MANUAL TRANSMISSION

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HYDRAULIC UNIT ..... Refer to GROUP27B

WARNING REGARDING SERVICING OF SUPPLEMENTAL RESTRAINT SYSTEM (SRS) EQUIPPED VEHICLES

WARNING!

(1) Improper service or maintenance of any component of the SRS, or any SRS-related component, can lead to personal injury or death to service personnel (from inadvertent firing of the air bag) or to driver and passenger (from rendering the SRS inoperative).

(2) Service or maintenance of any SRS component or SRS-related component must be performed only at an authorized MITSUBISHI dealer.

(3) MITSUBISHI dealer personnel must thoroughly review this manual, and especially its GROUP 52B - Supplemental Restraint System (SRS) before beginning any service or maintenance of any component of the SRS or any SRS-related component.

NOTE

The SRS includes the following components: SRS-ECU, SRS warning lamp, air bag module, clock spring, and interconnecting wiring. Other SRS-related components (that may have to be removed/installed in connection with SRS service or maintenance) are indicated in the table of contents by an asterisk (*).

GENERAL

OUTLINE OF CHANGE

With the addition of the EVOLUTION-VII, the W5M51 transmission service adjustment procedure has been set as follows.

GENERAL INFORMATION

Items		Specifications	
Grade		RS, RS II	RS, RS II (With super cross gear)
Transmission model		W5M51	
Engine model		4G63-DOHC-T/C	
Type		5-speed, floor-shift	
Gear ratio	1st	2.785	2.785
	2nd	1.950	1.950
	3rd	1.407	1.444
	4th	1.031	1.096
	5th	0.720	0.825
	Reverse	3.416	3.416
Final reduction ratio (Differential gear ratio)		4.529	4.529
Front limited-slip differential (Helical-gear type)		Not provided	Provided
Transfer	Reduction ratio	3.307	3.307
	Limited-slipdifferential	VCU or hydraulic multi plate clutch (ACD)	VCU or hydraulic multi plate clutch (ACD)

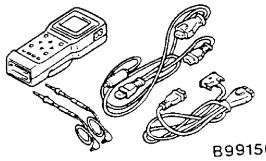
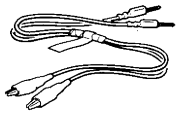
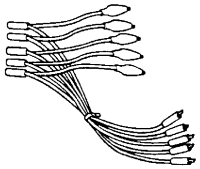
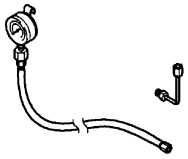
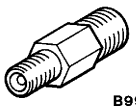
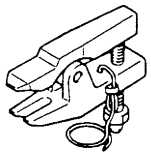
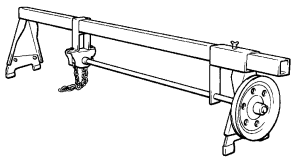
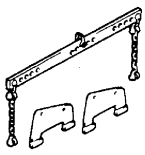
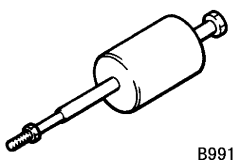
SERVICE SPECIFICATION

Item	Standard value
Hydraulic unit generation oil pressure MPa	1.0 - 1.6

LUBRICANTS

Item		Specified lubricant	Quantity L
Transmission oil		Gear oil SAE 75W-90 or 75W-85W conforming to API GL-4	2.8
Transfer oil	Vehicles without ACD or vehicles without ACD and AYC	MITSUBISHI Genuine Gear Oil Part No.8149630 EX, CASTROL HYPOY LS (GL-5, SAE 90), SHELL-LSD (GL-5, SAE 80W - 90) or equivalent	0.55
	Vehicles with ACD or vehicles with ACD and AYC		0.6
Fluid	Piping between ACD and hydraulic unit	DIA QUEEN ATF SP III	0.9
	Pipes between ACD and hydraulic unit and between AYC and hydraulic unit		1.0

SPECIAL TOOLS

Tool	Number	Name	Use
 B991502	MB991502	MUT-II Sub assembly	Diagnosis code checking
	MB991529	Diagnosis code checking harness	
	MB991348	Test harness set	G sensor check
	MD998330 (including MD998331)	Oil pressure gauge (3.0 MPa)	Hydraulic pressure measurement <ACD>
 B991705	MB991705	Adapter	
 B991113	MB990635, MB991113 or MB991406	Steering linkage puller	Tie rod end and lower disconnection
	GENERAL SERVICE TOOL MZ203827	Engine lifter	Supporting the engine assembly during removal and installation of the transmission
 B991453	MB991453	Engine hanger attachment set	
 B991721	MB991721	Slide hammer	Output shaft removal

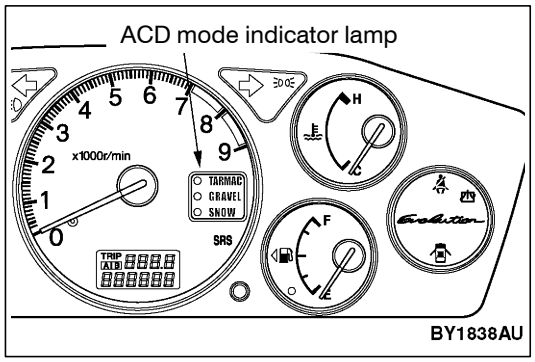
TROUBLESHOOTING <ACD>

BASIC TROUBLESHOOTING CONDITIONS

Refer to GROUP 00 - How to Use Troubleshooting/Inspection Service Points.

NOTE
Before starting the troubleshooting procedure, make sure that the following items have been checked okay.

- Is the appropriate steering wheel installed at the center of the steering column shaft correctly?
- Are the tire, wheel size, specifications, air pressure, balance, and wear state normal?
- Is the wheel alignment normal?
- Has the engine, suspension, etc. been remodeled in such a way that it will affect the ACD and AYC systems?



DIAGNOSIS FUNCTION

READING DIAGNOSIS CODE

Read a diagnosis code by the MUT-II or ACD mode indicator lamp. (Refer to GROUP 00 - How to Use Troubleshooting/ Inspection Service Points.)

NOTE
Connect the MUT-II to the diagnosis connector (16-pin).

ERASING DIAGNOSIS CODES

When using the MUT-II

Connect the MUT-II to the diagnosis connector (16-pin) and erase the diagnosis code.

Caution
Turn the ignition switch to the "LOCK"(OFF) position before connecting or disconnecting the MUT-II.

INSPECTION CHART FOR DIAGNOSIS CODES

Diagnosis code No.	Diagnosis items		Reference page
12	Power supply voltage (valve power supply) system	open circuit or short-circuit	22A-8
13	Fail-safe relay system <inside 4WD-ECU>	open circuit or short-circuit	22A-8
21	Wheel speed sensor <FR> system	open circuit or short-circuit	22A-9
22	Wheel speed sensor <FL> system	open circuit or short-circuit	22A-9
23	Wheel speed sensor <RR> system	open circuit or short-circuit	22A-9
24	Wheel speed sensor <RL> system	open circuit or short-circuit	22A-9
25	Wrong-diameter tire		22A-11
26	Wheel speed sensor (faulty output signal)		22A-13
31	Steering wheel sensor <ST-1, ST-2, ST-N> system	open circuit or short-circuit	22A-15
32	Steering wheel sensor <ST-N> system	short-circuit	22A-16
33		fixed	22A-16
34	Steering wheel sensor <ST-1, ST-2> system	short-circuit or output fixed	22A-17
41	TPS system	open circuit or ground	22A-18
42		short-circuit	22A-18
45	Pressure sensor system	open circuit or ground	22A-19
46		open earth	22A-19
47		abnormal power supply	22A-20
51	Longitudinal G sensor system	open circuit or short-circuit	22A-21
52		defective sensor	22A-22
56	Lateral G sensor system	open circuit or short-circuit	22A-23
57		defective sensor	22A-24
61	Stop lamp switch system	open circuit	22A-25
62	ACD mode switch system	stuck	22A-26
63	Parking brake switch system	short-circuit or not returned to original position	22A-27
65	ABS monitor system	open circuit or defective ABS	22A-28
71	Proportional valve <AYC> system	open circuit or short-circuit	Refer to GROUP 27B.
72	Directional control valve <Right> system	open circuit or short-circuit	
73	Directional control valve <Left> system	open circuit or short-circuit	
74	Proportional valve <ACD> system	open circuit or short-circuit	22A-29

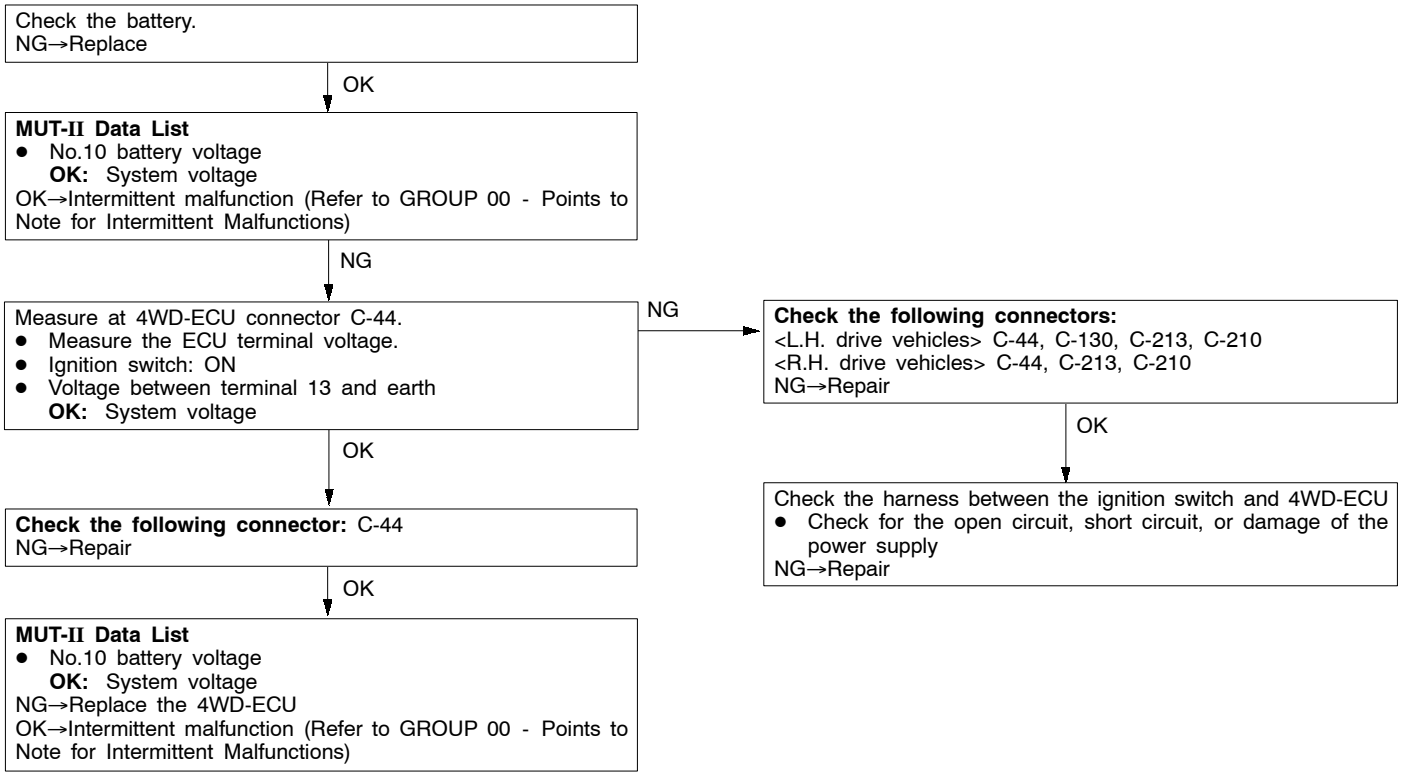
Diagnosis code No.	Diagnosis items		Reference page
81	Electric pump relay system	open circuit or short-circuit	22A-29
82		electric pump malfunction or pressure sensor defect	22A-30
84	AYC control error		Refer to GROUP 27B.
85	ACD control error		-

NOTE
Code No.85 is not a code number output due to malfunction, but a code number output when control for the 4WD-ECU to protect the ACD is stopped in excessive driving. ACD control can be recovered by turning the ignition switch ON to OFF to ON.

INSPECTION PROCEDURES FOR DIAGNOSIS CODES

Code No.12 Power supply voltage (valve power supply) system	Probable cause
The power supply circuit opens or short-circuits if the power supply voltage of the 4WD-ECU is below 9 V or above 18 V. Or code No.12 is output when the battery voltage drops.	• Defective harness or connector • Defective battery • Defective 4WD-ECU

NOTE
Refer to the corresponding item if any other diagnosis code is being output.



Code No.13 Fail-safe relay system <inside 4WD-ECU>	Probable cause
Code No.13 will be output as the open circuit or short circuit of the fail-safe relay when the voltage is above 6 V during failsafe relay OFF or when the voltage is below 6 V during ON.	• Defective 4WD-ECU

Replace the 4WD-ECU.

Code No.21 Wheel speed sensor <FR> system Code No.22 Wheel speed sensor <FL> system Code No.23 Wheel speed sensor <RR> system Code No.24 Wheel speed sensor <RL> system	Probable cause
A diagnosis code corresponding to the open circuit or short circuit of the wheel speed sensor is output when one wheel speed sensor has detected a vehicle speed of above 15 km/h, but any one of the remaining three wheel speed sensors could not detect the vehicle speed.	• Wheel speed sensor fault • Rotor fault • Wheel bearing fault • Harness or connector fault • ABS-ECU fault <Vehicles with ACD and AYC> • 4WD-ECU fault

<Vehicles with ACD and AYC>

MUT-II Diagnosis Code
- Are the ABS Diagnosis Code Numbers.11, 12, 13, 14, 21, 22, 23, and 24 output?

YES → Refer to GROUP 35B - Troubleshooting.

NO ↓

MUT-II Data List
- No.01 Vehicle speed sensor <FR>
- No.02 Vehicle speed sensor <FL>
- No.03 Vehicle speed sensor <RR>
- No.04 Vehicle speed sensor <RL>

OK: The speed meter display and MUT-II display match.
OK→Intermittent malfunction (Refer to GROUP 00 - Points to Note for Intermittent Malfunctions.)

NG ↓

Measure at 4WD-ECU connector C-44.
- Measure the ECU terminal voltage.
- Ignition switch: ON
- Rotate the tire corresponding to the measured terminal by one and a half to one rotate per second.

(1) Voltage between terminal 9 and body earth <FR>
(2) Voltage between terminal 6 and body earth <FL>
(3) Voltage between terminal 7 and body earth <RR>
(4) Voltage between terminal 8 and body earth <RL>

OK: Changes at 0 V ↔ 5 V

OK → **Check the following connector:** C-44
NG→Repair

OK ↓

MUT-II Data List
- No.01 Vehicle speed sensor <FR>
- No.02 Vehicle speed sensor <FL>
- No.03 Vehicle speed sensor <RR>
- No.04 Vehicle speed sensor <RL>

OK: The speed meter display and MUT-II display match.
NG→Replace the 4WD-ECU
OK→Intermittent malfunction (Refer to GROUP 00 - Points to Note for Intermittent Malfunctions.)

NG ↓

Check the following connectors:
<L.H. drive vehicles> C-44, B-123
<R.H. drive vehicles> C-44, C-147, B-123
NG→Repair

OK ↓

Check the harness between 4WD-ECU and ABS-ECU.
- Check for open circuit, ground, and short-circuit of the output line.

NG→Repair

<Vehicles with ACD>

Check the installation of the wheel speed sensor.
NG→Repair

OK

MUT-II Data List
- No.01 Vehicle speed sensor <FR>
- No.02 Vehicle speed sensor <FL>
- No.03 Vehicle speed sensor <RR>
- No.04 Vehicle speed sensor <RL>

OK: The speed meter display and MUT-II display match.
OK→Intermittent malfunction (Refer to GROUP 00 - Points to Note for Intermittent Malfunctions.)

NG

Measure at 4WD-ECU connector C-44.
- Disconnect the connector and measure at the harness side.

(1) Resistance between terminals 9 and 22 (vehicle speed sensor <FR>)
(2) Resistance between terminals 6 and 19 (vehicle speed sensor <FL>)
(3) Resistance between terminals 7 and 20 (vehicle speed sensor <RR>)
(4) Resistance between terminals 8 and 21 (vehicle speed sensor <RL>)

OK: 1.2 - 1.6 kΩ

NG → Check the wheel speed sensor.
(Refer to GROUP 35B - Wheel Speed Sensor.)
NG→Replace

OK

Check the following connectors:
<L.H. drive vehicles> C-44, A-03, A-37, D-10, D-04, D-30, C-146, C-111, C-128, A-43
<R.H. drive vehicles> C-44, A-03, A-37, D-10, D-04, D-30, C-146, C-111, C-136, C-147
NG→Repair

OK

Check the harness between the 4WD-ECU and each wheel speed sensor.
- Check for open circuit, grounding, and short circuit of the output line.
- Check for open circuit and damage of the earth line

NG→Repair

OK

MUT-II Data List
- No.01 Vehicle speed sensor <FR>
- No.02 Vehicle speed sensor <FL>
- No.03 Vehicle speed sensor <RR>
- No.04 Vehicle speed sensor <RL>

OK: The speed meter display and MUT-II display match.
NG→Replace the 4WD-ECU.
OK→Intermittent malfunction (Refer to GROUP 00 - Points to Note for Intermittent Malfunctions)

Check the wheel speed sensor output voltage. (Refer to P.22A-44.)

NG → Check the wheel speed sensor and rotor
(Refer to GROUP 35B - Wheel Speed Sensor.)
NG→Repair

OK

Check the wheel beearing. (Refer to GROUP 26 - On-vehicle Service, and GROUP 27B - Rear Hub Assembly.)
NG→Repair

OK

Check the following connector: C-44
NG→Repair

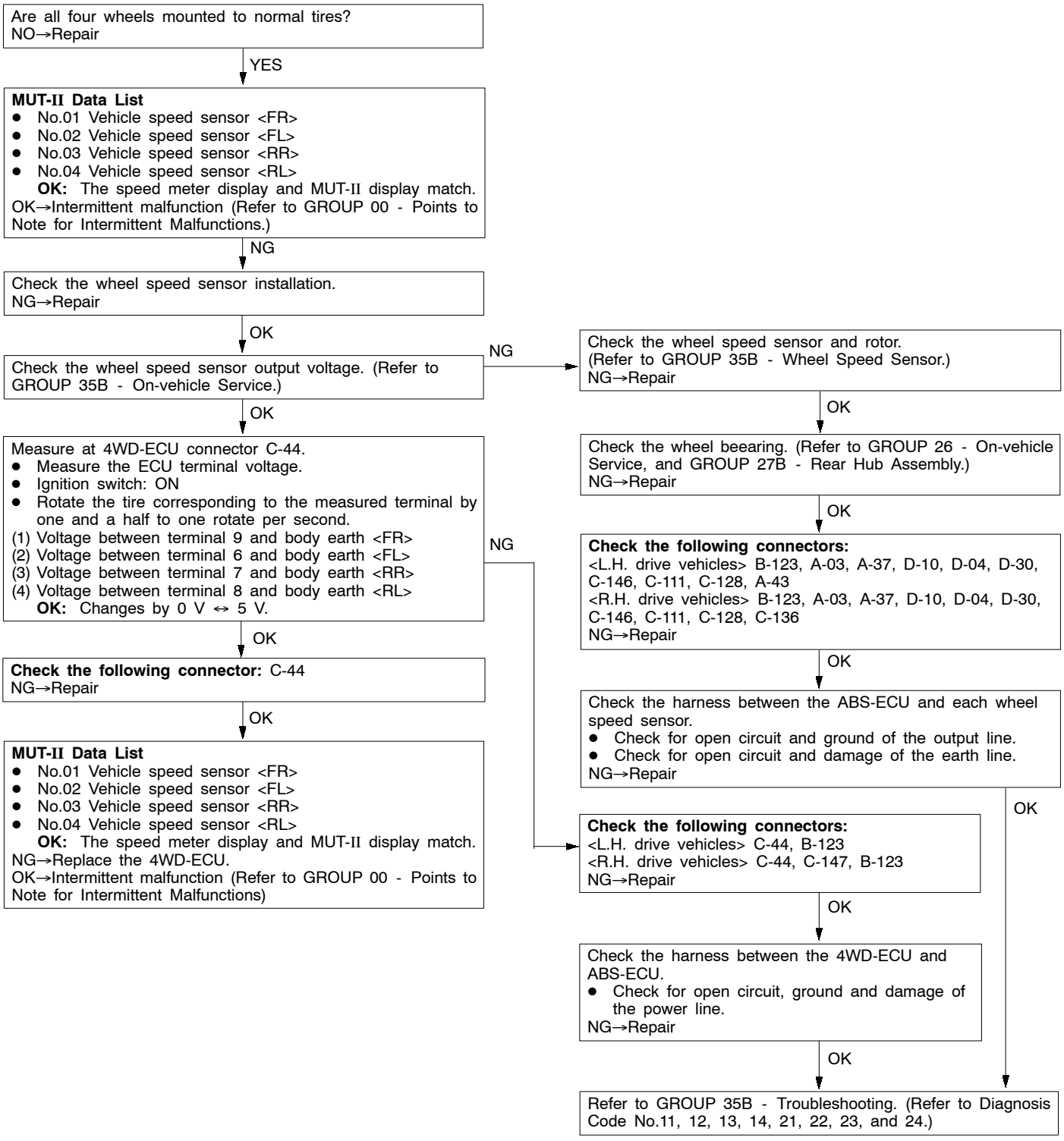
OK

MUT-II Data List
- No.01 Vehicle speed sensor <FR>
- No.02 Vehicle speed sensor <FL>
- No.03 Vehicle speed sensor <RR>
- No.04 Vehicle speed sensor <RL>

OK: The speed meter display and MUT-II display match.
NG→Replace the 4WD-ECU
OK→Intermittent malfunction (Refer to GROUP 00 - Points to Note for Intermittent Malfunctions.)

Code No.25 Wrong-diameter tire	Probable cause
Code No.25 is output as wrong-diameter tire when one of the four vehicle speeds is outside the range of specified values in respect to the average of the four vehicle speed sensors, when the vehicle speed is above 20 km/h with the steering wheel in the straight ahead position. However the warning lamp does not light up.	• Tire fault • Wheel speed sensor fault • Rotor fault • Wheel bearing fault • Harness or connector fault • ABS-ECU fault <Vehicles with ACD and AYC> • 4WD-ECU fault

<Vehicles with ACD and AYC>



<Vehicles with ACD>

Check the installation of the wheel speed sensor.
NG→Repair

OK

MUT-II Data List
- No.01 Vehicle speed sensor <FR>
- No.02 Vehicle speed sensor <FL>
- No.03 Vehicle speed sensor <RR>
- No.04 Vehicle speed sensor <RL>

OK: The speed meter display and MUT-II display match.
OK→Intermittent malfunction (Refer to GROUP 00 - Points to Note for Intermittent Malfunctions)

NG

Measure at 4WD-ECU connector C-44.
- Disconnect the connector and measure at the harness side.

(1) Resistance between terminals 9 and 22 (vehicle speed sensor <FR>)
(2) Resistance between terminals 6 and 19 (vehicle speed sensor <FL>)
(3) Resistance between terminals 7 and 20 (vehicle speed sensor <RR>)
(4) Resistance between terminals 8 and 21 (vehicle speed sensor <RL>)

OK: 1.2 - 1.6 kΩ

NG → Check the wheel speed sensor.
(Refer to GROUP 35B - Wheel Speed Sensor.)
NG→Replace

OK

Check the following connectors:
<L.H. drive vehicles> C-44, A-03, A-37, D-10, D-04, D-30, C-146, C-111, C-128, A-43
<R.H. drive vehicles> C-44, A-03, A-37, D-10, D-04, D-30, C-146, C-111, C-136, C-147
NG→Repair

OK

Check the harness between the 4WD-ECU and each wheel speed sensor.
- Check for open circuit and ground of the output line.
- Check for open circuit and damage of the earth line.

NG→Repair

OK

MUT-II Data List
- No.01 Vehicle speed sensor <FR>
- No.02 Vehicle speed sensor <FL>
- No.03 Vehicle speed sensor <RR>
- No.04 Vehicle speed sensor <RL>

OK: The speed meter display and MUT-II display match.
NG→Replace the 4WD-ECU.
OK→Intermittent malfunction (Refer to GROUP 00 - Points to Note for Intermittent Malfunctions)

OK

Check the wheel speed sensor output voltage. (Refer to P.22A-44.)

NG → Check the wheel speed sensor and rotor.
(Refer to GROUP 35B - Wheel Speed Sensor.)
NG→Repair

OK

Check the following connector: C-44
NG→Repair

OK

MUT-II Data List
- No.01 Vehicle speed sensor <FR>
- No.02 Vehicle speed sensor <FL>
- No.03 Vehicle speed sensor <RR>
- No.04 Vehicle speed sensor <RL>

OK: The speed meter display and MUT-II display match.
NG→Replace the 4WD-ECU.
OK→Intermittent malfunction (Refer to GROUP 00 - Points to Note for Intermittent Malfunctions)

OK

Check the wheel beearing. (Refer to GROUP 26 - On-vehicle Service, and GROUP 27B - Rear Hub Assembly.)
NG→Repair

Code No.26 Wheel speed sensor system (faulty output signal)	Probable cause
Code No.26 is output as output signal error of the wheel speed sensor when one wheel speed is outside the specified range at the vehicle speed of above 20 km/h. However, warning lamp will light up.	• Tire fault • Wheel speed sensor fault • Rotor fault • Wheel bearing fault • Harness or connector fault • ABS-ECU fault <Vehicles with ACD and AYC> • 4WD-ECU fault

<Vehicles with ACD and AYC>

Are the four wheels mounted to normal tires.
NO→Repair

YES →

MUT-II Diagnosis Code
- Are the ABS Diagnosis Code Nos.11, 12, 13, 14, 21, 22, 23, 24 output?

NO → **MUT-II Data List**
- No.01 Vehicle speed sensor <FR>
- No.02 Vehicle speed sensor <FL>
- No.03 Vehicle speed sensor <RR>
- No.04 Vehicle speed sensor <RL>

OK: The speed meter display and MUT-II display match.
OK→Intermittent malfunction (Refer to GROUP 00 - Points to Note for Intermittent Malfunctions)

NG

Check the installation of the wheel speed sensor.
NG→Repair

OK

Check the wheel speed sensor output voltage. (Refer to GROUP 35B - On-vehicle Service.)

NG →
Check the wheel speed sensor and rotor.
(Refer to GROUP 35B - Wheel Speed Sensor.)
NG→Repair

OK

Check the wheel beearing.
(Refer to GROUP 26 - On-vehicle Service, and GROUP 27B - Rear Hub Assembly.)
NG→Repair

OK

Check the following connectors:
<L.H. drive vehicles> B-123, A-03, A-37, D-10, D-04, D-30, C-146, C-111, C-128, A-43
<R.H. drive vehicles> B-123, A-03, A-37, D-10, D-04, D-30, C-146, C-111, C-128, C-136
NG→Repair

OK

Check the harness between the ABS-ECU and each wheel speed sensor.
- Check for open circuit, ground, and short circuit of the output line.
- Check for open circuit and damage of the earth line.

NG→Repair

OK

Measure at 4WD-ECU connector C44.
- Measure the ECU terminal voltage.
- Ignition switch: ON
- Rotate the tire corresponding to the measured terminal by one and a half to one rotate per second.

(1) Voltage between terminal 9 and the body earth <FR>
(2) Voltage between terminal 6 and body earth <FL>
(3) Voltage between terminal 7 and body earth <RR>
(4) Voltage between terminal 8 and body earth <RL>

OK: Changes at 0 V ↔ 5 V.

NG →
Check the following connectors:
<L.H. drive vehicles> C-44, B-123
<R.H. drive vehicles> C-44, C-147, B-123
NG→Repair

OK

Check the harness between the 4WD-ECU and ABS-ECU.
- Check for open circuit, ground and damage of the power line.

NG→Repair

OK

Check the following connector: C-44
NG→Repair

OK

MUT-II Data List
- No.01 Vehicle speed sensor <FR>
- No.02 Vehicle speed sensor <FL>
- No.03 Vehicle speed sensor <RR>
- No.04 Vehicle speed sensor <RL>

OK: The speed meter display and MUT-II display match.
NG→Replace the 4WD-ECU.
OK→Intermittent malfunction (Refer to GROUP 00 - Points to Note for Intermittent Malfunctions)

<Vehicles with ACD>

Check the installation of the wheel speed sensor.
NG→Repair

OK

MUT-II Data List
- No.01 Vehicle speed sensor <FR>
- No.02 Vehicle speed sensor <FL>
- No.03 Vehicle speed sensor <RR>
- No.04 Vehicle speed sensor <RL>

OK: The speed meter display and MUT-II display match.
OK→Intermittent malfunction (Refer to GROUP 00 - Points to Note for Intermittent Malfunctions)

NG

Measure at 4WD-ECU connector C-44.
- Disconnect the connector and measure at the harness side.

(1) Resistance between terminals 9 and 22 (vehicle speed sensor <FR>)
(2) Resistance between terminals 6 and 19 (vehicle speed sensor <FL>)
(3) Resistance between terminals 7 and 20 (vehicle speed sensor <RR>)
(4) Resistance between terminals 8 and 21 (vehicle speed sensor <RL>)

OK: 1.2 - 1.6 kΩ

NG → Check the wheel speed sensor. (Refer to GROUP 35B - Wheel Speed Sensor.)
NG→Replace

OK

Check the following connectors:
<L.H. drive vehicles> C-44, A-03, A-37, D-10, D-04, D-30, C-146, C-111, C-128, A-43
<R.H. drive vehicles> C-44, A-03, A-37, D-10, D-04, D-30, C-146, C-111, C-136, C-147
NG→Repair

OK

Check the harness between the 4WD-ECU and wheel speed sensor.
- Check for open circuit, grounding, and short-circuit of the output line.
- Check for open circuit and damage of the earth line

NG→Repair

OK

MUT-II Data List
- No.01 Vehicle speed sensor <FR>
- No.02 Vehicle speed sensor <FL>
- No.03 Vehicle speed sensor <RR>
- No.04 Vehicle speed sensor <RL>

OK: The speed meter display and MUT-II display match.
NG→Replace the 4WD-ECU.
OK→Intermittent malfunction (Refer to GROUP 00 - Points to Note for Intermittent Malfunctions)

OK

Check the wheel speed sensor output voltage. (Refer to P.22A-44.)

NG → Check the wheel speed sensor and rotor.
(Refer to GROUP 35B - Wheel Speed Sensor.)
NG→Repair

OK

Check the following connector: C-44
NG→Repair

OK

MUT-II Data List
- No.01 Vehicle speed sensor<FR>
- No.02 Vehicle speed sensor<FL>
- No.03 Vehicle speed sensor<RR>
- No.04 Vehicle speed sensor<RL>

OK: The speed meter display and MUT-II display match.
NG→Replace the 4WD-ECU.
OK→Intermittent malfunction (Refer to GROUP 00 - Points to Note for Intermittent Malfunctions)

OK

Check the wheel bearing (Refer to GROUP 26 - On-vehicle Service, and GROUP 27B - Rear Hub Assembly.)
NG→Repair

Code No.31 Steering wheel sensor <ST-1, ST-2, ST-N> system	Probable cause
Code No.31 is output when open circuit or short circuit of the steering wheel sensor output line (ST-1, ST-2, or ST-N) occurs.	• Steering wheel sensor fault • Harness or connector fault • 4WD-ECU fault

MUT-II Diagnosis Code
- Are the ABS Diagnosis Code Nos.81, 82, 83 output?

YES → Measure at Steering wheel sensor connector C-230.
- Disconnect the connector and measure at the harness side.
- Ignition switch: ON
- Voltage between terminal 2 and earth
  OK: System voltage
- Resistance between terminal 3 and body earth
  OK: 2 Ω or less

NG → **Check the following connectors:** C-230, C-102, C-209, C-210
NG→Repair

OK → Check the harness between the ignition switch and steering wheel sensor.
- Check for open circuit and damage on power line.

NG→Repair

OK → **Check the following connector:** C-230
NG→Repair

OK → Replace the Steering wheel sensor.

NO → **MUT-II Data List**
- No.21 Steering wheel sensor voltage <ST-1>
- No.22 Steering wheel sensor voltage <ST-2>
- No.23 Steering wheel sensor voltage <ST-N>
  OK: Refer to P.22A-35 (Data List Reference Table).

OK→Intermittent malfunction (Refer to GROUP 00 - Points to Note for Intermittent Malfunctions)

NG → Measure at 4WD-ECU connector C-43.
- Measure the ECU terminal voltage.
- Ignition switch: ON

(1) Voltage between terminal 33 and earth (Steering wheel sensor <ST-1>)
(2) Voltage between terminal 34 and earth (Steering wheel sensor <ST-2>)
(3) Voltage between terminal 44 and earth (Steering wheel sensor <ST-N>)
OK: When the steering wheel is turned, changes at approx. 1.5 V – 3.5 V.

OK → **Check the following connector:** C-43
NG→Repair

OK → **MUT-II Data List**
- No.21 Steering wheel sensor voltage <ST-1>
- No.22 Steering wheel sensor voltage <ST-2>
- No.23 Steering wheel sensor voltage <ST-N>
  OK: Refer to P.22A-35 (Data List Reference Table).

NG→Replace the 4WD-ECU.
OK→Intermittent malfunction (Refer to GROUP 00 - Points to Note for Intermittent Malfunctions)

NG (Changes at 1 V - 4.5 V or more) / NG (No change from 0 V or from above 4.5 V) → Measure at steering wheel sensor connector C-230.
- Disconnect the connector and measure at the harness side.
- Ignition switch: ON

(1) Voltage between terminal 2 and earth
OK: System voltage
(2) Resistance between terminal 3 and body earth
OK: 2 Ω or less

(1) NG → **Check the following connectors:** C-230, C-102, C-209, C-210
NG→Repair

OK → Check the harness between the steering wheel sensor and ignition switch.
- Check for open circuit, ground and damage of the power line.

NG→Repair

(2) NG → **Check the following connector:** C-230, C-08
NG→Repair

OK → Check the harness between the steering wheel sensor and body earth.
- Check for open circuit and damage of the earth line.

NG→Repair

OK → **Check the following connectors:**
<L.H. drive vehicles> C-230, C-128, C-43
<R.H. drive vehicles> C-230, C-43
NG→Repair

OK → Check the harness between 4WD-ECU and steering wheel sensor.
- Check for open circuit, short circuit, and damage of the output line.

NG→Repair

OK → Replace the steering wheel sensor.

Code No.32, 33 Steering wheel sensor <ST-N> system	Probable cause
Code No.32 is output when the steering wheel sensor ST-N has been detected at the neutral position in a state where the steering wheel has been determined to have changed above 40°C from steering wheel sensor ST-1 and ST-2. Code No.33 is output when the steering wheel sensor ST-N has been detected at the neutral position in a state where the steering wheel has been determined to have changed above 400°C from steering wheel sensor ST-1 and ST-2.	• Harness or connector fault • Steering wheel sensor fault • 4WD-ECU fault

MUT-II Data List
- No.52 Steering wheel sensor <ST-N>

(1) Steering wheel: Neutral
OK: ON
(2) Steering wheel: Turn from neutral position
OK: OFF
OK→Intermittent malfunction (Refer to GROUP 00 - Points to Note for Intermittent Malfunctions)

NG ↓

Measure at 4WD-ECU connector C-43.
- Measure the ECU terminal voltage.
- Ignition switch: ON
- Voltage between terminal 44 and earth (Steering wheel sensor <ST-N>)
  OK: When the steering wheel is turned, changes to approx. 1.5 V or 3.5 V.

OK → **Check the following connector:** C-43
NG→Repair

OK ↓

MUT-II Data List
- No.52 Steering wheel sensor <ST-N>

(1) Steering wheel: Neutral
OK: ON
(2) Steering wheel: Turn from the neutral position
OK: OFF
NG→Replace 4WD-ECU.
OK→Intermittent malfunction (Refer to GROUP 00 - Points to Note for Intermittent Malfunctions)

NG ↓

Check the following connectors:
<L.H. drive vehicles> C-230, C-128, C-43
<R.H. drive vehicles> C-230, C-43
NG→Repair

OK ↓

Check the harness between the 4WD-ECU and steering wheel sensor.
- Check for damage of the output line.

Check the damage between the steering wheel sensor and body earth.
- Check for open circuit and damage of the earth line.

NG→Repair

OK ↓

Replace the steering wheel sensor.

Code No.34 Steering wheel sensor <ST-1, ST-2> system	Probable cause
Code No.34 is output when no change in the steering wheel sensor signal at a vehicle speed of above 15 km/h is detected for a total of more than 15 minutes <ST-1, ST-2>, and turning is detected during this time.	• Harness or connector fault • Steering wheel sensor fault • 4WD-ECU fault

MUT-II Data List
- No.53 Steering wheel sensor <ST-1>
  OK: When the steering wheel is rotated to the left, ON and OFF are repeated.
- No.54 Steering wheel sensor <ST-2>
  OK: When the steering wheel is rotated to the right, ON and OFF are repeated.

OK→Intermittent malfunction (Refer to GROUP 00 - Points to Note for Intermittent Malfunctions)

NG ↓

Measure at 4WD-ECU connector C-43.
- Measure the ECU terminal voltage.
- Ignition switch: ON

(1) Voltage between terminal 33 and earth (Steering wheel sensor <ST-1>)
(2) Voltage between terminal 34 and earth (Steering wheel sensor <ST-2>)
OK: When the steering wheel is turned, changes at approx. 1.5 V or 3.5 V

OK → **Check the following connector:** C-43
NG→Repair

OK ↓

MUT-II Data List
- No.53 Steering wheel sensor <ST-1>
  OK: When the steering wheel is rotated to the left, ON and OFF are repeated
- No.54 Steering wheel sensor <ST-2>
  OK: When the steering wheel is rotated to the right ON and OFF are repeated.

NG→Replace the 4WD-ECU.
OK→Intermittent malfunction (Refer to GROUP 00 - Points to Note for Intermittent Malfunctions.)

NG ↓

Check the following connectors:
<L.H. drive vehicles> C-230, C-128, C-43
<R.H. drive vehicles> C-230, C-43
NG→Repair

OK ↓

Check the harness between the 4WD-ECU and steering wheel sensor.
- Check for damage of the output line.

Check the harness between the steering wheel sensor and body earth.
- Check for open circuit and damage of the earth line.

NG→Repair

OK ↓

Replace the steering wheel sensor.

Code No.41, 42 TPS system	Probable cause
Code No.41 is output as excessively small output when the TPS output is below 0.2 V In the idling state. Code No.42 is output as excessively large output when the TPS output is more than 4.8 V for more than 2 minutes continuously below a vehicle speed of 10 km/h.	• TPS fault • Harness or connector fault • 4WD-ECU fault

MUT-II Diagnosis Code
- Is the MPI diagnosis code No.P0120 output?

YES → Refer to GROUP 13A - Troubleshooting.

NO ↓

MUT-II Data List
- No.13 TPS voltage
  OK: Refer to P.22A-35 (Data List Reference Table).

OK→Intermittent malfunction (Refer to GROUP 00 - Points to Note for Intermittent Malfunctions)

NG ↓

Measure at 4WD-ECU connector C-43.
- Measure the ECU terminal voltage.
- Ignition switch: ON
- Voltage between terminal 39 and earth

(1) Accelerator pedal: Full closed
  OK: 535 - 735 mV
(2) Accelerator pedal: Full throttle
  OK: 4,500 - 5,000 mV

NG → Adjust the TPS (Refer to GROUP 13A - On-vehicle Service.)

OK ↓

Check the following connector: C-43
NG→Repair

OK ↓

MUT-II Data List
- No.13 TPS voltage
  OK: Refer to P.22A-35 (Data List Reference Table).

NG→Replace 4WD-ECU.
OK→Intermittent malfunction (Refer to GROUP 00 - Points to Note for Intermittent Malfunctions)

OK ↓

Check the following connectors:
<L.H. drive vehicles> C-43, C-108, B-02
<R.H. drive vehicles> C-43, C-147, C-108, B-02
NG→Repair

OK ↓

Check the harness between TPS and 4WD-ECU.
- Check for open circuit, ground, and damage of the output line.

NG→Repair

Code No.45 Pressure sensor system (Open circuit or ground)	Probable cause
Code No.45 is output when the output signal from the pressure sensor is below 0.2 V.	• Harness or connector fault • Pressure sensor fault • 4WD-ECU fault

MUT-II Data List
- No.18 Pressure sensor
  OK: Refer to P.22A-35 (Data List Reference Table).

OK→Intermittent malfunction (Refer to GROUP 00 - Points to Note for Intermittent Malfunctions)

NG

Measure at 4WD-ECU connector C-43.
- Measure the ECU terminal voltage.
- Ignition switch: ON
- Voltage between 32 and earth
  OK: 0.5 - 1.5 V

NG → **Check the following connectors:**
<L.H. drive vehicles> C-43, C-128, C-134, F-24, F-29
<R.H. drive vehicles> C-43, C-134, F-24, F-29
NG→Repair

OK

Check the harness between the pressure sensor and 4WD-ECU.
- Check for open circuit, ground, and damage of the power line.
- Check for open circuit, ground, and damage of the output line.

NG→Repair

OK

Replace the pressure sensor.

OK

Check the following connector: C-43
NG→Repair

OK

MUT-II Data List
- No.18 Pressure sensor
  OK: Refer to P.22A-35 (Data List Reference Table).

NG→Replace the 4WD-ECU.
OK→Intermittent malfunction (Refer to GROUP 00 - Points to Note for Intermittent Malfunctions)

Code No.46 Pressure sensor system (open earth)	Probable cause
Code No.46 is output when the output signal from the pressure sensor is above 2.0 V.	• Harness or connector fault • Pressure sensor fault • 4WD-ECU fault

Measure at pressure sensor connector F-29.
- Disconnect the connector and measure at the harness side.
- Resistance between terminal 3 and earth
  OK: 2 Ω or less

NG → **Check the following connectors:**
<L.H. drive vehicles> F-29, C-44, C-128, C-134, F-24
<R.H. drive vehicles> F-29, C-44, C-134, F-24
NG→Repair

OK

Check the harness between the pressure sensor and 4WD-ECU.
- Check for open circuit and damage of the earth line.

NG→Repair

OK

Replace the 4WD-ECU.

OK

Check the following connector: F-29
NG→Repair

OK

Replace the pressure sensor.

Code No.47 Pressure sensor system (Abnormal power supply)	Probable cause
Code No.47 is output when the pressure sensor power supply voltage is above 4.0V during pressure sensor power OFF or less than 4.0V during pressure sensor power ON.	• Harness or connector fault • Pressure sensor fault • 4WD-ECU fault

MUT-II Data List
- No.19 Pressure sensor power supply
  OK: Approx. 5 V

OK→Intermittent malfunction (Refer to GROUP 00 - Points to Note for Intermittent Malfunctions)

NG ↓

Measure at 4WD-ECU connector C-43.
- Measure the ECU terminal voltage.
- Ignition switch: ON
- Voltage between terminal 43 and earth
  OK: 4.9 - 5.1 V

NG → **Check the following connectors:**
<L.H. drive vehicles> C-43, C-128, C-134, F-24, F-29
<R.H. drive vehicles> C-43, C-134, F-24, F-29
NG→Repair

OK ↓

Check the following connector: C-43
NG→Repair

OK ↓

Check the harness between the pressure sensor and 4WD-ECU.
- Check for open circuit, ground and damage of the power line.

NG→Repair

OK ↓

MUT-II Data List
- No.19 Pressure sensor power supply
  OK: Approx. 5 V

NG→Replace the 4WD-ECU.
OK→Intermittent malfunction (Refer to GROUP 00 - Points to Note for Intermittent Malfunctions)

Replace the pressure sensor.

Code No.51 Longitudinal G sensor system	Probable cause
Code No.51 is output when the output signal of the longitudinal G sensor is less than 0.5 V or above 4.5 V.	• Harness or connector fault • Longitudinal G sensor fault • ABS-ECU fault <Vehicles with ACD and AYC> • 4WD-ECU fault

MUT-II Data List
- No.14 Longitudinal G sensor voltage
  OK: Refer to P.22A-35 (Data List Reference Table).

OK→Intermittent malfunction (Refer to GROUP 00 - Points to Note for Intermittent Malfunctions)

NG

Measure at longitudinal G sensor connector D-32.
- Disconnect the connector and measure at the harness side.
- Ignition switch: ON

(1) Voltage between terminal 1 and earth
OK: System voltage
(2) Resistance between terminal 3 and earth.
OK: 2 Ω or less

(1) NG → **Check the following connectors:** D-32, C-213, C-210
NG→Repair

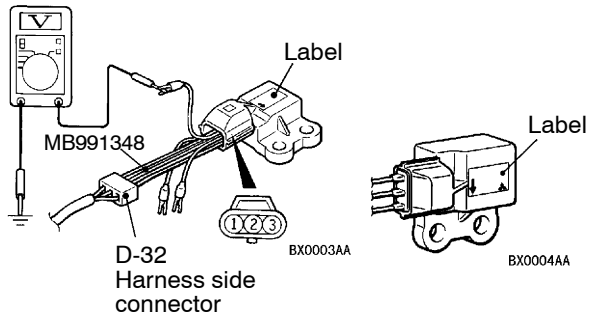
OK

Check the harness between the longitudinal G sensor and ignition switch.
- Check for open circuit, ground and damage of the power line.

NG→Repair

(2) NG

OK



- Remove the longitudinal G sensor.
- Connect the special tool between the connector D-32 at the harness of the longitudinal G sensor and the longitudinal G sensor.
- Ignition switch: ON
- Voltage between terminal 2 and body earth [when the longitudinal G sensor is placed horizontally]
  OK: 2.4 - 2.6 V
- Voltage between terminal 2 and body earth [when the longitudinal G sensor is placed with the labeled side facing at the side]
  OK: 3.3 - 3.7 V

NG → Replace the longitudinal G sensor.

OK

Check the following connectors:
<Vehicles with ACD and AYC> D-32, C-44, C-128, B-123
<L.H. drive vehicles with ACD> D-32, C-128, C-44
<R.H. drive vehicles with ACD> D-32, C-44
NG→Repair

OK

Check the harness between the longitudinal G sensor and 4WD-ECU.
- Check for open circuit, ground and damage of the power line.

Check the harness between the longitudinal G sensor and ABS-ECU. <Vehicles with ACD and AYC>
- Check for ground and damage of the power line.

NG→Repair

OK → **MUT-II Data List**
- No.14 Longitudinal G sensor voltage
  OK: Refer to P.22A-35 (Data List Reference Table).

NG→Refer to GROUP 35B - Troubleshooting, <Vehicles with ACD and AYC>, or replace the 4WD-ECU.
OK→Intermittent malfunction (Refer to GROUP 00 - Points to Note for Intermittent Malfunctions)

Check the following connectors:
<L.H. drive vehicles with ACD and AYC> D-32, C-128, C-130, B-123
<R.H. drive vehicles with ACD and AYC> D-32, C-128, B-123
<L.H. drive vehicles with ACD> D-32, C-128, C-130, C-44
<R.H. drive vehicles with ACD> D-32, C-44
NG→Repair

OK

Check the harness between the longitudinal G sensor and ABS-ECU. <Vehicles with ACD and AYC>
- Check for open circuit and damage of the earth line.

Check the harness between the longitudinal G sensor and 4WD-ECU. <Vehicles with ACD>
- Check for open circuit and damage of the earth line.

NG→Repair

OK

MUT-II Data List
- No.14 Longitudinal G sensor voltage
  OK: Refer to P.22A-35 (Data List Reference Table).

NG→Refer to GROUP 35B - Troubleshooting, <Vehicles with ACD and AYC> or replace the 4WD-ECU <Vehicles with ACD>.
OK→Intermittent malfunction (Refer to GROUP 00 - Points to Note for Intermittent Malfunctions)

Code No.52 Longitudinal G sensor system	Probable cause
Code No.52 is output when the G sensor has exceeded the specified value in a state where the ABS and brake are not operating above the vehicle speed of 10 km/h.	● Harness or connector fault ● Longitudinal G sensor fault ● ABS-ECU fault <Vehicles with ACD and AYC> ● 4WD-ECU fault

MUT-II Data List
- No.14 Longitudinal G sensor voltage
  OK: Refer to P.22A-35 (Data List Reference Table).

OK→Intermittent malfunction (Refer to GROUP 00 - Points to Note for Intermittent Malfunctions)

NG

Check the longitudinal G sensor. (Refer to P.22A-21.)
NG→Replace

OK

Measure at 4WD-ECU connector C-44.
- Measure the ECU terminal voltage.
- Ignition switch: ON
- Voltage between terminal 23 and earth
  OK: 2.4 - 2.6 V (body is in horizontal state)

NG

Check the following connectors:
<Vehicles with ACD and AYC> D-32, C-44, C-128, B-123
<L.H. drive vehicles with ACD> D-32, C-128, C-44
<R.H. drive vehicles with ACD> D-32, C-44
NG→Repair

OK

Check the harness between the longitudinal G sensor and 4WD-ECU.
- Check for open circuit, ground and damage of the power line.

Check the harness between the longitudinal G sensor and ABS-ECU. <Vehicles with ACD and AYC>
- Check for ground and damage of the power line

NG→Repair

OK

MUT-II Data List
- No.14 Longitudinal G sensor voltage
  OK: Refer to P.22A-35. (Data List Reference Table)

NG→Refer to GROUP 35B - Troubleshooting <Vehicles with ACD and AYC>, or replace the 4WD-ECU.
OK→Intermittent malfunction (Refer to GROUP 00 - Points to Note for Intermittent Malfunctions)

OK

Check the following connectors: C-44
NG→Repair

OK

MUT-II Data List
- No.14 Longitudinal G sensor voltage
  OK: Refer to P.22A-35 (Data List Reference Table).

NG→Replace the 4WD-ECU.
OK→Intermittent malfunction (Refer to GROUP 00 - Points to Note for Intermittent Malfunctions)

Code No.56 Lateral G sensor system	Probable cause
Code No.56 is output when the output signal of the lateral G sensor is below 0.5 V or above 4.5 V.	• Harness or connector fault • Lateral G sensor fault • ABS-ECU fault <Vehicles with ACD and AYC> • 4WD-ECU fault

MUT-II Data List
- No.15 Lateral G sensor voltage
  OK: Refer to P.22A-35 (Data List Reference Table).

OK→Intermittent malfunction (Refer to GROUP 00 - Points to Note for Intermittent Malfunctions)

NG

Measure at lateral G sensor connector D-33.
- Disconnect the connector and measure at the harness side.
- Ignition switch: ON

(1) Voltage between terminal 1 and earth.
OK: System voltage

(2) Resistance between terminal 3 and earth.
OK: 2 Ω or less

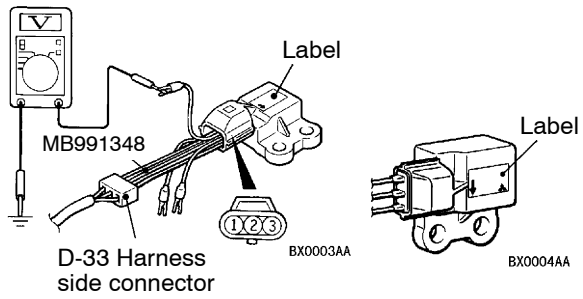
(1) NG → **Check the following connectors:** D-33, C-213, C-210
NG→Repair

OK

(2) NG → Check the harness between the lateral G sensor and ignition switch.
- Check for the open circuit, ground and damage of the power line.

NG→Repair

OK



- Remove the lateral G sensor.
- Connect the special tool between the connector D-33 at the harness of the lateral G sensor connector and the lateral G sensor.
- Ignition switch: ON
- Voltage between terminal 2 and body earth [when the lateral G sensor is placed on a horizontal ground]
  OK: 2.4 - 2.6 V
- Voltage between terminal 2 and body earth [when the lateral G sensor is placed with the labeled side facing the side]
  OK: 3.3 - 3.7 V

NG → Replace the lateral G sensor.

OK

Check the following connectors:
<Vehicles with ACD and AYC> D-33, C-44, C-128, B-123
<L.H. drive vehicles with ACD> D-33, C-128, C-44
<R.H. drive vehicles with ACD> D-33, C-44
NG→Repair

OK

Check the harness between the lateral G sensor and 4WD-ECU.
- Check for open circuit, ground and damage of the power line.

Check the harness between the lateral G sensor and ABS-ECU. <Vehicles with ACD and AYC>
- Check for ground and damage of the power line.

NG→Repair

OK → **MUT-II Data List**
- No.15 Lateral G sensor voltage
  OK: Refer to P.22A-35. (Data List Reference Table)

NG→Refer to GROUP 35B - Troubleshooting <Vehicles with ACD and AYC>, or replace the 4WD-ECU.
OK→Intermittent malfunction (Refer to GROUP 00 - Points to Note for Intermittent Malfunctions)

Check the following connectors:
<Vehicles with ACD and AYC> D-33, C-128, B-123
<L.H. drive vehicles with ACD> D-33, C-128, C-44
<R.H. drive vehicles with ACD> D-33, C-44
NG→Repair

OK

Check the harness between the lateral G sensor and ABS-ECU. <Vehicles with ACD and AYC>
- Check for open circuit and damage of the earth line.

Check the harness between the lateral G sensor and 4WD-ECU.<Vehicles with ACD>
- Check for open circuit and damage of the earth line.

NG→Repair

OK

MUT-II Data List
- No.15 Lateral G sensor voltage
  OK: Refer to P.22A-35. (Data List Reference Table)

NG→Refer to GROUP 35B - Troubleshooting <Vehicles with ACD and AYC>, or replace the 4WD-ECU <Vehicles with ACD>.
OK→Intermittent malfunction (Refer to GROUP 00 - Points to Note for Intermittent Malfunctions)

Code No.57 Lateral G sensor system	Probable cause
Code No.57 is output when the G sensor has exceeded the specified value in a state where the ABS and brake are not operating above the vehicle speed of 10 km/h.	• Harness or connector fault • Lateral G sensor fault • ABS-ECU fault <Vehicles with ACD and AYC> • 4WD-ECU fault

MUT-II Data List
- No.15 Lateral G sensor voltage
  OK: Refer to P.22A-35. (Data List Reference Table)

OK→Intermittent malfunction (Refer to GROUP 00 - Points to Note for Intermittent Malfunctions)

NG

Check the Lateral G sensor. (Refer to P.22A-23.)
NG→Replace

OK

Measure at 4WD-ECU connector C-44.
- Measure the ECU terminal voltage.
- Ignition switch: ON
- Voltage between terminal 11 and earth.
  OK: 2.4 - 2.6 V (Vehicle is in the horizontal state)

NG →

Check the following connectors:
<Vehicles with ACD and AYC> D-33, C-44, C-128, B-123
<L.H. drive vehicles with ACD> D-33, C-128, C-44
<R.H. drive vehicles with ACD> D-33, C-44
NG→Repair

OK

Check the harness between the lateral G sensor and 4WD-ECU.
- Check for open circuit, ground and damage of the power line.

Check the harness between the lateral G sensor and ABS-ECU. <Vehicles with ACD and AYC>
- Check for ground and damage of the power line.

NG→Repair

OK

MUT-II Data List
- No.15 Lateral G sensor voltage
  OK: Refer to P.22A-35 (Data List Reference Table).

NG→Refer to GROUP 35B -Troubleshooting <Vehicles with ACD and AYC>, or replace the 4WD-ECU.
OK→Intermittent malfunction (Refer to GROUP 00 - Points to Note for Intermittent Malfunctions)

OK

Check the following connector: C-44
NG→Repair

OK

MUT-II Data List
- No.15 Lateral G sensor voltage
  OK: Refer to P.22A-35 (Data List Reference Table).

NG→Replace the 4WD-ECU.
OK→Intermittent malfunction (Refer to GROUP 00 - Points to Note for Intermittent Malfunctions)

Code No.61 Stop lamp switch system	Probable cause
Code No.61 is output when the stop lamp switch is ON for more than 15 minutes when the vehicle speed is above 15 km/h.	• Brake pedal fault • Stop lamp switch fault • Harness or connector fault • 4WD-ECU fault

Check for brake pedal height
(Refer to GROUP 35A – On-vehicle Service.)
NG→Adjust

OK

MUT-II Data List
- No.56 Stop lamp switch

(1) Depress the brake pedal.
OK: ON
(2) Release the brake pedal.
OK: OFF
OK→Intermittent malfunction (Refer to GROUP 00 - Points to Note for Intermittent Malfunctions)

NG

Check the following connector: C-103
NG→Repair

OK

Check the stop lamp switch.
(Refer to GROUP 35A - Brake Pedal.)
NG→Replace

OK

Measure at stop lamp switch connector C-103.
- Disconnect the connector and measure at the harness side.
- Voltage between terminal 2 and earth

OK: System voltage

NG → **Check the following connectors:** C-103, C-135
NG→Repair

OK

Check the harness between the stop lamp switch and battery.
- Check for open circuit or damage of the power line.

NG→Repair

OK

Measure at 4WD-ECU connector C-43.
- Measure the ECU terminal voltage.
- Voltage between terminal 38 and earth

(1) Depress the brake pedal.
OK: System voltage
(2) Release the brake pedal
OK: 1 V or less

OK → **Check the following connector:** C-43
NG→Repair

OK

MUT-II Data List
- No.56 Stop lamp switch

(1) Depress the brake pedal.
OK: ON
(2) Release the brake pedal.
OK: OFF
NG→Replace the 4WD-ECU.
OK→Intermittent malfunction (Refer to GROUP 00 - Points to Note for Intermittent Malfunctions)

NG

Check the following connectors:
<L.H. drive vehicles> C-103, C-43, C-108, C-130
<R.H. drive vehicles> C-103, C-43
NG→Repair

OK

Check the harness between the 4WD-ECU and stop lamp switch.
- Check for open circuit and damage of the power line.

NG→Repair

OK

Check the stop lamp bulb.
NG→Replace

OK → Check the harness between the stop lamp switch and stop lamp.
- Check for open circuit and damage of the power line.

Check the harness between the strop lamp and body earth.
- Check for open circuit and damage of the earth line.

NG→Repair

Code No.62 ACD mode switch system	Probable cause
Code No.62 is output when the ACD mode switch is ON for more than 60 seconds.	● ACD mode switch fault ● Harness or connector fault ● 4WD-ECU fault

MUT-II Data List
- No.63 ACD mode switch

(1) Press the ACD mode switch.
OK: ON
(2) Release the ACD mode switch.
OK: OFF
OK→Intermittent malfunction (Refer to GROUP 00 - Points to Note for Intermittent Malfunctions)

NG

Check the ACD mode switch. (Refer to P.22A-57.)
NG→Replace

OK

Measure at ACD mode switch connector C-142.
- Disconnect the connector and measure at the harness side.
- Ignition switch: ON
- Voltage between terminal 2 and earth

OK: System voltage

NG → **Check the following connectors:**
<L.H. drive vehicles> C-142, C-29, C-213, C-210
<R.H. drive vehicles> C-142, C-209, C-210
NG→Repair

OK

Check the harness between the ACD mode switch and ignition switch.
- Check for open circuit or damage of the power line.

NG→Repair

OK

Check the harness between the junction block and combination meter.
- Check for ground and damage of the power line.

NG→Repair

OK

Measure at 4WD-ECU connector C-43.
- Measure the ECU terminal voltage.
- Ignition switch: ON
- Voltage between terminal 47 and earth

(1) Press the ACD mode switch.
OK: System voltage
(2) Release the ACD mode switch.
OK: 1 V or less

NG → **Check the following connectors:**
<L.H. drive vehicles> C-142, C-128, C-43
<R.H. drive vehicles> C-142, C-43
NG→Repair

OK

Check the harness between the 4WD-ECU and ACD mode switch.
- Check for open circuit and damage of the power line

NG→Repair

OK

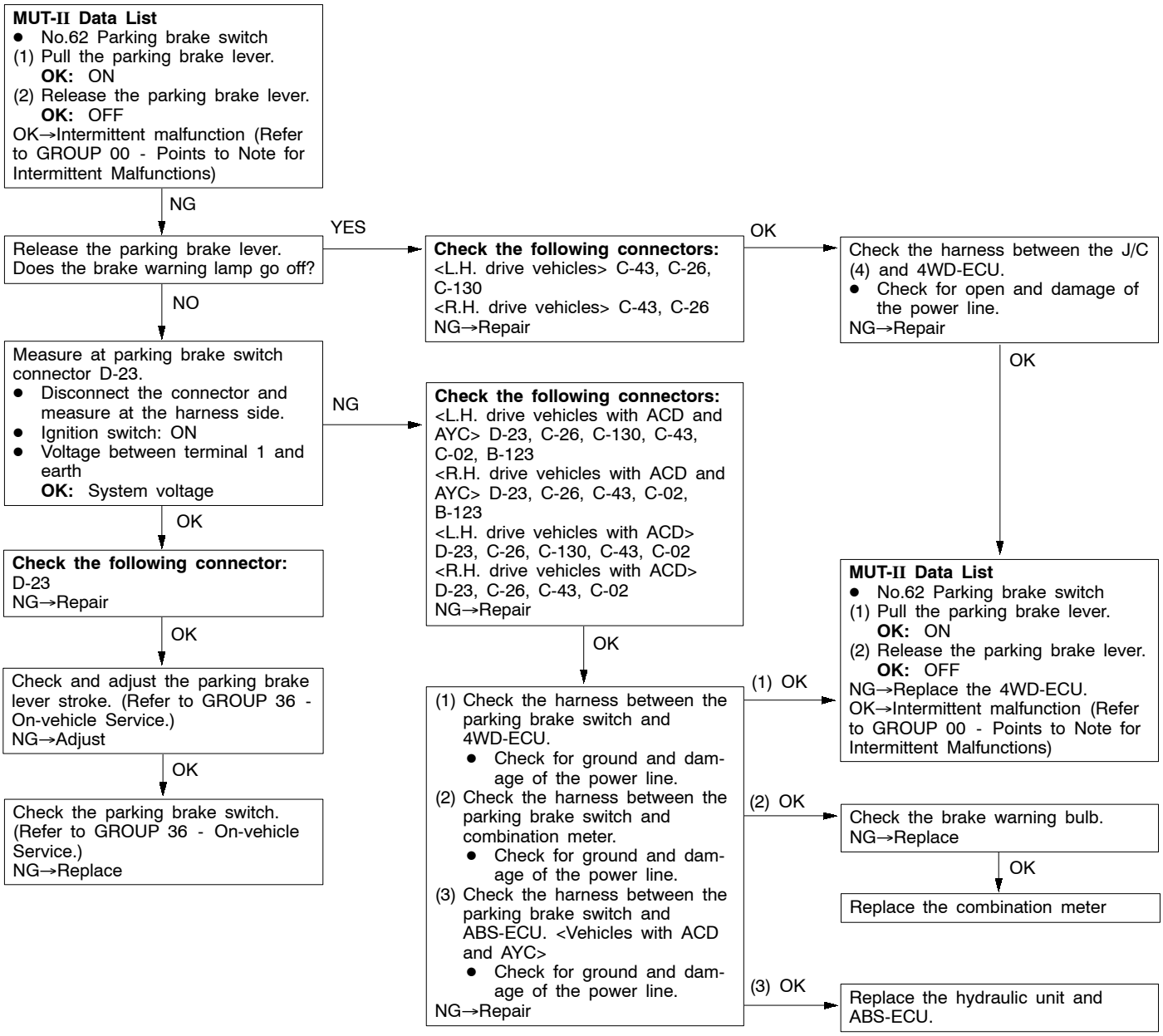
Check the following connector: C-43
NG→Repair

OK

MUT-II Data List
- No.63 ACD mode switch

(1) Press the ACD mode switch.
OK: ON
(2) Release the ACD mode switch.
OK: OFF
NG→Replace the 4WD-ECU.
OK→Intermittent malfunction (Refer to GROUP 00 - Points to Note for Intermittent Malfunctions)

Code No.63 Parking brake switch system	Probable cause
Code No.63 is output when the parking brake switch is ON for more than 15 minutes with the vehicle speed above 15 km/h.	• Parking brake switch fault • Harness or connector fault • ABS-ECU fault <Vehicles with ACD and AYC> • 4WD-ECU fault



Code No.65 ABS monitor system	Probable cause
Code No.65 is output when ABS is detected to be operating for more than 1 minute continuously.	• Harness or connector fault • ABS-ECU fault <Vehicles with ACD and AYC> • 4WD-ECU fault

<Vehicles with ACD and AYC>

MUT-II Data List
- No.61 ABS monitor

(1) ABS-ECU connector: Disconnected
OK: ON
(2) ABS-ECU connector: Connect
OK: OFF
OK→Intermittent malfunction (Refer to GROUP 00 - Points to Note for Intermittent Malfunctions)

(1) NG → **Check the following connectors:**
<L.H. drive vehicles> C-43, B-123
<R.H. drive vehicles> C-43, B-128, B-123
NG→Repair

OK → Check the harness between the 4WD-ECU and ABS-ECU.
- Check for short circuit and damage of the output line.

NG→Repair

(2) NG

Measure at 4WD-ECU connector C-43.
- Disconnect the connector and measure at the harness side.
- Voltage between terminal 49 and body earth.
  OK: System voltage

NG → **Check the following connectors:**
<L.H. drive vehicles> C-43, B-123
<R.H. drive vehicles> C-43, B-128, B-123
NG→Repair

OK → Check the harness between the 4WD-ECU and ABS-ECU.
- Check for open circuit, ground, and damage of the output line.

NG→Repair

OK → **Check the following connector:** C-43
NG→Repair

OK → **MUT-II Data List**
- No.61 ABS monitor
  OK: OFF

NG→Replace the 4WD-ECU.
OK→Intermittent malfunction (Refer to GROUP 00 - Points to Note for Intermittent Malfunctions)

OK → Measure at ABS-ECU connector B-123.
- Measure the ECU terminal voltage.
- Voltage between terminal 3 and body earth.
- Implement ABS actuator test (No.05: ABS signal).
  OK: Below 1 V for 10 seconds while executing , after which system voltage.

NG→Replace the hydraulic unit and ABS-ECU.

<Vehicles with ACD>

Measure at 4WD-ECU connector C-43.
- Disconnect the connector and measure at the harness side.
- Resistance between terminal 50 and body earth
  OK: 2 Ω or less

NG → **Check the following connectors:**
<L.H. drive vehicles> C-43
<R.H. drive vehicles> C-43, C-08
NG→Repair

OK → Check the harness between 4WD-ECU and body earth.
- Check for open circuit and damage of the power line

NG→Repair

OK → **Check the following connector:** C-43
NG→Repair

OK → Replace the 4WD-ECU.

Code No.74 Proportional valve <ACD> system	Probable cause
Code No.74 is output when open circuit or short circuit of the control circuit of the proportional valve <ACD> has occurred.	● Proportional valve <ACD> fault ● Harness or connector fault ● 4WD-ECU fault

MUT-II Data List
- No.11 Proportional valve current <ACD>
  OK: Refer to P.22A-35 (Data List Reference Table).

OK→Intermittent malfunction (Refer to GROUP 00 - Points to Note for Intermittent Malfunctions)

OK ↓

Measure at proportional valve <ACD> connector F-27.
- Disconnect the connector, and measure at the proportional valve.
- Resistance between terminals 2 and 3.
  OK: Below 4.7 Ω

NG → Replace the hydraulic unit.

OK ↓

Measure at proportional valve <ACD> connector F-27.
- Disconnect the connector and measure at the harness side.
- Resistance between terminal 2 and body earth.
  OK: 2 Ω or less

OK → **Check the following connectors:**
<L.H. drive vehicles> F-27, F-24, C-134, C-130, C-44
<R.H. drive vehicles> F-27, F-24, C-134, C-44
NG→Repair

OK ↓

Check the harness between the 4WD-ECU and proportional valve <ACD>.
- Check for open circuit, ground, and damage of the output line.

NG→Repair

OK ↓

MUT-II Data List
- No.11 proportional valve current <ACD>
  OK: Refer to P.22A-35 (Data List Reference Table).

NG→Replace the 4WD-ECU.
OK→Intermittent malfunction (Refer to GROUP 00 - Points to Note for Intermittent Malfunctions)

NG ↓

Check the following connectors: F-27, F-24
NG→Repair

OK ↓

Check the harness between the proportional valve <ACD> and body earth.
- Check for open circuit and damage of the earth line.

NG→Repair

Code No.81 Electric pump relay system	Probable cause
Output when the coil circuit of the electric pump relay has open circuited or short circuited.	● Electric pump relay fault ● Harness or connector fault ● 4WD-ECU fault

MUT-II Actuator Test
- No.12 Electric pump drive
  OK: The operating sound of the electric pump can be heard.

OK→Intermittent malfunction (Refer to GROUP 00 - Points to Note for Intermittent Malfunctions)

NG ↓

Check the electric pump relay. (Refer to P.22A-57.)

NG → Replace the electric pump relay.

OK ↓

Measure at electric pump relay connector B-139.
- Disconnect the connector and measure at the harness side.
- Resistance between terminal 1 and body earth
  OK: 2 Ω or less

OK → **Check the following connectors:**
<L.H. drive vehicles> B-139, C-44
<R.H. drive vehicles> B-139, C-147, C-44
NG→Repair

OK ↓

Check the harness between the 4WD-ECU and electric pump relay.
- Check for open circuit, short circuit, and damage of the power line.

NG→Repair

OK ↓

MUT-II Actuator Test
- No.12 Electric pump drive
  OK: Operating sounds of the electric pump can be heard.

NG→Replace the 4WD-ECU.
OK→Intermittent malfunction (Refer to GROUP 00 - Points to Note for Intermittent Malfunctions)

NG ↓

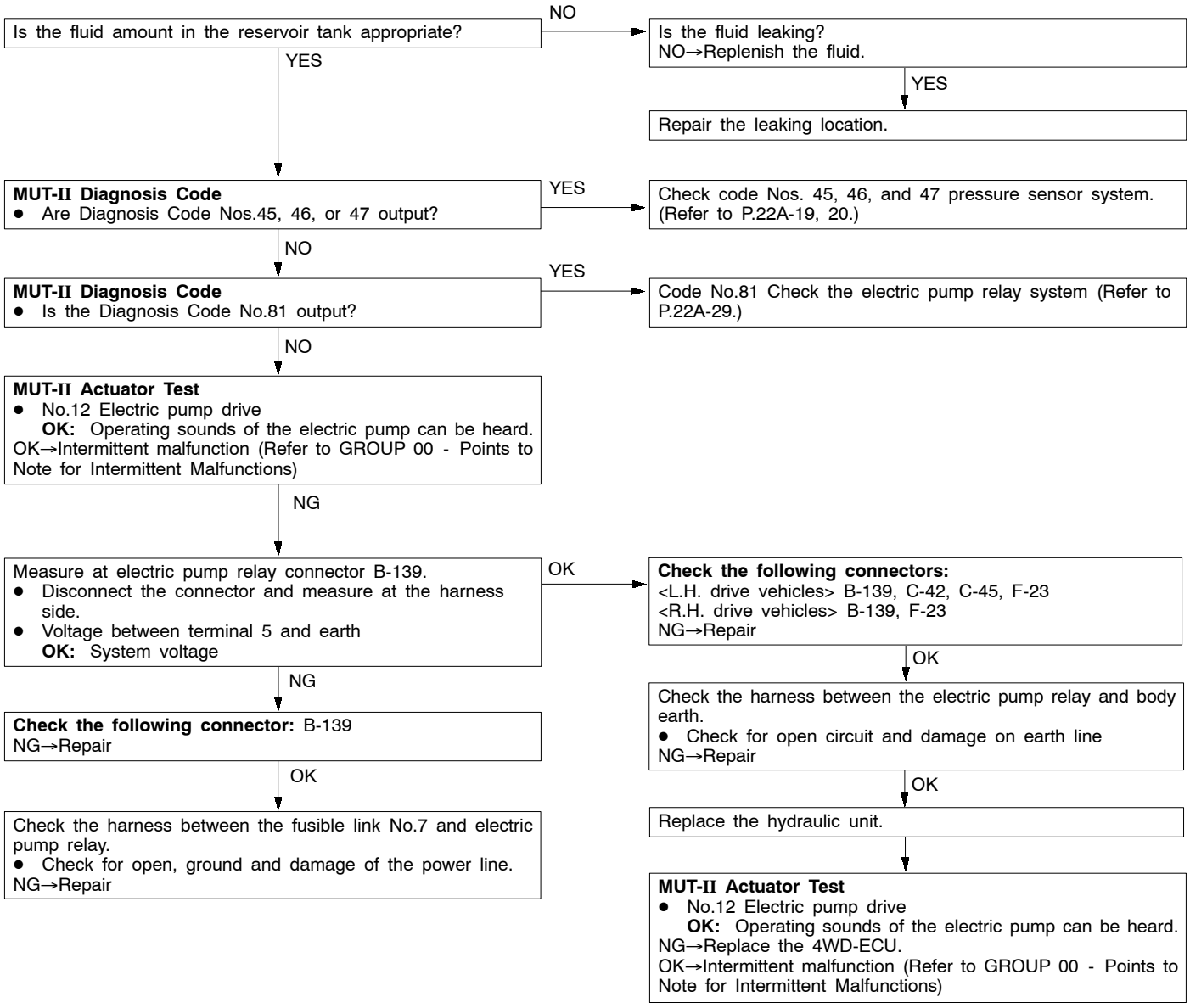
Check the following connector: B-139
NG→Repair

OK ↓

Check the harness between the electric pump relay and body earth.
- Check for open circuit and damage of the earth line.

NG→Repair

Code No.82 Electric pump relay system	Probable cause
Code No.82 is output when the pressure sensor does not reach the specified value even if the 4WD-ECU has output the electric pump motor drive command.	• Insufficient fluid • Pressure sensor fault • Electric pump relay fault • Hydraulic unit fault • Harness or connector fault • 4WD-ECU fault



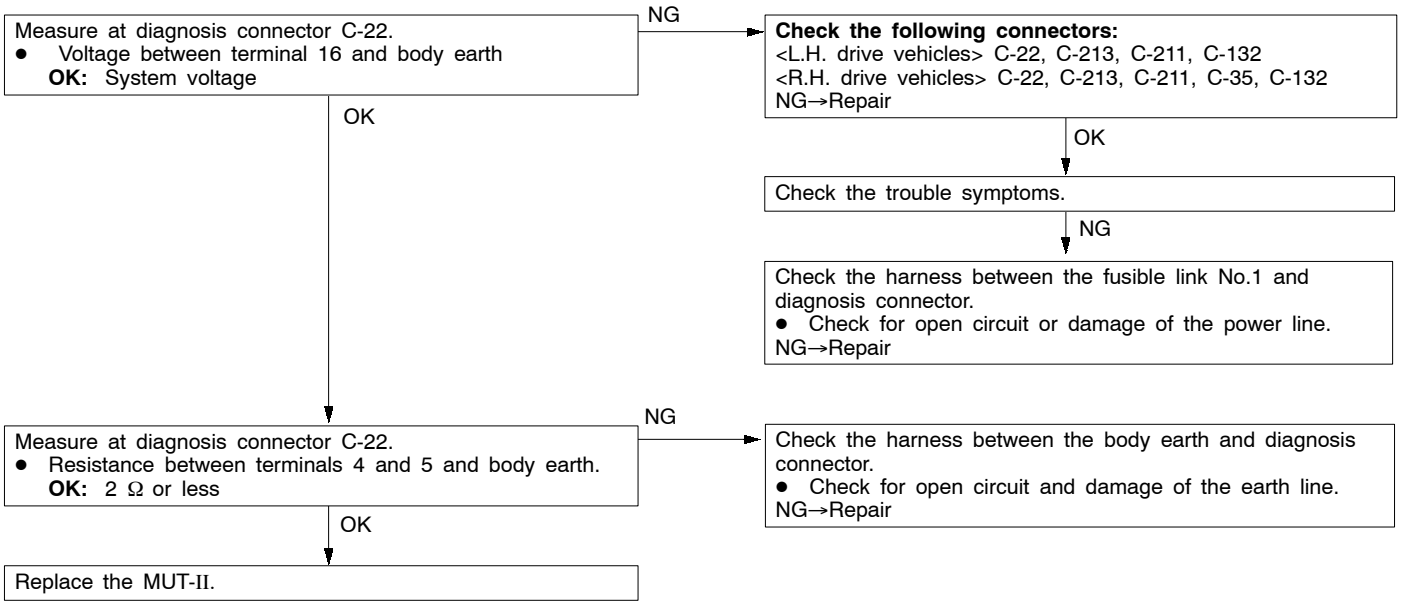
INSPECTION CHART FOR TROUBLE SYMPTOMS

Trouble symptom	Inspection procedure No.	Reference page
No communication possible between MUT-II and all systems.	1	22A-31
No communication possible between MUT-II and 4WD-ECU.	2	22A-32
ACD mode indicator lamp does not light up when the ignition switch is set to "ON" (engine is stopped).	3	22A-33
More than two ACD mode indicator lamps remain lit even after the engine is started	4	22A-34
The ACD does not operate (no diagnostic code).	5	22A-34
The AYC does not operate (no diagnostic code).	6	Refer to GROUP 27B.
The rear tire sounds when turning at low speed corners (vehicle slows down)	7	
Noise is produced from the torque transfer differential during turning.	8	

INSPECTION PROCEDURES FOR TROUBLE SYMPTOMS

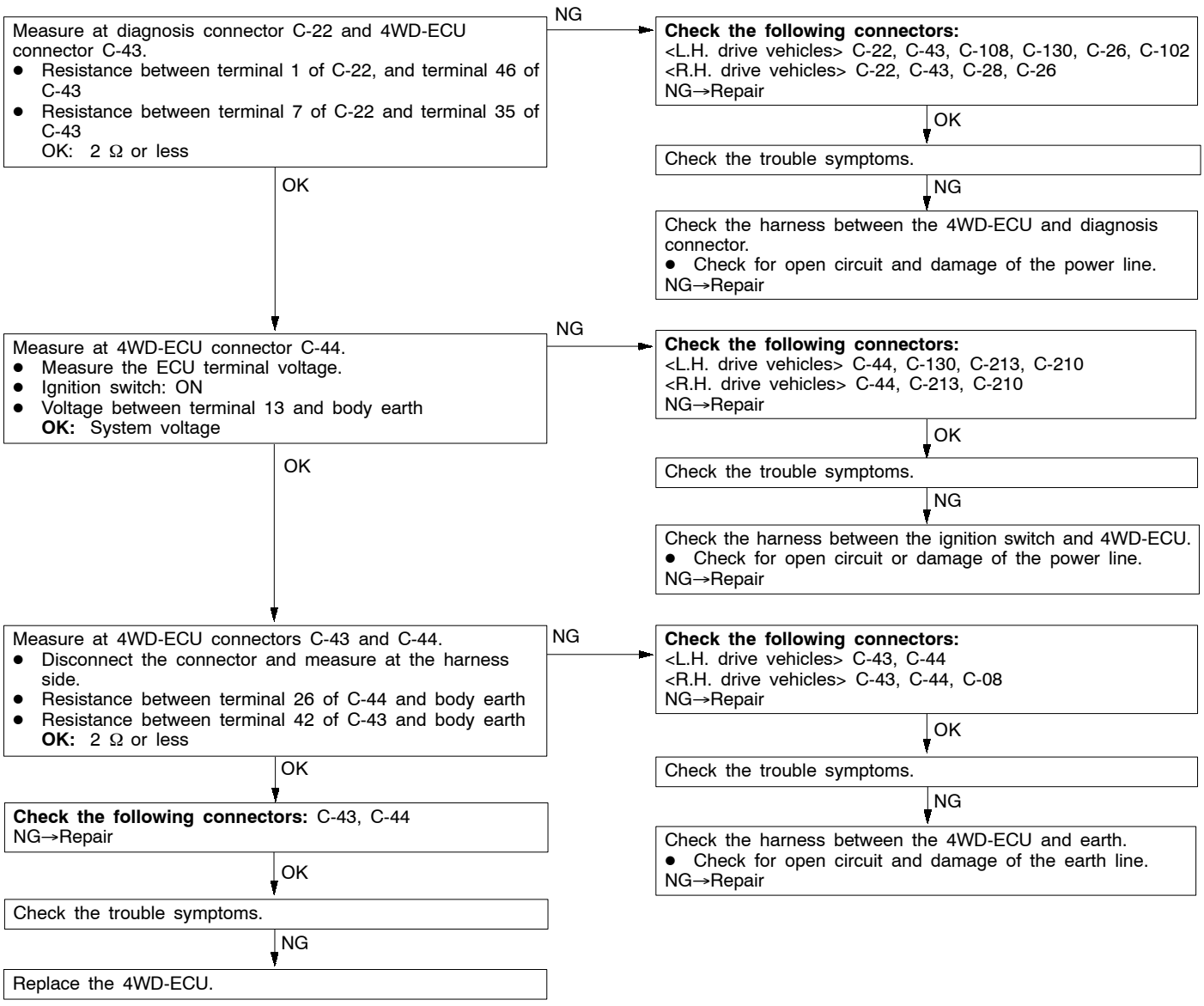
Inspection procedure 1

No communication possible between MUT-II and all systems.	**Probable cause**
The diagnosis connector power supply circuit, earth circuit, or MUT-II may be faulty.	• Diagnostic connector fault • Harness or connector fault • MUT-II fault



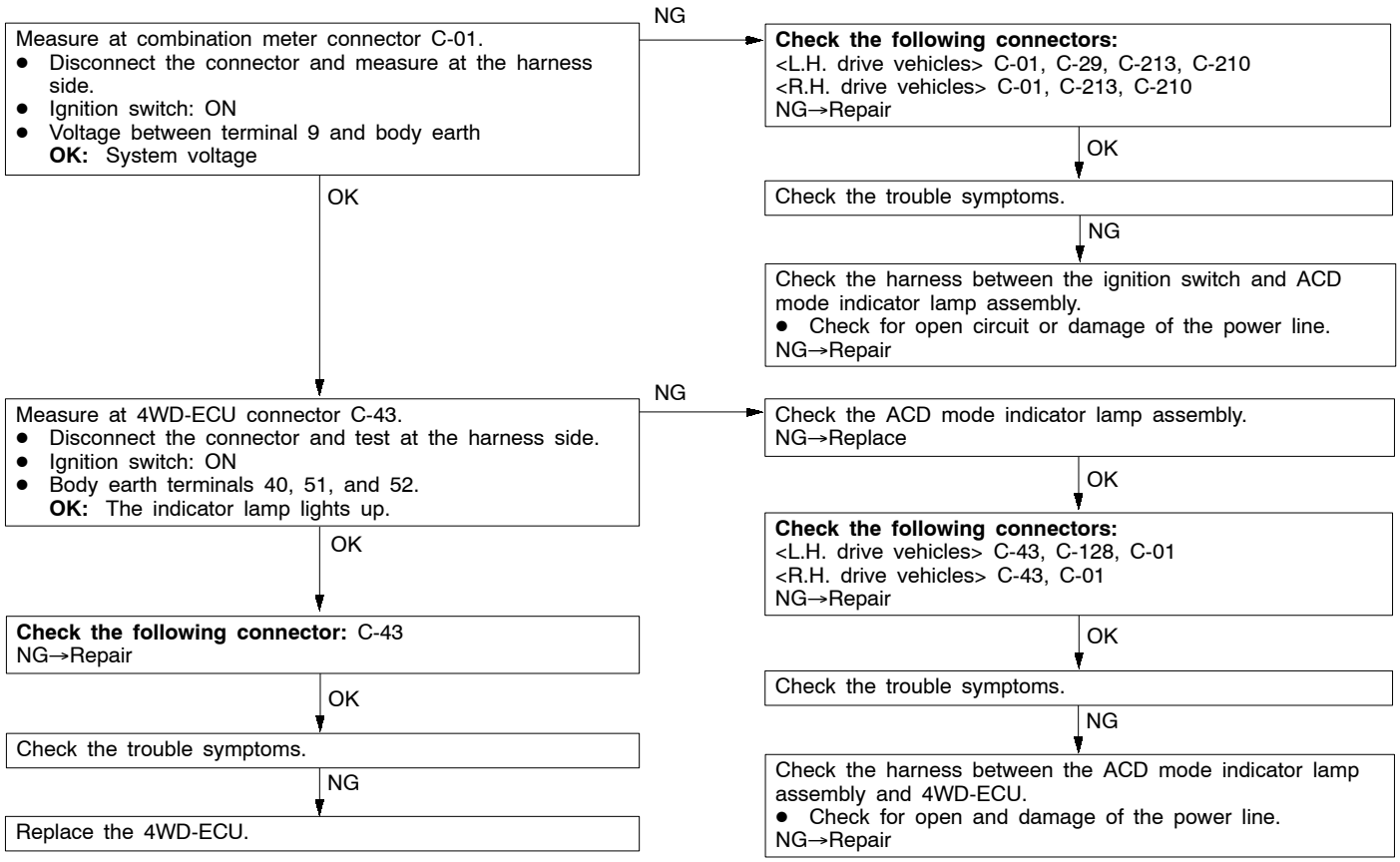
Inspection procedure 2

No communication is possible between the MUT-II and 4WD-ECU.	Probable cause
The diagnostic output circuit, 4WD-ECU power supply circuit, earth circuit, or 4WD-ECU may be faulty.	• Harness or connector fault • 4WD-ECU fault



Inspection procedure 3

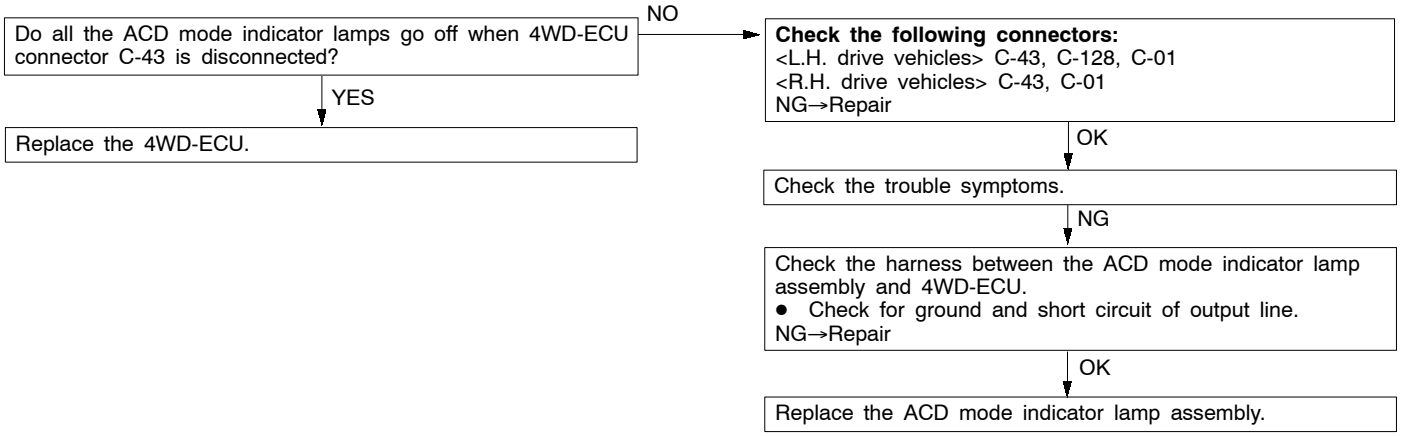
The ACD mode indicator lamp does not light up when the ignition switch is turned "ON" (engine stop).	Probable cause
The ACD mode indicator lamp circuit or 4WD-ECU may be faulty.	• Harness or connector fault • ACD mode indicator lamp assembly fault • 4WD-ECU fault



Inspection procedure 4

More than two ACD mode indicator lamps remain lit even after the engine starts	Probable cause
The output circuit of the ACD mode indicator lamp may be faulty.	● Harness or connector fault ● 4WD-ECU fault ● ACD mode indicator lamp assembly fault

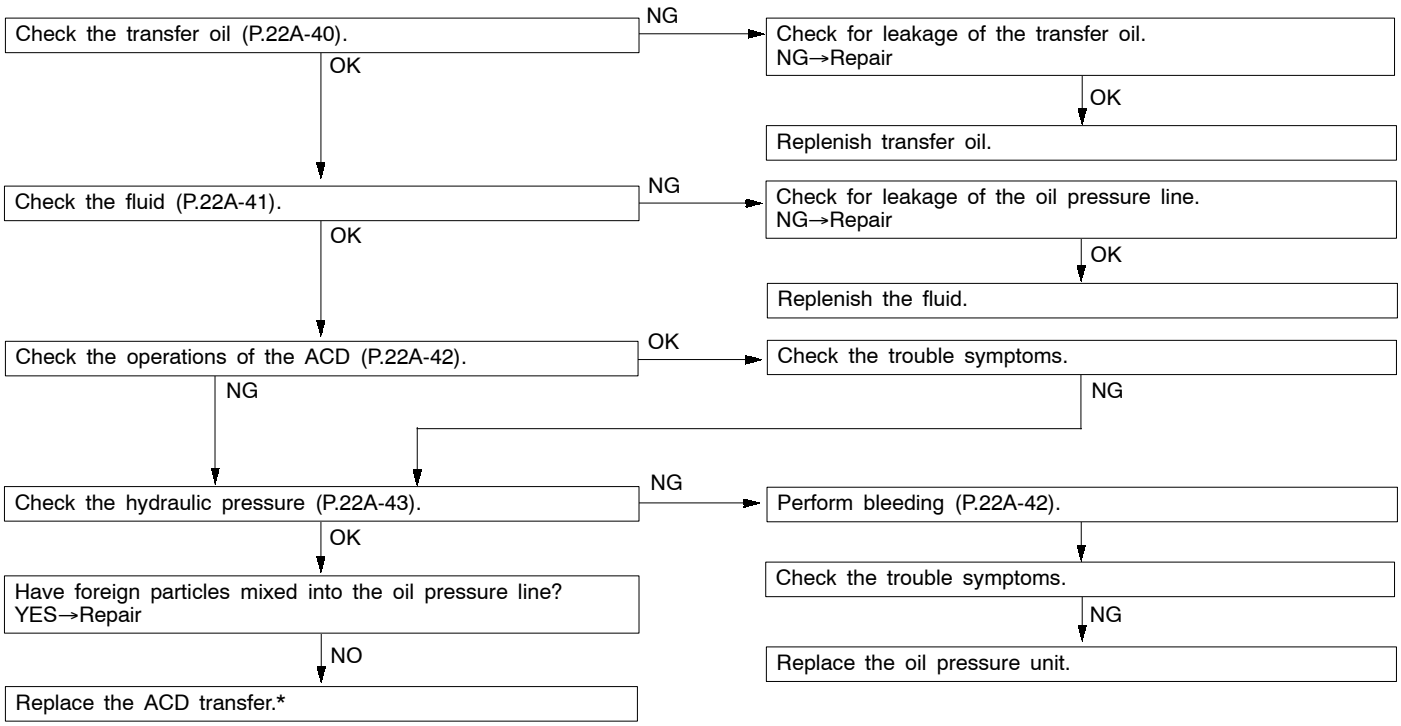
NOTE
This phenomenon occurs only when communication with the MUT-II is possible (4WD-ECU power supply fault) and at the same time, no diagnostic code (no trouble code) is output.



Inspection procedure 5

ACD does not operate (No diagnosis code)	Probable cause
Insufficient operating oil, oil leakage, faulty operations of the oil pressure unit, and faulty operations of the ACD transfer may be suspected.	● Leakage of transfer oil ● Insufficient transfer oil ● Leakage of oil pressure line ● Insufficient fluid ● Hydraulic unit fault ● ACD transfer fault

NOTE:
1. This malfunction is restricted to only when no diagnostic code (no trouble code) is output.
2. *: Refer to GROUP 22B.



DATA LIST REFERENCE TABLE

Item no.	Check item	Check condition		Normal conditions
01	Wheel speed sensor <FR>	Execute actual driving.		The speed meter display and MUT-II display match.
02	Wheel speed sensor <FL>			
03	Wheel speed sensor <RR>			
04	Wheel speed sensor <RL>			
05	Wheel speed sensor <FR> (0.2 km/h)			
06	Wheel speed sensor <FL> (0.2 km/h)			
07	Wheel speed sensor <RR> (0.2 km/h)			
08	Wheel speed sensor <RL> (0.2 km/h)			
09	Vehicle speed			
10	Battery voltage	Ignition switch: ON		System voltage
11	Proportional valve current <ACD>	During ACD operation		50 - 1,000 mA
12	Proportional valve current <AYC>	During AYC operation		50 - 1,000 mA
13	TPS voltage	Ignition switch: ON Engine: Stopped	Accelerator pedal: Full closed	535 - 735 mV
			Accelerator pedal: Press	Gradually rises from the above value
			Accelerator pedal: Full throttle	4,500 - 5,000 mV
14	Longitudinal G sensor voltage	Ignition switch: ON	Vehicle stopped (horizontal) state	2.4 - 2.6 V
			Actual driving	The displayed value increases and decreases mainly around 2.5 V.
15	Lateral G sensor voltage	Ignition switch: ON	Vehicle stopped (horizontal) state	2.4 - 2.6 V
			Perform actual driving	The displayed value increases and decreases mainly around 2.5 V.
16	Steering operation angle	Ignition switch: ON	Steering wheel: Steer by 90 degrees to the right	R90 deg
			Steering wheel: Steer by 90 degrees to the left	L90 deg
17	Steering angle velocity	Ignition switch: ON	Steering wheel: No steering	0 deg/s
			Steering wheel: Steer	The display changes according to the revolution speed.
18	Pressure sensor	During electric pump motor operations		1.0 - 1.6 MPa

Item no.	Check item	Check condition		Normal conditions
19	Pressure sensor power supply	Ignition switch: ON		Approx.5 V
20	Valve power supply	Ignition switch: ON		System voltage
21	Steering wheel sensor voltage <ST-1>	Ignition switch: ON	Steering wheel: Turn	1 - 2 V and 2.5 - 4.5 V are displayed alternately.
22	Steering wheel sensor voltage <ST-2>	Ignition switch: ON	Steering wheel: Turn	1 - 2 V and 2.5 - 4.5 V are displayed alternately.
23	Steering wheel sensor voltage <ST-N>	Ignition switch: ON	Steering wheel: Neutral	1 - 2 V
			Steering wheel: Turn	2.5 - 4.5 V
51	Idle switch	Ignition switch: ON	Accelerator pedal: Full closed	ON
			Accelerator pedal: Press	OFF
52	Steering wheel sensor <ST-N>	Ignition switch: ON	steering wheel: Neutral	ON
			Steering wheel: Turn from the neutral position	OFF
53	Steering wheel sensor <ST-1>	Ignition switch: ON	Steering wheel: Turn slowly	ON and OFF are displayed alternaltely.
54	Steering wheel sensor <ST-2>	Ignition switch: ON	Steering wheel: Turn slowly	ON and OFF are displayed alternately
55	Steering wheel sensor learning <ST-N>	Perform actual driving	Steering wheel sensor neutral position learning executed	ON
			Steering wheel sensor neutral position learning unexecuted	OFF
56	Stop lamp switch	Ignition switch: ON Engine: Stopped	Brake pedal: Depress	ON
			Brake pedal: Release	OFF
57	Motor monitor	Electric pump motor is currently operating		ON
		Electric pump motor is currently not operating		OFF
58	Oil pressure state	Electric pump motor is currently operating		LOW
		Electric pump motor is currently not operating		HIGH
59	Directional valve <Right>	AYC clutch right side is currently operating		ON
		AYC clutch right side is currently not operating		OFF
60	Directional valve <Left>	AYC clutch left side is currently operating		ON
		AYC clutch left side is currently not operating		OFF
61	ABS monitor	ABS is currently operating		ON
		ABS is currently not operating		OFF
62	Parking brake switch	Ignition switch: ON Engine:Stopped	Parking brake lever: Pull	ON
			Parking brake lever: Release	OFF
63	ACD mode switch	Ignition switch: ON Engine:Stopped	ACD mode switch: Press	ON
			ACD mode switch: Release	OFF

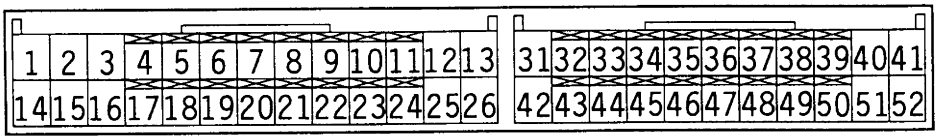
ACTUATOR TEST JUDGEMENT VALUE

Item no.	Check item	Test description	Normal state
01	Bleeding <ACD>	Input current to the Proportional valve according to the steering angle, and operate the Proportional valve for five minutes.	Make sure no air leaks from the bleeder screw on the transfer.
02	Bleeding <AYC>	Input current to the Proportional valve according to the steering angle, and operate the directional valve for five minutes.	Make sure no air leaks from the bleeder screw on the torque transfer differential.
03	Check the oil volume	Operate the directional valve to the left and right for 20 seconds.	Check that the oil volume of the reservoir tank is appropriate.
04	Electric pump drive	Operate the electric pump for 5 seconds.	Operation sounds of the electric pump can be heard.
05	Check the operations of the ACD	Operate the Proportional valve <ACD> and supply the maximum oil pressure to the multi plate clutch.	9Generate the tight corner braking phenomenon.
06	Check clutch operations <Left>	Operate the direction valve and supply the maximum oil pressure to the left clutch.	When the wheels are lifted, speed difference will occur between the rear left and right wheels.
07	Check clutch operations <Right>	Operate the direction valve and supply the maximum oil pressure to the right clutch.	When the wheels are lifted, speed difference will occur between the rear left and right wheels.
08	Control OFF	Turn OFF the electric pump relay, and turn OFF the control of the ACD and AYC.	In actual driving, there is difference between control ON and OFF.

(1) The actuator test can be executed only when all the following conditions are satisfied.
- All wheel speed sensor inputs below 20 km/h
- No system malfunction detected
- Steering angle is within ±30 degrees from the neutral position

(2) When the actuator test corresponds to one of the following conditions, forced driving will be cleared.
- When any one of the wheel speed sensor input is detected to be above 20 km/h (excluding Item No.08 “Control OFF”.)
- When system malfunction is detected (excluding diagnostic code No.82, 84, and 85)
- When the forced drive time is exceeded
- When the MUT-II is removed
- When the Clear key of the MUT-II is operated

CHECK AT 4WD-ECU TERMINALS



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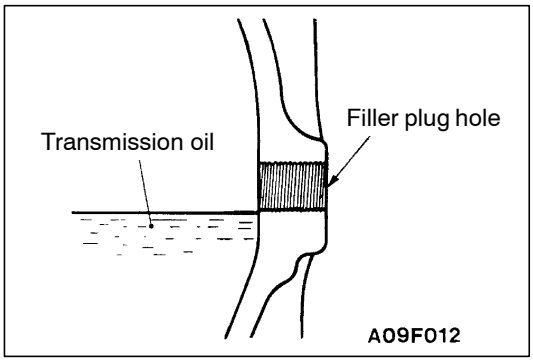
NOTE:
1. *1 indicates the eliminated terminal when only ACD is installed.
2. *2 indicates the terminal added when only ACD is installed.

Terminal no.	Check item	Check condition		Normal state
1	Proportional valve <ACD>	Operate the Proportional valve in the actuator test (Item No.01). <ACD>	While executing the actuator test	System voltage
			After completing the actuator test	1 V or less
3*1	Proportional valve <AYC>	Operate the Proportional valve in the actuator test (Item No. 02). <AYC>	While executing the actuator test	System voltage
			After completing the actuator test	1 V or less
6	Wheel speed sensor <FL>	Vehicle is stopping		1 V or less
		Moving forward slowly		0 ↔ 5 V flushing
7	Wheel speed sensor <RR>	Vehicle is stopping		1 V or less
		Moving forward slowly		0 ↔ 5 V flushing
8	Wheel speed sensor <RL>	Vehicle is stopping		1 V or less
		Moving forward slowly		0 ↔ 5 V flushing
9	Wheel speed sensor <FR>	Vehicle is stopping		1 V or less
		Moving forward slowly		0 ↔ 5 V flushing
10	Pressure sensor earth	Any time		1 V or less
11	Lateral G sensor	Ignition switch: ON Vehicle horizontal state		2.4 - 2.6 V
13	4WD-ECU power supply	Ignition switch: OFF		0 V
		Ignition switch: ON		System voltage
14*1	Directional valve <Right>	Operate the directional valve <right> in the actuator test (Item No. 07)	While executing the actuator test	System voltage
			After completing the actuator test	1 V or less
15*1	Directional valve <Left>	Operate the directional valve <left> in the actuator test (Item No. 06)	While executing the actuator test	System voltage
			After completing the actuator test	1 V or less
16	Electric pump relay power supply	When the electric pump motor is not operating		0 V
		While the electric pump motor is operating		System voltage
19*2	Wheel speed sensor earth <FL>	Any time		1 V or less
20*2	Wheel speed sensor earth <RR>	Any time		1 V or less
21*2	Wheel speed sensor earth <RL>	Any time		1 V or less
22*2	Wheel speed sensor earth <FR>	Any time		1 V or less
23	Longitudinal G sensor	Ignition switch: ON Vehicle horizontal state		2.4 - 2.6 V

Terminal no.	Check item	Check condition		Normal state
24*2	Longitudinal G sensor earth, lateral G sensor earth	Any time		1 V or less
26	ECU earth	Any time		1 V or less
31	ECU backup power supply	Any time		System voltage
32	Pressure sensor	Ignition switch: ON		0.5 - 1.5 V
33	Steering wheel sensor <ST-1>	Ignition switch: ON	Steering wheel: Turn slowly	1 - 2 V ⇔ 2.5 - 4.5 V flushing
34	Steering wheel sensor <ST-2>	Ignition switch: ON	Steering wheel: Turn slowly	1 - 2 V ⇔ 2.5 - 4.5 V flushing
35	Diagnosis data input/ output	-		-
36	Idle switch	Ignition switch: ON	Accelerator pedal: Full closed	1 V or less
			Accelerator pedal: Depress	4.5 - 5.0 V
37	Parking brake switch	Ignition switch: ON	Parking brake lever: Pull	1 V or less
			Parking brake lever: Release	System voltage
38	Stop lamp switch	Ignition switch: ON	Brake pedal: Depress	System voltage
			Brake pedal: Release	1 V or less
39	TPS	Ignition switch: ON	Accelerator pedal: Full closed	0.5 - 0.7 V
			Accelerator pedal: Full throttle	4.5 - 5.5 V
40	ACD mode indicator lamp <TARMAC>	Ignition switch: ON	ACD mode indicator lamp position: TARMAC	0 V
			ACD mode indicator lamp position: Except for above	Approx. 10.5 V
42	ECU earth	Any time		1 V or less
43	Pressure sensor earth	Any time		1 V or less
44	Steering wheel sensor <ST-N>	Ignition switch: ON	Steering wheel: Neutral	1 - 2 V
			Steering wheel: Turn from the neutral position	2.5 - 4.5 V
46	Diagnosis control	-		-
47	ACD mode switch	Ignition switch: ON	Switch: Press	System voltage
			Switch: Release	0 V
49*1	ABS monitor	With ABS not active		System voltage
		With ABS active		1.5 V or less
50*2	Earth	Any time		1 V or less
51	ACD mode indicator lamp <SNOW>	Ignition switch: ON	ACD mode indicator lamp position: SNOW	0 V
			ACD mode indicator lamp position: Except for above	Approx. 10.5 V
52	ACD mode indicator lamp <GRAVEL>	Ignition switch: ON	ACD mode indicator lamp position: GRAVEL	0 V
			ACD mode indicator lamp position: Except for above	Approx. 10.5 V

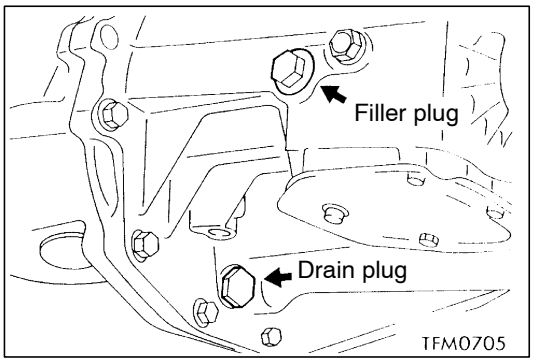


ON-VEHICLE SERVICE

TRANSMISSION OIL CHECK

1. Remove the oil filler plug.
2. Oil level should be at the lower portion of the filler plug hole.
3. Check that the transmission oil is not noticeably dirty, and that it has a suitable viscosity.
4. Tighten the filler plug to the specified torque.

   Tightening torque: 32 ± 2 N·m



TRANSMISSION OIL REPLACEMENT

1. Remove oil filler plug and oil drain plug.
2. Drain oil.
3. Tighten the oil drain plug to the specified torque.

   Tightening torque: 32 ± 2 N·m

4. Fill with specified oil till the level comes to the lower portion of oil filler plug hole.

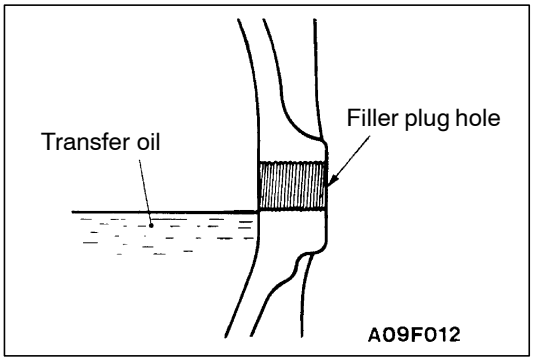
   Specified transmission oil:

   Gear oil SAE 75W-90 or 75W-85W conforming to API GL-4

   Quantity: 2.8 L

5. Tighten the oil filler plug to the specified torque.

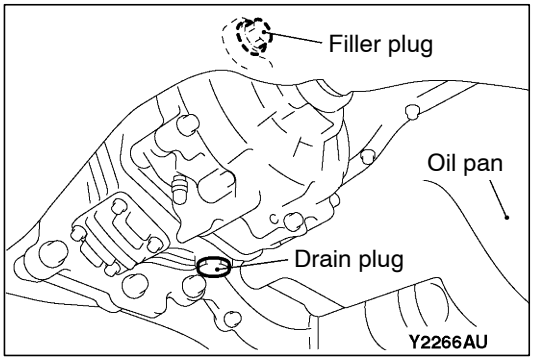
   Tightening torque: 32 ± 2 N·m



TRANSFER OIL CHECK

1. Remove the oil filler plug.
2. Oil level should be at the lower portion of the filler plug hole.
3. Check that the transfer oil is not noticeably dirty, and that it has a suitable viscosity.
4. Tighten the filler plug to the specified torque.

   Tightening torque: 32 ± 2 N·m



TRANSFER OIL REPLACEMENT

1. Remove oil filler plug and oil drain plug.
2. Drain oil.
3. Tighten the oil drain plug to the specified torque.

   Tightening torque: 32 ± 2 N·m

4. Fill with specified oil till the level comes to the lower portion of oil filler plug hole.

   Specified transfer oil:

   MITSUBISHI Genuine Gear Oil Part No.8149630 EX, CASTROL HYPOY LS (GL-5, SAE 90), SHELL-LSD (GL-5, SAE 80W - 90) or equivalent

   Quantity:

   0.55 L <Vehicles without ACD or vehicles without ACD and AYC>

   0.6 L <Vehicles with ACD or vehicles with ACD and AYC>

5. Tighten the oil filler plug to the specified torque.

   Tightening torque: 32 ± 2 N·m

FLUID CHECK <VEHICLES WITH ACD OR VEHICLES WITH ACD AND AYC>

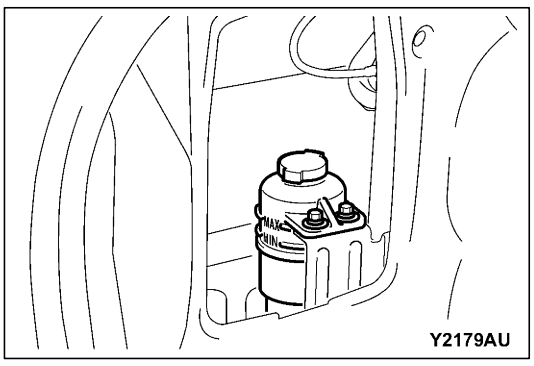
1. Remove the maintenance lid located in the luggage compartment.
2. **<Not using MUT-II>**
   If the vehicle has been run, leave it for 90 min. or more in an ordinary temperature (10°C – 30°C) to allow the accumulator internal pressure to drop.

   NOTE
   If the ambient temperature is 10°C or less, allow more time to leave the vehicle to stand idle.

   <Using MUT-II>
   Set the MUT-II to the 16-pin diagnosis connector. Turn ON the ignition switch, perform MUT-II actuator test (Item No.03), forcibly drive the hydraulic unit and remove the pressure in the accumulator.

   Caution
   Turn the ignition switch to the "LOCK"(OFF) position before connecting or disconnecting the MUT-II.

   NOTE
   (1) In the actuator test (Item No. 03: Oil Level Check Mode), the directional valve of the hydraulic unit is moved to the left and right for 20 times, and then the differential is cleared automatically. Drive can also be cleared forcibly using the Clear key of the MUT-II.
   (2) If the function has been stopped by fail-safe, the hydraulic unit cannot be cleared forcibly.



3. Check that the fluid level in the oil reservoir is in the range between MAX and MIN.
4. If the fluid level is lower than MIN, add the specified fluid.

   Specified fluid: Dia Queen ATF SP III

5. Reinstall the maintenance lid.

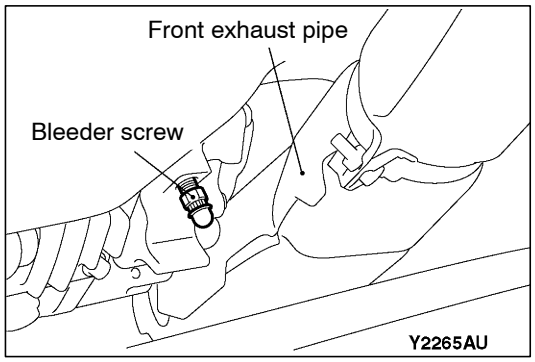
BLEEDING <VEHICLES WITH ACD OR VEHICLES WITH ACD AND AYC>

1. Lift up the vehicle.
2. Set the MUT-II to the 16-pin diagnosis connector.

   Caution
   Turn the ignition switch to the "LOCK"(OFF) position before connecting or disconnecting the MUT-II.

3. Turn the ignition switch to the "ON" position.
4. Set the steering wheel in the straight-ahead position.
5. Perform the MUT-II actuator test (Item No.02), and forcibly drive the hydraulic unit.

   NOTE
   (1) The actuator test (Item No.01: Bleeding Mode) will be performed for 5 minutes, after which it will be cleared automatically. Drive can also be cleared during forced driving using the clear key of the MUT-II.
   (2) If the hydraulic unit function has been stopped by fail-safe, the hydraulic unit cannot be forcibly driven.



6. Remove the cap of the bleeder screw on the transfer, and connect the vinyl hose.
7. Slowly turn the steering wheel to the left or right from the neutral state. Loosen the bleeder screw, and check that air is discharged together with the fluid.
8. After the air is discharged, tighten the bleeder screw, and return the steering wheel to the neutral state.

   Caution
   During bleeding, replenish the fluid so that some always remains in the oil reservoir.

9. Repeat steps 6 and 7 several 2 to 3 times, and after checking that no more air mixes in, tighten the bleeder screw at the specified torque.

   Tightening torque: 5 ± 1 N·m

10. After bleeding, check the fluid level. (Refer to P. 22A-41.)

    Caution
    If bleeding is not performed completely, noise may be produced from the hydraulic unit, or the durability of the pump, etc. may drop.

11. On vehicles with AYC, perform bleeding when the hydraulic unit is removed. (Refer to GROUP 27B - On-vehicle Service.)

ACD OPERATION CHECK <VEHICLES WITH ACD OR VEHICLES WITH ACD AND AYC>

1. Lift up the vehicle.
2. Set the MUT-II to the 16-pin diagnosis connector.

   Caution
   Turn the ignition switch to the "LOCK"(OFF) position before connecting or disconnecting the MUT-II.

3. Start the engine.

4. Set the gear to the 2nd gear or above, operate the MUT-II, and check from the service data (Item No.09) that the wheel speed is within 10 km/h to 20 km/h.

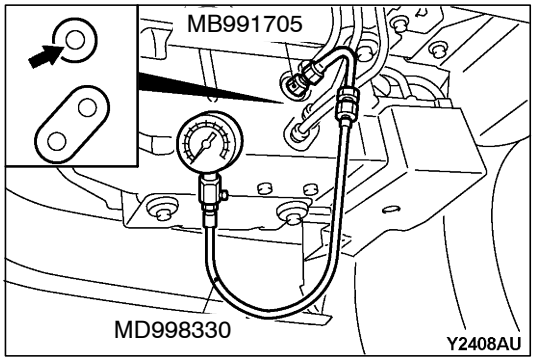
   NOTE
   (1) Set the steering wheel to the neutral position
   (2) The ACD may continue operating (operation sounds can be heard) when the steering wheel is steered, this is not a system fault. In this case, set the steering wheel to the neutral position, and perform the following operations to stop the ACD.
   - Release the clutch.
   - Set the gear to "N".
   - Stop the engine

5. Perform the MUT-II actuator test (Item No.05), and forcibly drive the transfer.

   NOTE
   (1) The actuator test (Item No. 05: ACD Operation Check Mode) is performed for 1 minute, after which it will be cleared automatically. Drive can also be cleared during forced driving using the clear key of the MUT-II.
   (2) If the hydraulic unit function has been stopped by fail-safe, the transfer cannot be forcibly driven.

6. Check that the front and rear wheel speeds satisfy the following in the MUT-II actuator test (Item No.05).
   <Actuator test: While executing Item No. 05>
   The front wheel will be faster than the back wheels by more than 2 km/h.

   NOTE
   If the above are not satisfied, check the oil pressure as the system may be faulty.



HYDRAULIC PRESSURE CHECK <VEHICLES WITH ACD OR VEHICLES WITH ACD AND AYC>

1. Lift up the vehicle.
2. Set the MUT-II to the 16-pin diagnosis connector.

   Caution
   Turn the ignition switch to the "LOCK"(OFF) position before connecting or disconnecting the MUT-II.

3. Disconnect the hydraulic unit and transfer connector assembly, and connect the special tool to the hydraulic unit.
4. Turn the ignition switch to "ON".
5. Perform the MUT-II actuator test (Item No.05), and forcibly drive the hydraulic unit.

   NOTE
   (1) The actuator test (Item No. 05 ACD Operation Check Mode) is performed for 1 minute, after which it will be cleared automatically. Drive can also be cleared during forced driving using the clear key of the MUT-II.

(2) If the hydraulic unit function has been stopped by fail-safe, the hydraulic unit cannot be forcibly driven.

6. Check that the generated oil pressure of the hydraulic unit satisfies the standard value.

Standard value: 1.0 – 1.6 MPa

Caution
While the oil pressure is checked, add fluid as necessary to ensure that it is left in the oil reservoir during the entire procedure.

7. If the measured value exceeds the standard value, replace the hydraulic unit.
8. Connect the hydraulic unit and transfer connector assembly, and tighten the flare nut at the specified torque.

Tightening torque: 34 ± 5 N·m (when screw is dry)
26 ± 4 N·m (when screw is applied with oil)

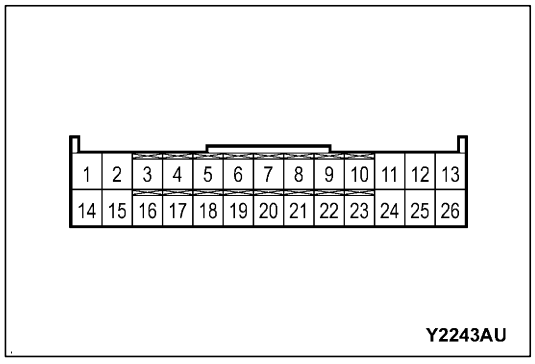
9. Supply the specified fluid up to the MAX level of the oil reservoir, and bleed the oil pressure pipes.

Specified fluid: DIA QUEEN ATF SP III
Quantity:
0.9 dm^3 <Pipes between ACD and hydraulic unit>
1.0 dm^3 <Pipes between ACD and hydraulic unit>

WHEEL SPEED SENSOR OUTPUT VOLTAGE MEASUREMENT <VEHICLES WITH ACD (VEHICLES WITHOUT AYC)>

1. Lift the vehicle, and release the parking brake.
2. Disconnect the 4WD-ECU connector, and measure at the connector of the harness.

Caution
Insert the probe from the harness of the connector. Inserting in the terminal side may cause contact fault.



3. Rotate the measured wheel by about 1/2 to 1 rotations/second, and check the output voltage between the following terminals using a circuit tester (AC mV range) or oscilloscope.

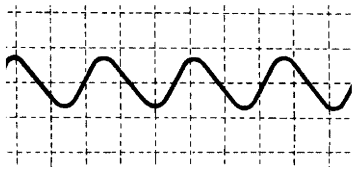
Terminal No.

Front left	Front right	Rear left	Rear right
6	9	8	7
19	22	21	20

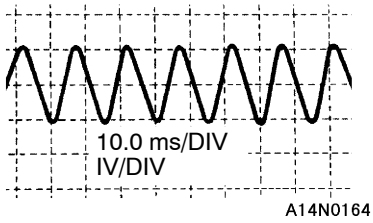
Output voltage:
Above 70 mV when measured with the circuit tester
Above 200 mVP-P when measured with the oscilloscope

4. If the output voltage is lower than the above values, the following reasons may be suspected. Check or replace the wheel speed sensor.
   - Excessive clearance between the ball piece of the wheel speed sensor and ABS rotor
   - Wheel speed sensor faul

When rotated with the hand



When idling (5 – 6 km/h)
1st gear



INSPECTION PROCEDURE USING OSCILLOSCOPE

After checking the connected state of the harness of the wheel speed sensor and connector, and measure the output voltage waveform of each wheel speed sensor on the oscilloscope as follows.
Start the engine, shift the transmission to the 1st gear to rotate the driving wheel, and rotate the non-driving wheel at constant velocity with the hand.

NOTE
1. It is also possible to actually drive the vehicle and observe the waveform.
2. The output voltage is low if the wheel speed is low and gradually increases as the speed increases.

<Waveform observation points>

Phenomenon	Probable cause	Solution
Waveform amplitude is too small or not output at all	Wheel seed sensor fault	Replace the sensor
Excessive waveform amplitude (However allowed if above the minimum amplitude of 100 mV)	Excessive vibration or concentricity of the axle hub	Replace the hub
	4WD-ECU earth fault	Correct
Noise in the waveform or waveform is abnormal	Open circuit of the sensor	Replace the sensor
	Open circuit of the harness	Replace the harness
	Wheel speed sensor installation fault	Correct the installation of the sensor
	Chipping or flattening of the ABS rotor	Replace the ABS rotor

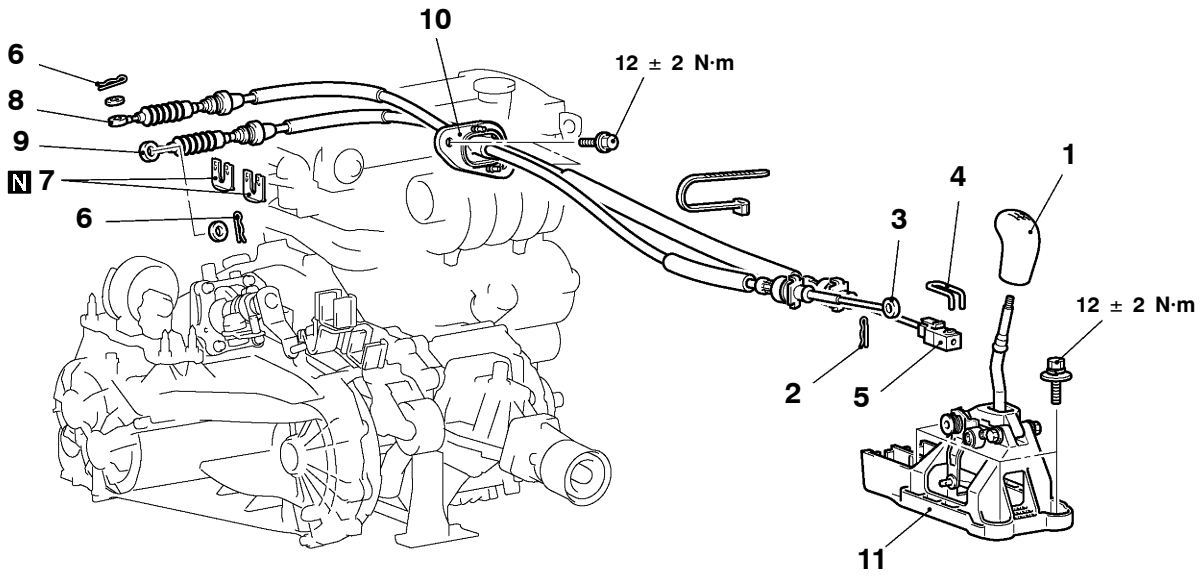
Caution
As the wheel speed sensor cable follows the movement of the front or rear suspension, it will change considerably on poor condition roads. Therefore, also observe the output voltage waveform of the wheel speed sensor with the sensor harness vibrated to simulate special conditions such as driving in poor road conditions.

TRANSMISSION CONTROL

REMOVAL AND INSTALLATION

Pre-removal Operation
- Strut Tower Bar Removal and Installation (Refer to GROUP 42.)
- Air Cleaner Removal (Refer to GROUP 15.)
- Battery and Battery Tray Removal
- Air Pipe C, Air By-pass Hose, Air Hose D, Air Hose E, and Air Hose A Removal (Refer to GROUP 15 - Intercooler.)

Caution: SRS
Be careful not to subject the SRS-ECU to any shocks during removal and installation of the shift cable and select cable assembly.



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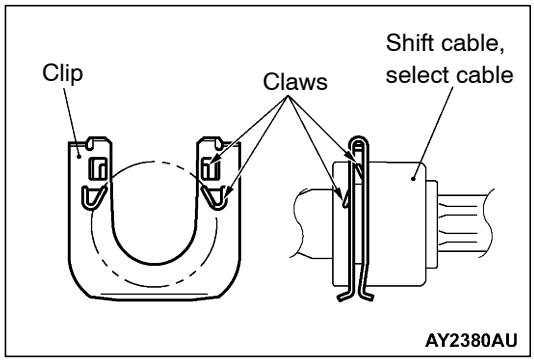
Shift cable and select cable assembly removal steps

1. Shift knob
- Front floor console (Refer to GROUP 52A)
2. Snap pin
3. Select cable connection (Shift lever side)
4. Clip
5. Shift cable connection (Shift lever side)
6. Snap pin
◀A▶ ▶A◀ 7. Clip
◀A▶ ▶A◀ 8. Select cable connection (Transmission side)
◀A▶ ▶A◀ 9. Shift cable connection (Transmission side)
▶A◀ 10. Shift cable and Select cable assembly

Shift lever assembly removal steps

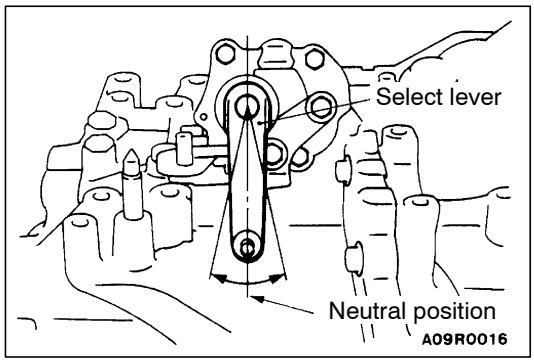
1. Shift knob
- Front floor console (Refer to GROUP 52A)
2. Snap pin
3. Select cable connection (Shift lever side)
4. Clip
5. Shift cable connection (Shift lever side)
11. Shift lever assembly



REMOVAL SERVICE POINT

◀A▶ CLIP/SELECT CABLE CONNECTION (TRANSMISSION)/SHIFT CABLE (TRANSMISSION) INSTALLATION

Push up the claws of the clip using a screwdriver, etc., and then remove the clip from the bracket together with the cables.



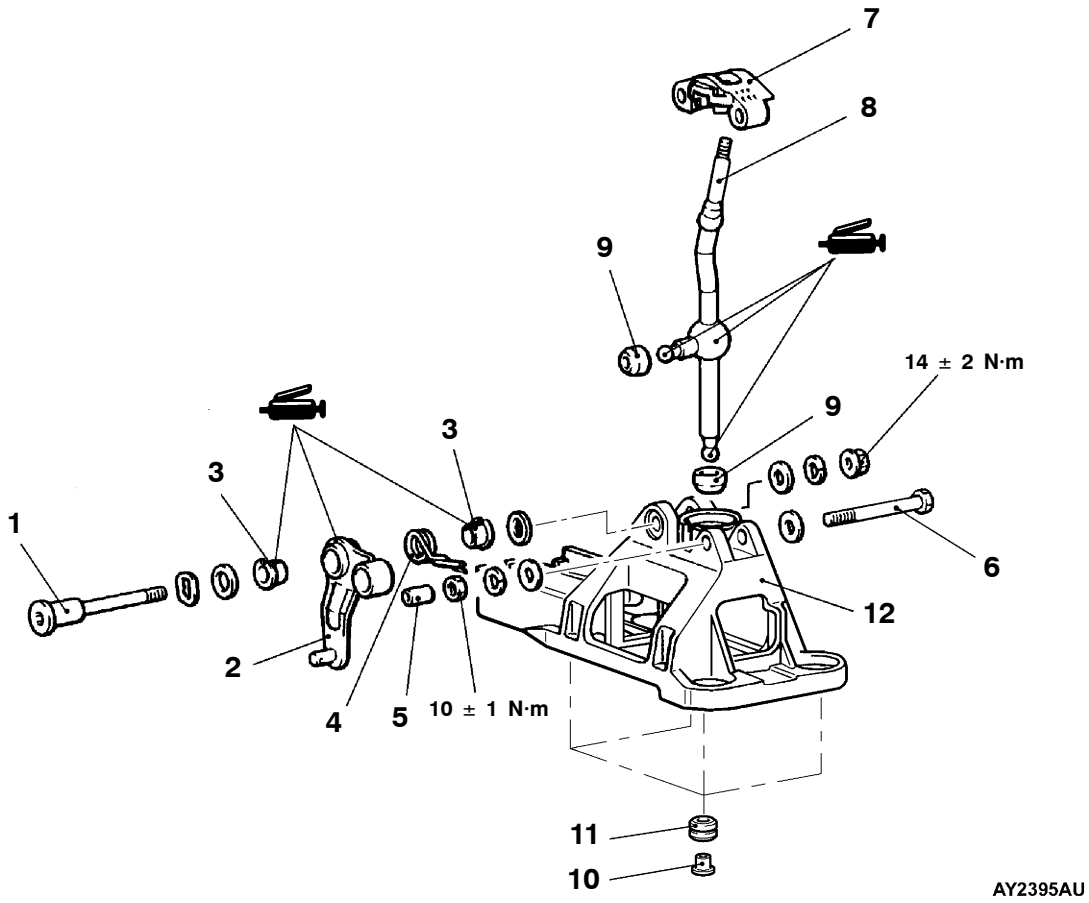
INSTALLATION SERVICE POINT

▶A◀ CLIP/SELECT CABLE AND SHIFT CABLE ASSEMBLY/SHIFT CABLE CONNECTION/SELECT CABLE CONNECTION INSTALLATION

1. Set the transmission side shift lever and the passenger compartment side shift lever to the neutral position.
2. Install the painted part of the shift cable end (transmission side) and painted part of the select cable (transmission side) facing the snap pin.
3. After installing the new clip to the cable bracket of the transmission, install the shift cable and select cable to the cable bracket.
4. Move the shift lever to all positions and check that the operation is smooth.

SHIFT LEVER ASSEMBLY

DISASSEMBLY AND REASSEMBLY



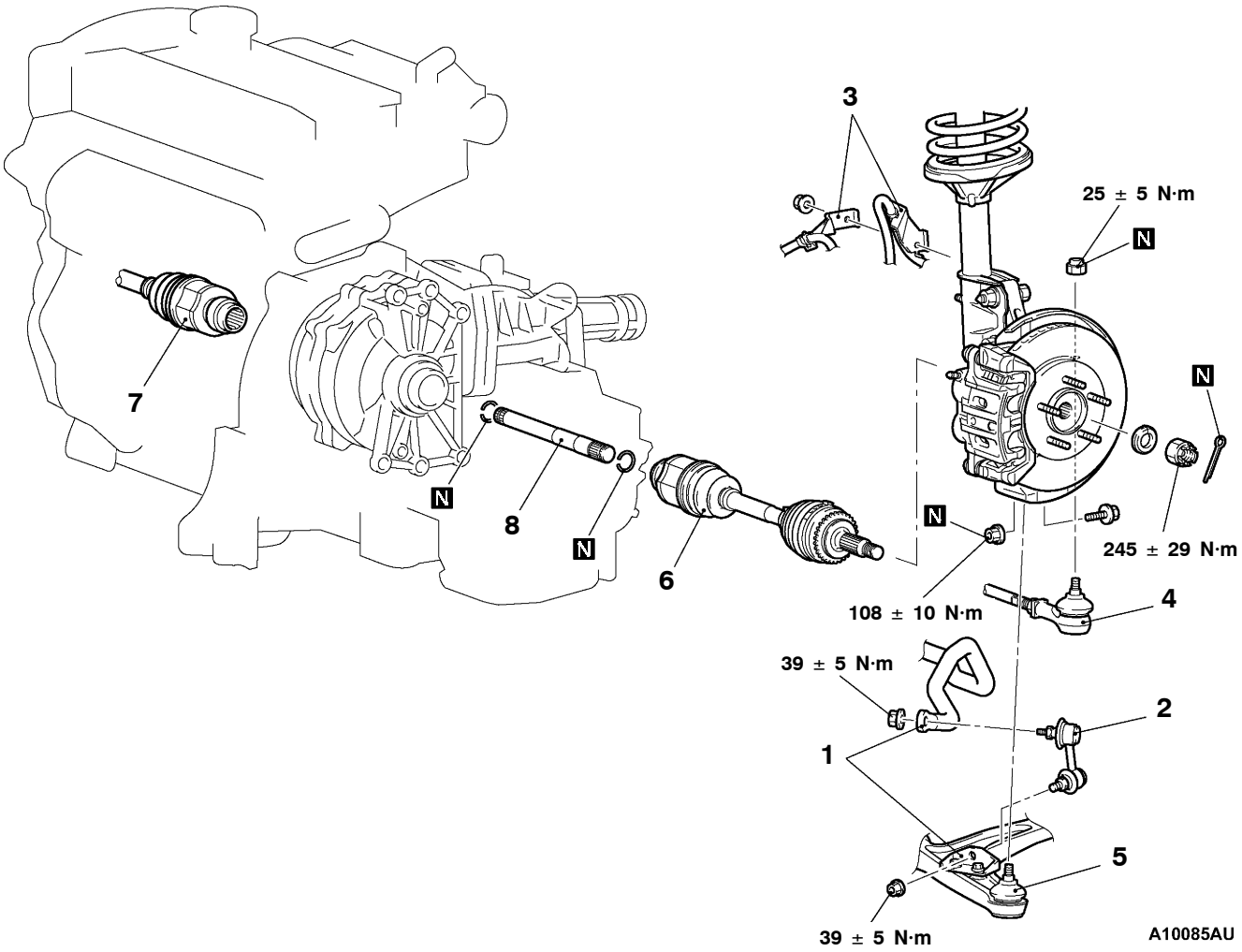
Disassembly steps

1. Bolt
2. Select lever
3. Bushing
4. Return spring
5. Collar
6. Bolt
7. Cap
8. Shift lever
9. Shift lever bushing
10. Distance piece
11. Bushing
12. Base block

TRANSFER ASSEMBLY

REMOVAL AND INSTALLATION

Pre-removal and Post-installation Operation
- Under Cover Removal and Installation (Refer to GROUP 51 - Front Bumper.)
- Side Under Cover Removal and Installation
- Transmission Oil Draining and Supplying (Refer to P.22A-40.)
- Transfer Oil Draining and Supplying (Refer to P.22A-40.)
- Engine Coolant Draining and Supplying (Refer to GROUP 14 - On-vehicle Service.)
- Crossmember Bar Removal and Installation (Refer to GROUP 32 - Engine Roll Stopper, Centermember.)
- Front Exhaust Pipe Removal and Installation (Refer to GROUP 15 - Exhaust Pipe and Main Muffler.)
- Battery and Battery Tray Removal and Installation
- Air Cleaner, Air Intake Hose Removal and Installation (Refer to GROUP 15 - Air Cleaner.)
- Secondary Air Hose Removal and Installation (Refer to GROUP 15 - Secondary Air Control System.)
- Strut Tower Bar Removal and Installation (Refer to GROUP 42.)
- Air Hose E, Air By-pass Hose and Air By-pass Valve, Air Pipe C, Air Hose D, Air Pipe B, Air Hose A Removal and Installation (Refer to GROUP 15 - Intercooler.)
- Radiator Removal and Installation (Refer to GROUP 14.)
- Bleeding and Hydraulic Pressure Check <ACD> (Refer to P.22A-42, 43) <after installation only>

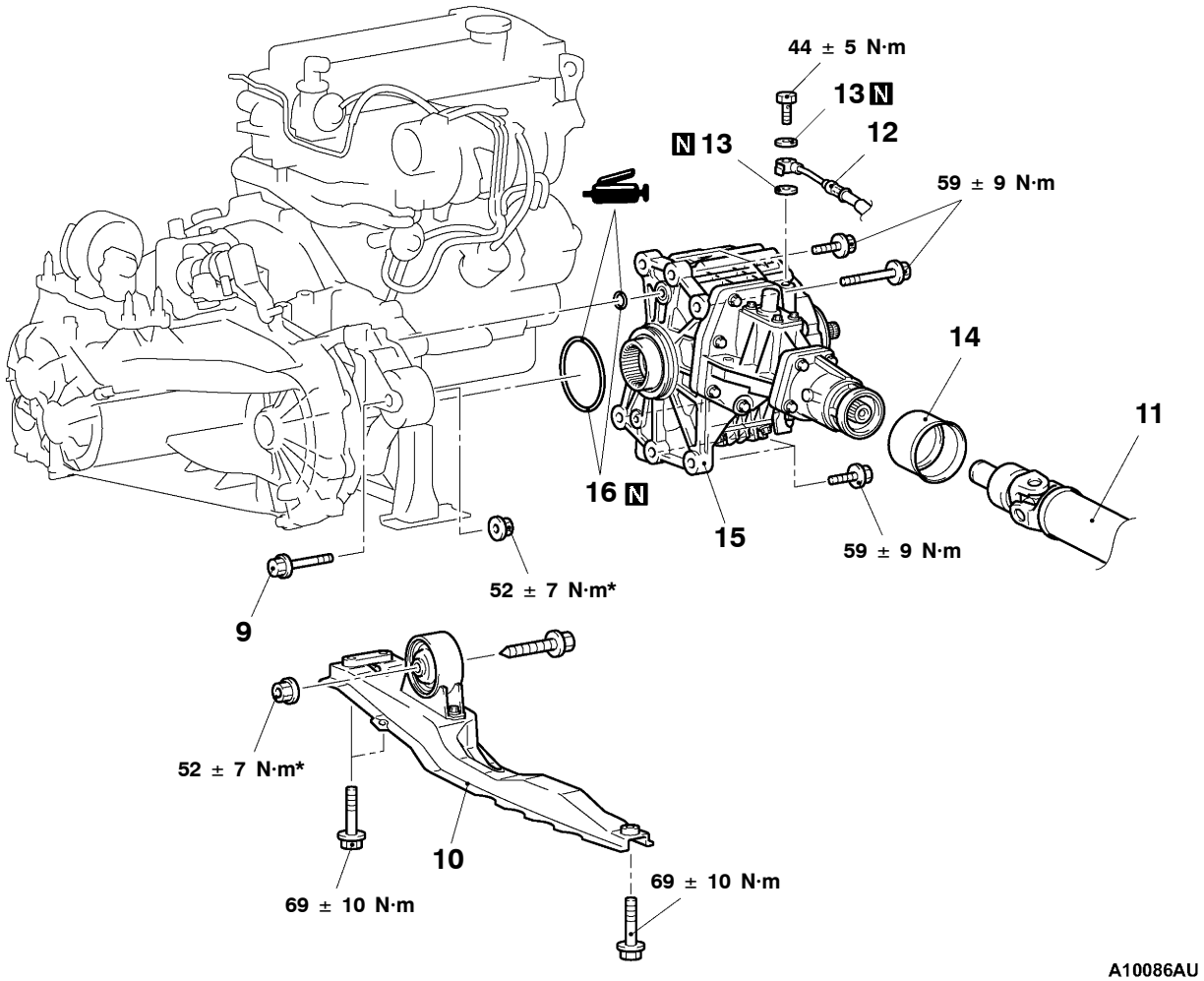


Removal steps

1. Stabilizer bar connection
2. Stabilizer link
3. Wheel speed sensor cable clamp and brake hose clamp

◀A▶
◀B▶
◀B▶
◀C▶

4. Tie rod end connection
5. Lower arm ball joint connection
6. Drive shaft <L.H.> connection
7. Drive shaft <R.H.> connection
8. Output shaft

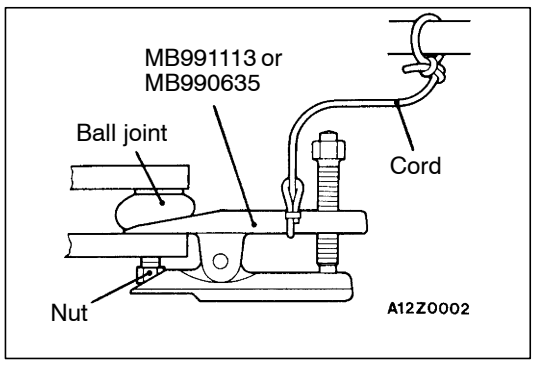


9. Rear roll stopper connection bolt
10. Centermember assembly
11. Front propeller shaft (Refer to GROUP 25.)
12. Transfer oil pressure hose assembly <Vehicle of ACD, ACD+AYC>
13. Gasket <Vehicle of ACD, ACD+AYC>
14. Dust seal guard

◀D▶ 15. Transfer assembly

16. O-ring

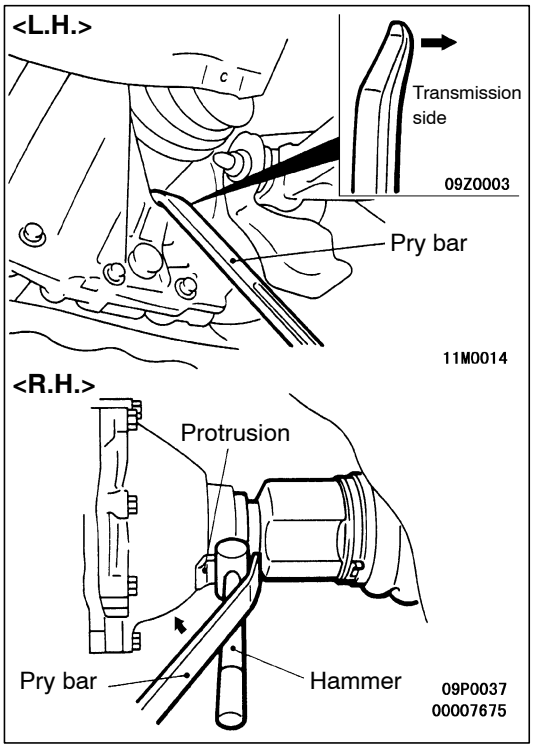
Caution
***: Indicates parts which should be initially tightened, and then fully tightened after placing the vehicle horizontally and loading the full weight of the engine on the vehicle body.**



REMOVAL SERVICE POINTS

◀A▶ TIE ROD END DISCONNECTION

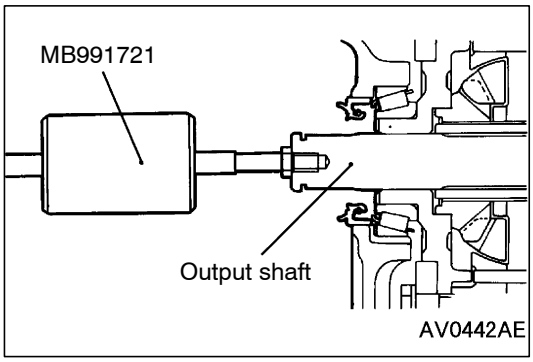
Caution
1. **Loosen the nut only; do not remove it from the ball joint. Otherwise ball joint thread will be damaged.**
2. **The special tool should be suspended by a cord to prevent it from coming off.**



◀B▶ DRIVE SHAFT <L.H.>/DRIVE SHAFT <R.H.> DISCONNECTION

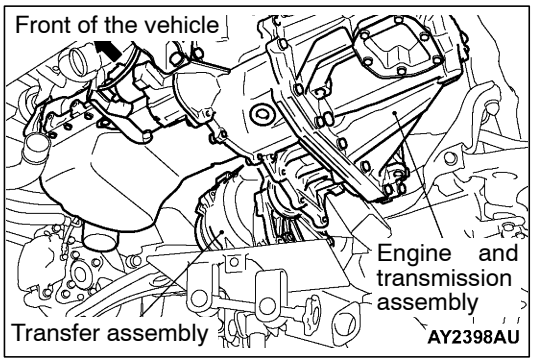
1. As shown in the figure, pull out the transfer shaft <L.H.> from the transmission using the pry bar. As shown in the illustration, press a hammer, etc. against the driveshaft <R.H.>, and pull out the driveshaft from the transfer assembly using the pry shaft.

   Caution
   As the TJ may damage when the driveshaft is pulled out from the BJ side, be sure to use the lever.
2. Cover with a cloth to prevent foreign particles from entering the transfer.



◀C▶ OUTPUT SHAFT REMOVAL

1. Using the special tool (MB991721), remove the output shaft.
2. Cover with a cloth to prevent foreign particles from entering the transmission case.



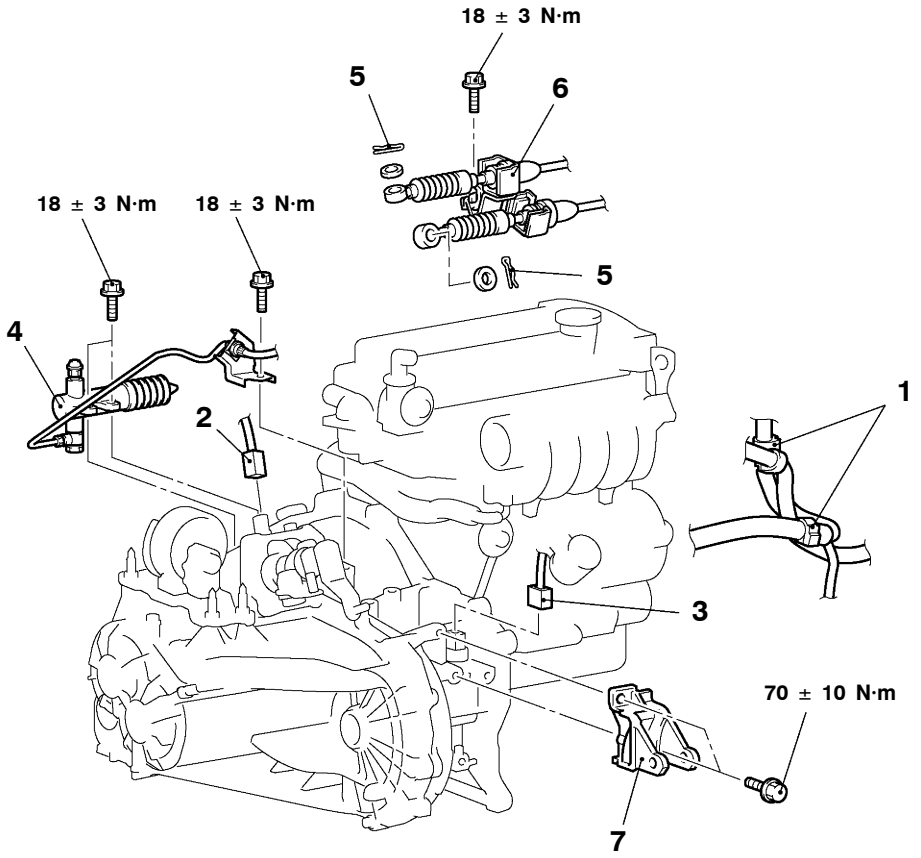
◀D▶ TRANSFER ASSEMBLY REMOVAL

With the engine mount and transmission mount installed, roll the engine and transmission assembly towards the front of the vehicle, and remove the transfer assembly from between the engine block and crossmember.

TRANSMISSION ASSEMBLY

REMOVAL AND INSTALLATION

Pre-removal and Post-installation Operation
- Transfer Assembly Removal and Installation (Refer to P.22A-49.)
- Starter Motor Removal and Installation (Refer to GROUP 16.)
- Air Cleaner Bracket Removal and Installation (Refer to GROUP 15 - Air Cleaner.)
- Rear Roll Rod Assembly and Rear Roll Rod Bracket <L.H. Drive Vehicles>, Rear Roll Mount <R.H. Drive Vehicles> Removal and Installation (Refer to GROUP 32 - Engine Roll Stopper.)



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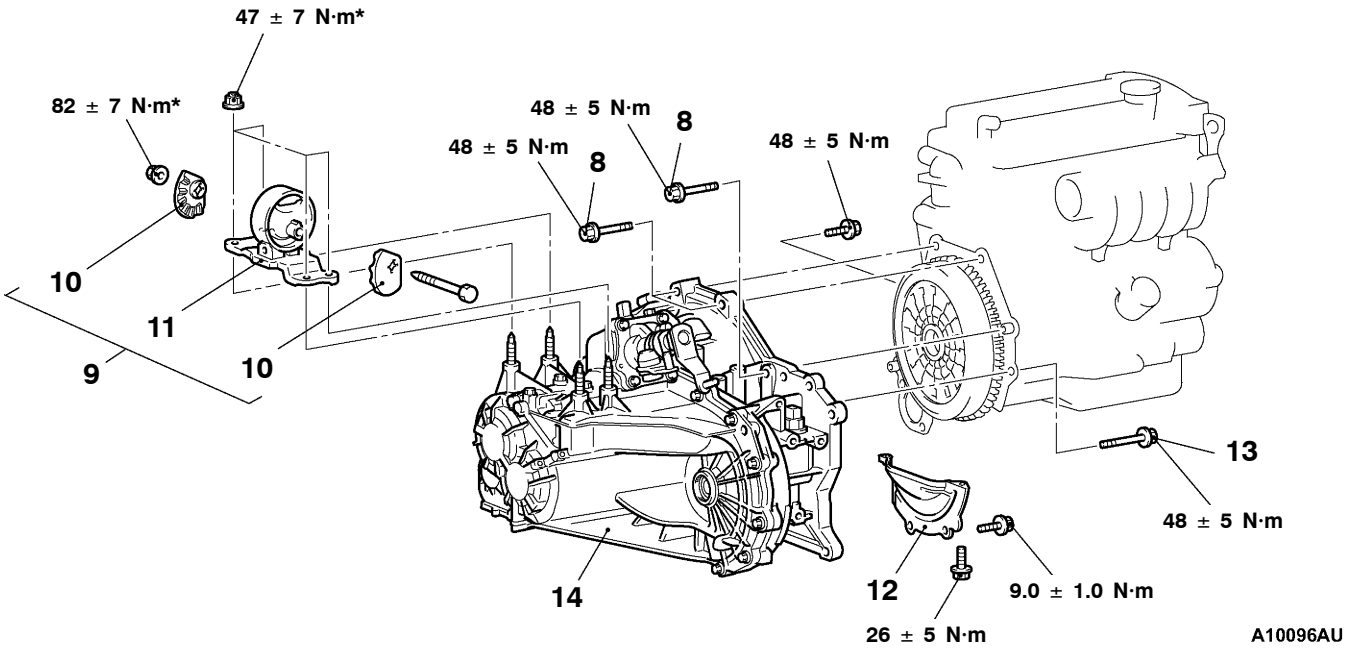
Removal steps
1. Transmission harness clamp
2. Back-up lamp switch connector connection
3. Vehicle speed sensor connector connection
4. Clutch release cylinder and clutch oil pipe

◀A▶

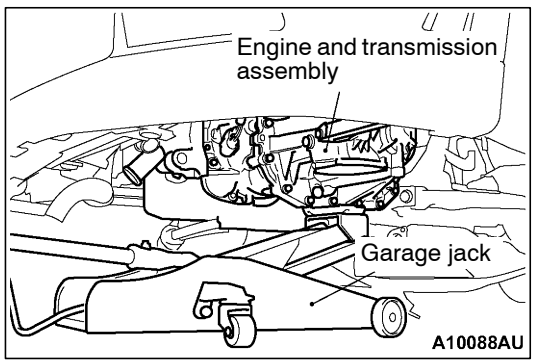
5. Snap pin
6. Shift cable and select cable assembly connection
7. Rear roll mount bracket

- Engine and transmission assembly supporting



8. Transmission assembly upper part coupling bolts
◀A▶ 9. Transmission mount assembly
▶A◀ 10. Transmission mount stopper
11. Transmission mount bracket
◀B▶ ● Engine assembly supporting
◀C▶ ● Clutch release bearing connection
12. Bell housing cover
13. Transmission assembly lower part coupling bolts
14. Transmission assembly

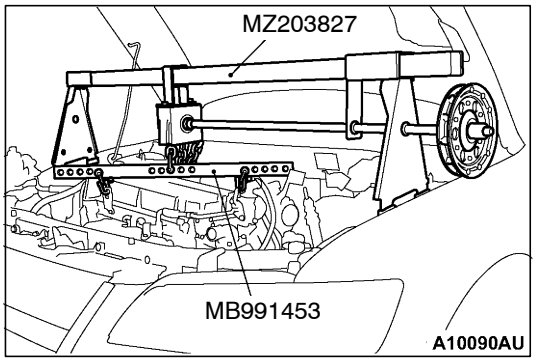
Caution
***: Indicates parts which should be initially tightened, and then fully tightened after placing the vehicle horizontally and loading the full weight of the engine on the vehicle body.**



REMOVAL SERVICE POINTS

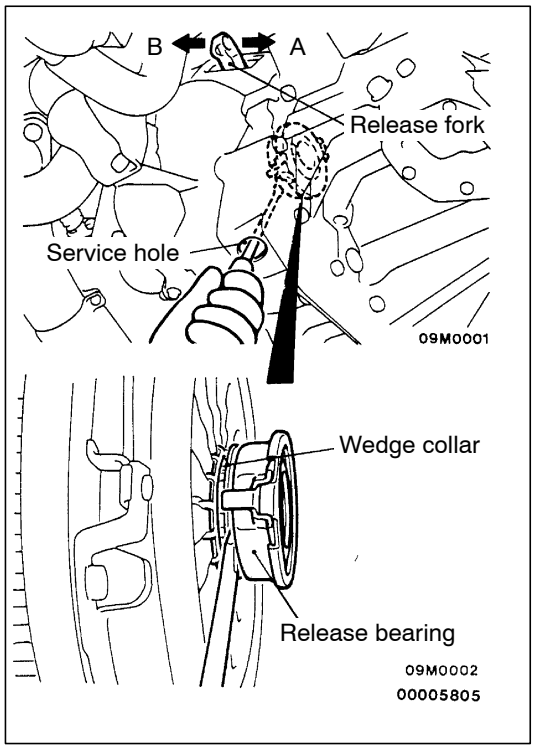
◀A▶ ENGINE AND TRANSMISSION ASSEMBLY SUPPORTING/TRANSMISSION MOUNT ASSEMBLY REMOVAL

While supporting the engine and transmission assembly with a garage jack, remove the transmission mount assembly.



◀B▶ ENGINE ASSEMBLY SUPPORTING

Set the special tool to the vehicle to support the engine assembly.



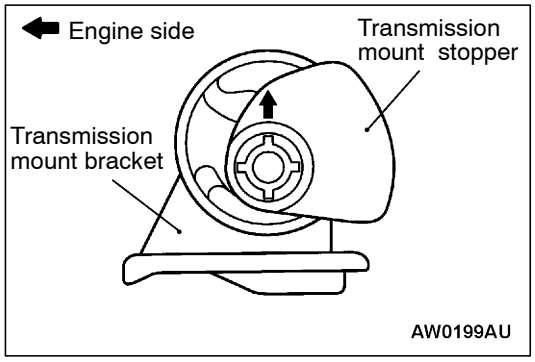
◀C▶ CLUTCH RELEASE BEARING SEPARATION

1. Remove the cover from the service hole in the clutch housing.
2. While pushing the release fork by hand in the direction A, insert a flap-tip screwdriver between the release bearing and the wedge collar.

   Caution
   Be sure to push the release fork in the direction A before inserting a screwdriver.
3. Separate the release bearing from the wedge collar by prying with the screwdriver (turning the screwdriver grip 90˚).

   NOTE
   The release fork is forced to move fully in the direction B by the return spring as soon as it is separated from the wedge collar.

   Caution
   If it is hard to turn the screwdriver (to pry off the release bearing), remove the screwdriver once and repeat the above procedure after pushing the release fork fully in the direction a two to three times. Forcibly prying can cause the release bearing to be damaged.



INSTALLATION SERVICE POINT

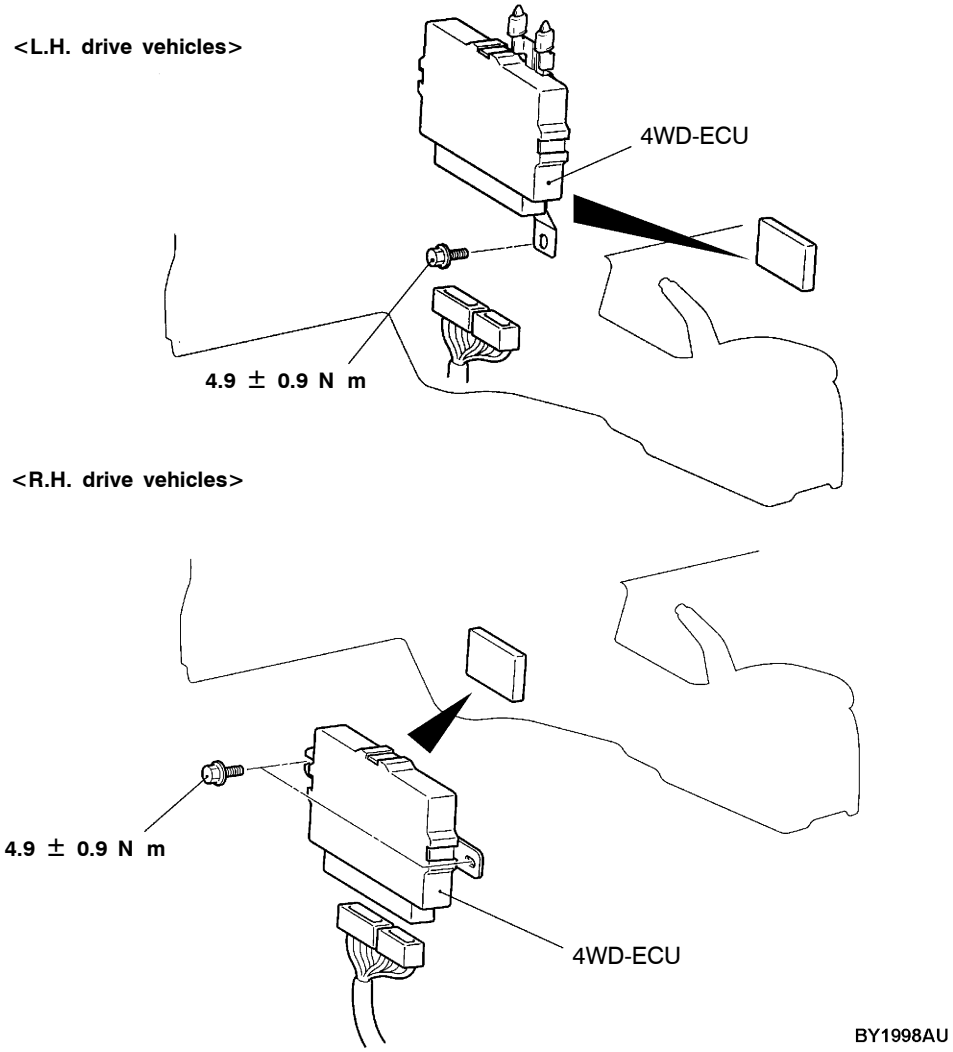
▶A◀ TRANSMISSION MOUNT STOPPER INSTALLATION

Install so that the arrow on the transmission mounting stopper faces the top of the vehicle.

4WD-ECU <VEHICLES WITH ACD OR VEHICLES WITH ACD AND AYC>

REMOVAL AND INSTALLATION

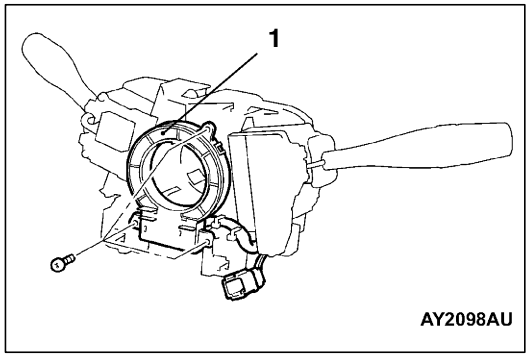
Pre-removal and Post-installation Operation
- Cowl Side Trim <R.H.> Removal and Installation. (Refer to GROUP 52A - Trims.) <L.H. drive vehicles>
- Front floor Console Removal and Installation. (Refer to GROUP 52A - Floor Console.) <R.H. drive vehicles>

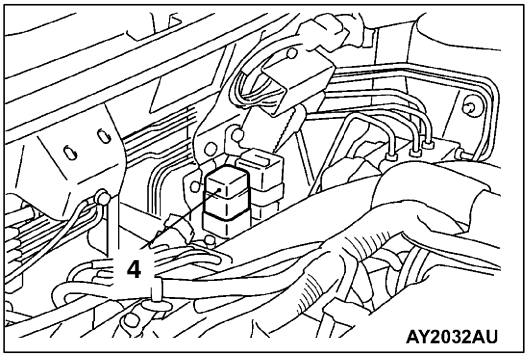


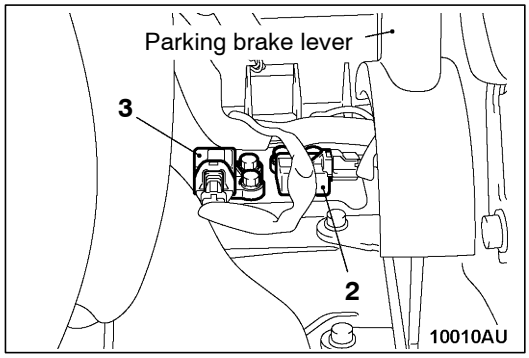
SENSOR, SWITCH AND RELAY <VEHICLES WITH ACD OR VEHICLES WITH ACD AND AYC>

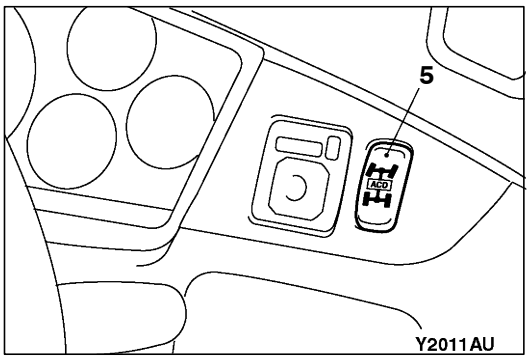
REMOVAL AND INSTALLATION

Caution
Before removing the steering wheel and air bag module assembly, be sure to refer to GROUP 52B Precautions in Servicing and Airbag Module Clock Spring.









Steering wheel sensor removal steps

- Steering wheel and column cover (Refer to GROUP 37A.)

1. Steering wheel sensor

G sensor removal steps

- Floor console (Refer to GROUP 52A.)

2. Longitudinal G sensor
3. Lateral G sensor

Electric pump relay removal

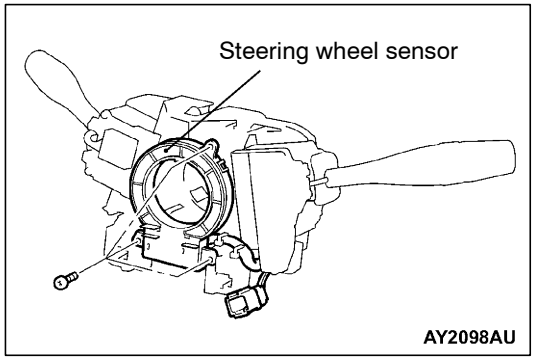
4. Electric pump relay

ACD mode switch removal steps

- Instrument panel ornament (Refer to GROUP 52A – Instrument Panel.)

5. ACD mode switch

NOTE
For details on the wheel speed sensor, refer to GROUP 35B.

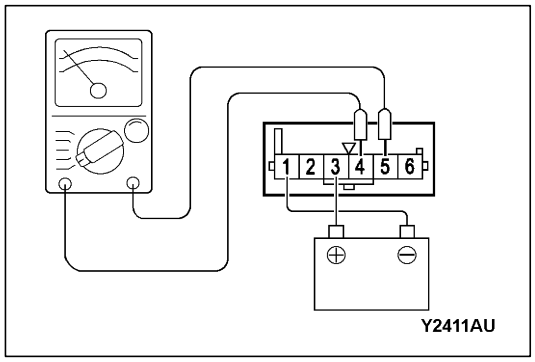


REMOVAL SERVICE POINT

◀A▶ STEERING WHEEL SENSOR REMOVAL

Remove the steering wheel sensor from the column switch.

Caution
Make sure no oil adheres to the steering wheel sensor because a photocoupler is used.

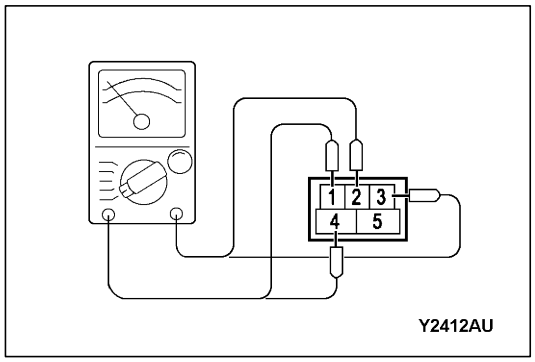


INSPECTION

ELECTRIC PUMP RELAY CONTINUITY CHECK

1. Using a jumper wire, connect a battery (+) to terminal 13 of the electric pump relay and battery (-) to terminal 1.
2. While intermittently disconnecting the jumper wire at the battery side, check for continuity between terminals 4 and 5 of the electric pump relay.

Jumper wire	Continuity between No.4 - No.5
Connected	Continuity
Disconnected	No continuity



ACD MODE SWITCH CONTINUITY CHECK

ACD mode switch terminal	ACD mode switch	Continuity
No.1 - No.2	ON	Continuity
	OFF	No continuity
No.3 - No.4	-	Continuity

NOTES

MANUAL TRANSMISSION OVERHAUL

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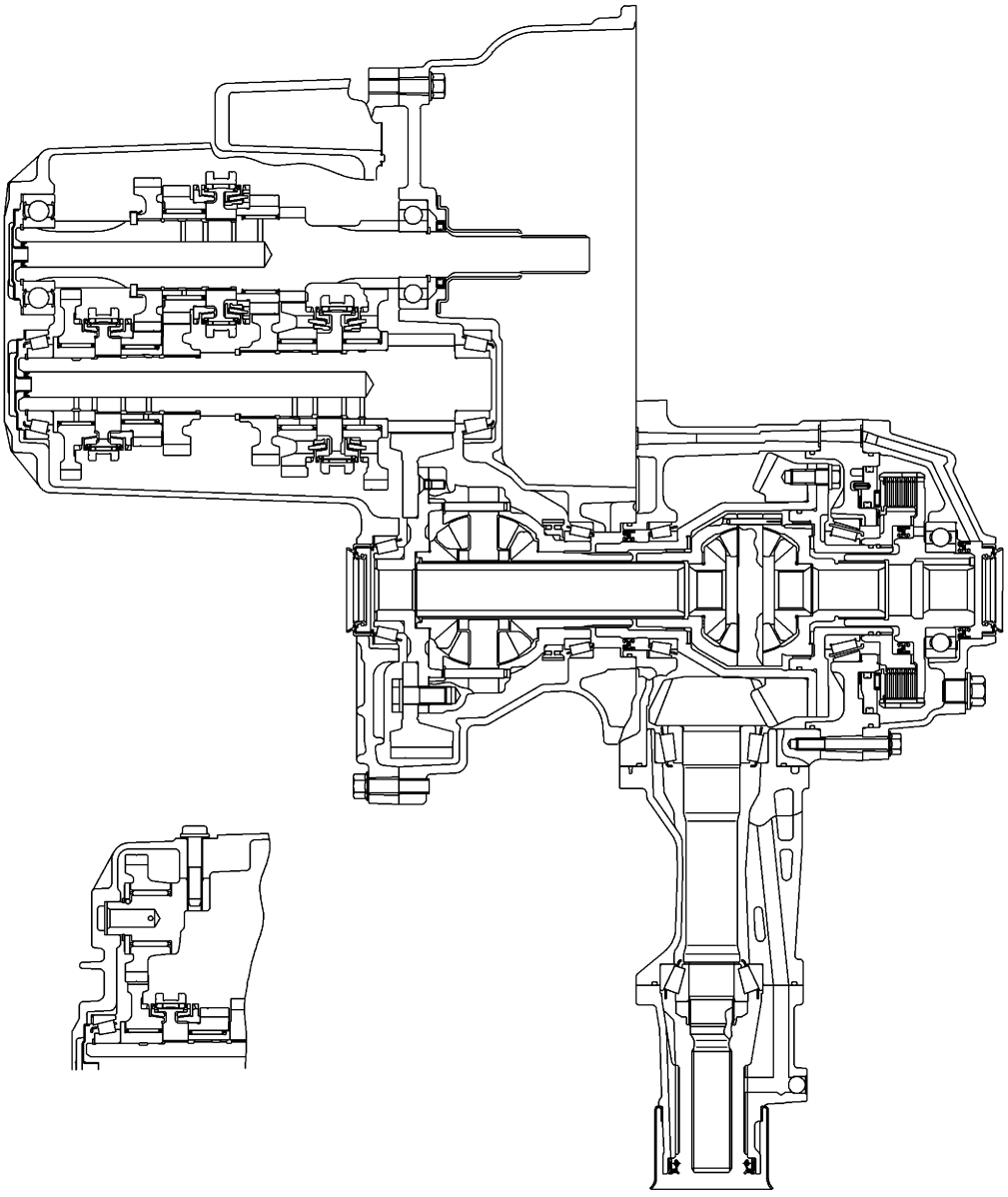
GENERAL DESCRIPTION

SECTIONAL VIEW

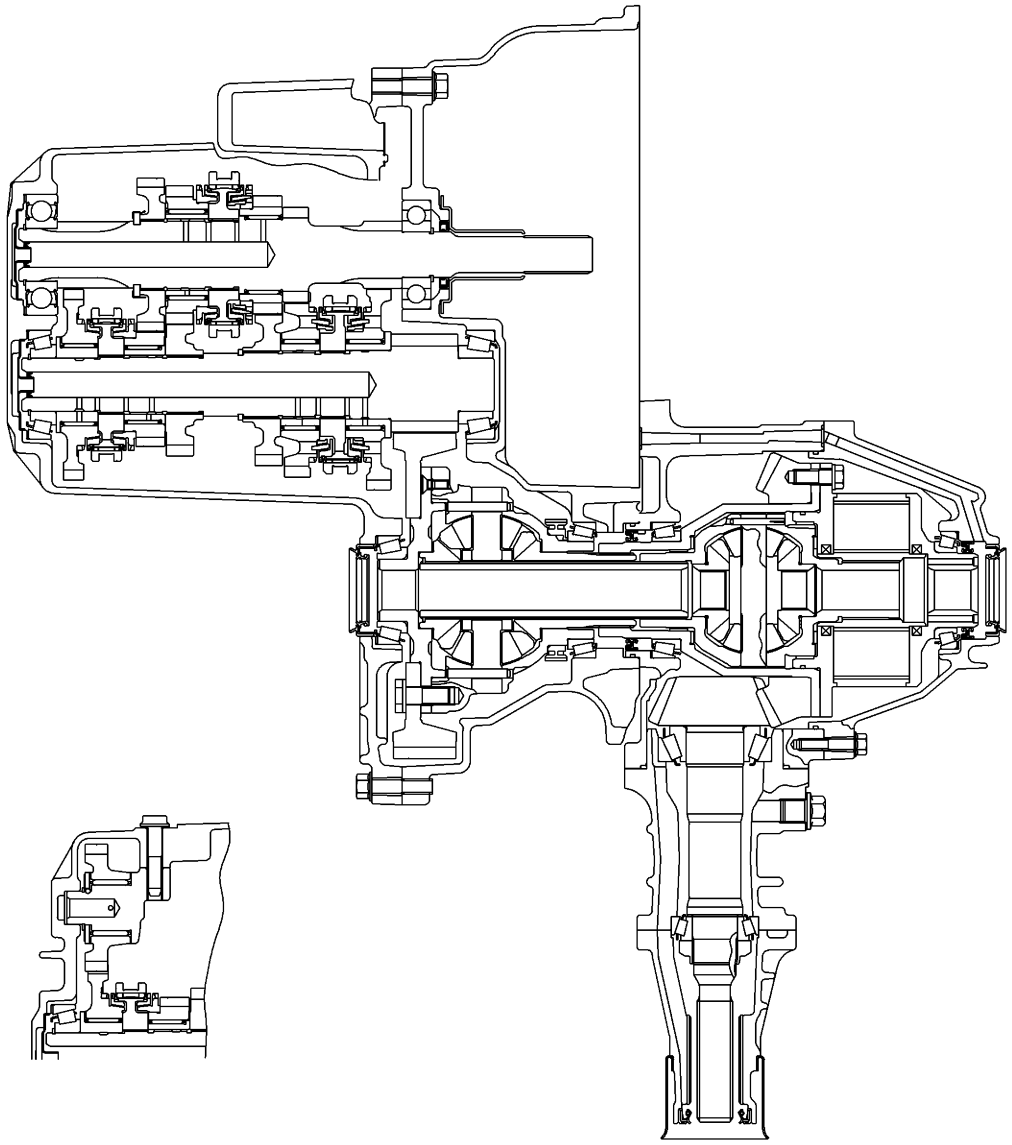
<W5M51-2-X5B3>



TFM1050

SECTIONAL VIEW

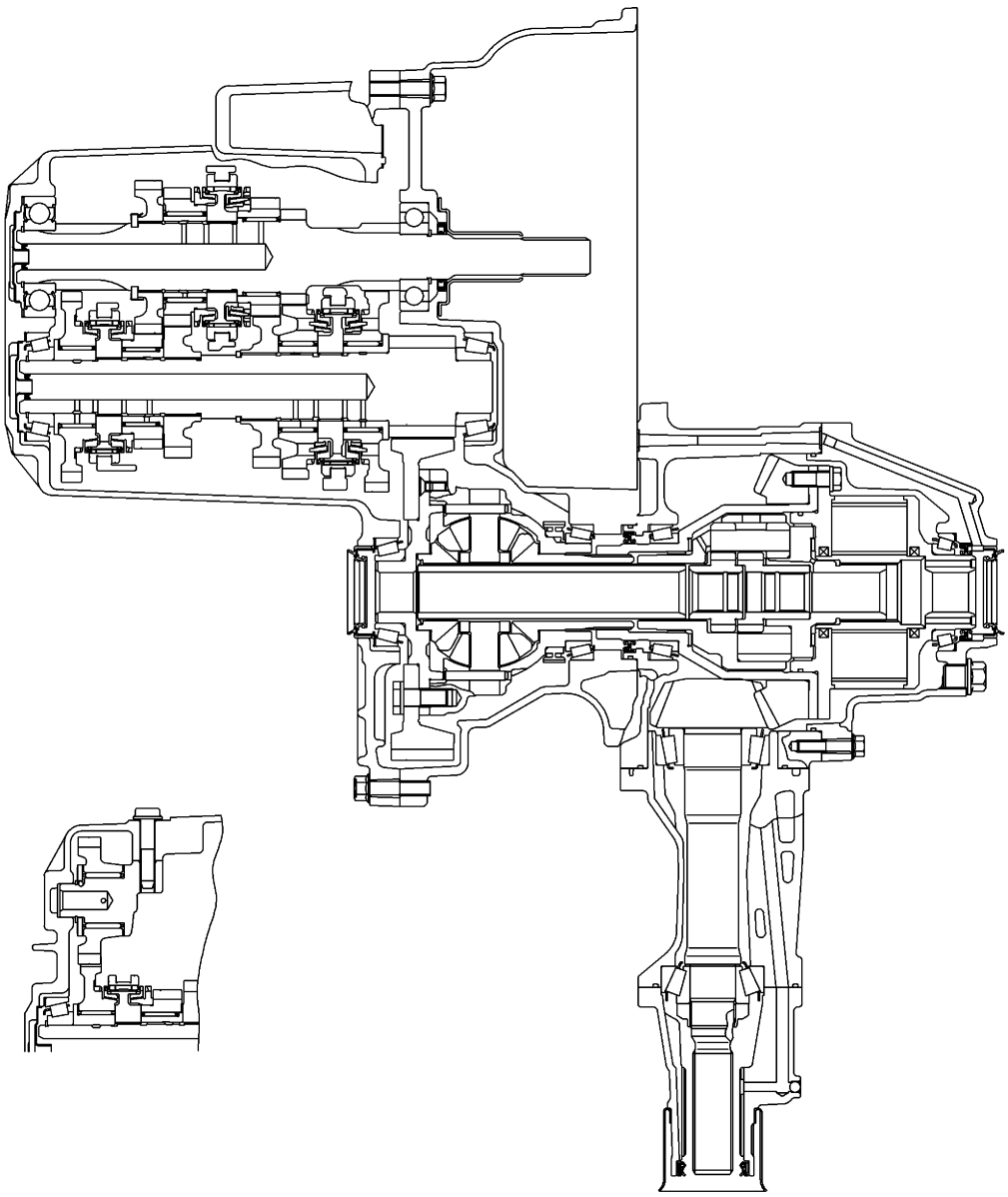
<W5M51-2-X5B1>



TFM1051

SECTIONAL VIEW

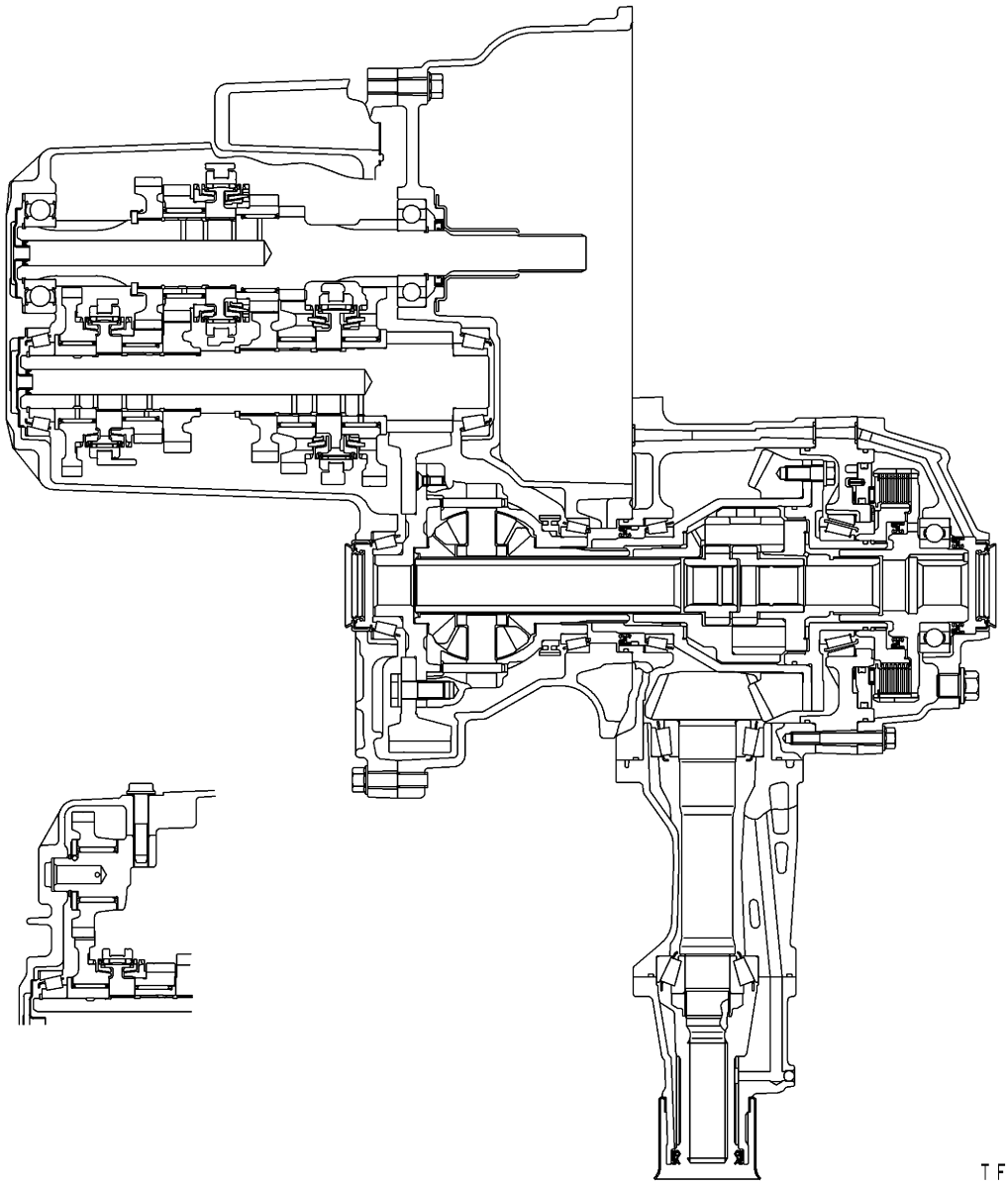
<W5M51-2-X5B2>



TFM1052

SECTIONAL VIEW

<W5M51-2-X5B, X5B4>



TFM1053

SPECIFICATIONS

TRANSMISSION MODEL TABLE

Transmission model	Gear ratio	Speedometer gear ratio	Final reduction ratio	Front LSD	Vehicle model	Engine model
W5M51-2-X5B	A	28/36	4.529	Provided	CT9A	4G63-I/C•T/C
W5M51-2-X5B1	B	28/36	4.529	Not provided	CT9A	4G63-I/C•T/C
W5M51-2-X5B2	C	28/36	4.529	Provided	CT9A	4G63-I/C•T/C
W5M51-2-X5B3	B	28/36	4.529	Not provided	CT9A	4G63-I/C•T/C
W5M51-2-X5B4	C	28/36	4.529	Provided	CT9A	4G63-I/C•T/C

GEAR RATIO TABLE

	A	B	C
1st	2.928	2.785	←
2nd	1.950	←	←
3rd	1.407	←	1.444
4th	1.031	←	1.096
5th	0.720	←	0.825
Reverse	3.416	←	←
Transfer gear ratio	0.3018	←	←

SERVICE SPECIFICATIONS

Items	Standard value mm	Limit value mm
Input shaft end play	0.05 loose to 0.17 loose	-
Input shaft front bearing end play	0.01 tight to 0.12 loose	-
Input shaft rear bearing end play	0.01 tight to 0.12 loose	-
Input shaft 5th speed gear end play	0.01 tight to 0.09 loose	-
Output shaft preload	0.13 tight to 0.18 tight	-
Output shaft bearing end play	0.01 tight to 0.09 loose	-
Output shaft 3rd speed gear end play	0.01 tight to 0.09 loose	-
Center differential case preload	0.05 tight to 0.11 tight	-
Center differential case pinion backlash	0.025 - 0.150	-
Clearance between synchronizer ring rear surface and gears	-	0.5

SEALANTS

TRANSMISSION

Items	Specified sealants
Clutch housing and transmission case contact surface	MITSUBISHI genuine sealant Part No.MD997740 or equivalent
Control housing and transmission case contact surface	
Under cover and transmission case contact surface	
Air breather	3M SUPER WEATHERSTRIP No.8001 or equivalent
Center differential drive gear bolt	3M STUD Locking No.4170 or equivalent

FORM-IN-PLACE GASKET (FIPG)

FIPG is used for several members of this transmission. With this gasket, caution is required to the application amount, application procedure and state of the application surface so that the performance is sufficiently attained.
If sufficient gasket is not applied, leaks could occur, and if too much is applied, the gasket could protrude and plug or restrict the oil flow passage. Thus, to prevent leaks from the joined sections, it is absolutely necessary to evenly apply the correct amount.

DISASSEMBLY

The parts assembled with FIPG can be easily disassembled without special means. However, in some cases, the sealant on the contact surfaces must be broken by lightly tapping with a wood hammer or similar tool.
Washing the gasket surface
Completely remove all matters adhered on the contact surfaces with a gasket scraper. Confirm that the FIPG application surface is smooth. There must be no grease or foreign matter on the contact surfaces. Always remove the old FIPG that has entered the mounting holes and screw holes.

APPLICATION PROCEDURES

Apply an even coat of FIPG within the predetermined radius (1.5 ± 0.3 mm). Completely cover the areas around the mounting holds. The FIPG can be wiped off if it has not hardened. Install at the set position while the FIPG is still wet (within 10 minutes). When installing, make sure that the FIPG does not get on areas other than the required areas. After installing, do not subject the application areas to oil or water or start operation until the FIPG has sufficiently hardened (approx. one hour).
The FIPG application procedures differ according to the member, so follow the procedures given in this manual and apply the FIPG.

LUBRICANTS

TRANSMISSION

Items	Specified lubricants
Drive shaft oil seal lip section	MITSUBISHI genuine “DIA-QUEEN” multi gear oil <75W/85W> or equivalent
Input shaft oil seal lip section	
Control shaft oil seal lip section	
Select lever shoe	MITSUBISHI genuine grease Part No.0101011 or equivalent

TRANSFER

Items	Specified lubricants
Drive shaft oil seal lip section	MITSUBISHI genuine “DIA-QUEEN SUPER” hypoid gear oil (GL-5) or equivalent
Front differential oil seal lip section	
Each O-ring	

SNAP RINGS, SPACERS AND THRUST PLATES FOR ADJUSTMENT

SPACERS (FOR ADJUSTMENT OF INPUT SHAFT END PLAY)

Thickness mm	Identification	Part No.	Thickness mm	Identification	Part No.
1.34	34	MD723600	1.61	61	MD723609
1.43	43	MD723603	1.70	70	MD756760
1.52	52	MD723606	1.79	79	MD756763

SNAP RINGS (FOR ADJUSTMENT OF INPUT SHAFT FRONT BEARING CLEARANCE)

Thickness mm	Identification	Part No.	Thickness mm	Identification	Part No.
1.43	Green, two pieces	MD746708	1.59	Yellow, two pieces	MD746710
1.51	White, two pieces	MD746709			

SNAP RINGS (FOR ADJUSTMENT OF INPUT SHAFT REAR BEARING CLEARANCE)

Thickness mm	Identification	Part No.	Thickness mm	Identification	Part No.
1.44	None	MD746602	1.58	Brown	MD746604
1.51	Blue	MD746603			

THRUST PLATES (FOR ADJUSTMENT OF INPUT SHAFT 5TH SPEED GEAR CLEARANCE)

Thickness mm	Identification	Part No.	Thickness mm	Identification	Part No.
3.82	0	MD748465	3.98	6	MD748469
3.86	2	MD748466	4.02	7	MD748470
3.90	3	MD748467	4.06	8	MD748471
3.94	5	MD748468	4.10	9	MD748472

SPACERS (FOR ADJUSTMENT OF OUTPUT SHAFT PRELOAD)

Thickness mm	Identification	Part No.	Thickness mm	Identification	Part No.
0.86	86	MD720938	1.19	L	MD710456
0.89	89	MD720939	1.22	G	MD700271
0.92	92	MD720940	1.25	M	MD710457
0.95	95	MD720941	1.28	N	MD710458
0.98	98	MD720942	1.31	E	MD706574
1.01	01	MD720943	1.34	O	MD710459
1.04	04	MD720944	1.37	P	MD710460
1.07	07	MD720945	1.40	None	MD706573
1.10	J	MD710454	1.43	Q	MD710461
1.13	D	MD700270	1.46	R	MD710462
1.16	K	MD710455			

SNAP RINGS (FOR ADJUSTMENT OF OUTPUT SHAFT BEARING CLEARANCE)

Thickness mm	Identification	Part No.	Thickness mm	Identification	Part No.
1.36	Yellow	MD748449	1.55	White	MD748452
1.40	Green	MD748450	1.58	Brown	MD746604
1.44	None	MD746602	1.63	Orange	MD748453
1.48	Black	MD748451	1.68	Blue	MD748454
1.51	Blue	MD746603			

SNAP RINGS (FOR ADJUSTMENT OF OUTPUT SHAFT 3RD SPEED GEAR CLEARANCE)

Thickness mm	Identification	Part No.	Thickness mm	Identification	Part No.
2.81	None	MD746594	2.97	Green	MD746598
2.85	Blue	MD746595	3.01	Black	MD746599
2.89	Brown	MD746596	3.05	White	MD746600
2.93	Yellow	MD746597	3.09	Orange	MD746601

SPACERS (FOR ADJUSTMENT OF CENTER DIFFERENTIAL CASE PRELOAD)

Thickness mm	Identification	Part No.	Thickness mm	Identification	Part No.
0.74	74	MD727660	1.04	04	MD720944
0.77	77	MD754476	1.07	07	MD750945
0.80	80	MD727661	1.10	J	MD710454
0.83	83	MD720937	1.13	D	MD700270
0.86	86	MD720938	1.16	K	MD710455
0.89	89	MD720939	1.19	L	MD710456
0.92	92	MD720940	1.22	G	MD700271
0.95	95	MD720941	1.25	M	MD710457
0.98	98	MD720942	1.28	N	MD710458
1.01	01	MD720943	1.31	E	MD706547

SPACERS (FOR ADJUSTMENT OF CENTER DIFFERENTIAL CASE PINION BACKLASH)

Thickness mm	Identification	Part No.	Thickness mm	Identification	Part No.
0.6	-	MD748362	0.9	-	MD748365
0.7	-	MD748363	1.0	-	MD748366
0.8	-	MD748364	1.1	-	MD748367

TIGHTENING TORQUE

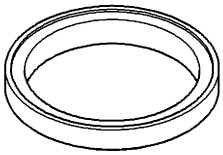
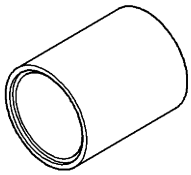
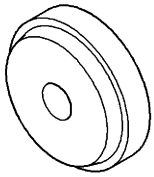
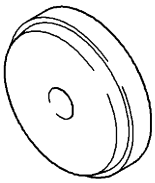
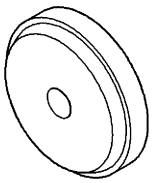
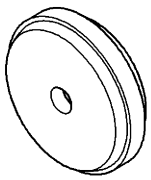
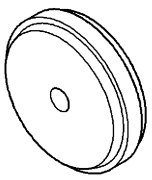
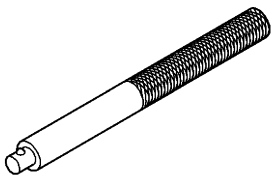
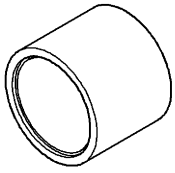
TRANSMISSION

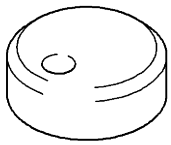
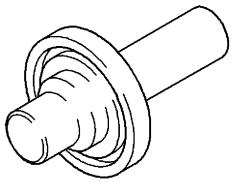
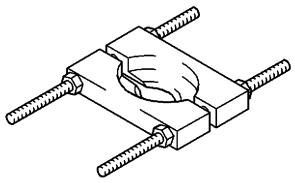
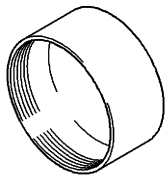
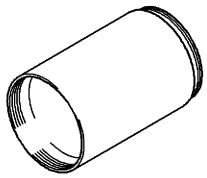
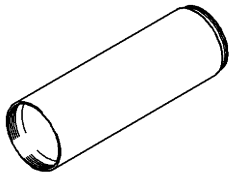
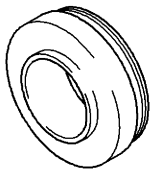
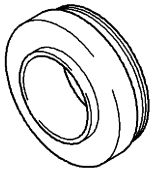
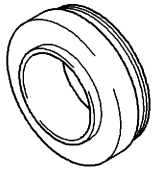
Items	Tightening torque N•m
Under cover mounting bolt	6.9 ± 1
Interlock plate bolt	30 ± 3
Clutch housing and transmission case tightening bolt	44 ± 5
Clutch release bearing retainer mounting bolt	9.8 ± 2
Control housing mounting bolt	18 ± 3
Shift cable bracket mounting bolt	18 ± 3
Speedometer gear mounting bolt	3.9 ± 1
Stopper bracket mounting bolt	18 ± 3
Select lever mounting bolt	18 ± 3
Select lever mounting nut	11 ± 1
Center differential drive gear mounting bolt	132 ± 5
Backup light switch	32 ± 2
Poppet spring	32 ± 2
Reverse idler gear shaft mounting bolt	48 ± 5
Roll stopper bracket mounting bolt	69 ± 9

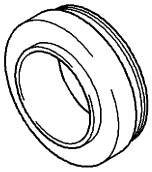
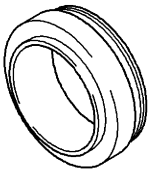
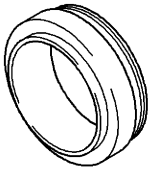
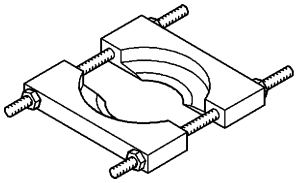
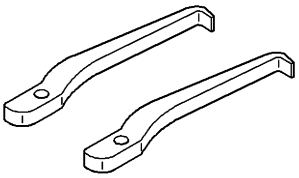
TRANSFER

Items	Tightening torque N•m
Transfer cover mounting bolt	23 ± 3
Transmission and transfer tightening bolt	69 ± 9

SPECIAL TOOLS

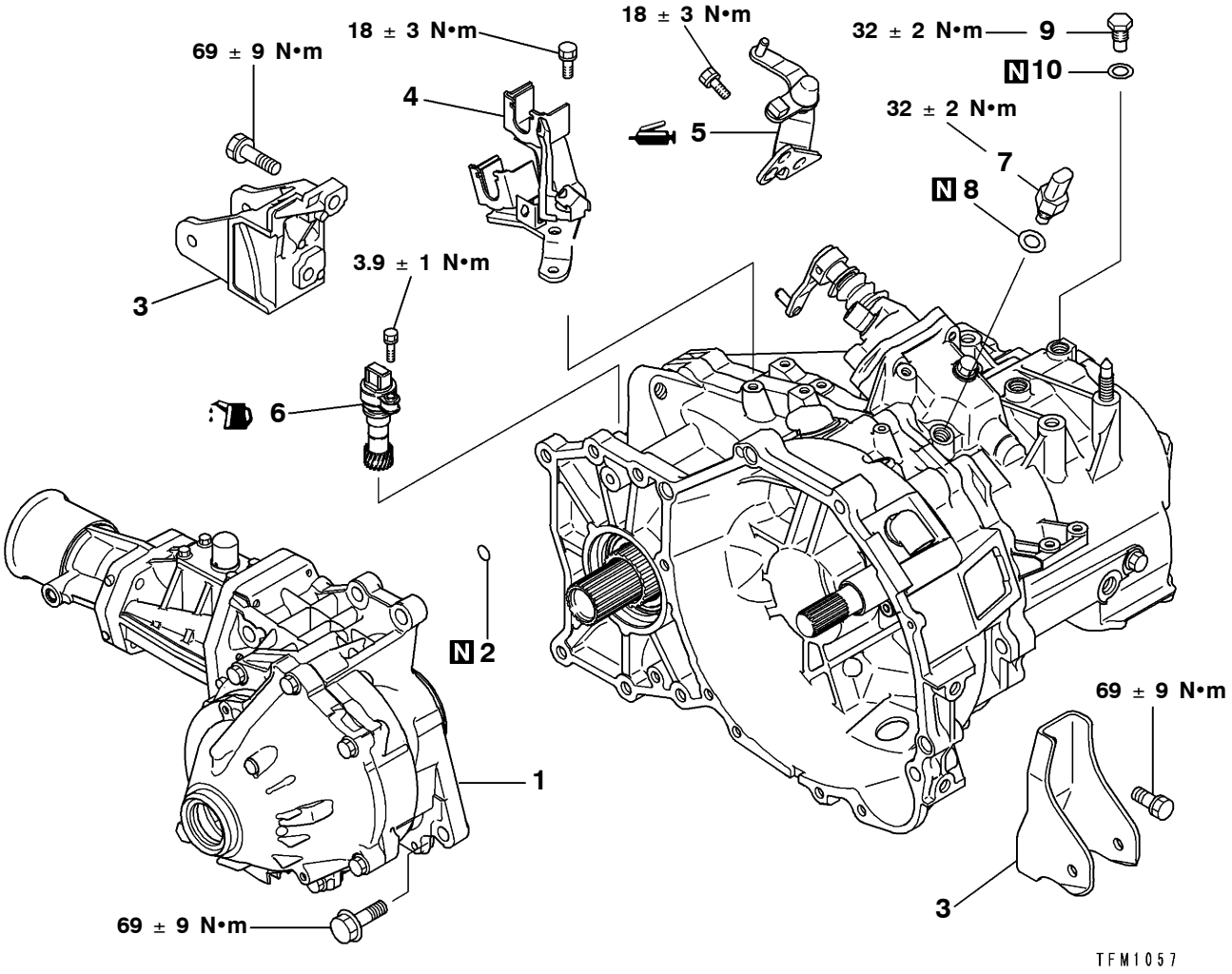
Tool	Number	Name	Use
	MB990887	Arm bush remover and installer ring	Installation of transfer oil seal
	MB990891	Bush remover and installer base	Installation of transfer oil seal
	MB990928	Installer adapter	Installation of input shaft oil seal
	MB990932	Installer adapter	Removal of differential case taper roller bearing
	MB990936	Installer adapter	Installation of transfer oil seal
	MB990935	Installer adapter	Installation of output shaft front taper roller bearing
	MB990937	Installer adapter	Installation of differential case taper roller bearing and transfer extention housing oil seal
	MB990938	Handle	Use for installer adaptor
	MB991445	Bush remover and installer base	Installation of differential case taper roller bearing outer race

Tool	Number	Name	Use
	MD998364	Camshaft oil seal installer	Installation of each gear, bearing and sleeve
	MD998800	Oil seal installer	Installation of differential oil seal and transfer cover oil seal
	MD998801	Bearing remover	Installation and removal of each gear, bearing and sleeve
	MD998812	Installer cap	Use for installer and installer adaptor
	MD998813	Installer 100	Use for installer cap and installer adaptor
	MD998814	Installer 200	Use for installer cap and installer adaptor
	MD998818	Installer adapter (38)	Installation of input shaft front bearing
	MD998819	Installer adapter (40)	Installation of input shaft rear bearing and output shaft taper roller bearing
	MD998820	Installer adapter (42)	Installation of reverse gear bearing sleeve

Tool	Number	Name	Use
	MD998821	Installer adapter (44)	Installation of 4th speed gear, 5th speed gear sleeve and 5th-reverse speed synchronizer hub
	MD998824	Installer adapter (50)	Installation of 1st-2nd speed synchronizer hub, 2nd speed gear sleeve and 3rd speed gear
	MD998825	Installer adapter (52)	Installation of 1st speed gear sleeve, 3rd-4th speed synchronizer hub, 4th speed gear sleeve, 5th speed gear and thrust plate stopper
	MD998917	Bearing remover	Installation and removal of each gear, bearing and sleeve
	MD999566	Claw	Removal of taper roller bearing outer race

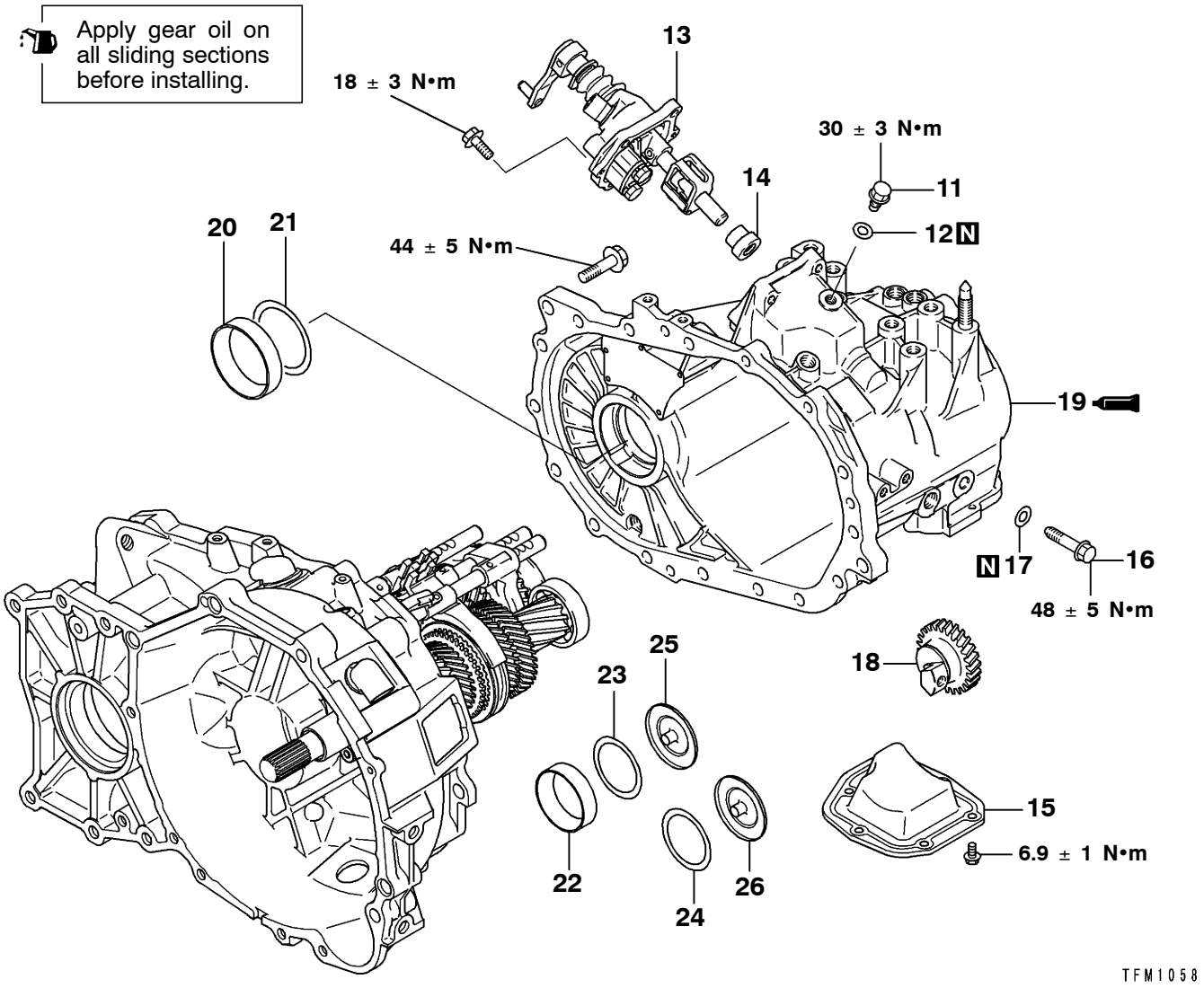
TRANSMISSION

DISASSEMBLY AND REASSEMBLY



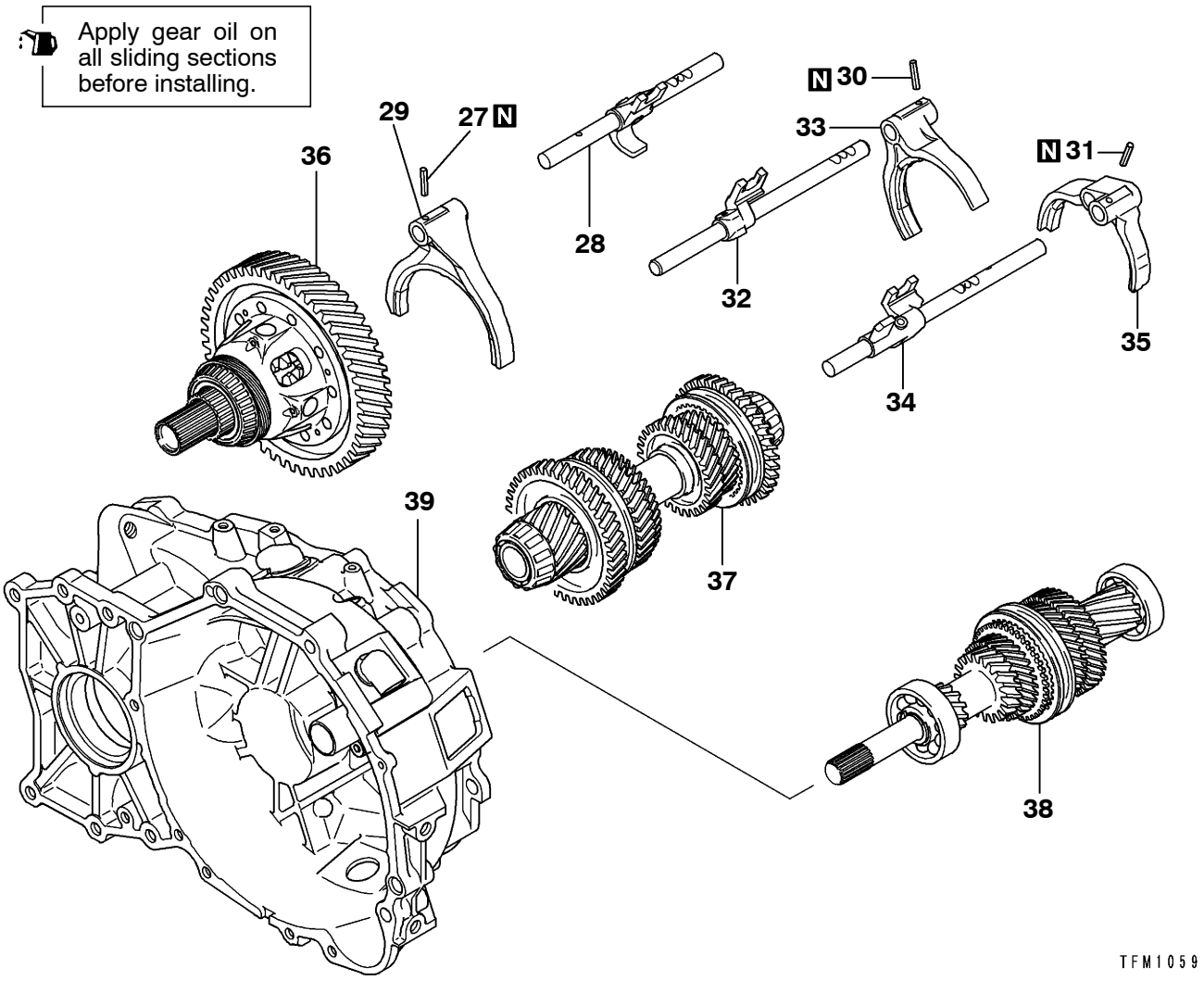
Disassembly steps

1. Transfer
2. O-ring
3. Roll stopper bracket
4. Shift cable bracket
5. Select lever
- ▶J◀ 6. Speedometer gear
7. Backup light switch
8. Gasket
- ▶I◀ 9. Poppet spring
- ▶H◀ 10. Gasket



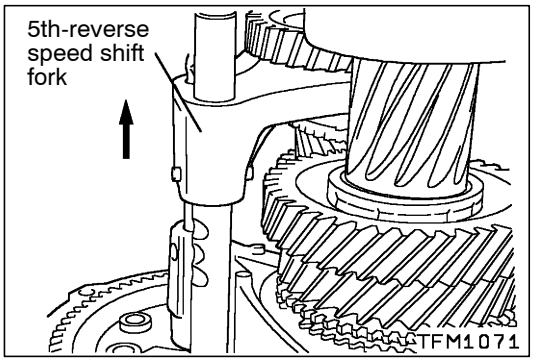
Disassembly steps

11. Interlock plate bolt
12. Gasket
▶G◀ 13. Control housing
14. Neutral return spring
▶F◀ 15. Under cover
16. Reverse idler shaft bolt
17. Gasket
18. Reverse idler gear
▶E◀ 19. Transmission case
20. Outer race
21. Outer race
▶D◀ 22. Spacer
▶D◀ 23. Spacer
▶D◀ 24. Spacer
25. Oil guide
26. Oil guide



Disassembly steps

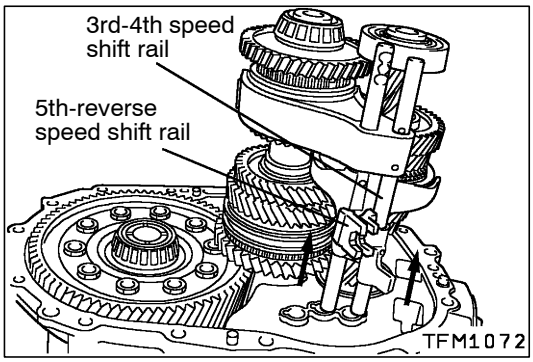
- ▶C◀ 27. Spring pin
- 28. 1st-2nd speed shift rail
- 29. 1st-2nd speed shift fork
- ▶C◀ 30. Spring pin
- ◀A▶ ▶C◀ 31. Spring pin
- ◀B▶ ▶B◀ 32. 3rd-4th speed shift rail
- ◀B▶ ▶B◀ 33. 3rd-4th speed shift fork
- ◀B▶ ▶B◀ 34. 5th-reverse speed shift rail
- ◀B▶ ▶B◀ 35. 5th-reverse speed shift fork
- ◀C▶ ▶A◀ 36. Center differential
- ◀C▶ ▶A◀ 37. Output shaft
- ◀C▶ ▶A◀ 38. Input shaft
- 39. Clutch housing



DISASSEMBLY SERVICE POINTS

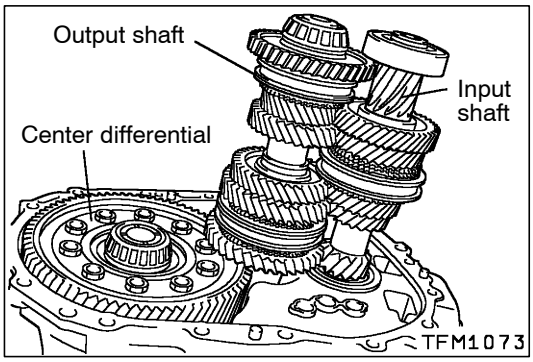
◀A▶ SPRING PIN REMOVAL

Shift the 5th-reverse speed shift fork in the direction shown in the illustration, and remove the spring pin.



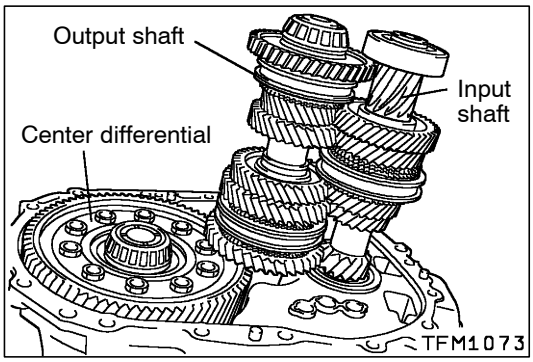
◀B▶ 3RD-4TH SPEED SHIFT RAIL/3RD-4TH SPEED SHIFT FORK/5TH-REVERSE SPEED SHIFT RAIL/5TH-REVERSE SPEED SHIFT FORK REMOVAL

(1) Move each shift rail in the direction shown in the illustration, and remove from the shift rail hole on the clutch housing.
(2) Remove each shift rail and shift fork as a set.



◀C▶ CENTER DIFFERENTIAL/OUTPUT SHAFT/INPUT SHAFT REMOVAL

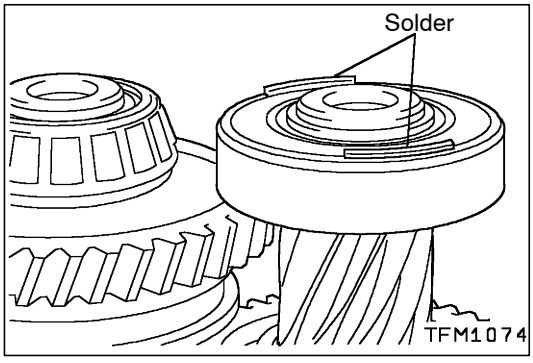
Remove the input shaft, output shaft and center differential from the clutch housing at the same time.



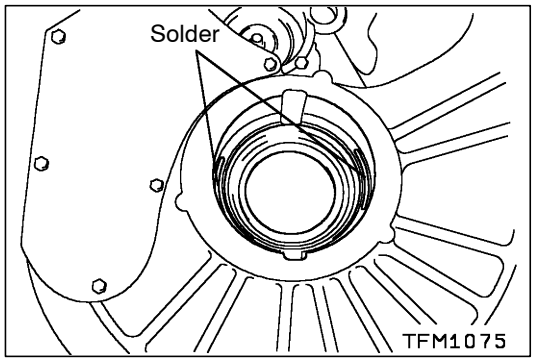
ADJUSTMENT BEFORE REASSEMBLY

SELECTION OF INPUT SHAFT END PLAY/OUTPUT SHAFT END PLAY/OUTPUT SHAFT PRELOAD AND CENTER DIFFERENTIAL PRELOAD ADJUSTMENT SPACER

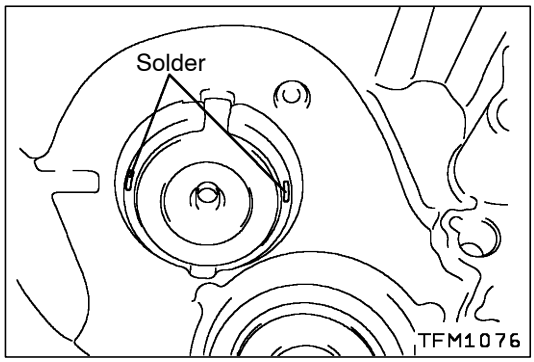
(1) Install the input shaft, output shaft and center differential onto the clutch housing at the same time.

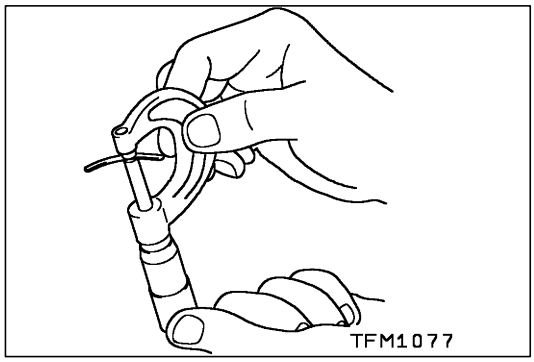


(2) Set solder (approx. 10 mm long, 1.6 mm diameter) on the input shaft rear bearing at the position shown in the illustration.



(3) Set solder (10 mm long, 1.6 mm diameter) on the transmission case at the position shown in the illustration.
(4) Install the outer race onto the transmission case.
(5) Install the transmission case, and tighten the bolt with the specified torque.





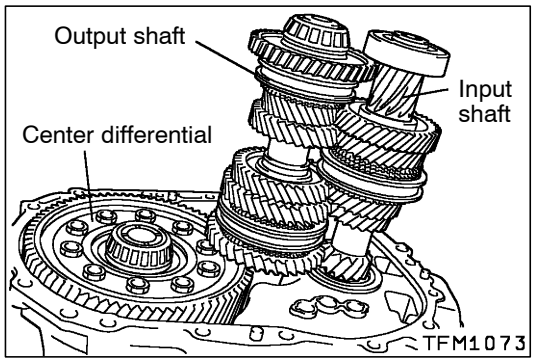
(6) If the solder has not been crushed, carry out steps (2) to (5) with solder having a larger diameter.
(7) Using a micrometer, measure the thickness of the crushed solder, and select a spacer so that the end play and preload are at the standard values.

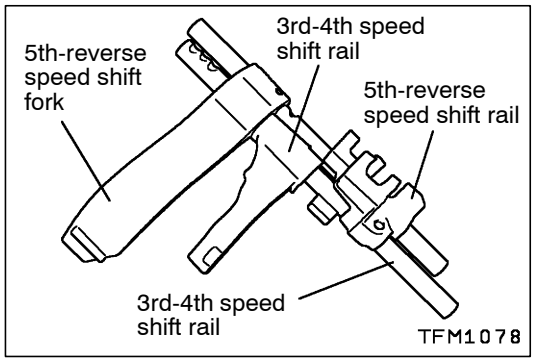
Standard value:
Input shaft end play
0.05mm loose to 0.17mm loose
Output shaft preload
0.13mm tight to 0.18mm tight
Center differential preload
0.05mm tight to 0.11mm tight

REASSEMBLY SERVICE POINTS

▶A◀ INPUT SHAFT/OUTPUT SHAFT/CENTER DIFFERENTIAL INSTALLATION

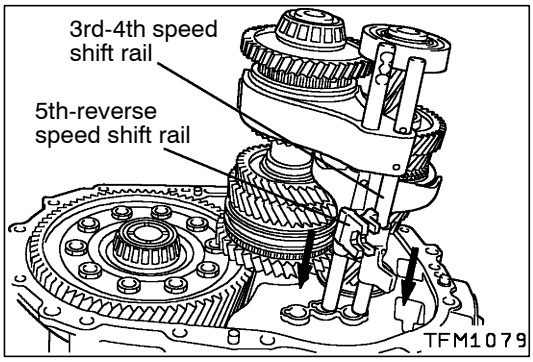
Install the input shaft, output shaft and center differential onto the clutch housing at the same time.



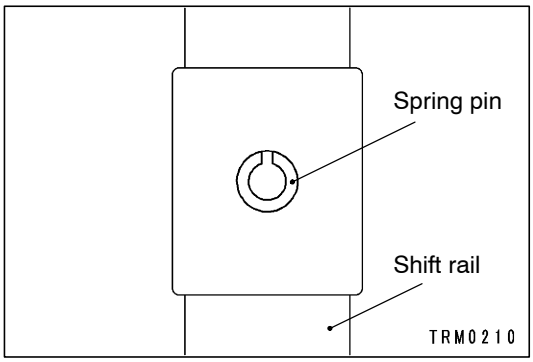


▶B◀ 5TH-REVERSE SPEED SHIFT FORK/5TH-REVERSE SPEED SHIFT RAIL/3RD-4TH SPEED SHIFT FORK/3RD-4TH SPEED SHIFT RAIL INSTALLATION

(1) Assemble the 3rd-4th speed shift rail, fork and the 5th-reverse speed shift rail and fork.



(2) Slide each shift rail in the direction shown in the illustration, and then install onto the shift rail hole on the clutch housing.

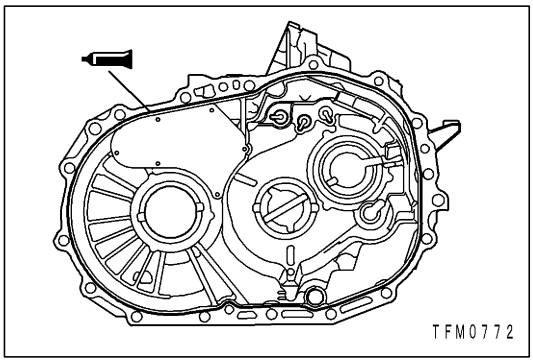


▶C◀ SPRING PIN INSTALLATION

Install the spring pin onto the shift rail so that the slit faces the direction shown in the illustration.

▶D◀ SPACER INSTALLATION

Install the spacer selected in the section “Adjustment before reassembly”.



▶E◀ TRANSMISSION CASE INSTALLATION

Apply sealant at the positions of the transmission case shown in the illustration.

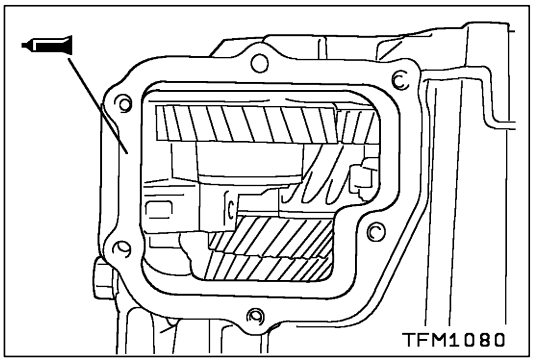
Sealant

Specified sealant:

MITSUBISHI genuine sealant Part No.MD997740 or equivalent

Caution

Evenly squeeze out the agent so that it is not insufficient or excessive.



▶F◀ UNDER COVER INSTALLATION

Apply sealant at the positions of the transmission case shown in the illustration.

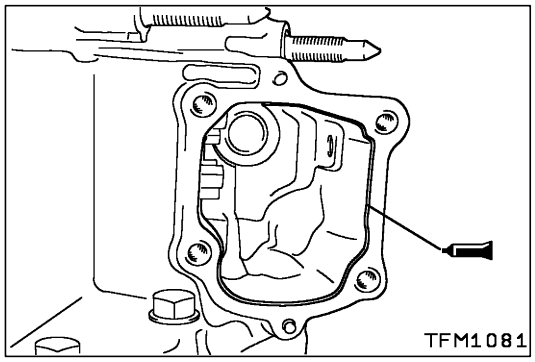
Sealant

Specified sealant:

MITSUBISHI genuine sealant Part No.MD997740 or equivalent

Caution

Evenly squeeze out the agent so that it is not insufficient or excessive.



▶G◀CONTROL HOUSING INSTALLATION

Apply sealant at the positions of the transmission case shown in the illustration.

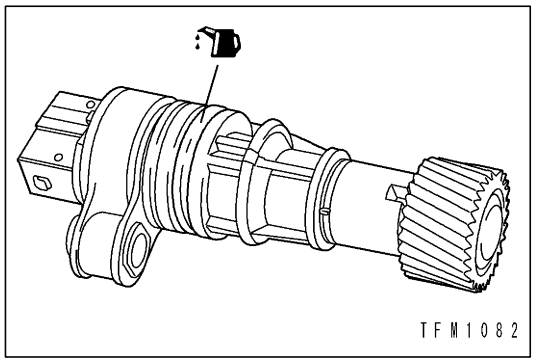
Sealant

Specified sealant:

MITSUBISHI genuine sealant Part No.MD997740 or equivalent

Caution

Evenly squeeze out the agent so that it is not insufficient or excessive.



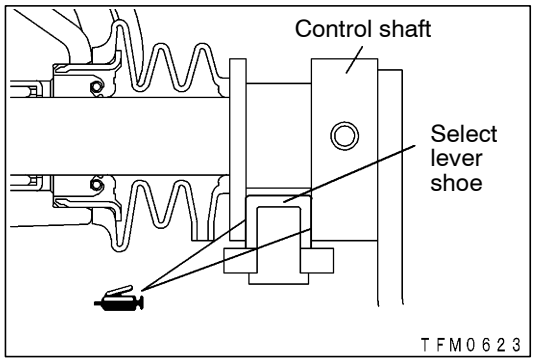
▶H◀SPEEDOMETER GEAR INSTALLATION

Apply transmission oil on the O-ring for the speedometer gear.

Transmission oil

Specified oil:

MITSUBISHI genuine "DIA-QUEEN" multi gear oil <75W/85W> or equivalent



▶I◀ SELECT LEVER INSTALLATION

Apply grease on the sliding section of the select lever shoe's control shaft.

Grease

Specified grease:

MITSUBISHI genuine grease Part No.0101011 or equivalent

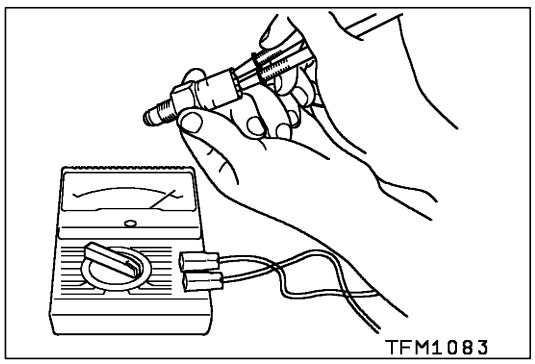
▶J◀ O-RING INSTALLATION

Apply transmission oil on the O-ring.

Transmission oil

Specified oil:

MITSUBISHI genuine "DIA-QUEEN" multi gear oil <75W/85W> or equivalent



INSPECTION

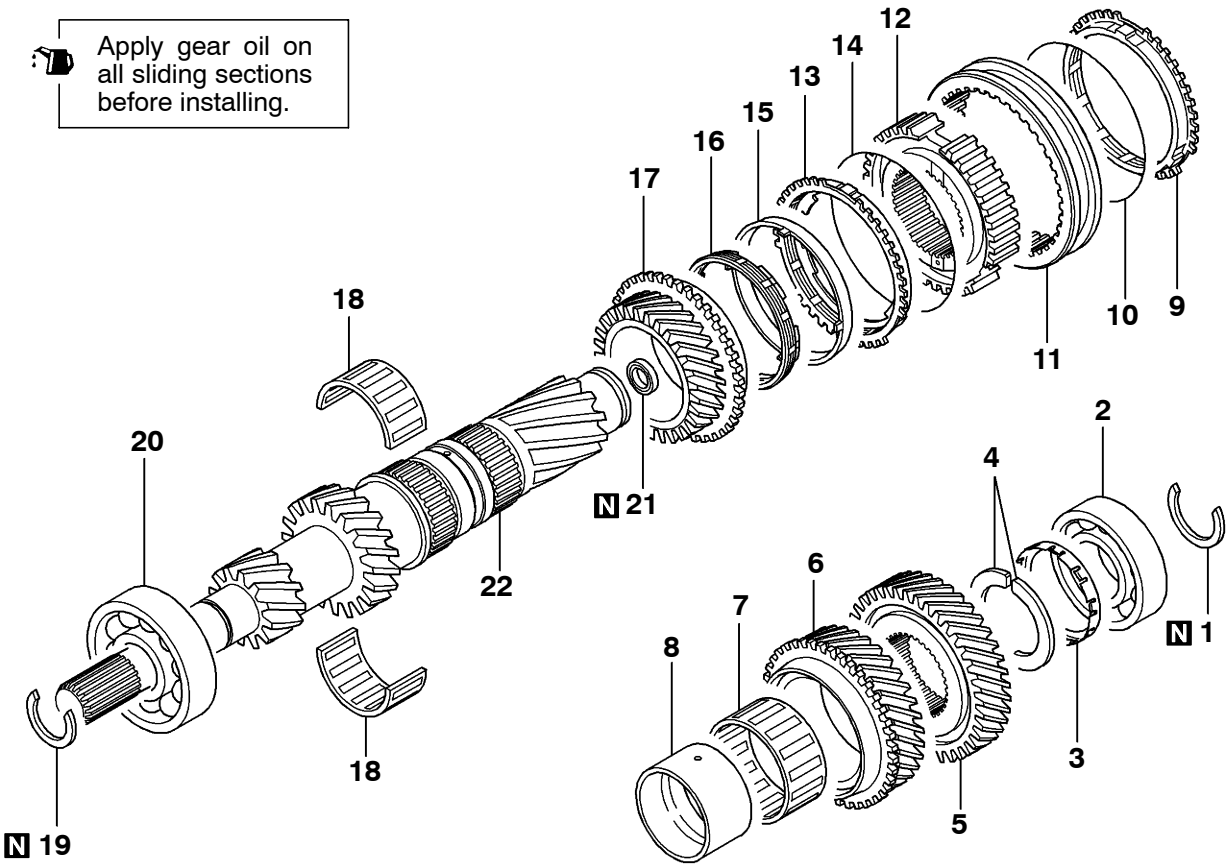
BACKUP LIGHT SWITCH

Check the continuity between the terminals.

Items	Continuity
Switch pressed	Continuity not established
Switch released	Continuity established

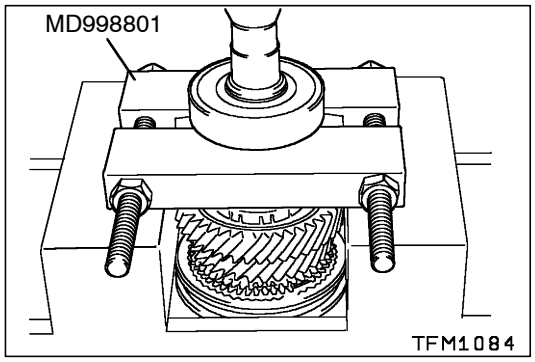
INPUT SHAFT

DISASSEMBLY AND REASSEMBLY



Disassembly steps

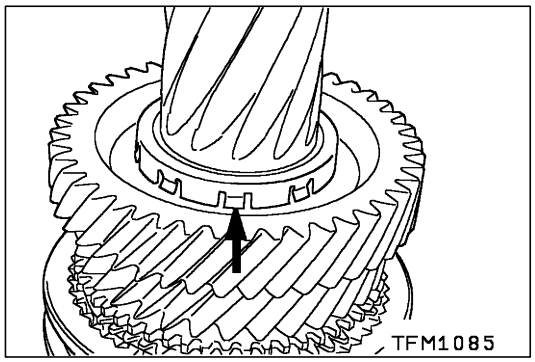
- ▶M◀ 1. Snap ring
- ◀A▶ ▶L◀ 2. Ball bearing
- ◀B▶ ▶K◀ 3. Thrust plate stopper
- ▶J◀ 4. Thrust plate
- ◀C▶ ▶I◀ 5. 5th speed gear
- 6. 4th speed gear
- 7. Needle roller bearing
- ◀D▶ ▶H◀ 8. 4th speed gear sleeve
- 9. Synchronizer ring
- ▶G◀ 10. Synchronizer spring
- ▶F◀ 11. Synchronizer sleeve
- ▶E◀ 12. 3rd-4th speed synchronizer hub
- 13. Outer synchronizer ring
- ▶D◀ 14. Synchronizer spring
- 15. Synchronizer cone
- 16. Inner synchronizer ring
- 17. 3rd speed gear
- 18. Needle roller bearing
- ▶C◀ 19. Snap ring
- ◀E▶ ▶B◀ 20. Ball bearing
- ▶A◀ 21. Oil seal
- 22. Input shaft



DISASSEMBLY SERVICE POINTS

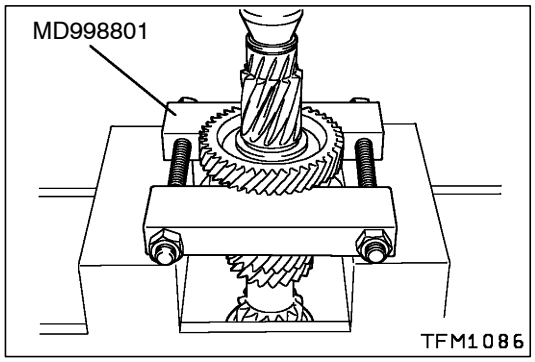
◀A▶ BALL BEARING REMOVAL

Using the special tool, remove the ball bearing from the input shaft.



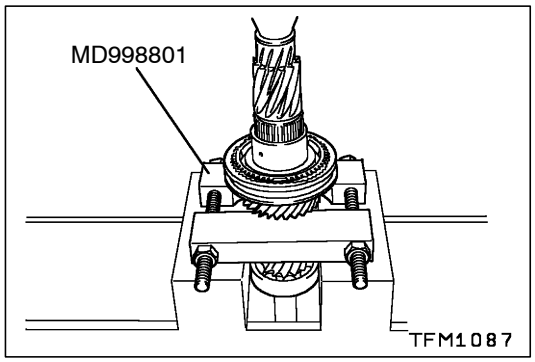
◀B▶ THRUST PLATE STOPPER REMOVAL

Using a screwdriver, lift the stopper at the position shown in the illustration, and remove the thrust plate stopper.



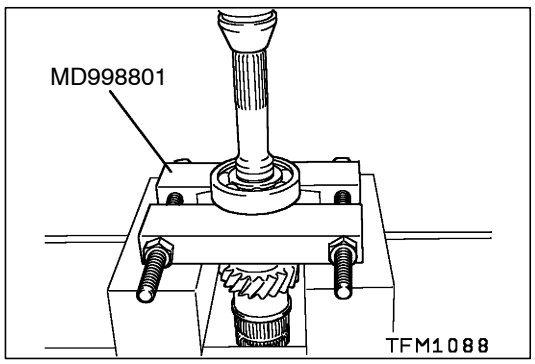
◀C▶ 5TH SPEED GEAR REMOVAL

Using the special tool, remove the 5th speed gear from the input shaft.



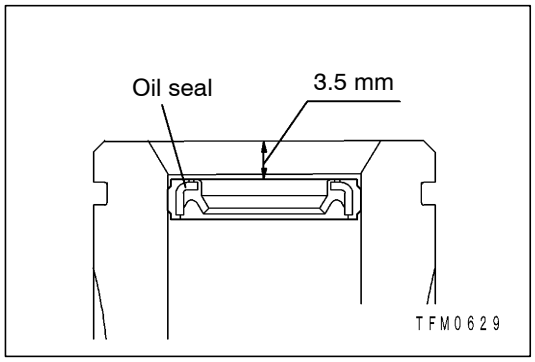
◀D▶ 4TH SPEED GEAR SLEEVE REMOVAL

Install the special tool on the 3rd speed gear, and remove the 4th speed gear sleeve from the input shaft.



◀E▶ BALL BEARING REMOVAL

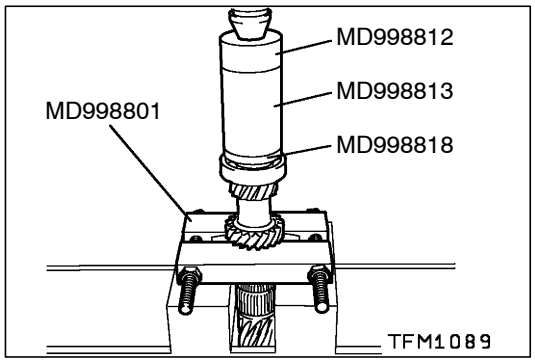
Using the special tool, remove the ball bearing from the input shaft.



REASSEMBLY SERVICE POINTS

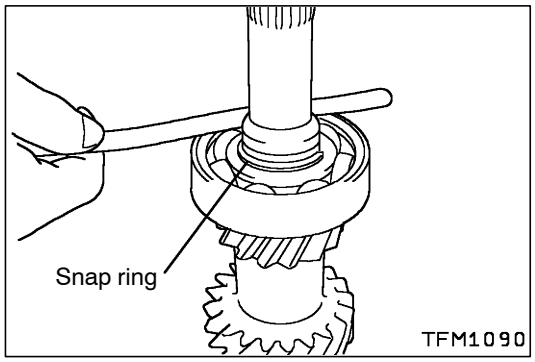
▶A◀ OIL SEAL INSTALLATION

Accurately tap in the oil seal to the dimensions shown in the illustration.



▶B◀ BALL BEARING INSTALLATION

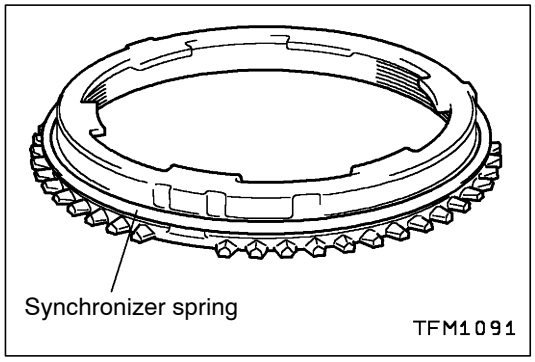
Using the special tool, install the ball bearing onto the input shaft.



▶C◀ SNAP RING INSTALLATION

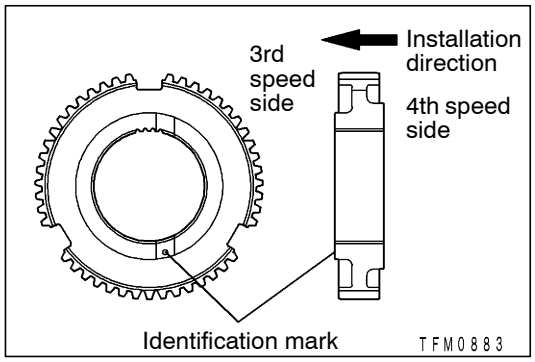
Select and install the snap ring so that the input shaft front bearing clearance is at the standard value.

Standard value: 0.01 mm tight to 0.12 mm loose



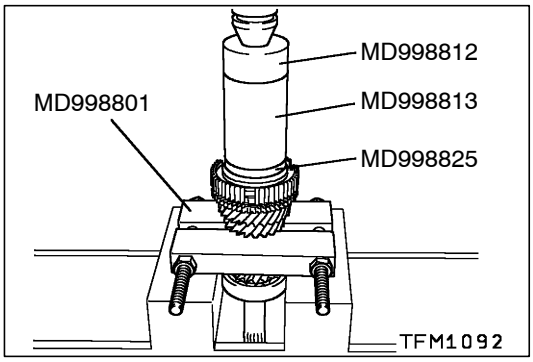
▶D◀ SYNCHRONIZER SPRING INSTALLATION

Accurately install the synchronizer spring onto the position of the synchronizer ring shown in the illustration.

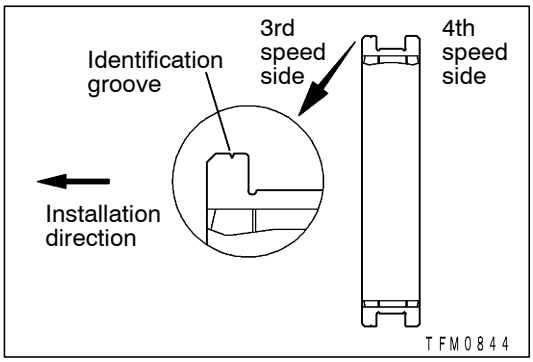


▶E◀ 3RD-4TH SPEED SYNCHRONIZER HUB INSTALLATION

Install the 3rd-4th speed synchronizer hub onto the input shaft at the direction shown in the illustration.

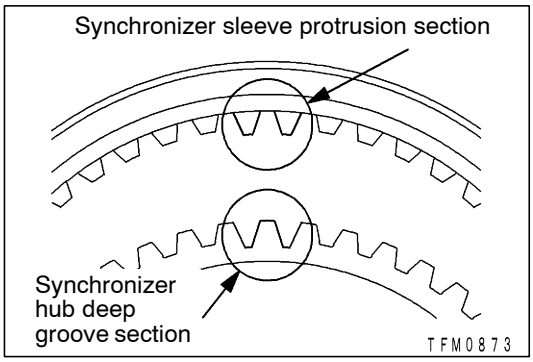


Caution
(1) Press in so that the synchronizer ring does not bite in.
(2) After assembling, confirm that the 3rd speed gear rotates smoothly.

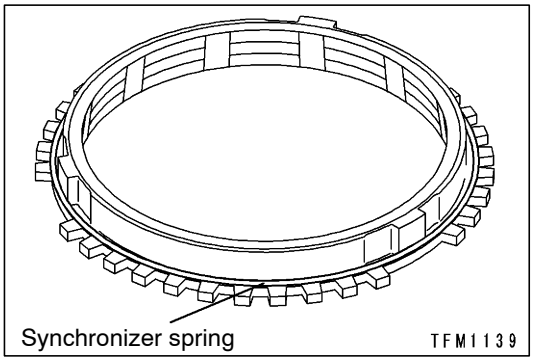


▶F◀ SYNCHRONIZER SLEEVE INSTALLATION

(1) Install the synchronizer sleeve onto the input shaft at the direction shown in the illustration.

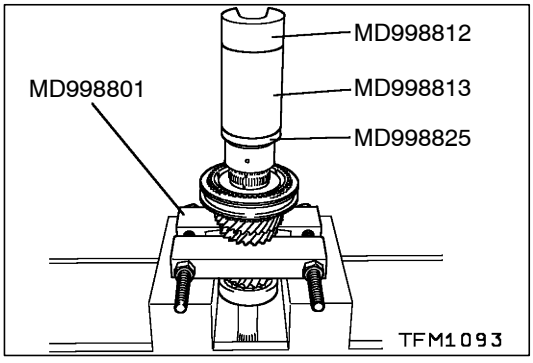


(2) Align the synchronizer hub deep grooves with the sleeve protrusions and install.



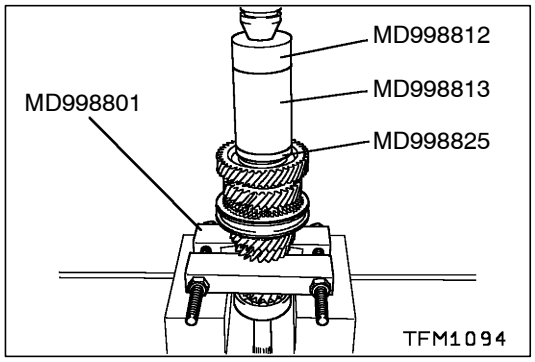
▶G◀SYNCHRONIZER SPRING INSTALLATION

Install the synchronizer spring onto the input shaft.



▶H◀ 4TH SPEED GEAR SLEEVE INSTALLATION

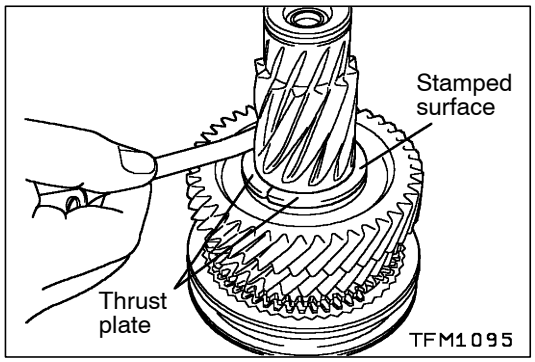
Using the special tool, install the 4th speed gear sleeve onto the input shaft.



▶I◀ 5TH SPEED GEAR INSTALLATION

Using the special tool, install the 5th speed gear onto the input shaft.

Caution
(1) Press in so that the synchronizer ring does not bite in.
(2) After assembling, confirm that the 4th speed gear rotates smoothly.

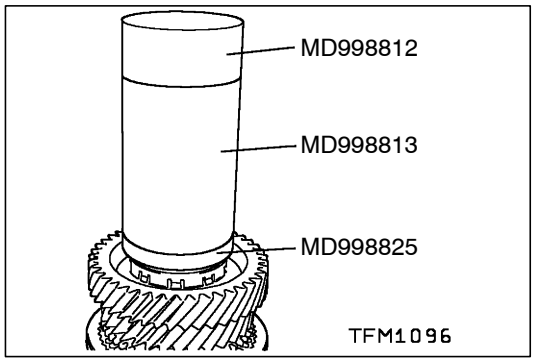


▶J◀ THRUST PLATE INSTALLATION

Select and install the thrust plate onto the input shaft so that the input shaft 5th speed gear clearance is at the standard value.

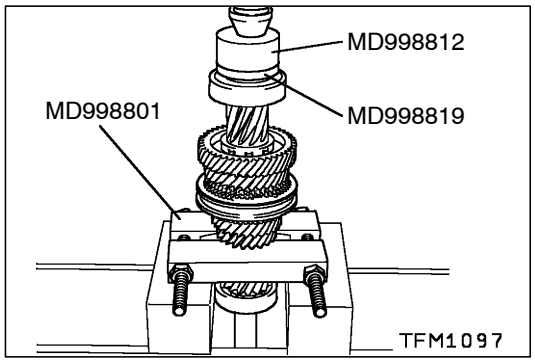
Standard value: 0.01 mm tight to 0.09 mm loose

Caution
Assemble the side with the identification stamp facing the thrust plate stopper side.



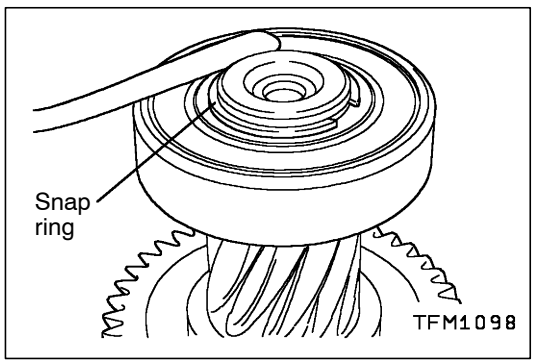
▶K◀ THRUST PLATE STOPPER INSTALLATION

Press the special tool by hand, and accurately fit the thrust plate stopper onto the input shaft so that it is not inclined.



▶L◀ BALL BEARING INSTALLATION

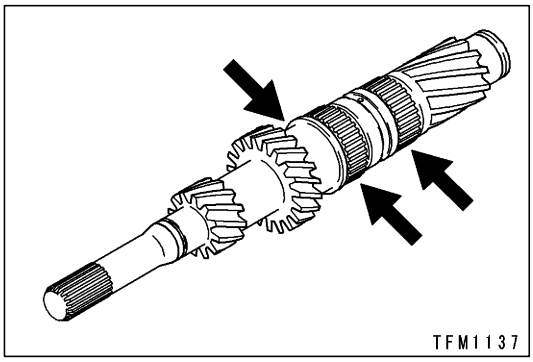
Using the special tool, install the ball bearing onto the input shaft.



▶M◀SNAP RING INSTALLATION

Select and install the snap ring onto the input shaft so that the input shaft rear bearing clearance is at the standard value.

Standard value: 0.01 mm tight to 0.12 mm loose



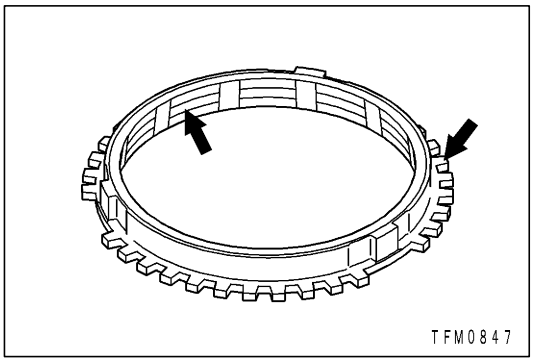
INSPECTION

INPUT SHAFT

(1) There must be no damage, abnormal wear or seizure on the outer diameter of the needle bearing installation section.
(2) Check the spline for damage and wear.

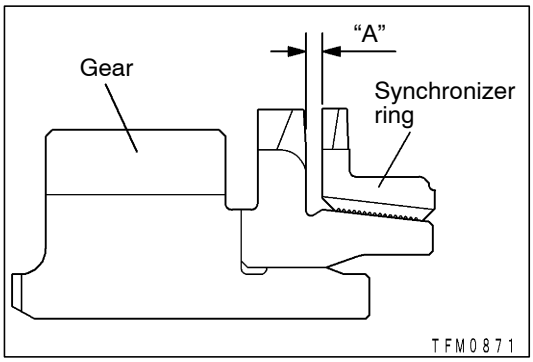
NEEDLE BEARING

(1) When the needle bearing is assembled with the input shaft and gears and rotated, the needle bearing must rotate smoothly without play or abnormal noise.
(2) The holder must not be deformed.



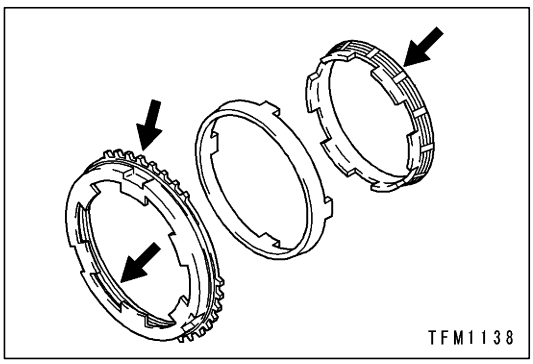
SYNCHRONIZER RING

(1) The clutch gear teeth must not be damaged or broken.
(2) The inner diameter of the cone must not be damaged or worn, and the screw threads must not be crushed.



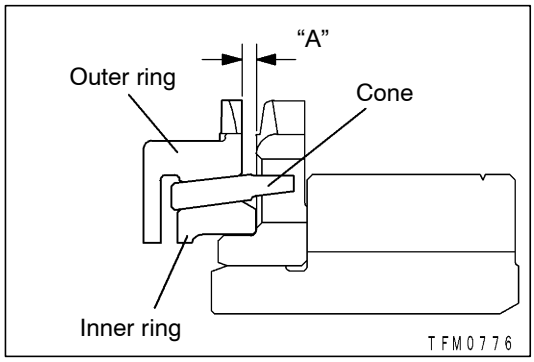
(3) Press the synchronizer ring against the gears, and check the clearance "A". Replace if "A" is less than the limit value.

Limit value: 0.5 mm



OUTER SYNCHRONIZER RING, INNER SYNCHRONIZER RING AND SYNCHRONIZER CONE

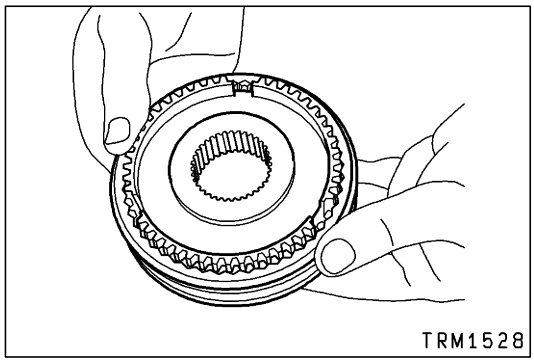
(1) The gear teeth and cone surface must not be damaged or broken.



(2) Assemble the outer ring, inner ring and cone. Press against the gears and check the clearance "A". Replace if "A" is less than the limit value.

Limit value: 0.5 mm

Caution
When replacing, replace the outer ring, inner ring and cone as a set.

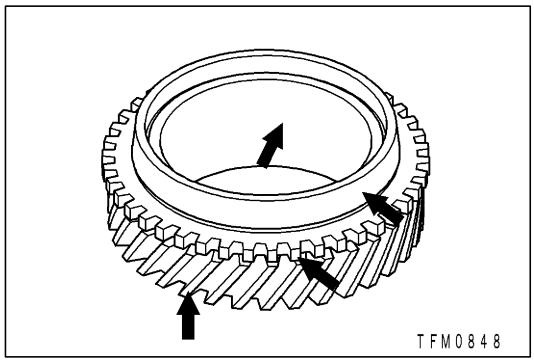


SYNCHRONIZER SLEEVE AND HUB

(1) When the synchronizer sleeve and hub are assembled and slid, the parts should slide without catching.
(2) There must be no damage on the front and back ends of the sleeve's inner surface.

SYNCHRONIZER SPRING

The spring must not be weak, deformed or broken.

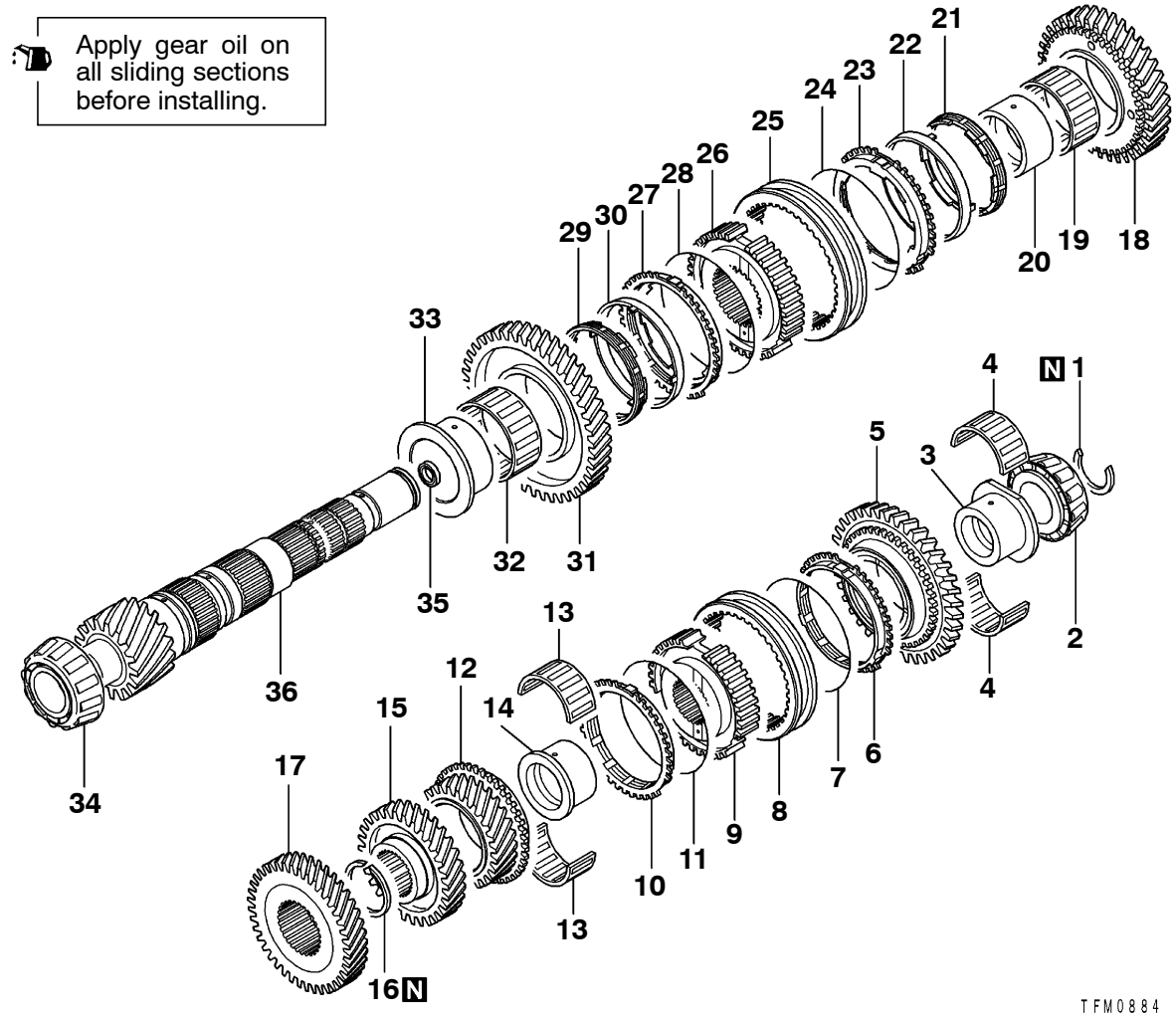


EACH SPEED GEAR

(1) None of the helical gears or clutch gear teeth must be damaged or worn.
(2) The synchronizer cone surface must not be rough, damaged or worn.
(3) The inner diameter and front/back surfaces of the gear must not be damaged or worn.

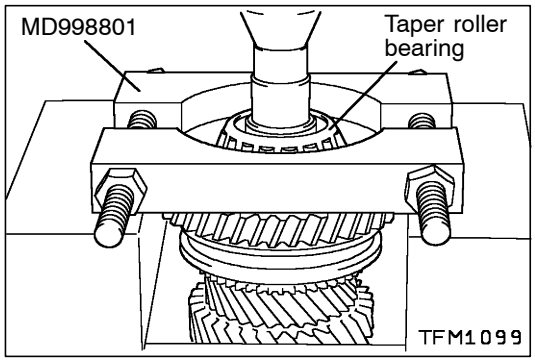
OUTPUT SHAFT

DISASSEMBLY AND REASSEMBLY



Disassembly steps

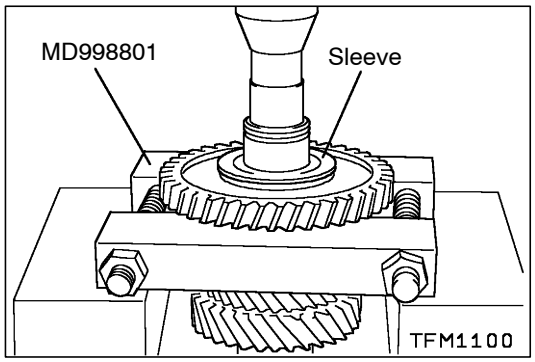
- ▶P◀ 1. Snap ring
- ◀A▶ ▶O◀ 2. Taper roller bearing
- ◀B▶ ▶N◀ 3. Reverse gear sleeve
- ▶N◀ 4. Needle roller bearing
- ▶N◀ 5. Reverse gear
- 6. Synchronizer ring
- ▶L◀ 7. Synchronizer spring
- ▶F◀ 8. Synchronizer sleeve
- ◀C▶ ▶M◀ 9. 5th-reverse speed synchronizer hub
- 10. Synchronizer ring
- ▶L◀ 11. Synchronizer spring
- 12. 5th speed gear
- 13. Needle roller bearing
- ▶K◀ 14. 5th speed gear sleeve
- ▶J◀ 15. 4th speed gear
- ▶I◀ 16. Snap ring
- ◀D▶ ▶H◀ 17. 3rd speed gear
- 18. 2nd speed gear
- 19. Needle roller bearing
- ◀E▶ ▶G◀ 20. 2nd speed gear sleeve
- 21. Inner synchronizer ring
- 22. Synchronizer cone
- 23. Outer synchronizer ring
- ▶D◀ 24. Synchronizer spring
- ▶F◀ 25. Synchronizer sleeve
- ▶E◀ 26. 1st-2nd speed synchronizer hub
- 27. Outer synchronizer ring
- ▶D◀ 28. Synchronizer spring
- 29. Inner synchronizer ring
- 30. Synchronizer cone
- 31. 1st speed gear
- 32. Needle roller bearing
- ◀F▶ ▶C◀ 33. 1st speed gear sleeve
- ◀G▶ ▶B◀ 34. Taper roller bearing
- ▶A◀ 35. Oil seal
- 36. Output shaft



DISASSEMBLY SERVICE POINTS

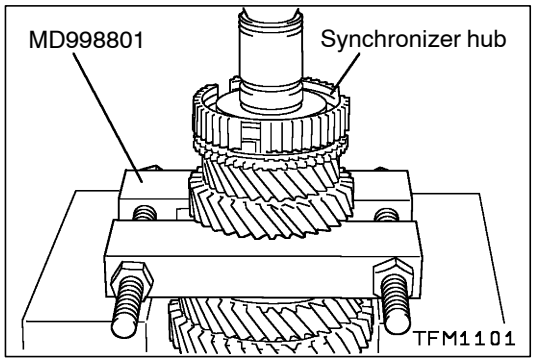
◀A▶ TAPER ROLLER BEARING REMOVAL

Using the special tool, remove the taper roller bearing from the output shaft.



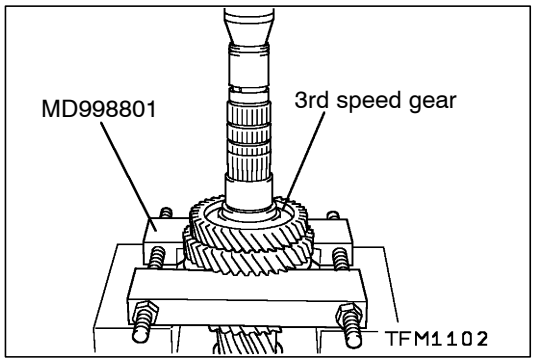
◀B▶ REVERSE GEAR BEARING SLEEVE REMOVAL

Install the special tool on the reverse gear, and remove the reverse gear bearing sleeve from the output shaft.



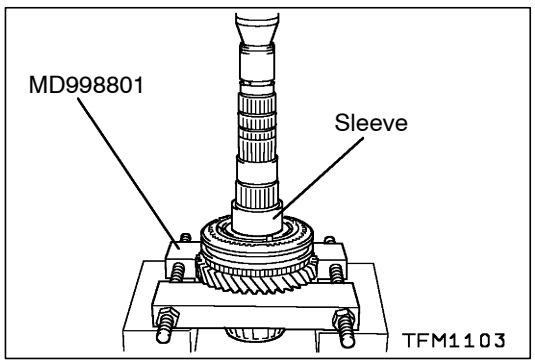
◀C▶ 5TH-REVERSE SPEED SYNCHRONIZER HUB REMOVAL

Install the special tool on the 4th speed gear, and remove 5th-reverse synchronizer hub.



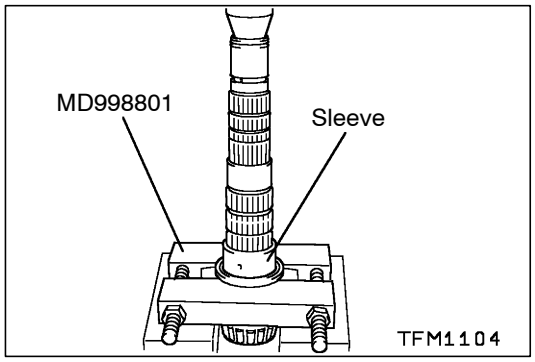
◀D▶ 3RD SPEED GEAR REMOVAL

Install the special tool on the 2nd speed gear, and remove the 3rd speed gear.



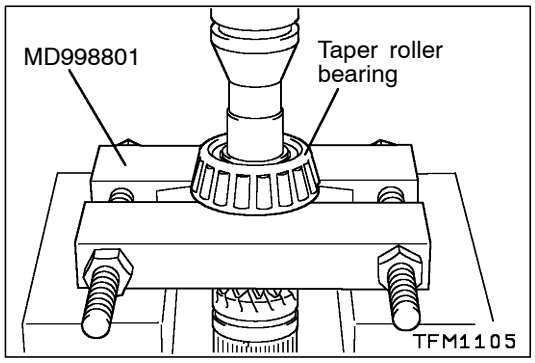
◀E▶ 2ND SPEED GEAR SLEEVE REMOVAL

Install the special tool on the 1st speed gear, and remove the 2nd speed gear sleeve.



◀F▶ 1ST SPEED GEAR SLEEVE REMOVAL

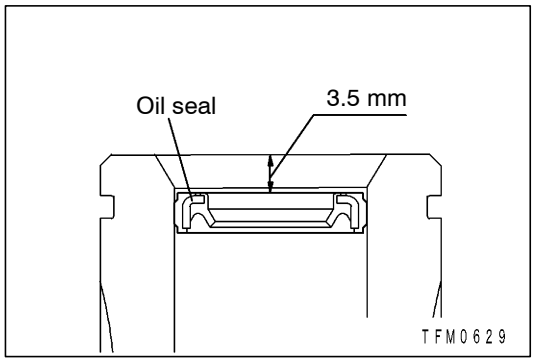
Using the special tool, remove the 1st speed gear sleeve from the output shaft.



◀G▶ TAPER ROLLER BEARING REMOVAL

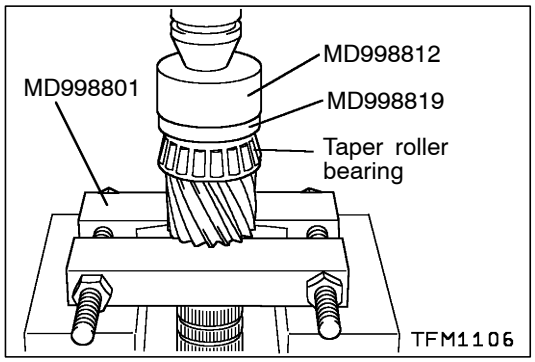
Using the special tool, remove the taper roller bearing from the output shaft.

REASSEMBLY SERVICE POINTS



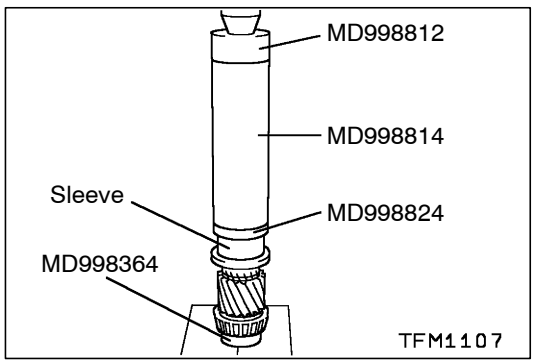
▶A◀ OIL SEAL INSTALLATION

Accurately tap in the oil seal to the dimensions shown in the illustration.



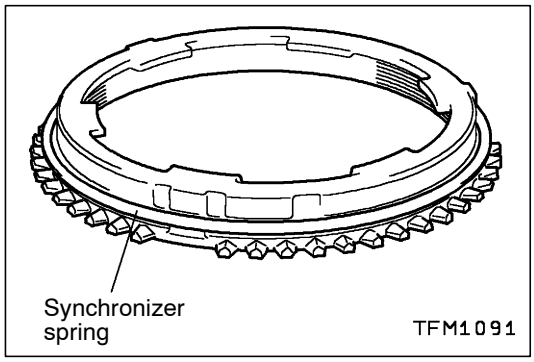
▶B◀ TAPER ROLLER BEARING INSTALLATION

Using the special tool, install the roller bearing onto the output shaft.



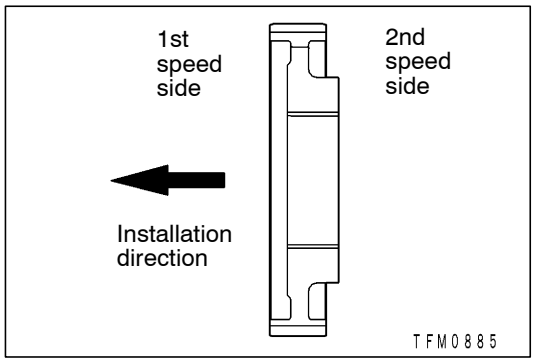
▶C◀ 1ST SPEED GEAR SLEEVE INSTALLATION

Using the special tool, install the 1st speed gear sleeve onto the output shaft.



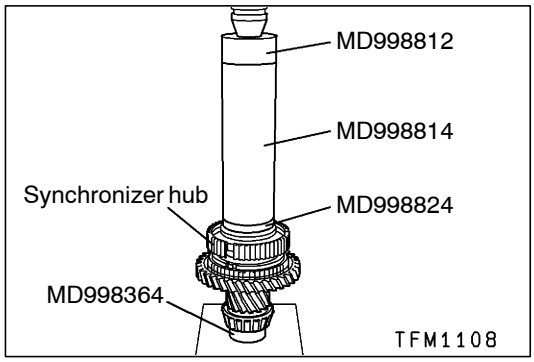
▶D◀ SYNCHRONIZER SPRING INSTALLATION

Install the synchronizer spring at the position shown in the illustration.



▶E◀ 1ST-2ND SPEED SYNCHRONIZER HUB

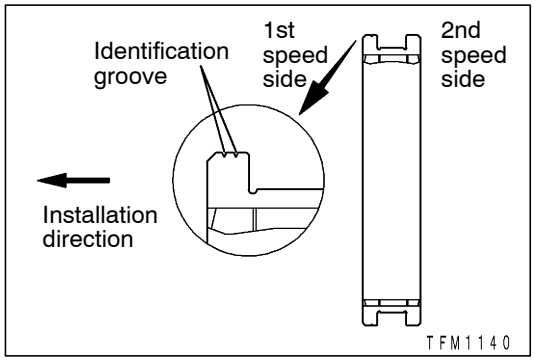
Using the special tool, install the 1st-2nd speed synchronizer hub onto the output shaft in the direction shown in the illustration.



Caution

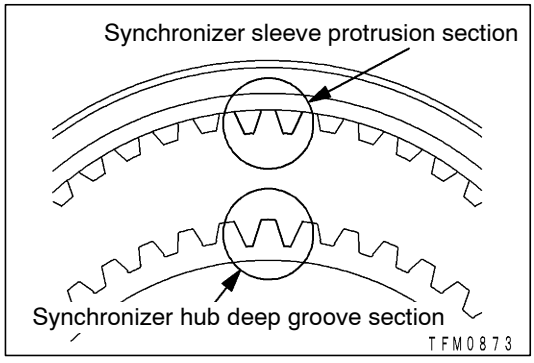
(1) Press in so that the synchronizer ring does not bite in.

(2) After assembling, confirm that the 1st speed gear rotates smoothly.

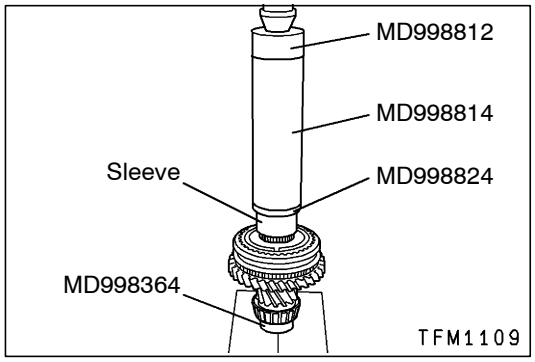


▶F◀ SYNCHRONIZER SLEEVE INSTALLATION

(1) Install the synchronizer sleeve onto the output shaft at the direction shown in the illustration.

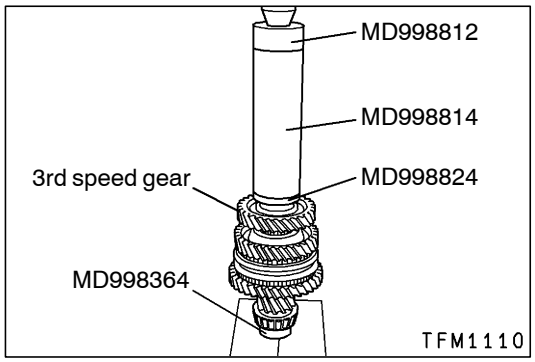


(2) Align the synchronizer hub deep grooves with the sleeve protrusions and install onto the output shaft.



▶G◀ 2ND SPEED GEAR SLEEVE INSTALLATION

Using the special tool, install the 2nd speed gear sleeve onto the output shaft.



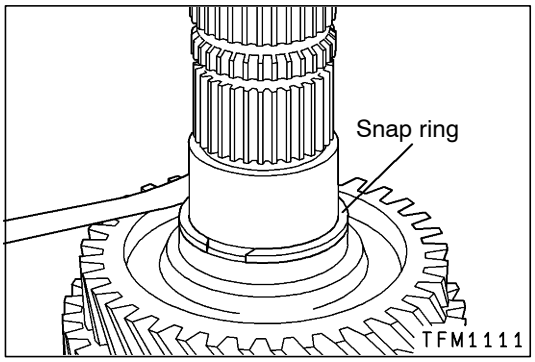
▶H◀ 3RD SPEED GEAR INSTALALTION

Using the special tool, install the 3rd speed gear onto the output shaft.

Caution

(1) Press in so that the synchronizer ring does not bite in.

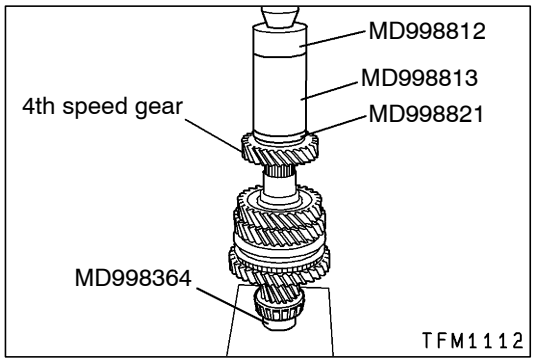
(2) After assembling, confirm that the 2nd speed gear rotates smoothly.



▶I◀ SNAP RING INSTALLATION

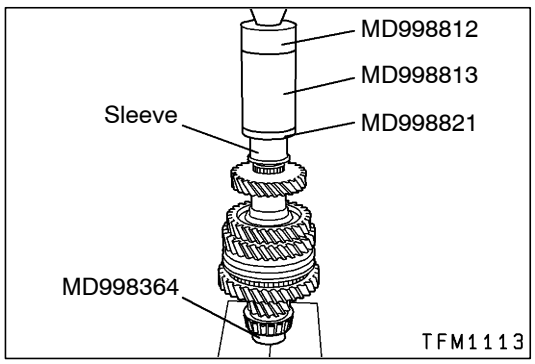
Select and install the snap ring onto the output shaft so that the output shaft 3rd speed gear clearance is at the standard value.

Standard value: 0.01 mm tight to 0.09 mm loose



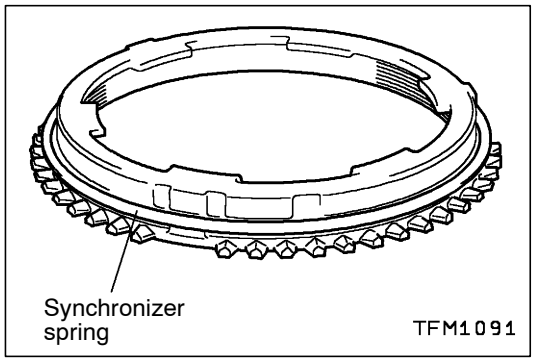
▶J◀ 4TH SPEED GEAR INSTALLATION

Using the special tool, install the 4th speed gear onto the output shaft.



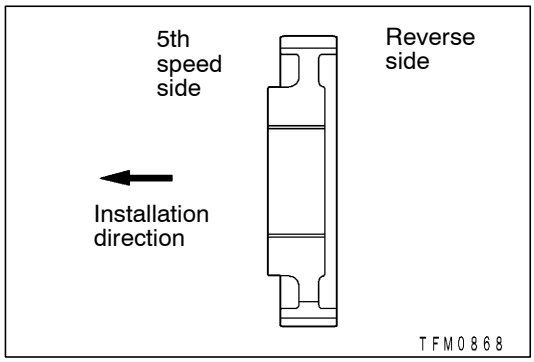
▶K◀ 5TH SPEED GEAR SLEEVE INSTALLATION

Using the special tool, install the 5th speed gear sleeve onto the output shaft.



▶L◀ SYNCHRONIZER SPRING INSTALLATION

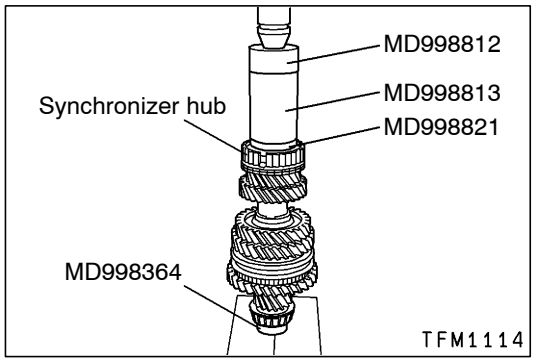
Install the synchronizer spring at the position shown in the illustration.



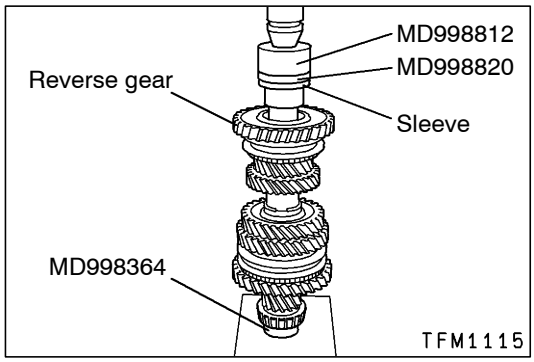
▶M◀5TH-REVERSE SPEED SYNCHRONIZER HUB INSTALLATION

Using the special tool, install the 5th-reverse synchronizer hub onto the output shaft in the direction shown in the illustration.

Caution
After assembling, confirm that the 5th speed gear rotates smoothly.

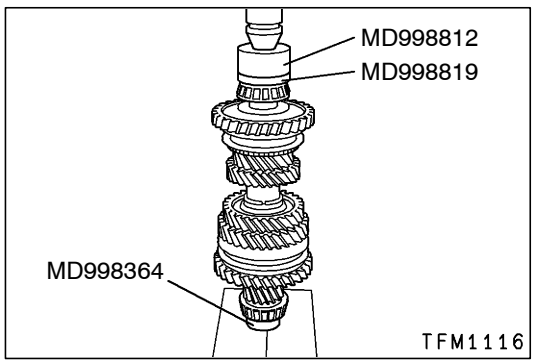


Caution
Press in so that the synchronizer ring does not bite in.



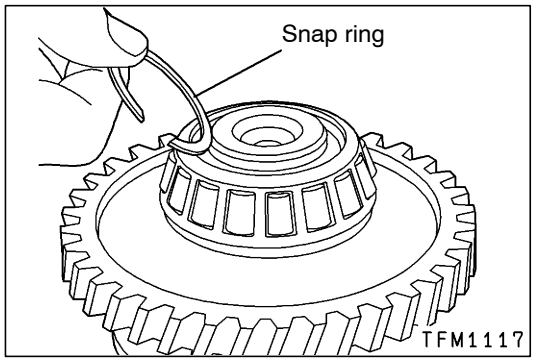
▶N◀ REVERSE GEAR/NEEDLE ROLLER BEARING/REVERSE GEAR BEARING SLEEVE INSTALLATION

Using the special tool, install the reverse gear/needle roller bearing/reverse gear bearing sleeve onto the output shaft.



▶O◀TAPER ROLLER BEARING INSTALLATION

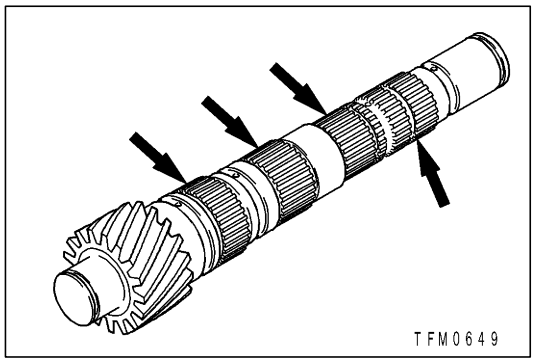
Using the special tool, install the taper roller bearing onto the output shaft.



▶P◀ SNAP RING INSTALLATION

Select and install the snap ring onto the output shaft so that the output shaft rear bearing clearance is at the standard value.

Standard value: 0.01 mm tight to 0.09 mm loose



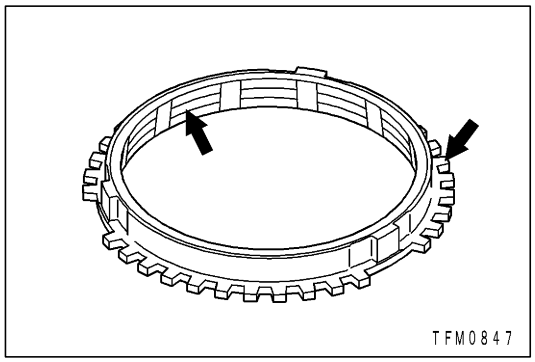
INSPECTION

OUTPUT SHAFT

Check the spline for damage and wear.

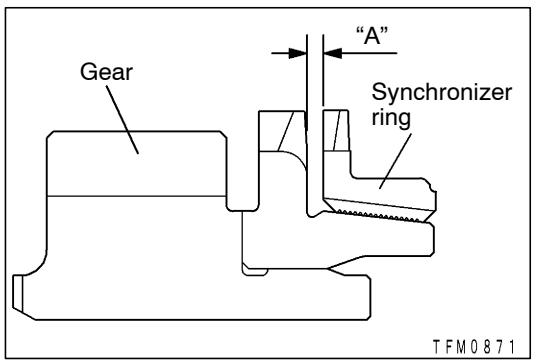
NEEDLE BEARING

(1) When the needle bearing is assembled with the bearing sleeve and gear and rotated, the needle bearing must rotate smoothly without play or abnormal noise.
(2) The holder must not be deformed.



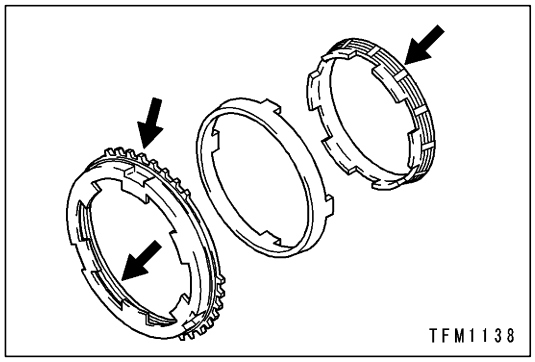
SYNCHRONIZER RING

(1) The clutch gear teeth must not be damaged or broken.
(2) The inner diameter of the cone must not be damaged or worn, and the screw threads must not be crushed.



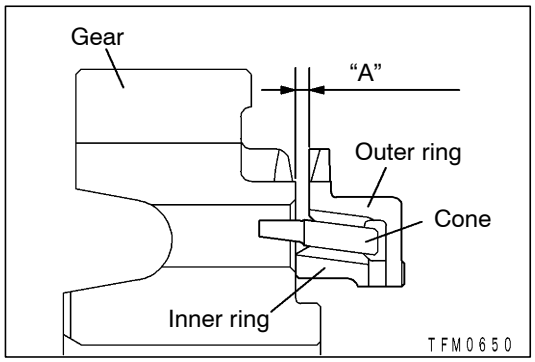
(3) Press the synchronizer ring against the gears, and check the clearance "A". Replace if "A" is less than the limit value.

Limit value: 0.5 mm



OUTER SYNCHRONIZER RING, INNER SYNCHRONIZER RING AND SYNCHRONIZER CONE

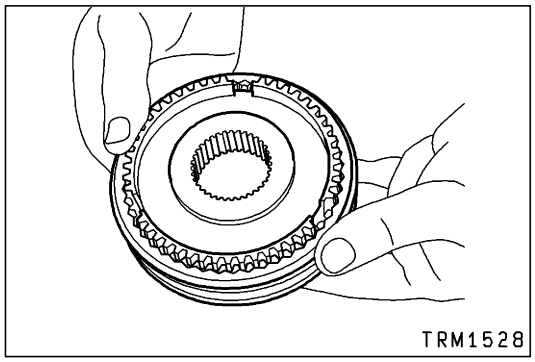
(1) The gear teeth and cone surface must not be damaged or broken.



(2) Assemble the outer ring, inner ring and cone. Press against the gears and check the clearance "A". Replace if "A" is less than the limit value.

Limit value: 0.5 mm

Caution
When replacing, replace the outer ring, inner ring and cone as a set.

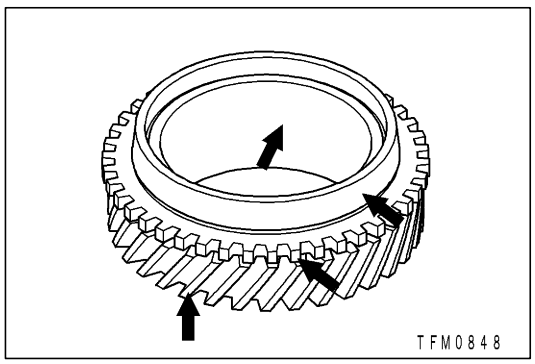


SYNCHRONIZER SLEEVE AND HUB

(1) When the synchronizer sleeve and hub are assembled and slid, the parts should slide without catching.
(2) There must be no damage on the front and back ends of the sleeve's inner surface.

SYNCHRONIZER SPRING

The spring must not be weak, deformed or broken.

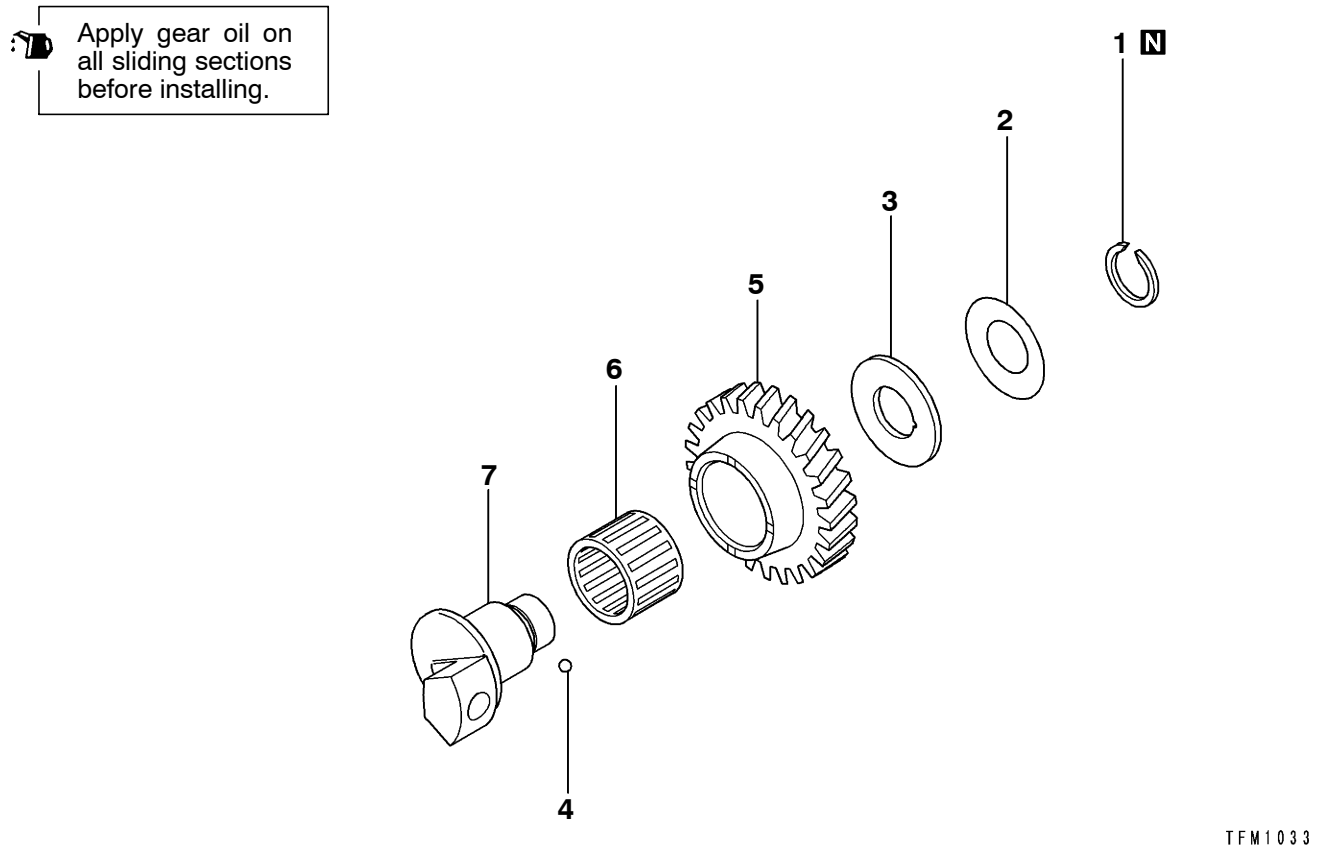


EACH SPEED GEAR

(1) None of the helical gears or clutch gear teeth must be damaged or worn.
(2) The synchronizer cone surface must not be rough, damaged or worn.
(3) The inner diameter and front/back surfaces of the gear must not be damaged or worn.

REVERSE IDLER GEAR

DISASSEMBLY AND REASSEMBLY



Disassembly steps

1. Snap ring
2. Cone spring
3. Thrust washer
4. Steel ball
5. Reverse idler gear
6. Needle roller bearing
7. Reverse idler gear shaft

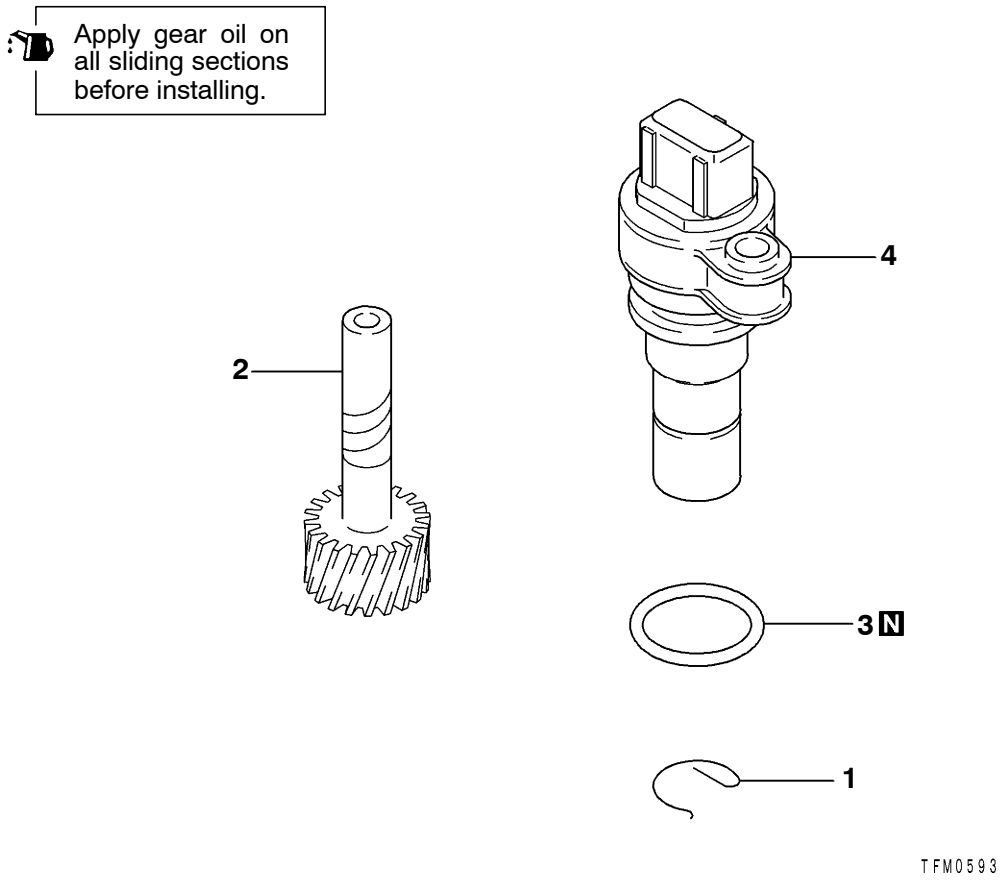
INSPECTION

NEEDLE ROLLER BEARING

(1) When the needle bearing is assembled with the shaft and gear and rotated, the needle bearing must rotate smoothly without play or abnormal noise.
(2) The holder must not be deformed.

SPEEDOMETER GEAR

DISASSEMBLY AND REASSEMBLY

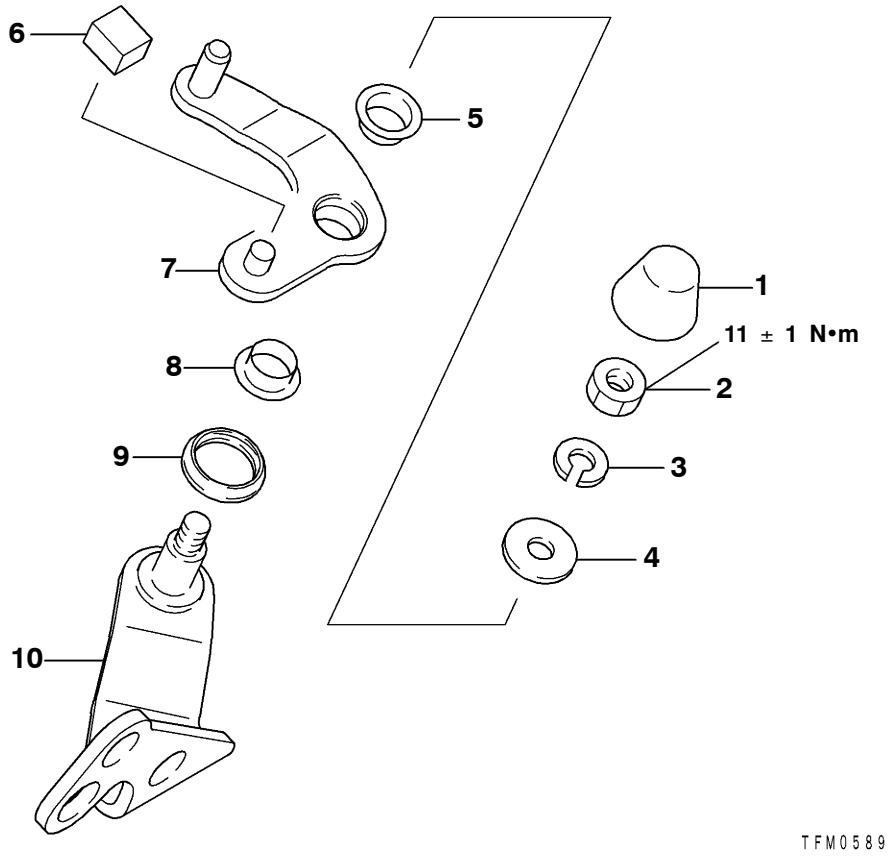


Disassembly steps

1. e-clip
2. Speedometer driven gear
3. O-ring
4. Sleeve

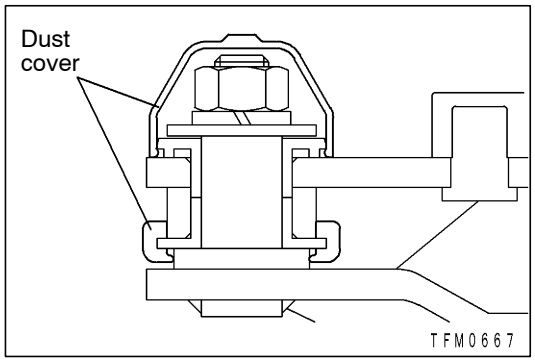
SELECT LEVER

DISASSEMBLY AND REASSEMBLY



Disassembly steps

▶A◀ 1. Dust cover
2. Nut
3. Spring washer
4. Plane washer
5. Select lever bush
6. Select lever shoe
7. Select lever
8. Select lever bush
▶A◀ 9. Dust cover
10. Select lever shaft



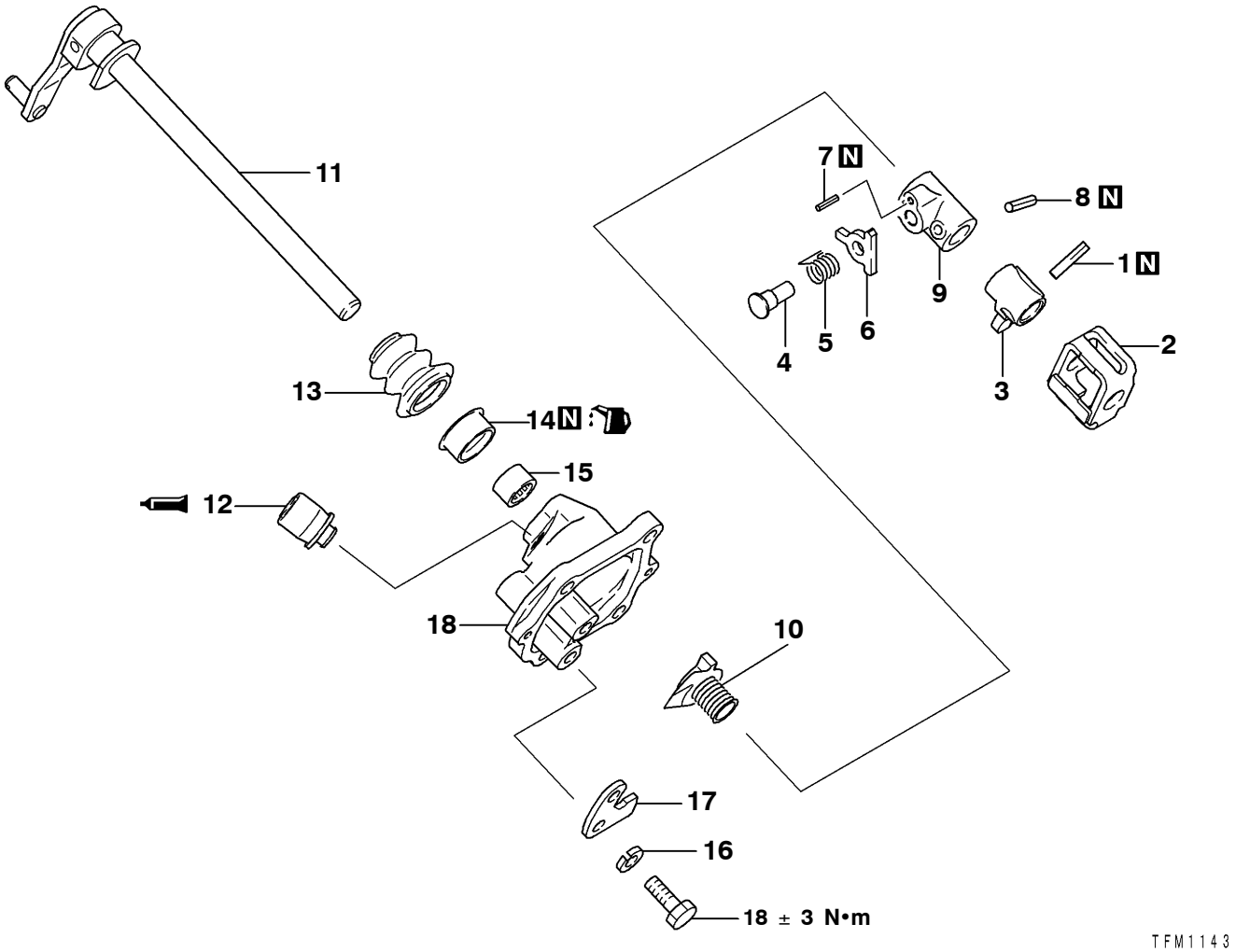
REASSEMBLY SERVICE POINT

▶A◀ DUST COVER INSTALLATION

Install the dust cover onto the select lever.

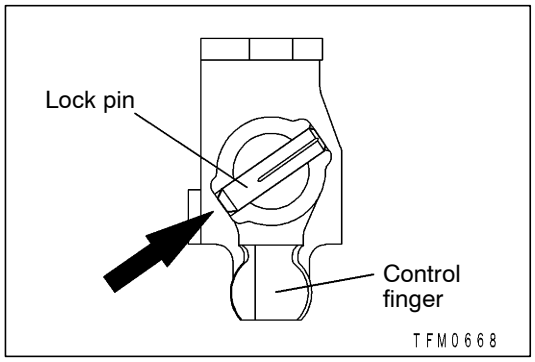
CONTROL HOUSING

DISASSEMBLY AND REASSEMBLY



Disassembly steps

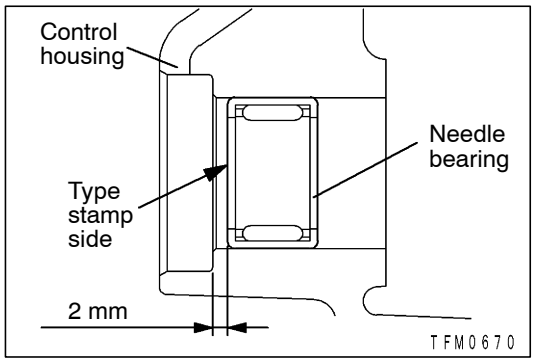
◀A▶ ▶F◀ 1. Lock pin
2. Interlock plate
3. Control finger
4. Pin
5. Return spring
6. Stopper plate
▶E◀ 7. Spring pin
▶D◀ 8. Spring pin
9. Stopper body
10. Neutral return spring
11. Control shaft
▶C◀ 12. Air breather
13. Control shaft boot
▶B◀ 14. Oil seal
▶A◀ 15. Needle bearing
16. Spring washer
17. Stopper bracket
18. Control housing



DISASSEMBLY SERVICE POINT

◀A▶ LOCK PIN REMOVAL

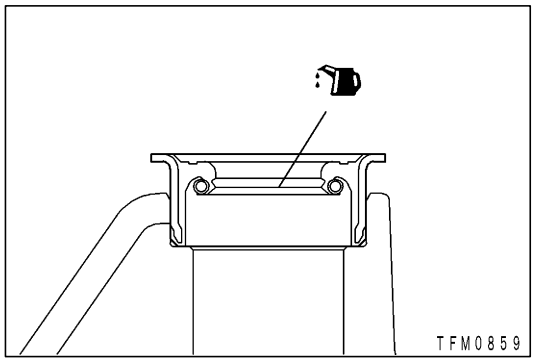
Tap out the lock pin from the direction shown in the illustration.



REASSEMBLY SERVICE POINTS

▶A◀ NEEDLE BEARING INSTALLATION

Press the needle bearing into the dimensions shown in the illustration so that the type stamp side faces the indicated direction.



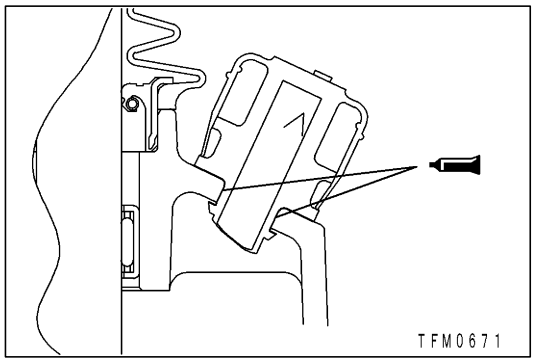
▶B◀ OIL SEAL INSTALLATION

Apply transmission oil on the oil seal lip section.

Transmission oil

Specified oil:

MITSUBISHI genuine "DIA-QUEEN" multi gear oil <75W/85W> or equivalent



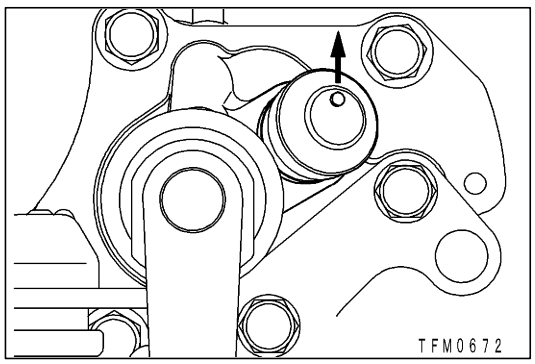
▶C◀ AIR BREATHER INSTALLATION

(1) Apply sealant on the periphery of the insertion section.

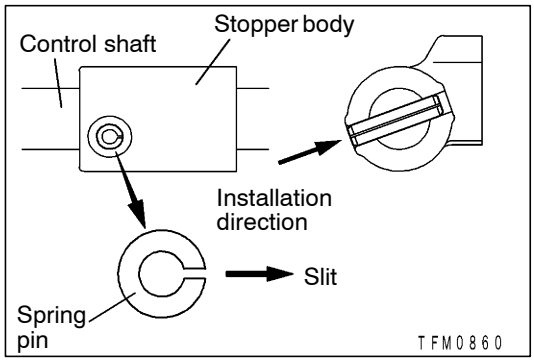
Sealant

Specified sealant:

3M SUPER WEATHERSTRIP No.8001 or equivalent

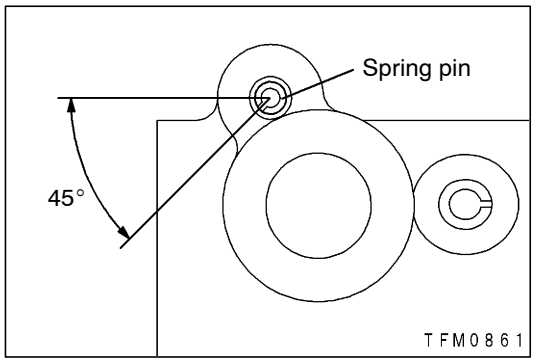


(2) Install so that the protrusion faces the direction shown in the illustration.



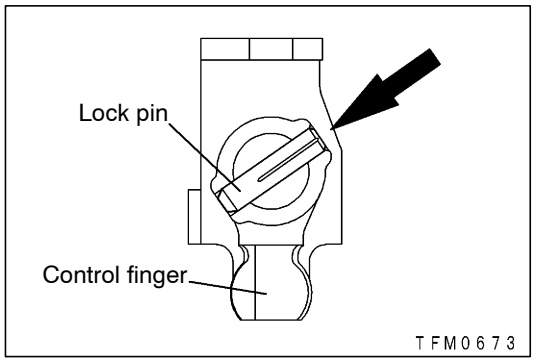
▶D◀ SPRING PIN INSTALLATION

Install the spring pin onto the stopper body from the direction shown in the illustration.



▶E◀ SPRING PIN INSTALLATION

Install the spring pin onto the stopper body.

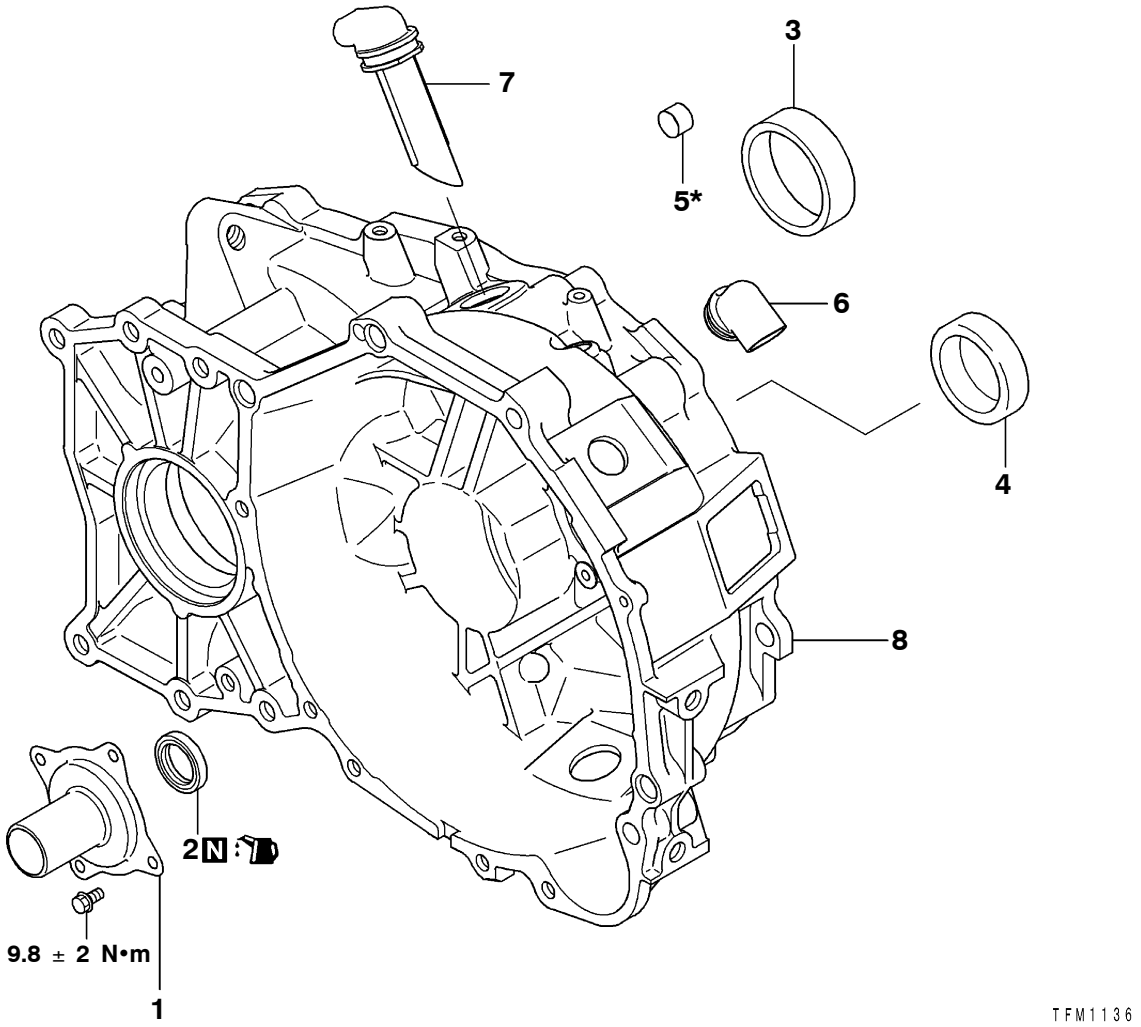


▶F◀ LOCK PIN INSTALLATION

Tap the lock pin into the control finger from the direction shown in the illustration.

CLUTCH HOUSING

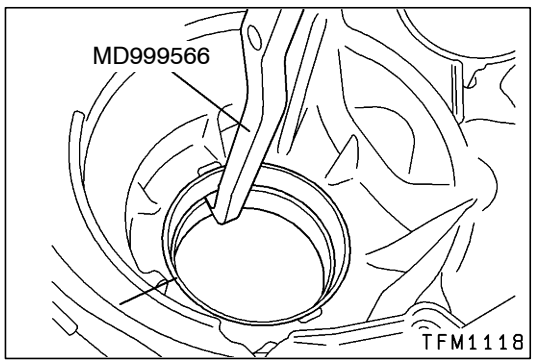
DISASSEMBLY AND REASSEMBLY



Disassembly steps

1. Clutch release bearing retainer
2. Oil seal
3. Outer race
4. Outer race
5. Bush*
6. Cover A
7. Cover B
8. Clutch housing

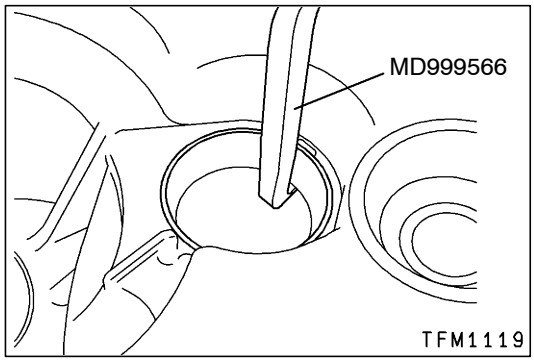
NOTE
*: Refer to the installation procedures only when replacing the clutch housing.



DISASSEMBLY SERVICE POINTS

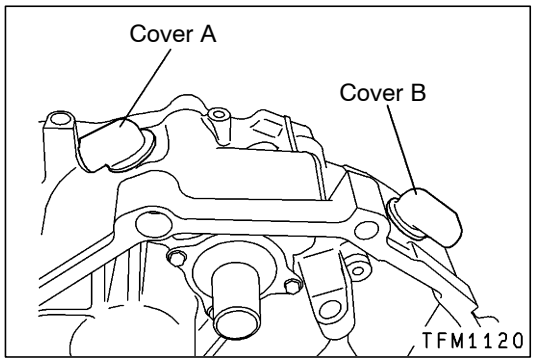
◀A▶ OUTER RACE REMOVAL

Using the special tool, remove the outer race from the clutch housing.



◀B▶ OUTER RACE REMOVAL

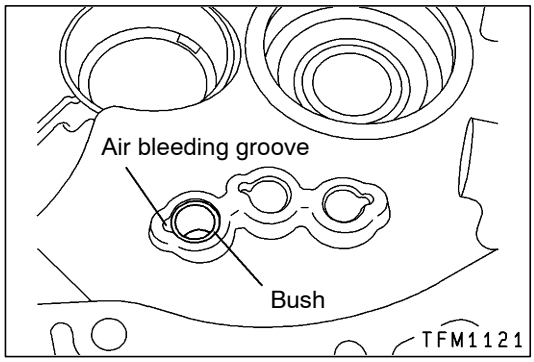
Using the special tool, remove the outer race from the clutch housing.



REASSEMBLY SERVICE POINTS

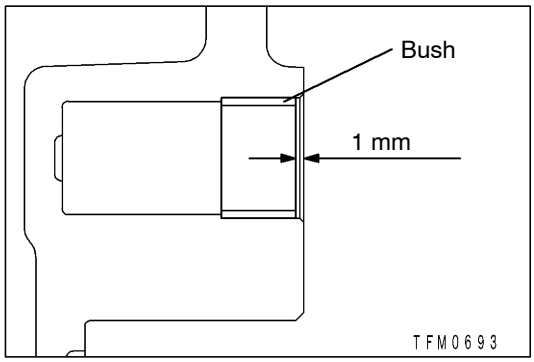
▶A◀ COVER A/COVER B INSTALLATION

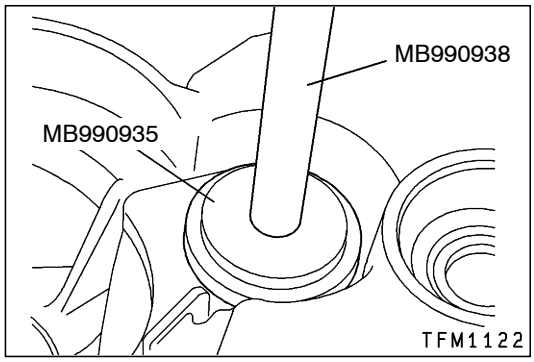
Install each cover onto the clutch housing in the direction shown in the illustration.



▶B◀ BUSH INSTALLATION

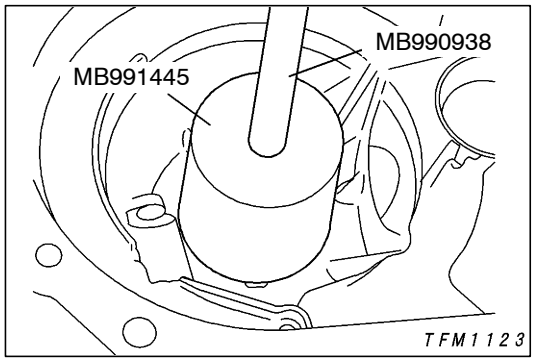
Press the bush into the clutch housing to the position shown in the illustration. Make sure that the split face of the bush does not cover the air bleeding groove on the housing.





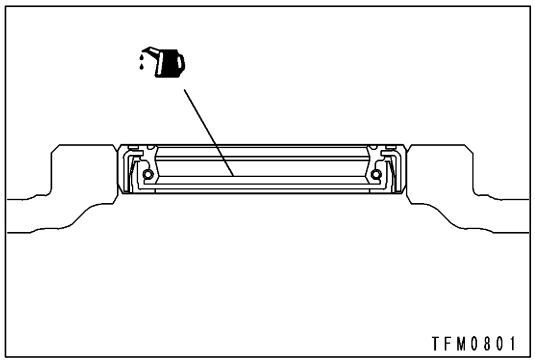
▶C◀ OUTER RACE INSTALLATION

Using the special tool, install the outer race onto the clutch housing.



▶D◀ OUTER RACE INSTALLATION

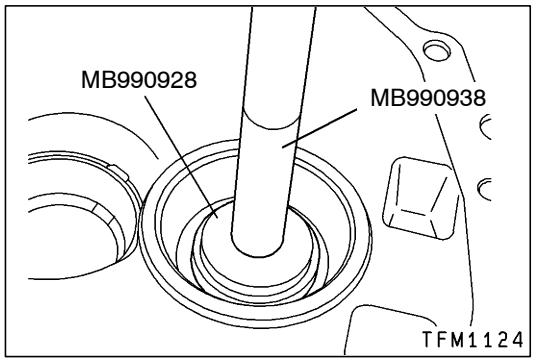
Using the special tool, install the outer race onto the clutch housing.



▶E◀ OIL SEAL INSTALLATION

(1) Apply transmission oil on the oil seal lip section.

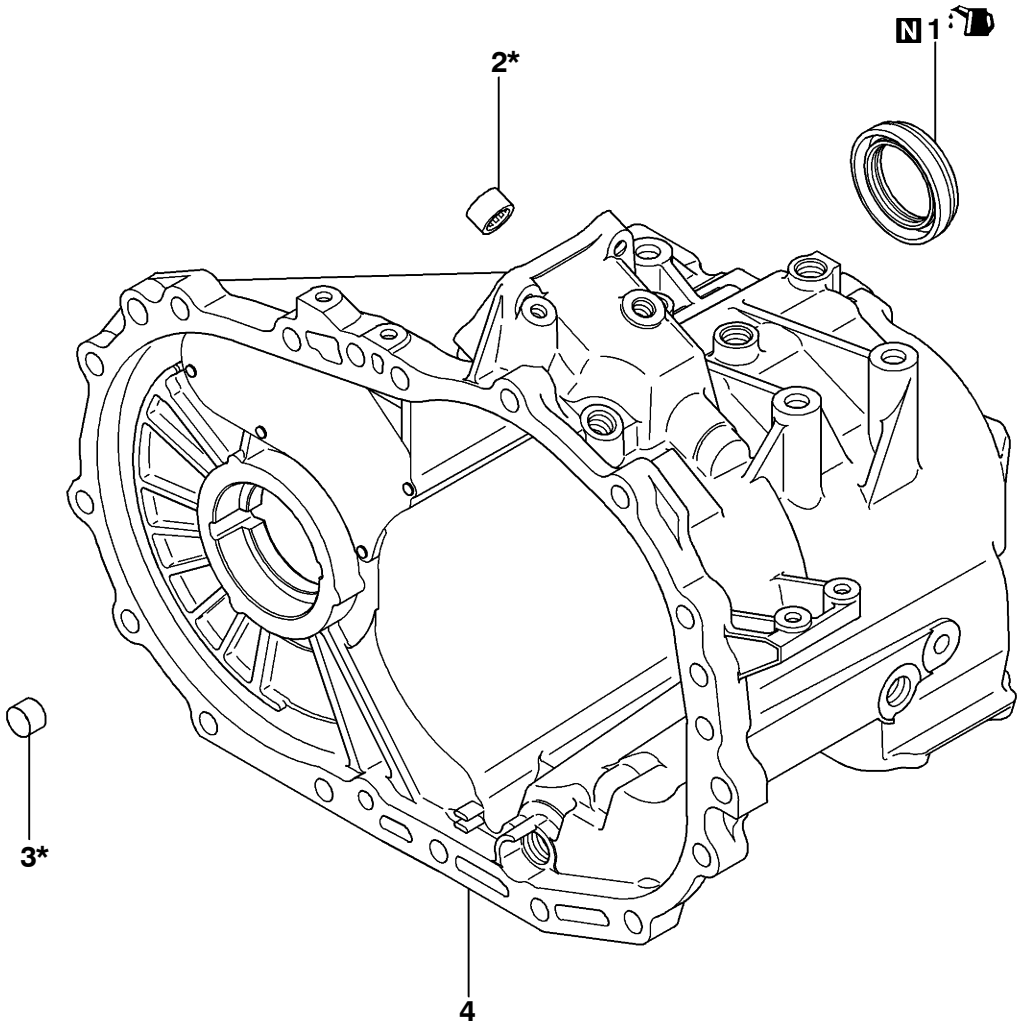
Transmission oil
Specified oil:
MITSUBISHI genuine "DIA-QUEEN" multi gear oil <75W/85W> or equivalent



(2) Using the special tool, install the oil seal onto the clutch housing.

TRANSMISSION CASE

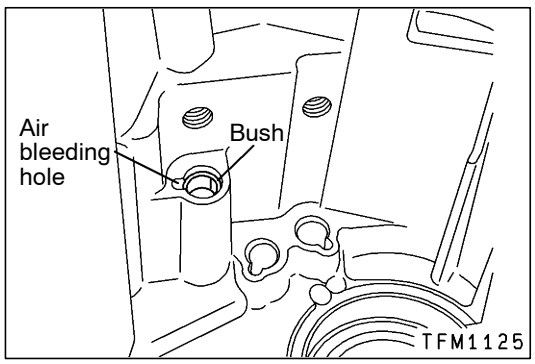
DISASSEMBLY AND REASSEMBLY



Disassembly steps

- ▶C◀ 1. Oil seal
- ▶B◀ 2. Needle bearing*
- ▶A◀ 3. Bush*
- 4. Transmission case

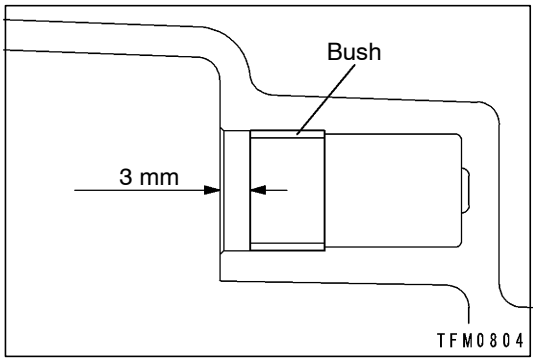
NOTE
*: Refer to the installation procedures only when replacing the transmission case.

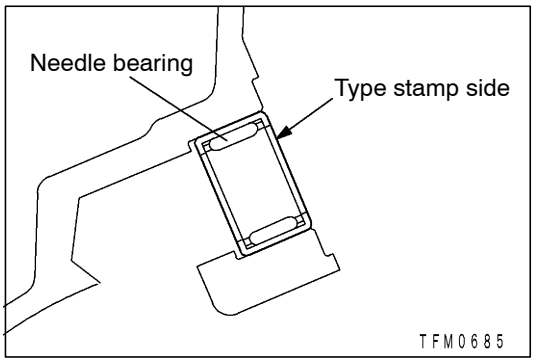


REASSEMBLY SERVICE POINTS

▶A◀ BUSH INSTALLATION

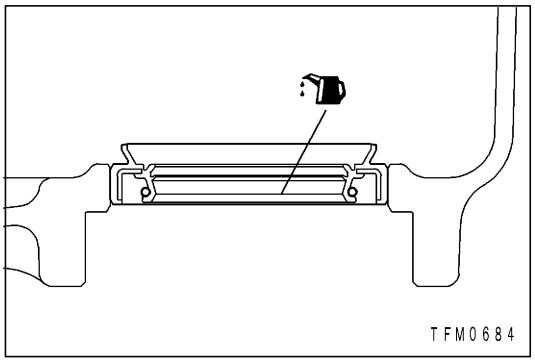
Press in the bush to the position shown in the illustration so that the split face of the bush does not cover the air bleeding groove on the case.





▶B◀ NEEDLE BEARING INSTALLATION

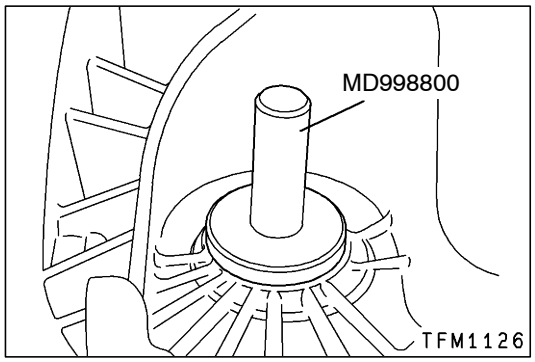
Press in to the flush with the type stamp side facing the direction shown in the illustration.



▶C◀ OIL SEAL INSTALLATION

(1) Apply transmission oil on the oil seal lip section.

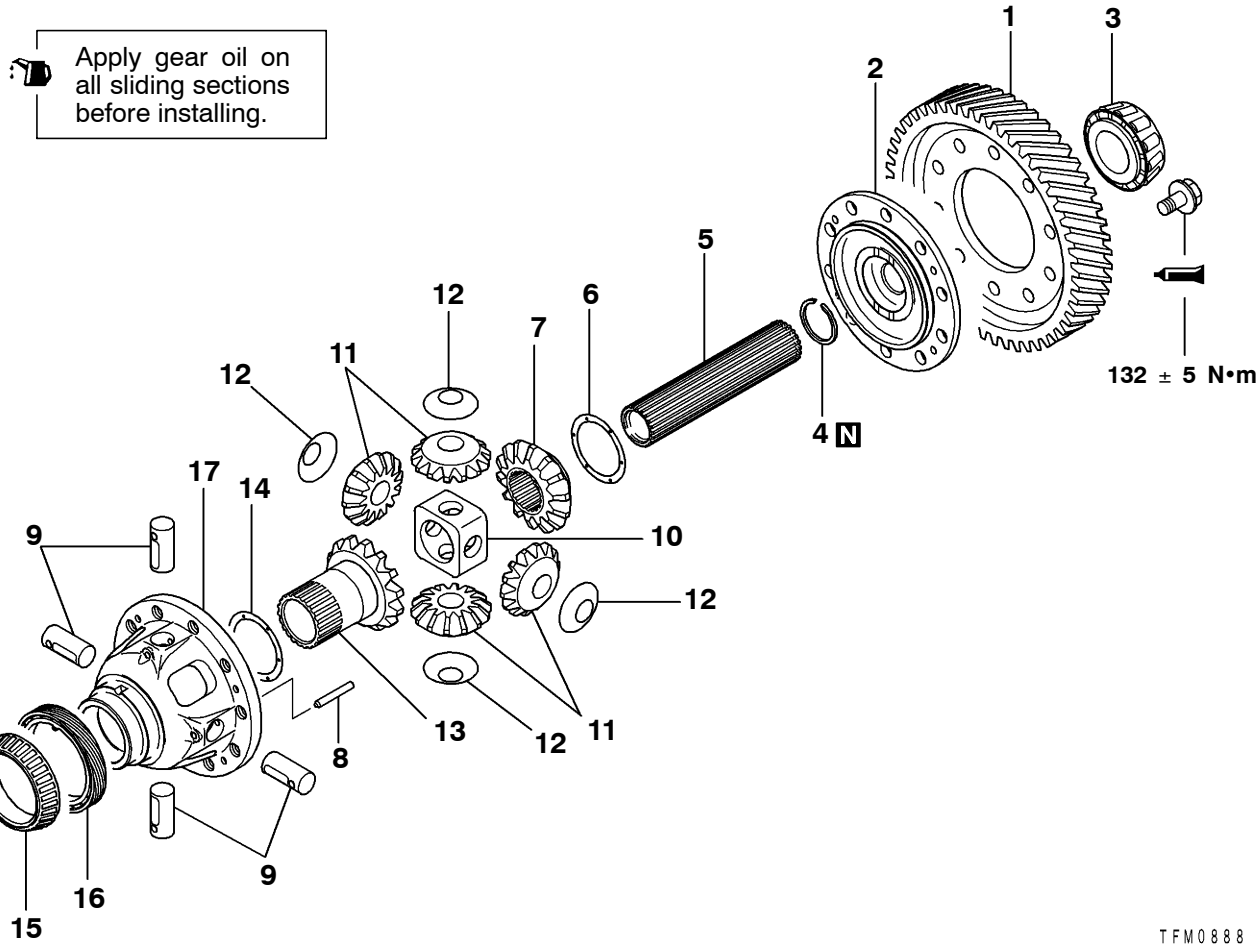
Transmission oil
Specified oil:
MITSUBISHI genuine "DIA-QUEEN" multi gear oil <75W/85W> or equivalent



(2) Using the special tool, install the oil seal onto the transmission case.

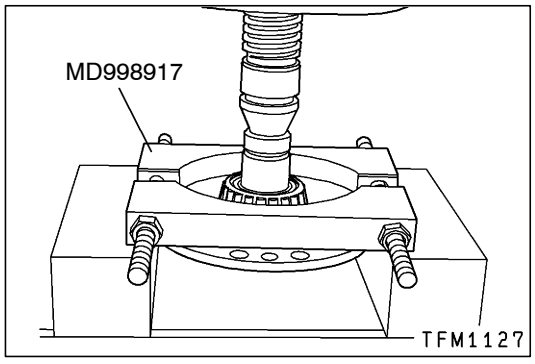
CENTER DIFFERENTIAL

DISASSEMBLY AND REASSEMBLY



Disassembly steps

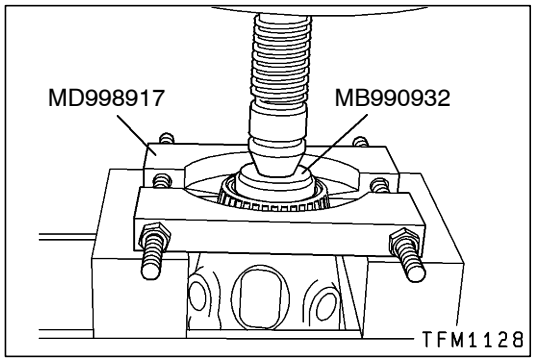
- ▶D◀ 1. Center differential drive gear
- ▶C◀ 2. Center differential flange
- ◀A▶ ▶B◀ 3. Taper roller bearing
- ▶C◀ 4. Snap ring
- ▶C◀ 5. Front output shaft
- ▶C◀ 6. Spacer
- ▶C◀ 7. Side gear
- ▶C◀ 8. Lock pin
- ▶C◀ 9. Pinion shaft
- ▶C◀ 10. Pinion shaft holder
- ▶C◀ 11. Pinion
- ▶C◀ 12. Washer
- ▶C◀ 13. Side gear
- ▶C◀ 14. Spacer
- ◀B▶ ▶A◀ 15. Taper roller bearing
- 16. Speedometer drive gear
- 17. Differential case



DISASSEMBLY SERVICE POINTS

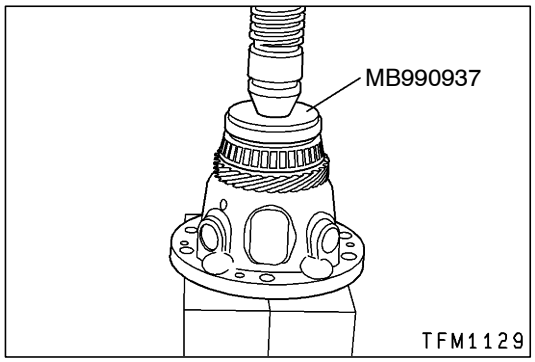
◀A▶ TAPER ROLLER BEARING REMOVAL

Using the special tool, remove the taper roller bearing from the center differential flange.



◀B▶ TAPER ROLLER BEARING REMOVAL

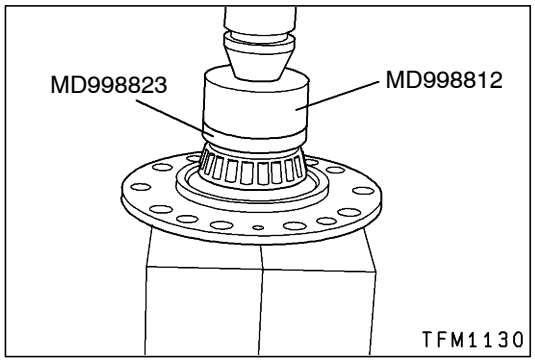
Using the special tool, remove the taper roller bearing from the center differential case.



REASSEMBLY SERVICE POINTS

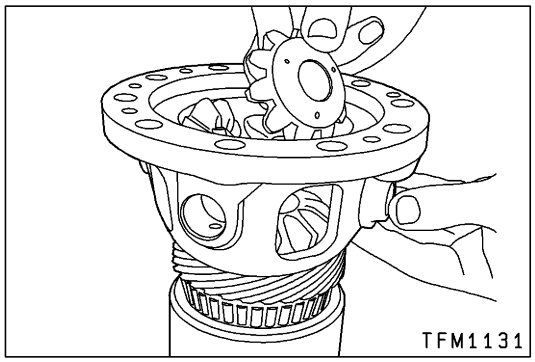
▶A◀ TAPER ROLLER BEARING INSTALLATION

Using the special tool, install the taper roller bearing onto the center differential case.



▶B◀ TAPER ROLLER BEARING INSTALLATION

Using the special tool, install the taper roller bearing onto the center differential flange.

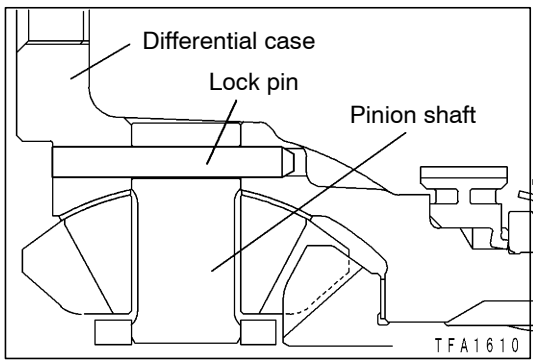


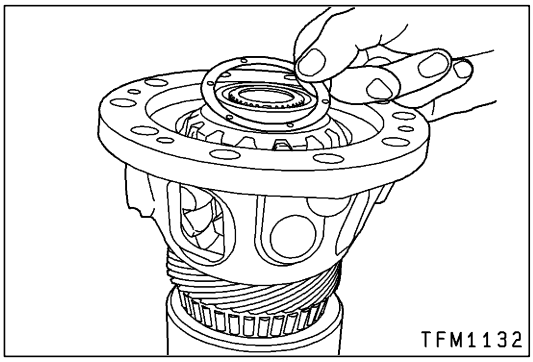
▶C◀ SPACER/SIDE GEAR/WASHER/PINION/PINION SHAFT HOLDER/PINION SHAFT/LOCK PIN/FRONT OUTPUT SHAFT/SNAP RING/CENTER DIFFERENTIAL FLANGE INSTALLATION

(1) After assembling the spacer onto the side gear, install the side gear into the center differential case.

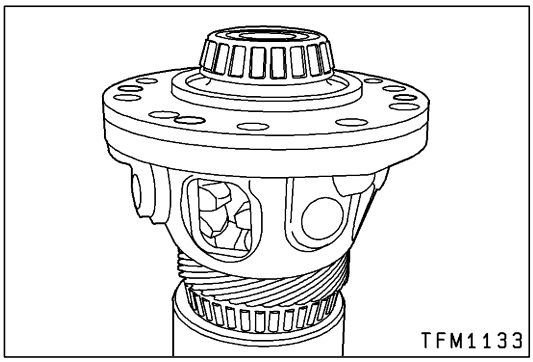
NOTE
When installing a new side gear, assemble a medium thickness (0.8 or 0.9 mm) spacer.

(2) Align the washer on the back of the pinion. Engage the four pieces onto the side gear simultaneously, and rotate to install at the specified position. Then, install the pinion shaft holder.
(3) Insert the pinion shaft into the differential case.
(4) Install the lock pin in the direction shown in the illustration.

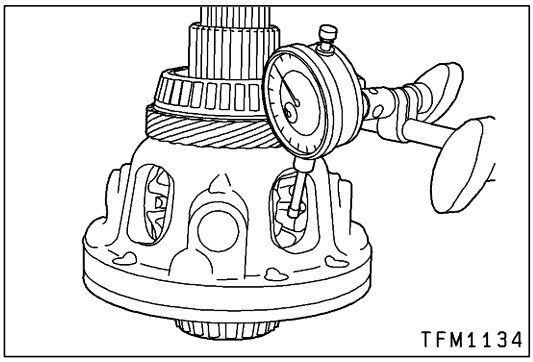




(5) Install the front output shaft onto the side gear, and install the snap ring.
(6) After assembling the side gear into the center differential case, install the spacer onto the side gear.



(7) Match the alignment marks, install the center differential flange, and temporarily fix the machine screw.

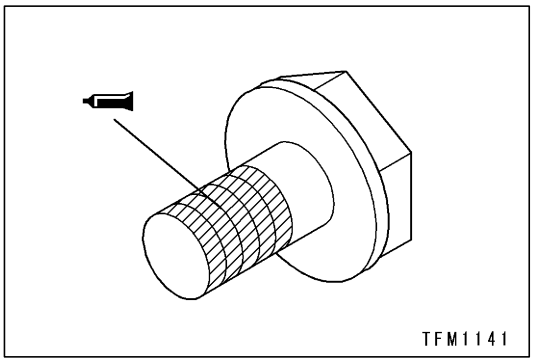


(8) Measure the backlash between the side gear and pinion.

Standard value: 0.025 - 0.150 mm

(9) If the backlash is not within the standard value, select a spacer, and measure the backlash again.

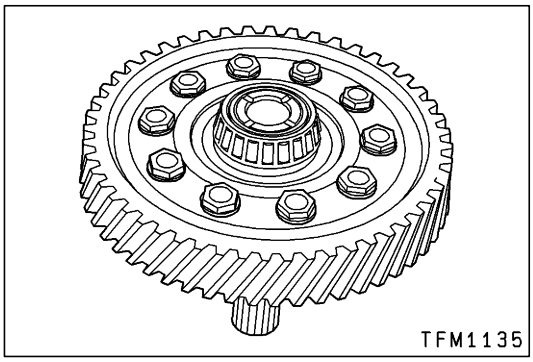
NOTE
Adjust so that the backlash on both sides is even.



▶D◀ CENTER DIFFERENTIAL DRIVE GEAR INSTALLATION

(1) Confirm that rust-proofing oil is applied, and then apply sealant on all of the bolt threads.

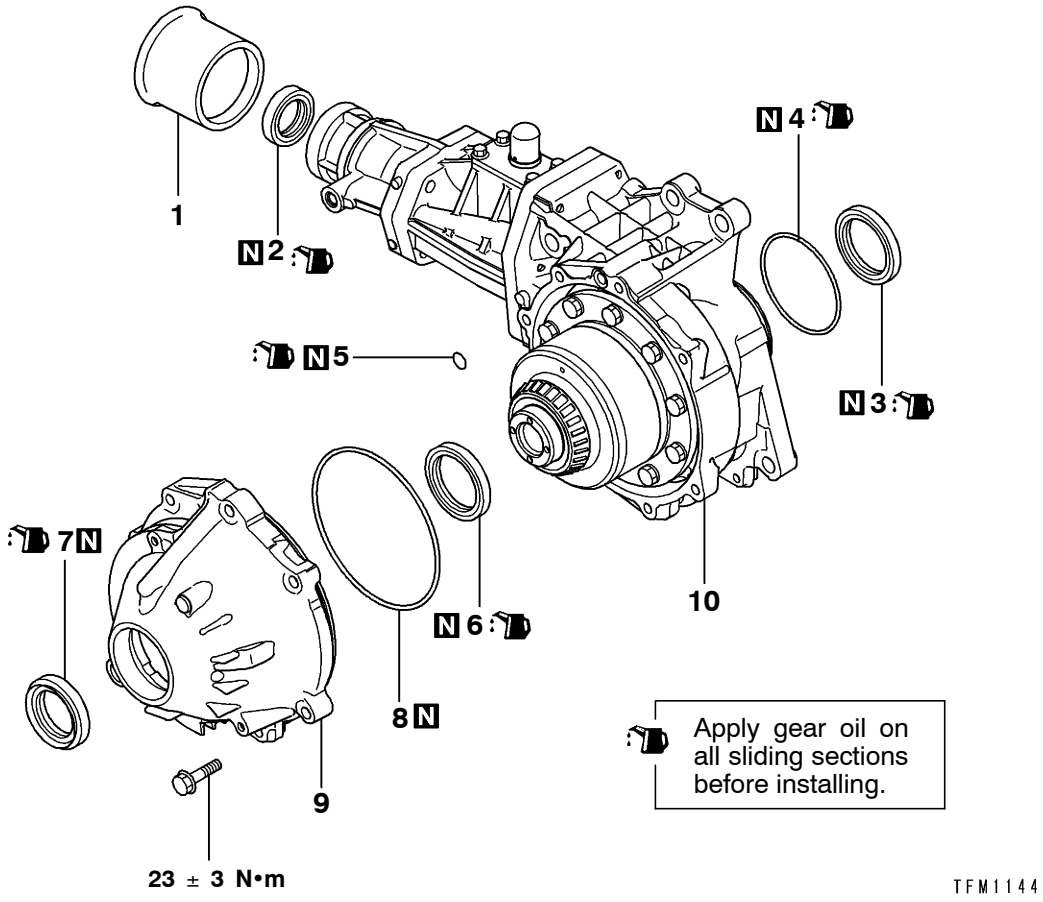
Sealant
Specified sealant:
3M STUD Locking No.4170 or equivalent



(2) Tighten with the specified torque following the order shown in the illustration.

TRANSFER

DISASSEMBLY AND REASSEMBLY



Disassembly steps

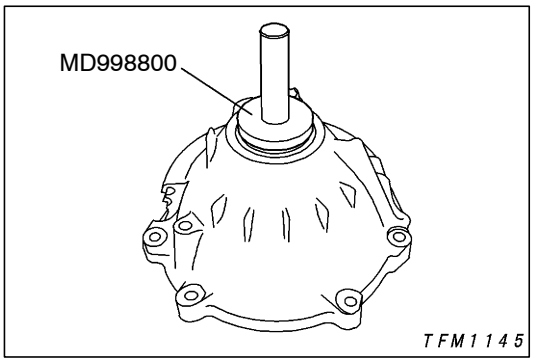
1. Dust seal guard
▶E◀ 2. Oil seal
▶D◀ 3. Oil seal
▶A◀ 4. O-ring
▶A◀ 5. O-ring
▶C◀ 6. Oil seal
▶B◀ 7. Oil seal
▶A◀ 8. O-ring
9. Transfer cover
10. Transfer

REASSEMBLY SERVICE POINTS

▶A◀ O-RING INSTALLATION

Apply hypoid gear oil on the O-ring.

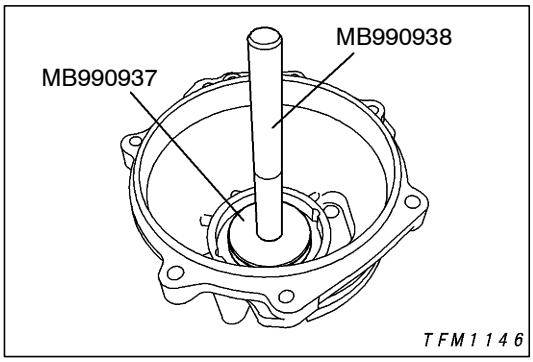
Hypoid gear oil
Specified oil:
MITSUBISHI genuine "DIA-QUEEN SUPER" hypoid gear oil (GL-5) or equivalent



▶B◀ OIL SEAL INSTALLATION

Apply hypoid gear oil on the lip section of the oil seal, and install using the special tool.

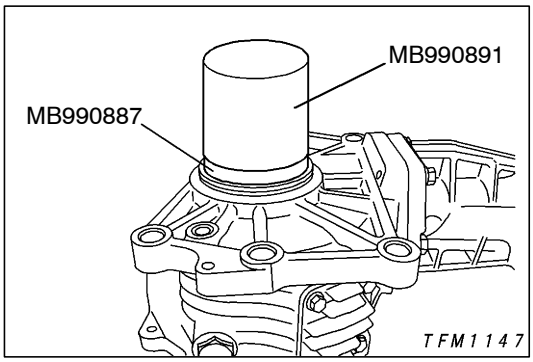
Hypoid gear oil
Specified oil:
MITSUBISHI genuine "DIA-QUEEN SUPER" hypoid gear oil (GL-5) or equivalent



▶C◀ OIL SEAL INSTALLATION

Apply hypoid gear oil on the lip section of the oil seal, and install using the special tool.

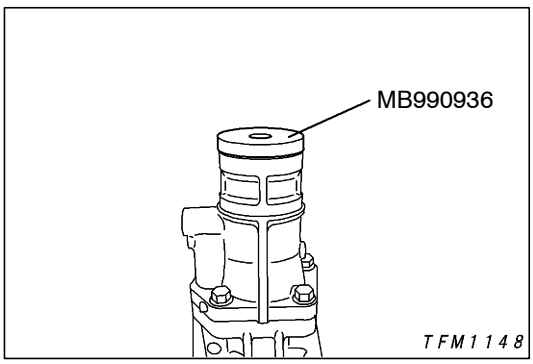
Hypoid gear oil
Specified oil:
MITSUBISHI genuine "DIA-QUEEN SUPER" hypoid gear oil (GL-5) or equivalent



▶D◀ OIL SEAL INSTALLATION

Apply hypoid gear oil on the lip section of the oil seal, and install using the special tool.

Hypoid gear oil
Specified oil:
MITSUBISHI genuine "DIA-QUEEN SUPER" hypoid gear oil (GL-5) or equivalent



▶E◀ OIL SEAL INSTALLATION

Apply hypoid gear oil on the lip section of the oil seal, and install using the special tool.

Hypoid gear oil
Specified oil:
MITSUBISHI genuine "DIA-QUEEN SUPER" hypoid gear oil (GL-5) or equivalent