AUTOMATIC TRANSMISSION

Click on the applicable bookmark to selected the required model year

AUTOMATIC TRANSMISSION

CONTENTS

23109000217

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

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 (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: impact sensors SRS-diagnosis unit, 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 INFORMATION

23100010141

Items		Vehicles with 4G63 engine	Vehicles with 4D56 engine
Transmission model		R4AW2-6	V4AW2-6
Type		4-speed full automatic	4-speed full automatic
Gear ratio	1st	2.826	2.826
	2nd	1.493	1.493
	3rd	1.000	1.000
	4th	0.730	0.688
	Reverse	2.703	2.703
Transfer type		–	2-speed
Gear ratio	High	–	1.000
	Low	–	1.925
Speedometer gear ratio (driven/drive)		22/6	25/8

SERVICE SPECIFICATIONS

23100030130

Items			Standard value
Distance between inner cable stopper and end of outer cable <4G63> mm			0 – 1
Distance between inner cable stopper and end of outer cable <4D56> mm			34 – 35
Lock-up solenoid valve coil resistance (at 20°C) Ω			Approx. 13
Stall speed r/min		4G63	2,100 – 2,400
		4D56	2,300 – 2,600
Governor pressure kPa		1,000 r/min	137 – 166
		2,000 r/min	245 – 284
		3,200 r/min	402 – 460
Line pressure kPa	At idle speed	D range	480 – 558
		R range	735 – 852
	At stall speed	D range	1,019 – 1,195
		R range	1,519 – 1,911
Operation temperature of engine coolant temperature switch °C	On (continuity)		50 ± 3
	Off (no continuity)		43
Clearance between shift lever guide and steering column mm			2.4 – 3.6

LUBRICANTS

23100040119

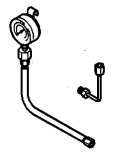
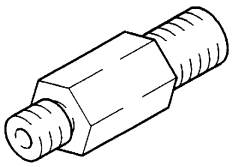
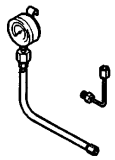
Items	Specified lubricants	Quantity ℓ
Transmission fluid	DEXRON-II or equivalent	R4AW2: Approx. 6.8 V4AW2: Approx. 7.2
Transfer oil	Hypoid gear oil SAE 75W-90, 75W-85W or 80W confirming to API GL-4	2.3
O-ring for oil filler pipe	DEXRON-II or equivalent	As required

SEALANTS

Items	Specified sealant	Remarks
Automatic transmission fluid temperature switch	3M ATD Part No.8660 or equivalent	Semi-drying sealant
Transfer control lever gasket and spring cover support	3M ATD Part No.8661 or equivalent	Semi-drying sealant
Engine coolant temperature switch	3M Nut Locking Part No.4171 or equivalent	Drying sealant

SPECIAL TOOLS

23100060139

Tool	Number	Name	Use
	MD998330 (includes MD998331)	Oil pressure gauge (2,942 kPa)	Measurement of oil pressure
	MD998920	Adapter	Connection of oil pressure gauge
	MD999563 (includes MD998331)	Oil pressure gauge (980 kPa)	Measurement of oil pressure

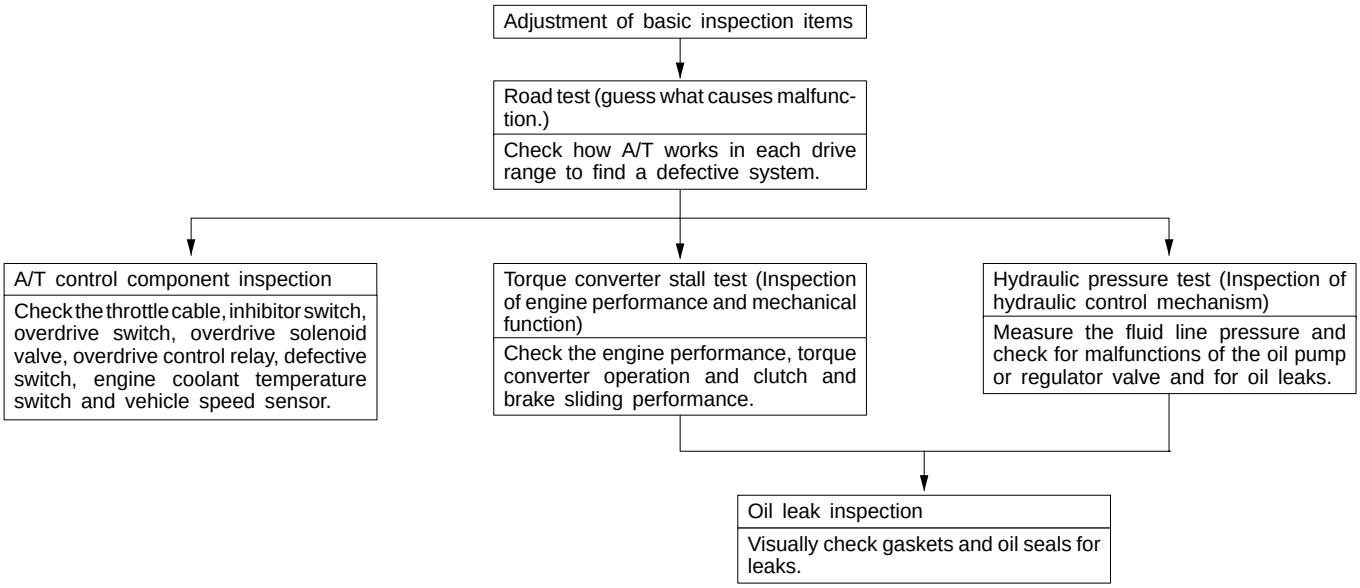
TROUBLESHOOTING

23100760152

STANDARD FLOW OF DIAGNOSIS TROUBLESHOOTING

Automatic transmission malfunctions may be caused by the following conditions.
(1) Improper maintenance and adjustment
(2) Shift control system malfunction
(3) Mechanical malfunctions
(4) Hydraulic malfunctions
(5) Poor engine performance

Troubleshooting in the event of any such malfunctions should begin by checking fluid level, ATF condition, manual linkage adjustment, throttle control cable adjustment and other conditions whose deviation from standards can be readily known. Then, road test shall be performed to determine whether or not the problem has been corrected or more diagnosis is necessary. If the problem still persists after these tests and corrections, hydraulic tests should be performed for further troubleshooting.



ROAD TEST

23100780158

Prior to performing road test, be sure to make basic checks including check and adjustment of fluid level and condition and adjustment of the throttle cable. For road test, the transfer must be placed in the 2H (2WD-high) position. In road test, various changes such as slips in transmission and shifting conditions are checked and the transmission operation at each shift position must have been checked.

D RANGE TEST

TEST 1

Start with throttle valve opened (50 % and full), and check upshift from 1-speed → 2-speed, 2-speed → 3-speed and 3-speed → 4-speed. Check that shifting points match shift pattern.

- OK → TEST 2
- NG

Does the upshift from 1-speed to 2-speed occur?

- No →
  - 1 – 2 shift valve malfunction
  - Governor malfunction
- Yes

Does the upshift from 2-speed to 3-speed occur?

- No →
  - 2 – 3 shift valve malfunction
  - Governor malfunction
- Yes

Does the upshift from 3-speed to 4-speed occur? (with throttle valve opening under 85%)

- No →
  - 3 – 4 shift valve malfunction
  - Governor malfunction
  - Overdrive switch or overdrive solenoid malfunction
  - Overdrive control relay malfunction
  - Engine coolant temperature switch malfunction <4G6>
- Yes

Check the shifting points.

- Incorrect →
  - Line pressure malfunction
  - Governor malfunction
  - Incorrect throttle cable adjustment
- Correct

Carry out the TEST 1 again.

TEST 2

Kickdown traveling at 2-speed, 3-speed and 4-speed. Check that possible kickdown vehicle speed limit at 2-speed → 1-speed, 3-speed → 1-speed, 3-speed → 2-speed, or 4-speed → 1-speed, 4-speed → 2-speed, 4-speed → 3-speed conforms with the shift pattern.

- OK → TEST 3
- NG

Does the downshift occur?

- No →
  - Shift valves malfunction
  - Governor malfunction
  - Overdrive switch or overdrive solenoid malfunction
  - Overdrive control relay malfunction
  - Detection switch malfunction
- Yes

Check the shifting point.

- Incorrect →
  - Line pressure malfunction
  - Governor malfunction
  - Detent regulator valve malfunction
- Correct

Carry out TEST 2 again.

TEST 3

When traveling in 3-speed or 4-speed, release accelerator pedal and shift to L. Check that 3-speed → 2-speed or 4-speed → 3-speed takes place immediately and 2-speed → 1-speed downshift conforms with shift pattern.

- OK → TEST 4
- NG

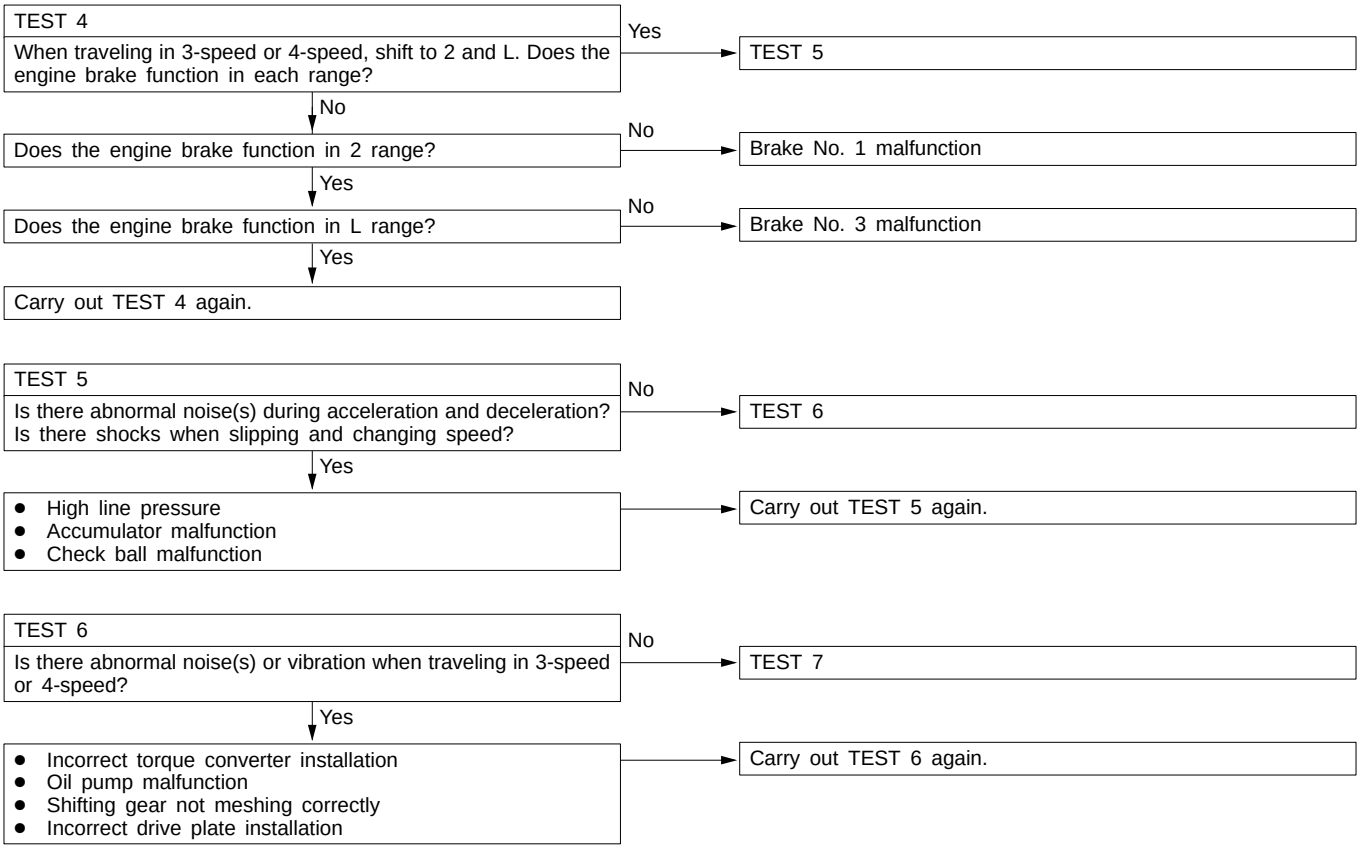
Does the downshift from 2-speed to 1-speed occur?

- No →
  - 1 – 2 shift valve malfunction
  - Governor malfunction
- Yes

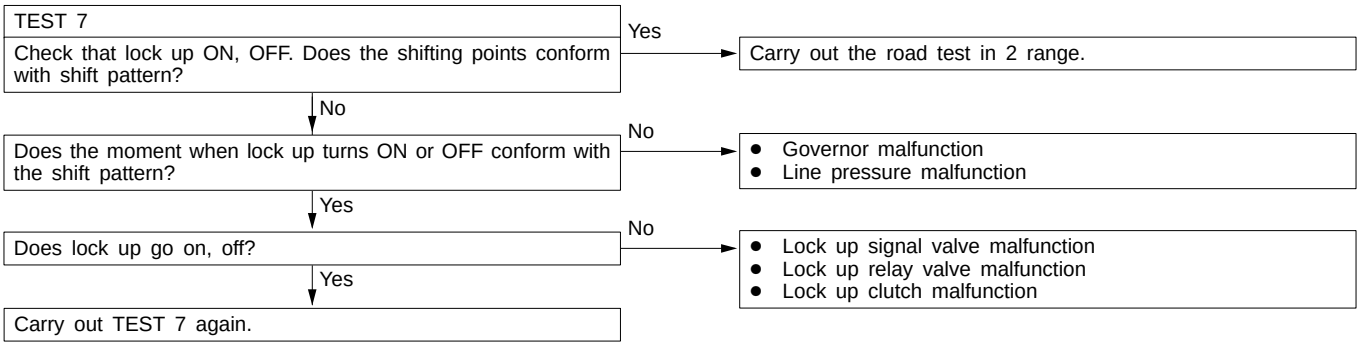
Check the Shifting point.

- Incorrect →
  - Incorrect throttle cable adjustment
  - Governor malfunction
  - Line pressure malfunction
  - Low coast modulator valve malfunction
- Correct

Carry out TEST 3 again.



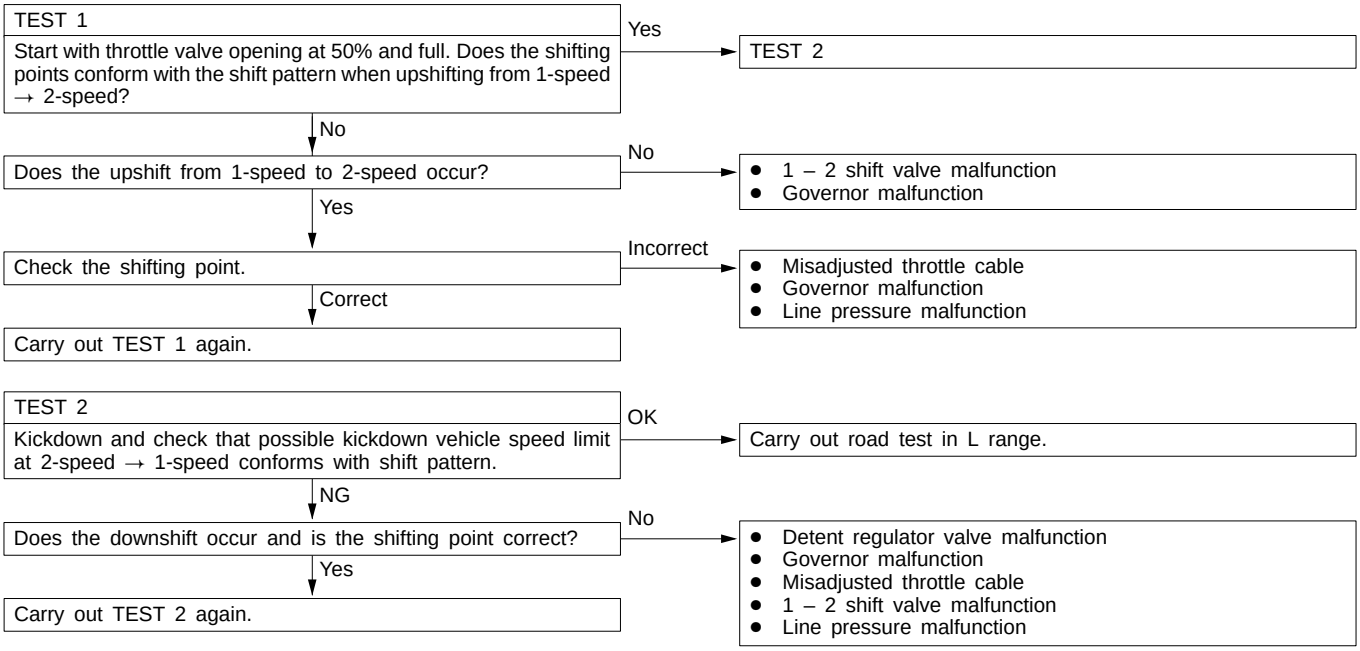
NOTE
Abnormal noises and vibrations are often caused by an unbalanced propeller shaft, differential, tyre, torque converter, engine, etc. Extremely thorough inspection is therefore required.



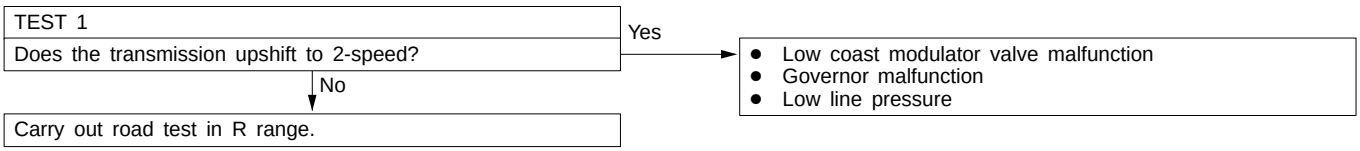
NOTE
(1) Determine the moment when lock up turns ON by decreased engine r/min or by a slight shock back and forth.
(2) Determine the moment when lock up turns OFF by increased engine r/min.
(3) Check lock up condition by pumping the accelerator slightly. If engine r/min rises in accordance with throttle valve opening size, determine that the lock up is OFF, if not, determine it ON.

(When lock up is OFF, drive power is transferred through the fluid in the torque converter and therefore, when the accelerator pedal is depressed, slipping occurs inside the torque converter with a resulting large increase in engine r/min.)

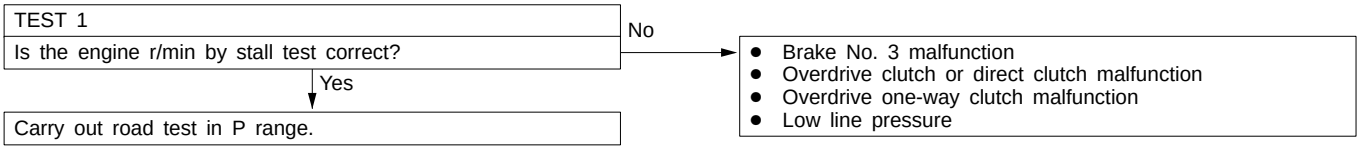
2 RANGE TEST



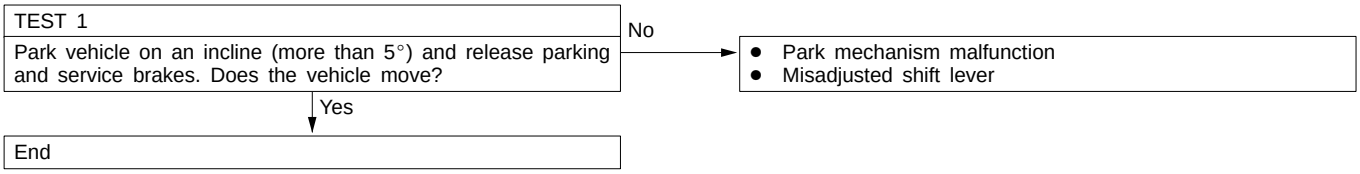
L RANGE TEST



R RANGE TEST

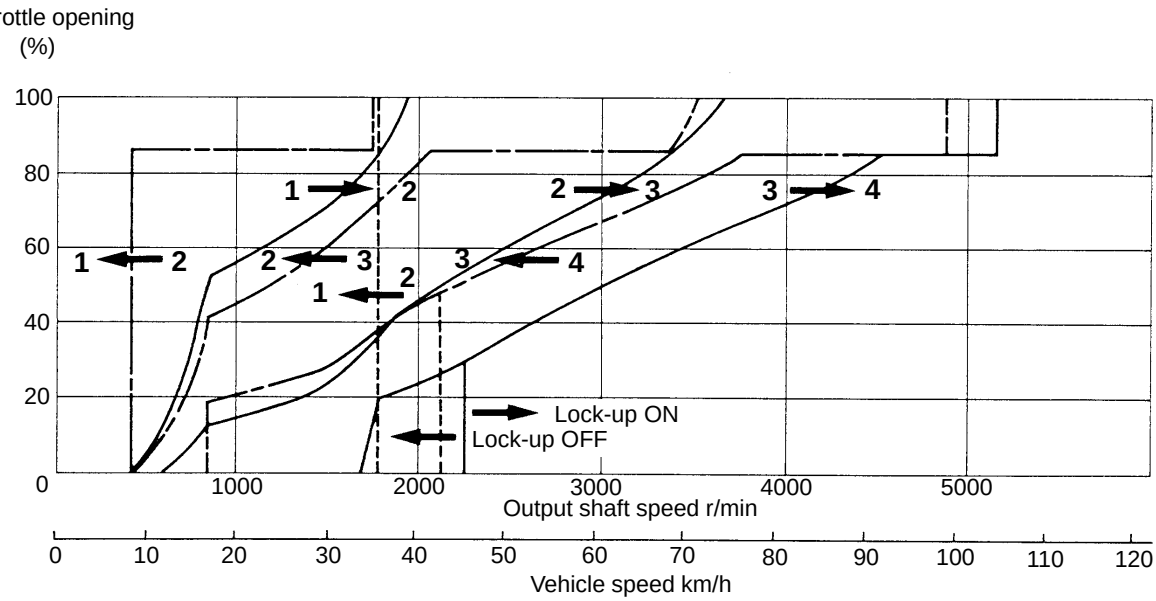


P RANGE TEST



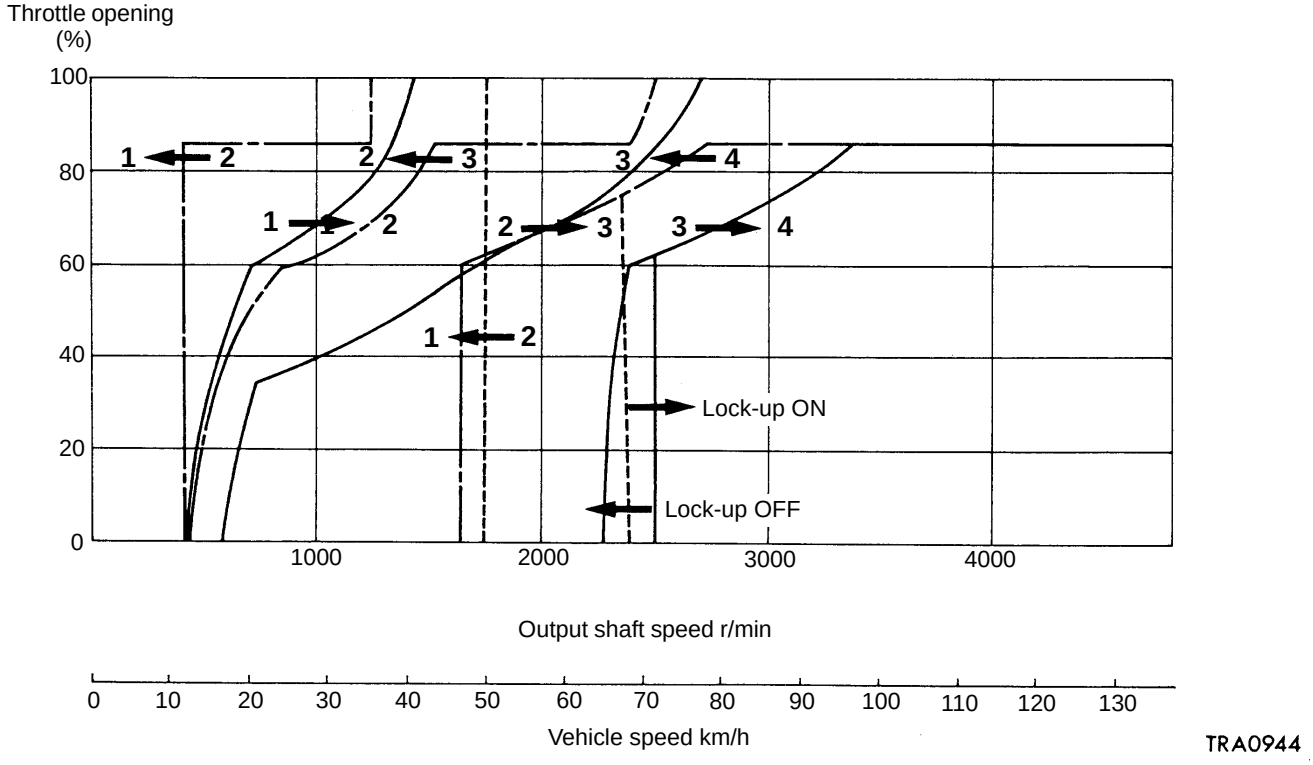
SHIFT PATTERN

<4G63 engine>



TRA0943

<4D56 engine>

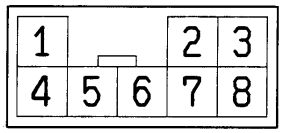


TRA0944

CHECK AT OVERDRIVE CONTROL RELAY

23101130013

Terminal Voltage Reference Table



Overdrive control relay connector

TRA0956

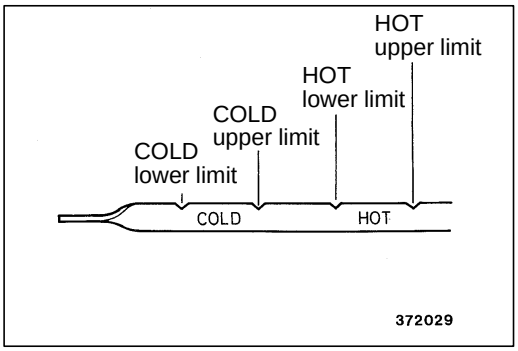
Inspection terminal	Inspection item	Check requirement		Standard value
2	Overdrive switch	Ignition switch: ON	Overdrive switch: OFF	System voltage
			Overdrive switch: ON	0 V
3	Ignition switch	Ignition switch: OFF		0 V
		Ignition switch: ON		System voltage
4	Detection switch	Run the vehicle	Throttle valve: constant opening (under 85 %)	System voltage
			Throttle valve: Full opening	0 V
5	Overdrive solenoid valve	Run the vehicle at 50 km/h Overdrive switch: ON	Throttle valve: constant opening (under 85 %)	0 V
			Throttle valve: Full opening	11 V or more
6	Earth	Always		0 V
7	Engine coolant temperature switch	Ignition switch: ON	30°C or lower	System voltage
			60°C or higher	0 V
8	Vehicle speed sensor	Ignition switch: ON Move the vehicle slowly forward		0 V ↔ 5 V (Changes repeatedly)

ON-VEHICLE SERVICE

23100090121

AUTOMATIC TRANSMISSION FLUID CHECK

1. Place the vehicle on a level surface.
2. Before removing the dipstick, wipe all dirt from area around the dipstick.
3. With the selector lever in the “P” position and the parking brake applied, start the engine.
4. The engine should be running at idle and the transmission should be warmed up sufficiently. (fluid temperature 70 – 80°C)
5. Move the selector lever through all positions to fill the torque converter and hydraulic circuit with fluid. Then place the lever in the “N” position.

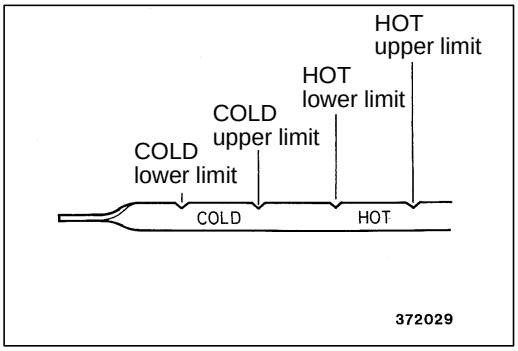


6. Check that fluid level is at oil level gauge “HOT”. If fluid level is low, add fluid to “HOT” level.

   Transmission fluid: DEXRON-II or equivalent

   NOTE
   Low fluid level can allow the oil pump to take in air together with fluid, leading to various troubles. Air trapped in hydraulic circuit forms bubbles which make the fluid spongy. This lowers pressure and shows down pressure buildup. If the transmission has too much fluid, gears churn up foam and cause same conditions as when the fluid level is low, resulting in premature deterioration of ATF. In either case, air bubbles can cause overheating and fluid oxidation and varnishing, which can interfere with normal valve, clutch and servo operation. Foaming can also result in fluid escaping from the transmission vent where it may be mistaken for a fluid leak.
7. Check fluid condition.

   NOTE
   When fluid smells burned, it is contaminated with metal bushing or friction material particles and hence a complete overhaul of the transmission is needed. Be sure to examine fluid on the dipstick closely.
8. After fluid has been checked, insert the dipstick until it is seated fully to seal out water and dirt.

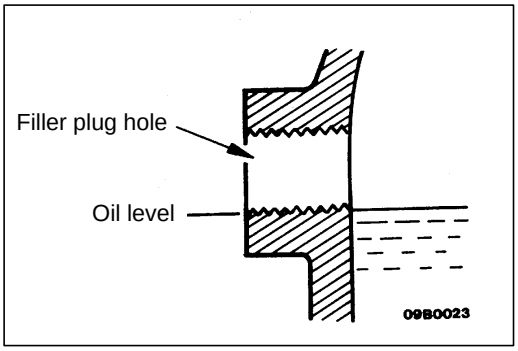


AUTOMATIC TRANSMISSION FLUID CHANGE

23100100145

Caution
If ATF change is required due to damage to the transmission, be sure to clean the cooler system.

(1) Raise the vehicle on hoist. Place a drain container with large opening under the drain plug (located in bottom of the oil pan).
(2) Remove the drain plug to let ATF drain.
(3) Install the drain plug and new gasket and tighten to 20 Nm.
(4) Refill ATF through the oil level gauge hole until its level reached at COLD lower limit of the level gauge.
(5) Start the engine and allow to idle for at least two minutes. Then, with the parking brake and service brake applied, move the selector lever through all positions and finally place in the “N” or “P” position.
(6) After the transmission is warmed up to the normal operating temperature, recheck the fluid level, which must be between the HOT upper limit and HOT lower limit marks.
(7) Insert the dipstick fully to prevent dirt from entering the transmission.

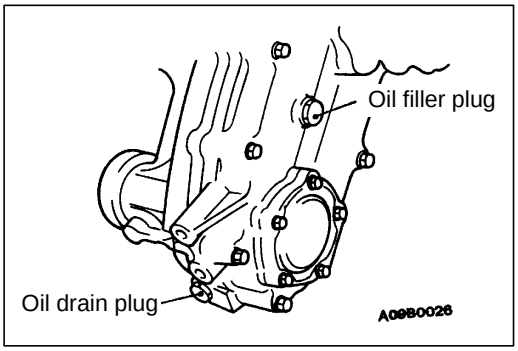


TRANSFER OIL LEVEL CHECK

23100110063

Inspect each component for evidence of leakage, and check the oil level by removing the filler plug. If the oil is contaminated, it is necessary to replace it with new oil.

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



TRANSFER OIL REPLACEMENT

23100120066

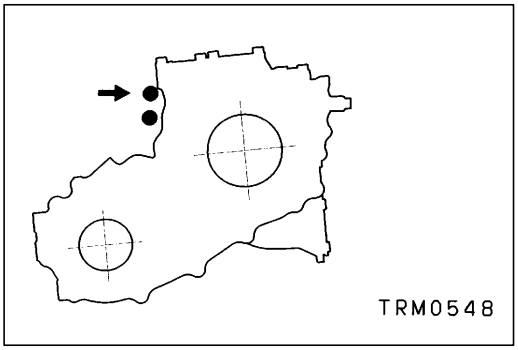
1. Remove the oil filler plug and oil drain plug.
2. Drain oil.
3. Tighten the oil drain plug to the specified torque.

   Specified torque: 33 Nm
4. Fill with specified oil till the level comes to the lower portion of the oil filler plug hole.

   Specified transmission oil:
   Hypoid gear oil SAE 75W-90, 75W-85W or 80W conforming to API GL-4

   Quantity: 2.3 ℓ
5. Tighten the oil filler plug to the specified torque.

   Specified torque: 33 Nm

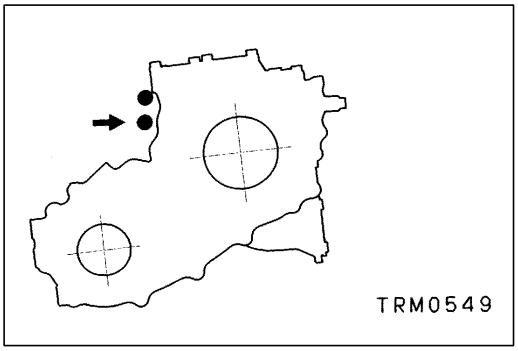


4WD DETECTION SWITCH CONTINUITY CHECK <4WD>

23101110017

Check the continuity between terminals of the black connector indicated in the illustration.

Transfer lever position	Terminal No.	
	1	2
2H		
4H	○	○

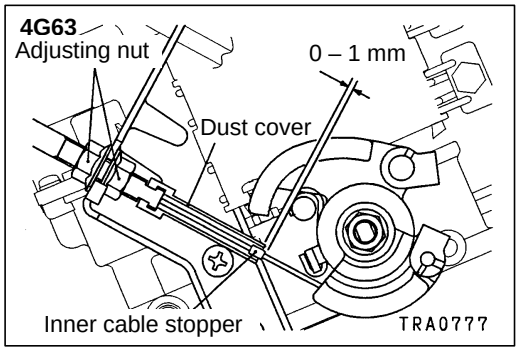


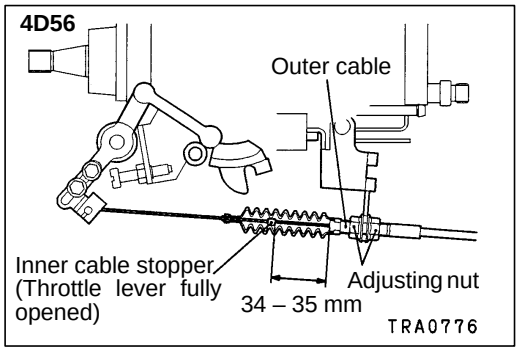
HIGH/LOW DETECTION SWITCH CONTINUITY CHECK <4WD>

23100330025

Check the continuity between terminals of the gray connector indicated in the illustration.

Transfer lever position	Terminal No.	
	1	2
4H	○	○
4L	○	○
4H – 4L		





THROTTLE CABLE CHECK AND ADJUSTMENT

23100280047

<4G63>

(1) Check the throttle lever and the bracket for deformation.
(2) Measure the distance between the inner cable stopper and the end of the dust cover when the throttle lever is fully opened.

Standard value: 0 – 1 mm

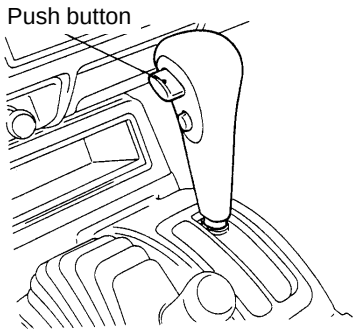
(3) If the distance is not within the standard value, turn the adjusting nut.

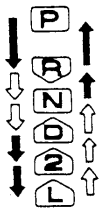
<4D56>

(1) Check throttle lever for defective or bent and the throttle cable bracket for deformation.
(2) Remove the outer cable side of the boot to expose the inner cable stopper.
(3) Pull the throttle lever fully open and measure the distance between the inner cable stopper and the end of the outer cable.

Standard value: 34 – 35 mm

(4) If the distance is not within the standard value, turn the adjusting nut.





09A0048

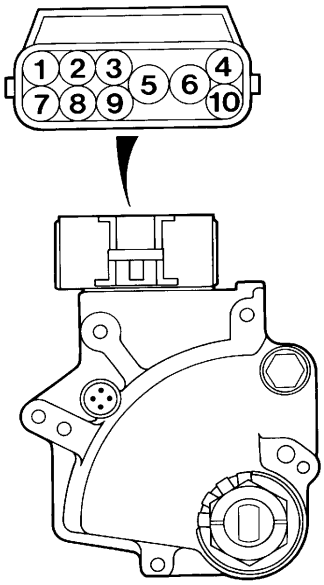
⇦ Button not pressed
⬅ Button pressed

00004942

SELECTOR LEVER OPERATION CHECK

23100130038

1. Shift selector lever to each range and check that lever moves smoothly and is controlled. Check the position indicator is correct.
2. Check the selector lever can be moved to each position (by button operation as shown in the illustration).
3. Start the engine and check if the vehicle moves forward when the selector lever is moved from N or D, and moves backward when moved to R.
4. When the shift lever malfunctions, adjust control cable and selector lever sleeve. Check the shift lever assembly sliding parts for worn.

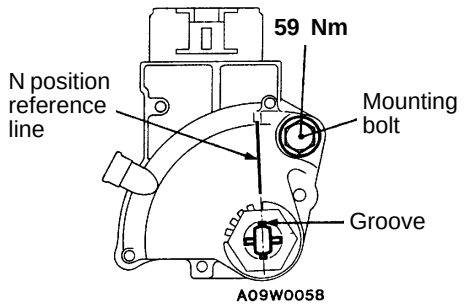


TRA0812

INHIBITOR SWITCH CONTINUITY CHECK

23100140208

Position	Terminal No.									
	1	2	3	4	5	6	7	8	9	10
P	○				○	○				○
R	○								○	
N	○				○	○	○			
D	○							○		
2	○		○							
L	○	○								

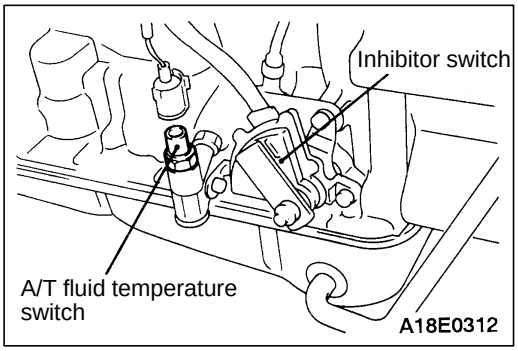


A09W0058

INHIBITOR SWITCH AND CONTROL CABLE ADJUSTMENT

23100150126

1. Shift the manual control lever to the N position.
2. Loosen the inhibitor switch mounting bolt.
3. Turn the inhibitor switch to align the N position reference line on the inhibitor switch with the groove.
4. Tighten the mounting bolt to the specified torque.

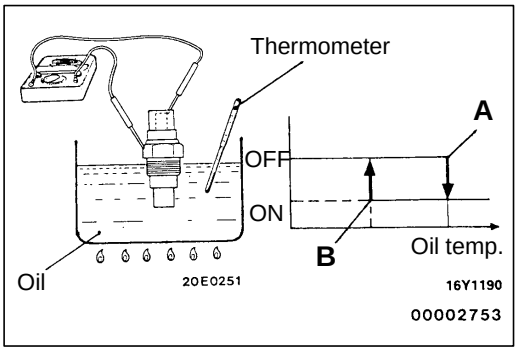


AUTOMATIC TRANSMISSION FLUID TEMPERATURE SWITCH CHECK

23100350038

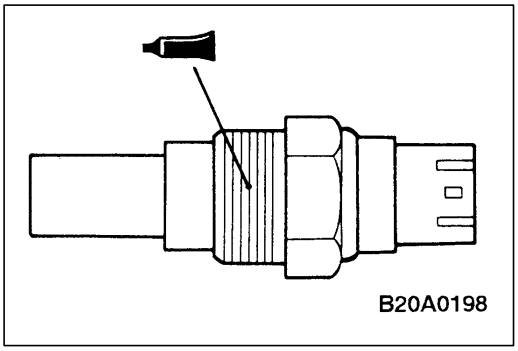
1. Remove the automatic transmission fluid temperature switch from the transmission.

Caution
Use care to prevent foreign materials from entering the automatic transmission fluid temperature switch mounting hole.



2. Immerse the automatic transmission fluid temperature switch in fluid up to the threaded portion as shown in the illustration.
3. Use a circuit tester or similar tool to check the continuity. The switch can be judged to be good if the conditions are within the following ranges

Item	Temperature
Continuity (temperature at point A)	143 – 151 °C
No continuity (temperature at point B)	125 °C or less



4. Apply a small amount of specified sealant to thread of the automatic transmission fluid temperature switch.

Specified sealant:
3M ATD Part No.8660 or equivalent

5. Install the automatic transmission fluid temperature switch.

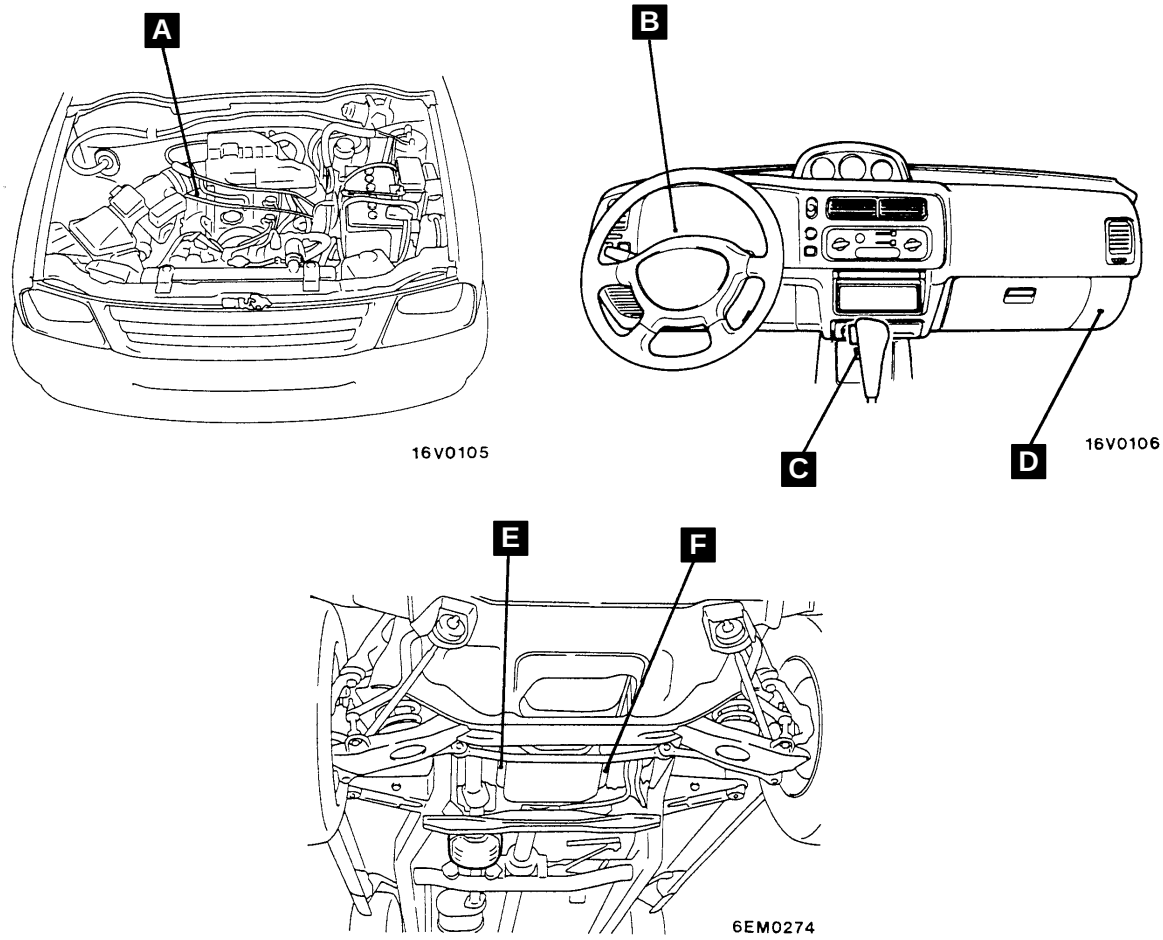
Tightening torque: 30 Nm

6. Check the quantity of the automatic transmission fluid.

A/T CONTROL COMPONENT LOCATION

23100860128

Name	Symbol	Name	Symbol
Detection switch	E	Overdrive solenoid valve	F
Engine coolant temperature switch <4G6>	A	Overdrive switch	C
Inhibitor switch	E	Vehicle speed sensor	B
Overdrive control relay	D	–	–

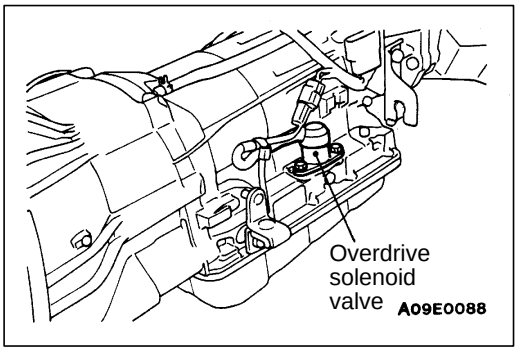


TRA0947

A/T CONTROL COMPONENT CHECK 23100140222

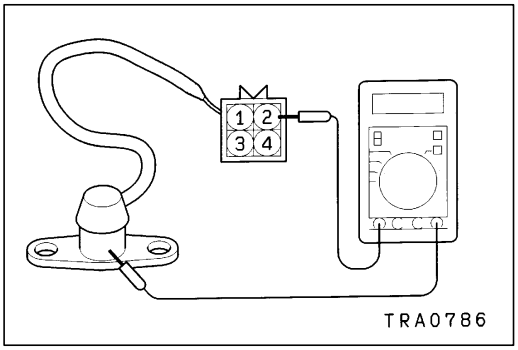
INHIBITOR SWITCH CHECK

Refer to P.23-14.



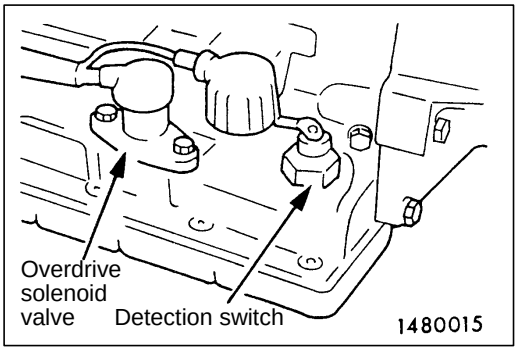
OVERDRIVE SOLENOID VALVE CHECK 23101120010

1. Disconnect the overdrive solenoid valve connector.



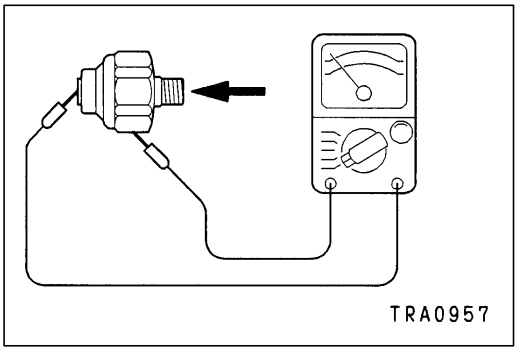
2. Measure the resistance between terminal (2) of the overdrive solenoid valve connector and the body earth.

   Standard value: Approx. 13 Ω
3. If the resistance is not within the standard value, replace the overdrive solenoid valve.



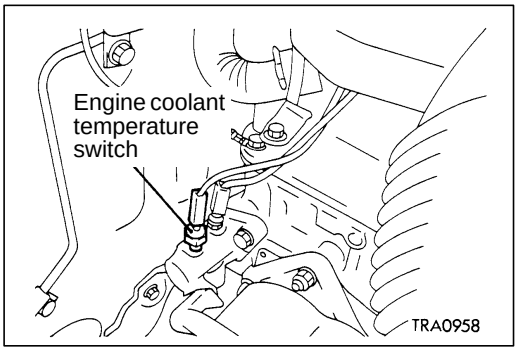
DETECTION SWITCH CHECK 23101140016

1. Remove the detection switch from the transmission case.



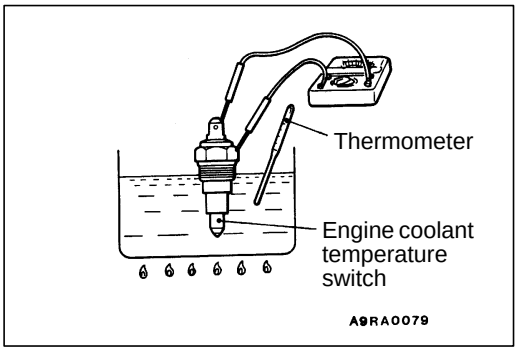
2. While blowing the low-compressed air into the switch, check the continuity between terminal and switch body.

Item	Continuity
Pressure not applied	No continuity (Infinite resistance)
Pressure applied	Continuity (0 Ω)



ENGINE COOLANT TEMPERATURE SWITCH 23101020020

1. Disconnect the engine coolant temperature switch connector.



2. Immerse the sensing portion of switch in hot water and check the continuity between the switch connector terminal and the switch body.

   Standard value:

Item	Temperature
On (continuity)	50 ± 3°C
Off (no continuity)	43°C

3. Replace the engine coolant temperature switch if necessary.
4. Apply the specified sealant to the threaded portion and tighten to the specified torque.

   Specified sealant:
   3M Nut Locking Part No.4171 or equivalent

   Tightening torque: 7.4 Nm

VEHICLE SPEED SENSOR CHECK 23100460137

Refer to GROUP 54 – On-vehicle Service.

OVERDRIVE SWITCH CHECK 23100380143

Refer to P.23-26.

CONVERTER STALL TEST

23100540138

In this test, the engine maximum speed when the torque converter stalls with the shift lever in the "D" or "R" range is measured to check operation of the torque converter, starter and one-way clutch and check holding performance of the transmission clutch (including brake).

Caution
Do not stand in front or at rear of the vehicle during this test.

(1) Check the transmission fluid level. The fluid temperature should be at the level after normal operation (70 – 80°C). The engine coolant temperature should also be at the level after normal operation (80 – 90°C).
(2) Apply chocks to the rear wheels (right and left).
(3) Mount an engine tachometer.
(4) Apply fully the parking and service brakes.
(5) Start the engine.
(6) With the selector lever in the "D" range, fully depress the accelerator pedal and read off the engine maximum speed.

Standard value:
2,100 – 2,400 r/min <4G63>
2,300 – 2,600 r/min <4D56>

NOTE
When doing so, do not keep the engine running with throttle full open for more than 5 seconds. If two or more stall tests are needed, place the selector lever in the "N" position and run the engine at about 1,000 r/min to allow the transmission fluid to cool before another stall test.

(7) Place the selector lever in the "R" range and perform the test as above.

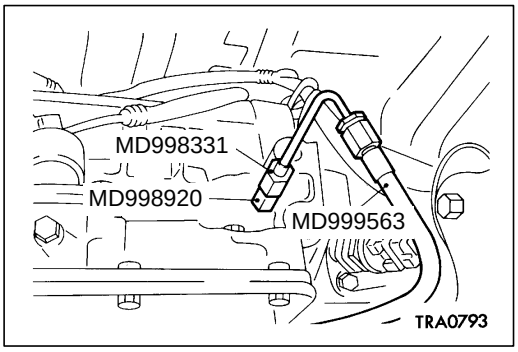
JUDGEMENT OF STALL TEST RESULTS

Stall speed in "D" and "R" range is equal to each other but lower than the nominal value.	(1) Engine output is low. (2) Starter one-way clutch is faulty. (Faulty torque converter is suspected if it is lower than nominal by more than 600 r/min)
Stall speed in "D" range is higher than nominal.	(1) Overdrive clutch slipping (2) Overdrive one-way clutch faulty (3) Forward clutch slipping (4) One-way clutch No. 2 faulty (5) Low line pressure
Stall speed in "R" range is higher than nominal.	(1) Overdrive clutch slipping (2) Overdrive one-way clutch faulty (3) Direct clutch slipping (4) Brake No. 3 slipping (5) Low line pressure

HYDRAULIC PRESSURE TEST

23100550131

The hydraulic pressure tests (governor pressure and line pressure tests) are important in determining the causes of transmission failures. Before conducting these tests, fluid level and condition and throttle cable adjustment, etc. must be checked for defects or abnormalities. When conducting the tests, the engine and transmission should be at correct operating temperatures, (engine coolant 80 – 90°C, transmission fluid 70 – 80°C.)



GOVERNOR PRESSURE TEST

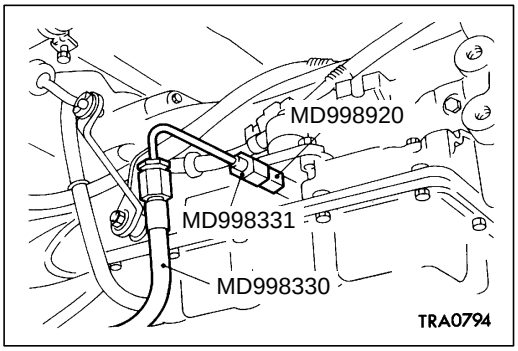
(1) Place vehicle on a chassis dynamometer.
(2) Remove plug from governor pressure take off port.
(3) Install special tool as shown in figure and place the meter inside vehicles.
(4) Apply parking brake.
(5) Start engine.
(6) Release parking brakes.
(7) Shift to D and measure governor pressure at each output shaft r/min.

Standard value:

Output shaft speed r/min	Governor pressure kPa
1,000	137 – 166
2,000	245 – 284
3,200	402 – 460

JUDGEMENT BY GOVERNOR PRESSURE

Governor pressure is not within the standard value	● Line pressure malfunction ● Oil leak in governor circuit ● Governor malfunction



LINE PRESSURE TEST

(1) Place the vehicle on a chassis dynamometer.
(2) Remove the plug from the line pressure take off port.
(3) Install special tool as shown in the figure and place the meter inside vehicle.
(4) Apply the parking brake.
(5) Start the engine.
(6) Place the selector lever in the “D” range.
(7) Depress the brake pedal firmly by the left foot and operate the accelerator pedal by the right foot to measure the line pressure at each engine r/min. If the measured pressure is not nominal, check adjustment of the throttle cable and readjust if necessary before conducting the test again.
(8) Place the selector lever in the “R” range and test as above. When measuring the hydraulic pressure for reverse, change the oil-pressure gauge to 3,000 kPa.

Standard value:

Items		Line pressure kPa	
		“D” range	“R” range
At idle	4G63	480 – 558	735 – 852
	4D56	441 – 500	608 – 686
At stall	4G63	1019 – 1195	1519 – 1911
	4D56	1098 – 1294	1470 – 1863

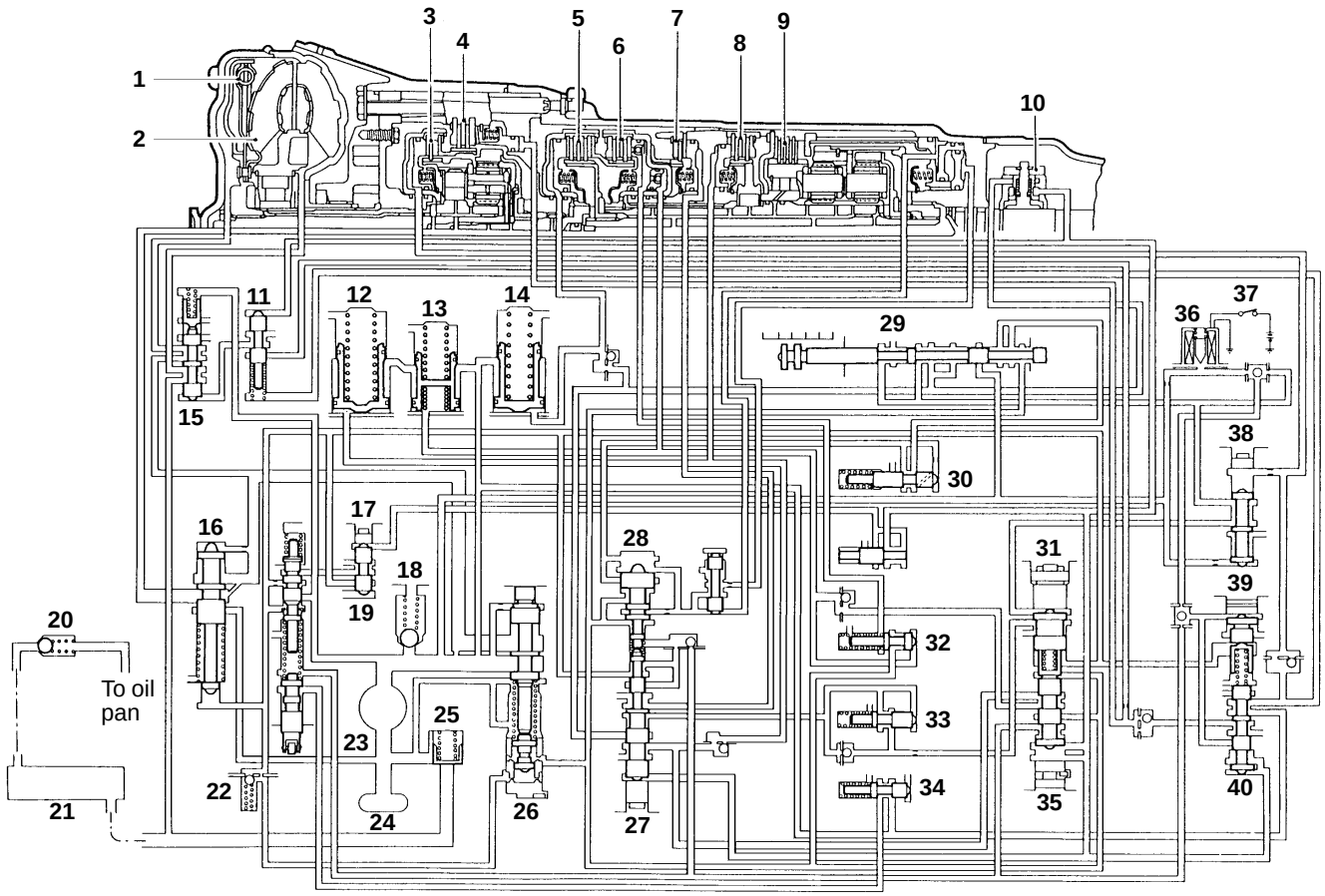
JUDGEMENT BY LINE PRESSURE

Hydraulic pressure higher than nominal in all ranges	(1) Regulator valve faulty (2) Throttle valve faulty (3) Throttle control cable incorrectly adjusted
Hydraulic pressure lower than nominal in all ranges	(1) Oil pump faulty (2) Regulator valve faulty (3) Throttle valve faulty (4) Throttle control cable incorrectly adjusted (5) Overdrive clutch faulty
Hydraulic pressure lower than nominal in “D” range	(1) Large fluid leaks in “D” range hydraulic circuit (2) Forward clutch faulty (3) Overdrive clutch faulty
Hydraulic pressure lower than nominal in “R” range	(1) Large fluid leaks in “R” range hydraulic circuit (2) Brake No. 3 faulty (3) Direct clutch faulty (4) Overdrive clutch faulty

HYDRAULIC CIRCUIT

23100880100

N (NEUTRAL)



ATRA0215

1. Lock-up clutch
2. Torque converter
3. Overdrive clutch
4. Overdrive brake
5. Forward clutch
6. Direct clutch
7. Brake No. 1
8. Brake No. 2
9. Brake No. 3
10. Governor
11. Lock-up signal valve
12. Accumulator B2
13. Accumulator C2
14. Accumulator C3
15. Lock-up relay valve
16. Secondary regulator valve
17. Cut-back valve
18. Relief valve
19. Throttle valve
20. Check valve
21. Oil cooler
22. Damping check valve
23. Oil pump
24. Strainer
25. Cooler bypass valve
26. Primary regulator valve
27. 1-2 shift valve
28. Low-coast shift valve
29. Manual valve
30. Low coast modulator valve
31. Intermediate shift valve
32. Reverse clutch sequence valve
33. Intermediate modulator valve
34. Detent regulator valve
35. 2-3 shift valve
36. Overdrive solenoid valve
37. Overdrive switch
38. D-2 down timing valve
39. 3rd-coast shift valve
40. 3-4 shift valve

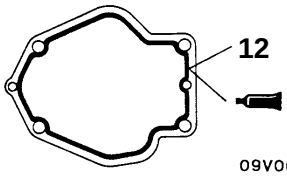
TRANSMISSION CONTROL

23100660162

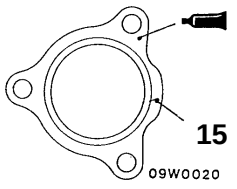
REMOVAL AND INSTALLATION

Pre-removal and Post-installation Operation
- Front Floor Console Removal and Installation (Refer to GROUP 52A.)

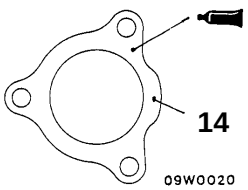
Caution: SRS
Be careful not to subject the SRS diagnosis unit to any shocks during removal and installation of the selector lever assembly.



Sealant:
3M ATD Part No.8661 or equivalent

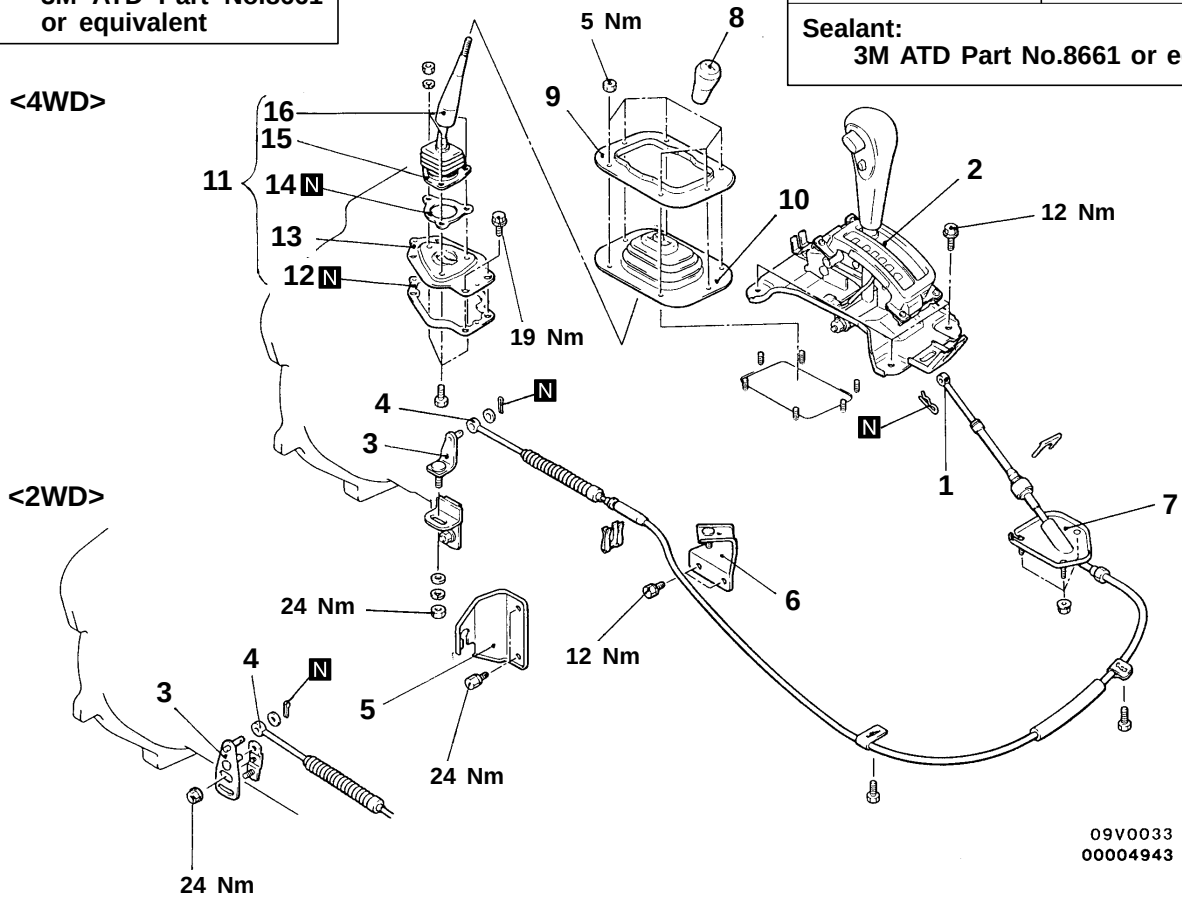


Apply sealant to contact surface with transfer control lever



Apply sealant to both sides

Sealant:
3M ATD Part No.8661 or equivalent



Selector lever assembly removal steps
1. Transmission control cable connection (selector lever side)
2. Selector lever assembly

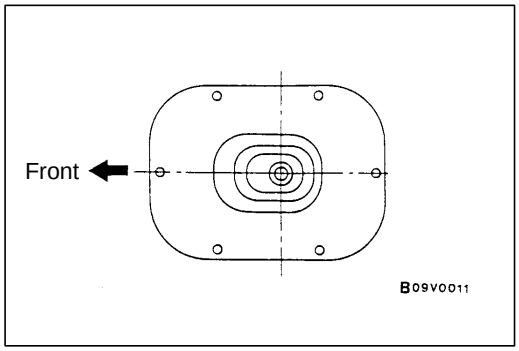
Transmission control cable assembly removal steps
- Rear console assembly (Refer to GROUP 52A.)

1. Transmission control cable connection (selector lever side)
3. Transmission control upper lever
4. Transmission control cable connection (transmission side)
5. Cable end bracket
6. Cable bracket <4WD>
7. Transmission control cable assembly

Transfer lever assembly removal steps
8. Transfer shift knob
9. Retainer

▶A◀ 10. Dust cover

11. Transfer control lever assembly
12. Gasket
13. Stopper plate
14. Gasket
15. Spring cover support
16. Transfer control lever



INSTALLATION SERVICE POINT

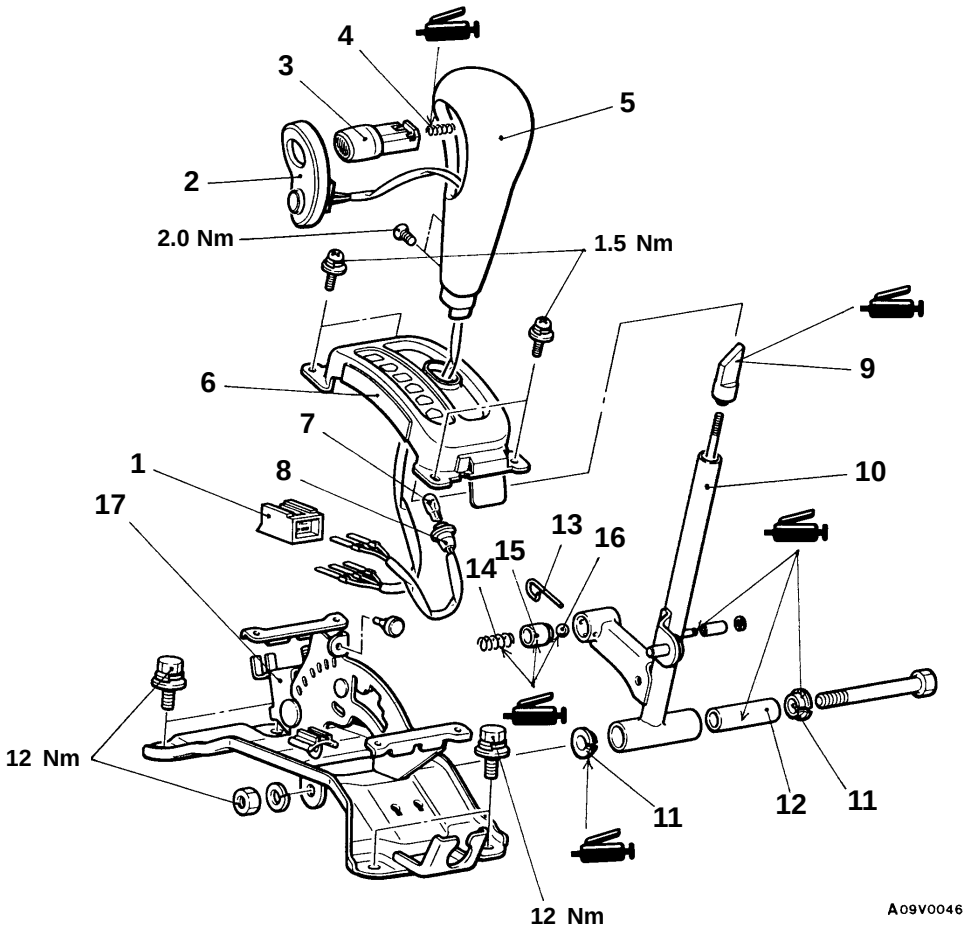
▶A◀ DUST COVER INSTALLATION

Install the dust cover as shown in the illustration.

SELECTOR LEVER ASSEMBLY

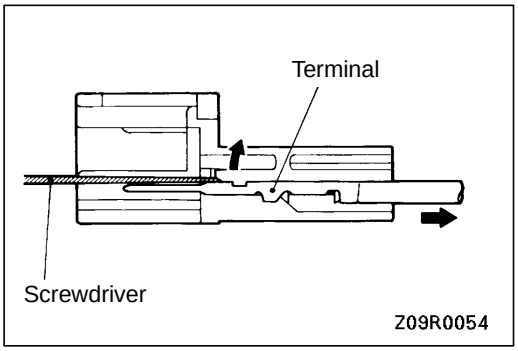
23100680106

DISASSEMBLY AND REASSEMBLY



Removal steps

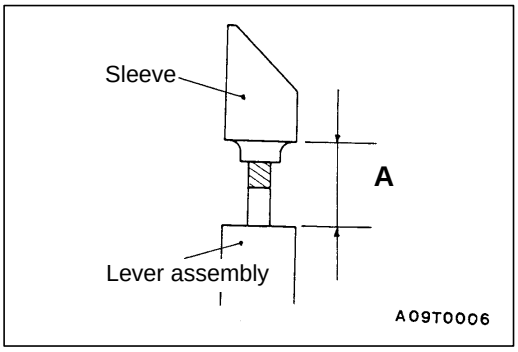
◀A▶ 1. Overdrive switch and indicator lamp connector
2. Overdrive switch
3. Button
4. Spring
▶B◀ 5. Shift knob
6. Indicator panel assembly
7. Bulb
8. Position indicator socket assembly
▶A◀ 9. Sleeve
10. Lever assembly
11. Shift bushing
12. Collar
13. Pin
14. Spring
15. Ball support
16. Ball
17. Bracket



DISASSEMBLY SERVICE POINT

◀A▶ OVERDRIVE SWITCH AND INDICATOR LAMP CONNECTOR REMOVAL

Disconnect the connector and remove the terminal from the connector.

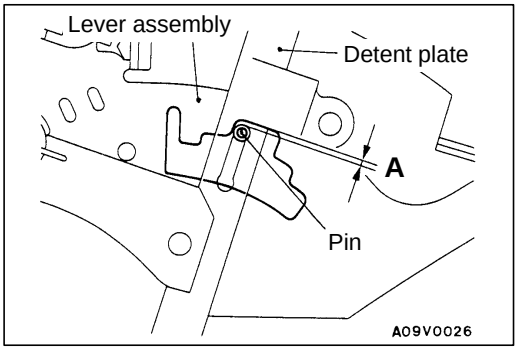


REASSEMBLY SERVICE POINTS

▶A◀ SLEEVE INSTALLATION

Shift the selector lever to the N position, and then turn the sleeve so that the clearance between the sleeve and lever assembly end is within the standard value.

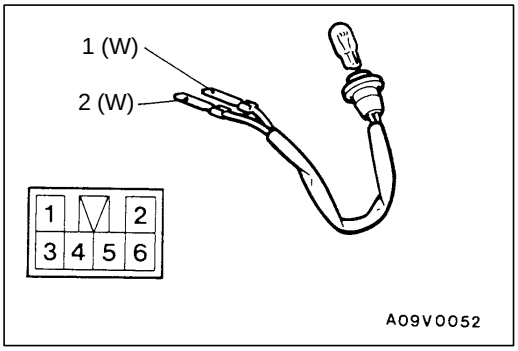
Standard value (A): 16.0 – 16.8 mm



▶B◀ SHIFT KNOB INSTALLATION

Shift the selector lever to the N position, and then turn the sleeve so that the clearance between the detent plate and pin is within the standard value.

Standard value (A): 0.1 – 0.9 mm

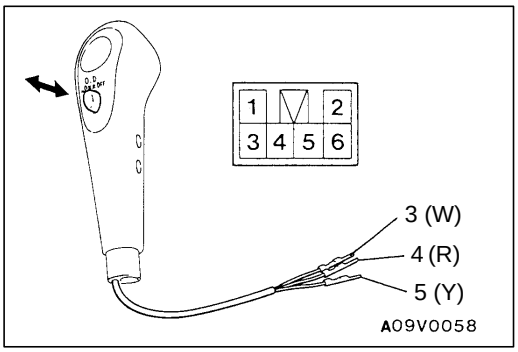


INSPECTION

23101100014

POSITION INDICATOR LAMP CHECK

Terminal No.	1	2
Always	○	○



OVERDRIVE SWITCH CHECK

23100380129

Switch position	Terminal No.		
	3	4	5
ON (Overdrive activation)	○	○	
OFF (Overdrive non-activation)	○		○

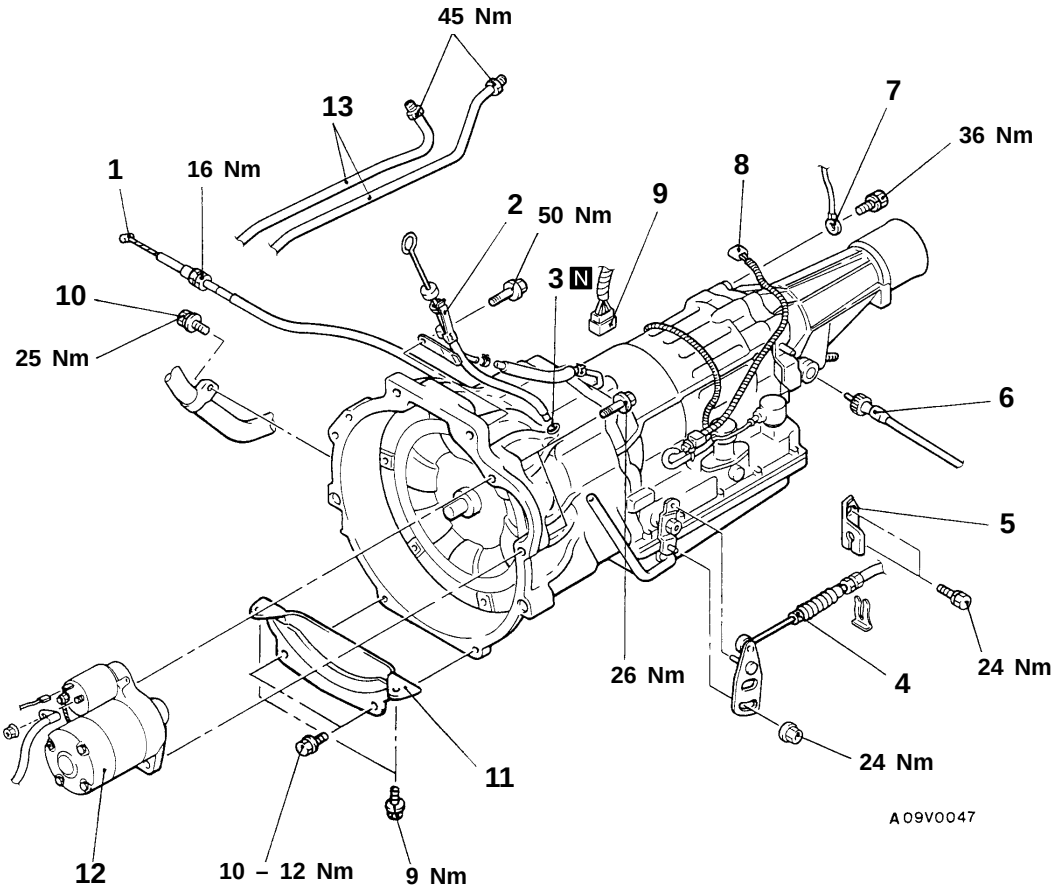
TRANSMISSION ASSEMBLY <2WD>

23100570168

REMOVAL AND INSTALLATION

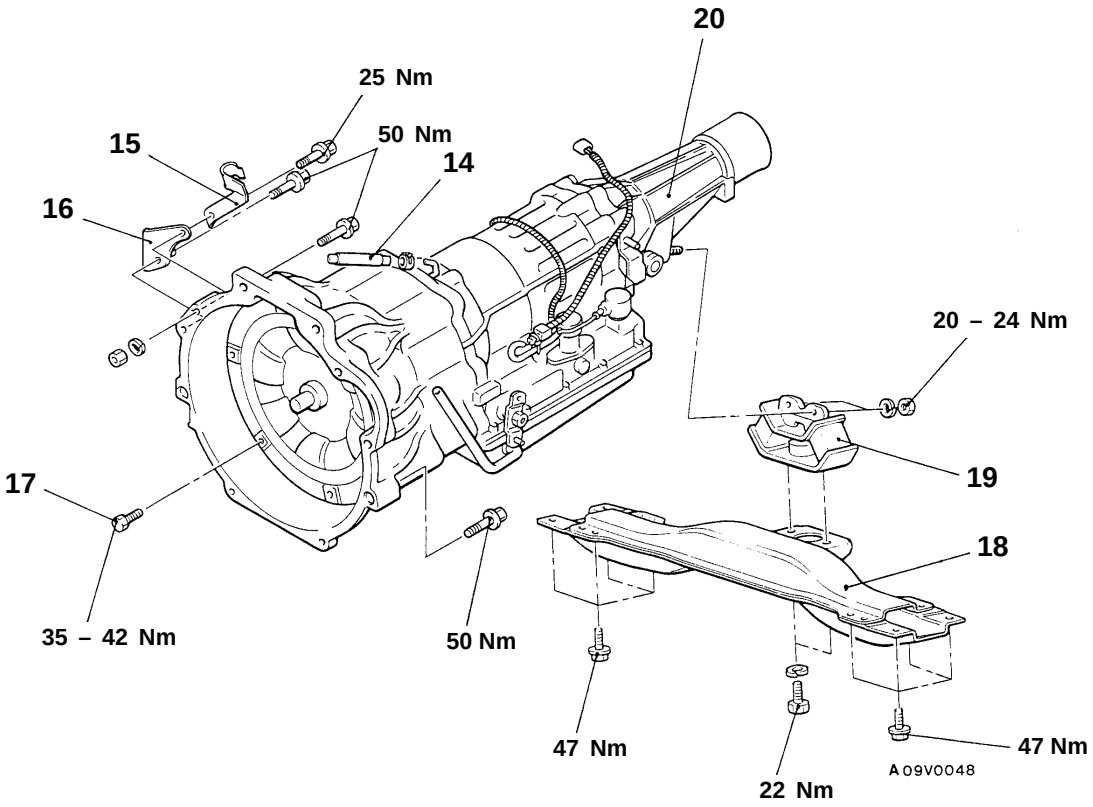
Pre-removal Operation
(1) Selector Lever Removal (Refer to P.23-23.)
(2) Transmission Fluid Draining (Refer to P.23-11.)
(3) Propeller Shaft Removal (Refer to GROUP 25.)

Post-installation Operation
(1) Propeller Shaft Installation (Refer to GROUP 25.)
(2) Transmission Fluid Filling (Refer to P.23-11.)
(3) Selector Lever Installation (Refer to P.23-23.)
(4) Selector Lever Operation Check (Refer to P.23-14.)
(5) Speedometer Operation Check



Removal steps

▶B◀ 1. Throttle cable connection
2. Filler tube assembly
3. O-ring
4. Transmission control cable connection
5. Cable end bracket
6. Speedometer cable connection
7. Earth cable
8. Overdrive solenoid valve connector
9. Inhibitor switch connector
10. Exhaust pipe clamp mounting bolt
11. Bell housing cover
◀A▶ 12. Starter motor
13. Transmission oil cooler tube connection



14. Breather hose
15. Throttle cable clamp
16. Exhaust pipe clamp bracket
◀B▶ 17. Torque converter and drive plate connection bolt
- Support the transmission with a transmission jack

18. No.2 crossmember
19. Rear engine support insulator
▶A◀ 20. Transmission assembly

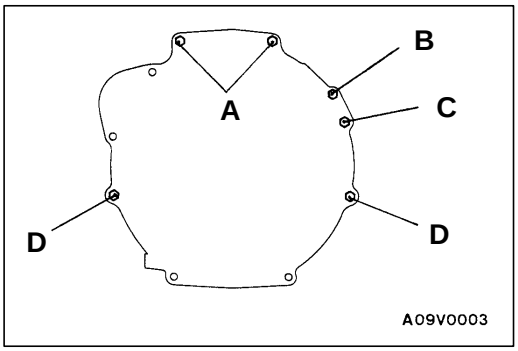
REMOVAL SERVICE POINTS

◀A▶ STARTER MOTOR REMOVAL

Remove the starter motor with the starter motor harnesses still connected, and secure it inside the engine compartment.

◀B▶ TORQUE CONVERTER AND DRIVE PLATE CONNECTION BOLTS REMOVAL

1. Remove the connection bolts (6 places) while turning the crankshaft.
2. Press in the torque converter to the transmission side so the torque converter does not remain on the engine side.

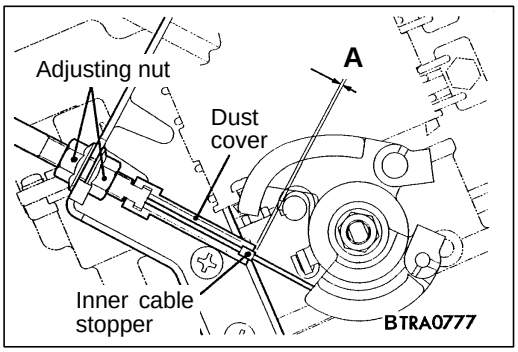


INSTALLATION SERVICE POINTS

▶A◀ TRANSMISSION ASSEMBLY INSTALLATION

The sizes of the mounting bolts are different. So be sure not to confuse them.

Bolt	Diameter x Length mm
A	10 x 40
B	8 x 55
C	10 x 60
D	10 x 65



▶B◀ THROTTLE CABLE INSTALLATION

After installing the throttle cable, adjust it by the following procedure.

(1) Open the throttle lever completely and adjust the cable with the adjusting nut so that the distance between the inner cable stopper and the outer cable end is at the standard value.

Standard value (A): 0 – 1 mm

(2) Tighten the adjusting nut to the specified torque.

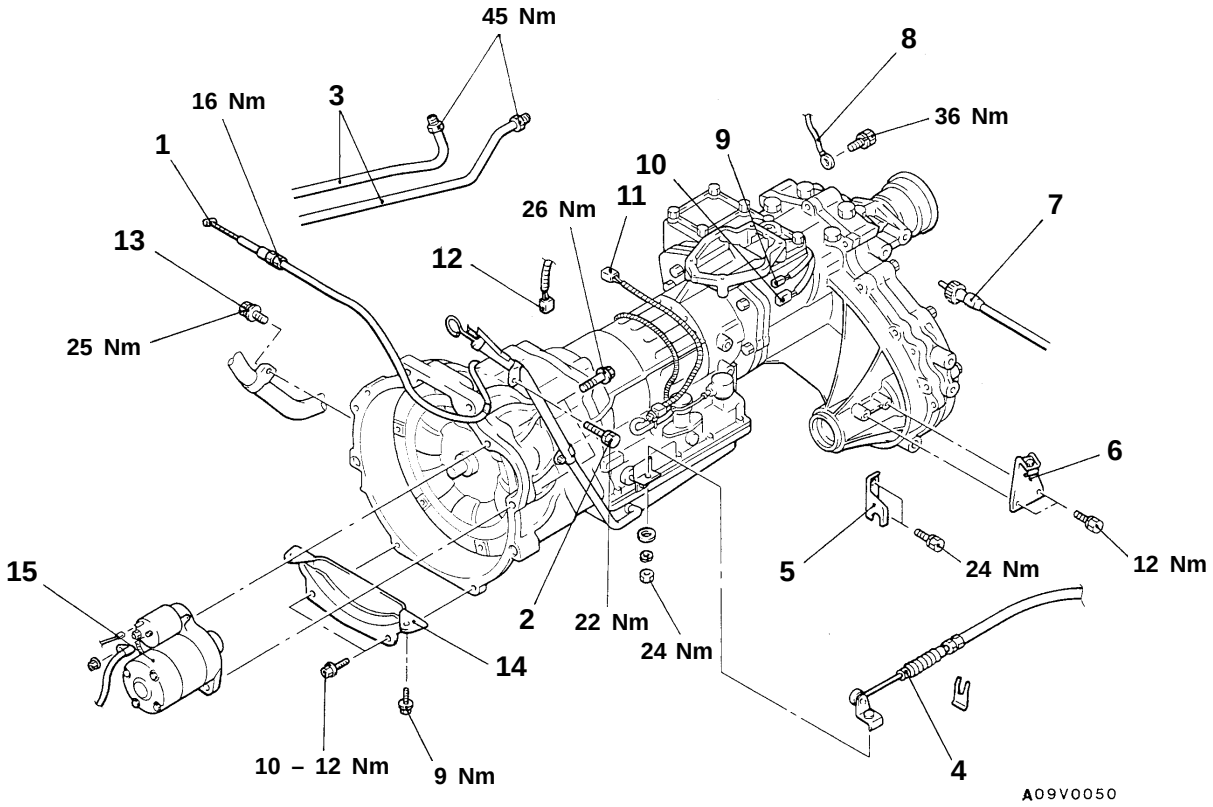
TRANSMISSION ASSEMBLY <4WD>

23100630033

REMOVAL AND INSTALLATION

Pre-removal Operation
(1) Selector Lever and Transfer Control Lever Removal (Refer to P.23-23.)
(2) Transfer Case Protector Removal
(3) Transmission Fluid Draining (Refer to P.23-11.)
(4) Transfer Oil Draining (Refer to P.23-12.)
(5) Front and Rear Propeller Shaft Removal (Refer to GROUP 25.)

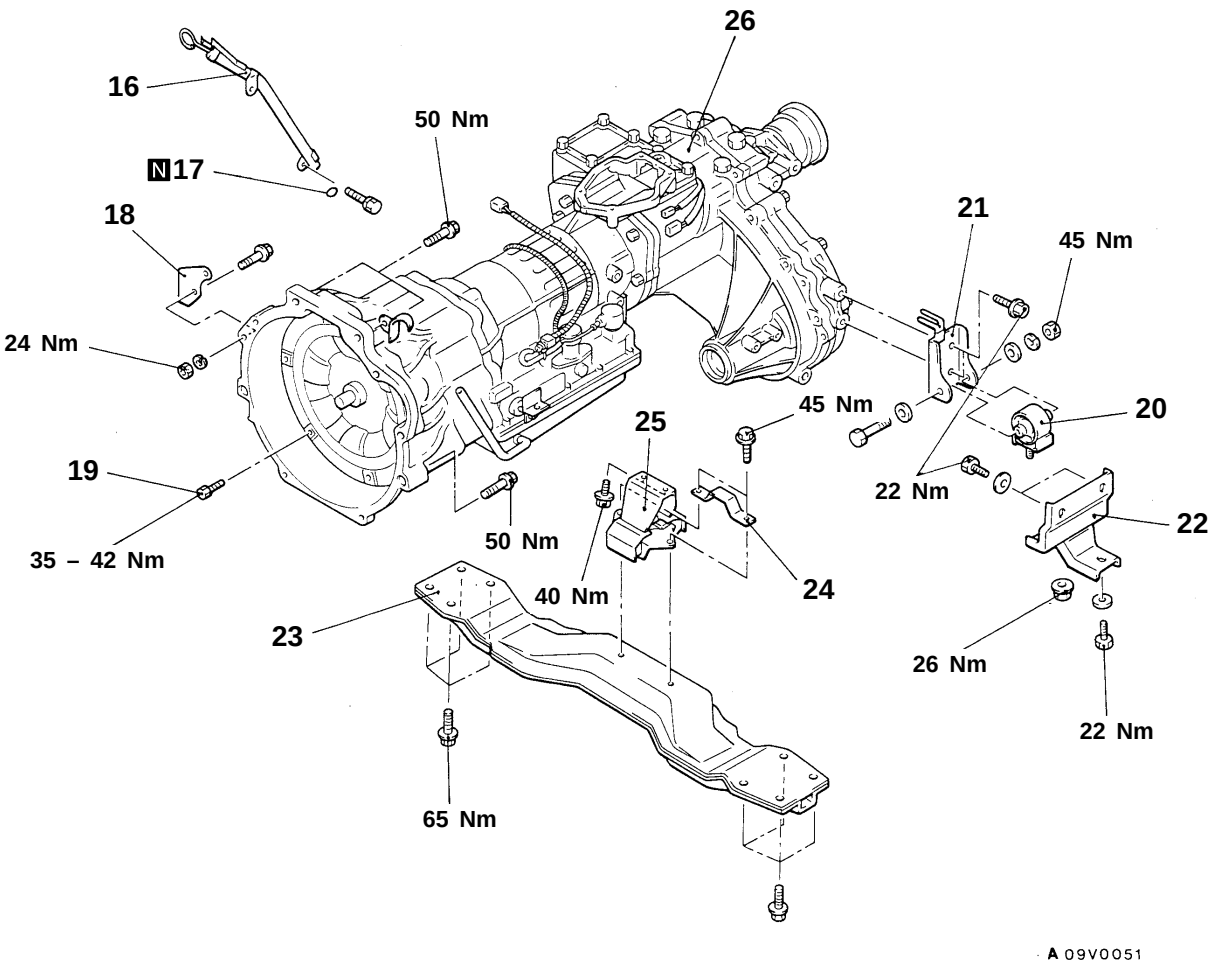
Post-installation Operation
(1) Front and Rear Propeller Shaft Installation (Refer to GROUP 25.)
(2) Transfer Oil Filling (Refer to P.23-12.)
(3) Transmission Fluid Filling (Refer to P.23-11.)
(4) Transfer Case Protector Installation
(5) Selector Lever and Transfer Control Lever Installation (Refer to P.23-23.)
(6) Selector Lever Operation Check (Refer to P.23-14.)
(7) Speedometer Operation Check



Removal steps

▶B◀ 1. Throttle cable connection
2. Filler tube assembly mounting bolt
3. Oil cooler tube connection
4. Transmission control lever connection
5. Cable end bracket
6. Cable bracket
7. Speedometer cable connection
8. Earth cable
9. 4WD detection switch connector
10. High/Low detection switch connector
11. Overdrive solenoid valve connector
12. Inhibitor switch connector
13. Exhaust pipe clamp mounting bolt
14. Bell housing cover

◀A▶ 15. Starter motor



16. Filler tube assembly
17. O-ring
18. Exhaust pipe clamp bracket
◀B▶ 19. Torque converter and drive plate connection bolt
- Support the transmission with a transmission jack

20. Transfer roll stopper
21. Transfer mount bracket
22. Transfer support bracket
23. No.2 crossmember
24. Stopper
25. Rear engine support insulator
▶A◀ 26. Transmission assembly

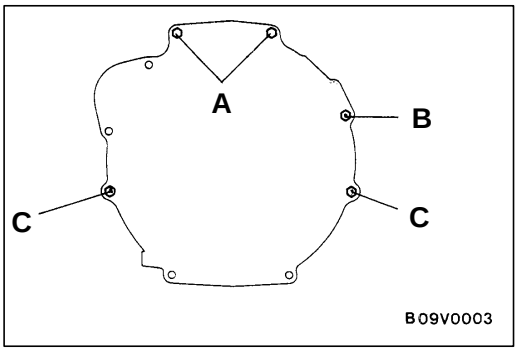
REMOVAL SERVICE POINTS

◀A▶ STARTER MOTOR REMOVAL

Remove the starter motor with the starter motor harnesses still connected, and secure it inside the engine compartment.

◀B▶ TORQUE CONVERTER AND DRIVE PLATE CONNECTION BOLTS REMOVAL

1. Remove the connection bolts (6 places) while turning the crankshaft.
2. Press in the torque converter to the transmission side so the torque converter does not remain on the engine side.

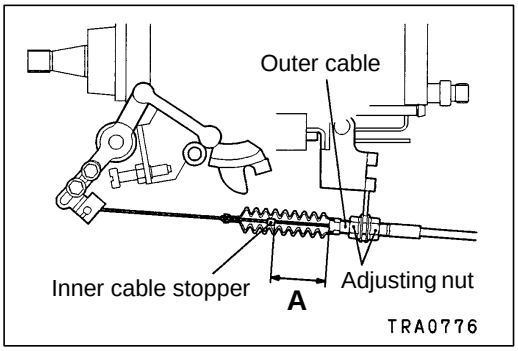


INSTALLATION SERVICE POINTS

▶A◀ TRANSMISSION ASSEMBLY INSTALLATION

The sizes of the mounting bolts are different. So be sure not to confuse them.

Bolt	Diameter x Length mm
A	10 x 40
B	10 x 55
C	10 x 65



▶B◀ THROTTLE CABLE INSTALLATION

After installing the throttle cable, adjust it by the following procedure.

(1) Pull out the cable from the boot outer cable side until the inner cable stopper can be seen.
(2) Open the throttle lever completely and adjust the cable with the adjusting nut so that the distance between the inner cable stopper and the outer cable end is at the standard value.

Standard value (A): 34 – 35 mm

(3) Tighten the adjusting nut to the specified torque.

4WD INDICATOR-ECU

23101090014

REMOVAL AND INSTALLATION

Refer to GROUP 22.

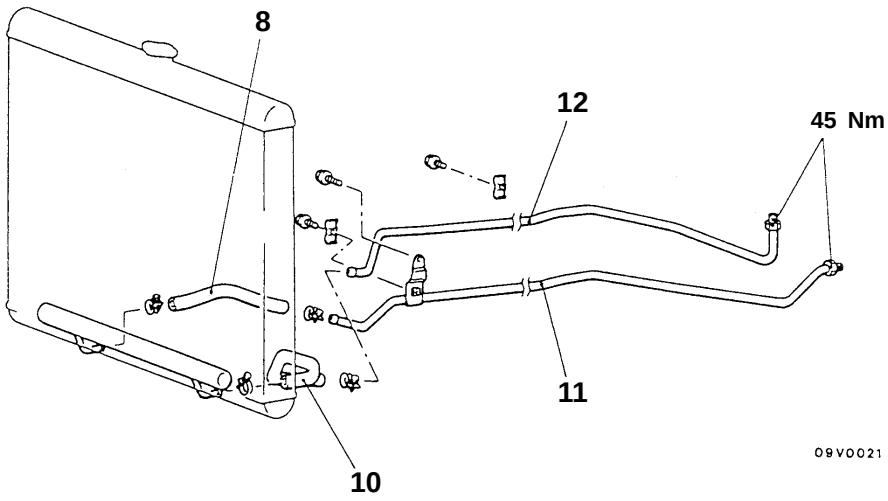
TRANSMISSION OIL COOLER

23100700017

REMOVAL AND INSTALLATION

Pre-removal and Post-installation Operation
(1) Radiator Grille Removal and Installation (Refer to GROUP 51.) <4WD>
(2) Transmission Fluid Draining and Supplying (Refer to P.23-11.)
(3) Skid Plate, and Front Under Cover Removal and Installation

<2WD>



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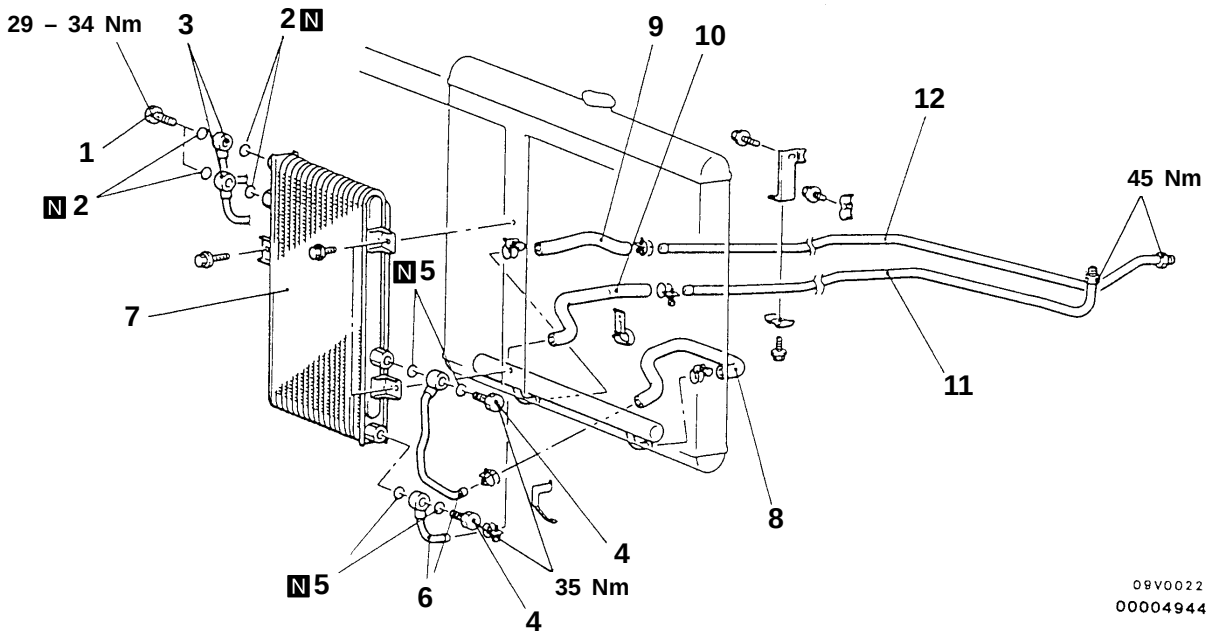


Removal steps

1. Eye bolt (for engine oil cooler)
2. Gasket (for engine oil cooler)
3. Engine oil cooler tube assembly connection
4. Eye bolt (for transmission oil cooler)
5. Gasket
6. Transmission oil cooler tube assembly connection
7. Oil cooler assembly
8. Return hose (A)
9. Return hose (B)
10. Feed hose
11. Return tube
12. Feed tube

GROUP 23
AUTOMATIC TRANSMISSION

GENERAL

OUTLINE OF CHANGE(S)

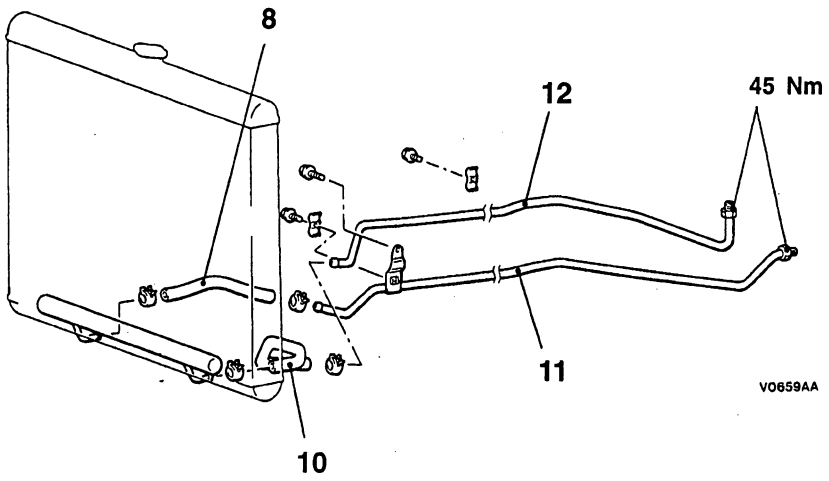
The hose clips have been modified. Therefore, service procedure has been added.

TRANSMISSION OIL COOLER

REMOVAL AND INSTALLATION

Pre-removal and Post-installation Operation
- Radiator Grille Removal and Installation (Refer to GROUP 51.) <4WD>
- Transmission Fluid Draining and Supplying
- Skid Plate, and Front Under Cover Removal and Installation

<2WD>



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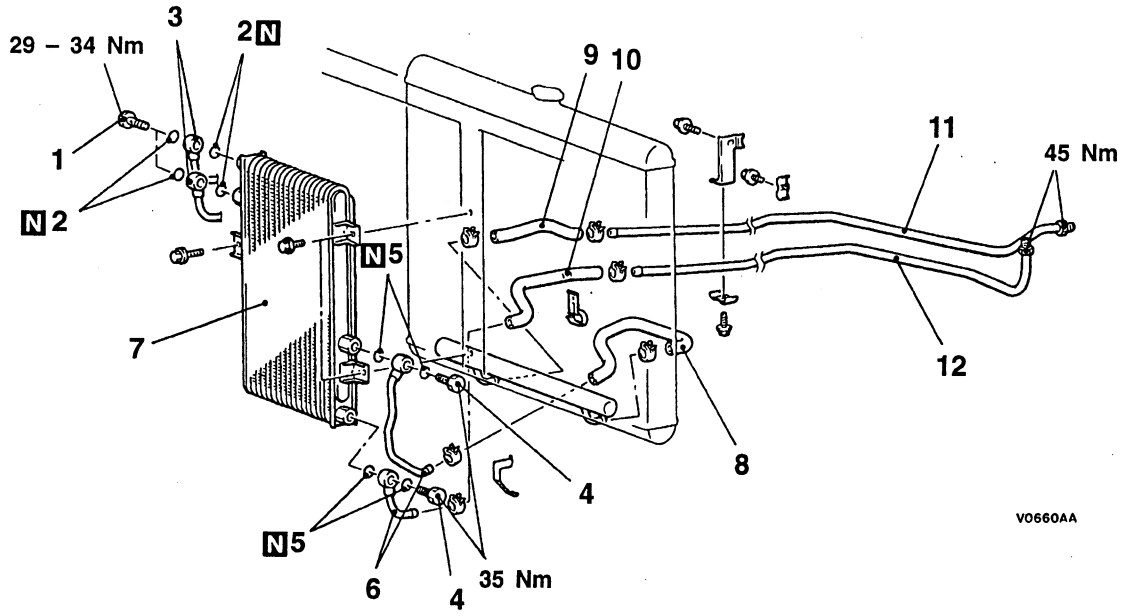


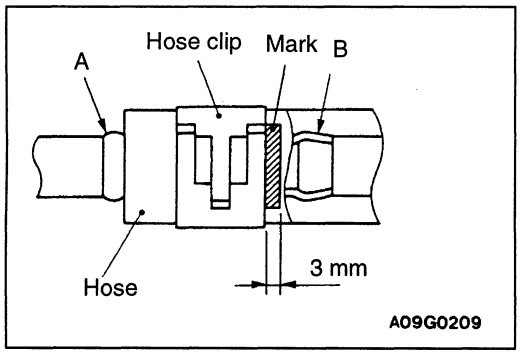
Removal steps

1. Eye bolt (for engine oil cooler)
2. Gaskets (for engine oil cooler)
3. Engine oil cooler tube assembly connection
4. Eye bolts (for transmission oil cooler)
5. Gaskets
6. Transmission oil cooler tube assembly connection
7. Oil cooler assembly
- ▶B◀ 8. Return hose (A)
- ▶B◀ 9. Return hose (B)
- ▶B◀ 10. Feed hoses
- ▶A◀ 11. Return tubes
- ▶A◀ 12. Feed tubes

INSTALLATION SERVICE POINT

▶A◀ FEED TUBE/RETURN TUBE INSTALLATION

1. Temporarily tighten the feed tube flare nut and return tube flare nut to the transmission assembly.
2. Connect the return hose to the return tube, and feed hose to feed tube. (Refer to ▶B◀ FEED HOSE/RETURN HOSE (B)/RETURN HOSE (A) INSTALLATION.)
3. Temporarily tighten the clamps, starting from the nearest one to the transmission assembly.
4. Securely tighten the feed tube flare nut and return tube flare nut.



▶B◀ FEED HOSE/RETURN HOSE (B)/RETURN HOSE (A) INSTALLATION

1. Connect the feed hose, return hose (B) and return hose (A) with the mark upwards.
2. Insert the hose up to bulge A on the nipple and tube, as shown.
3. Attach the hose clip at the position being sure that it is not on top of bulge B, as shown.

SERVICE BULLETIN

QUALITY INFORMATION ANALYSIS
OVERSEAS SERVICE DEPT. MITSUBISHI MOTORS CORPORATION

SERVICE BULLETIN	**No.:** MSB-99E23-001	
	Date: 1999-12-15	**<Model>** (EC,EXP) L200 (K00) **<M/Y>** 99-10
Subject: ADDITION OF DESCRIPTION OF ABS IDLE-UP SOLENOID VALVE ABOLISHMENT		
Group: AUTOMATIC TRANSAXLE	**Draft No.:** 99SY031213	
INFORMATION	**INTERNATIONAL CAR ADMINISTRATION OFFICE**	T.NITTA - PROJECT LEADER AFTER SALES SERVICE & CS PROMOTION

1. Description:

In the ’99 L200 Workshop Manual, a description of abolishment of the ABS idle-up solenoid valve has been added.

2. Applicable Manuals:

Manual	Pub. No.	Language	Page(s)
’99 L200 Workshop Manual chassis	PWTE96E1-C	(English)	23-3
	PWTS96E1-C	(Spanish)	
	PWTF96E1-C	(French)	
	PWTG96E1-C	(German)	

3. Interchangeability:

Not interchangeable

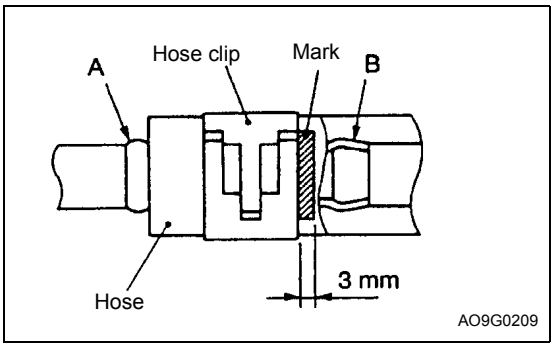
4. Effective Date:

From the first production vehicle of 1999 model

INSTALLATION SERVICE POINT

▶A◀ FEED TUBE/RETURN TUBE INSTALLATION

1. Temporarily tighten the feed tube flare nut and return tube flare nut to the transmission assembly.
2. Connect the return hose to the return tube, and feed hose to feed tube. (Refer to ▶B◀ FEED HOSE/ RETURN HOSE (B)/RETURN HOSE (A) INSTALLATION.)
3. Temporarily tighten the claps, starting form the nearest one to the transmission assembly.
4. Securely tighten the feed tube flare nut and return tube flare nut.



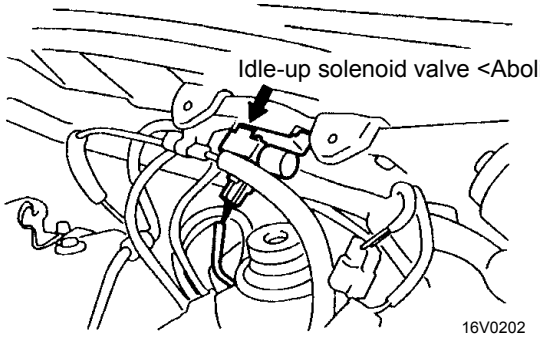
▶B◀ FEED HOSE/RETURN HOSE (B) RETURN HOSE (A) INSTALLATION

1. Connect the feed hose, return hose (B) and return hose (A) with the mark upwards
2. Insert the hose up to bulge A on the nipple and tube, as shown.
3. Attach the hose clip at the position being sure that it is not on top of bulge B, as shown.

The following descriptions come here.

GROUP 35B/35C
ANTI-SKID BRAKING SYSTEM (ABS) <2WD/4WD>

GENERAL
OUTLINE OF CHANGES
- The ABS idle-up solenoid valve has been abolished. <4D56>



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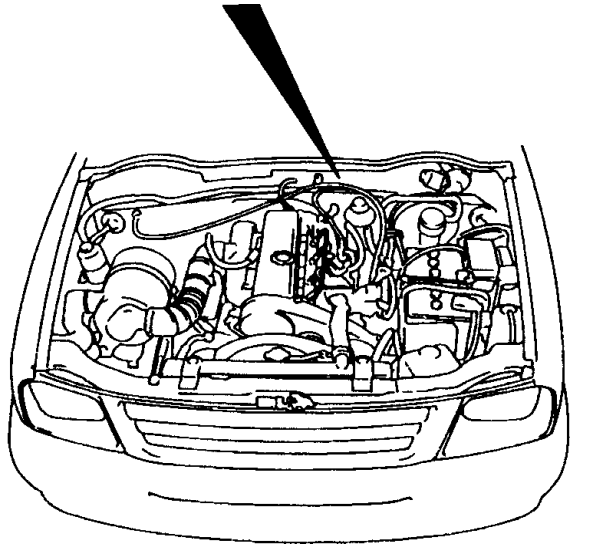
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GROUP 23
AUTOMATIC TRANSMISSION

GENERAL

OUTLINE OF CHANGES

With additional vehicle with emission regulation step III compatible 4D5 engine, the service procedure different from service adjustment procedure of the vehicle with 4D5 engine has been established.

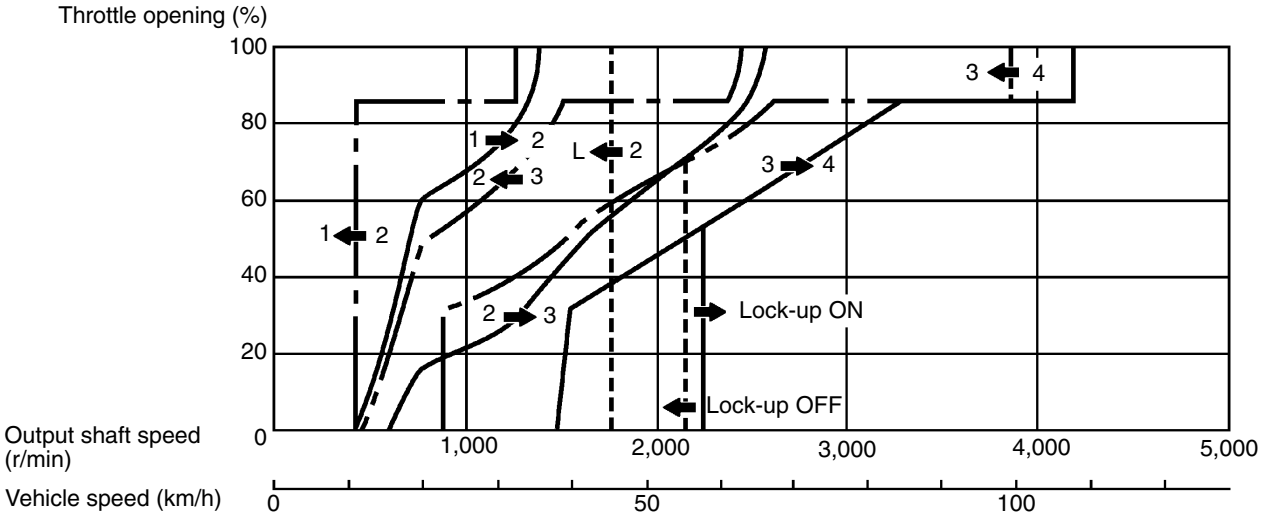
SERVICE SPECIFICATIONS

Items	Standard value
Play of the accelerator cable inner cable mm	1 – 2
Dimension of the throttle cable inner cable stopper and outer cable end mm	0.8 – 1.5

TROUBLESHOOTING

SHIFT PATTERN

<2WD>



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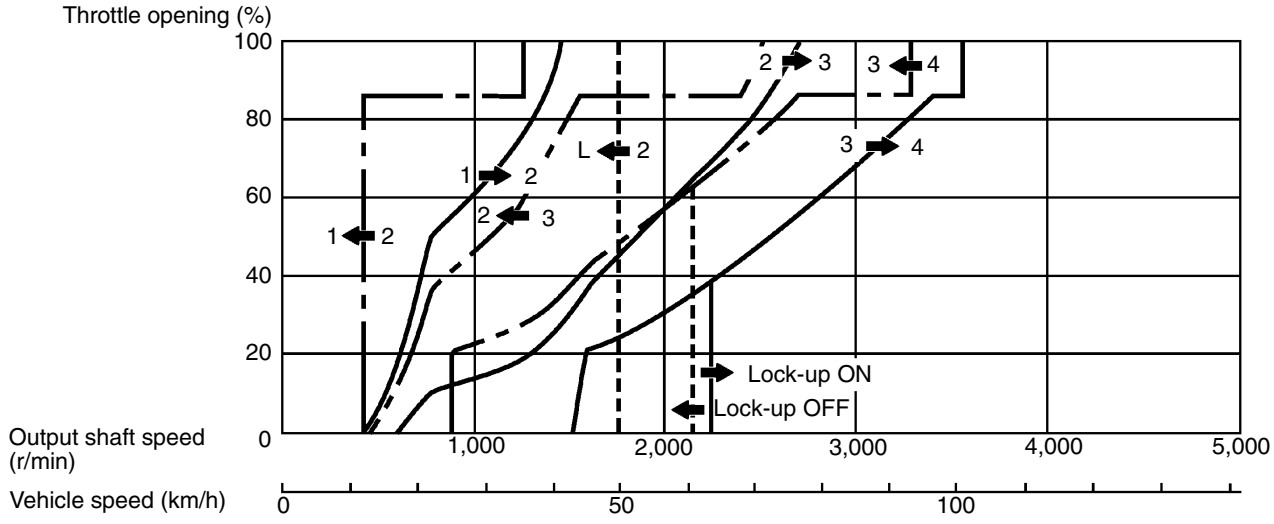

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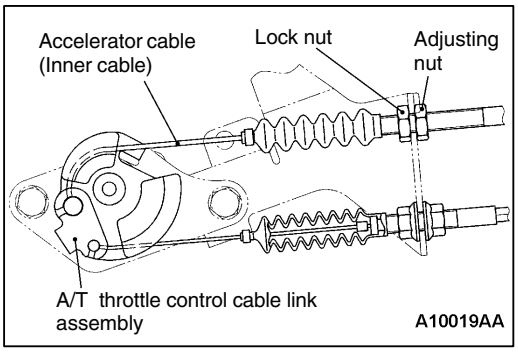
ON-VEHICLE SERVICE

ACCELERATOR CABLE AND THROTTLE CABLE CHECK AND ADJUSTMENT

1. Check the accelerator cable and the throttle cable for bends.
2. Check that the A/T throttle control cable link assembly and bracket do not become deformed.

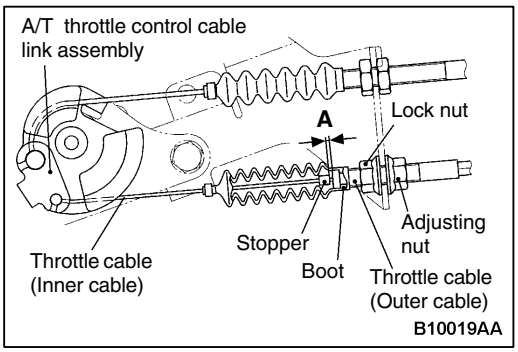


3. Check the play of the accelerator cable inner cable.

   Standard value: 1 – 2 mm

4. If the play in inner cable is out of standard value, adjust by following the step below.
   (1) Loosen the locking nut and adjusting nut in order to have the A/T throttle control cable link assembly to be free.
   (2) Tighten the adjusting nut until the A/T throttle control cable link assembly operates, turn the adjusting nut one turn in opposite direction.
   (3) Tighten the lock nut in specified torque.

   Tightening torque: 10 ± 1 N·m



5. Remove the throttle cable boot and check the dimension of the inner cable stopper and the outer cable end.

   Standard value: 0.8 – 1.5 mm

6. If the dimension A between the inner cable stopper and the outer cable end is out of standard value, adjust by following the step below.
   (1) Loosen the locking nut and adjusting nut in order to have the A/T throttle control cable link assembly to be free.
   (2) Turn the adjusting nut, adjust in order that the dimension A between the inner cable stopper and the outer cable end is in standard value.
   (3) Tighten the lock nut in specified torque.

   Tightening torque: 16 ± 2 N·m

NOTES