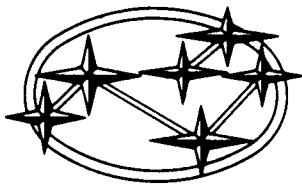


TRANSMISSION CONTROL SYSTEM 3-3

SUBARU

1988



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MECHANISM AND FUNCTION

4WD Shift Mechanism (Selective 4WD)

Shifting from front-wheel to 4-wheel drive or vice versa is accomplished by utilizing the intake manifold vacuum pressure.

In Front-Wheel Drive

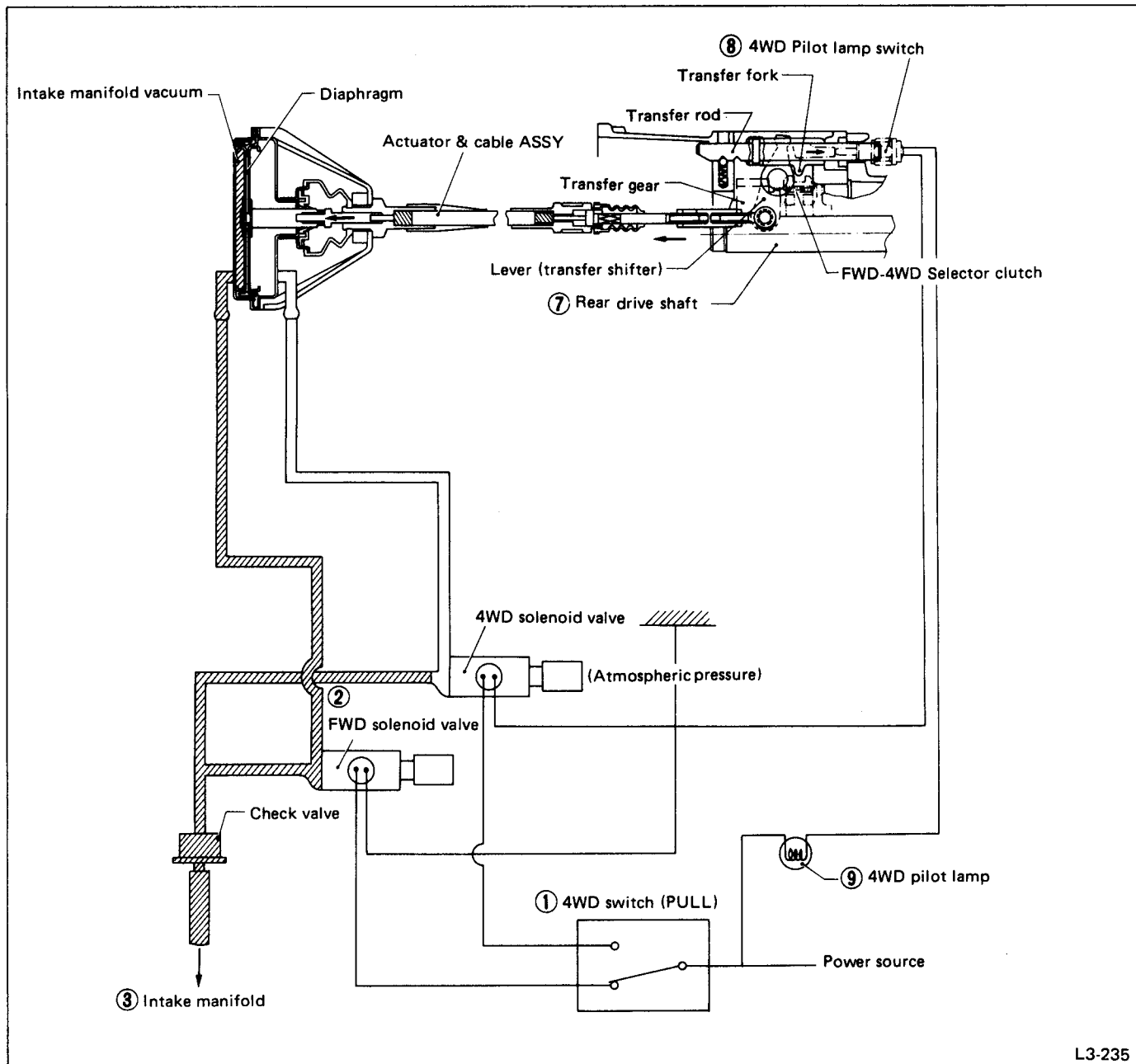


Fig. 1

When the 4WD switch button ① is pulled out with the engine on, the FWD solenoid valve ② is energized and the valve ② opens. This admits the intake manifold ③ vacuum pressure to the vacuum chamber so that the diaphragm is pulled in the direction of the arrow.

At this point, the power from the engine is not transferred to the rear drive shaft ⑦ and thus the vehicle is in front-wheel drive. The 4WD pilot lamp ⑨ in the combination meter remains off because the 4WD pilot lamp switch ⑧ is not turned on.

In 4-Wheel Drive

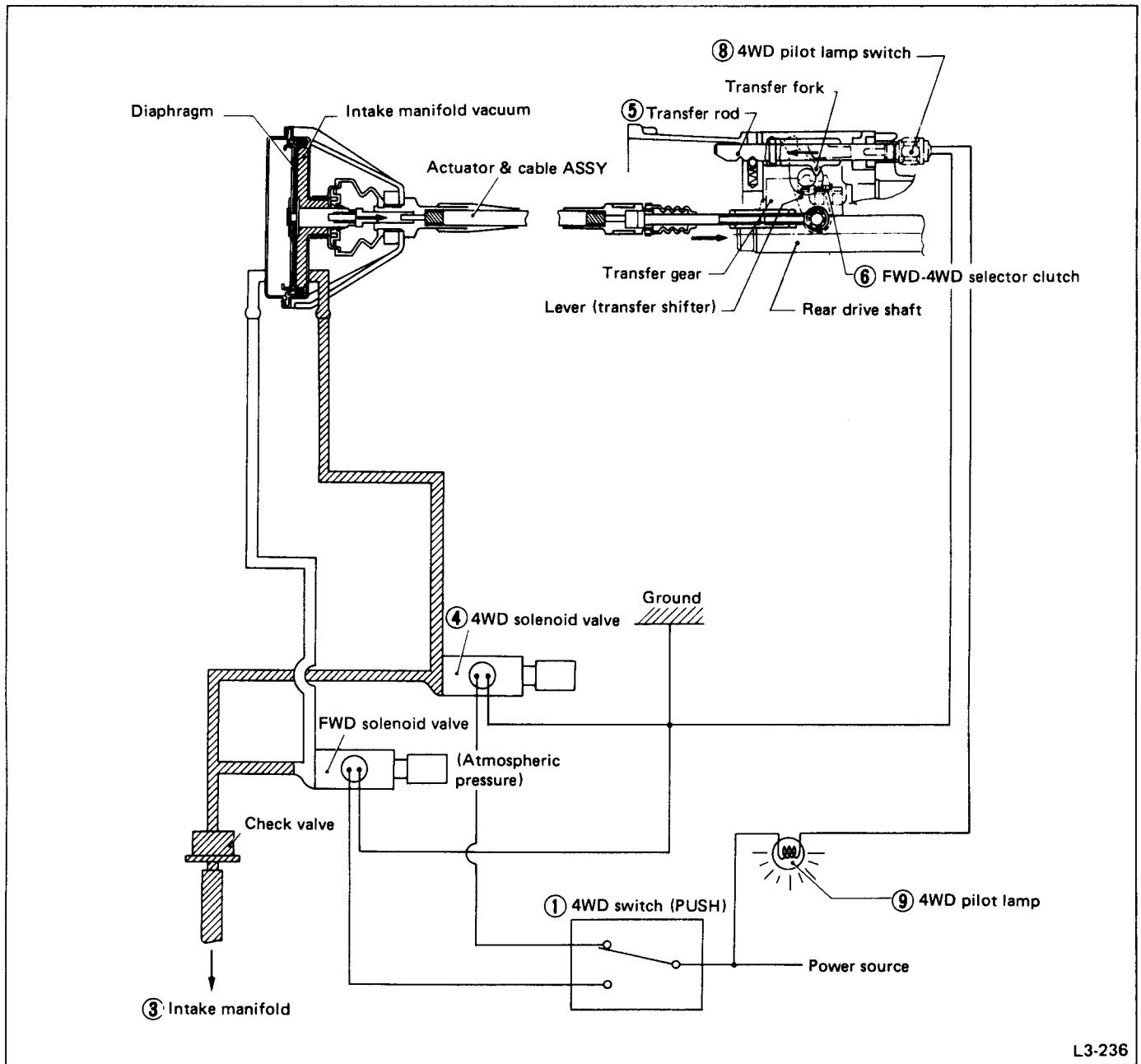


Fig. 2

When the 4WD switch button ① is pushed in with the engine on, the 4WD solenoid valve ④ is energized and the valve ④ opens. At this time, the vacuum pressure from the intake manifold ③ enters the valve so that the diaphragm inside the vacuum chamber is pulled in the direction of the arrow. The transfer rod ⑤ connected to the diaphragm also moves

in that direction. This causes the FWD-4WD selector clutch ⑥ to engage the spline of the transfer gear so that the vehicle is set in 4-wheel drive. In 4-wheel drive, the 4WD pilot lamp switch ⑧ turns on the 4WD pilot lamp ⑨ in the combination meter. Changing from 4-wheel drive to front-wheel drive is accomplished by pushing the 4WD switch button ①.

Knob and Switch (MT, Selective 4WD)

1) Construction

The switch is soldered to the cord and is held to the knob with a screw. The cord is routed along the groove in the knob. The knob is secured to the lever with a spring pin.

2) Operation

When the switch is pressed to ON, the car is set to the 4WD mode; when it is pressed again, the car is set to the FWD mode.

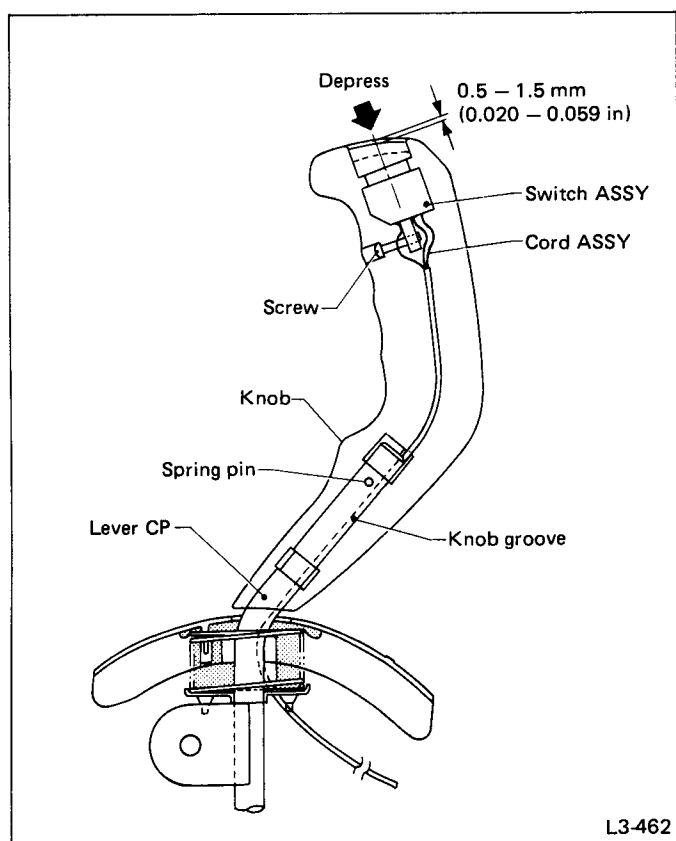


Fig. 3

Manual Transmission

T2: 14 – 22 (1.4 – 2.2, 10 – 16)



Automatic Transmission

Tightening torque: N·m (kg-m, ft-lb)

T1: 13 – 23 (1.3 – 2.3, 9 – 17)

T2: 10 – 18 (1.0 – 1.8, 7 – 13)

T3: 9 – 15 (0.9 – 1.5, 6.5 – 10.8)

T4: 1.3 – 2.6 (0.13 – 0.27, 0.9 – 2.0)

T5: 4.4 – 7.4 (0.45 – 0.75, 3.3 – 5.4)

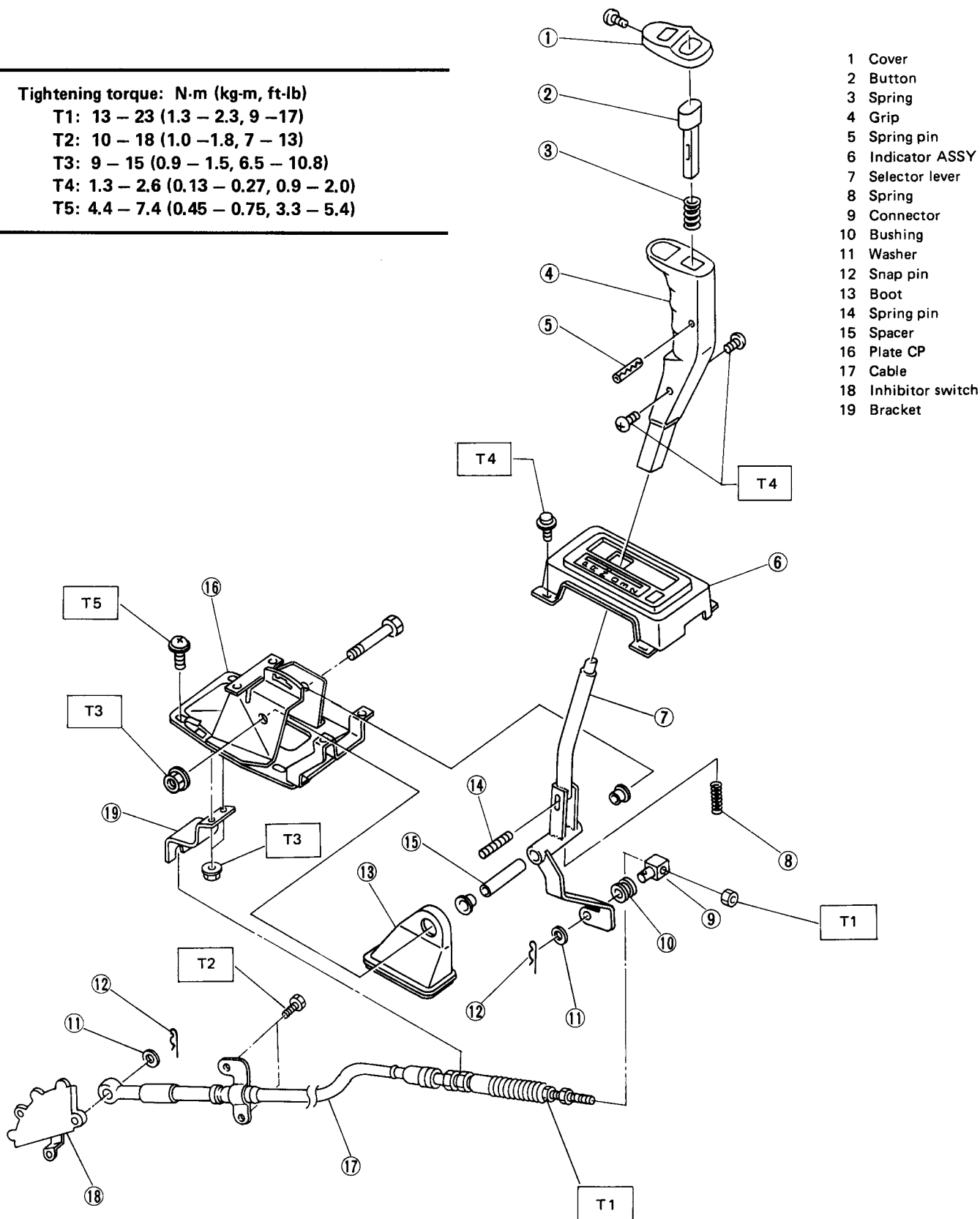


Fig. 5

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SERVICE PROCEDURE

Manual Transmission

ON-CAR SERVICE

Confirm the following: (Selective 4WD vehicle only)

- 1) The switch activation stroke of the lever CP is 5 mm (0.20 in). ON-operation force is not more than 14.7 N (1.5 kg, 3.3 lb). There is no binding.
- 2) A single push of the switch turns on 4WD mode and an additional push returns to FWD mode.

REMOVAL

- 1) Remove the console box. (Selective 4WD)
- 2) Disconnect the connector for 4WD switch. (Selective 4WD)
- 3) Remove the rear exhaust pipe.

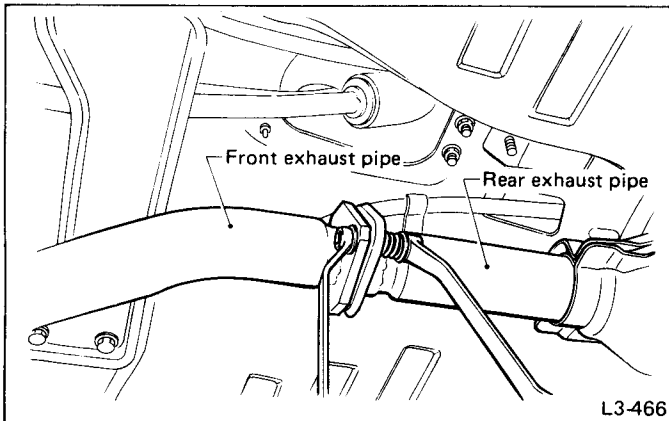


Fig. 6

- 4) Remove the spring between joint CP and bracket CP.

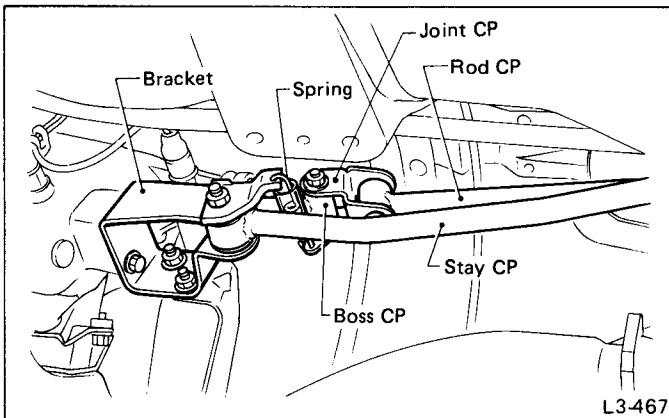


Fig. 8

- 5) Remove the bolt to take off the stay CP from the transmission.
- 6) Remove the bolt to disconnect the rod from the joint.
- 7) Remove the nut to take off the gearshift lever ASSY from the body.

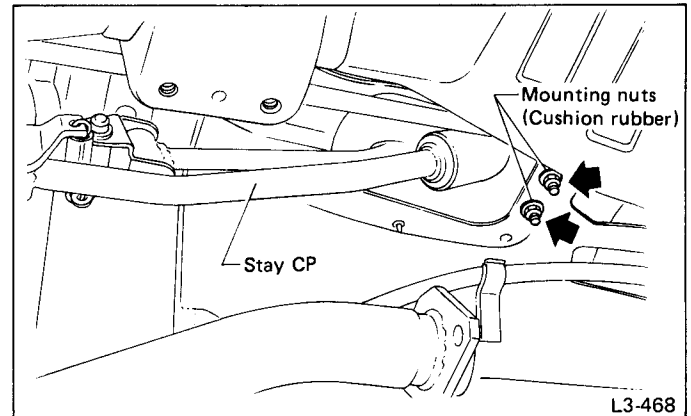


Fig. 9

DISASSEMBLY

- 1) Disconnect the rod from the gearshift lever ASSY.

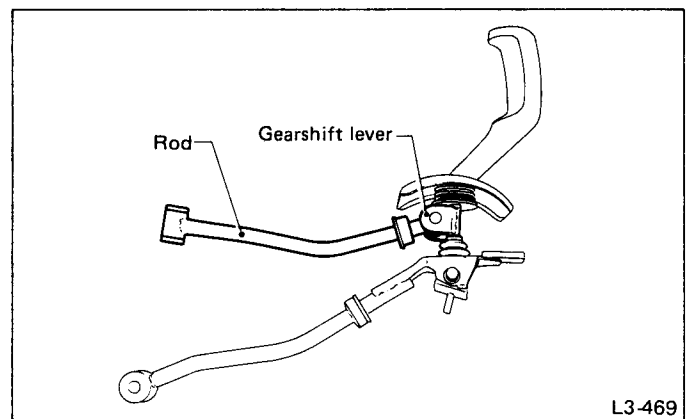


Fig. 10

2) Remove the following parts from the rod CP both sides.

- ① Spacer
- ② Bushing (Rubber)
- ③ Bushing (Nylon)

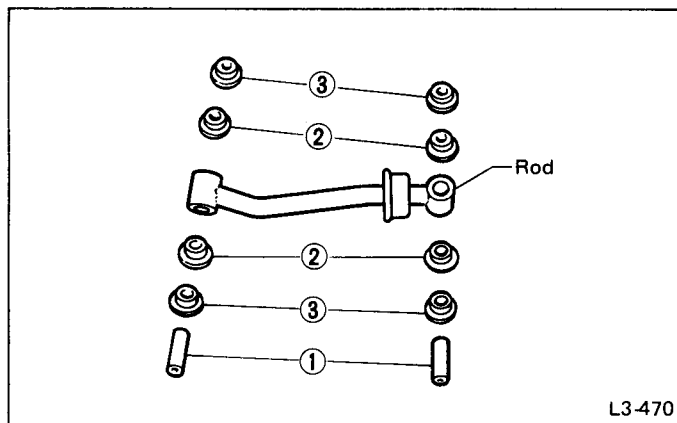


Fig. 11

5) Remove the following parts from the lever:

- ① Cushion
- ② Bushing
- ③ Plate CP
- ④ Dust seal
- ⑤ Locking wire

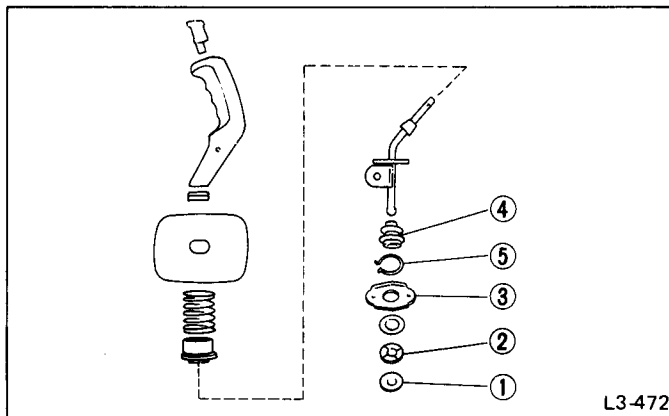


Fig. 13

3) Remove the cushion rubber.

4) Remove two nuts to disconnect the lever from the stay CP.

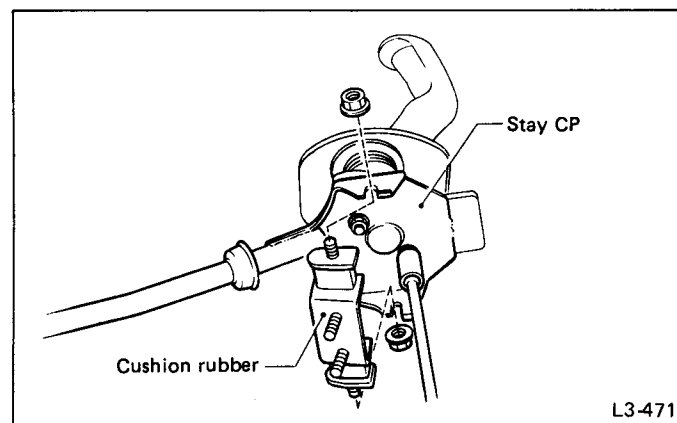


Fig. 12

6) Remove the following parts from the stay CP.
(FWD/Full-Time 4WD)

- ① Bushing
- ② Spacer
- ③ Spring bracket CP
- ④ Bracket CP

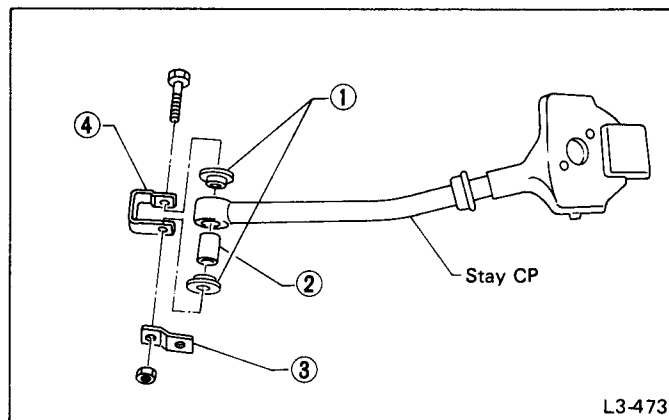


Fig. 14

(Selective 4WD)

- ① Bushing
- ② Washer
- ③ Spring plate
- ④ Bracket CP

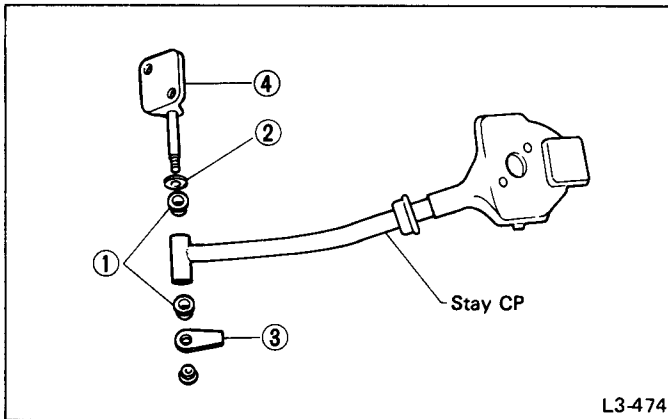


Fig. 15

CHECK

Check the following parts for deformation, damage, and wear. Repair or replace any defective parts. Determine defective parts by comparing with new parts.

- ① Bushing
- ② Cushion
- ③ Spacer
- ④ Dust seal
- ⑤ Link, rod, and lever
- ⑥ Joint CP
- ⑦ Spring
- ⑧ Wiring harness (Selective 4WD)

ASSEMBLY

- 1) Clean all parts before assembly.
- 2) Mount the following parts on the stay CP.

(FWD/Full-Time 4WD)

- ① Bushing
- ② Spacer
- ③ Spring bracket CP
- ④ Bracket CP

(Selective 4WD)

- ① Bushing
- ② Washer
- ③ Spring plate
- ④ Bracket CP

- 3) Assemble the plate CP and dust seal.

- (1) Tighten with the locking wire [1 mm (0.04 in) dia.] to the extent that the dust seal will not come off.
- (2) Direct the locking wire end toward the plate side so as not to damage the dust seal.

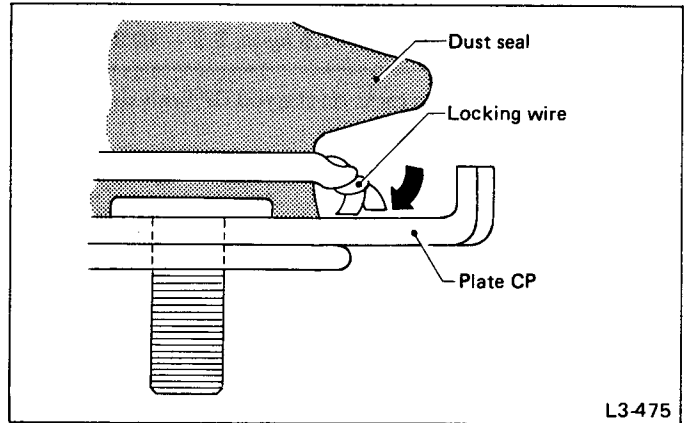


Fig. 16

- 4) Mount the following parts on the lever.

- ① Dust seal
- ② Bushing
 - Apply grease [SUNLIGHT No. 2 (003602010) or equivalent] to the inner surface of the bushing.
- ③ Cushion

- 5) Mount the above-mentioned lever on the stay CP.

- (1) Apply sealant on the stay CP surface mating with the plate, not at a place inside the bolt hole and where sealant will fall into the hollow.

Sealant: Butyl rubber tape [1.5 mm (0.059 in) dia.]

- (2) Mount the plate CP on the stay CP.

Tightening torque:

14 – 22 N·m (1.4 – 2.2 kg·m, 10 – 16 ft-lb)

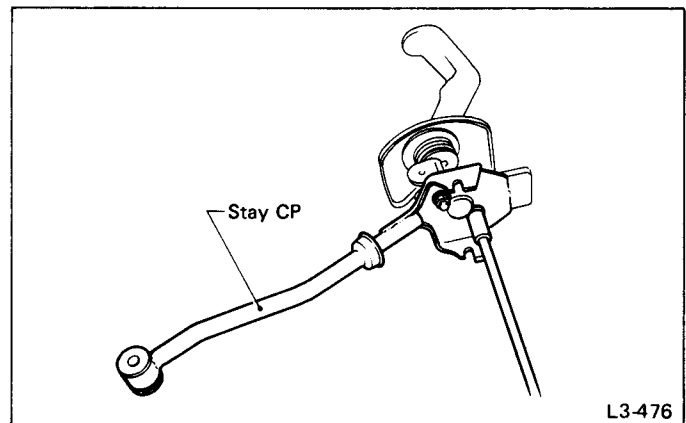


Fig. 17

- (3) After assembling, check that the lever moves smoothly.
- (4) Mount the cushion rubber on the stay CP.

Tightening torque:**Stay CP to cushion rubber**

9 – 15 N·m (0.9 – 1.5 kg-m, 6.5 – 10.8 ft-lb)

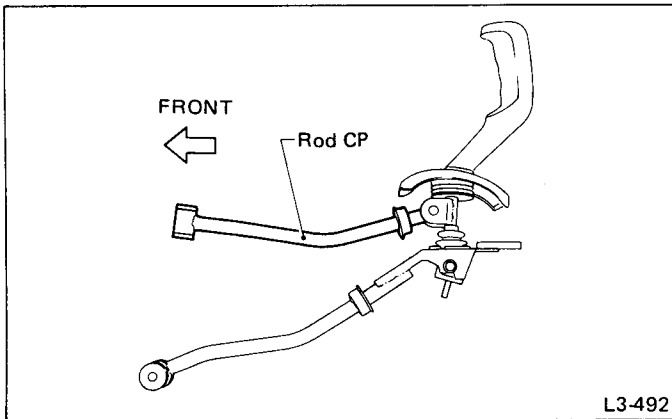
- 6) Mount the following parts on the rod CP both sides.

- ① Bushing (Rubber)
- ② Bushing (Nylon)
- ③ Spacer

(1) Apply grease [SUNLIGHT No. 2 (003602010) or equivalent] to the inner and side surfaces of the bushings when installing the spacers.

(2) Mount the chrome-plated (silver) spacer at the lever end and the galvanized (yellow) spacer at the transmission end.

(3) The rod should be installed in the direction shown in the figure below.



L3-492

Fig. 18

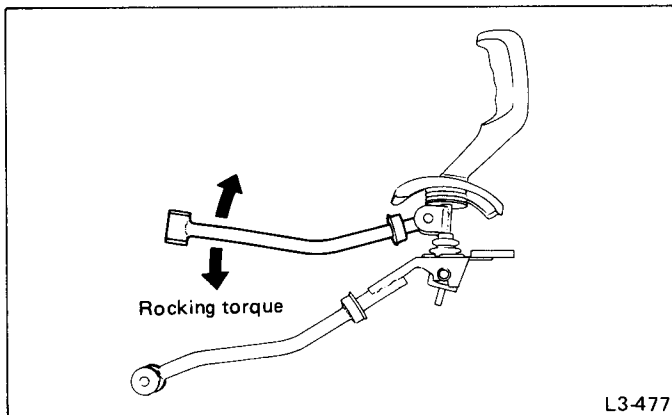
- 7) Connect the rod CP to the lever.

Tightening torque:

9 – 15 N·m (0.9 – 1.5 kg-m, 6.5 – 10.8 ft-lb)

Rocking torque:

2.7 N·m (0.28 kg-m, 2.0 ft-lb) or lower



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Fig. 19

- 8) Check that there is no excessive play and that the parts move smoothly.

INSTALLATION

- 1) Mount the rod CP at the joint on the transmission.
 - Insert the bolt from the lower side.

Tightening torque:

9 – 15 N·m (0.9 – 1.5 kg-m, 6.5 – 10.8 ft-lb)

- 2) Mount the bracket CP on the transmission.

Tightening torque:

14 – 22 N·m (1.4 – 2.2 kg-m, 10 – 16 ft-lb)

- 3) Mount the gearshift lever ASSY on the body.

Tightening torque:

14 – 22 N·m (1.4 – 2.2 kg-m, 10 – 16 ft-lb)

- 4) Mount the spring between joint CP and bracket CP.

For FWD models, the hook shape of the spring differs at each end. The longer hook end should be attached at the joint CP.

- 5) Connect the connector for 4WD switch. (Selective 4WD)
- 6) Install the console box. (Selective 4WD)
- 7) Check that the lever moves smoothly.
- 8) Install the exhaust pipe (rear).

Automatic Transmission**REMOVAL**

- 1) Remove the cable ASSY.
 - (1) Separate cable from transmission lever.
 - (2) Remove cable clamp from transmission case.

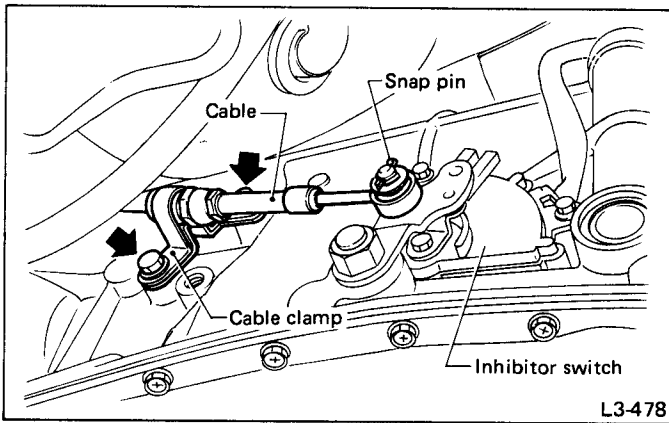


Fig. 20

(3) Disconnect cable from selector lever.

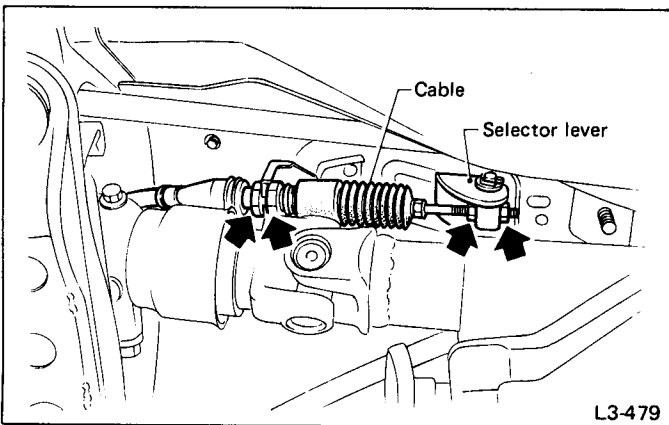


Fig. 21

(4) Remove the cable ASSY from bracket by removing mounting nuts.

- 2) Remove the hand brake cover.
- 3) Remove the console box. (Refer to 5-3 console box.)
- 4) Disconnect the illumination light connector and 1-HOLD switch connector.
- 5) Remove the selector lever ASSY.

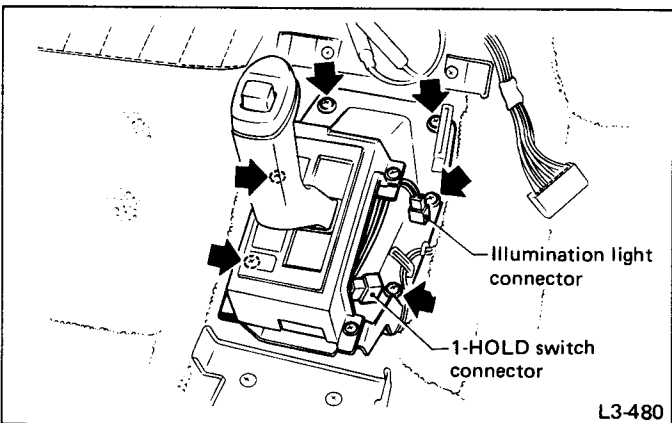


Fig. 22

Remove body and plate CP while removing butyl rubber seal.

DISASSEMBLY

- 1) Remove the following parts from the lever assembly.
 - Grip
 - Indicator ASSY

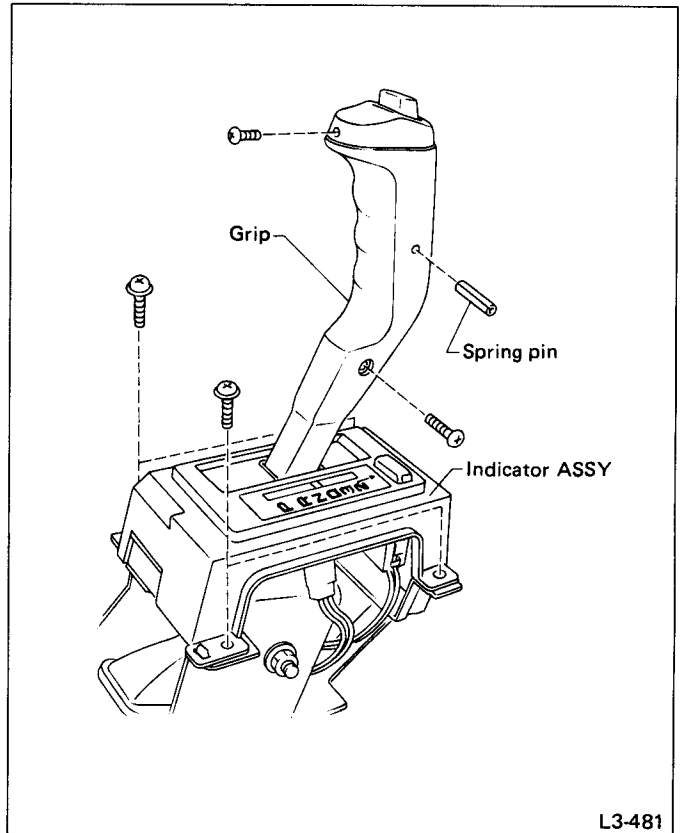


Fig. 23

- 2) Drive out the spring pin to the position where it is detached from the guide plate of plate CP as shown in figure.

Be careful not to damage the connected parts.

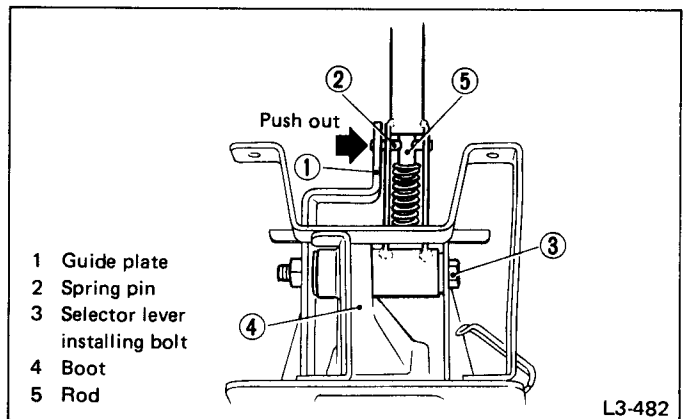


Fig. 24

3) Remove selector lever installing bolt and detach the boot by pushing it from underneath, then disconnect the selector lever from plate CP.

Do not remove the bushings from selector lever.

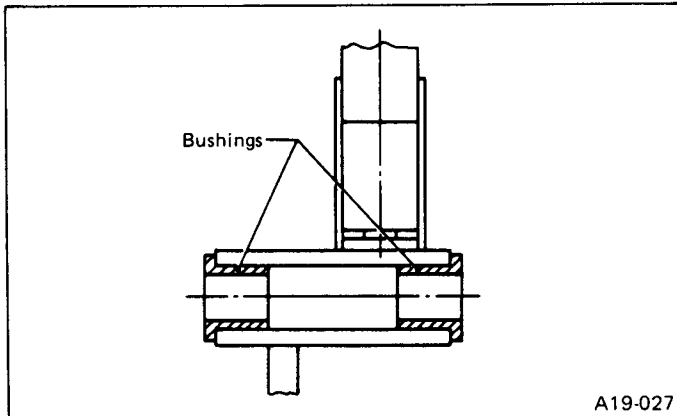


Fig. 25

4) Install the grip and button to the selector lever temporarily, and drive the spring pin out from rod, taking care not to make damage on connected parts.

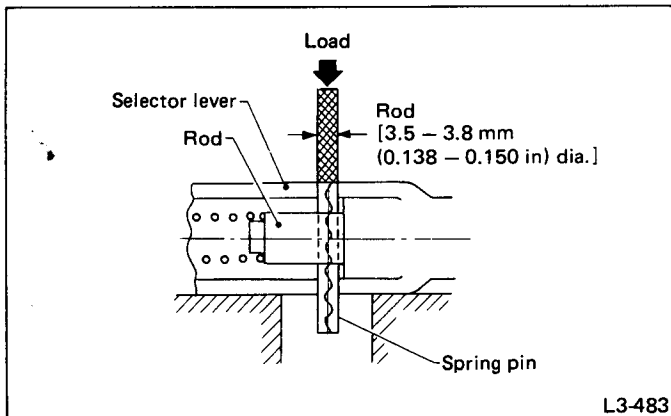


Fig. 26

INSPECTION

1) Inspect the removed parts by comparing with new ones for deformation, damage and wear. Correct or replace if defective.

- ① Rubber bushing
- ② Selector lever rod
- ③ Boot
- ④ Plate CP
- ⑤ Spring
- ⑥ Button
- ⑦ Grip
- ⑧ Indicator ASSY

2) Confirm the following parts for operating condition before assembly.

- (1) Sliding condition of the button in the grip ... they should be moved smoothly.
- (2) Insertion of the grip on the selector lever ... When pushing the grip on selector lever by hand, the screw holes should be aligned in line.
- (3) Operation of the selector lever and rod ... they should be moved smoothly.
- (4) Insertion of the spacer into the selector lever ... it should be inserted lightly by fingers.

ASSEMBLY

- 1) Clean all disassembled parts.
- 2) Assemble rod to selector lever.
 - (1) Apply grease on both sliding part ends of rod and spring, then insert them into selector lever.

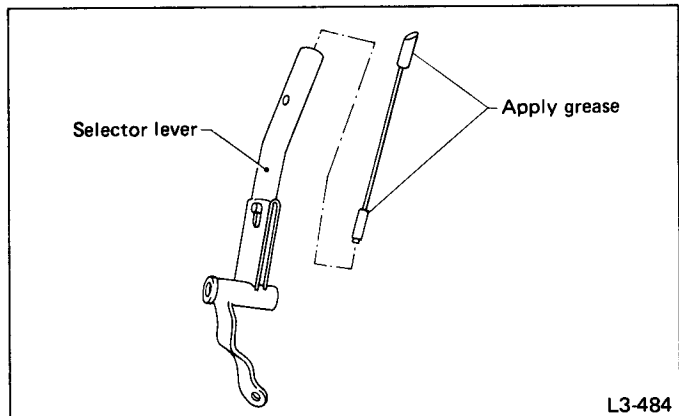


Fig. 27

- (2) Match the oblong hole of selector lever and the spring pin hole of rod.
- (3) Press the spring pin into the selector lever and rod from side opposite arm.

In order to prevent the spring pin from contacting with the guide plate of plate CP, stop the spring pin at the same level of selector lever outer surface as shown in figure.

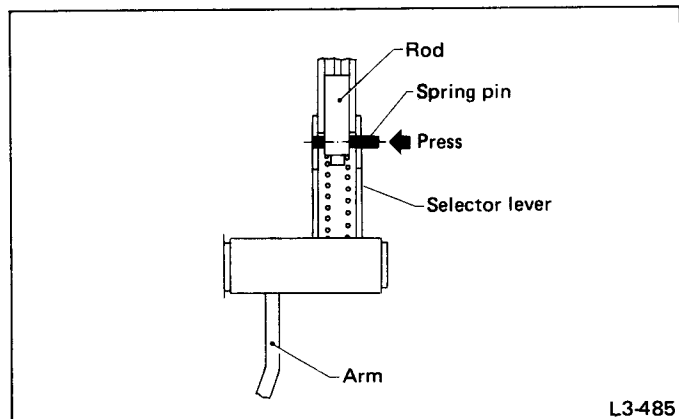


Fig. 28

3) Assemble the following parts to selector lever.

- ① Spring
Apply grease to prevent noise.
- ② Rubber bushing
- ③ Boot
Coat grease on sliding surface of the boot.
- ④ Spacer
Coat grease on the surface of spacer.
- ⑤ Connector
- ⑥ Washer
- ⑦ Snap pin

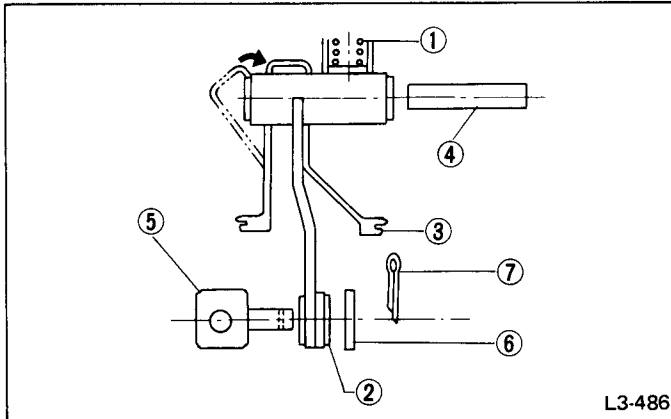


Fig. 29

4) Assemble selector lever to plate CP.

- (1) Install the selector lever to the plate CP, and insert the bolt. Tighten flange nut to the specified torque.

Tightening torque (Flange nut):

9 – 15 N·m (0.9 – 1.5 kg-m, 6.5 – 10.8 ft-lb)

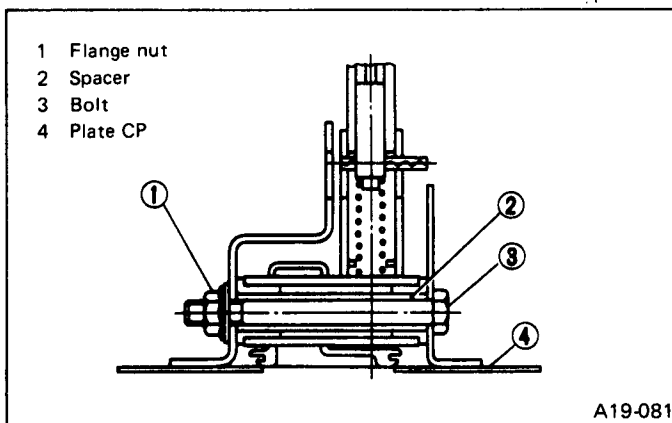


Fig. 30

- (2) Insert the boot into the plate by pushing boot edge with fingers.

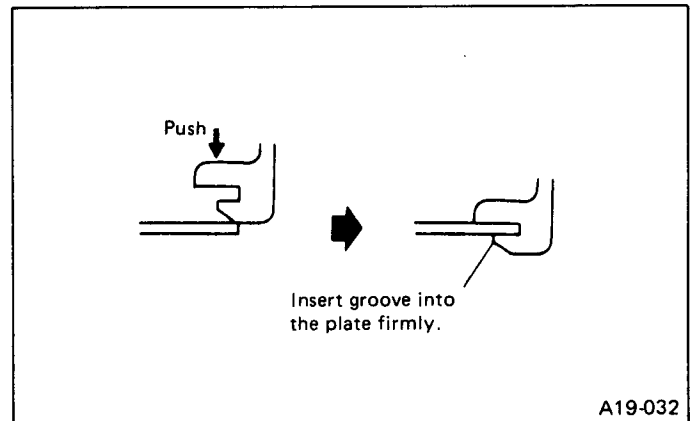


Fig. 31

- (3) Drive in the spring pin to the same level as selector lever outer surface.

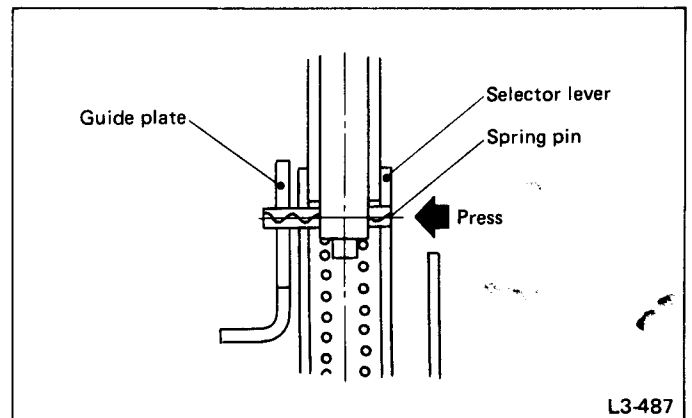


Fig. 32

5) Assemble indicator to plate CP.

Tightening torque (Flange screw):

1.3 – 2.6 N·m (0.13 – 0.27 kg-m, 0.9 – 2.0 ft-lb)

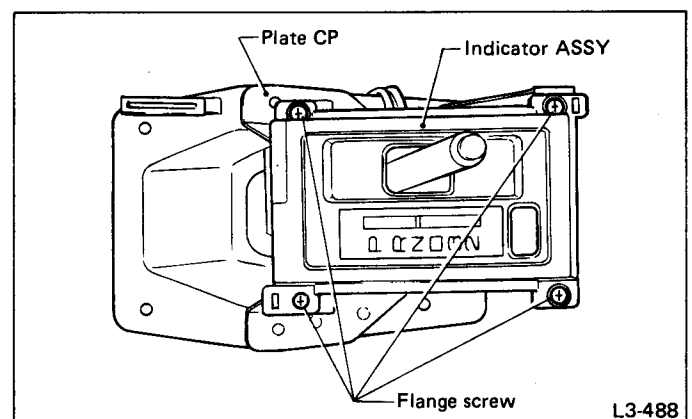


Fig. 33

6) Assemble the grip cover, spring, and button to selector lever.

- (1) Apply grease on the sliding part of the grip and button, and spring.
- (2) Insert the spring and button into the grip and then drive in the spring pin.

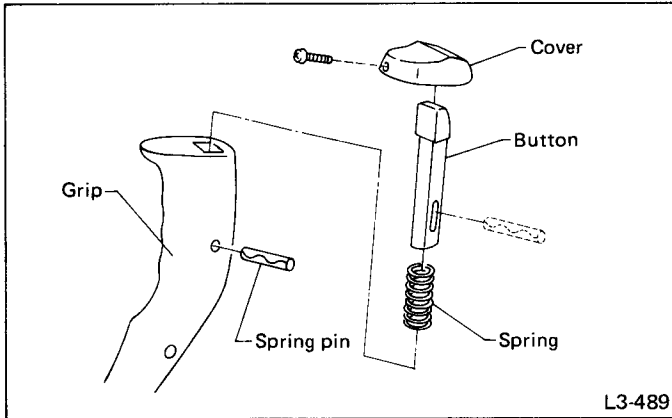


Fig. 34

- (3) Attach the cover on the grip.
- (4) Insert the grip on the select lever, then tighten screws to the specified torque with the torque driver.

Tightening torque:

1.3 – 2.6 N·m (0.13 – 0.27 kg·m, 0.9 – 2.0 ft·lb)

5 to 6 mm (0.20 to 0.24 in) length screw should be used.

7) After the completion of fitting, transfer the select lever to range "P" ~ "2", pressing the button of the grip; then check whether the indicator and select lever agree, whether the pointer and position mark agree and what the operating force is.

INSTALLATION

- 1) Mount the select lever ASSY onto the car body.
 - (1) Apply Butyl rubber (sealing agent) between the select lever through the hole in the car body and the threaded fitting hole, and use six bolts for fitting.

Tightening torque:

4.4 – 7.4 N·m (0.45 – 0.75 kg·m, 3.3 – 5.4 ft·lb)

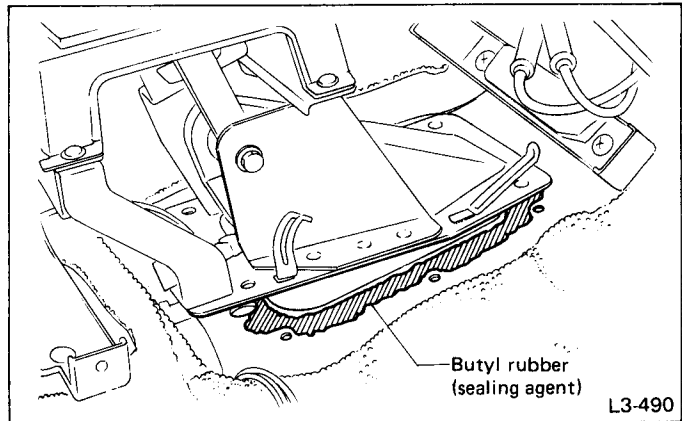


Fig. 35

- (2) Set the location of the select lever at "N".
- 2) Connect the cable ASSY.
 - (1) Set the location of the selector arm of the transmission at "N".
 - (2) Pass the inner cable through the selector arm pin and then connect it using a washer and snap pin.

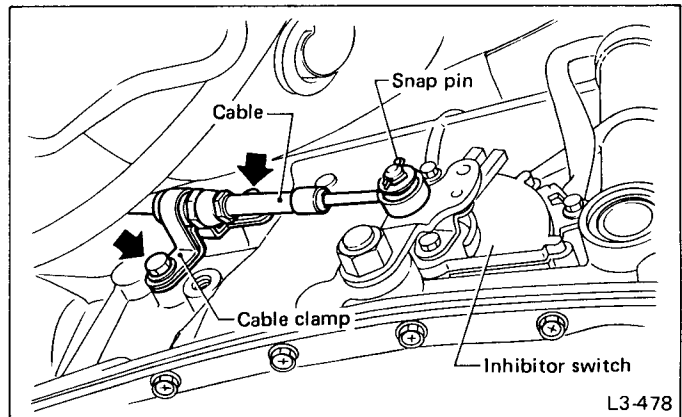


Fig. 36

- (3) Attach the outer cable to transmission case with bolts.
- (4) Insert the thread portion of the other inner cable end into the connector hole of the selector lever, and fix the other outer cable end to the bracket.

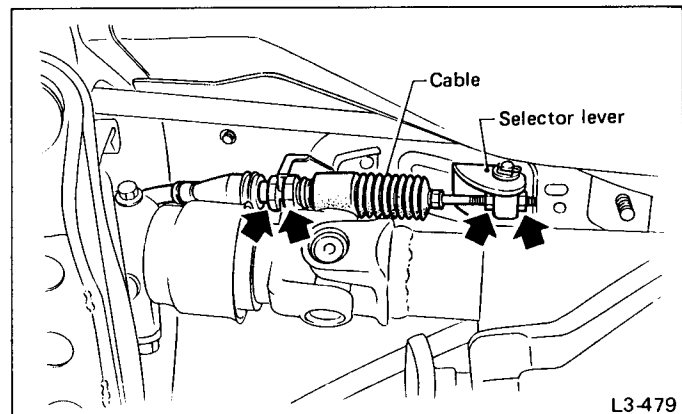


Fig. 37

- 3) Adjust the inner cable length.
(1) Push select lever arm in the "W" direction with a force of 2.0 – 6.9 N (0.2 – 0.7 kg, 0.4 – 1.5 lb) until nut ① contacts the connector.

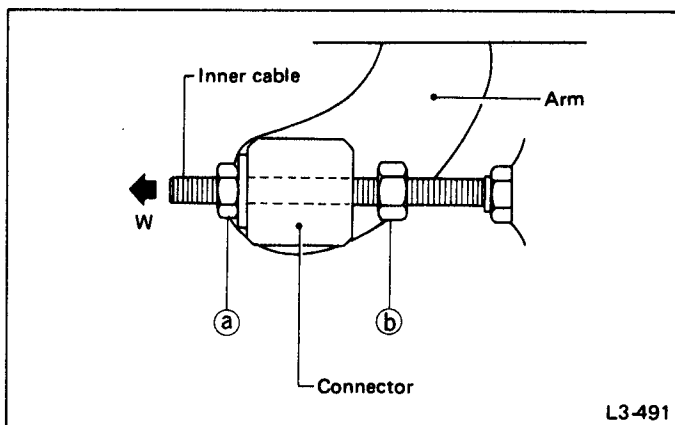


Fig. 38

- (2) While firmly grasping nut ① with a wrench, tighten nut ②.

Tightening torque:

13 – 23 N·m (1.3 – 2.3 kg·m, 9 – 17 ft·lb)

- 4) After completion of the fitting, make sure that the lever operates smoothly all across the operating range.
- 5) Connect the harnesses and check the following items.
- (1) The engine starts operating when it is in positions "P" and "N", but not in other positions.
 - (2) The back-up lamp is lit when it is in position "R", but not in other positions.
 - (3) The above starting and lighting are not performed at the same time.
 - (4) Check that select lever does not move from "N" to "R" without pushing the button.
 - (5) Check that select lever does not move from "R" to "P" without pushing the button.
 - (6) Check that select lever does not move from "P" to "R" without pushing the button.
 - (7) Check that select lever does not move from "3" to "2" without pushing the button.
- 6) Fit the console.