OFF”.**



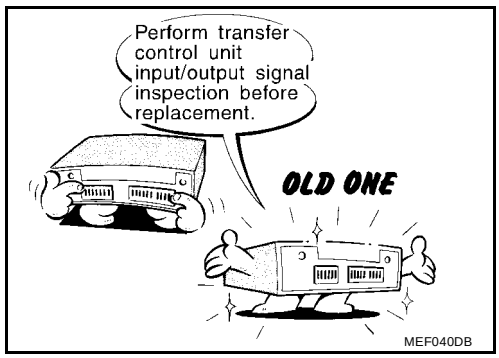
SEF289H

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



SEF291H

- **Before replacing transfer control unit, perform transfer control unit input/output signal inspection and make sure whether transfer control unit functions properly or not. Refer to TF-27, "Transfer Control Unit Input/Output Signal Reference Values" .**



MEF040DB

Service Notice

UDS0008Y

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

- Use lint-free cloth or towels for wiping parts clean. Common shop rags can leave fibers that could interfere with the operation of the transfer.

Wiring Diagrams and Trouble Diagnosis

UDS0008Z

When reading wiring diagrams, refer to the following:

- GI-14, "How to Read Wiring Diagrams".
- PG-4, "POWER SUPPLY ROUTING CIRCUIT".

When performing trouble diagnosis, refer to the following:

- GI-9, "How to Follow Trouble Diagnoses".
- GI-27, "How to Perform Efficient Diagnosis for an Electrical Incident".

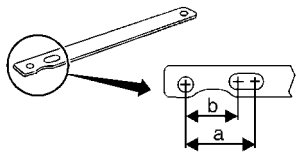
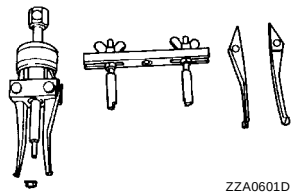
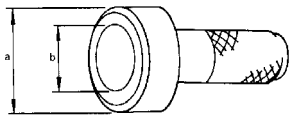
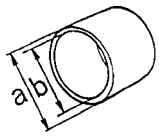
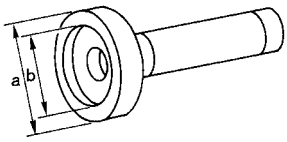
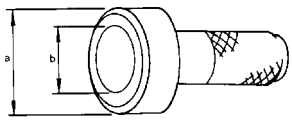
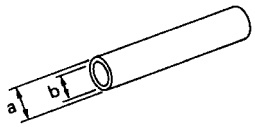
PREPARATION

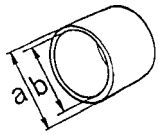
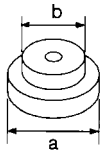
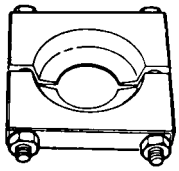
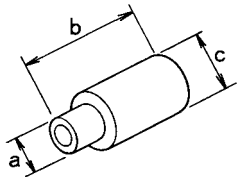
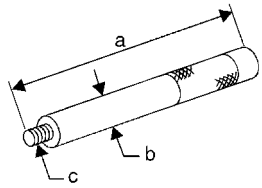
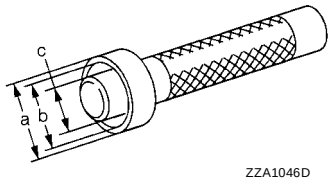
PFP:00002

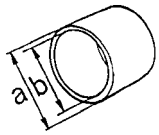
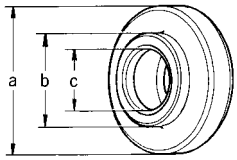
Special Service Tools

EDS0031D

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

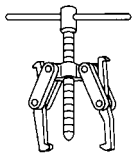
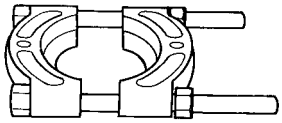
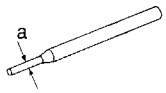
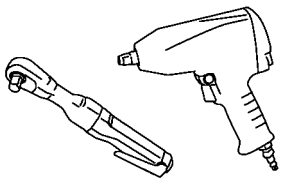
Tool number (Kent-Moore No.) Tool name		Description
KV40104000 (—) Flange wrench	 NT659	● Removing self-lock nut ● Installing self-lock nut **a: 85 mm (3.35 in)** **b: 65 mm (2.56 in)**
ST33290001 (J-34286) Puller	 ZZA0601D	● Removing front oil seal ● Removing rear oil seal ● Removing metal bushing
KV38100500 (—) Drift	 ZZA0811D	● Installing front oil seal ● Installing rear oil seal ● Installing rear bearing ● Installing front bearing **a: 80 mm (3.15 in) dia.** **b: 60 mm (2.36 in) dia.**
KV40105310 (—) Drift	 ZZA1003D	● Installing dust cover **a: 89 mm (3.50 in) dia.** **b: 80.7 mm (3.17 in) dia.**
KV38100200 (—) Drift	 ZZA1143D	● Removing sun gear assembly ● Removing input bearing ● Installing sun gear assembly **a: 65 mm (2.56 in) dia.** **b: 49 mm (1.93 in) dia.**
ST30720000 (J-25405) Drift	 ZZA0811D	● Installing input bearing ● Installing input oil seal ● Installing carrier bearing **a: 77 mm (3.03 in) dia**. **b: 55 mm (2.17 in) dia.**
KV32102700 (—) Drift	 ZZA0534D	● Installing mainshaft rear bearing **a: 48 mm (1.89 in) dia.** **b: 41 mm (1.61 in) dia.**

Tool number (Kent-Moore No.) Tool name	Description
KV40104830 (—) Drift  ZZA1003D	● Installing input oil seal **a: 70 mm (2.76 in) dia.** **b: 63.5 mm (2.50 in) dia.**
ST35300000 (—) Drift  NT073	● Removing carrier bearing ● Installing metal bushing ● Removing front bearing **a: 59 mm (2.32 in) dia.** **b: 45 mm (1.77 in) dia.**
ST30021000 (J-22912-01) Puller  ZZA0537D	● Removing carrier bearing ● Removing front bearing ● Removing rear bearing
ST33710000 (—) Drift  ZZA1057D	● Removing needle bearing ● Removing metal bushing ● Removing rear bearing **a: 89 mm (3.5 in)** **b: 30 mm (1.18 in) dia.** **c: 24 mm (0.94 in) dia.**
ST35325000 (—) Drift bar  NT663	● Removing metal bushing **a: 215 mm (8.46 in)** **b: 25 mm (0.98 in) dia.** **c: M12 × 1.5P**
ST33220000 (—) Drift  ZZA1046D	● Installing needle bearing **a: 37 mm (1.46 in) dia.** **b: 31 mm (1.22 in) dia.** **c: 22 mm (0.87 in) dia.**

Tool number (Kent-Moore No.) Tool name	Description
ST27863000 (—) Drift  ZZA1003D	● Installing carrier bearing **a: 75 mm (2.95 in) dia.** **b: 62 mm (2.44 in) dia.**
ST30901000 (J-26010-01) Drift  ZZA0978D	● Installing rear bearing ● Installing front bearing **a: 79 mm (3.11 in) dia.** **b: 45 mm (1.77 in) dia.** **c: 35.2 mm (1.38 in) dia.**

Commercial Service Tools

EDS0031E

Tool name	Description
Puller  NT077	● Removing companion flange ● Removing mainshaft rear bearing
Puller  ZZB0823D	● Removing mainshaft rear bearing
Pin punch  NT410	● Removing retaining pin **a: 6mm (0.24in) dia.**
Power tool  PBIC0190E	● Loosening bolts and nuts

NOISE, VIBRATION AND HARSHNESS (NVH) TROUBLESHOOTING

PFP:00003

NVH Troubleshooting Chart

UDS00092

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

Reference page		TF-12			TF-88			TF-110	TF-96	TF-105
SUSPECTED PARTS (Possible cause)		TRANSFER FLUID (Level low)	TRANSFER FLUID (Wrong)	TRANSFER FLUID (Level too high)	LIQUID GASKET (Damaged)	O-RING (Worn or damaged)	OIL SEAL (Worn or damaged)	SHIFT FORK (Worn or damaged)	GEAR (Worn or damaged)	BEARING (Worn or damaged)
Symptom	Noise	1	2						3	3
	Transfer fluid leakage		3	1	2	2	2			
	Hard to shift or will not shift		1	1				2		

TRANSFER FLUID

PFP:31001

Replacement

UDS00093

Refer to MA-24, "Changing Transfer Fluid" .

Inspection

UDS00094

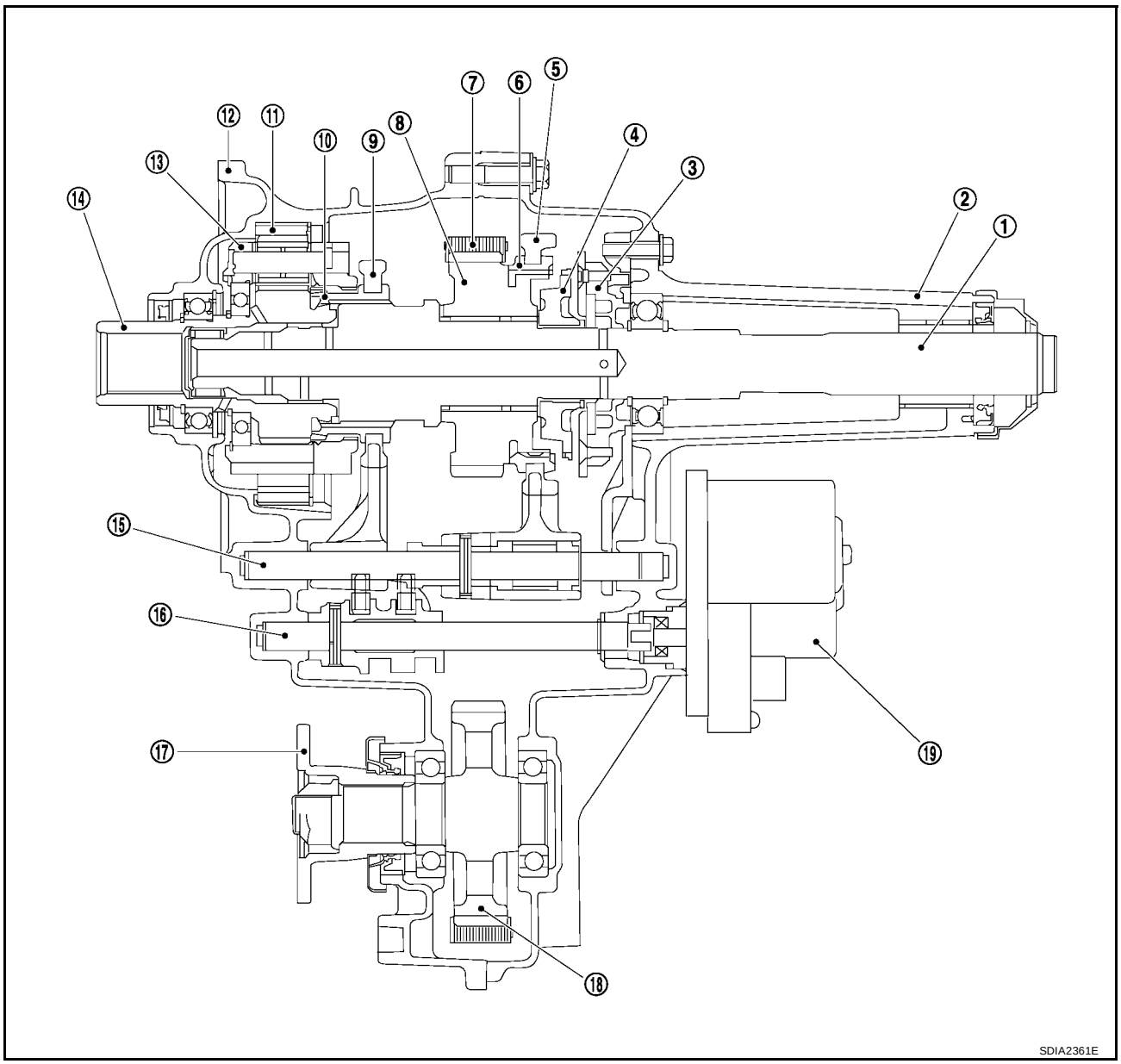
Refer to MA-24, "Checking Transfer Fluid" .

4WD SYSTEM

PFP:33084

Cross-section View

UDS000A1

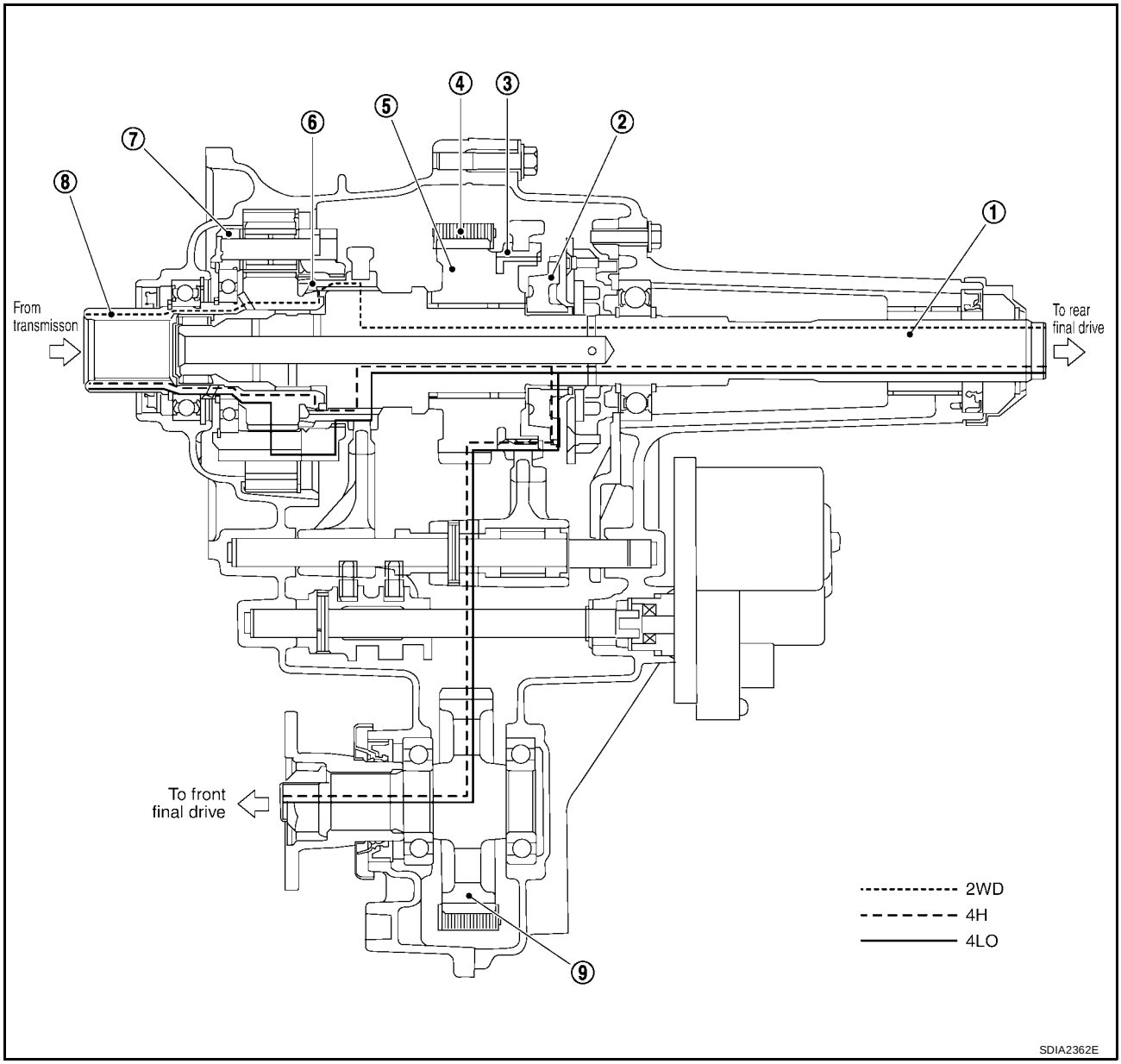


1. Mainshaft
2. Rear case
3. Oil pump assembly
4. Clutch gear
5. 2-4 shift fork
6. 2-4 sleeve
7. Drive chain
8. Sprocket
9. L-H shift fork
10. L-H sleeve
11. Internal gear
12. Front case
13. Planetary carrier assembly
14. Sun gear assembly
15. L-H shift rod
16. Control shift rod
17. Companion flange
18. Front drive shaft
19. Transfer control device

Power Transfer

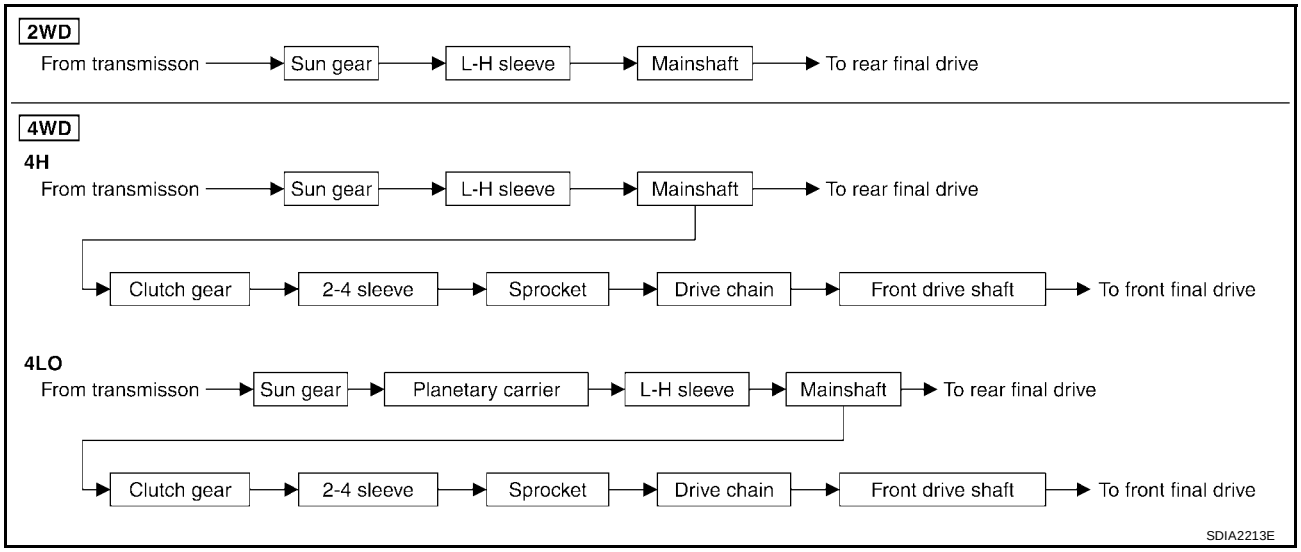
UDS000C0

POWER TRANSFER DIAGRAM



1.	Mainshaft	2.	Clutch gear	3.	2-4 sleeve
4.	Drive chain	5.	Sprocket	6.	L-H sleeve
7.	Planetary carrier assembly	8.	Sun gear assembly	9.	Front drive shaft

POWER TRANSFER FLOW



System Description

UDS00096

TRANSFER CONTROL DEVICE

Actuator motor and actuator position switch are integrated. Transfer control device switch 4H-4LO under 4WD condition and 2WD-4WD.

Actuator motor

It is operated by signal from transfer control unit, and it operates control shift rod so as to switch 4H-4LO under 4WD condition and 2WD-4WD.

Actuator position switch

It detects actuator motor position, and sends it to transfer control unit.

WAIT DETECTION SWITCH

It detects that transfer gear is in 4WD by 2-4 shift fork position.

NOTE:
If 4WD shift switch is switched to 4H or 4LO, transfer is not in 4WD completely when gear does not engage. (Wait detection system is operating.)

4LO SWITCH

It detects that transfer gear is under 4LO condition by L-H shift fork position.

ATP SWITCH

It detects that transfer gear is under neutral condition by L-H shift fork position.

NOTE:
Transfer gear may be under neutral condition in 4H-4LO.

TRANSFER CONTROL UNIT

- Transfer control unit controls transfer control device by input signals of each sensor and each switch. And it switches 4H-4LO under 4WD condition and 2WD-4WD.
- Self-diagnosis can be done.

TRANSFER RELAY

Applies power supply to transfer control unit.

4WD SHIFT SWITCH AND INDICATOR LAMP

4WD shift switch	Indicator lamp		Operation of 4WD shift switch	Use condition
	4WD shift	4LO		
2WD		OFF	2WD ⇔ 4H switching can be done while driving. The indicator lamp will change when the driving mode is changed. Gear shifting between 2WD ⇔ 4H position must be performed at speeds below 100km/h (60 MPH).	For driving on dry, paved roads.
4H				For driving on rough, sandy or snow-covered roads.
		Flashing	To shift between 4H ⇔ 4LO, stop the vehicle and select the A/T selector lever to the "N" position with the brake pedal depressed. Depress and turn the 4WD shift switch. The 4WD shift switch will not shift to the desired mode if the transmission is not in "N" or the vehicle is moving with the brake pedal depressed. The 4LO indicator lamp will be lit when the 4LO is engaged.	The 4LO indicator lamp flashes when shifting between 4LO ⇔ 4H.
4LO		ON		For use when maximum power and traction is required at low speed (for example on steep grades or rocky, sandy, muddy roads.).

SDIA2363E

4WD shift switch

Able to select from 2WD, 4H or 4LO.

4WD shift indicator lamp

- Displays driving conditions selected by 4WD shift switch with rear indicator, front and center indicator while engine is running. (When 4H or 4LO, 4LO indicator lamp also works on. And when 4WD warning lamp is turned on, all 4WD shift indicator lamps are turned off.)
- Turns ON when ignition switch is turned ON, for purpose of lamp check. Turns OFF approximately for 1 seconds after the engine starts if system is normal.

4LO indicator lamp

- Displays 4LO condition while engine is running. 4LO indicator lamp flashes if transfer gear does not shift completely under 4H⇔4LO. In this condition, transfer may be under neutral condition and A/T parking mechanism may not be operated.
- Turns ON when ignition switch is turned ON, for purpose of lamp check. Turns OFF approximately for 1 seconds after the engine starts if system is normal.

4WD WARNING LAMP

Turns ON or FLASH when there is a malfunction in 4WD system.
Also turns ON when ignition switch is turned ON, for purpose of lamp check. Turns OFF approximately for 1 seconds after the engine starts if system is normal.

4WD warning lamp indication

Condition	4WD warning lamp
Lamp check	Turns ON when ignition switch is turned ON. Turns OFF after engine start.
4WD system malfunction	ON (For indicated malfunction items, see the “NOTE”)
During self-diagnosis	Flickers at malfunction mode.
Large difference in diameter of front/ rear tires	Slow flashing: 1 time/2 seconds (Continuing to flash until turning ignition switch OFF)
Other than above (system normal)	OFF

NOTE:
4WD warning lamp is turned on when the following one or more parts are malfunctioning.

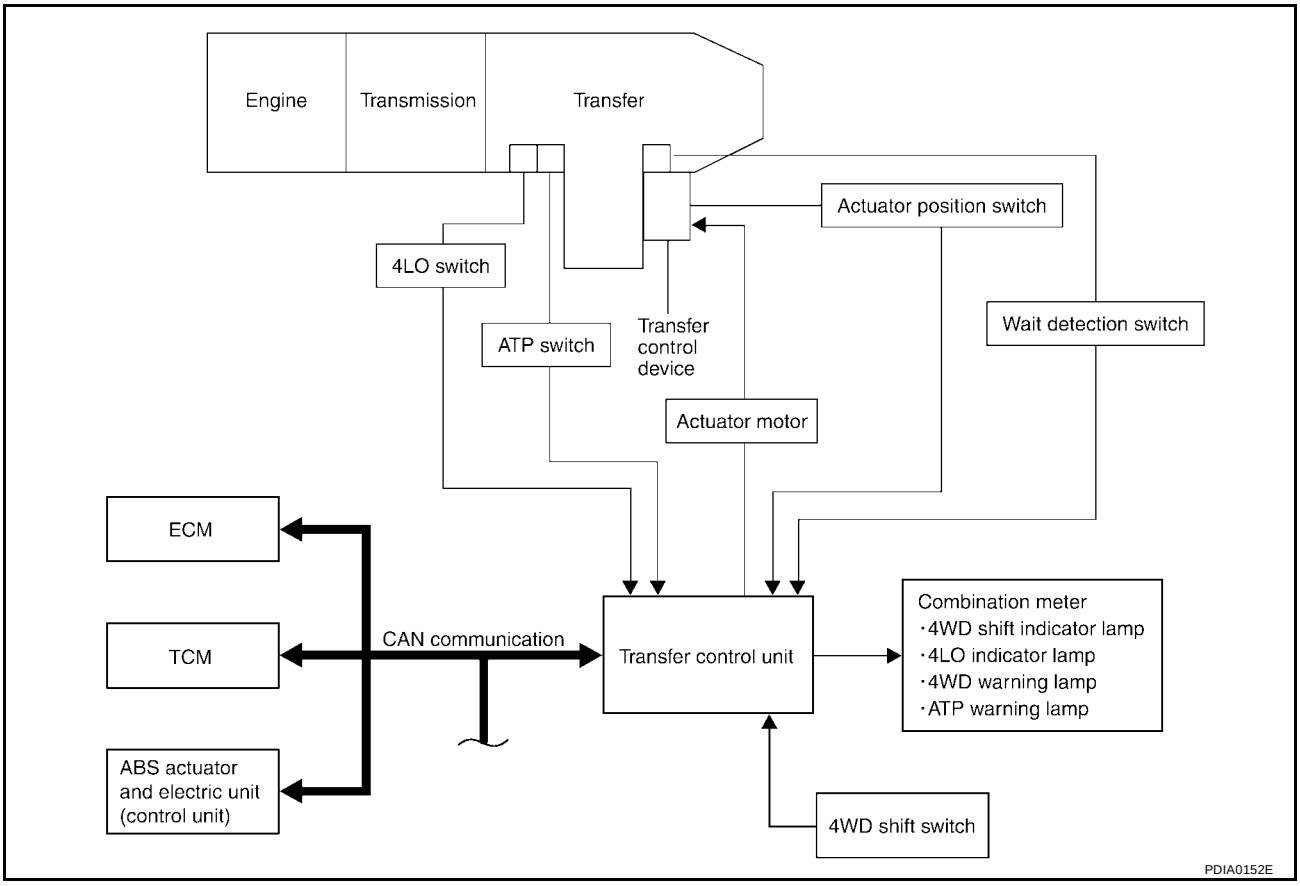
- Vehicle speed signal (from ABS)
- CAN communication line
- AD converter
- Engine speed signal
- 4WD shift switch
- Wait detection switch
- Actuator motor
- Transfer control device
- PNP switch signal

ATP WARNING LAMP

Even if A/T selector lever is in “P” position, vehicle may move because A/T parking mechanism does not operate when transfer is under neutral condition. ATP warning lamp is turned on so as to indicate this condition to the driver.

System Diagram

UDS00097



COMPONENTS FUNCTION DESCRIPTION

Component parts	Function
Transfer control unit	Controls transfer control device and switches 4H-4LO under 4WD condition and 2WD-4WD.
Transfer control device	Actuator motor and actuator position switch are integrated so as to switch driving types.
Actuator motor	Controls shift rods by signals from transfer control unit.
Actuator position switch	Detects actuator motor position.
Wait detection switch	Detects that transfer is under 4WD condition.
4LO switch	Detects that transfer is under 4LO condition.
ATP switch	Detects that transfer is under neutral condition.
4WD shift switch	Able to select from 2WD, 4H or 4LO.
4WD warning lamp	● Illuminates if malfunction is detected in electrical system of 4WD system. ● There is 1 blink in 2 seconds if rotation difference of front wheels and rear wheels is large.
ATP warning lamp	Indicates that A/T parking mechanism does not operate when A/T selector lever is in “P” position and transfer is under neutral condition.
4WD shift indicator lamp	Displays driving condition selected by 4WD shift switch.
4LO indicator lamp	Displays 4LO condition.
ABS actuator and electric unit (control unit)	Transmits the following signals via CAN communication to Transfer control unit. ● Vehicle speed signal ● Stop lamp switch signal (brake signal)
TCM	Transmits the following signal via CAN communication to Transfer control unit. ● Output shaft revolution signal ● A/T position indicator signal (PNP switch signal)
ECM	Transmits the following signal via CAN communication to Transfer control unit. ● Engine speed signal

CAN Communication

UDS00098

Refer to LAN-8, "CAN COMMUNICATION" .

TROUBLE DIAGNOSIS

PFP:00004

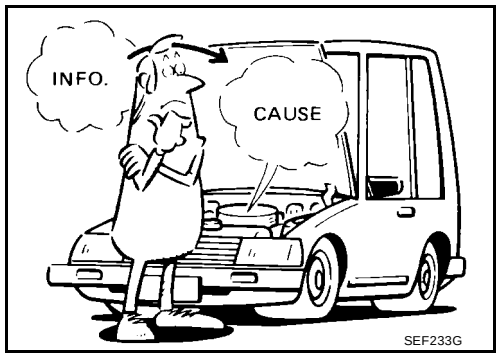
How to Perform Trouble Diagnosis

UDS0009A

BASIC CONCEPT

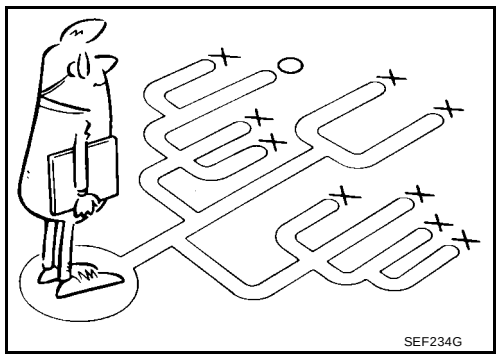
- To perform trouble diagnosis, it is the most important to have understanding about vehicle systems (control and mechanism) thoroughly.
- It is also important to clarify customer complaints before inspection.
  First of all, reproduce symptoms, and understand them fully.
  Ask customer about his/her complaints carefully. In some cases, it will be necessary to check symptoms by driving vehicle with customer.

  CAUTION:
  Customers are not professional. It is dangerous to make an easy guess like "maybe the customer means that...," or "maybe the customer mentions this symptom".



SEF233G

- It is essential to check symptoms right from the beginning in order to repair malfunctions completely.
  For intermittent malfunctions, reproduce symptoms based on interview with customer and past examples. Do not perform inspection on ad hoc basis. Most intermittent malfunctions are caused by poor contacts. In this case, it will be effective to shake suspected harness or connector by hand. When repairing without any symptom diagnosis, you cannot judge if malfunctions have actually been eliminated.
- After completing diagnosis, always erase diagnostic memory. Refer to TF-37, "ERASE SELF-DIAGNOSIS" .
- For intermittent malfunctions, move harness or harness connector by hand. Then check for poor contact or reproduced open circuit.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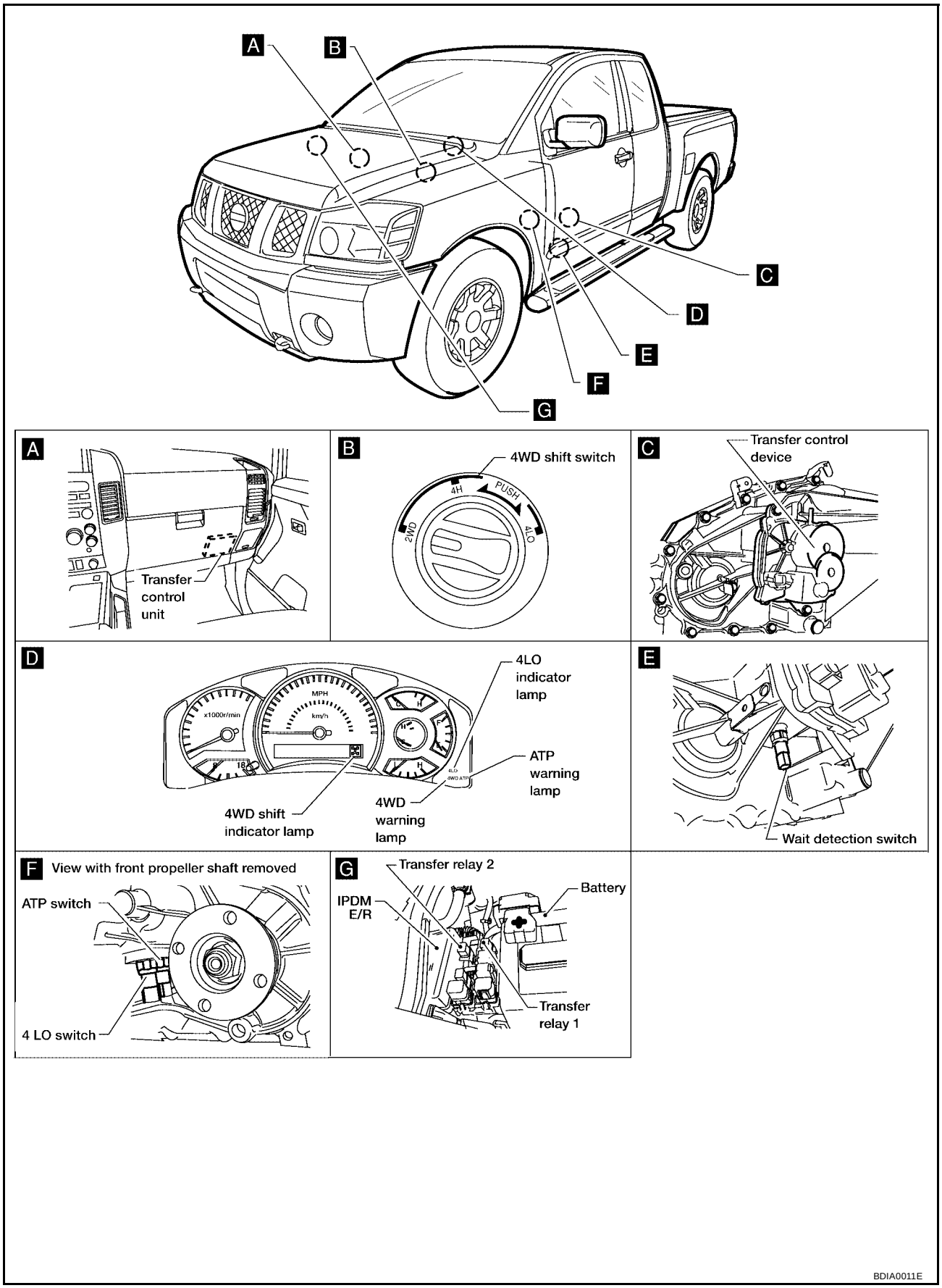
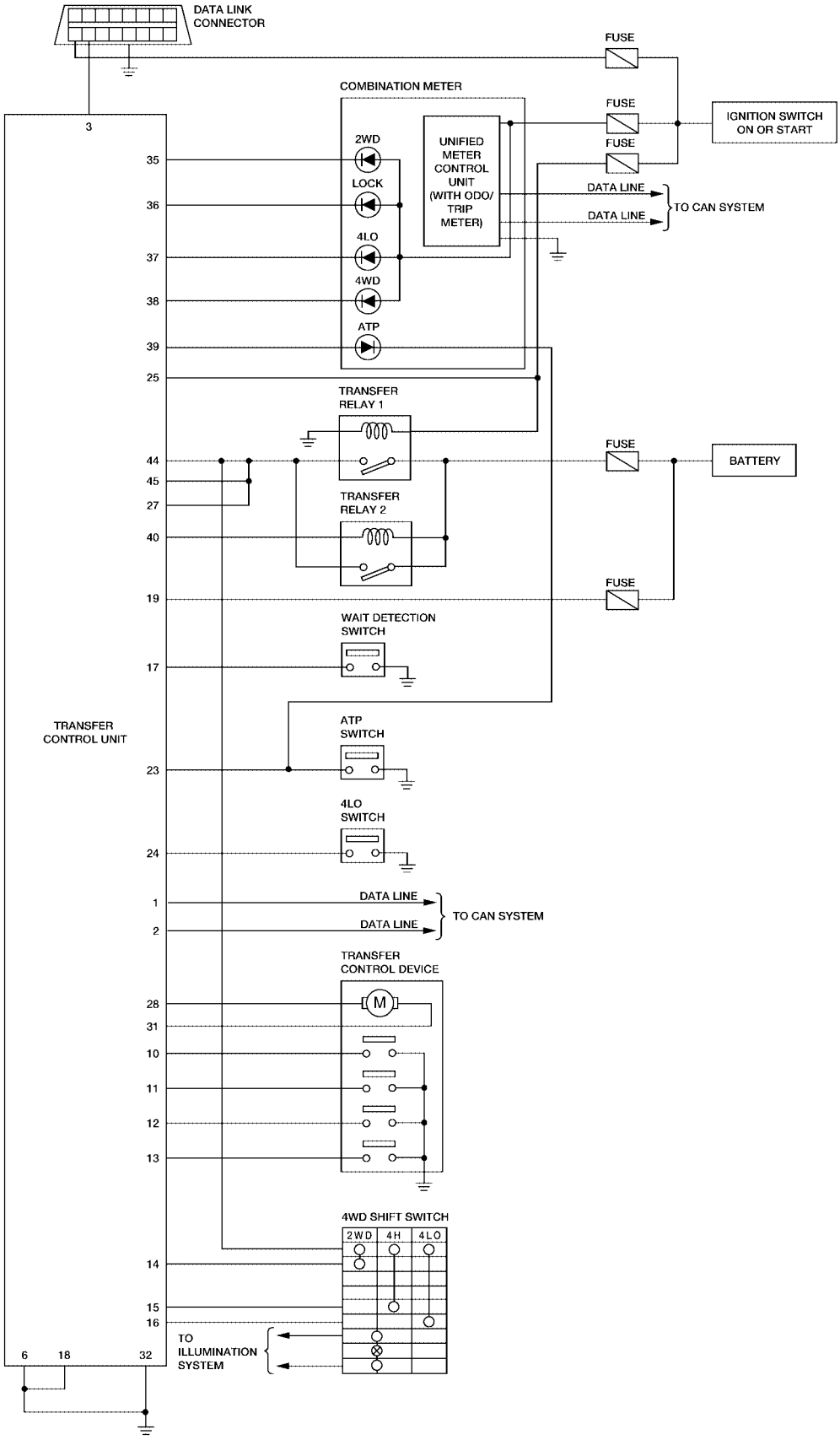
Location of Electrical Parts

UDS0009B



Circuit Diagram

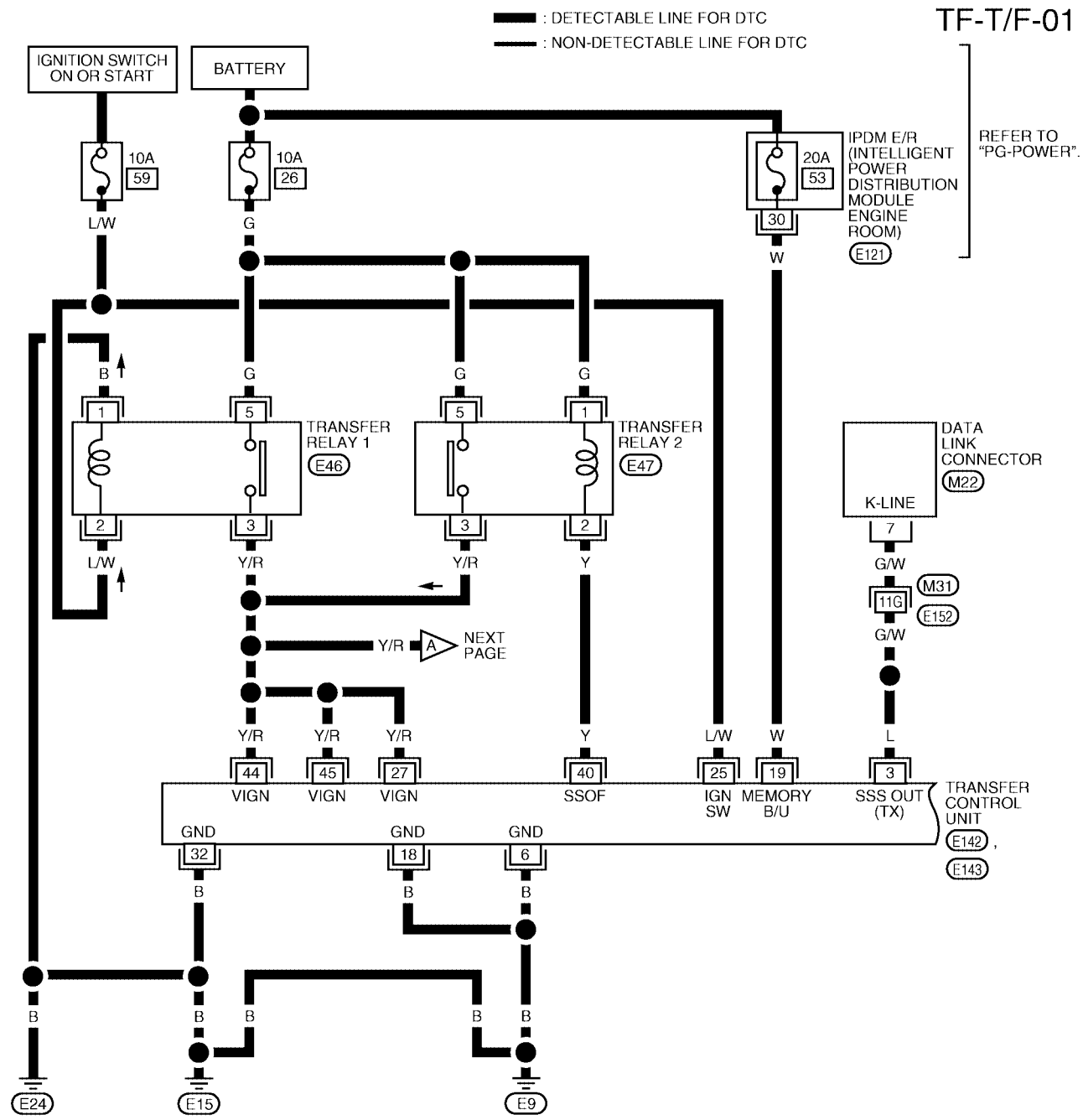
UDS0009C

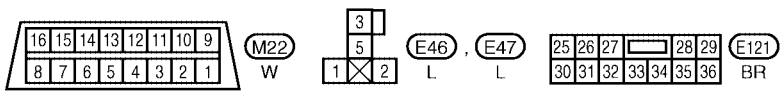


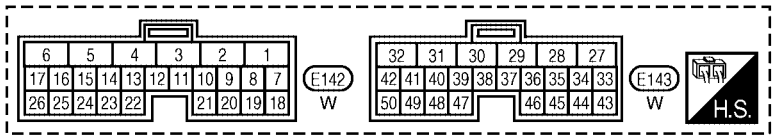
BDWA0005E

Wiring Diagram — T/F —

UDS0009D



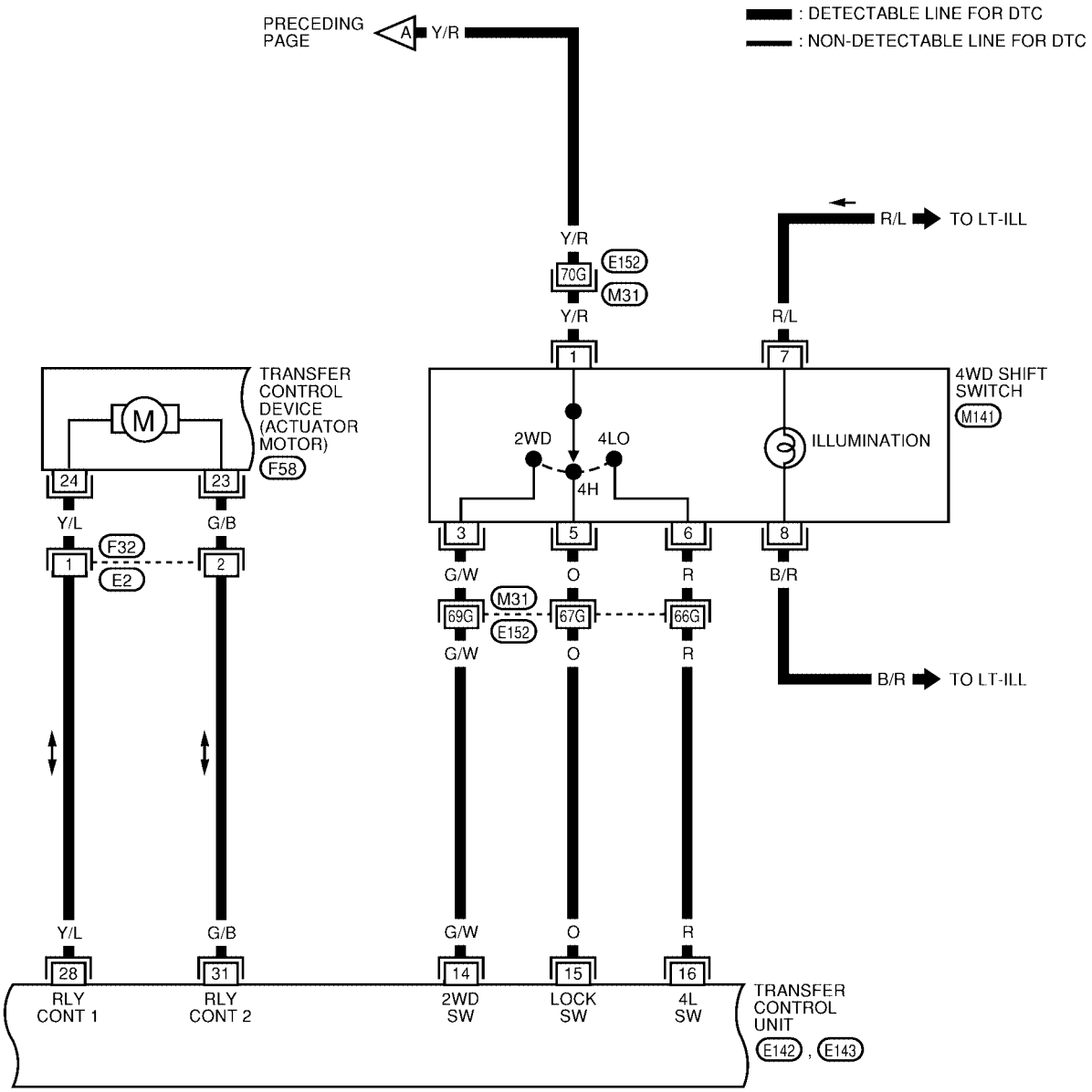


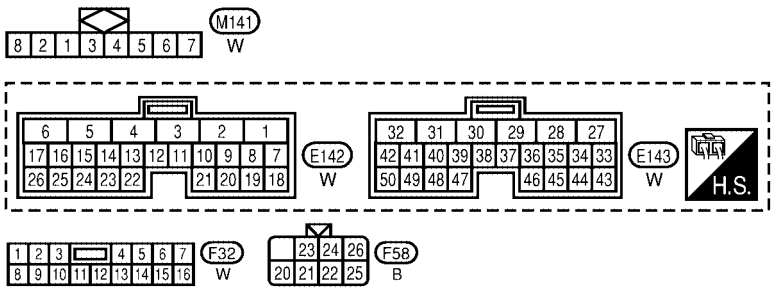


REFER TO THE FOLLOWING.
M31 - SUPER MULTIPLE JUNCTION (SMJ)

WDWA0013E

TF-T/F-02

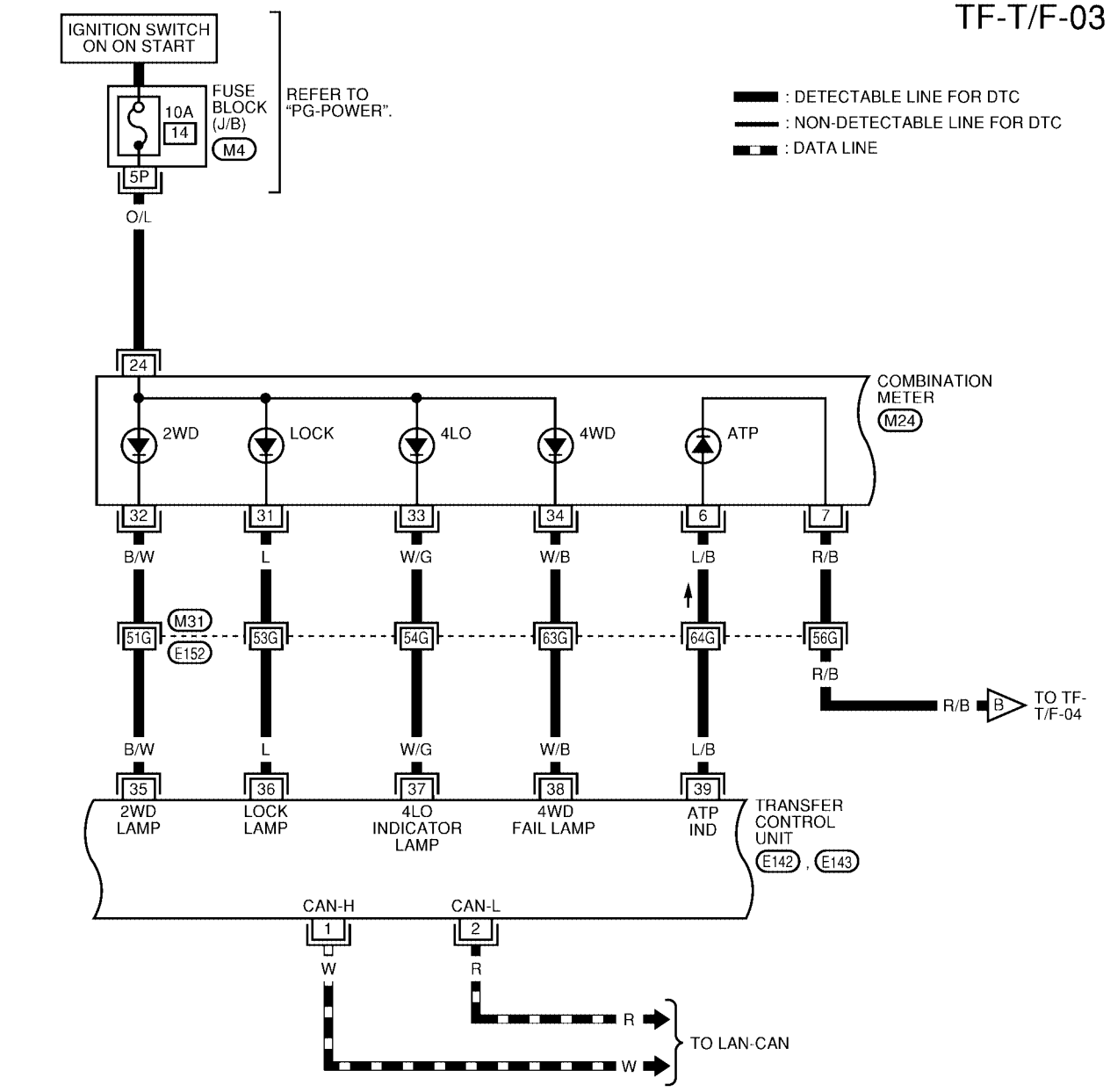


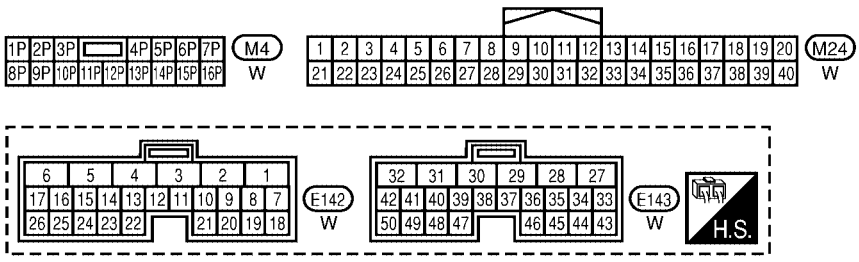


REFER TO THE FOLLOWING.
M31 - SUPER MULTIPLE JUNCTION (SMJ)

BDWA0002E

TF-T/F-03

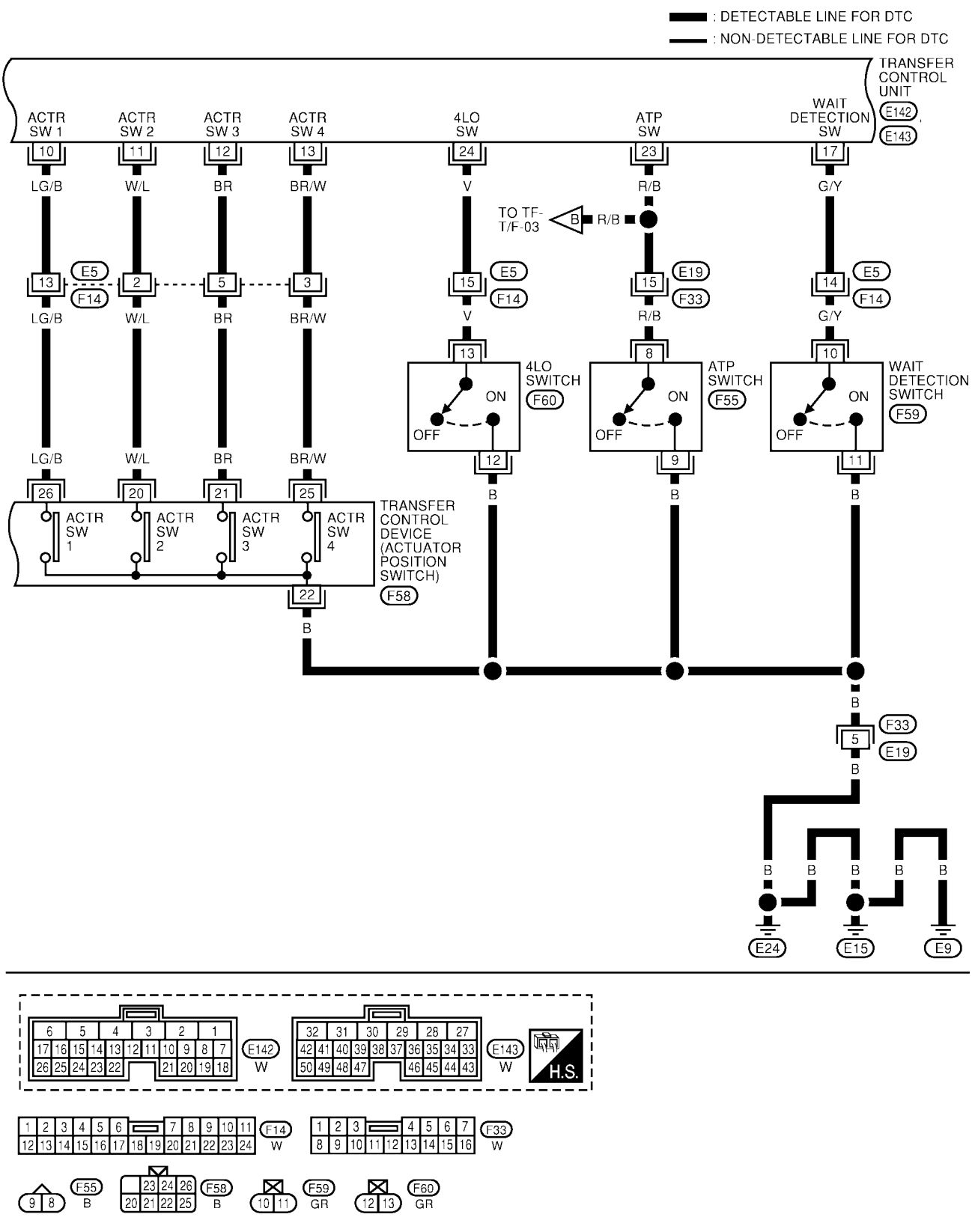




REFER TO THE FOLLOWING.
M31 - SUPER MULTIPLE JUNCTION (SMJ)

BDWA0003E

TF-T/F-04



BDWA0004E

Trouble Diagnosis Chart for Symptoms

UDS0009E

If 4WD warning lamp turns ON, perform self-diagnosis. Refer to TF-36, "Self-Diagnostic Procedure" .

Symptom	Condition	Check item	Reference page
4WD shift indicator lamp and 4LO indicator lamp do not turn ON (4WD shift indicator lamp and 4LO indicator lamp check)	Ignition switch: ON	Power supply and ground for transfer control unit	TF-68
		Combination meter	
4WD warning lamp does not turn ON (4WD warning lamp check)	Ignition switch: ON	Power supply and ground for transfer control unit	TF-70
		Combination meter	
4WD shift indicator lamp or 4LO indicator lamp do not change	Engine running	4WD shift switch	TF-73
		Wait detection switch	
		4LO switch	
		ATP switch	
		Transfer inner parts	
ATP warning lamp does not turn ON	Engine running	CAN communication line	TF-74
		4WD shift switch	
		PNP switch signal	
		ATP switch	
		Combination meter	
		Transfer inner parts	
4WD shift indicator lamp repeats flashing	Engine running	Wait detection switch	TF-76
		4LO switch	
		Transfer inner parts	
4WD warning lamp flashes slowly Slow flashing: 1 time/2 seconds	While driving	Tire size is different between front and rear of vehicle.	TF-77

Transfer Control Unit Input/Output Signal Reference Values

UDS0009F

TRANSFER CONTROL UNIT INSPECTION TABLE

Specifications with CONSULT-II

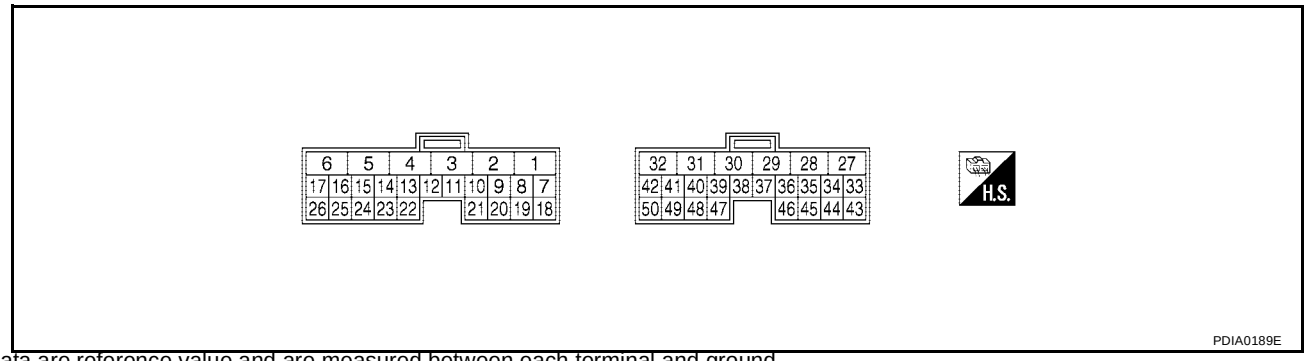
Monitored item [Unit]	Content	Condition	Display value
VHCL/S SEN·FR [km/h] or [mph]	Wheel speed (Front wheel)	Vehicle stopped	0 km/h (0 mph)
		Vehicle running **CAUTION:** **Check air pressure of tire under standard condition.**	Approximately equal to the indication on speedometer (Inside of ±10%)
VHCL/S SEN·RR [km/h] or [mph]	Wheel speed (Rear wheel)	Vehicle stopped	0 km/h (0 mph)
		Vehicle running **CAUTION:** **Check air pressure of tire under standard condition.**	Approximately equal to the indication on speedometer (Inside of ±10%)
ENGINE SPEED [rpm]	Engine speed	Engine stopped (Engine speed: Less than 400 rpm)	0 rpm
		Engine running (Engine speed: 400 rpm or more)	Approximately equal to the indication on tachometer
BATTERY VOLT [V]	Power supply voltage for transfer control unit	Ignition switch: ON	Battery voltage
2WD SWITCH [ON/OFF]	Input condition from 4WD shift switch	4WD shift switch: 2WD	ON
		4WD shift switch: 4H and 4LO	OFF

Monitored item [Unit]	Content	Condition		Display value
4H SWITCH [ON/OFF]	Input condition from 4WD shift switch	4WD shift switch: 4H		ON
		4WD shift switch: 2WD and 4LO		OFF
4L SWITCH [ON/OFF]	Input condition from 4WD shift switch	4WD shift switch: 4LO		ON
		4WD shift switch: 2WD and 4H		OFF
4L POSI SW [ON/OFF]	Condition of 4LO switch	● Vehicle stopped ● Engine running ● A/T selector lever “N” position ● Brake pedal depressed	4WD shift switch: 4LO	ON
			Except the above	OFF
ATP SWITCH [ON/OFF]	Condition of ATP switch	● Vehicle stopped ● Engine running ● A/T selector lever “P” position ● Brake pedal depressed	4WD shift switch : 4H to 4LO or 4LO to 4H (While actuator motor is operating.)	ON
			Except the above	OFF
WAIT DETCT SW [ON/OFF]	Condition of wait detection switch	● Vehicle stopped ● Engine running ● A/T selector lever “N” position ● Brake pedal depressed	4WD shift switch : 4H and 4LO	ON
			4WD shift switch: 2WD	OFF
4WD MODE [2H/4H/4L]	Control status of 4WD (Output condition of 4WD shift indicator lamp and 4LO indicator lamp)	4WD shift switch (Engine running)	2WD	2H
			4H	4H
			4LO	4L
VHCL/S COMP [km/h] or [mph]	Vehicle speed	Vehicle stopped		0 km/h (0 mph)
		Vehicle running **CAUTION:** **Check air pressure of tire under standard condition.**		Approximately equal to the indication on speedometer (Inside of ±10%)
SHIFT ACT 1 [ON/OFF]	Output condition to actuator motor (clockwise)	● Vehicle stopped ● Engine running ● A/T selector lever “N” position ● Brake pedal depressed	4WD shift switch : 4H to 4LO	ON
			Except the above	OFF
SHIFT AC MON1 [ON/OFF]	Check signal (reinput signal) for transfer control unit signal output	● Vehicle stopped ● Engine running ● A/T selector lever “N” position ● Brake pedal depressed	4WD shift switch : 4H to 4LO	ON
			Except the above	OFF
SHIFT ACT 2 [ON/OFF]	Output condition to actuator motor (counterclockwise)	● Vehicle stopped ● Engine running ● A/T selector lever “N” position ● Brake pedal depressed	4WD shift switch : 4LO to 4H	ON
			Except the above	OFF
SHIFT AC MON2 [ON/OFF]	Check signal (reinput signal) for transfer control unit signal output	● Vehicle stopped ● Engine running ● A/T selector lever “N” position ● Brake pedal depressed	4WD shift switch : 4LO to 4H	ON
			Except the above	OFF

Monitored item [Unit]	Content	Condition		Display value
SHIFT ACT/R MON [ON/OFF]	Operating condition of actuator motor relay (integrated in transfer control unit)	● Vehicle stopped ● Engine running ● A/T selector lever “N” position ● Brake pedal depressed	When 4WD shift switch is operated	ON
			When 4WD shift switch is not operated	OFF
SHIFT POS SW1 [ON/OFF]	Condition of actuator position switch 1	4WD shift switch: 2WD and 4LO		ON
		4WD shift switch: 4H		OFF
SHIFT POS SW2 [ON/OFF]	Condition of actuator position switch 2	4WD shift switch: 4LO		ON
		4WD shift switch: 2WD and 4H		OFF
SHIFT POS SW3 [ON/OFF]	Condition of actuator position switch 3	4WD shift switch: 2WD and 4H		ON
		4WD shift switch: 4LO		OFF
SHIFT POS SW4 [ON/OFF]	Condition of actuator position switch 4	4WD shift switch: 4H and 4LO		ON
		4WD shift switch: 2WD		OFF
4WD FAIL LAMP [ON/OFF]	4WD warning lamp condition	4WD warning lamp: ON		ON
		4WD warning lamp: OFF		OFF
2WD IND [ON/OFF]	Rear indicator of 4WD shift indicator lamp condition	Rear indicator of 4WD shift indicator lamp: ON		ON
		Rear indicator of 4WD shift indicator lamp: OFF		OFF
4H IND [ON/OFF]	Front and center indicator of 4WD shift indicator lamp condition	Front and center indicator of 4WD shift indicator lamp : ON		ON
		Front and center indicator of 4WD shift indicator lamp : OFF		OFF
4L IND [ON/OFF]	4LO indicator lamp condition	4LO indicator lamp: ON		ON
		4LO indicator lamp: OFF		OFF

Specifications between transfer control unit terminals

TRANSFER CONTROL UNIT TERMINAL CONNECTOR LAYOUT



Data are reference value and are measured between each terminal and ground.

Terminal	Wire color	Item	Condition	Data (Approx.)
1	W	CAN H	–	–
2	R	CAN L	–	–
3	L	K-LINE (CONSULT-II signal)	–	–
6	B	Ground	Always	0V
10	LG/B	Actuator position switch 1	4WD shift switch: 2WD and 4LO	0V
			4WD shift switch: 4H	Battery voltage
11	W/L	Actuator position switch 2	4WD shift switch: 4LO	0V
			4WD shift switch: 2WD and 4H	Battery voltage
12	BR	Actuator position switch 3	4WD shift switch: 2WD and 4H	0V
			4WD shift switch: 4LO	Battery voltage

Terminal	Wire color	Item	Condition		Data (Approx.)
13	BR/W	Actuator position switch 4	4WD shift switch: 4H and 4LO		0V
			4WD shift switch: 2WD		Battery voltage
14	G/W	4WD shift switch (2WD)	Ignition switch: ON	4WD shift switch: 2WD	Battery voltage
				4WD shift switch: 4H and 4LO	0V
15	O	4WD shift switch (4H)		4WD shift switch: 4H	Battery voltage
				4WD shift switch: 2WD and 4LO	0V
16	R	4WD shift switch (4LO)		4WD shift switch: 4LO	Battery voltage
				4WD shift switch: 2WD and 4H	0V
17	G/Y	Wait detection switch	● Vehicle stopped ● Engine running ● A/T selector lever “N” position ● Brake pedal depressed	4WD shift switch: 4H and 4LO	0V
				4WD shift switch: 2WD	Battery voltage
18	B	Ground	Always		0V
19	W	Power supply (Memory back-up)	Ignition switch: ON		Battery voltage
			Ignition switch: OFF		Battery voltage
23	R/B	ATP switch	● Vehicle stopped ● Engine running ● A/T selector lever “P” position ● Brake pedal depressed	4WD shift switch: 4H to 4LO or 4LO to 4H (While actuator motor is operating.)	0V
				Except the above	Battery voltage
24	V	4LO switch	● Vehicle stopped ● Engine running ● A/T selector lever “N” position ● Brake pedal depressed	4WD shift switch: 4LO	0V
				Except the above	Battery voltage
25	L/W	Ignition switch monitor	Ignition switch: ON		Battery voltage
			Ignition switch: OFF		0V
27	Y/R	Actuator motor power supply	Ignition switch: ON		Battery voltage
			Ignition switch: OFF		0V
28	Y/L	Actuator motor (+)	4WD shift switch: 2WD to 4H or 4H to 4LO or 2WD to 4LO		Battery voltage
			Except the above		0V
31	G/B	Actuator motor (-)	4WD shift switch: 4LO to 4H or 4H to 2WD or 4LO to 2WD		Battery voltage
			Except the above		0V
32	B	Actuator motor ground	Always		0V

Terminal	Wire color	Item	Condition		Data (Approx.)
35	B/W	4WD shift indicator lamp (Rear indicator)	Engine running	Rear indicator of 4WD shift indicator lamp : ON	0V
				Rear indicator of 4WD shift indicator lamp : OFF	Battery voltage
36	L	4WD shift indicator lamp (Front and center indicator)		Front and center indicator of 4WD shift indicator lamp: ON	0V
				Front and center indicator of 4WD shift indicator lamp: OFF	Battery voltage
37	W/G	4LO indicator lamp		4LO indicator lamp: ON	0V
				4LO indicator lamp: OFF	Battery voltage
38	W/B	4WD warning lamp		4WD warning lamp: ON	0V
				4WD warning lamp: OFF	Battery voltage
39	L/B	ATP warning lamp	● Vehicle stopped ● Engine running ● A/T selector lever “P” position ● Brake pedal depressed	4WD shift switch: 4H to 4LO or 4LO to 4H (While actuator motor is operating.)	Battery voltage
				Except the above	0V
40	Y	Transfer relay 2	ignition switch ON		0V
			ignition switch OFF		Battery voltage
44	Y/R	Power supply	Ignition switch: ON		Battery voltage
			Ignition switch: OFF		0V
45	Y/R	Power supply	Ignition switch: ON		Battery voltage
			Ignition switch: OFF		0V

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

CONSULT-II Function

UDS0009G

FUNCTION

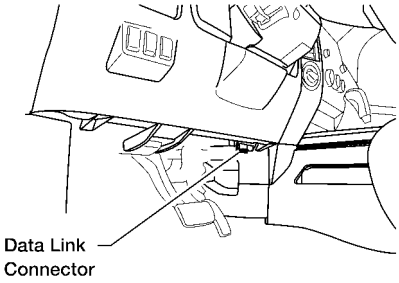
Diagnostic test mode	Function	Reference page
Self-diagnostic results	● Self-diagnostic results can be read and erased quickly.	TF-33
Data monitor	● Input/Output data in the transfer control unit can be read.	TF-34
CAN diagnostic support monitor	● The results of transmit/receive diagnosis of CAN communication can be read.	LAN-6

CONSULT-II SETTING PROCEDURE

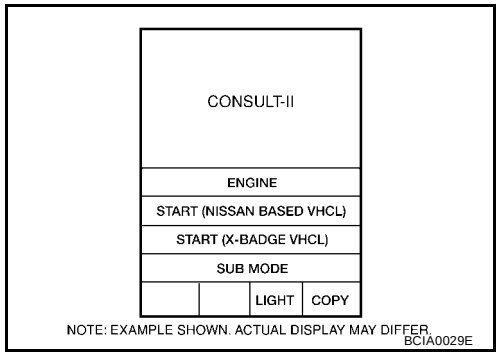
CAUTION:
If CONSULT-II is used with no connection of CONSULT-II CONVERTER, malfunctions might be detected in self-diagnosis depending on control unit which carry out CAN communication.

- For details, refer to the separate “CONSULT-II Operations Manual”.

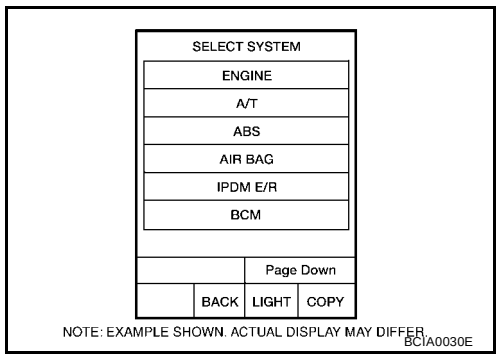
1. Turn ignition switch “OFF”.
2. Connect CONSULT-II and CONSULT-II CONVERTER to data link connector on vehicle.
3. Turn ignition switch “ON”.



4. Touch “START (NISSAN BASED VHCL)”.



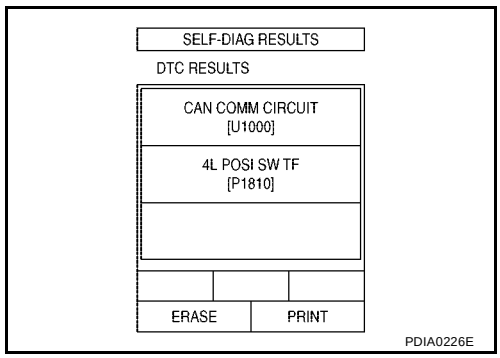
5. Touch “ALL MODE AWD/4WD”.
   If “ALL MODE AWD/4WD” is not indicated, go to GI-38, "CONSULT-II Data Link Connector (DLC) Circuit" .
6. Perform each diagnostic test mode according to each service procedure.



SELF-DIAG RESULT MODE

Operation procedure

1. Perform “CONSULT-II SETTING PROCEDURE”. Refer to TF-31, "CONSULT-II SETTING PROCEDURE".
2. With engine at idle, touch “SELF-DIAG RESULTS”.
   Display shows malfunction experienced since the last erasing operation.



Display item list

Items (CONSULT-II screen terms)	Diagnostic item is detected when...	Check item
INITIAL START [P1801]	● Due to removal of battery which cuts off power supply to transfer control unit, self-diagnosis memory function is suspended.	TF-38, "Power Supply Circuit For Transfer Control Unit"
CONTROL UNIT 1 [P1802]	● Malfunction is detected in the memory (RAM) system of transfer control unit.	TF-40, "Transfer Control Unit"
CONTROL UNIT 2 [P1803]	● Malfunction is detected in the memory (ROM) system of transfer control unit.	TF-40, "Transfer Control Unit"
CONTROL UNIT 3 [P1804]	● Malfunction is detected in the memory (EEPROM) system of transfer control unit.	TF-40, "Transfer Control Unit"
VHCL SPEED SEN·AT [P1807]	● Malfunction is detected in output shaft revolution signal that is output from TCM through CAN communication. ● Improper signal is input while driving.	TF-41, "Output Shaft Revolution Signal (TCM)"
VHCL SPEED SEN·ABS [P1808]	● Malfunction is detected in vehicle speed signal that is output from ABS actuator and electric unit (control unit) through CAN communication. ● Improper signal is input while driving.	TF-42, "Vehicle Speed Sensor (ABS)"
CONTROL UNIT 4 [P1809]	● AD converter system of transfer control unit is malfunctioning.	TF-40, "Transfer Control Unit"
4L POSI SW TF [P1810]	● Improper signal from 4LO switch is input due to open or short circuit.	TF-42, "4LO Switch"
BATTERY VOLTAGE [P1811]	● Power supply voltage for transfer control unit is abnormally low while driving.	TF-38, "Power Supply Circuit For Transfer Control Unit"
4WD MODE SW [P1813]	● More than two switch inputs are simultaneously detected due to short circuit of 4WD shift switch.	TF-45, "4WD Shift Switch"
4WD DETECT SWITCH [P1814]	● Improper signal from wait detection switch is input due to open or short circuit.	TF-49, "Wait Detection Switch"
PNP SW/CIRC [P1816]	● When A/T PNP switch signal is malfunction or communication error between the vehicles.	TF-52, "PNP Switch Signal"
SHIFT ACTUATOR [P1817]	● Motor does not operate properly due to open or short circuit in actuator motor. ● Malfunction is detected in the actuator motor. (When 4WD shift switch is operated and actuator motor is not operated)	TF-53, "Actuator Motor"
SHIFT ACT POSI SW [P1818]	● Improper signal from actuator position switch is input due to open or short circuit. ● Malfunction is detected in the actuator position switch.	TF-57, "Actuator Position Switch"
SHIFT ACT CIR [P1819]	● Malfunction is detected in the transfer relay 2. ● Malfunction occurs in transfer control device drive circuit.	TF-38, "Power Supply Circuit For Transfer Control Unit", TF-60, "Transfer Control Device"

Items (CONSULT-II screen terms)	Diagnostic item is detected when...	Check item
ENGINE SPEED SIG [P1820]	● Malfunction is detected in engine speed signal that is output from ECM through CAN communication. ● Improper signal is input while driving.	TF-63, "Engine Speed Signal"
CAN COMM CIRCUIT [U1000]	● Malfunction has been detected from CAN communication line.	TF-64, "CAN Communication Line"
NO DTC IS DETECTED. FURTHER TESTING MAY BE REQUIRED.	● No NG item has been detected.	—

CAUTION:

If "CAN COMM CIRCUIT [U1000]" is displayed with other DTCs, first perform the trouble diagnosis for CAN communication line.

NOTE:

If "SHIFT ACT POSI SW [P1818]" or "SHIFT ACT CIR [P1819]" is displayed, first erase self-diagnostic results. ("SHIFT ACT POSI SW [P1818]" or "SHIFT ACT CIR [P1819]" may be displayed after installing transfer control unit or transfer assembly.)

How to erase self-diagnostic results

1. Perform applicably inspection of malfunctioning item and then repair or replace.
2. Start engine and select "SELF-DIAG RESULTS" mode for "ALL MODE AWD/4WD" with CONSULT-II.
3. Touch "ERASE" on CONSULT-II screen to erase DTC memory.

   CAUTION:

   If memory cannot be erased, perform applicably diagnosis.

DATA MONITOR MODE

Operation procedure

1. Perform "CONSULT-II SETTING PROCEDURE". Refer to TF-31, "CONSULT-II SETTING PROCEDURE" .
2. Touch "DATA MONITOR".
3. Select from "SELECT MONITOR ITEM", screen of data monitor mode is displayed.

   NOTE:

   When malfunction is detected, CONSULT-II performs REAL-TIME DIAGNOSIS.
   Also, any malfunction detected while in this mode will be displayed at real time.

Display item list

×: Standard –: Not applicable

Monitored item (Unit)	Monitor item selection			Remarks
	ECU INPUT SIGNALS	MAIN SIGNALS	SELECTION FROM MENU	
VHCL/S SEN·FR [km/h] or [mph]	×	–	×	Wheel speed calculated by ABS actuator and electric unit (control unit). Signal input with CAN communication line.
VHCL/S SEN·RR [km/h] or [mph]	×	–	×	Wheel speed calculated by TCM. Signal input with CAN communication line.
ENGINE SPEED [rpm]	×	–	×	Engine speed is displayed. Signal input with CAN communication line.
BATTERY VOLT [V]	×	–	×	Power supply voltage for transfer control unit.
2WD SWITCH [ON/OFF]	×	–	×	4WD shift switch signal status is displayed. (4L means 4LO of 4WD shift switch.)
4H SWITCH [ON/OFF]	×	–	×	
4L SWITCH [ON/OFF]	×	–	×	

Monitored item (Unit)	Monitor item selection			Remarks
	ECU INPUT SIGNALS	MAIN SIGNALS	SELECTION FROM MENU	
4L POSI SW [ON/OFF]	×	–	×	This means 4LO switch. 4LO switch signal status is displayed.
ATP SWITCH [ON/OFF]	×	–	×	ATP switch signal status is displayed.
WAIT DETCT SW [ON/OFF]	×	–	×	Wait detection switch signal status is displayed.
4WD MODE [2H/4H/4L]	–	×	×	Control status of 4WD recognized by transfer control unit. (2WD, 4H or 4LO)
VHCL/S COMP [km/h] or [mph]	–	×	×	Vehicle speed recognized by transfer control unit.
SHIFT ACT 1 [ON/OFF]	–	×	×	Output condition to actuator motor (clockwise)
SHIFT ACT MON 1 [ON/OFF]	–	–	×	Check signal (reinput signal) for transfer control unit signal output
SHIFT ACT 2 [ON/OFF]	–	×	×	Output condition to actuator motor (counterclockwise)
SHIFT ACT MON 2 [ON/OFF]	–	–	×	Check signal (reinput signal) for transfer control unit signal output
SFT ACT/R MON [ON/OFF]	–	–	×	Operating condition of actuator motor relay (integrated in transfer control unit)
SHIFT POS SW 1 [ON/OFF]	×	–	×	Condition of actuator position switch 1
SHIFT POS SW 2 [ON/OFF]	×	–	×	Condition of actuator position switch 2
SHIFT POS SW 3 [ON/OFF]	×	–	×	Condition of actuator position switch 3
SHIFT POS SW 4 [ON/OFF]	×	–	×	Condition of actuator position switch 4
4WD FAIL LAMP [ON/OFF]	–	×	×	Control status of 4WD warning lamp is displayed.
2WD IND [ON/OFF]	–	–	×	Control status of 4WD shift indicator lamp (rear) is displayed.
4H IND [ON/OFF]	–	–	×	Control status of 4WD shift indicator lamp (front and center) is displayed.
4L IND [ON/OFF]	–	–	×	Control status of 4LO indicator lamp is displayed.
Voltage [V]	–	–	×	The value measured by the voltage probe is displayed.
Frequency [Hz]	–	–	×	The value measured by the pulse probe is displayed.
DUTY-HI (high) [%]	–	–	×	
DUTY-LOW (low) [%]	–	–	×	
PLS WIDTH-HI [msec]	–	–	×	
PLS WIDTH-LOW [msec]	–	–	×	

Self-Diagnostic Procedure

UDS000A2

SELF-DIAGNOSTIC PROCEDURE (WITH CONSULT-II)

Refer to TF-33, "SELF-DIAG RESULT MODE" .

SELF-DIAGNOSTIC PROCEDURE (WITHOUT CONSULT-II)

Description

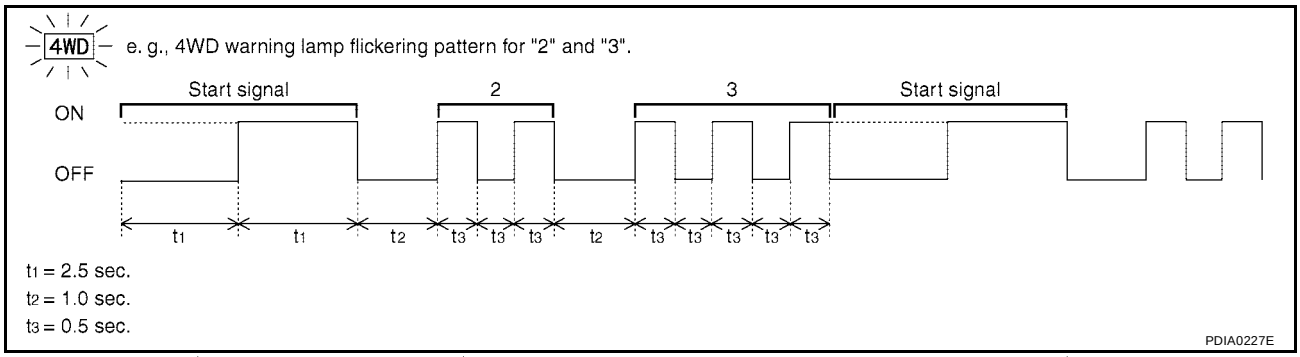
If the engine starts when there is something wrong with the 4WD system, the 4WD warning lamp turns ON or flickers in the combination meter. When the system functions properly, the warning lamp turns ON when the ignition switch is turned to “ON”, and it turns OFF after engine starts. To locate the cause 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-36, "Diagnostic procedure" .

Diagnostic procedure

1. Warn up engine.
2. Turn ignition switch “ON” and “OFF” at least twice, and then turn ignition switch “OFF”.
3. Move A/T selector lever to “P” position.
4. Turn 4WD shift switch to “2WD” position.
5. Turn ignition switch “ON”. (Do not start engine.)
6. 4WD warning lamp ON.
   If 4WD warning lamp does not turn ON, refer to TF-70, "4WD Warning Lamp Does Not Turn ON" .
7. Move A/T selector lever to “R” position.
8. Turn 4WD shift switch to “2WD”, “4H” and “2WD” in order.
9. Move A/T selector lever to “P” position.
10. Turn 4WD shift switch to “4H”, “2WD” and “4H” in order.
11. Move A/T selector lever to “N” position.
12. Turn 4WD shift switch to “2WD” position.
13. Move A/T selector lever to “P” position.
14. Read the flickering of 4WD warning lamp.
    Refer to TF-36, "Judgement self-diagnosis" .

Judgement self-diagnosis

When a malfunction is detected, the malfunction route is indicated by flickering of the 4WD warning lamp.



Flickering pattern or flickering condition	Items	Diagnostic item is detected when...	Check item
2	Output shaft revolution signal (from TCM)	● Malfunction is detected in output shaft revolution signal that is output from TCM through CAN communication. ● Improper signal is input while driving.	TF-41, "Output Shaft Revolution Signal (TCM)"
3	Vehicle speed signal (from ABS)	● Malfunction is detected in vehicle speed signal that is output from ABS actuator and electric unit (control unit) through CAN communication. ● Improper signal is input while driving.	TF-42, "Vehicle Speed Sensor (ABS)"
4	CAN communication	● Malfunction has been detected from CAN communication.	TF-64, "CAN Communication Line"

Flickering pattern or flickering condition	Items	Diagnostic item is detected when...	Check item
5	AD converter	● AD converter system of transfer control unit is malfunctioning.	TF-40, "Transfer Control Unit"
6	4LO switch	● Improper signal from 4LO switch is input due to open or short circuit.	TF-42, "4LO Switch"
7	Engine speed signal	● Malfunction is detected in engine speed signal that is output from ECM through CAN communication. ● Improper signal is input while driving.	TF-63, "Engine Speed Signal"
8	Power supply	● Power supply voltage for transfer control unit is abnormally low while driving.	TF-38, "Power Supply Circuit For Transfer Control Unit"
9	4WD shift switch	● More than two switch inputs are simultaneously detected due to short circuit of 4WD shift switch.	TF-45, "4WD Shift Switch"
10	Wait detection switch	● Improper signal from wait detection switch is input due to open or short circuit.	TF-49, "Wait Detection Switch"
11	Actuator motor	● Motor does not operate properly due to open or short circuit in actuator motor. ● Malfunction is detected in the actuator motor. (When 4WD shift switch is operated and actuator motor is not operated.)	TF-53, "Actuator Motor"
12	Actuator position switch	● Improper signal from actuator position switch is input due to open or short circuit. ● Malfunction is detected in the actuator position switch.	TF-57, "Actuator Position Switch"
13	Transfer control device	● Malfunction is detected in the transfer relay 2. ● Malfunction occurs in transfer control device drive circuit.	TF-38, "Power Supply Circuit For Transfer Control Unit", TF-60, "Transfer Control Device"
14	PNP switch signal	● When A/T PNP switch signal is malfunction or communication error between the vehicles.	TF-52, "PNP Switch Signal"
Repeats flickering every 0.25 sec.	Data erase display	● Power supply failure of memory back-up. ● Battery is disconnected for a long time. ● Battery performance is poor.	TF-38, "Power Supply Circuit For Transfer Control Unit"
Repeats flickering every 2 to 5 sec.	—	Circuits that the self-diagnosis covers have no malfunction.	—
No flickering	PNP switch or 4WD shift switch	PNP switch or 4WD shift switch circuit is shorted or open.	TF-52, "PNP Switch Signal" or TF-45, "4WD Shift Switch"

NOTE:
If “actuator position switch” or “transfer control device” is displayed, first erase self-diagnostic results. (They may be displayed after installing transfer control unit or transfer assembly.)

ERASE SELF-DIAGNOSIS

- In order to make it easier to find the cause of hard-to-duplicate malfunctions, malfunction information is stored into the control unit as necessary during use by the user. This memory is not erased no matter how many times the ignition switch is turned ON and OFF.
- However, this information is erased by turning ignition switch “OFF” after performing self-diagnostics or by erasing the memory using the CONSULT-II.

TROUBLE DIAGNOSIS FOR SYSTEM

PFP:00000

Power Supply Circuit For Transfer Control Unit

UDS0009H

CONSULT-II REFERENCE VALUE IN DATA MONITOR MODE

Data are reference value.

Monitored item [Unit]	Content	Condition	Display value
BATTERY VOLT [V]	Power supply voltage for transfer control unit	Ignition switch: ON	Battery voltage

TRANSFER CONTROL UNIT TERMINALS AND REFERENCE VALUE

Data are reference value and are measured between each terminal and ground.

Terminal	Wire color	Item	Condition	Data (Approx.)
6	B	Ground	Always	0V
18	B	Ground	Always	0V
19	W	Power supply (Memory back-up)	Ignition switch: ON	Battery voltage
			Ignition switch: OFF	Battery voltage
25	L/W	Ignition switch monitor	Ignition switch: ON	Battery voltage
			Ignition switch: OFF	0V
32	B	Actuator motor ground	Always	0V
40	Y	Transfer relay 2	Ignition switch: ON	0V
			Ignition switch: OFF	Battery voltage
44	Y/R	Power supply	Ignition switch: ON	Battery voltage
			Ignition switch: OFF	0V
45	Y/R	Power supply	Ignition switch: ON	Battery voltage
			Ignition switch: OFF	0V

CAUTION:

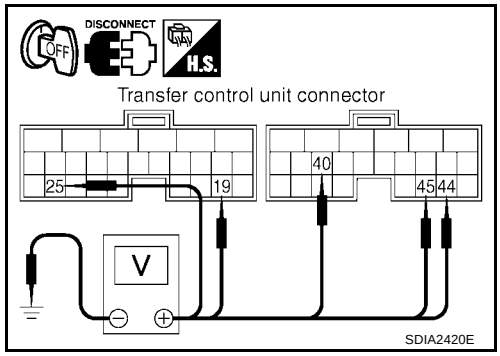
When using a circuit tester to measure voltage for inspection, be sure not to extend forcibly any connector terminals.

DIAGNOSTIC PROCEDURE

1. CHECK POWER SUPPLY

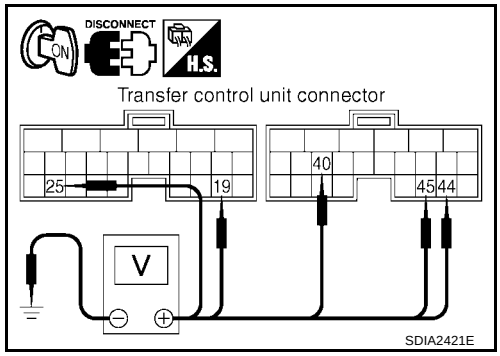
1. Turn ignition switch “OFF”.
2. Disconnect transfer control unit harness connector.
3. Check voltage between transfer control unit harness connector terminals and ground.

Connector	Terminal (Wire color)	Voltage (Approx.)
E142	19 (W) - Ground	Battery voltage
	25 (L/W) - Ground	0V
E143	40 (Y) - Ground	Battery voltage
	44 (Y/R) - Ground	0V
	45 (Y/R) - Ground	0V



4. Turn ignition switch “ON”. (Do not start engine.)
5. Check voltage between transfer control unit harness connector terminals and ground.

Connector	Terminal (Wire color)	Voltage (Approx.)
E142	19 (W) - Ground	Battery voltage
	25 (L/W) - Ground	
E143	40 (Y) - Ground	
	44 (Y/R) - Ground	
	45 (Y/R) - Ground	



OK or NG

OK >> GO TO 2.

NG >> Check the following. If any items are damaged, repair or replace damaged parts.

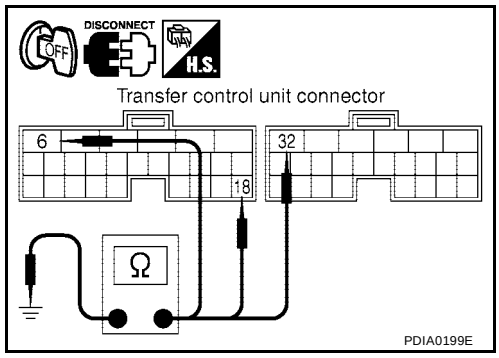
- 10A fuses [No. 26 located in the fuse and fusible link box or 59 located in the fuse and relay box]
- 20A fuse [No. 53, located in the IPDM E/R]
- Harness for short or open between battery and transfer control unit harness connector terminals 19, 40, 44 and 45
- Harness for short or open between ignition switch and transfer control unit harness connector terminal 25
- Harness for short or open between ignition switch and transfer relay 1 harness connector E46 terminal 2 (L/W)
- Harness for short or open between transfer relay 1 harness connector E46 terminal 1 (B) and ground
- Battery and ignition switch. Refer to PG-4, “POWER SUPPLY ROUTING CIRCUIT”.
- Transfer relay 1, 2. Refer to TF-40, "COMPONENT INSPECTION" .

2. CHECK GROUND CIRCUIT

1. Turn ignition switch “OFF”.
2. Disconnect transfer control unit harness connector.
3. Check continuity between transfer control unit harness connector E142 terminals 6 (B), 18 (B), E143 terminal 32 (B) and ground.

   Continuity should exist.

   Also check harness for short to ground and short to power.



OK or NG

OK >> GO TO 3.
NG >> Repair open circuit or short to ground or short to power in harness or connectors.

3. CHECK TRANSFER CONTROL UNIT

Check transfer control unit input/output signal. Refer to TF-27, "Transfer Control Unit Input/Output Signal Reference Values" .

OK or NG

OK >> GO TO 4.
NG >> Check transfer control unit pin terminals for damage or loose connection with harness connector. If any items are damaged, repair or replace damaged parts.

4. CHECK DTC

Perform the self-diagnosis, after driving a vehicle for a while.

OK or NG

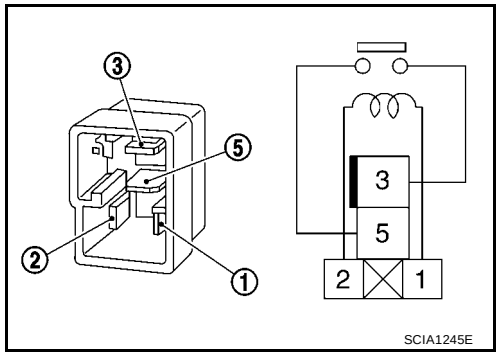
OK >> **INSPECTION END**
NG >> Replace transfer control unit.

COMPONENT INSPECTION

1. Apply 12V direct current between transfer relay 1, 2 terminals 1 and 2.
2. Check continuity between relay terminals 3 and 5.

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

3. If NG, replace the transfer relay 1 or 2.



Transfer Control Unit

UDS0009I

DIAGNOSTIC PROCEDURE

1. INSPECTION START

Do you have CONSULT-II?

YES or NO

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

2. PERFORM SELF-DIAGNOSIS (WITH CONSULT-II)

With CONSULT-II

1. Turn ignition switch “ON”. (Do not start engine.)
2. Select “SELF-DIAG RESULTS” mode for “ALL MODE AWD/4WD” with CONSULT-II.
3. Touch “ERASE”.
4. Turn ignition switch “OFF” and wait at least 10 seconds.
5. Perform the self-diagnosis again.

Is the “CONTROL UNIT 1 [P1802]”, “CONTROL UNIT 2 [P1803]”, “CONTROL UNIT 3 [P1804]” or “CONTROL UNIT 4 [P1809]” displayed?

YES >> Replace transfer control unit. Refer to TF-79, "TRANSFER CONTROL UNIT" .
NO >> **INSPECTION END**

3. PERFORM SELF-DIAGNOSIS (WITHOUT CONSULT-II)

Without CONSULT-II

1. Perform the self-diagnosis and then erase self-diagnostic results. Refer to TF-36, "SELF-DIAGNOSTIC PROCEDURE (WITHOUT CONSULT-II)" and TF-37, "ERASE SELF-DIAGNOSIS" .
2. Perform the self-diagnosis again.

Do the self-diagnostic results indicate AD converter?

YES >> Replace transfer control unit. Refer to TF-79, "TRANSFER CONTROL UNIT" .
NO >> **INSPECTION END**

Output Shaft Revolution Signal (TCM)

UDS000A5

DIAGNOSTIC PROCEDURE

1. CHECK DTC WITH TCM

Perform self-diagnosis with TCM. Refer to AT-96, "CONSULT-II SETTING PROCEDURE" .

Is any malfunction detected by self-diagnosis?

YES >> Check the malfunctioning system.
NO >> GO TO 2.

2. CHECK TRANSFER CONTROL UNIT

Check transfer control unit input/output signal. Refer to TF-27, "Transfer Control Unit Input/Output Signal Reference Values" .

OK or NG

OK >> GO TO 3.
NG >> Check transfer control unit pin terminals for damage or loose connection with harness connector. If any items are damaged, repair or replace damaged parts.

3. CHECK DTC

Perform the self-diagnosis, after driving a vehicle for a while.

OK or NG

OK >> **INSPECTION END**
NG >> Perform self-diagnosis with TCM again. Refer to AT-96, "SELF-DIAGNOSTIC RESULT MODE" .

Vehicle Speed Sensor (ABS)

UDS000A4

DIAGNOSTIC PROCEDURE

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

Perform self-diagnosis with ABS actuator and electric unit (control unit). Refer to BRC-24, "SELF-DIAGNOSIS" (without VDC) or BRC-24, "SELF-DIAGNOSIS" (with VDC).

Is any malfunction detected by self-diagnosis?

YES >> Check the malfunctioning system.
NO >> GO TO 2.

2. CHECK TRANSFER CONTROL UNIT

Check transfer control unit input/output signal. Refer to TF-27, "Transfer Control Unit Input/Output Signal Reference Values" .

OK or NG

OK >> GO TO 3.
NG >> Check transfer control unit pin terminals for damage or loose connection with harness connector. If any items are damaged, repair or replace damaged parts.

3. CHECK DTC

Perform the self-diagnosis, after driving a vehicle for a while.

OK or NG

OK >> **INSPECTION END**
NG >> Perform self-diagnosis with ABS actuator and electric unit (control unit) again. Refer to BRC-24, "SELF-DIAGNOSIS" (without VDC) or BRC-24, "SELF-DIAGNOSIS" (with VDC).

4LO Switch

UDS000A8

CONSULT-II REFERENCE VALUE IN DATA MONITOR MODE

Data are reference value.

Monitored item	Content	Condition		Display value
4L POSI SW [ON/OFF]	Condition of 4LO switch	● Vehicle stopped ● Engine running ● A/T selector lever “N” position ● Brake pedal depressed	4WD shift switch: 4LO	ON
			Except the above	OFF

TRANSFER CONTROL UNIT TERMINALS AND REFERENCE VALUE

Data are reference value and are measured between each terminal and ground.

Terminal	Wire color	Item	Condition		Data (Approx.)
24	V	4LO switch	● Vehicle stopped ● Engine running ● A/T selector lever “N” position ● Brake pedal depressed	4WD shift switch: 4LO	0V
				Except the above	Battery voltage

CAUTION:

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

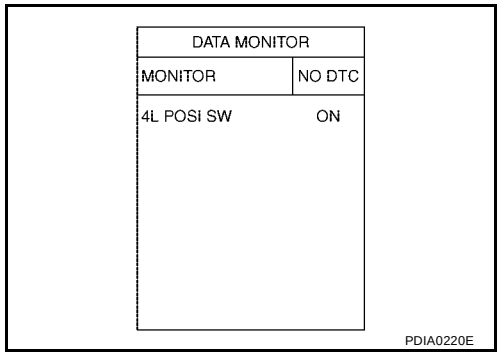
DIAGNOSTIC PROCEDURE

1. CHECK 4LO POSITION SWITCH SIGNAL

With CONSULT-II

1. Start engine.
2. Select “DATA MONITOR” mode for “ALL MODE AWD/4WD” with CONSULT-II.
3. Read out the value of “4L POSI SW”.

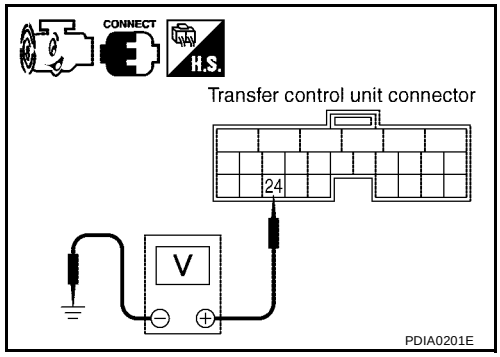
Condition		Display value
● Vehicle stopped ● Engine running ● A/T selector lever “N” position ● Brake pedal depressed	4WD shift switch: 4LO	ON
	Except the above	OFF



Without CONSULT-II

1. Start engine.
2. Check voltage between transfer control unit harness connector terminal and ground.

Connector	Terminal (Wire color)	Condition		Voltage (Approx.)
E142	24 (V) - Ground	● Vehicle stopped ● Engine running ● A/T selector lever “N” position ● Brake pedal depressed	4WD shift switch: 4LO	0V
			Except the above	Battery voltage



OK or NG

OK >> GO TO 5.
NG >> GO TO 2.

2. CHECK HARNESS BETWEEN TRANSFER CONTROL UNIT AND 4LO SWITCH

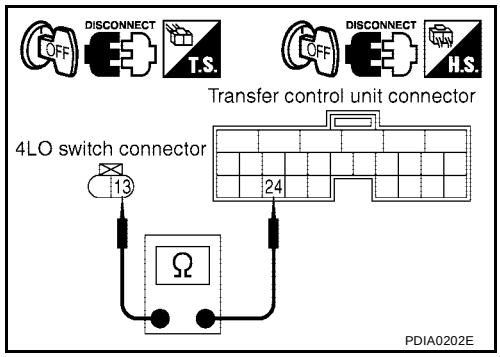
1. Turn ignition switch “OFF”.
2. Disconnect transfer control unit harness connector and the 4LO switch harness connector.
3. Check continuity between transfer control unit harness connector E142 terminal 24 (V) and 4LO switch harness connector F60 terminal 13 (V).

Continuity should exist.

Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 3.
NG >> Repair or replace damaged parts.



3. CHECK GROUND CIRCUIT

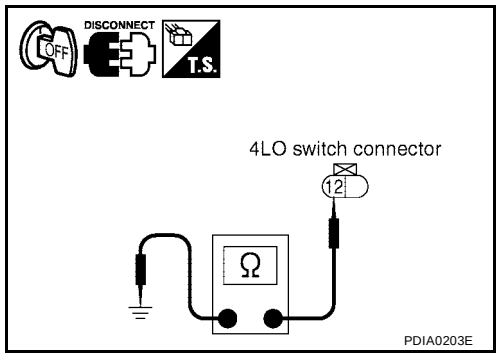
1. Turn ignition switch “OFF”.
2. Disconnect 4LO switch harness connector.
3. Check continuity between 4LO switch harness connector F60 terminal 12 (B) and ground.

Continuity should exist.

Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 4.
NG >> Repair open circuit or short to ground or short to power in harness or connectors.



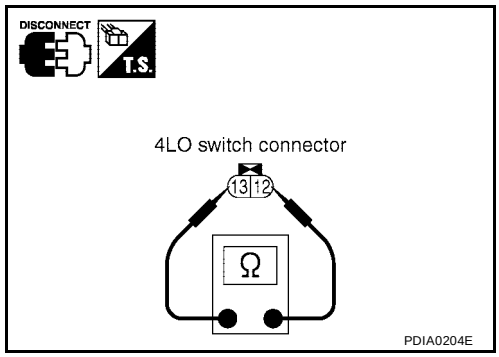
4. CHECK 4LO SWITCH

1. Turn ignition switch “OFF”.
2. Disconnect 4LO switch harness connector.
3. Remove 4LO switch.
4. Push and release 4LO switch and check continuity between 4LO switch harness connector F60 terminals 12 and 13.

Connector	Terminal	Condition	Continuity
F60	12 - 13	Push 4LO switch	Yes
		Release 4LO switch	No

OK or NG

OK >> GO TO 5.
NG >> Replace 4LO switch.



5. CHECK TRANSFER CONTROL UNIT

Check transfer control unit input/output signal. Refer to TF-27, "Transfer Control Unit Input/Output Signal Reference Values" .

OK or NG

OK >> GO TO 6.
NG >> Check transfer control unit pin terminals for damage or loose connection with harness connector. If any items are damaged, repair or replace damaged parts.

6. CHECK DTC

Perform the self-diagnosis, after driving a vehicle for a while.

OK or NG

OK >> **INSPECTION END**
NG >> Replace transfer control unit. Refer to TF-79, "TRANSFER CONTROL UNIT" .

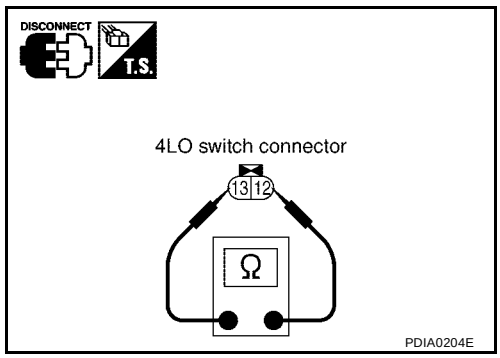
COMPONENT INSPECTION

1. Turn ignition switch “OFF”.
2. Disconnect 4LO switch harness connector.
3. Remove 4LO switch.

4. Push and release 4LO switch and check continuity between 4LO switch harness connector F60 terminals 12 and 13.

Connector	Terminal	Condition	Continuity
F60	12 - 13	Push 4LO switch	Yes
		Release 4LO switch	No

5. If NG, replace the 4LO switch.



UDS000AA

4WD Shift Switch

CONSULT-II REFERENCE VALUE IN DATA MONITOR MODE

Data are reference value.

Monitored item [Unit]	Content	Condition		Display value
2WD SWITCH [ON/OFF]	Input condition from 4WD shift switch	4WD shift switch: 2WD		ON
		4WD shift switch: 4H and 4LO		OFF
4H SWITCH [ON/OFF]	Input condition from 4WD shift switch	4WD shift switch: 4H		ON
		4WD shift switch: 2WD and 4LO		OFF
4L SWITCH [ON/OFF]	Input condition from 4WD shift switch	4WD shift switch: 4LO		ON
		4WD shift switch: 2WD and 4H		OFF
4WD MODE [2H/4H/4L]	Control status of 4WD (Output condition of 4WD shift indicator lamp and 4LO indicator lamp)	4WD shift switch (Engine running)	2WD	2H
			4H	4H
			4LO	4L

TRANSFER CONTROL UNIT TERMINALS AND REFERENCE VALUE

Data are reference value and are measured between each terminal and ground.

Terminal	Wire color	Item	Condition		Data (Approx.)
14	G/W	4WD shift switch (2WD)	Ignition switch: ON	4WD shift switch: 2WD	Battery voltage
				4WD shift switch: 4H and 4LO	0V
15	O	4WD shift switch (4H)		4WD shift switch: 4H	Battery voltage
				4WD shift switch: 2WD and 4LO	0V
16	R	4WD shift switch (4LO)		4WD shift switch: 4LO	Battery voltage
				4WD shift switch: 2WD and 4H	0V

CAUTION:

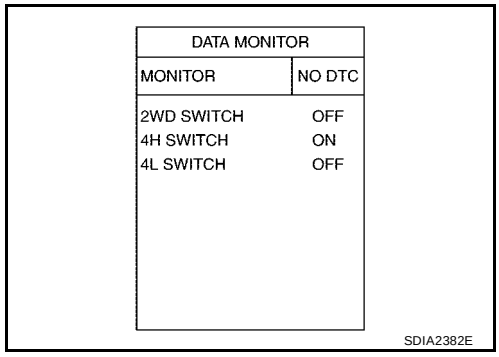
When using a circuit tester to measure voltage for inspection, be sure not to extend forcibly any connector terminals.

DIAGNOSTIC PROCEDURE

1. CHECK 4WD SHIFT SWITCH SIGNAL

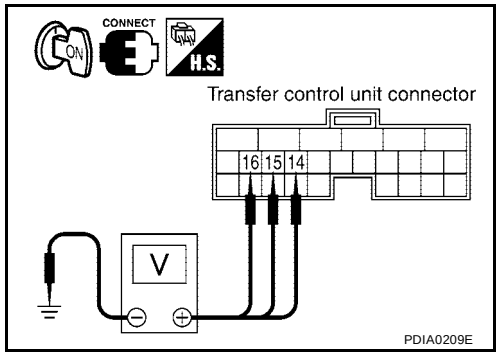
With CONSULT-II

1. Turn ignition switch “ON”.
2. Select “DATA MONITOR” mode for “ALL MODE AWD/4WD” with CONSULT-II.
3. Read out ON/OFF switching action of the “2WD SWITCH”, “4H SWITCH”, “4L SWITCH” with operating 4WD shift switch.



Without CONSULT-II

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



Connector	Terminal (Wire color)	Condition	Voltage (Approx.)
E142	14 (G/w) - Ground	4WD shift switch: 2WD	Battery voltage
		4WD shift switch: 4H and 4LO	0V
	15 (O) - Ground	4WD shift switch: 4H	Battery voltage
		4WD shift switch: 2WD and 4LO	0V
	16 (R) - Ground	4WD shift switch: 4LO	Battery voltage
		4WD shift switch: 2WD and 4H	0V

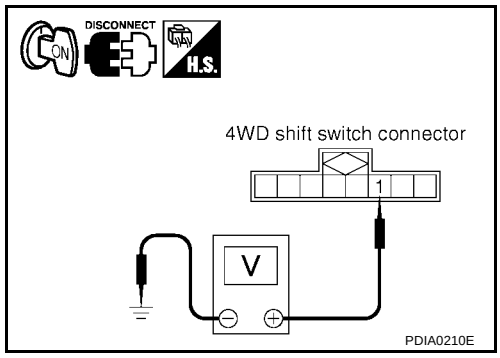
OK or NG

OK >> GO TO 5.
NG >> GO TO 2.

2. CHECK 4WD SHIFT SWITCH POWER SUPPLY CIRCUIT

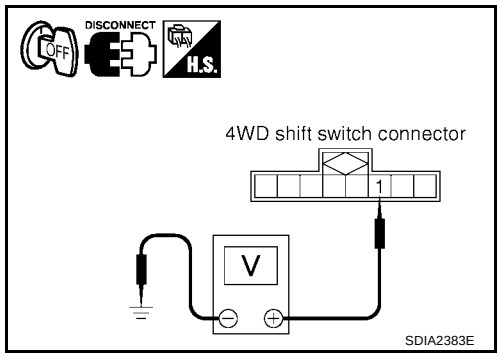
1. Turn ignition switch “ON”.
2. Disconnect 4WD shift switch harness connector.
3. Check voltage between 4WD shift switch harness connector terminal 1 and ground.

Connector	Terminal (Wire color)	Voltage (Approx.)
M141	1 (Y/R) - Ground	Battery voltage



4. Turn ignition switch “OFF”.
5. Check voltage between 4WD shift switch harness connector terminal 1 and ground.

Connector	Terminal (Wire color)	Voltage (Approx.)
M141	1 (Y/R) - Ground	0V



OK or NG

OK >> GO TO 3.

NG >> Check the following. If any items are damaged, repair or replace damaged parts.

- 10A fuses [No. 26 located in the fuse and fusible link box or 59 located in the fuse and relay box]
- Harness for short or open between battery and 4WD shift switch harness connector terminal 1
- Harness for short or open between ignition switch and transfer relay 1 harness connector E46 terminal 2 (L/W)
- Harness for short or open between transfer relay 1 harness connector E46 terminal 1 (B) and ground.
- Battery and ignition switch. Refer to PG-4, “POWER SUPPLY ROUTING CIRCUIT”.
- Transfer relay 1. Refer to TF-40, "COMPONENT INSPECTION" .

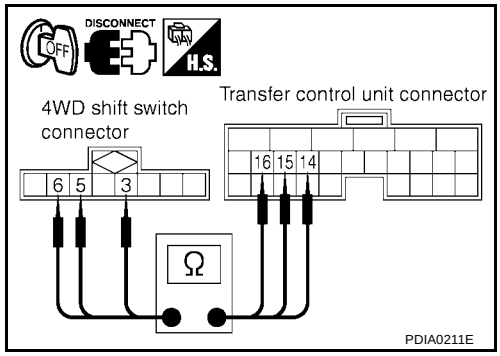
3. CHECK HARNESS BETWEEN 4WD SHIFT SWITCH AND TRANSFER CONTROL UNIT

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

- Transfer control unit harness connector E142 terminal 14 (G/W) and 4WD shift switch harness connector M141 terminal 3 (G/W).
- Transfer control unit harness connector E142 terminal 15 (O) and 4WD shift switch harness connector M141 terminal 5 (O).
- Transfer control unit harness connector E142 terminal 16 (R) and 4WD shift switch harness connector M141 terminal 6 (R).

Continuity should exist.

Also check harness for short to ground and short to power.



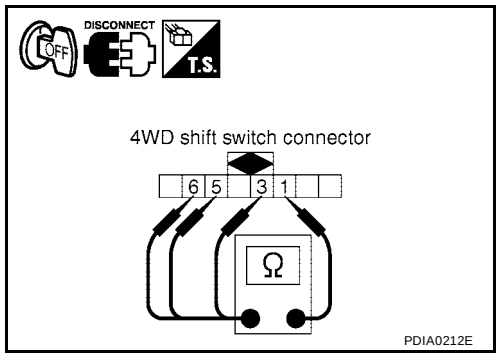
OK or NG

OK >> GO TO 4.

NG >> Repair or replace damaged parts.

4. CHECK 4WD SHIFT SWITCH

1. Turn ignition switch “OFF”.
2. Disconnect 4WD shift switch harness connector.
3. Operate 4WD shift switch and check continuity between 4WD shift switch harness connector terminals.



Connector	Terminal	Condition	Continuity
M141	1 - 3	4WD shift switch: 2WD	Yes
		4WD shift switch: 4H and 4LO	No
	1 - 5	4WD shift switch: 4H	Yes
		4WD shift switch: 2WD and 4LO	No
	1 - 6	4WD shift switch: 4LO	Yes
		4WD shift switch: 2WD and 4H	No

OK or NG

OK >> GO TO 5.
NG >> Replace 4WD shift switch.

5. CHECK TRANSFER CONTROL UNIT

Check transfer control unit input/output signal. Refer to TF-27, "Transfer Control Unit Input/Output Signal Reference Values" .

OK or NG

OK >> GO TO 6.
NG >> Check transfer control unit pin terminals for damage or loose connection with harness connector. If any items are damaged, repair or replace damaged parts.

6. CHECK DTC

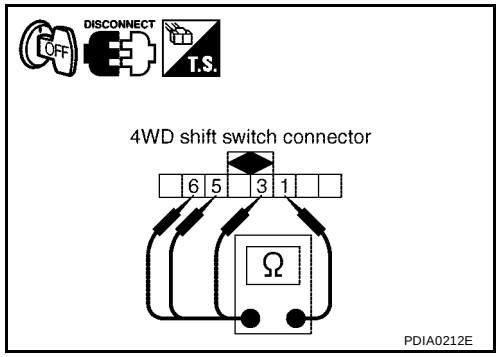
Perform the self-diagnosis, after driving a vehicle for a while.

OK or NG

OK >> **INSPECTION END**
NG >> Replace transfer control unit. Refer to TF-79, "TRANSFER CONTROL UNIT" .

COMPONENT INSPECTION

1. Turn ignition switch “OFF”.
2. Disconnect 4WD shift switch harness connector.
3. Operate 4WD shift switch and check continuity between 4WD shift switch harness connector terminals.



Connector	Terminal	Condition	Continuity
M141	1 - 3	4WD shift switch: 2WD	Yes
		4WD shift switch: 4H and 4LO	No
	1 - 5	4WD shift switch: 4H	Yes
		4WD shift switch: 2WD and 4LO	No
	1 - 6	4WD shift switch: 4LO	Yes
		4WD shift switch: 2WD and 4H	No

4. If NG, replace the 4WD shift switch.

Wait Detection Switch

UDS000A9

CONSULT-II REFERENCE VALUE IN DATA MONITOR MODE

Data are reference value.

Monitored item	Content	Condition		Display value
WAIT DETCT SW [ON/OFF]	Condition of wait detection switch	● Vehicle stopped ● Engine running ● A/T selector lever “N” position ● Brake pedal depressed	4WD shift switch : 4H and 4LO	ON
			4WD shift switch: 2WD	OFF

TRANSFER CONTROL UNIT TERMINALS AND REFERENCE VALUE

Data are reference value and are measured between each terminal and ground.

Terminal	Wire color	Item	Condition		Data (Approx.)
17	G/Y	Wait detection switch	● Vehicle stopped ● Engine running ● A/T selector lever “N” position ● Brake pedal depressed	4WD shift switch: 4H and 4LO	0V
				4WD shift switch: 2WD	Battery voltage

CAUTION:

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

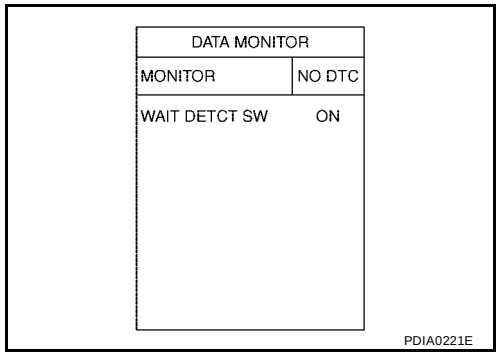
DIAGNOSTIC PROCEDURE

1. CHECK WAIT DETECTION SWITCH SIGNAL

With CONSULT-II

1. Start engine.
2. Select “DATA MONITOR” mode for “ALL MODE AWD/4WD” with CONSULT-II.
3. Read out the value of “WAIT DETCT SWITCH”.

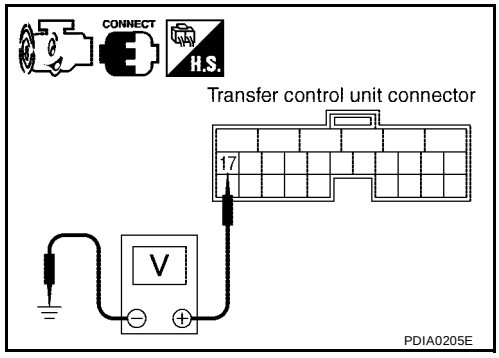
Condition		Display value
● Vehicle stopped ● Engine running ● A/T selector lever “N” position ● Brake pedal depressed	4WD shift switch: 4H and 4LO	ON
	4WD shift switch: 2WD	OFF



Without CONSULT-II

1. Start engine.
2. Check voltage between transfer control unit harness connector terminal and ground.

Connector	Terminal (Wire color)	Condition		Voltage (Approx.)
E142	17 (G/Y) - Ground	● Vehicle stopped ● Engine running ● A/T selector lever “N” position ● Brake pedal depressed	4WD shift switch : 4H and 4LO	0V
			4WD shift switch: 2WD	Battery voltage



OK or NG

OK >> GO TO 5.
NG >> GO TO 2.

2. CHECK HARNESS BETWEEN TRANSFER CONTROL UNIT AND WAIT DETECTION SWITCH

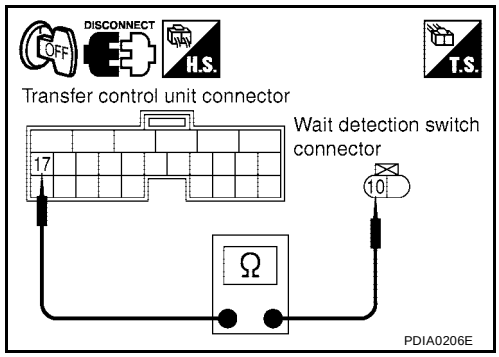
1. Turn ignition switch “OFF”.
2. Disconnect transfer control unit harness connector and the wait detection switch harness connector.
3. Check continuity between transfer control unit harness connector E142 terminal 17 (G/Y) and wait detection switch harness connector F59 terminal 10 (G/Y).

Continuity should exist.

Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 3.
NG >> Repair or replace damaged parts.



3. CHECK GROUND CIRCUIT

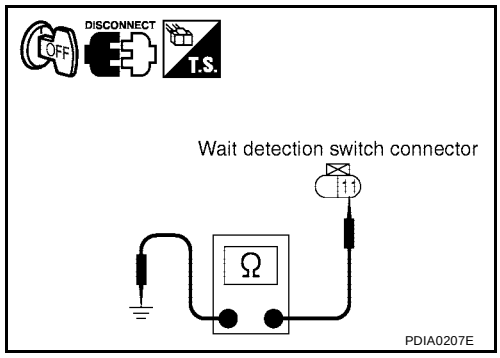
1. Turn ignition switch “OFF”.
2. Disconnect wait detection switch harness connector.
3. Check continuity between wait detection switch harness connector F59 terminal 11 (B) and ground.

   Continuity should exist.

   Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 4.
NG >> Repair open circuit or short to ground or short to power in harness or connectors.



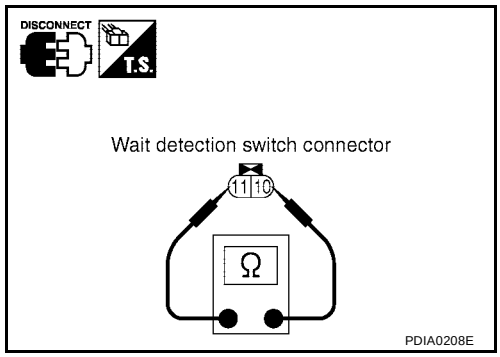
4. CHECK WAIT DETECTION SWITCH

1. Turn ignition switch “OFF”.
2. Disconnect wait detection switch harness connector.
3. Remove wait detection switch.
4. Push and release wait detection switch and check continuity between wait detection switch harness connector F59 terminals 10 and 11.

Connector	Terminal	Condition	Continuity
F59	10 - 11	Push wait detection switch	Yes
		Release wait detection switch	No

OK or NG

OK >> GO TO 5.
NG >> Replace wait detection switch.



5. CHECK TRANSFER CONTROL UNIT

Check transfer control unit input/output signal. Refer to TF-27, "Transfer Control Unit Input/Output Signal Reference Values" .

OK or NG

OK >> GO TO 6.
NG >> Check transfer control unit pin terminals for damage or loose connection with harness connector. If any items are damaged, repair or replace damaged parts.

6. CHECK DTC

Perform the self-diagnosis, after driving a vehicle for a while.

OK or NG

OK >> **INSPECTION END**
NG >> Replace transfer control unit. Refer to TF-79, "TRANSFER CONTROL UNIT" .

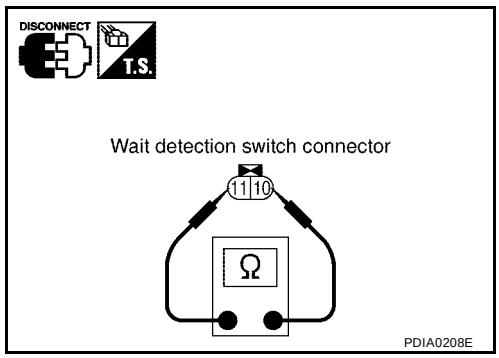
COMPONENT INSPECTION

1. Turn ignition switch “OFF”.
2. Disconnect wait detection switch harness connector.
3. Remove wait detection switch.

4. Push and release wait detection switch and check continuity between wait detection switch harness connector F59 terminals 10 and 11.

Connector	Terminal	Condition	Continuity
F59	10 - 11	Push wait detection switch	Yes
		Release wait detection switch	No

5. If NG, replace the wait detection switch.



PNP Switch Signal

UDS000A7

DIAGNOSTIC PROCEDURE

1. CHECK DTC WITH TCM

Perform self-diagnosis with TCM. Refer to AT-96, "CONSULT-II SETTING PROCEDURE" .

Is any malfunction detected by self-diagnosis?

YES >> Check the malfunctioning system.
NO >> GO TO 2.

2. CHECK TRANSFER CONTROL UNIT

Check transfer control unit input/output signal. Refer to TF-27, "Transfer Control Unit Input/Output Signal Reference Values" .

OK or NG

OK >> GO TO 3.
NG >> Check transfer control unit pin terminals for damage or loose connection with harness connector. If any items are damaged, repair or replace damaged parts.

3. CHECK DTC

Perform the self-diagnosis, after driving a vehicle for a while.

OK or NG

OK >> **INSPECTION END**
NG >> Perform self-diagnosis with TCM again. Refer to AT-96, "CONSULT-II SETTING PROCEDURE" .

Actuator Motor

UDS000AB

CONSULT-II REFERENCE VALUE IN DATA MONITOR MODE

Data are reference value.

Monitored item	Content	Condition		Display value
SHIFT ACT 1 [ON/OFF]	Output condition to actuator motor (clockwise)	● Vehicle stopped ● Engine running ● A/T selector lever “N” position ● Brake pedal depressed	4WD shift switch : 4H to 4LO	ON
			Except the above	OFF
SHIFT AC MON1 [ON/OFF]	Check signal (reinput signal) for transfer control unit signal output	● Vehicle stopped ● Engine running ● A/T selector lever “N” position ● Brake pedal depressed	4WD shift switch : 4H to 4LO	ON
			Except the above	OFF
SHIFT ACT 2 [ON/OFF]	Output condition to actuator motor (counterclockwise)	● Vehicle stopped ● Engine running ● A/T selector lever “N” position ● Brake pedal depressed	4WD shift switch : 4LO to 4H	ON
			Except the above	OFF
SHIFT AC MON2 [ON/OFF]	Check signal (reinput signal) for transfer control unit signal output	● Vehicle stopped ● Engine running ● A/T selector lever “N” position ● Brake pedal depressed	4WD shift switch : 4LO to 4H	ON
			Except the above	OFF

TRANSFER CONTROL UNIT TERMINALS AND REFERENCE VALUE

Data are reference value and are measured between each terminal and ground.

Terminal	Wire color	Item	Condition	Data (Approx.)
27	Y/R	Actuator motor power supply	Ignition switch: ON	Battery voltage
			Ignition switch: OFF	0V
28	Y/L	Actuator motor (+)	4WD shift switch: 2WD to 4H or 4H to 4LO or 2WD to 4LO	Battery voltage
			Except the above	0V
31	G/B	Actuator motor (-)	4WD shift switch: 4LO to 4H or 4H to 2WD or 4LO to 2WD	Battery voltage
			Except the above	0V

CAUTION:

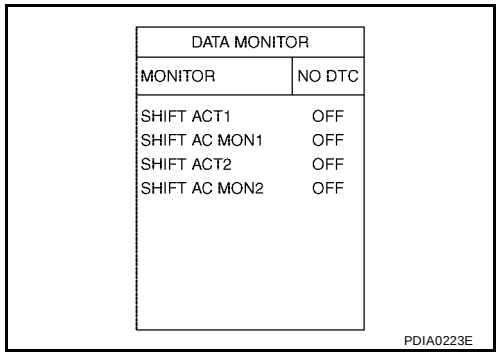
When using a circuit tester to measure voltage for inspection, be sure not to extend forcibly any connector terminals.

DIAGNOSTIC PROCEDURE

1. CHECK ACTUATOR MOTOR SIGNAL

With CONSULT-II

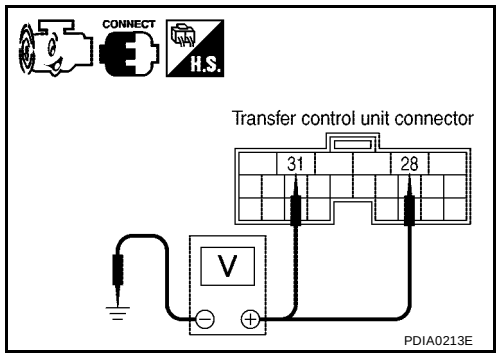
1. Start engine.
2. Select “DATA MONITOR” mode for “ALL MODE AWD/4WD” with CONSULT-II.
3. Read out the value of “SHIFT ACT 1”, “SHIFT ACT MON 1”, “SHIFT ACT 2”, “SHIFT ACT MON 2”.



Monitored item	Condition		Display value
SHIFT ACT 1	● Vehicle stopped ● Engine running ● A/T selector lever “N” position ● Brake pedal depressed	4WD shift switch : 4H to 4LO	ON
		Except the above	OFF
SHIFT AC MON1		4WD shift switch : 4H to 4LO	ON
		Except the above	OFF
SHIFT ACT 2		4WD shift switch : 4LO to 4H	ON
		Except the above	OFF
SHIFT AC MON2		4WD shift switch : 4LO to 4H	ON
		Except the above	OFF

Without CONSULT-II

1. Start engine.
2. Check voltage between transfer control unit harness connector terminal and ground.



Connector	Terminal (Wire color)	Condition	Voltage (Approx.)
E143	28 (Y/L) - Ground	4WD shift switch: 2WD to 4H or 4H to 4LO or 2WD to 4LO	Battery voltage
		Except the above	0V
	31 (G/B) - Ground	4WD shift switch: 4LO to 4H or 4H to 2WD or 4LO to 2WD	Battery voltage
		Except the above	0V

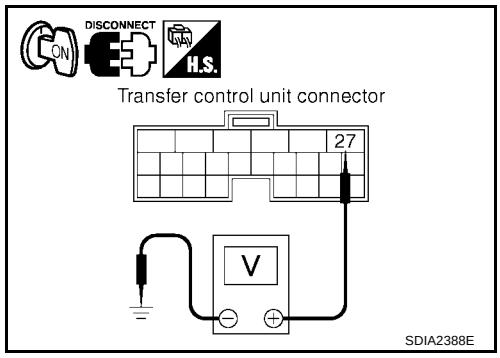
OK or NG

OK >> GO TO 5.
NG >> GO TO 2.

2. CHECK ACTUATOR MOTOR POWER SUPPLY CIRCUIT

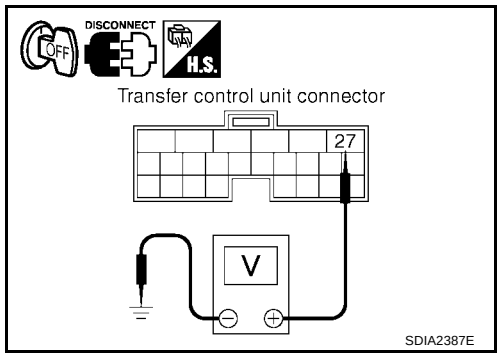
1. Turn ignition switch “ON”. (Do not start engine.)
2. Disconnect transfer control unit harness connector.
3. Check voltage between transfer control unit harness connector terminal 27 and ground.

Connector	Terminal (Wire color)	Voltage (Approx.)
E143	27 (Y/R) - Ground	Battery voltage



4. Turn ignition switch “OFF”.
5. Check voltage between transfer control unit harness connector terminal 27 and ground.

Connector	Terminal (Wire color)	Voltage (Approx.)
E143	27 (Y/R) - Ground	0V



OK or NG

OK >> GO TO 3.

NG >> Check the following. If any items are damaged, repair or replace damaged parts.

- 10A fuses [No. 26 located in the fuse and fusible link box or 59 located in the fuse and relay box]
- Harness for short or open between battery and transfer control unit harness connector terminal 27
- Harness for short or open between ignition switch and transfer relay 1 harness connector E46 terminal 2 (L/W)
- Harness for short or open between transfer relay 1 harness connector E46 terminal 1 (B) and ground.
- Battery and ignition switch. Refer to PG-4, “POWER SUPPLY ROUTING CIRCUIT”.
- Transfer relay 1. Refer to TF-40, "COMPONENT INSPECTION" .

3. CHECK HARNESS BETWEEN TRANSFER CONTROL UNIT AND ACTUATOR MOTOR

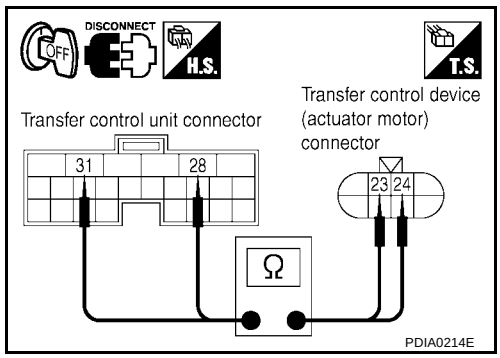
1. Turn ignition switch “OFF”.
2. Disconnect transfer control unit harness connector and the transfer control device (actuator motor) harness connector.
3. Check continuity between the following terminals.

– Transfer control unit harness connector E143 terminal 28 (Y/L) and transfer control device (actuator motor) harness connector F58 terminal 24 (Y/L).

– Transfer control unit harness connector E143 terminal 31 (G/B) and transfer control device (actuator motor) harness connector F58 terminal 23 (G/B).

Continuity should exist.

Also check harness for short to ground and short to power.



OK or NG

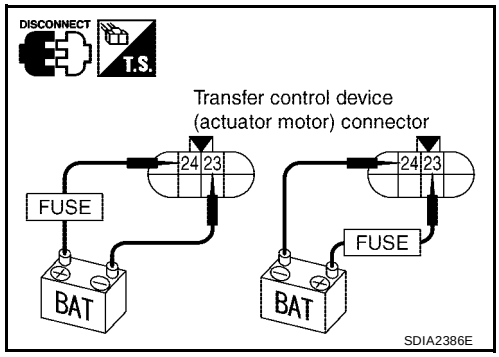
OK >> GO TO 4.

NG >> Repair or replace damaged parts.

4. CHECK ACTUATOR MOTOR

1. Remove transfer control device. Refer to TF-79, "TRANSFER CONTROL UNIT" .
2. Check operation by applying battery voltage to transfer control device (actuator motor) harness connector F58 terminals 23 and 24.

CAUTION:
Be careful not to cause burnout of the harness.



Connector	Terminal	Actuator motor
F58	24 (Battery voltage) - 23 (Ground)	Clockwise rotate
	23 (Battery voltage) - 24 (Ground)	Counterclockwise rotate

Does actuator motor rotate?

YES >> GO TO 5.
NO >> Replace transfer control device (actuator motor). Refer to TF-84, "Removal and Installation" .

5. CHECK TRANSFER CONTROL UNIT

Check transfer control unit input/output signal. Refer to TF-27, "Transfer Control Unit Input/Output Signal Reference Values" .

OK or NG

OK >> GO TO 6.
NG >> Check transfer control unit pin terminals for damage or loose connection with harness connector. If any items are damaged, repair or replace damaged parts.

6. CHECK DTC

Perform the self-diagnosis, after driving a vehicle for a while.

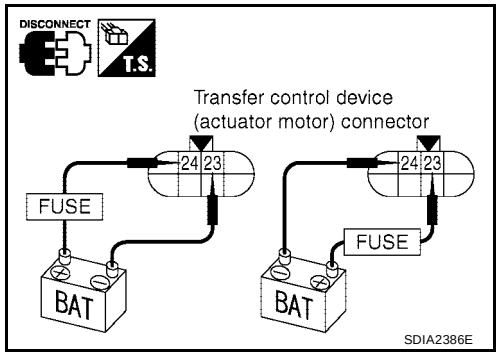
OK or NG

OK >> **INSPECTION END**
NG >> Replace transfer control unit. Refer to TF-79, "TRANSFER CONTROL UNIT" .

COMPONENT INSPECTION

1. Remove transfer control device. Refer to TF-84, "Removal and Installation" .
2. Check operation by applying battery voltage to transfer control device (actuator motor) harness connector F58 terminals 23 and 24.

CAUTION:
Be careful not to cause burnout of the harness.



Connector	Terminal	Actuator motor
F58	24 (Battery voltage) - 23 (Ground)	Clockwise rotate
	23 (Battery voltage) - 24 (Ground)	Counterclockwise rotate

3. If NG, replace transfer control device (actuator motor). Refer to TF-84, "Removal and Installation" .

Actuator Position Switch

UDS000AC

CONSULT-II REFERENCE VALUE IN DATA MONITOR MODE

Data are reference value.

Monitored item [Unit]	Content	Condition	Display value
SHIFT POS SW1 [ON/OFF]	Condition of actuator position switch 1	4WD shift switch: 2WD and 4LO	ON
		4WD shift switch: 4H	OFF
SHIFT POS SW2 [ON/OFF]	Condition of actuator position switch 2	4WD shift switch: 4LO	ON
		4WD shift switch: 2WD and 4H	OFF
SHIFT POS SW3 [ON/OFF]	Condition of actuator position switch 3	4WD shift switch: 2WD and 4H	ON
		4WD shift switch: 4LO	OFF
SHIFT POS SW4 [ON/OFF]	Condition of actuator position switch 4	4WD shift switch: 4H and 4LO	ON
		4WD shift switch: 2WD	OFF

TRANSFER CONTROL UNIT TERMINALS AND REFERENCE VALUE

Data are reference value and are measured between each terminal and ground.

Terminal	Wire color	Item	Condition	Data (Approx.)
10	LG/B	Actuator position switch 1	4WD shift switch: 2WD and 4LO	0V
			4WD shift switch: 4H	Battery voltage
11	W/L	Actuator position switch 2	4WD shift switch: 4LO	0V
			4WD shift switch: 2WD and 4H	Battery voltage
12	BR	Actuator position switch 3	4WD shift switch: 2WD and 4H	0V
			4WD shift switch: 4LO	Battery voltage
13	BR/W	Actuator position switch 4	4WD shift switch: 4H and 4LO	0V
			4WD shift switch: 2WD	Battery voltage

CAUTION:

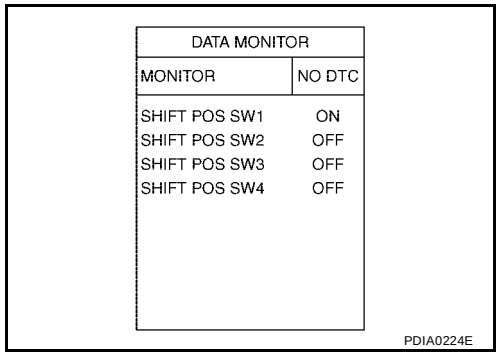
When using a circuit tester to measure voltage for inspection, be sure not to extend forcibly any connector terminals.

DIAGNOSTIC PROCEDURE

1. CHECK ACTUATOR POSITION SWITCH SIGNAL

With CONSULT-II

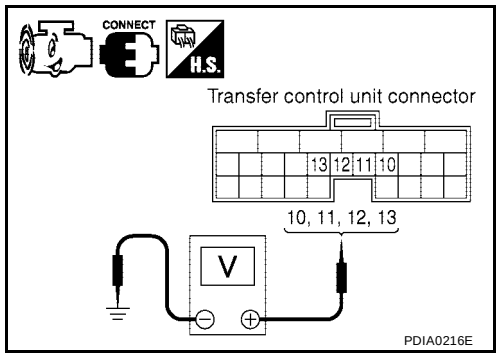
1. Start engine.
2. Select “DATA MONITOR” mode for “ALL MODE AWD/4WD” with CONSULT-II.
3. Read out the value of “SHIFT POS SW1”, “SHIFT POS SW2”, “SHIFT POS SW3”, “SHIFT POS SW4”.



Monitored item	Condition	Display value
SHIFT POS SW1	4WD shift switch: 2WD and 4LO	ON
	4WD shift switch: 4H	OFF
SHIFT POS SW2	4WD shift switch: 4LO	ON
	4WD shift switch: 2WD and 4H	OFF
SHIFT POS SW3	4WD shift switch: 2WD and 4H	ON
	4WD shift switch: 4LO	OFF
SHIFT POS SW4	4WD shift switch: 4H and 4LO	ON
	4WD shift switch: 2WD	OFF

Without CONSULT-II

1. Start engine.
2. Check voltage between transfer control unit harness connector terminal and ground.



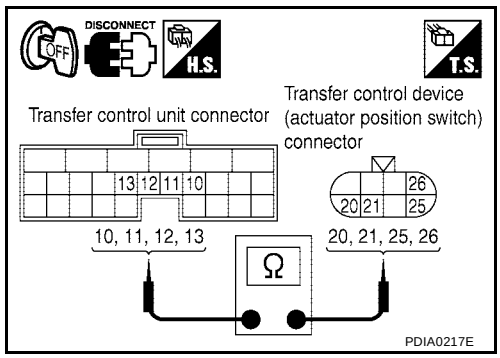
Connector	Terminal (Wire color)	Condition	Voltage (Approx.)
E142	10 (LG/B) - Ground	4WD shift switch: 2WD and 4LO	0V
		4WD shift switch: 4H	Battery voltage
	11 (W/L) - Ground	4WD shift switch: 4LO	0V
		4WD shift switch: 2WD and 4H	Battery voltage
	12 (BR) - Ground	4WD shift switch: 2WD and 4H	0V
		4WD shift switch: 4LO	Battery voltage
	13 (BR/W) - Ground	4WD shift switch: 4H and 4LO	0V
		4WD shift switch: 2WD	Battery voltage

OK or NG

OK >> GO TO 4.
NG >> GO TO 2.

2. CHECK HARNESS BETWEEN TRANSFER CONTROL UNIT AND ACTUATOR POSITION SWITCH

1. Turn ignition switch “OFF”.
2. Disconnect transfer control unit harness connector and the transfer control device (actuator position switch) harness connector.
3. Check continuity between the following terminals.



- Transfer control unit harness connector E142 terminal 10 (LG/B) and transfer control device (actuator position switch) harness connector F58 terminal 26 (LG/B).
- Transfer control unit harness connector E142 terminal 11 (W/L) and transfer control device (actuator position switch) harness connector F58 terminal 20 (W/L).
- Transfer control unit harness connector E142 terminal 12 (BR) and transfer control device (actuator position switch) harness connector F58 terminal 21 (BR).
- Transfer control unit harness connector E142 terminal 13 (BR/W) and transfer control device (actuator position switch) harness connector F58 terminal 25 (BR/W).

Continuity should exist.

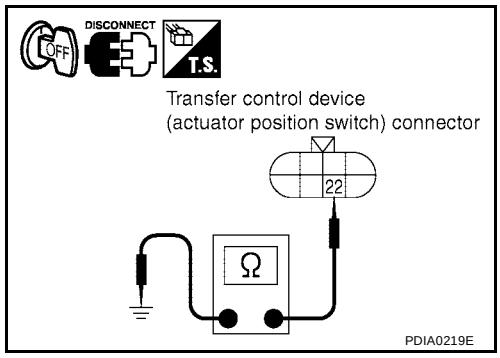
Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 3.
NG >> Repair or replace damaged parts.

3. CHECK GROUND CIRCUIT

1. Turn ignition switch “OFF”.
2. Disconnect transfer control device (actuator position switch) harness connector.
3. Check continuity between transfer control device (actuator position switch) harness connector F58 terminal 22 (B) and ground.



Continuity should exist.

Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 4.
NG >> Repair open circuit or short to ground or short to power in harness or connectors.

4. CHECK TRANSFER CONTROL UNIT

Check transfer control unit input/output signal. Refer to TF-27, "Transfer Control Unit Input/Output Signal Reference Values" .

OK or NG

OK >> GO TO 5.
NG >> Check transfer control unit pin terminals for damage or loose connection with harness connector. If any items are damaged, repair or replace damaged parts.

5. CHECK DTC

Perform the self-diagnosis, after driving a vehicle for a while.

OK or NG

OK >> **INSPECTION END**
NG >> Replace transfer control device. Refer to TF-84, "Removal and Installation" .

Transfer Control Device

UDS000AD

CONSULT-II REFERENCE VALUE IN DATA MONITOR MODE

Data are reference value.

Monitored item [Unit]	Content	Condition		Display value
SHIFT ACT/R MON [ON/OFF]	Operating condition of actuator motor relay (integrated in transfer control unit)	● Vehicle stopped ● Engine running ● A/T selector lever “N” position ● Brake pedal depressed	When 4WD shift switch is operated	ON
			When 4WD shift switch is not operated	OFF

TRANSFER CONTROL UNIT TERMINALS AND REFERENCE VALUE

Data are reference value and are measured between each terminal and ground.

Terminal	Wire color	Item	Condition	Data (Approx.)
25	L/W	Ignition switch monitor	Ignition switch: ON	Battery voltage
			Ignition switch: OFF	0V
27	Y/R	Actuator motor power supply	Ignition switch: ON	Battery voltage
			Ignition switch: OFF	0V
32	B	Actuator motor ground	Always	0V
40	Y	Transfer relay 2	Ignition switch: ON	0V
			Ignition switch: OFF	Battery voltage

CAUTION:

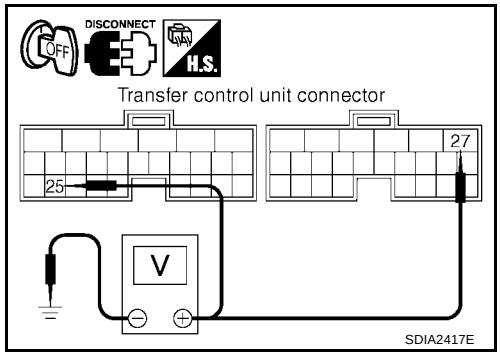
When using a circuit tester to measure voltage for inspection, be sure not to extend forcibly any connector terminals.

DIAGNOSTIC PROCEDURE

1. CHECK POWER SUPPLY

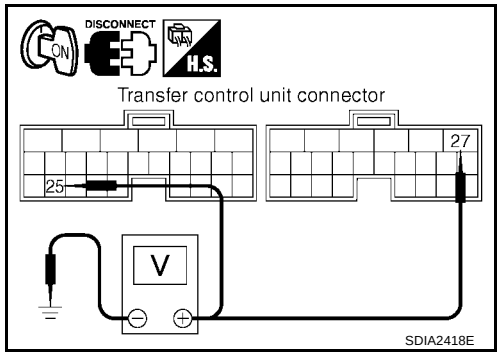
1. Turn ignition switch “OFF”.
2. Disconnect transfer control unit harness connector.
3. Check voltage between transfer control unit harness connector terminal and ground.

Connector	Terminal (Wire color)	Voltage (Approx.)
E142	25 (L/W) - Ground	0V
E143	27 (Y/R) - Ground	



4. Turn ignition switch “ON”. (Do not start engine.)
5. Check voltage between transfer control unit harness connector terminals and ground.

Connector	Terminal (Wire color)	Voltage (Approx.)
E142	25 (L/W) - Ground	Battery voltage
E143	27 (Y/R) - Ground	



OK or NG

OK >> GO TO 2.

NG >> Check the following. If any items are damaged, repair or replace damaged parts.

- 10A fuses [No. 26 located in the fuse and fusible link box or 59 located in the fuse and relay box]
- Harness for short or open between battery and transfer control unit harness connector terminal 27
- Harness for short or open between ignition switch and transfer relay 1 harness connector E46 terminal 2 (L/W)
- Harness for short or open between ignition switch and transfer control unit harness connector terminal 25
- Harness for short or open between transfer relay 1 harness connector E46 terminal 1 (B) and ground
- Battery and ignition switch. Refer to PG-4, “POWER SUPPLY ROUTING CIRCUIT”.
- Transfer relay 1. Refer to TF-40, "COMPONENT INSPECTION" .

2. CHECK GROUND CIRCUIT

1. Disconnect transfer control unit harness connector.
2. Check continuity between transfer control unit harness connector E143 terminal 32 (B) and ground.

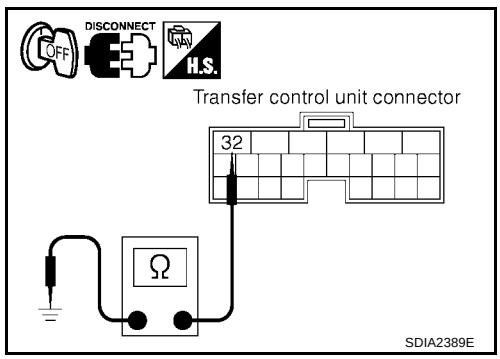
Continuity should exist.

Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 3.

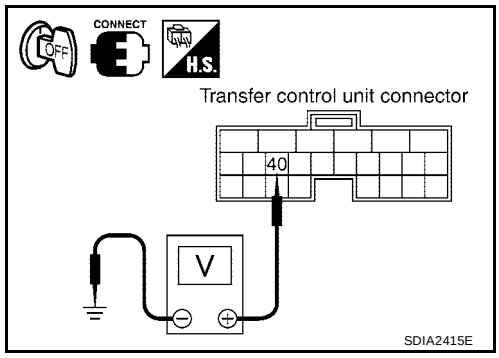
NG >> Repair open circuit or short to ground or short to power in harness or connectors.



3. CHECK POWER SUPPLY SIGNAL

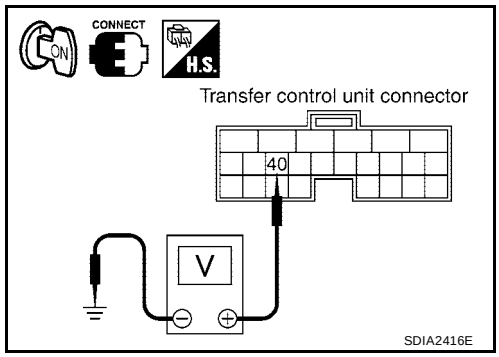
1. Turn ignition switch “OFF”.
2. Connect transfer control unit harness connector.
3. Check voltage between transfer control unit harness connector terminal and ground.

Connector	Terminal (Wire color)	Voltage (Approx.)
E143	40 (Y) - Ground	Battery voltage



4. Turn ignition switch “ON”. (Do not start engine.)
5. Check voltage between transfer control unit harness connector terminal and ground.

Connector	Terminal (Wire color)	Voltage (Approx.)
E143	40 (Y) - Ground	0V



OK or NG

OK >> GO TO 4.
NG >> Check the following. If any items are damaged, repair or replace damaged parts.

- Harness for short or open between battery and transfer control unit harness connector terminal 40
- Transfer relay 2. Refer to TF-40, "COMPONENT INSPECTION" .

4. CHECK TRANSFER CONTROL UNIT

Check transfer control unit input/output signal. Refer to TF-27, "Transfer Control Unit Input/Output Signal Reference Values" .

OK or NG

OK-1 >> With CONSULT-II: GO TO 5.
OK-2 >> Without CONSULT-II: GO TO 6.
NG >> Check transfer control unit pin terminals for damage or loose connection with harness connector. If any items are damaged, repair or replace damaged parts.

5. PERFORM SELF-DIAGNOSIS (WITH CONSULT-II)

With CONSULT-II

1. Turn ignition switch “ON”. (Do not start engine.)
2. Select “SELF-DIAG RESULTS” mode for “ALL MODE AWD/4WD” with CONSULT-II.
3. Touch “ERASE”.
4. Turn ignition switch “OFF” and wait at least 10 seconds.
5. Perform the self-diagnosis again.

Is the “SHIFT ACT CIR [P1819]” displayed?

YES >> Replace transfer control unit. Refer to TF-79, "TRANSFER CONTROL UNIT" .
NO >> **INSPECTION END**

6. PERFORM SELF-DIAGNOSIS (WITHOUT CONSULT-II)

Without CONSULT-II

1. Perform the self-diagnosis and then erase self-diagnostic results. Refer to TF-36, "SELF-DIAGNOSTIC PROCEDURE (WITHOUT CONSULT-II)" and TF-37, "ERASE SELF-DIAGNOSIS" .
2. Perform the self-diagnosis again.

Do the self-diagnostic results indicate transfer control device?

YES >> Replace transfer control unit. Refer to TF-79, "TRANSFER CONTROL UNIT" .
NO >> **INSPECTION END**

Engine Speed Signal

UDS000A6

DIAGNOSTIC PROCEDURE

1. CHECK DTC WITH ECM

Perform self-diagnosis with ECM. Refer to EC-106, "SELF-DIAG RESULTS MODE" .

Is any malfunction detected by self-diagnosis?

YES >> Check the malfunctioning system.
NO >> GO TO 2.

2. CHECK TRANSFER CONTROL UNIT

Check transfer control unit input/output signal. Refer to TF-27, "Transfer Control Unit Input/Output Signal Reference Values" .

OK or NG

OK >> GO TO 3.
NG >> Check transfer control unit pin terminals for damage or loose connection with harness connector. If any items are damaged, repair or replace damaged parts.

3. CHECK DTC

Perform the self-diagnosis, after driving a vehicle for a while.

OK or NG

OK >> **INSPECTION END**
NG >> Perform self-diagnosis with ECM again. Refer to EC-106, "SELF-DIAG RESULTS MODE" .

CAN Communication Line

UDS0009M

DIAGNOSTIC PROCEDURE

1. CHECK CAN COMMUNICATION CIRCUIT

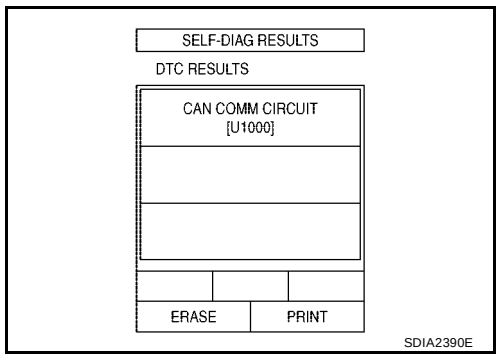
With CONSULT-II

1. Turn ignition switch “ON” and start engine.
2. Select “SELF-DIAG RESULTS” mode for “ALL MODE AWD/4WD” with in CONSULT-II.
3. Perform the self-diagnosis.

Is the “CAN COMM CIRCUIT [U1000]” displayed?

YES >> Print out CONSULT-II screen and go to LAN-6, "Precautions When Using CONSULT-II" .

NO >> **INSPECTION END**



ATP Switch

UDS000CB

CONSULT-II REFERENCE VALUE IN DATA MONITOR MODE

Data are reference value.

Monitored item [Unit]	Content	Condition		Display value
ATP SWITCH [ON/OFF]	Condition of ATP switch	● Vehicle stopped ● Engine running ● A/T selector lever “P” position ● Brake pedal depressed	4WD shift switch : 4H to 4LO or 4LO to 4H (While actuator motor is operating.)	ON
			Except the above	OFF

TRANSFER CONTROL UNIT TERMINALS AND REFERENCE VALUE

Data are reference value and are measured between each terminal and ground.

Terminal	Wire color	Item	Condition		Data (Approx.)
23	R/B	ATP switch	● Vehicle stopped ● Engine running ● A/T selector lever “P” position ● Brake pedal depressed	4WD shift switch: 4H to 4LO or 4LO to 4H (While actuator motor is operating.)	0V
				Except the above	Battery voltage

CAUTION:

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

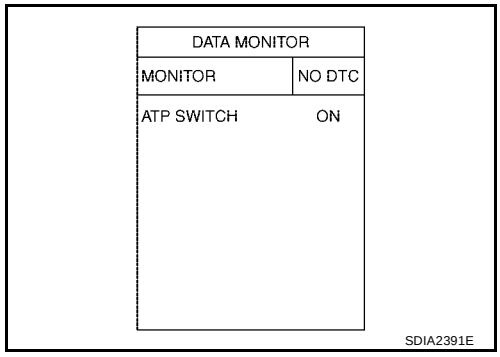
DIAGNOSTIC PROCEDURE

1. CHECK ATP SWITCH SIGNAL

With CONSULT-II

1. Start engine.
2. Select “DATA MONITOR” mode for “ALL MODE AWD/4WD” with CONSULT-II.
3. Read out the value of “ATP SWITCH”.

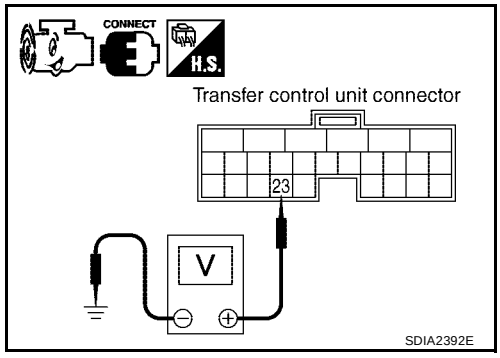
Condition		Display value
● Vehicle stopped ● Engine running ● A/T selector lever “P” position ● Brake pedal depressed	4WD shift switch: 4H to 4LO or 4LO to 4H (While actuator motor is operating.)	ON
	Except the above	OFF



Without CONSULT-II

1. Start engine.
2. Check voltage between transfer control unit harness connector terminal and ground.

Connector	Terminal (Wire color)	Condition		Voltage (Approx.)
E142	23 (R/B) - Ground	● Vehicle stopped ● Engine running ● A/T selector lever “P” position ● Brake pedal depressed	4WD shift switch: 4H to 4LO or 4LO to 4H (While actuator motor is operating.)	0V
			Except the above	Battery voltage



OK or NG

OK >> GO TO 5.
NG >> GO TO 2.

2. CHECK HARNESS BETWEEN TRANSFER CONTROL UNIT AND ATP SWITCH

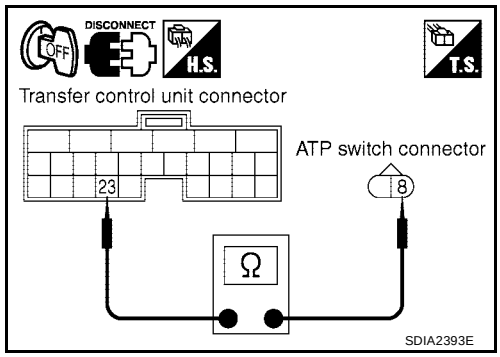
1. Turn ignition switch “OFF”.
2. Disconnect transfer control unit harness connector and the ATP switch harness connector.
3. Check continuity between transfer control unit harness connector E142 terminal 23 (R/B) and ATP switch harness connector F55 terminal 8 (R/B).

Continuity should exist.

Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 3.
NG >> Repair or replace damaged parts.

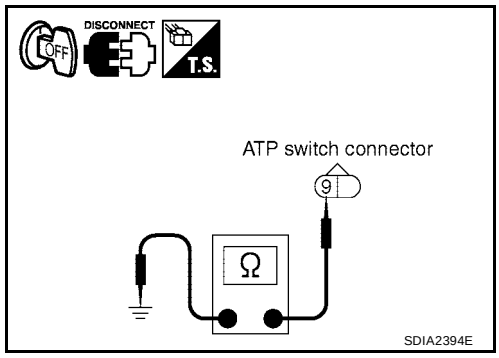


3. CHECK GROUND CIRCUIT

1. Turn ignition switch “OFF”.
2. Disconnect ATP switch harness connector.
3. Check continuity between ATP switch harness connector F55 terminal 9 (B) and ground.

Continuity should exist.

Also check harness for short to ground and short to power.



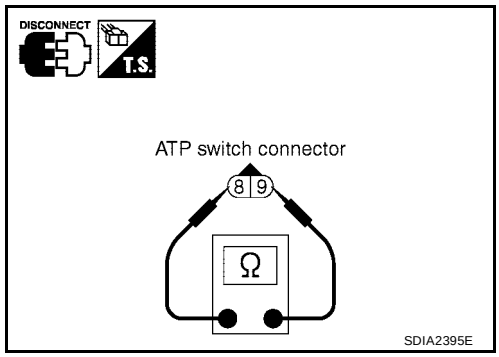
OK or NG

OK >> GO TO 4.
NG >> Repair open circuit or short to ground or short to power in harness or connectors.

4. CHECK ATP SWITCH

1. Turn ignition switch “OFF”.
2. Disconnect ATP switch harness connector.
3. Remove ATP switch.
4. Push and release ATP switch and check continuity between ATP switch harness connector F55 terminals 8 and 9.

Connector	Terminal	Condition	Continuity
F55	8 - 9	Push ATP switch	Yes
		Release ATP switch	No



OK or NG

OK >> GO TO 5.
NG >> Replace ATP switch.

5. CHECK TRANSFER CONTROL UNIT

Check transfer control unit input/output signal. Refer to TF-27, "Transfer Control Unit Input/Output Signal Reference Values" .

OK or NG

OK >> GO TO 6.
NG >> Check transfer control unit pin terminals for damage or loose connection with harness connector. If any items are damaged, repair or replace damaged parts.

6. CHECK ATP WARNING LAMP

1. Turn ignition switch “ON”. (Do not start engine.)
2. Set the selector lever to “P” position and engage the parking brake.
3. Switch 4WD shift switch from 4H to 4LO or 4LO to 4H.

Does ATP warning lamp “ON”, while actuator motor is operating?

YES >> **INSPECTION END**
NO >> Go to TF-74, "ATP Warning Lamp Does Not Turn ON" .

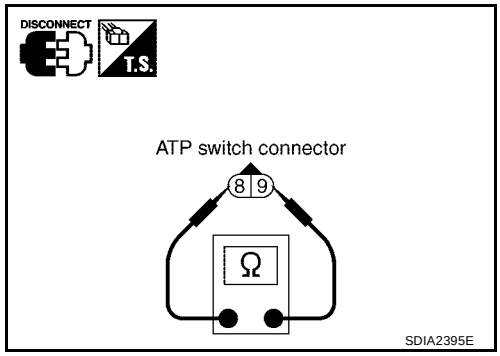
COMPONENT INSPECTION

1. Turn ignition switch “OFF”.
2. Disconnect ATP switch harness connector.
3. Remove ATP switch.

4. Push and release ATP switch and check continuity between ATP switch harness connector F55 terminals 8 and 9.

Connector	Terminal	Condition	Continuity
F55	8 - 9	Push ATP switch	Yes
		Release ATP switch	No

5. If NG, replace the ATP switch.



TROUBLE DIAGNOSIS FOR SYMPTOMS

PFP:00007

4WD Shift Indicator Lamp and 4LO Indicator Lamp Do Not Turn ON

UDS000CC

SYMPTOM:

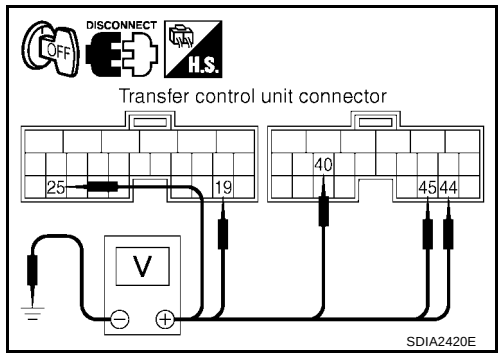
4WD shift indicator lamp and 4LO indicator lamp do not turn ON for approx. 1 second when turning ignition switch to “ON”.

DIAGNOSTIC PROCEDURE

1. CHECK TRANSFER CONTROL UNIT POWER SUPPLY CIRCUIT

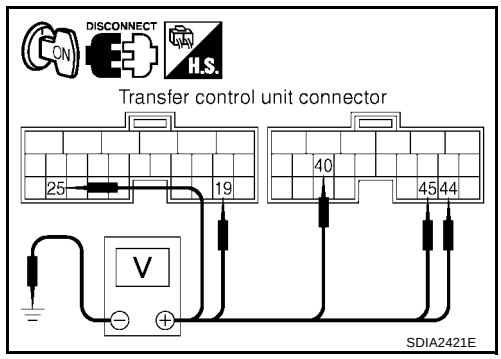
1. Turn ignition switch “OFF”.
2. Disconnect transfer control unit harness connector.
3. Check voltage between transfer control unit harness connector terminals and ground.

Connector	Terminal (Wire color)	Voltage (Approx.)
E142	19 (W) - Ground	Battery voltage
	25 (L/W) - Ground	0V
E143	40 (Y) - Ground	Battery voltage
	44 (Y/R) - Ground	0V
	45 (Y/R) - Ground	0V



4. Turn ignition switch “ON”. (Do not start engine.)
5. Check voltage between transfer control unit harness connector terminals and ground.

Connector	Terminal (Wire color)	Voltage (Approx.)
E142	19 (W) - Ground	Battery voltage
	25 (L/W) - Ground	
E143	40 (Y) - Ground	
	44 (Y/R) - Ground	
	45 (Y/R) - Ground	



OK or NG

OK >> GO TO 2.

NG >> Check the following. If any items are damaged, repair or replace damaged parts.

- 10A fuses [No. 26 located in the fuse and fusible link box or 59 located in the fuse and relay box]
- 20A fuse [No. 53, located in the IPDM E/R]
- Harness for short or open between battery and transfer control unit harness connector terminals 19, 40, 44 and 45
- Harness for short or open between ignition switch and transfer control unit harness connector terminal 25
- Harness for short or open between ignition switch and transfer relay 1 harness connector E46 terminal 2 (L/W)
- Harness for short or open between transfer relay 1 harness connector E46 terminal 1 (B) and ground
- Battery and ignition switch. Refer to PG-4, “POWER SUPPLY ROUTING CIRCUIT”.
- Transfer relay 1, 2. Refer to TF-40, "COMPONENT INSPECTION" .

2. CHECK TRANSFER CONTROL UNIT GROUND CIRCUIT

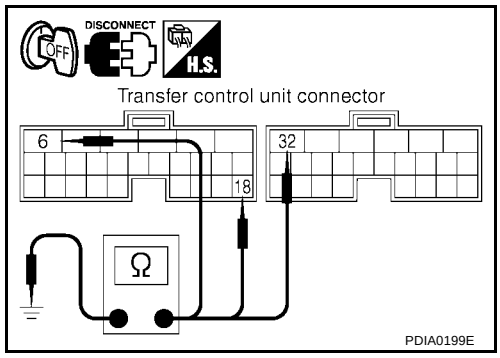
1. Turn ignition switch “OFF”.
2. Disconnect transfer control unit harness connector.
3. Check continuity between transfer control unit harness connector E142 terminals 6 (B), 18 (B), E143 terminal 32 (B) and ground.

   Continuity should exist.

   Also check harness for short to ground and short to power.

OK or NG

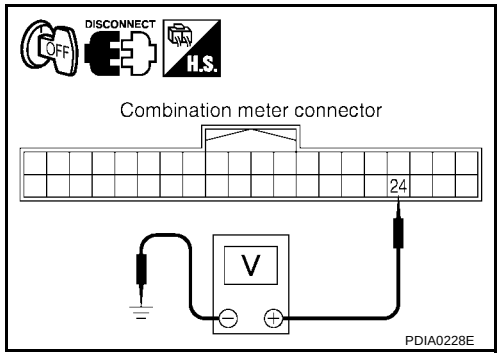
OK >> GO TO 3.
NG >> Repair open circuit or short to ground or short to power in harness or connectors.



3. CHECK COMBINATION METER POWER SUPPLY CIRCUIT

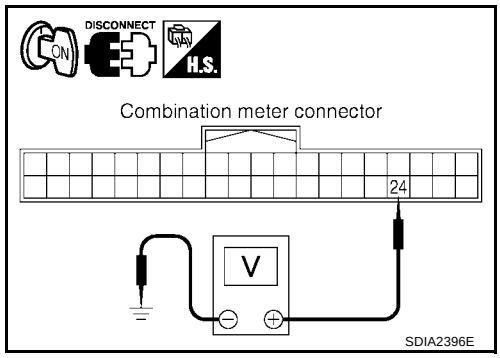
1. Turn ignition switch “OFF”.
2. Disconnect transfer control unit harness connector.
3. Check voltage between combination meter harness connector terminals and ground.

Connector	Terminal (Wire color)	Voltage (Approx.)
M24	24 (O/L) - Ground	0V



4. Turn ignition switch “ON”. (Do not start engine.)
5. Check voltage between combination meter harness connector terminals and ground.

Connector	Terminal (Wire color)	Voltage (Approx.)
M24	24 (O/L) - Ground	Battery voltage



OK or NG

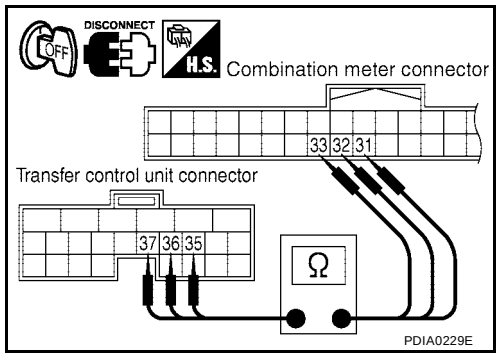
OK >> GO TO 4.
NG >> Check the following. If any items are damaged, repair or replace damaged parts.

- 10A fuses [No. 26 located in the fuse and fusible link box or 59 located in the fuse and relay box]
- Harness for short or open between battery and combination meter harness connector terminal 24
- Battery and Ignition switch. Refer to PG-4, “POWER SUPPLY ROUTING CIRCUIT”.
- Transfer relay 1, 2. Refer to TF-40, "COMPONENT INSPECTION" .

4. CHECK HARNESS BETWEEN TRANSFER CONTROL UNIT AND COMBINATION METER

1. Turn ignition switch “OFF”.
2. Disconnect transfer control unit harness connector and combination meter harness connector.
3. Check continuity between the following terminals.

- Transfer control unit harness connector E143 terminal 35 (B/W) and combination meter harness connector M24 terminal 32 (B/W)
- Transfer control unit harness connector E143 terminal 36 (L) and combination meter harness connector M24 terminal 31 (L)
- Transfer control unit harness connector E143 terminal 37 (W/G) and combination meter harness connector M24 terminal 33 (W/G)



Continuity should exist.

Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 5.
NG >> Repair or replace damaged parts.

5. CHECK 4WD SHIFT INDICATOR LAMP AND 4LO INDICATOR LAMP CIRCUIT

1. Turn ignition switch “OFF”.
2. Check the combination meter. Refer to DI-5, "COMBINATION METERS" .

OK or NG

OK >> GO TO 6.
NG >> Replace the combination meter. Refer to DI-25, "Removal and Installation of Combination Meter" .

6. SYMPTOM CHECK

Check again.

OK or NG

OK >> **INSPECTION END**
NG >> GO TO 7.

7. CHECK TRANSFER CONTROL UNIT

Check transfer control unit input/output signal. Refer to TF-27, "Transfer Control Unit Input/Output Signal Reference Values" .

OK or NG

OK >> **INSPECTION END**
NG >> Check transfer control unit pin terminals for damage or loose connection with harness connector. If any items are damaged, repair or replace damaged parts.

4WD Warning Lamp Does Not Turn ON

UDS0009O

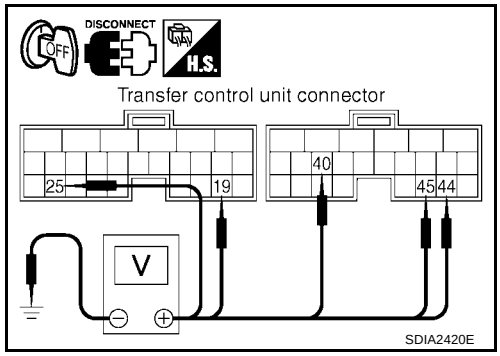
SYMPTOM:

4WD warning lamp do not turn ON when turning ignition switch to “ON”.

DIAGNOSTIC PROCEDURE

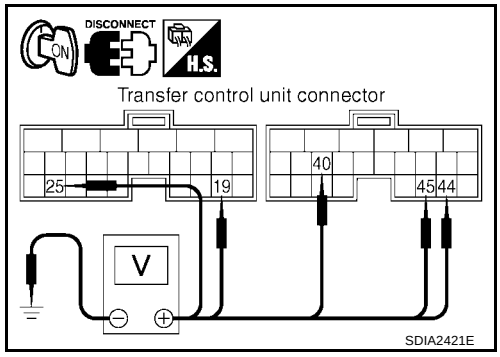
1. CHECK TRANSFER CONTROL UNIT POWER SUPPLY CIRCUIT

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



Connector	Terminal (Wire color)	Voltage (Approx.)
E142	19 (W) - Ground	Battery voltage
	25 (L/W) - Ground	0V
E143	40 (Y) - Ground	Battery voltage
	44 (Y/R) - Ground	0V
	45 (Y/R) - Ground	0V

4. Turn ignition switch “ON”. (Do not start engine.)
5. Check voltage between transfer control unit harness connector terminals and ground.



Connector	Terminal (Wire color)	Voltage (Approx.)
E142	19 (W) - Ground	Battery voltage
	25 (L/W) - Ground	
E143	40 (Y) - Ground	
	44 (Y/R) - Ground	
	45 (Y/R) - Ground	

OK or NG

OK >> GO TO 2.

NG >> Check the following. If any items are damaged, repair or replace damaged parts.

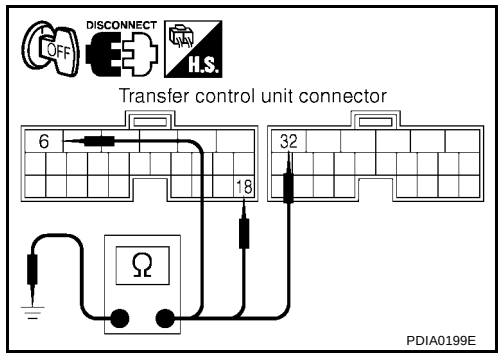
- 10A fuses [No. 26 located in the fuse and fusible link box or 59 located in the fuse and relay box]
- 20A fuse [No. 53, located in the IPDM E/R]
- Harness for short or open between battery and transfer control unit harness connector terminals 19, 40, 44 and 45
- Harness for short or open between ignition switch and transfer control unit harness connector terminal 25
- Harness for short or open between ignition switch and transfer relay 1 harness connector E46 terminal 2 (L/W)
- Harness for short or open between transfer relay 1 harness connector E46 terminal 1 (B) and ground
- Battery and ignition switch. Refer to PG-4, “POWER SUPPLY ROUTING CIRCUIT”.
- Transfer relay 1, 2. Refer to TF-40, "COMPONENT INSPECTION" .

2. CHECK TRANSFER CONTROL UNIT GROUND CIRCUIT

1. Turn ignition switch “OFF”.
2. Disconnect transfer control unit harness connector.
3. Check continuity between transfer control unit harness connector E142 terminals 6 (B), 18 (B), E143 terminal 32 (B) and ground.

   Continuity should exist.

   Also check harness for short to ground and short to power.



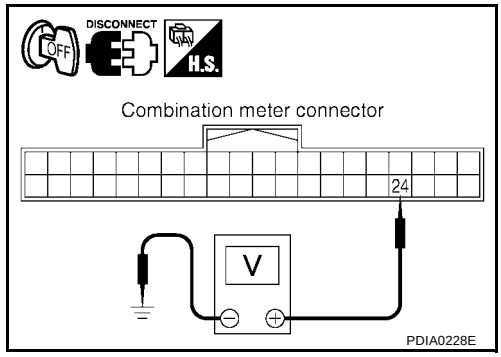
OK or NG

OK >> GO TO 3.
NG >> Repair open circuit or short to ground or short to power in harness or connectors.

3. CHECK COMBINATION METER POWER SUPPLY CIRCUIT

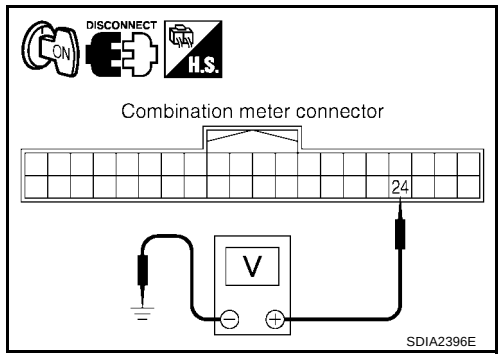
1. Turn ignition switch “OFF”.
2. Disconnect combination meter harness connector.
3. Check voltage between combination meter harness connector terminals and ground.

Connector	Terminal (Wire color)	Voltage (Approx.)
M24	24 (O/L) - Ground	0V



4. Turn ignition switch “ON”. (Do not start engine.)
5. Check voltage between combination meter harness connector terminals and ground.

Connector	Terminal (Wire color)	Voltage (Approx.)
M24	24 (O/L) - Ground	Battery voltage



OK or NG

OK >> GO TO 4.
NG >> Check the following. If any items are damaged, repair or replace damaged parts.

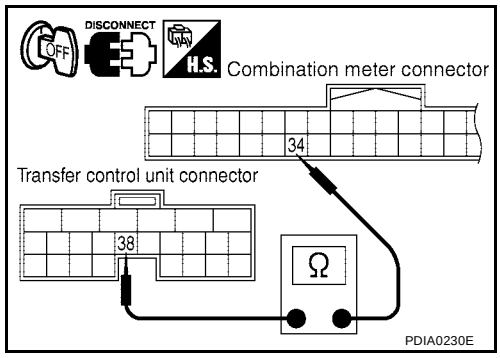
- 10A fuses [No. 26 located in the fuse and fusible link box or 59 located in the fuse and relay box]
- Harness for short or open between battery and combination meter harness connector terminal 24
- Battery and Ignition switch. Refer to PG-4, “POWER SUPPLY ROUTING CIRCUIT”.
- Transfer relay 1, 2. Refer to TF-40, "COMPONENT INSPECTION" .

4. CHECK HARNESS BETWEEN TRANSFER CONTROL UNIT AND COMBINATION METER

1. Turn ignition switch “OFF”.
2. Disconnect transfer control unit harness connector and combination meter harness connector.
3. Check continuity between transfer control unit harness connector E143 terminal 38 (W/B) and combination meter harness connector M24 terminal 34 (W/B).

Continuity should exist.

Also check harness for short to ground and short to power.



OK or NG

OK >> GO TO 5.
NG >> Repair or replace damaged parts.

5. CHECK 4WD WARNING LAMP CIRCUIT

1. Turn ignition switch “OFF”.
2. Check the combination meter. Refer to DI-5, "COMBINATION METERS" .

OK or NG

OK >> GO TO 6.
NG >> Replace the combination meter. Refer to DI-25, "Removal and Installation of Combination Meter" .

6. SYMPTOM CHECK

Check again.

OK or NG

OK >> **INSPECTION END**
NG >> GO TO 7.

7. CHECK TRANSFER CONTROL UNIT

Check transfer control unit input/output signal. Refer to TF-27, "Transfer Control Unit Input/Output Signal Reference Values" .

OK or NG

OK >> **INSPECTION END**
NG >> Check transfer control unit pin terminals for damage or loose connection with harness connector. If any items are damaged, repair or replace damaged parts.

4WD Shift Indicator Lamp or 4LO Indicator Lamp Do Not Change

UDS000CD

SYMPTOM:

4WD shift indicator lamp or 4LO indicator lamp do not change when switch 4WD shift switch.

DIAGNOSTIC PROCEDURE

1. CONFIRM THE SYMPTOM

Confirm 4WD shift indicator lamp and 4LO indicator lamp when ignition switch is turned to ON.

Do 4WD shift indicator lamp and 4LO indicator lamp turn on?

YES >> GO TO 2.
NO >> Go to TF-68, "4WD Shift Indicator Lamp and 4LO Indicator Lamp Do Not Turn ON" .

2. CHECK SYSTEM FOR 4WD SHIFT SWITCH

Perform trouble diagnosis for 4WD shift switch system. Refer to TF-45, "4WD Shift Switch" .

OK or NG

OK >> GO TO 3.
NG >> Repair or replace damaged parts.

3. CHECK SYSTEM FOR WAIT DETECTION SWITCH

Perform trouble diagnosis for wait detection switch system. Refer to TF-49, "Wait Detection Switch" .

OK or NG

OK >> GO TO 4.
NG >> Repair or replace damaged parts.

4. CHECK SYSTEM FOR 4LO SWITCH

Perform trouble diagnosis for 4LO switch system. Refer to TF-42, "4LO Switch" .

OK or NG

OK >> GO TO 5.
NG >> Repair or replace damaged parts.

5. CHECK SYSTEM FOR ATP SWITCH

Perform trouble diagnosis for ATP switch system. Refer to TF-64, "ATP Switch" .

OK or NG

OK >> GO TO 6.
NG >> Repair or replace damaged parts.

6. SYMPTOM CHECK

Check again.

OK or NG

OK >> **INSPECTION END**
NG >> GO TO 7.

7. CHECK TRANSFER CONTROL UNIT

Check transfer control unit input/output signal. Refer to TF-27, "Transfer Control Unit Input/Output Signal Reference Values" .

OK or NG

OK >> GO TO 8.
NG >> Check transfer control unit pin terminals for damage or loose connection with harness connector. If any items are damaged, repair or replace damaged parts.

8. CHECK TRANSFER INNER PARTS

1. Disassemble transfer assembly. Refer to TF-88, "Disassembly and Assembly" .
2. Check transfer inner parts.

OK or NG

OK >> **INSPECTION END**
NG >> Repair or replace damaged parts.

ATP Warning Lamp Does Not Turn ON

UDS0009P

SYMPTOM:

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

DIAGNOSTIC PROCEDURE

1. CHECK SYSTEM FOR CAN COMMUNICATION LINE

Perform self-diagnosis. Refer to TF-36, "Self-Diagnostic Procedure" .

Do the self-diagnostic results indicate CAN communication?

YES >> Perform trouble diagnosis for CAN communication line. Refer to LAN-8, "CAN COMMUNICATION" .
NO >> GO TO 2.

2. CHECK SYSTEM FOR 4WD SHIFT SWITCH

Perform trouble diagnosis for 4WD shift switch system. Refer to TF-45, "4WD Shift Switch" .

OK or NG

OK >> GO TO 3.
NG >> Repair or replace damaged parts.

3. CHECK SYSTEM FOR PNP SWITCH SIGNAL

Perform trouble diagnosis for PNP switch signal system. Refer to TF-52, "PNP Switch Signal" .

OK or NG

OK >> GO TO 4.
NG >> Repair or replace damaged parts.

4. CHECK SYSTEM FOR ATP SWITCH

Perform trouble diagnosis for ATP switch system. Refer to TF-64, "ATP Switch" .

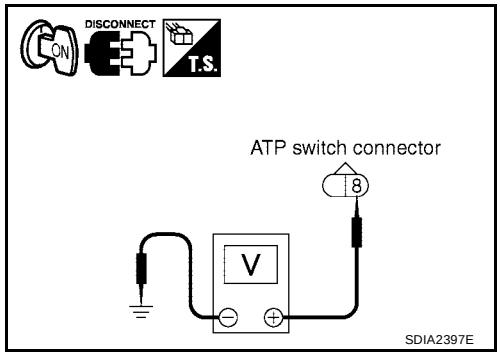
OK or NG

OK >> GO TO 5.
NG >> Repair or replace damaged parts.

5. CHECK ATP WARNING LAMP CIRCUIT

1. Turn ignition switch “ON”.
2. Disconnect ATP switch harness connector.
3. Check voltage between ATP switch harness connector terminal and ground.

Connector	Terminal (Wire color)	Condition		Voltage (Approx.)
F55	8 (R/B) - Ground	Ignition switch : ON	A/T selector lever “P” position	Battery voltage
			Except the above	0V



OK or NG

OK >> GO TO 9.
NG >> GO TO 6.

6. CHECK HARNESS BETWEEN TRANSFER CONTROL UNIT AND COMBINATION METER

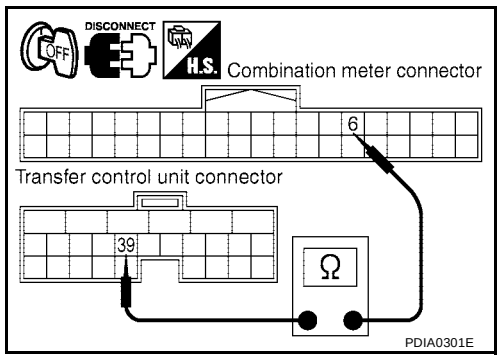
1. Turn ignition switch “OFF”.
2. Disconnect transfer control unit harness connector and combination meter harness connector.
3. Check continuity between transfer control unit harness connector E143 terminal 39 (L/B) and combination meter harness connector M24 terminal 6 (L/B).

Continuity should exist.

Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 7.
NG >> Repair or replace damaged parts.

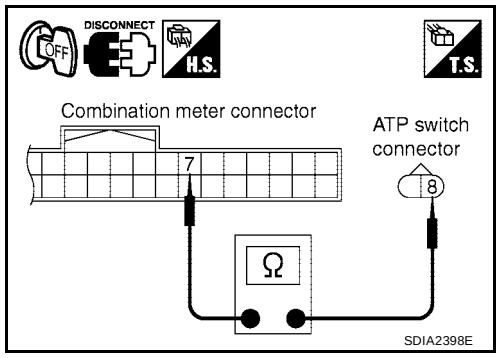


7. CHECK HARNESS BETWEEN COMBINATION METER AND ATP SWITCH

1. Turn ignition switch “OFF”.
2. Disconnect combination meter harness connector and ATP switch harness connector.
3. Check continuity between combination meter harness connector M24 terminal 7 (R/B) and ATP switch harness connector F55 terminal 8 (R/B).

   Continuity should exist.

   Also check harness for short to ground and short to power.



OK or NG

OK >> GO TO 8.
NG >> Repair or replace damaged parts.

8. CHECK ATP WARNING LAMP CIRCUIT

1. Turn ignition switch “OFF”.
2. Check the combination meter. Refer to DI-5, "COMBINATION METERS" .

OK or NG

OK >> GO TO 9.
NG >> Replace the combination meter. Refer to DI-25, "Removal and Installation of Combination Meter" .

9. SYMPTOM CHECK

Check again.

OK or NG

OK >> **INSPECTION END**
NG >> GO TO 10.

10. CHECK TRANSFER CONTROL UNIT

Check transfer control unit input/output signal. Refer to TF-27, "Transfer Control Unit Input/Output Signal Reference Values" .

OK or NG

OK >> GO TO 11.
NG >> Check transfer control unit pin terminals for damage or loose connection with harness connector. If any items are damaged, repair or replace damaged parts.

11. CHECK TRANSFER INNER PARTS

1. Disassemble transfer assembly. Refer to TF-88, "Disassembly and Assembly" .
2. Check transfer inner parts.

OK or NG

OK >> **INSPECTION END**
NG >> Repair or replace damaged parts.

4WD Shift Indicator Lamp Repeats Flashing

UDS000CE

SYMPTOM:

4WD shift indicator lamp keeps flashing.

DIAGNOSTIC PROCEDURE

1. CONFIRM THE SYMPTOM

1. Set 4WD shift switch to “2WD”.
2. Move vehicle forward and backward, or drive straight increasing or decreasing under 20 km/h (12 MPH).

Does 4WD shift indicator lamp keep flashing?

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

2. CHECK SYSTEM FOR WAIT DETECTION SWITCH

Perform trouble diagnosis for wait detection switch system. Refer to TF-49, "Wait Detection Switch" .

OK or NG

OK >> GO TO 3.
NG >> Repair or replace damaged parts.

3. CHECK SYSTEM FOR 4LO SWITCH

Perform trouble diagnosis for 4LO switch system. Refer to TF-42, "4LO Switch" .

OK or NG

OK >> GO TO 4.
NG >> Repair or replace damaged parts.

4. SYMPTOM CHECK

Check again.

OK or NG

OK >> **INSPECTION END**
NG >> GO TO 5.

5. CHECK TRANSFER CONTROL UNIT

Check transfer control unit input/output signal. Refer to TF-27, "Transfer Control Unit Input/Output Signal Reference Values" .

OK or NG

OK >> GO TO 6.
NG >> Check transfer control unit pin terminals for damage or loose connection with harness connector. If any items are damaged, repair or replace damaged parts.

6. CHECK TRANSFER INNER PARTS

1. Disassemble transfer assembly. Refer to TF-88, "Disassembly and Assembly" .
2. Check transfer inner parts.

OK or NG

OK >> **INSPECTION END**
NG >> Repair or replace damaged parts.

4WD Warning Lamp Flashes Slowly

UDS000CF

SYMPTOM:

While driving, 4WD warning lamp flashes slowly. (When continuing to flash until turning ignition switch OFF.)

NOTE:
Slow flashing: 1 time/2 seconds

DIAGNOSTIC PROCEDURE

1. CHECK TIRE

Check the following.

- Tire pressure
- Wear condition
- Longitudinal tire size (There is no difference between longitudinal tires.)

OK or NG

OK >> GO TO 2.
NG >> Repair or replace damaged parts.

2. SYMPTOM CHECK

Check again.

OK or NG

OK >> **INSPECTION END**
NG >> GO TO 3.

3. CHECK TRANSFER CONTROL UNIT

Check transfer control unit input/output signal. Refer to TF-27, "Transfer Control Unit Input/Output Signal Reference Values" .

OK or NG

OK >> **INSPECTION END**
NG >> Check transfer control unit pin terminals for damage or loose connection with harness connector. If any items are damaged, repair or replace damaged parts.

TRANSFER CONTROL UNIT

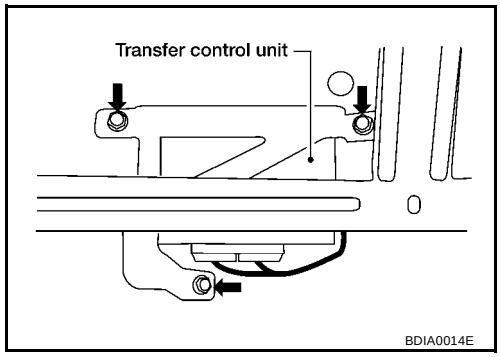
PFP:33084

Removal and Installation

EDS0031F

REMOVAL

1. Switch 4WD shift switch to 2WD and set transfer assembly to 2WD.
2. Remove the glove box assembly. Refer to IP-14, "LOWER INSTRUMENT PANEL RH AND GLOVE BOX" .
3. Disconnect transfer control unit connectors.
4. Remove the transfer control unit.



INSTALLATION

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

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

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

- After the installation, check 4WD shift indicator pattern. If NG, adjust position between transfer assembly and transfer control unit. Refer to TF-5, "METHOD FOR ADJUSTMENT WITH 4WD SHIFT SWITCH AT “4H” OR “4LO”" .

FRONT OIL SEAL

PFP:38189

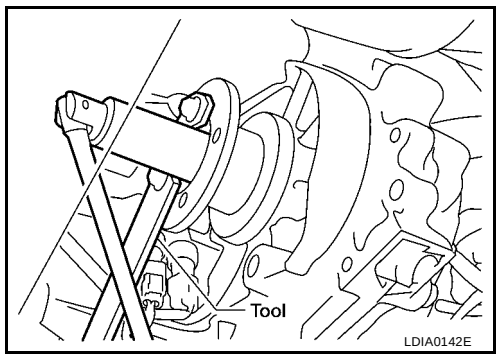
Removal and Installation

UDS0009U

REMOVAL

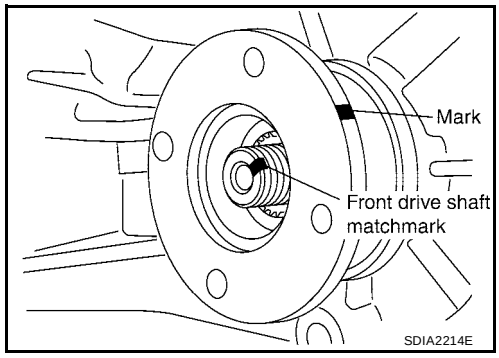
1. Partially drain transfer fluid. Refer to MA-24, "Changing Transfer Fluid" .
2. Remove front propeller shaft. Refer to PR-4, "Removal and Installation" .
3. Remove companion frange self-lock nut, using flange wrench.

   Tool number : KV40104000 (—)

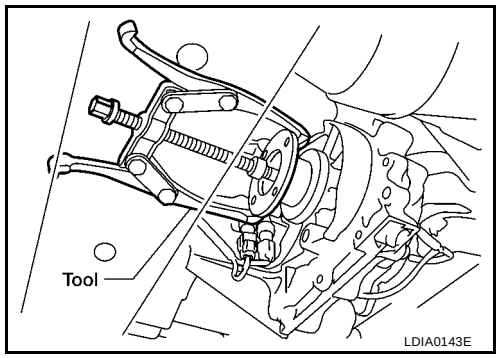


4. Put a matchmark on top of front drive shaft thread. The mark should be in line with the mark on the companion flange.

   CAUTION:
   Always mark top of front drive shaft screw using paint.



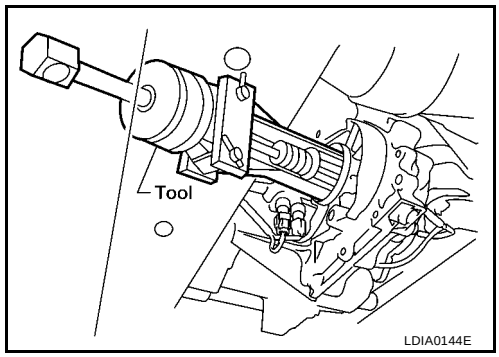
5. Remove companion flange, using suitable tool.



6. Remove front oil seal from front case, using puller.

   Tool number : ST33290001 (J34286)

   CAUTION:
   Be careful not to damage the front case.

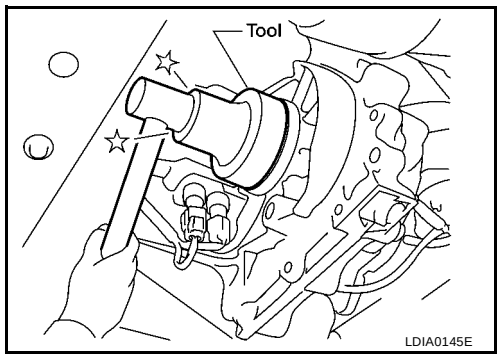


INSTALLATION

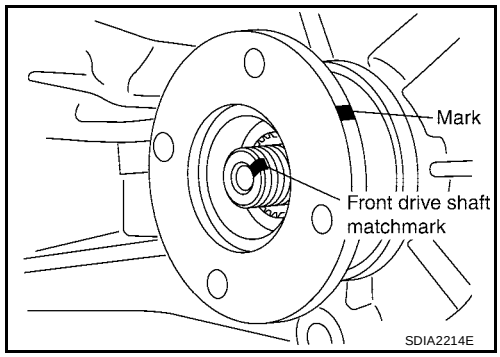
1. Install front oil seal until it is flush with end face of front case, using drift.

   Tool number : KV38100500 (—)

   CAUTION:
   - **Do not reuse oil seal.**
   - **Apply petroleum jelly to oil seal.**



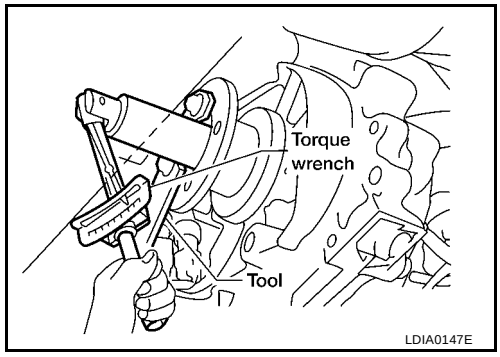
2. Install companion flange while align the matchmark of front drive shaft with the mark of companion flange.



3. Tighten self-lock nut to the specified torque, with flange wrench. Refer to TF-88, "COMPONENTS" .

   Tool number : KV40104000 (—)

   CAUTION:
   Do not reuse self-lock nut.
4. Install front propeller shaft. Refer to PR-4, "Removal and Installation" .
5. Refill transfer fluid, check fluid level and for fluid leakage. Refer to MA-24, "Changing Transfer Fluid" .



REAR OIL SEAL

PFP:33140

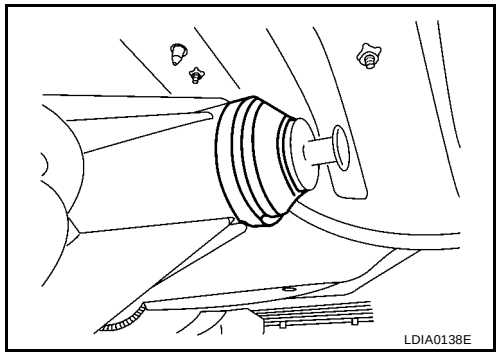
Removal and Installation

UDS0009V

REMOVAL

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

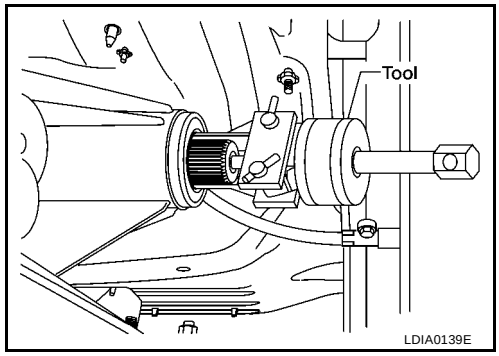
CAUTION:
Be careful not to damage the rear case.



4. Remove rear oil seal from rear case, using puller.

CAUTION:
Be careful not to damage the rear case.

Tool number : ST33290001 (J34286)

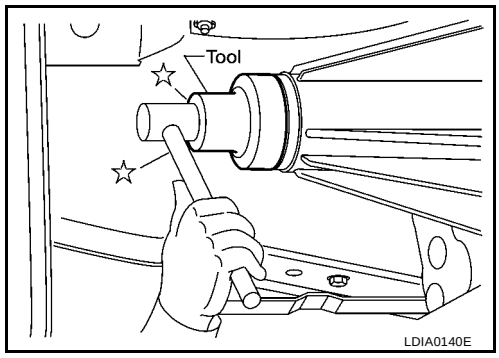


INSTALLATION

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

Tool number : KV38100500 (—)

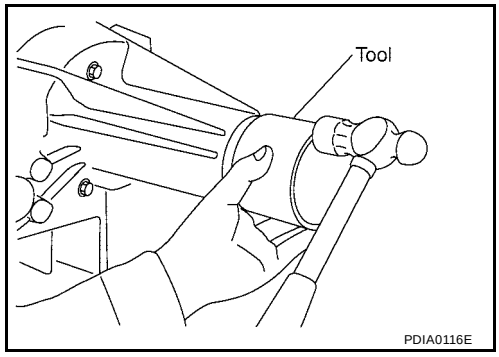
CAUTION:
- **Do not reuse oil seal.**
- **Apply petroleum jelly to oil seal.**



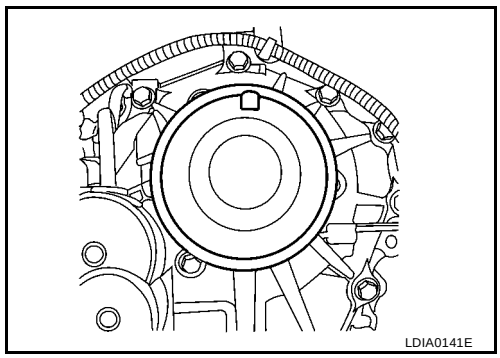
2. Install dust cover to rear case, using drift.

Tool number : KV40105310 (—)

CAUTION:
- **Do not reuse dust cover.**
- **Apply petroleum jelly to dust cover.**



- **Be sure to align indicator at top of transfer as shown.**



3. Install the rear propeller shaft. Refer to PR-8, "Removal and Installation" .
4. Refill transfer fluid, check fluid level and for fluid leakage. Refer to MA-24, "Changing Transfer Fluid" .

TRANSFER CONTROL DEVICE

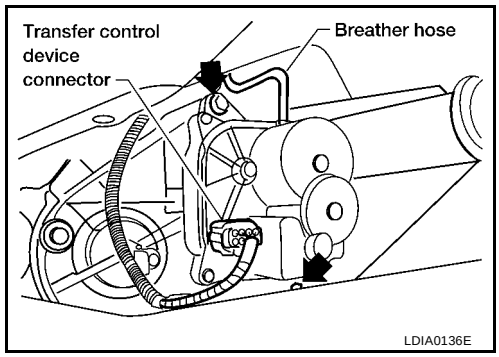
PFP:33251

Removal and Installation

UDS000AY

REMOVAL

1. Switch 4WD shift switch to 2WD and set transfer assembly to 2WD.
2. Disconnect transfer control device harness connector.
3. Remove breather hose from transfer control device.
4. Remove bolts and detach control device.

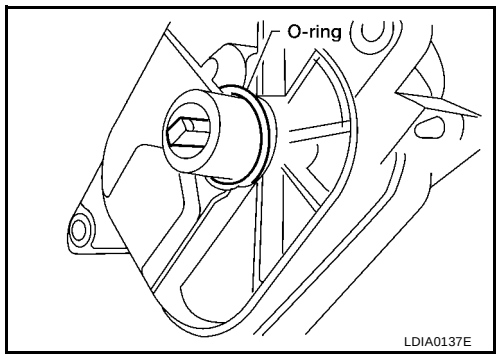


INSTALLATION

1. Install O-ring to transfer control device.

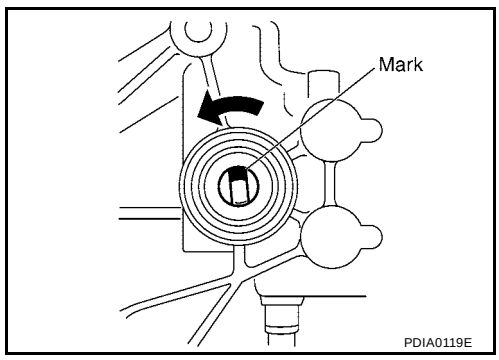
CAUTION:

- **Do not reuse O-ring.**
- **Apply petroleum jelly.**



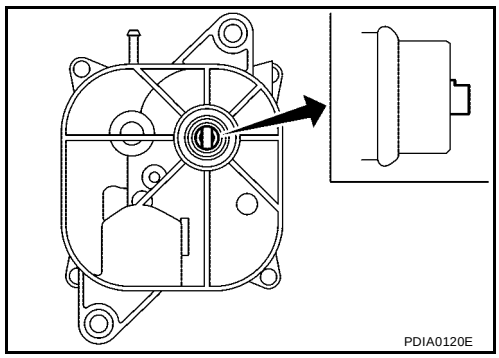
2. Install transfer control device.

a. Turn control shift rod fully counterclockwise using flat-bladed screwdriver, and then put mark on control shift rod.



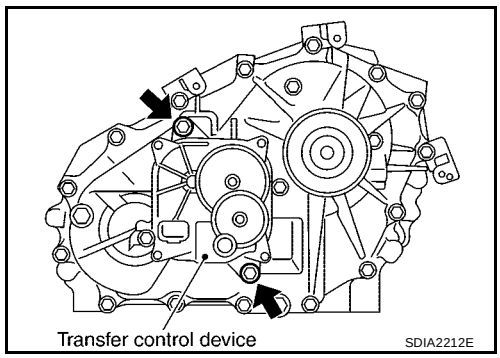
b. Align transfer control device shaft cutout with mark on control shift rod, and install.

NOTE:
Turn transfer control device when transfer control device connection does not match.



c. Tighten bolts to the specified torque. Refer to TF-88, "COMPONENTS" .

3. Install breather hose to transfer control device.
4. Connect transfer control device harness connector.
5. After the installation, check 4WD shift indicator pattern. If NG, adjust position between transfer assembly and transfer control unit. Refer to TF-4, "Precautions for Transfer Assembly and Transfer Control Unit Replacement" .



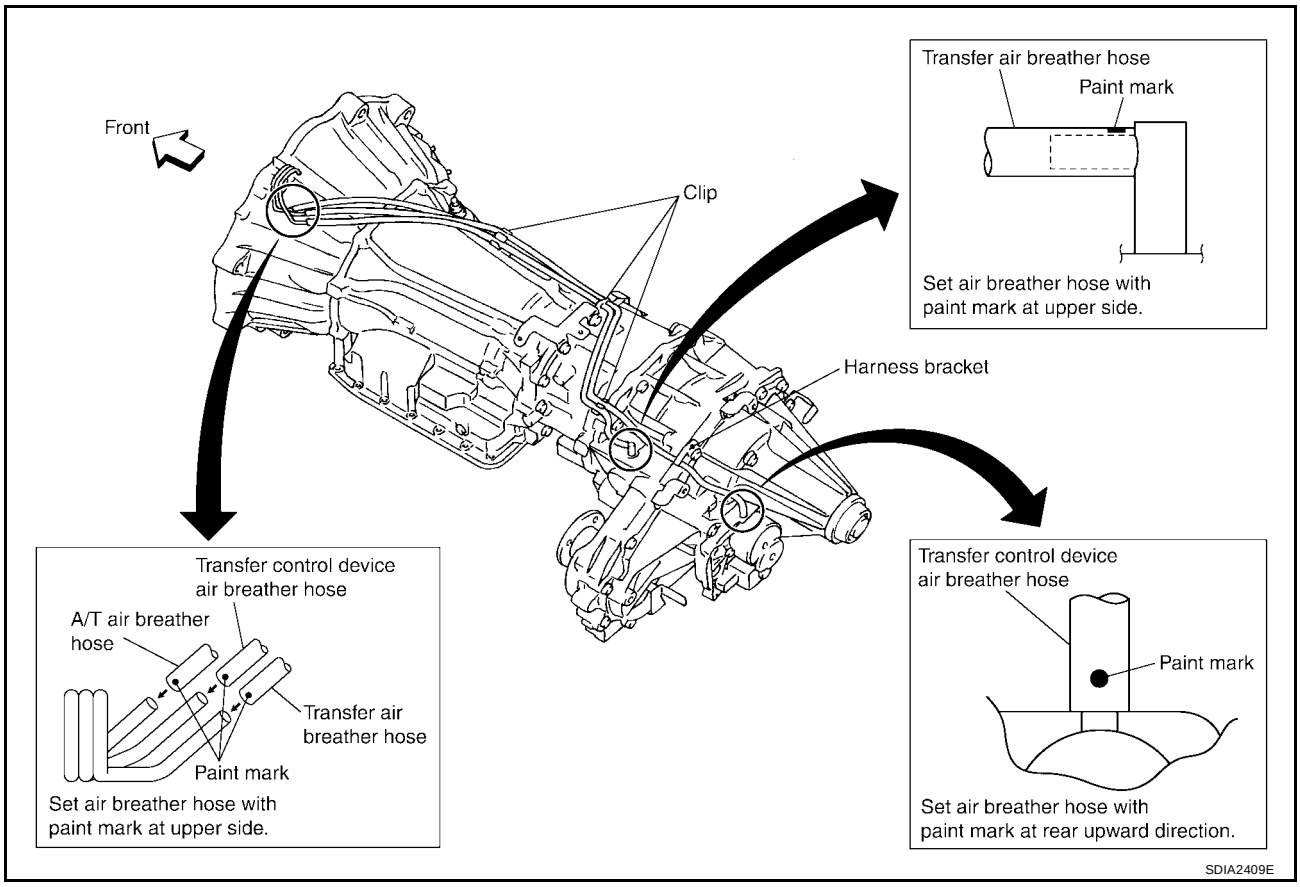
AIR BREATHER HOSE

PFP:31098

Removal and Installation

EDS0031G

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



CAUTION:

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

TRANSFER ASSEMBLY

PFP:33100

Removal and Installation

EDS0031H

REMOVAL

1. Switch 4WD shift switch to 2WD and set transfer assembly to 2WD.
2. Remove A/T undercover using power tools.
3. Remove center exhaust tubes and muffler. Refer to EX-4, "REMOVAL" .
4. Remove front and rear propeller shafts. Refer to PR-5, "REMOVAL" (front), PR-9, "REMOVAL" (rear).

   CAUTION:
   Do not damage spline, sleeve yoke or rear oil seal when removing the rear propeller shaft.

   NOTE:
   Insert a plug into rear oil seal after removing rear propeller shaft.
5. Remove A/T bolts. Refer to AT-269, "REMOVAL" .
6. Position two suitable jacks under A/T and transfer assembly.
7. Remove A/T crossmember. Refer to AT-269, "COMPONENTS" .

   WARNING:
   Support A/T and transfer assembly using two suitable jacks while removing A/T crossmember.
8. Remove breather hoses from the transfer rear case and transfer control device.
9. Disconnect the electrical connectors from the following:
   - ATP switch
   - 4LO switch
   - Wait detection switch
   - Transfer control device
10. Remove transfer to A/T and A/T to transfer bolts.

    WARNING:
    Support transfer assembly using suitable jack while removing it.
11. Remove transfer assembly.

    CAUTION:
    Do not damage rear oil seal (A/T).

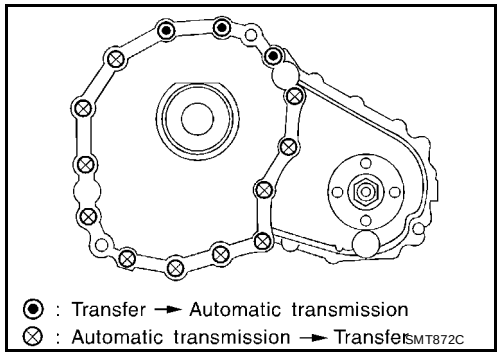
INSTALLATION

Install in the reverse order of removal.

- When installing the transfer to the transmission, install the bolts to the specified torque.

  Tightening torque : 36 N·m (3.7kg-m, 26 ft-lb)

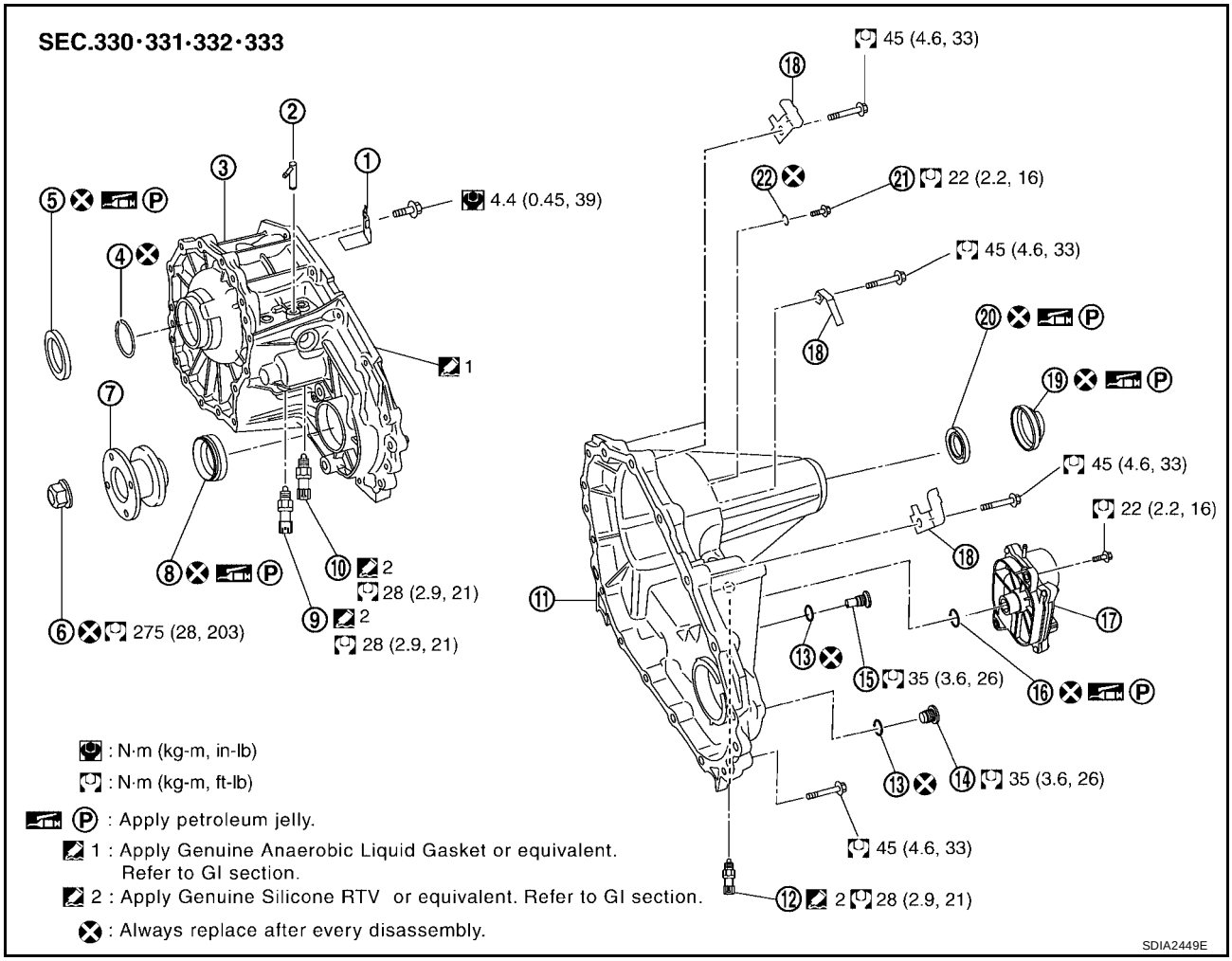
- Check the fluid level and for fluid leakage. Refer to MA-24, "Changing Transfer Fluid" .
- After the installation, check 4WD shift indicator pattern. If NG, adjust position between transfer assembly and transfer control unit. Refer to TF-4, "Precautions for Transfer Assembly and Transfer Control Unit Replacement" .



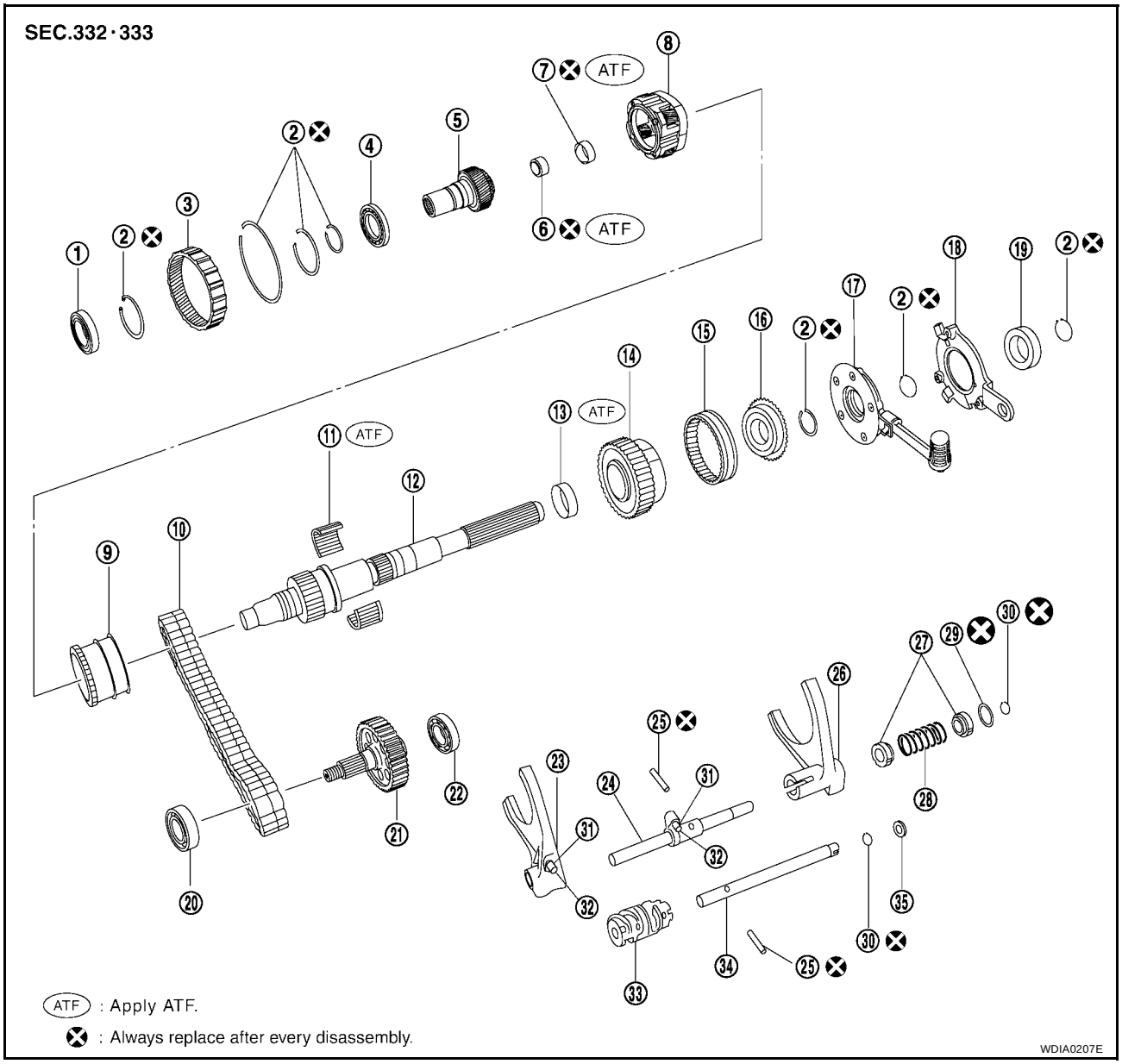
Disassembly and Assembly

EDS0031I

COMPONENTS



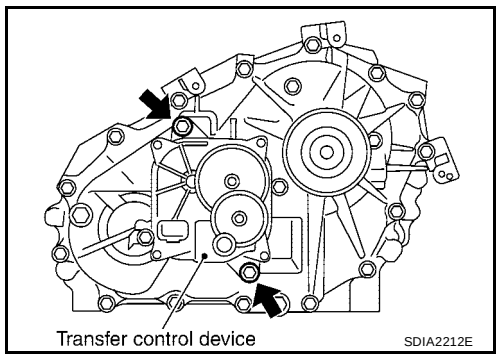
1. Baffle plate
2. Breather tube
3. Front case
4. Snap ring
5. Input oil seal
6. Self-lock nut
7. Companion flange
8. Front oil seal
9. 4LO switch (gray with green paint)
10. ATP switch (black)
11. Rear case
12. Wait detection switch (gray)
13. Gasket
14. Filler plug
15. Drain plug
16. O-ring
17. Transfer control device
18. Harness bracket
19. Dust cover
20. Rear oil seal
21. Retainer bolt
22. Gasket



1. Input bearing
2. Snap ring
3. Internal gear
4. Carrier bearing
5. Sun gear
6. Needle bearing
7. Metal bushing
8. Planetary carrier assembly
9. L-H sleeve
10. Drive chain
11. Mainshaft
12. Sprocket
13. 2-4 sleeve
14. Clutch gear
15. Oil pump assembly
16. Retainer
17. Mainshaft rear bearing
18. Front bearing
19. Front drive shaft
20. Rear bearing
21. L-H shift fork
22. L-H shift rod
23. Retaining pin
24. 2-4 shift bracket
25. 2-4 shift fork
26. Fork guide collar
27. 2-4 shift fork spring
28. Retaining ring
29. Snap ring
30. Shift collar
31. Clevis pin
32. Drum cam
33. Control shift rod
34. Spacer

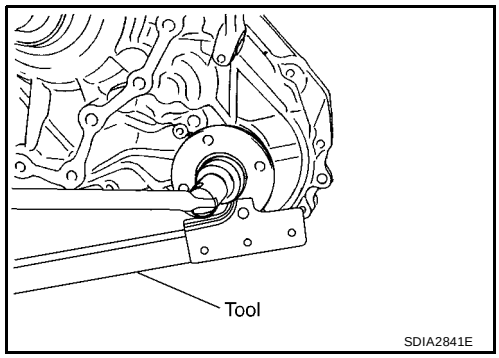
DISASSEMBLY

1. Remove drain plug and filler plug.
2. Remove transfer control device from rear case.
3. Remove O-ring form transfer control device.



4. Remove the self-lock nut from the companion flange, using Tool.

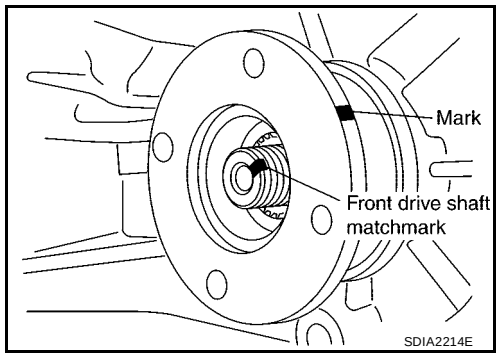
   Tool number : KV40104000 (—)



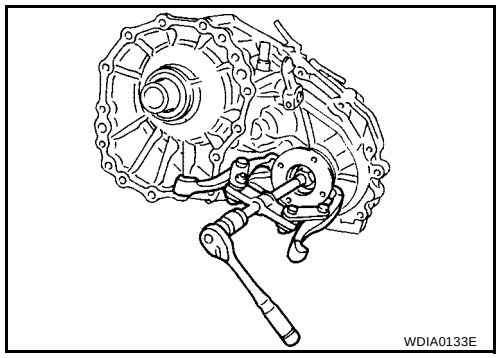
5. Put a matching mark on top of the front drive shaft in line with the mark on the companion flange.

   CAUTION:

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



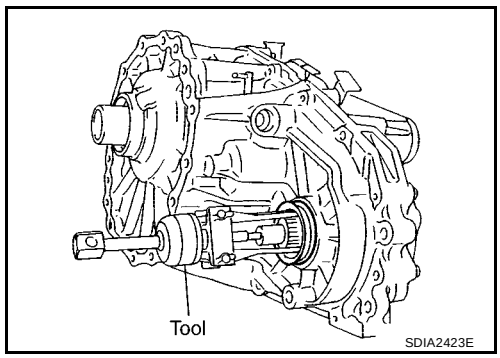
6. Remove the companion flange, using suitable tool.



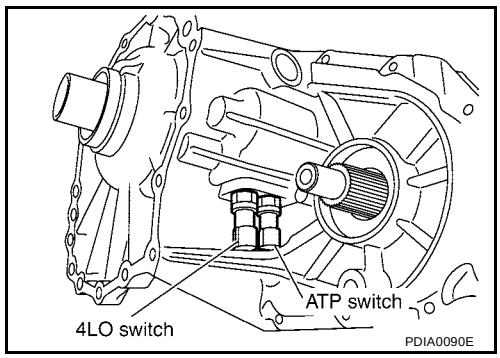
7. Remove front oil seal from front case, using Tool.

Tool number : ST33290001 (J-34286)

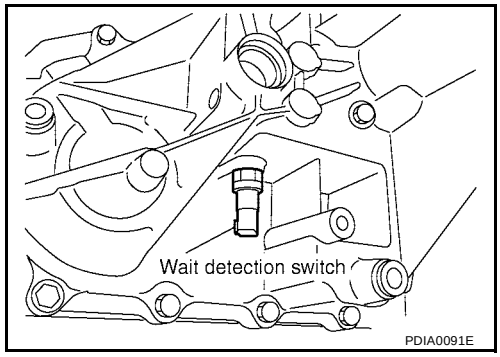
CAUTION:
Do not damage the front case or front drive shaft.



8. Remove the 4LO switch [gray (with green paint)] and ATP switch (black) from front case.

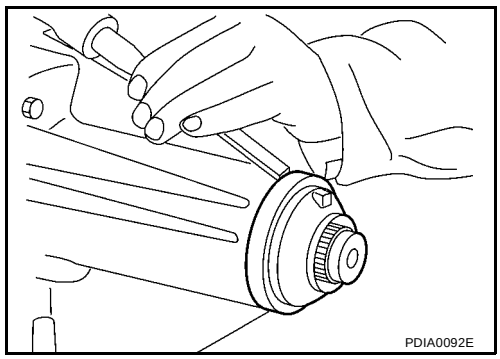


9. Remove wait detection switch (gray) from rear case.



10. Remove dust cover from rear case, using suitable tool.

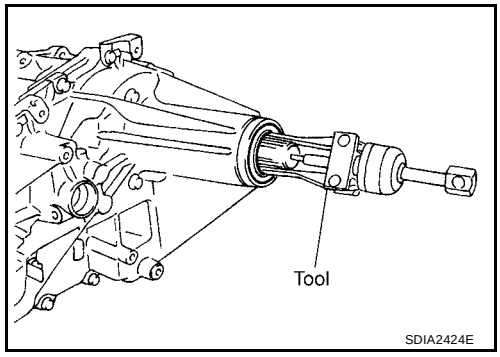
CAUTION:
Do not damage the rear case.



11. Remove rear oil seal from rear case, using Tool.

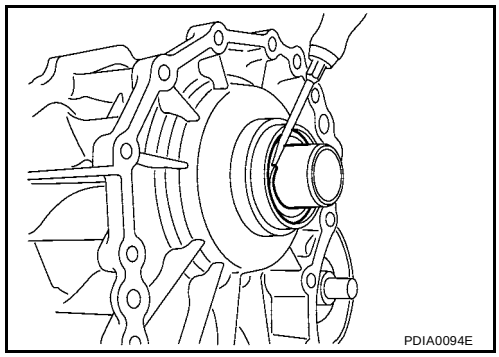
Tool number : ST33290001 (J-34286)

CAUTION:
Do not damage the rear case or mainshaft.

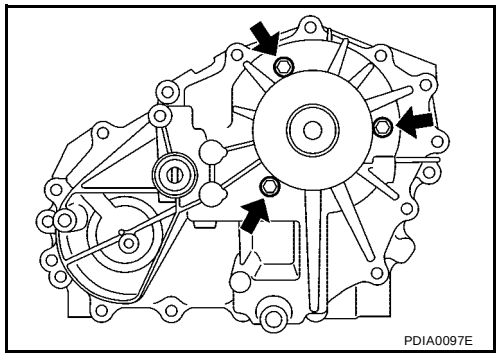


12. Remove the input oil seal from front case, using suitable tool.

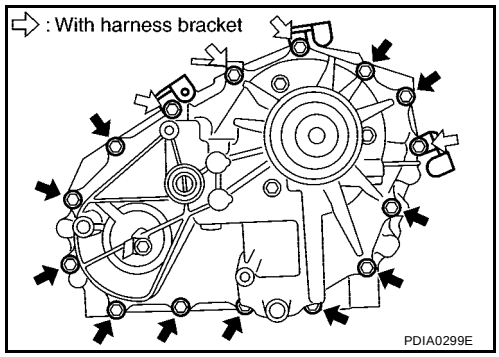
CAUTION:
Do not damage the front case, sun gear or input bearing.



13. Remove the retainer bolts and gaskets.



14. Remove rear case bolts and harness bracket from rear case.

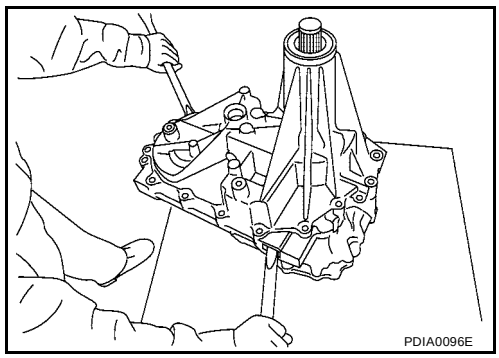


15. Separate front case and rear case. Then remove rear case by prying it up, using suitable tool.

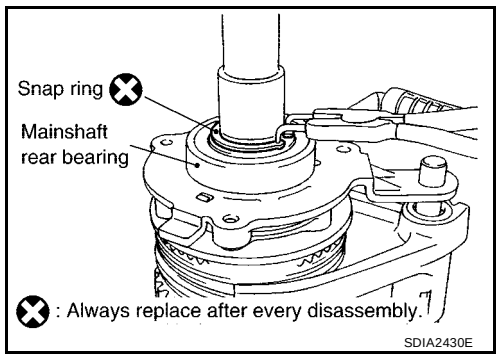
CAUTION:
Do not damage the mating surface.

16. Remove spacer from the control shift rod.

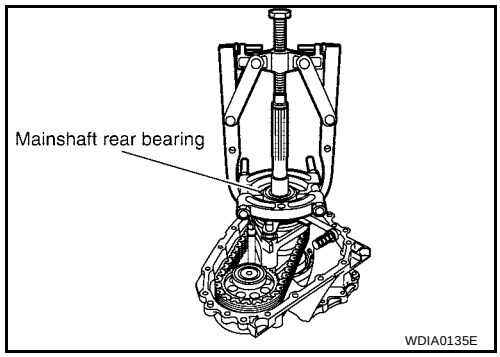
CAUTION:
Do not drop spacer.



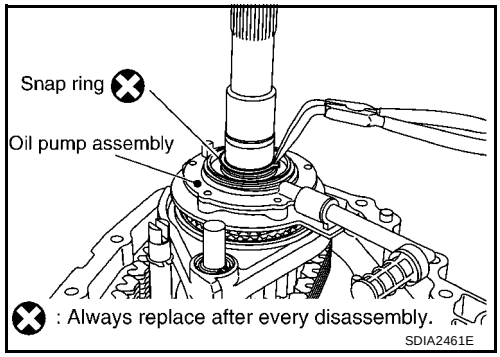
17. Remove snap ring from mainshaft, using suitable tool.



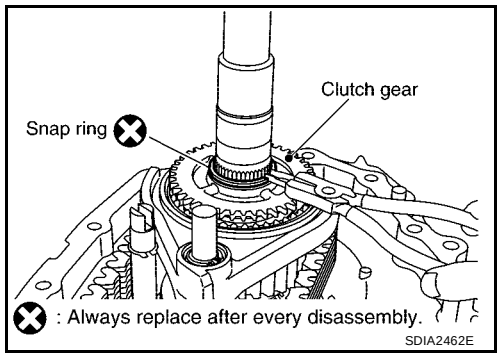
18. Remove the mainshaft rear bearing from mainshaft, using suitable tool.
19. Remove retainer from mainshaft.



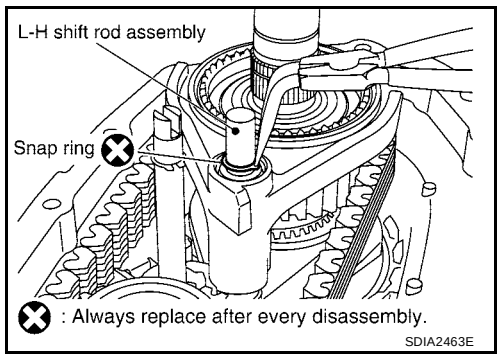
20. Remove snap ring from mainshaft, using suitable tool.
21. Remove oil pump assembly from mainshaft.



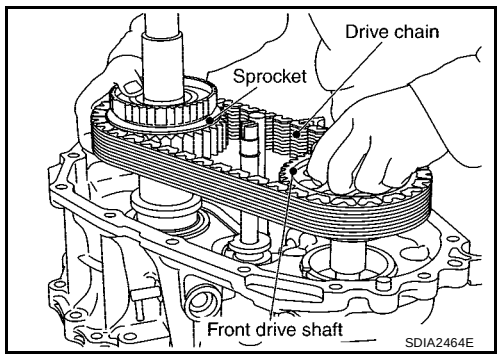
22. Remove snap ring from mainshaft, using suitable tool.
23. Remove clutch gear from mainshaft.



24. Remove snap ring from L-H shift rod assembly, using suitable tool.
25. Remove 2-4 sleeve and 2-4 shift fork assembly from mainshaft.

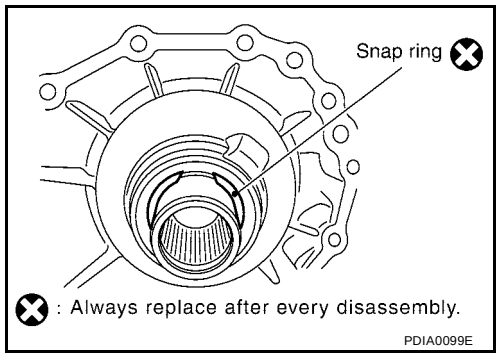


26. Remove drive chain together with sprocket and front drive shaft from front case.
27. Remove spacer and needle bearing from mainshaft.
28. Remove mainshaft from sun gear assembly.
29. Remove L-H shift rod assembly and control shift rod assembly from front case.
30. Remove L-H sleeve together with L-H shift fork assembly from planetary carrier assembly.



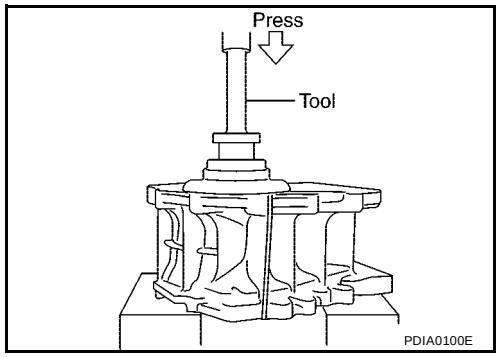
31. Remove snap ring from sun gear.

CAUTION:
Do not damage the sun gear or input bearing.

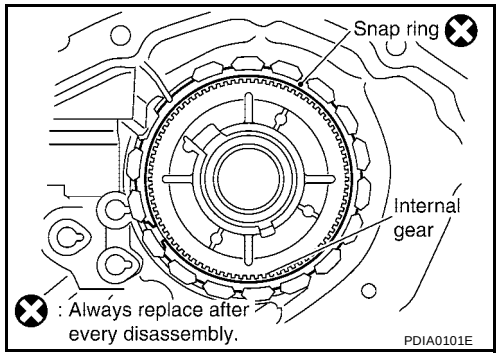


32. Press the sun gear assembly and planetary carrier assembly from front case, using Tool.

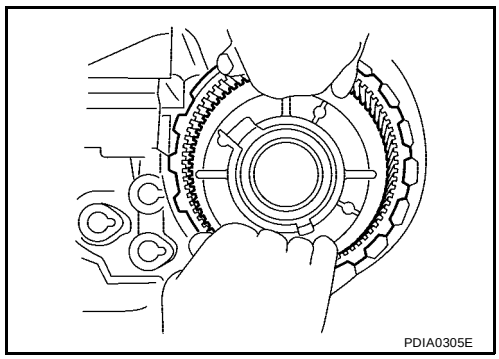
Tool number : KV38100200 (—)



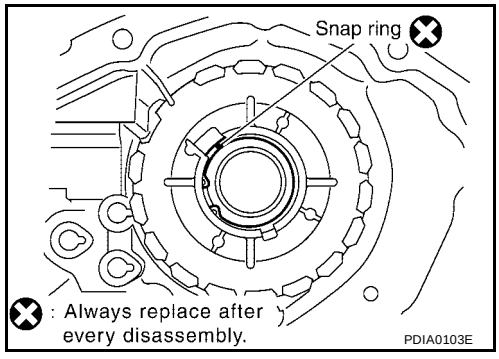
33. Remove snap ring from front case.



34. Remove internal gear from front case.

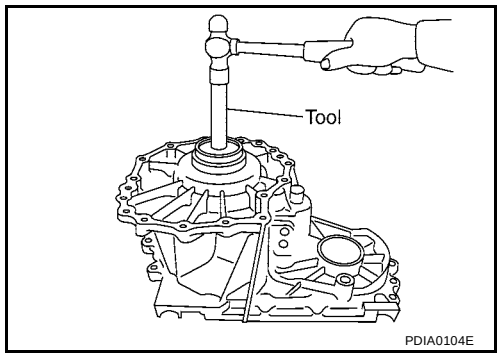


35. Remove snap ring from front case.

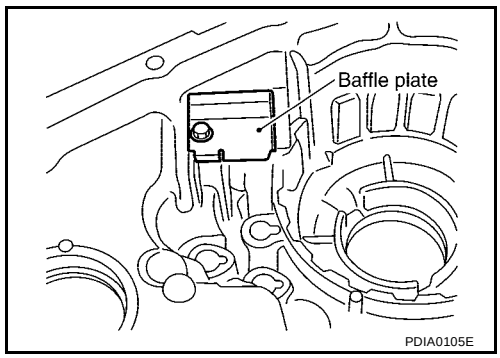


36. Remove the input bearing from front case, using Tool.

Tool number : KV38100200 (—)



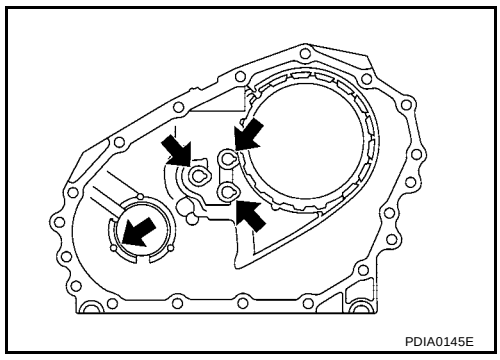
37. Remove baffle plate from front case.
38. Remove the breather tube from front case.



INSPECTION AFTER DISASSEMBLY

Case

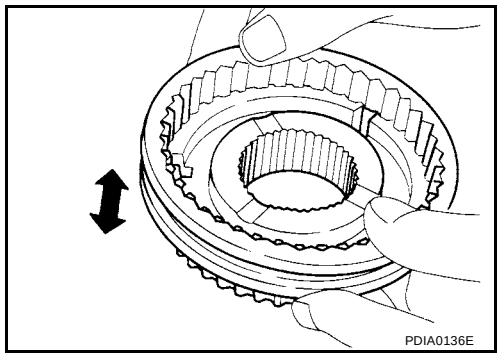
Check contact surfaces of shift rod and bearing for wear and damage. If any is found, replace with new one.



Sleeve

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

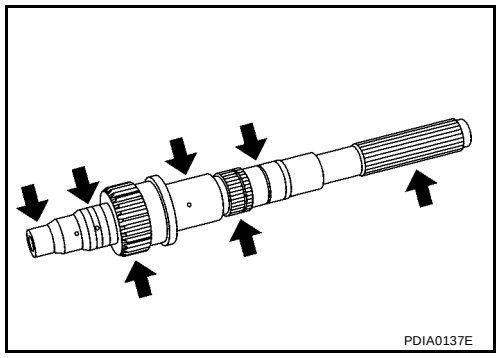
- Damage and excessive wear of contact surfaces of sprocket, mainshaft and sleeve.
- Sleeve must move smoothly.



Gear, Shaft and Drive Chain

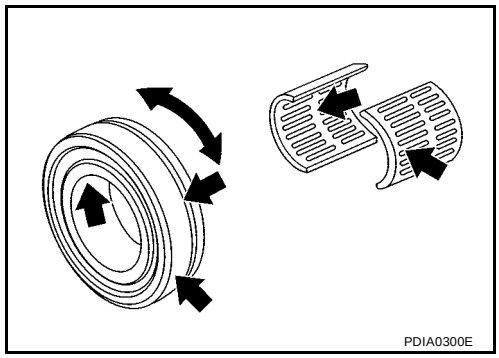
Check items below. If necessary, replace them with new ones.

- Damage, peeling, uneven wear and bending of the shaft.
- Excessive wear, damage and peeling of the gear.
- Excessive wear or damage to the drive chain



Bearing

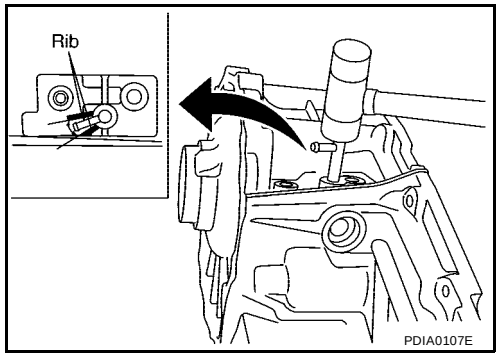
Check the bearing for damage and rough rotation. If necessary, replace it with a new one.



ASSEMBLY

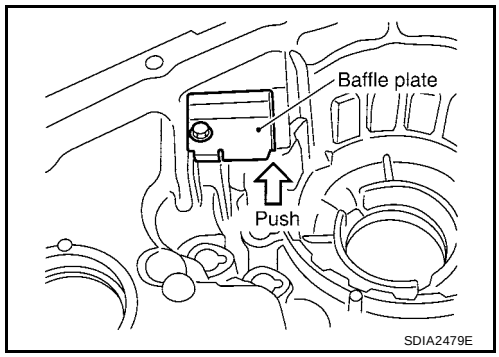
1. Install breather tube.

   CAUTION:
   Install breather tube in the direction shown.



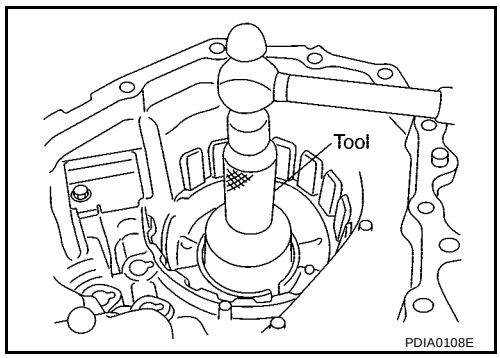
2. Install baffle plate to front case, and tighten bolt to the specified torque. Refer to TF-88, "COMPONENTS" .

   CAUTION:
   Install baffle plate by pushing it in the direction shown while tightening the bolt.



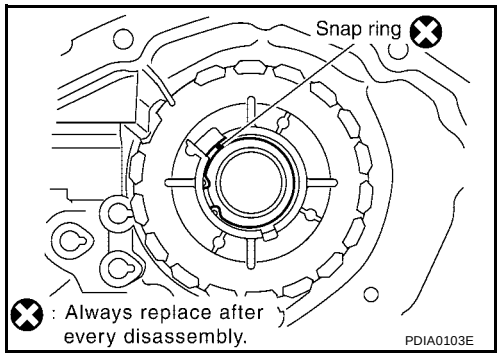
3. Install the input bearing to front case, using Tool.

Tool number : ST30720000 (J-25405)

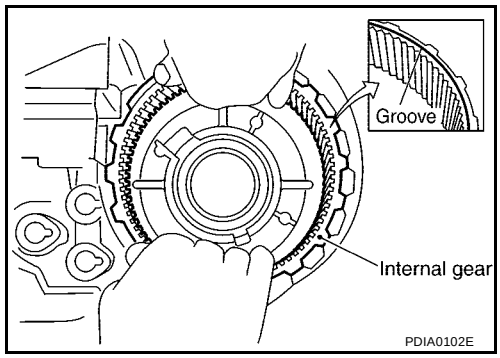


4. Install snap ring to front case.

CAUTION:
Do not reuse snap ring.

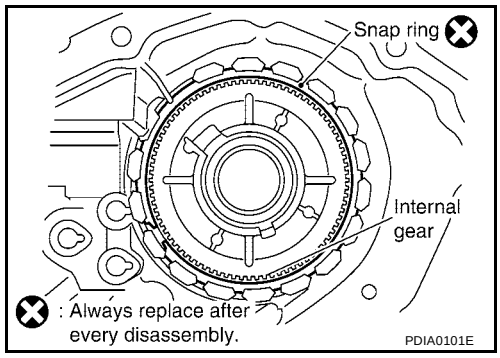


5. Install internal gear with groove facing up into front case.



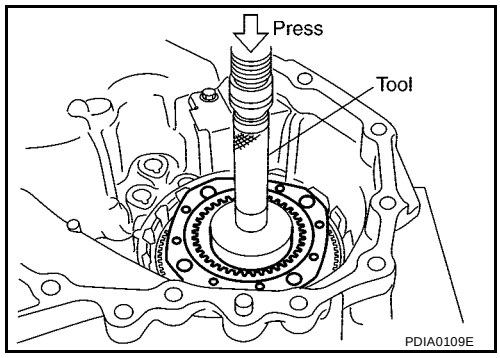
6. Install snap ring to front case.

CAUTION:
Do not reuse snap ring.



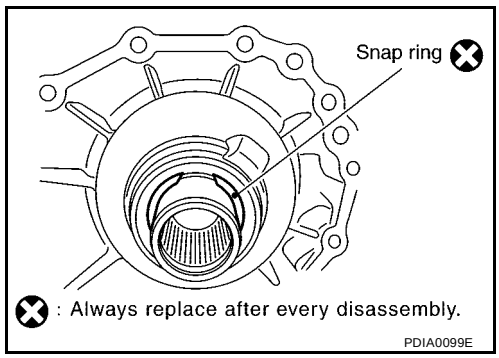
7. Install the planetary carrier assembly and sun gear assembly to front case, using Tool.

Tool number : KV38100200 (—)

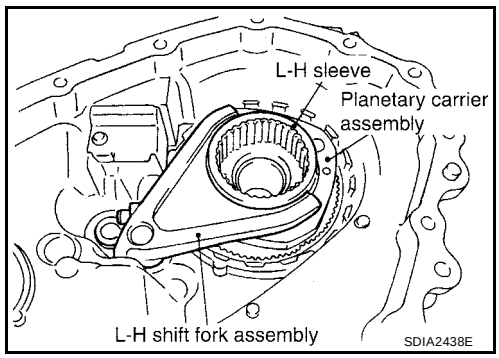


8. Install snap ring to sun gear.

CAUTION:
- **Do not reuse snap ring.**
- **Do not damage the sun gear.**



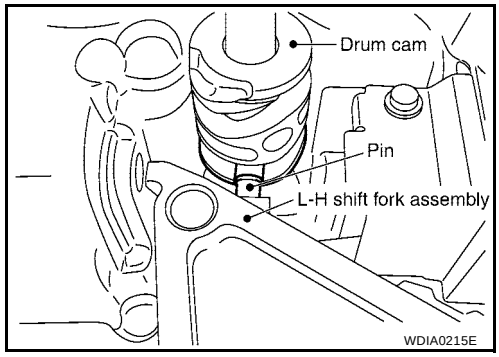
9. Set L-H sleeve together with L-H shift fork assembly onto planetary carrier assembly.



10. Install control shift rod assembly to front case.

CAUTION:
Set pin of L-H shift fork assembly into the groove of drum cam.

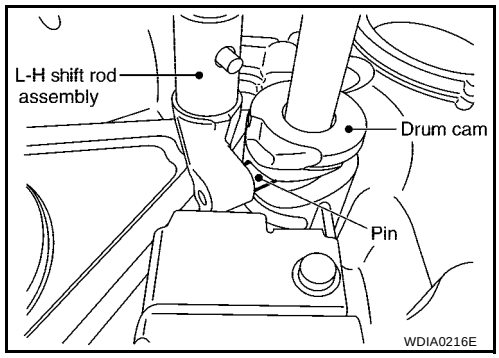
11. Turn control shift rod assembly fully counterclockwise.



12. Install L-H shift rod assembly through L-H shift fork assembly opening to front case.

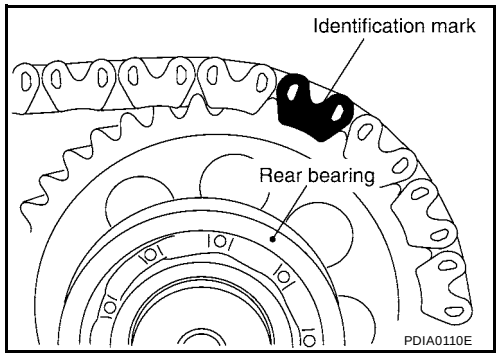
CAUTION:
Set pin of L-H shift rod assembly into the groove of drum cam.

13. Install mainshaft to sun gear assembly.
14. Apply ATF to spacer and periphery of needle bearing, install to mainshaft.

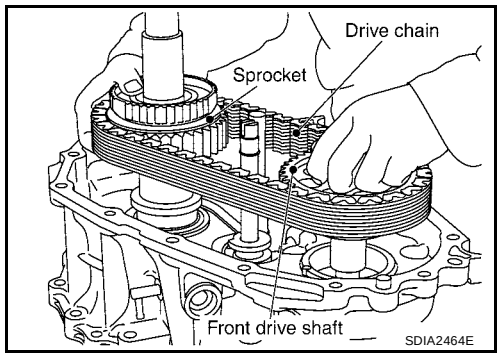


15. Set front drive shaft and sprocket to drive chain.

CAUTION:
Identification mark of drive chain should be on the side of rear bearing of front drive shaft.



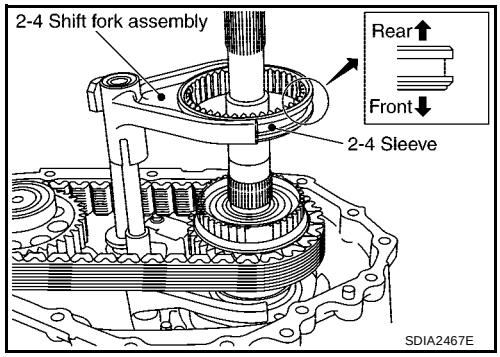
16. Install drive chain together with front drive shaft and sprocket to front case.



17. Install 2-4 sleeve and 2-4 shift fork assembly to mainshaft.

CAUTION:

- **Install with proper orientation of 2-4 sleeve.**
- **Install 2-4 shift fork with engaging the grooves of 2-4 shift fork in the retaining pin of 2-4 shift bracket.**

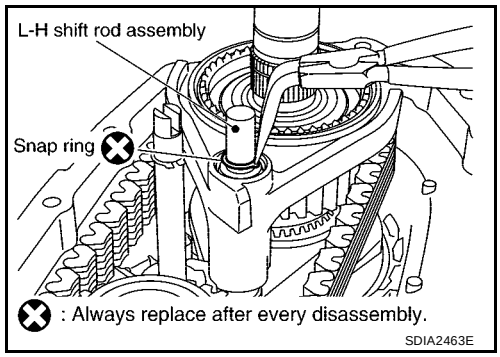


18. Install snap ring to L-H shift rod assembly, using suitable tool.

CAUTION:

Do not reuse snap ring.

19. Install clutch gear to mainshaft.

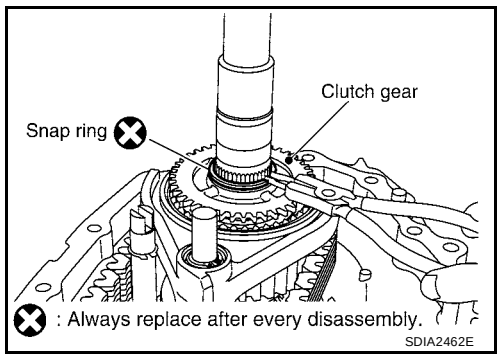


20. Install snap ring to mainshaft, using suitable tool.

CAUTION:

Do not reuse snap ring.

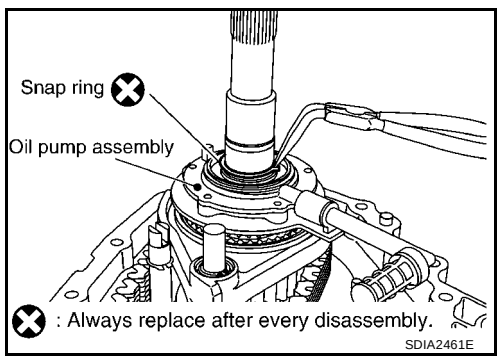
21. Install oil pump assembly to mainshaft.



22. Install snap ring to mainshaft, using suitable tool.

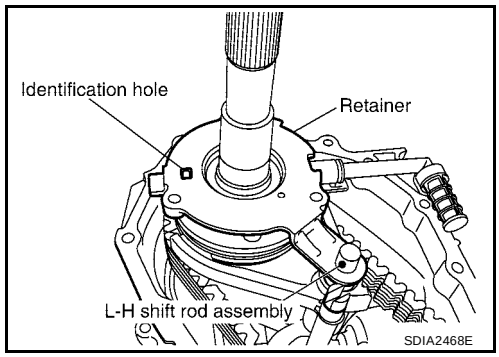
CAUTION:

Do not reuse snap ring.



23. Install retainer to mainshaft.

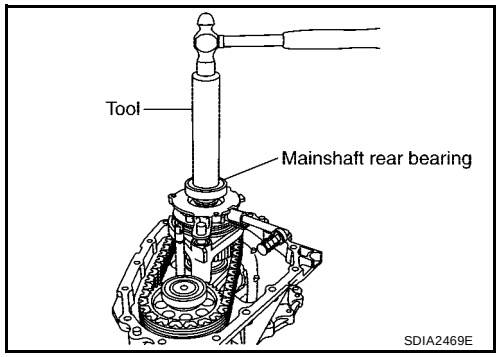
CAUTION:
Set the projection of oil pump assembly to identification hole, and then align locating hole of retainer to L-H shift rod assembly.



24. Install the mainshaft rear bearing to mainshaft, using Tool.

Tool number : KV32102700 (—)

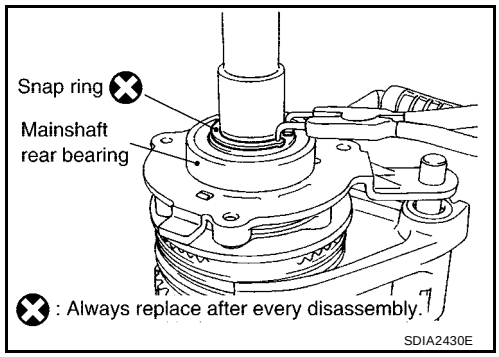
CAUTION:
Do not push too hard in order to avoid snap rings becoming dislodged from mainshaft.



25. Install snap ring to mainshaft, using suitable tool.

CAUTION:
Do not reuse snap ring.

26. Install spacer to control shift rod.

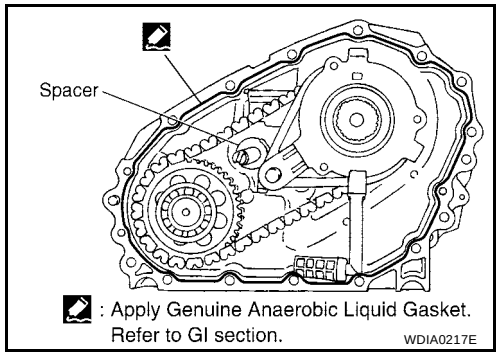


27. Apply liquid gasket to mating surface of front case.

- **Use Genuine Anaerobic Liquid Gasket or equivalent. Refer to GI-45, "Recommended Chemical Products and Sealants" .**

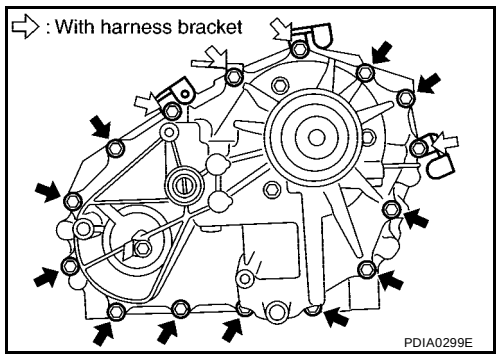
CAUTION:
Remove old sealant adhering to mating surfaces. Also remove any moisture, oil, or foreign material adhering to application and mating surfaces.

28. Install rear case to front case.



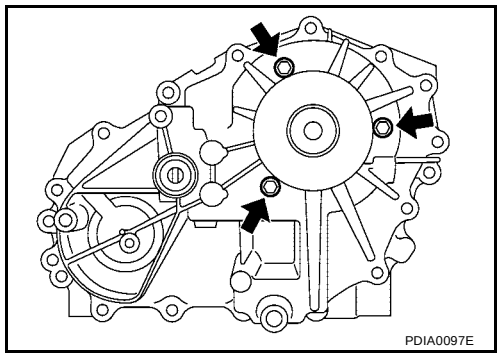
29. Tighten bolts to specified torque. Refer to TF-88, "COMPONENTS" .

CAUTION:
Be sure to install the harness brackets.



30. Install the retainer bolts with new gaskets. Tighten the bolts to the specified torque. Refer to TF-88, "COMPONENTS" .

CAUTION:
- **Do not reuse gasket.**
- **Tighten them to the specified torque again.**

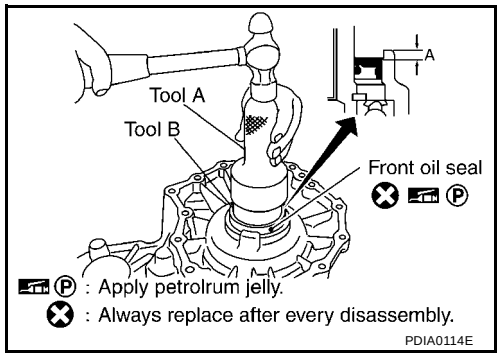


31. Install input oil seal to front case, using Tools.

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

Tool number A: ST30720000 (J-25405)
B: KV40104830 (—)

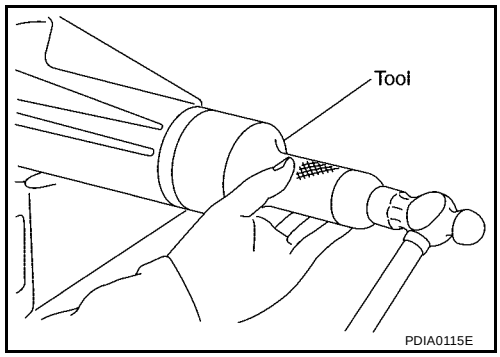
CAUTION:
- **Do not reuse oil seal.**
- **Apply petroleum jelly to oil seal.**



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

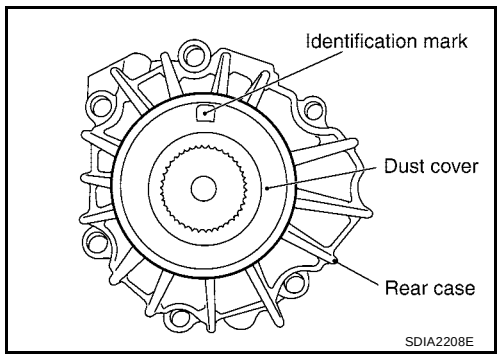
Tool number : KV38100500 (—)

CAUTION:
- **Do not reuse oil seal.**
- **Apply petroleum jelly to oil seal.**



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

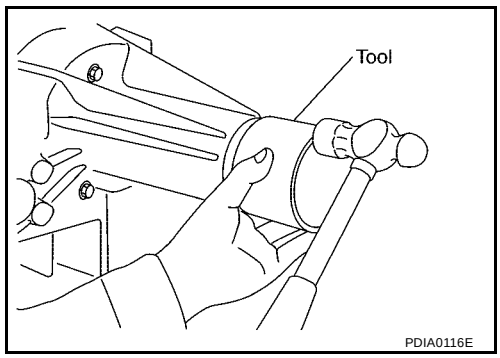
CAUTION:
- **Do not reuse dust cover.**
- **Position the identification mark at the position shown.**



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

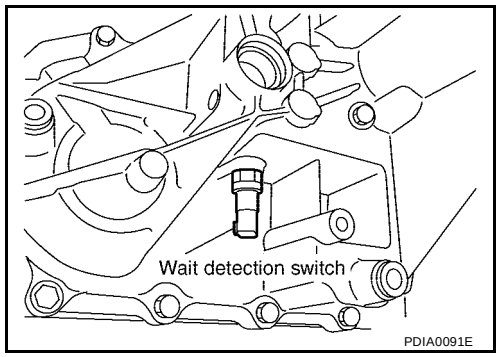
Tool number : KV40105310 (—)

CAUTION:
- **Do not reuse dust cover.**
- **Apply petroleum jelly to dust cover.**



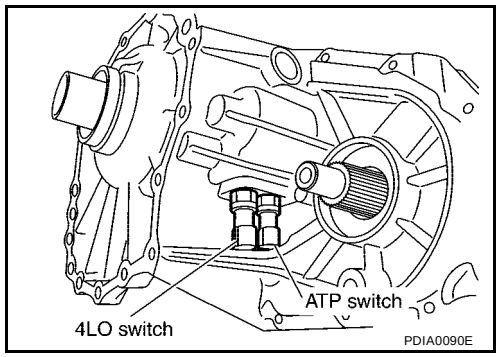
35. Apply sealant to threads of wait detection switch (gray). Then install it to rear case and tighten to the specified torque. Refer to TF-88, "COMPONENTS" .
    - **Use Genuine Silicone RTV or equivalent. Refer to GI-45, "Recommended Chemical Products and Sealants" .**

    CAUTION:
    Remove old sealant and oil adhering to threads.



36. Apply sealant to threads of 4LO switch (gray with green paint) and ATP switch (black). Then install them to front case and tighten to the specified torque. Refer to TF-88, "COMPONENTS" .
    - **Use Genuine Silicone RTV or equivalent. Refer to GI-45, "Recommended Chemical Products and Sealants" .**

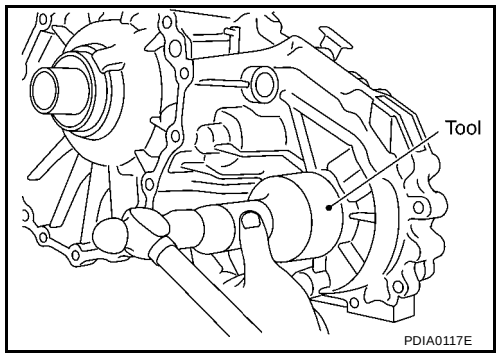
    CAUTION:
    Remove old sealant and oil adhering to threads.



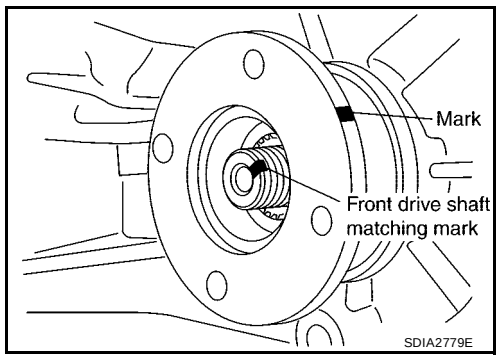
37. Install front oil seal until it is flush with end face of front case, using Tool.

    Tool number : KV38100500 (—)

    CAUTION:
    - **Do not reuse oil seal.**
    - **Apply petroleum jelly to oil seal.**



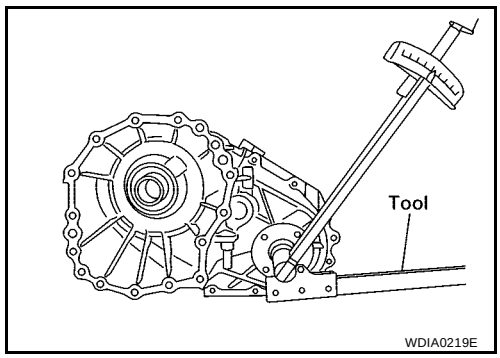
38. Align the matching mark on the front drive shaft with the mark on the companion flange, then install the companion flange.



39. Tighten self-lock nut to the specified torque, using Tool. Refer to TF-88, "COMPONENTS" .

Tool number : KV40104000 (—)

CAUTION:
Do not reuse self-lock nut.

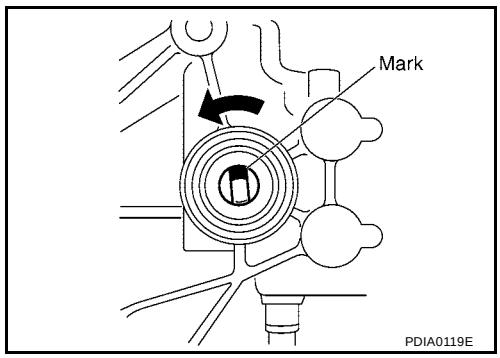


40. Install O-ring to transfer control device.

CAUTION:
- **Do not reuse O-ring.**
- **Apply petroleum jelly.**

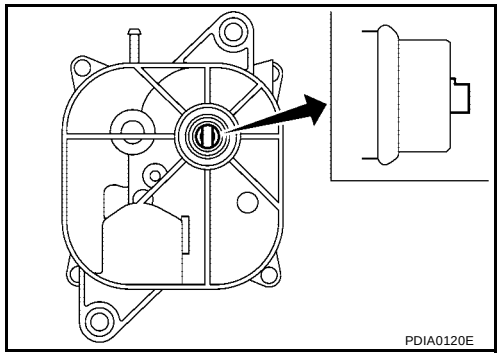
41. Install transfer control device to rear case.

a. Turn control shift rod fully counterclockwise using flat-bladed screwdriver, and then put a mark on control shift rod.

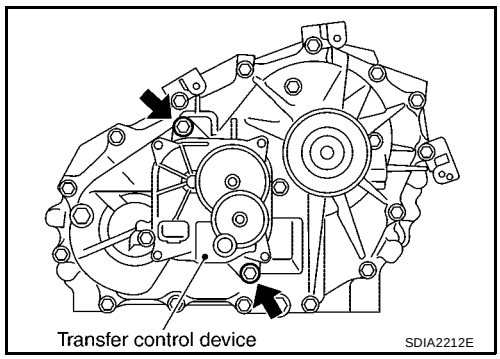


b. Align transfer control device shaft cutout with mark on control shift rod, and install.

NOTE:
Turn transfer control device when transfer control device connection does not match.



c. Tighten bolts to the specified torque. Refer to TF-88, "COMPONENTS" .



42. Install the drain plug and filler plug with new gaskets to the rear case. Tighten to the specified torque. Refer to TF-88, "COMPONENTS" .

CAUTION:
Do not reuse gasket.

PLANETARY CARRIER

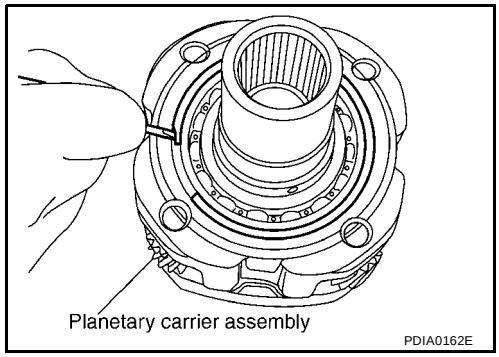
PFP:33113

Disassembly and Assembly

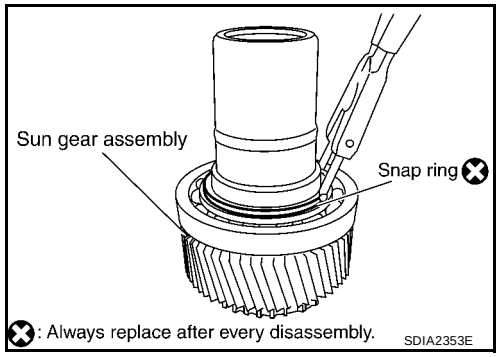
EDS0031J

DISASSEMBLY

1. Remove snap ring.
2. Remove sun gear assembly from planetary carrier assembly, using suitable tool.

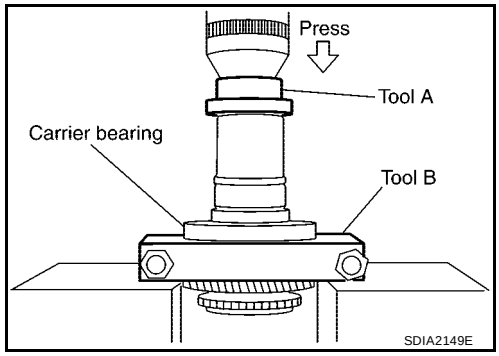


3. Remove snap ring from sun gear assembly, using suitable tool.



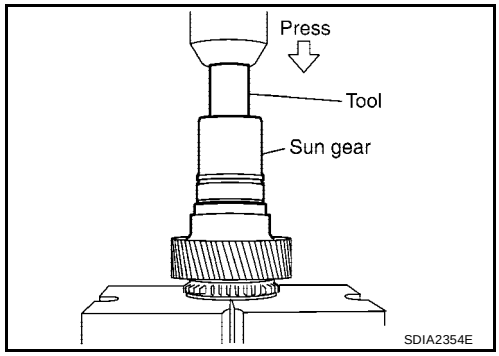
4. Remove the carrier bearing from sun gear, using Tools.

Tool number **A: ST35300000 (—)**
B: ST30021000 (J-22912-01)



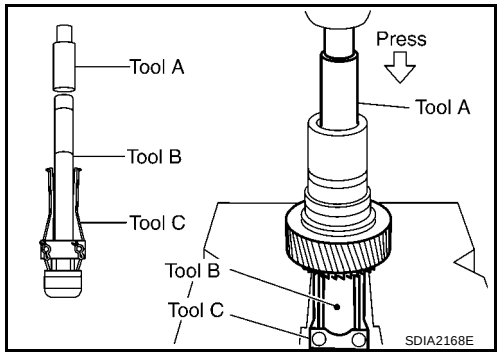
5. Remove the needle bearing from sun gear, using Tool.

Tool number **: ST33710000 (—)**



6. Remove the metal bushing from sun gear, using Tools.

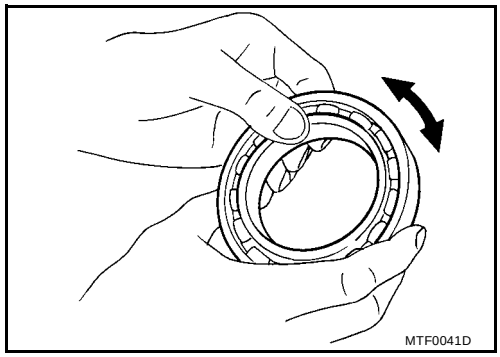
Tool number **A: ST33710000 (—)**
B: ST35325000 (—)
C: ST33290001 (J-34286)



INSPECTION AFTER DISASSEMBLY

Bearing

Check the bearing for damage and rough rotation. If necessary, replace it with a new one.

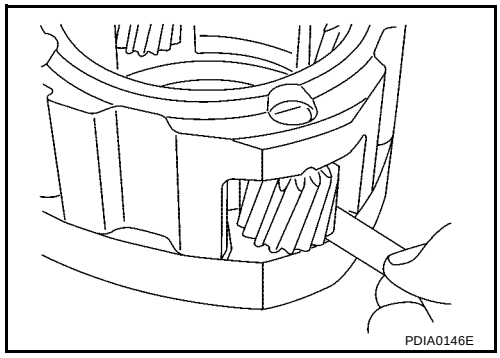


Planetary Carrier

- 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)

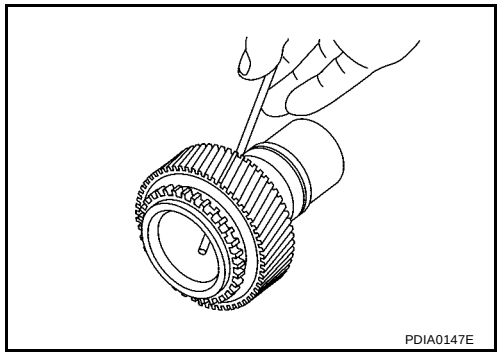
- Check working face of each gear, bearing and others for damage, burrs, partial wear, dents and other abnormality. If any is found, replace planetary carrier with new one.



Sun Gear

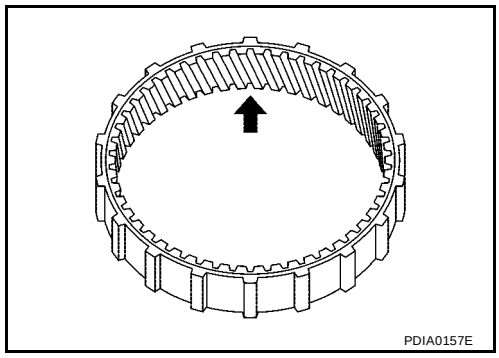
Check items below. If necessary, replace them with new ones.

- 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.
- Check the sliding and contact surface of each gear and bearing for damage, burrs, partial wear, dents and other abnormality. If any is found, replace the sun gear assembly with a new one.



Internal Gear

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



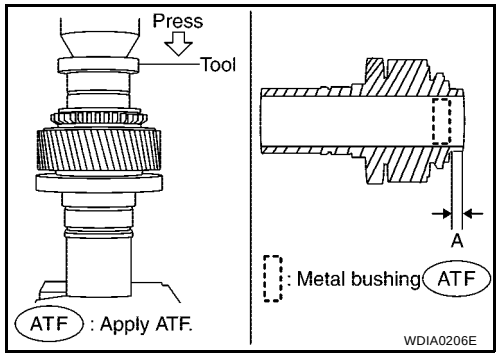
ASSEMBLY

1. Apply ATF to periphery of metal bushing, then install the metal bushing until it becomes dimension "A", using Tool.

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

   Tool number : ST35300000 (—)

   CAUTION:
   Do not reuse metal bushing.

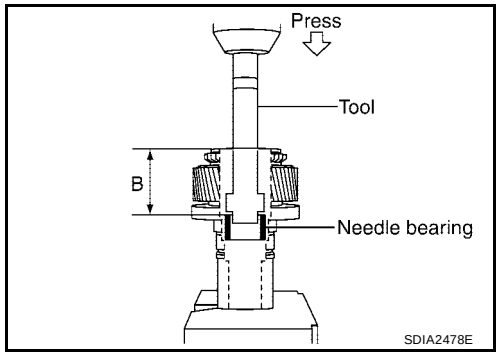


2. Apply ATF to needle bearing, then install the needle bearing until it becomes dimension "B", using Tool.

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

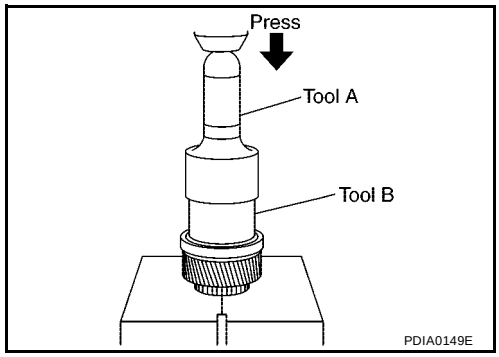
   Tool number : ST33220000 (—)

   CAUTION:
   Do not reuse needle bearing.



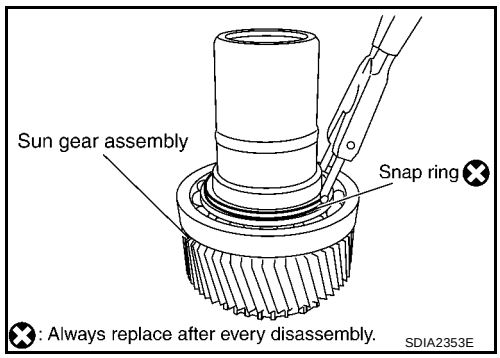
3. Install the carrier bearing to sun gear, using Tools.

   Tool number A: ST30720000 (J-25405)
   B: ST27863000 (—)



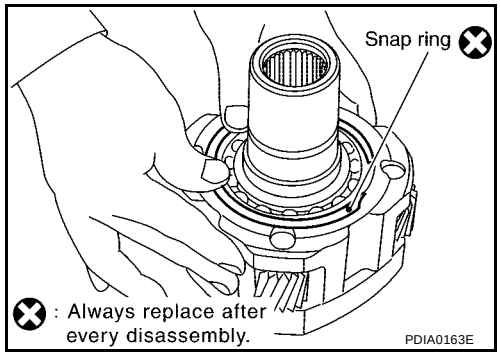
4. Install snap ring to sun gear assembly, using suitable tool.

CAUTION:
Do not reuse snap ring.



5. Install sun gear assembly to planetary carrier assembly.
6. Install snap ring to planetary carrier assembly.

CAUTION:
Do not reuse snap ring.



FRONT DRIVE SHAFT

PFP:39100

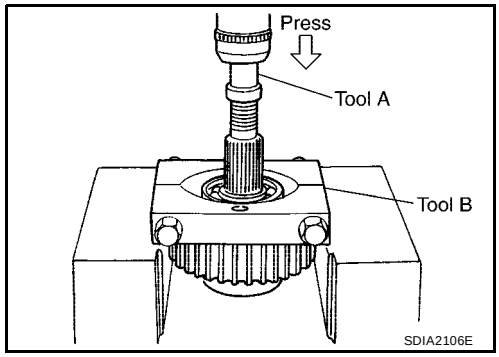
Disassembly and Assembly

EDS0031K

DISASSEMBLY

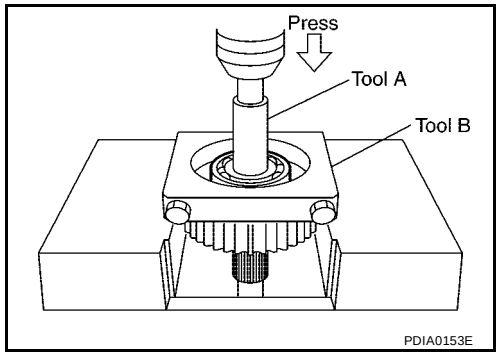
1. Remove the front bearing, using Tools.

Tool number **A: ST35300000 (—)**
B: ST30021000 (J-22912-01)



2. Remove the rear bearing, using Tools.

Tool number **A: ST33710000 (—)**
B: ST30021000 (J-22912-01)

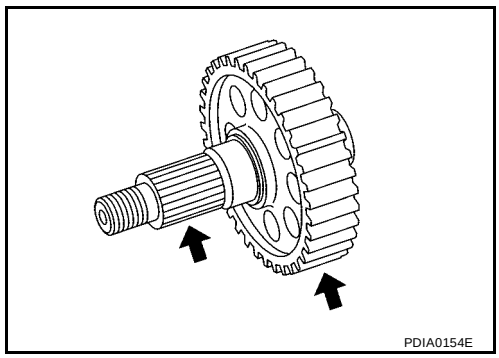


INSPECTION AFTER DISASSEMBLY

Front drive shaft

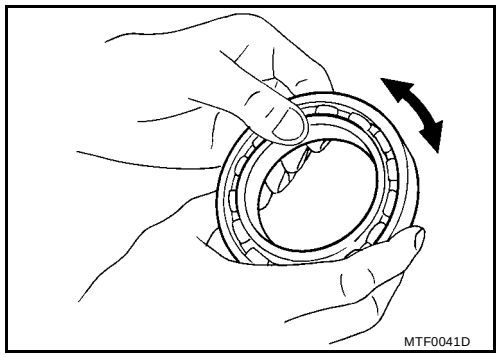
Check items below. If necessary, replace them with new ones.

- Damage, peeling, dent, uneven wear and bending of shaft.
- Excessive wear, damage and peeling of gear.



Bearing

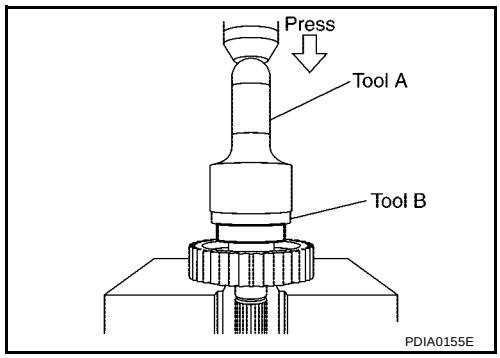
Check the bearing for damage and rough rotation. If necessary, replace it with a new one.



ASSEMBLY

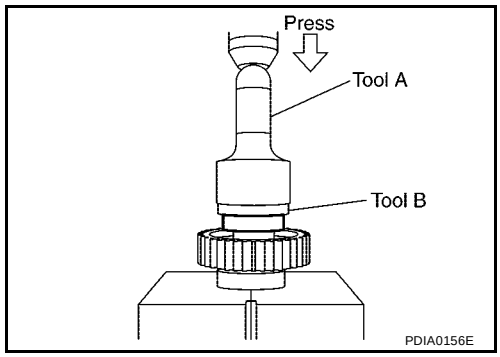
1. Install the rear bearing, using Tools.

Tool number **A: KV38100500 (—)**
B: ST30901000 (J-26010-01)



2. Install the front bearing, using Tools.

Tool number **A: KV38100500 (—)**
B: ST30901000 (J-26010-01)



SHIFT CONTROL

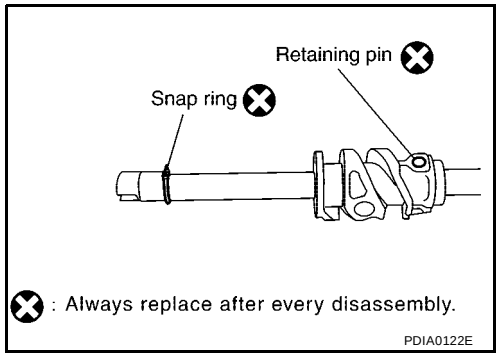
PFP:33167

Disassembly and Assembly

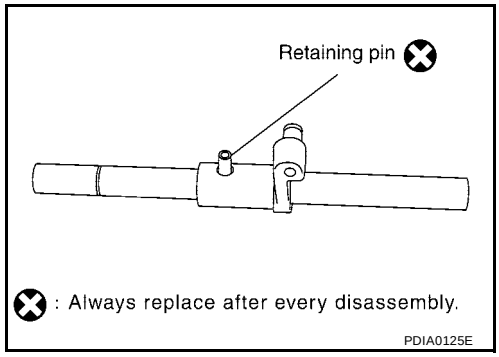
EDS0031L

DISASSEMBLY

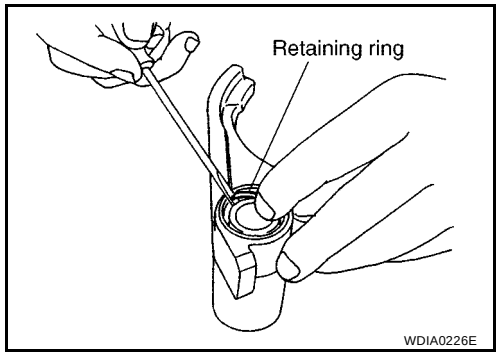
1. Remove snap ring and retaining pin using suitable tool. Then remove drum cam from control shift rod.



2. Remove retaining pin from L-H shift rod, using suitable tool.
3. Remove 2-4 shift bracket



4. Remove retaining ring from 2-4 shift fork, using suitable tool.
5. Remove fork guide collar and 2-4 shift fork spring from 2-4 shift fork



INSPECTION AFTER DISASSEMBLY

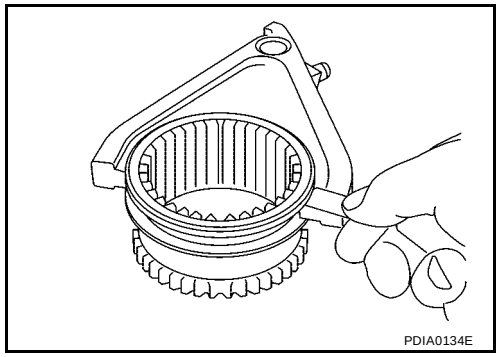
Shift fork

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

Standard value

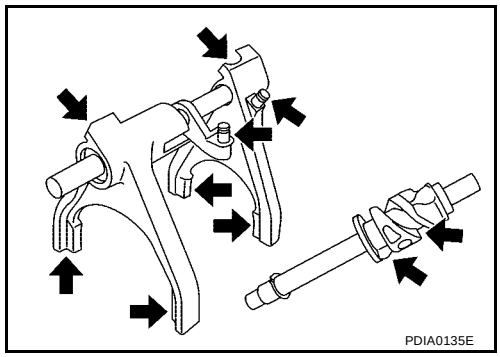
2-4 : Less than 0.46 mm (0.018 in)

L-H : Less than 0.46 mm (0.018 in)



Shift rod and fork components

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



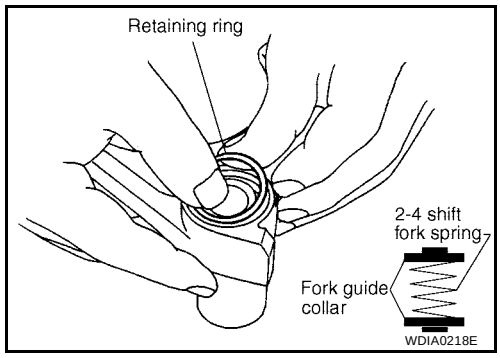
ASSEMBLY

1. Install clevis pin and shift collar to L-H shift fork after assembling them.

   CAUTION:
   Use caution when installing L-H shift fork, clevis pin or shift collar.
2. Install clevis pin and shift collar to 2-4 shift bracket after assembling them.

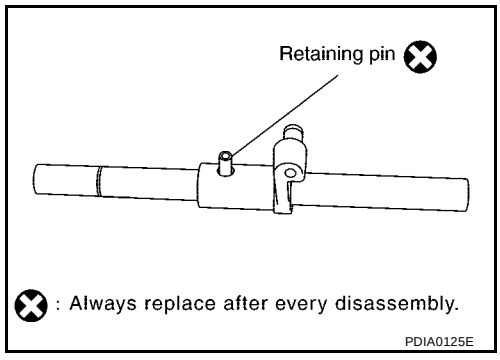
   CAUTION:
   Use caution when installing 2-4 shift bracket.
3. Install guide fork collar and 2-4 shift fork spring to the 2-4 shift fork, and then secure it with the retaining ring.

   CAUTION:
   - **Do not reuse retaining ring.**
   - **Be careful with orientation.**



4. Install 2-4shift bracket to the L-H shift rod.
5. Install retaining pin evenly to the L-H shift rod.

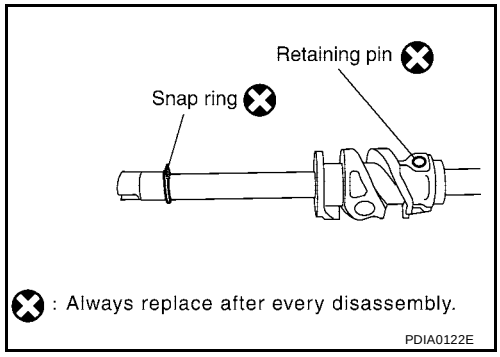
   CAUTION:
   Do not reuse retaining pin.



6. Install drum cam to the control shift rod, and then secure it with retaining pin.

   CAUTION:
   Do not reuse retaining pin.
7. Install snap ring to the control shift rod.

   CAUTION:
   Do not reuse snap ring.



SERVICE DATA AND SPECIFICATIONS (SDS)

PFP:00030

General Specifications

EDS0031M

Applied model			VK56DE
Transfer model			TX15A
Gear ratio	High		1.000
	Low		2.596
Number of teeth	Planetary gear	Sun gear	57
		Internal gear	91
	Front drive sprocket		38
	Front drive shaft		38
Fluid capacity (Approx.)		ℓ (US qt, Imp qt)	2.0 (2-1/8, 1-3/4)

Pinion Gear End Play

EDS0031N

Unit: mm (in)

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

Clearance Between Shift Fork and Sleeve

EDS0031O

Unit: mm (in)

Item	Standard
2-4 shift fork to 2-4 sleeve	Less than 0.46 mm (0.018 in)
L-H shift fork to L-H sleeve	Less than 0.46 mm (0.018 in)