

TRANSMISSION SECTION

This service manual has been prepared to provide SUBARU service personnel with the necessary information and data for the correct maintenance and repair of SUBARU vehicles.

This manual includes the procedures for maintenance, disassembling, reassembling, inspection and adjustment of components and diagnostics for guidance of experienced mechanics.

Please peruse and utilize this manual fully to ensure complete repair work for satisfying our customers by keeping their vehicle in optimum condition. When replacement of parts during repair work is needed, be sure to use SUBARU genuine parts.

All information, illustration and specifications contained in this manual are based on the latest product information available at the time of publication approval.

CONTROL SYSTEMS**CS****AUTOMATIC TRANSMISSION****AT****AUTOMATIC TRANSMISSION
(DIAGNOSTICS)****AT****MANUAL TRANSMISSION AND
DIFFERENTIAL****MT****CLUTCH SYSTEM****CL**

CONTROL SYSTEMS



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GENERAL DESCRIPTION

CONTROL SYSTEMS

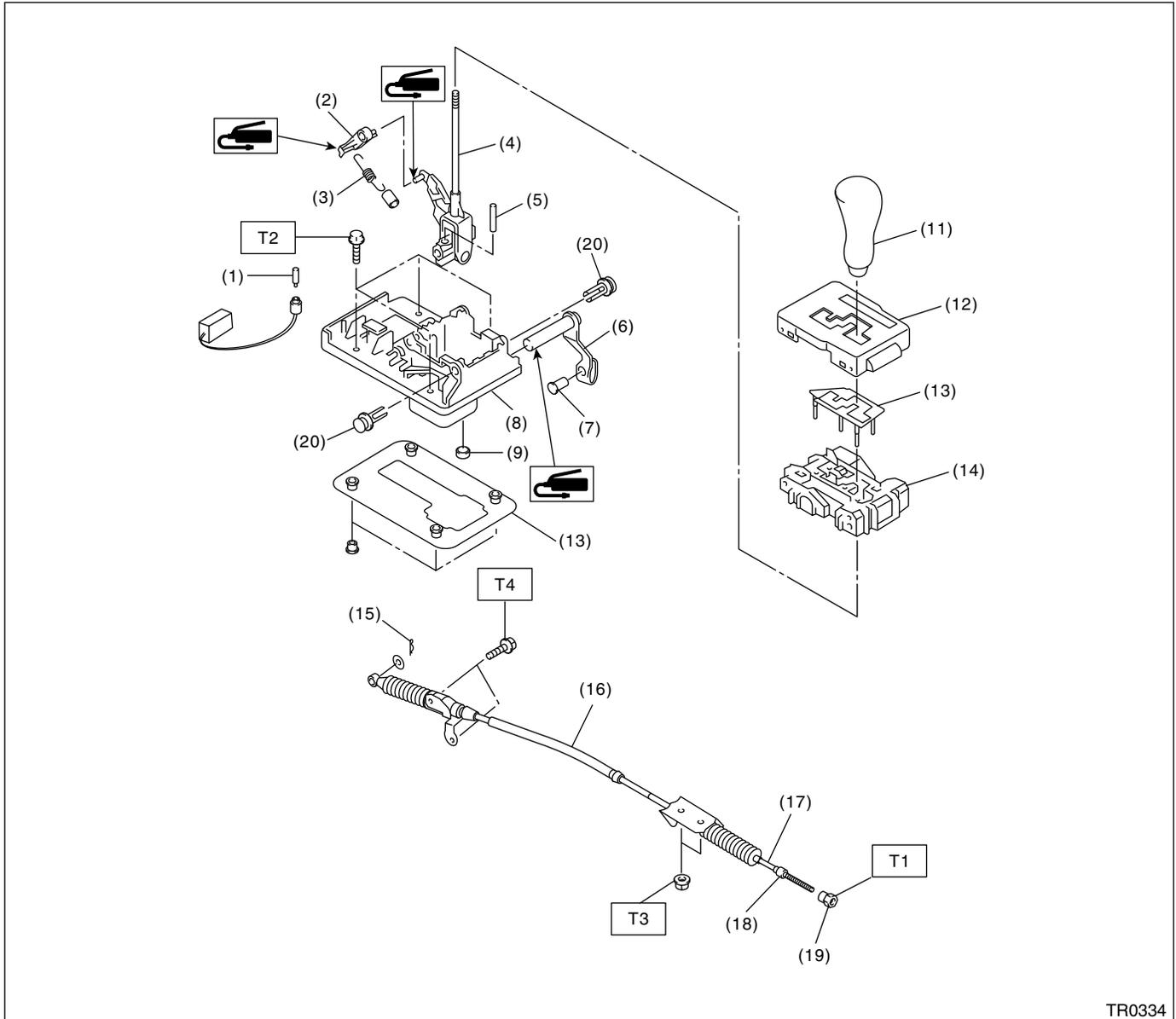
1. General Description

A: SPECIFICATIONS

Item	Specification
Vibration torque of rod against lever N·m (kgf-m, ft-lb)	0.7 (0.07, 0.5) or less

B: COMPONENT

1. AT SELECT LEVER



TR0334

- | | | |
|--------------------------|----------------------|------------|
| (1) Indicator light bulb | (10) Packing | (19) Nut A |
| (2) Detent arm | (11) Grip | (20) Clip |
| (3) Detent spring | (12) Indicator cover | |
| (4) Select lever upper | (13) Cushion | |
| (5) Straight pin | (14) Guide plate | |
| (6) Select lever lower | (15) Snap pin | |
| (7) Pin | (16) Outer cable | |
| (8) Plate | (17) Inner cable | |
| (9) Grommet | (18) Nut B | |

Tightening torque: N-m (kgf-m, ft-lb)

T1: 7.5 (0.76, 5.5)

T2: 13 (1.3, 9.4)

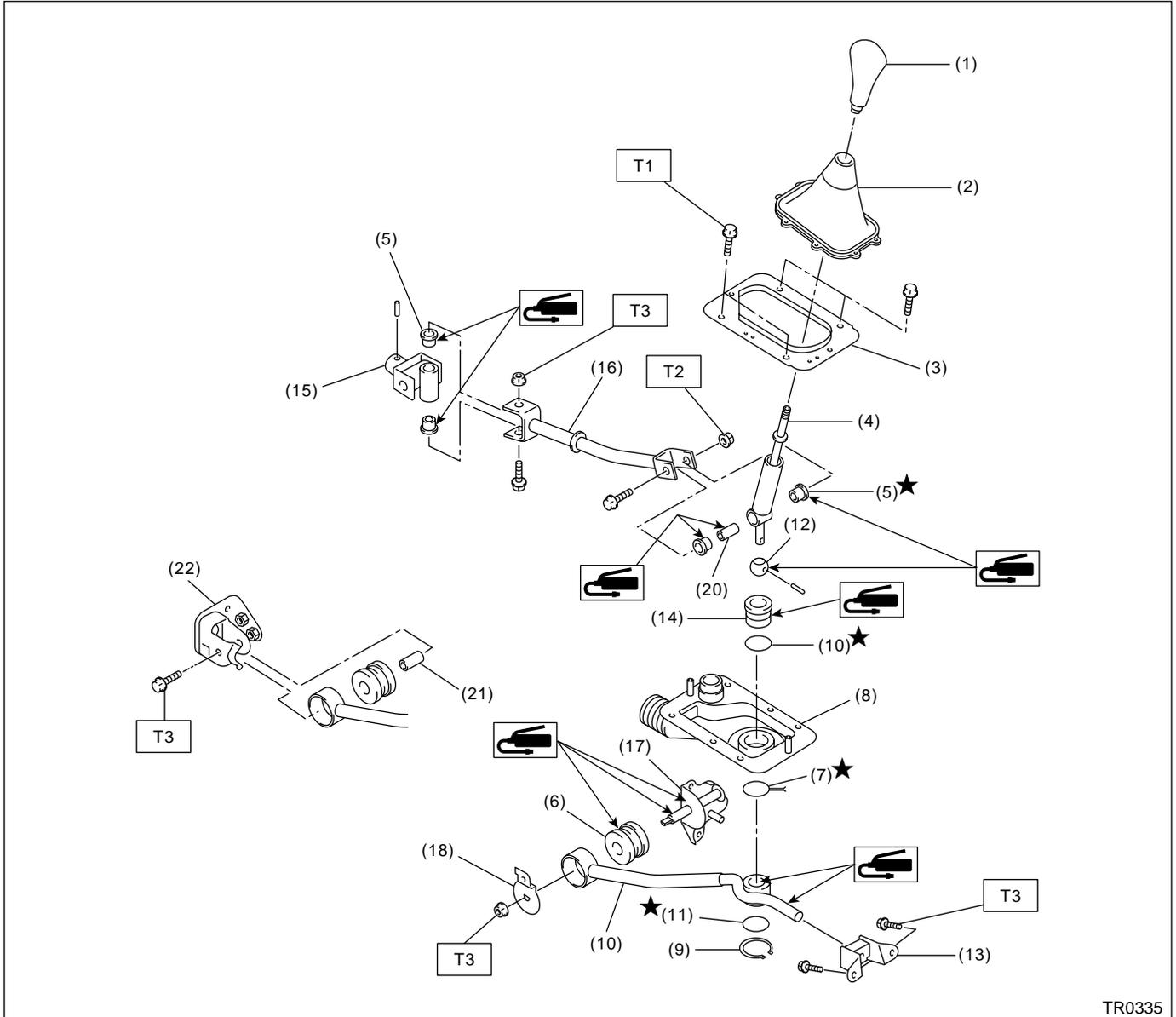
T3: 18 (1.8, 13.0)

T4: 33 (3.4, 25)

GENERAL DESCRIPTION

CONTROL SYSTEMS

2. MT GEAR SHIFT LEVER



TR0335

- | | | |
|--------------------------|----------------------------|--------------------------|
| (1) Gear shift knob | (10) O-ring A | (19) Stay |
| (2) Console boot | (11) O-ring B | (20) Spacer |
| (3) Boot plate | (12) Bushing (Shift lever) | (21) Spacer (FWD model) |
| (4) Lever | (13) Cushion rubber | (22) Bracket (FWD model) |
| (5) Bushing | (14) Bushing (Stay rear) | |
| (6) Bushing (Stay front) | (15) Joint | |
| (7) Locking wire | (16) Rod | |
| (8) Boot | (17) Bracket (AWD model) | |
| (9) Snap ring | (18) Washer | |

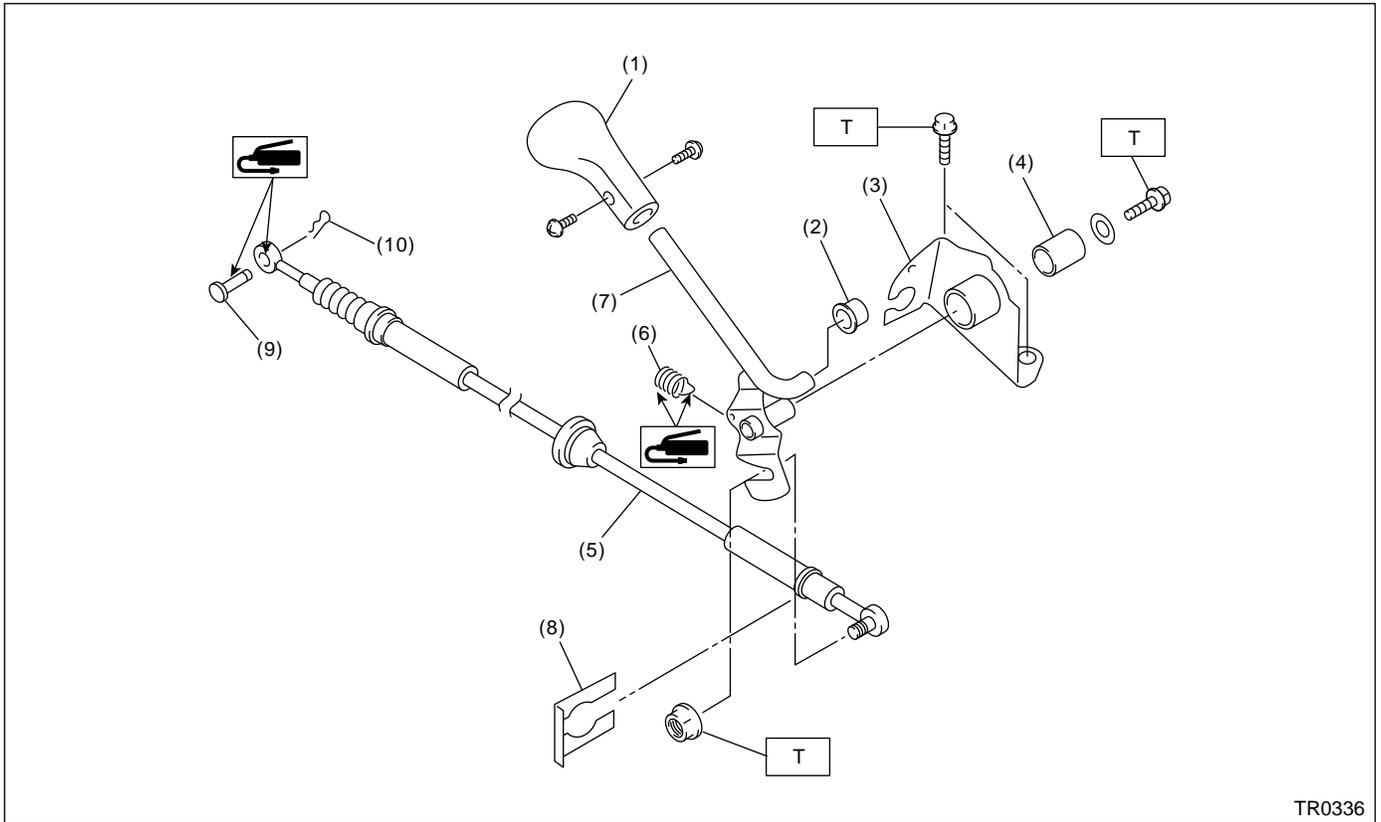
Tightening torque: N-m (kgf-m, ft-lb)

T1: 7.5 (0.76, 5.5)

T2: 11.8 (1.2, 8.7)

T3: 18 (1.8, 13.0)

3. DRIVE SELECT LEVER



TR0336

- | | |
|-------------|----------------|
| (1) Knob | (6) Spring |
| (2) Cap | (7) Lever |
| (3) Plate | (8) Clamp |
| (4) Bushing | (9) Clevis pin |
| (5) Cable | (10) Snap ring |

Tightening torque: N·m (kgf·m, ft·lb)
T: 18 (1.8, 13.0)

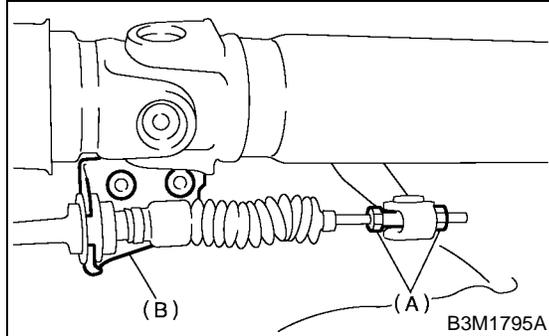
C: CAUTION

- Wear working clothing, including a cap, protective goggles, and protective shoes during operation.
- Remove contamination including dirt and corrosion before removal, installation or disassembly.
- Keep the disassembled parts in order and protect them from dust or dirt.
- Before removal, installation or disassembly, be sure to clarify the failure. Avoid unnecessary removal, installation, disassembly, and replacement.
- Use SUBARU genuine grease etc. or the equivalent. Do not mix grease etc. with that of another grade or from other manufacturers.
- Be sure to tighten fasteners including bolts and nuts to the specified torque.
- Place shop jacks or safety stands at the specified points.
- Apply grease onto sliding or revolution surfaces before installation.
- Before installing O-rings or snap rings, apply sufficient amount of grease to avoid damage and deformation.
- Before securing a part on a vice, place cushioning material such as wood blocks, aluminum plate, or shop cloth between the part and the vice.
- Before disconnecting electrical connectors, be sure to disconnect negative terminal from battery.

2. Select Lever

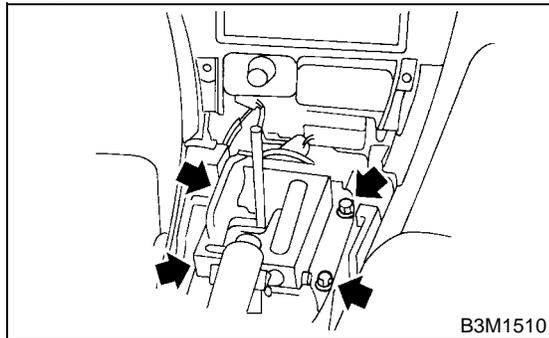
A: REMOVAL

- 1) Set the vehicle on the lift.
- 2) Disconnect ground terminal from battery.
- 3) Move the select lever to the "N" position.
- 4) Lift-up the vehicle.
- 5) Remove rear exhaust pipe and muffler.
- 6) Remove heat shield cover. (If equipped)
- 7) Disconnect cable from select lever and then remove cable bracket.



- (A) Adjusting nuts
- (B) Cable bracket

- 8) Lower the vehicle.
- 9) Remove console box. <Ref. to EI-24, REMOVAL, Console Box.>
- 10) Disconnect the connectors, then remove the four bolts to take out the select lever assembly from the body.

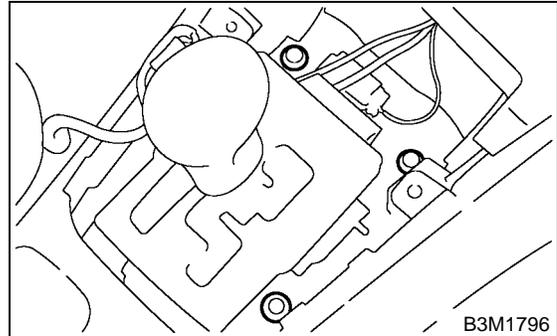


B: INSTALLATION

- 1) Mount the select lever onto the vehicle body.
- 2) Tighten the four bolts to install the select lever to the vehicle body, then connect connector.

Tightening torque:

13 N·m (1.3 kgf-m, 9.4 ft-lb)



- 3) Install console box. <Ref. to EI-22, INSTALLATION, Glove Box.>
- 4) Set location of select lever at "N" position.
- 5) Lift-up the vehicle.
- 6) Set location of range select lever to "N" position.
- 7) Insert the thread portion of the other inner cable and into the connector hole of the select lever, and fix the other outer cable end to the bracket.
- 8) Adjust the select cable position. <Ref. to CS-10, ADJUSTMENT, Select Cable.>
- 9) After completion of fitting, make sure that the select lever operates smoothly all across the operating range.
- 10) Inspect the following items. If the following inspection reveals problems, adjust the select cable and inhibitor switch. <Ref. to CS-10, ADJUSTMENT, Select Cable.> and <Ref. to AT-28, ADJUSTMENT, Inhibitor Switch.>
 - (1) The engine starts operating when select lever is in position "P", but not in other positions.
 - (2) The back-up light is lit when the select lever is in position "R", but not in other positions.
 - (3) Select lever and indicator positions are matched.
- 11) Install heat shield cover. (If equipped)
- 12) Install rear exhaust pipe and muffler.

SELECT LEVER

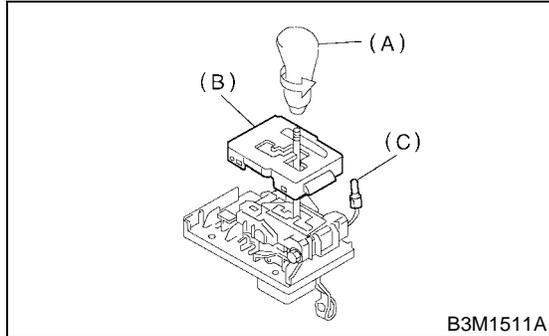
CONTROL SYSTEMS

C: DISASSEMBLY

- 1) Remove grip.
- 2) Remove indicator light and then remove indicator cover.

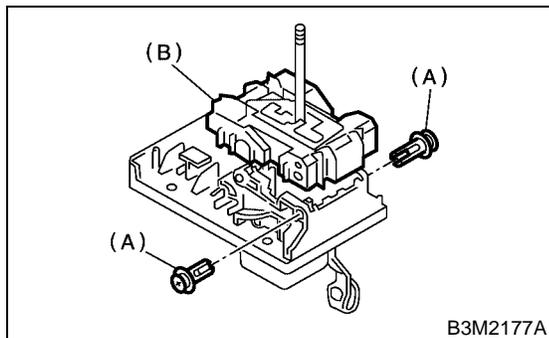
NOTE:

Be careful not to break the indicator light during removal.



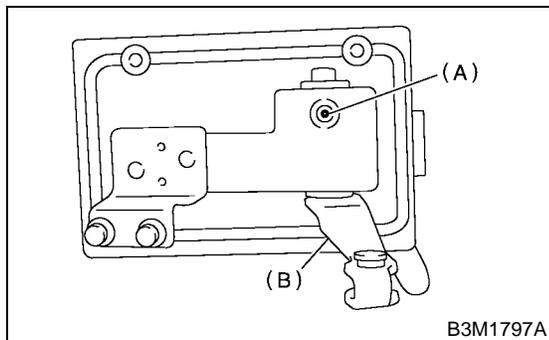
- (A) Grip
- (B) Indicator cover
- (C) Indicator light

- 3) Remove clips and then remove guide plate.



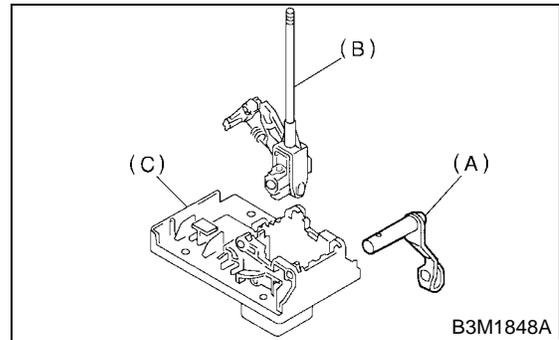
- (A) Clips
- (B) Guide plate

- 4) Remove cap and then extract straight pin.



- (A) Straight pin
- (B) Select lever lower

- 5) Remove select lever lower then take away select lever upper from plate.



- (A) Select lever lower
- (B) Select lever upper
- (C) Plate

D: ASSEMBLY

- 1) Clean all parts before assembly.
- 2) Apply grease [NIGTIGHT LYW No. 2 or equivalent] to each parts. <Ref. to CS-3, AT Select Lever.>
- 3) Assembly is in the reverse order of disassembly.
- 4) After completion of fitting, transfer select lever to range "P" — "1", then check whether the indicator and select lever agree, whether the pointer and position mark agree and what the operating force is.

E: INSPECTION

- 1) Inspect removed parts by comparing with new ones for deformation, damage and wear. Correct or replace if defective.
- 2) Confirm the following parts for operating condition before assembly. Moving condition of the selector lever upper... it should move smoothly.

3. Select Cable

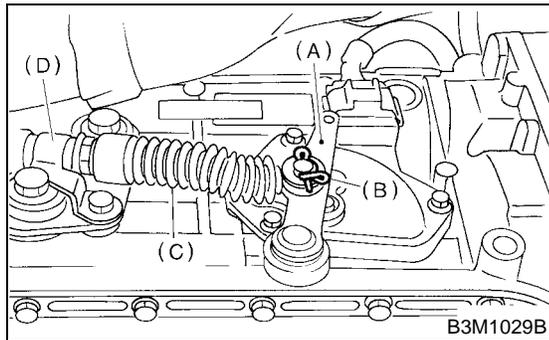
A: REMOVAL

- 1) Set the vehicle on the lift.
- 2) Disconnect ground terminal from battery.
- 3) Prior to removal, set lever to "N" position.
- 4) Lift-up the vehicle.
- 5) Remove front and center exhaust pipe.

CAUTION:

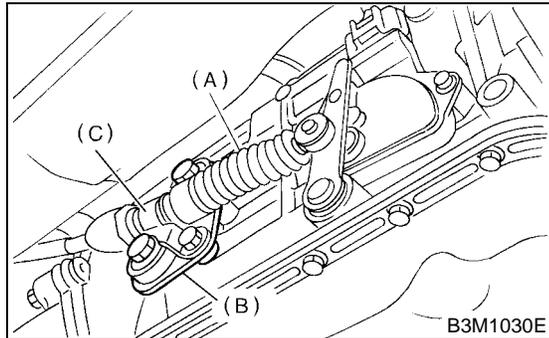
When removing exhaust pipes, be careful each exhaust pipe does not drop out.

- 6) Remove heat shield cover. (If equipped)
- 7) Remove snap pin from range select lever.



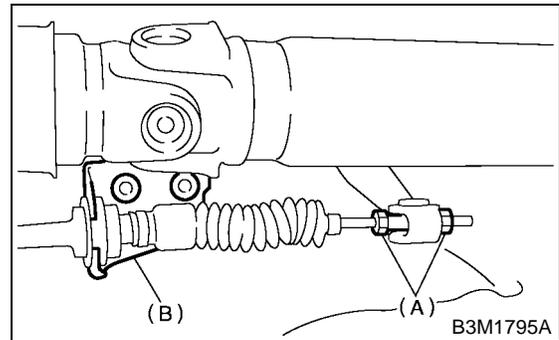
- (A) Range select lever
- (B) Snap pin
- (C) Select cable
- (D) Clamp

- 8) Remove plate assembly from transmission case.



- (A) Select cable
- (B) Plate ASSY
- (C) Clamp

- 9) Disconnect cable from select lever and then remove cable bracket.



- (A) Adjusting nuts
- (B) Cable bracket

- 10) Remove select cable from plate assembly.

SELECT CABLE

CONTROL SYSTEMS

B: INSTALLATION

1) Install select cable to plate assembly.

Tightening torque:

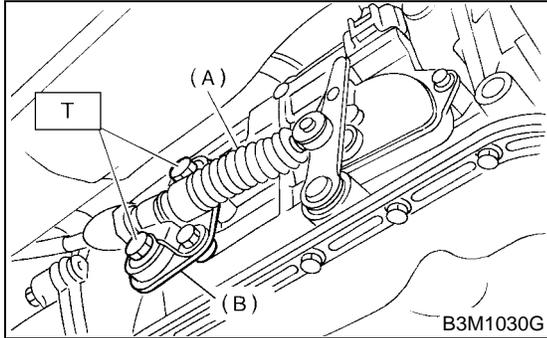
32 N·m (3.3 kgf-m, 24 ft-lb)

2) Install select cable to range select lever.

3) Install plate assembly to transmission.

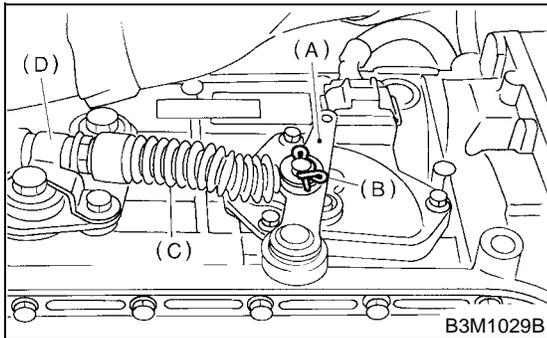
Tightening torque:

T: 24.5 N·m (2.5 kgf-m, 18.1 ft-lb)



- (A) Select cable
- (B) Plate ASSY

4) Install snap pin to range select lever.



- (A) Range select lever
- (B) Snap pin
- (C) Select cable
- (D) Clamp

5) Move the select lever to the "N" position, then adjust the select cable position. <Ref. to CS-10, ADJUSTMENT, Select Cable.>

6) Install heat shield cover. (If equipped)

7) Install from and center exhaust pipe.

C: INSPECTION

Check the removed cable and replace if damaged, rusty, or malfunctioning.

1) Check for smooth operation of the cable.

2) Check the inner cable for damage and rust.

3) Check the outer cable for damage, bends, and cracks.

4) Check the boot for damage, cracks, and deterioration.

5) Move select lever from "P" position to "1" position. You should be able to feel the detentes in each position. If the detentes cannot be felt or the position pointer is improperly aligned, adjust the cable.

D: ADJUSTMENT

1) Set the vehicle on the lift.

2) Disconnect ground terminal from battery.

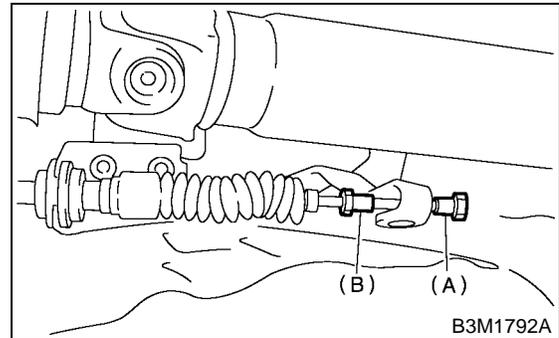
3) Set lever to "N" position.

4) Lift-up the vehicle.

5) Remove rear exhaust pipe and muffler.

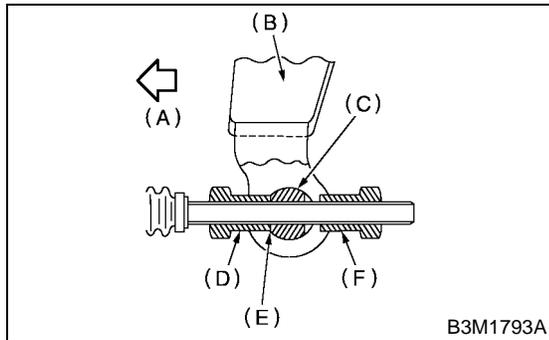
6) Remove heat shield cover. (If equipped)

7) Loosen the adjusting nut on each side.



- (A) Adjusting nut A
- (B) Adjusting nut B

8) Turn adjusting nut B until it lightly touches the connector.

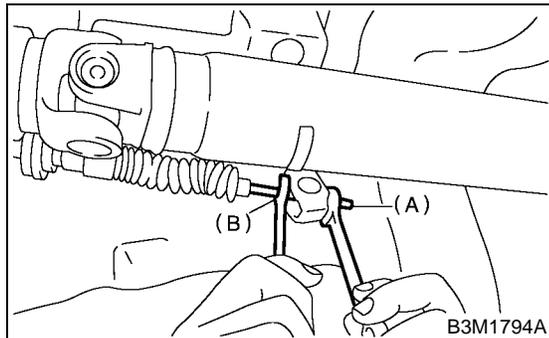


- (A) Front side
- (B) Select lever
- (C) Connector
- (D) Adjusting nut B
- (E) Contact point
- (F) Adjusting nut A

9) While preventing adjusting nut B from moving with a wrench, tighten adjusting nut A.

Tightening torque:

7.5 N·m (0.76 kgf-m, 5.5 ft-lb)



- (A) Adjusting nut A
- (B) Adjusting nut B

10) After completion of fitting, make sure that the select lever operates smoothly all across the operating range.

11) Install in the reverse order of removal.

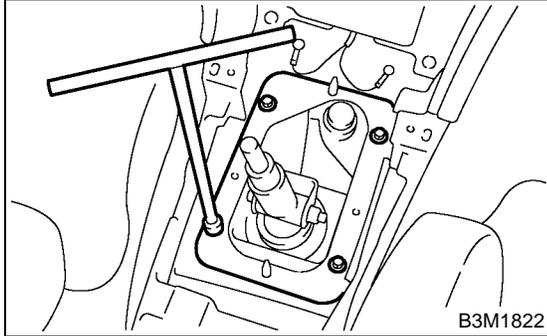
MT GEAR SHIFT LEVER

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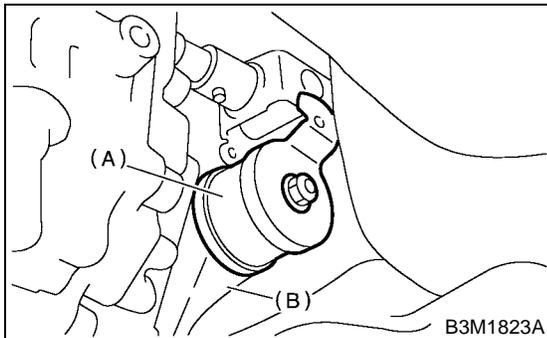
4. MT Gear Shift Lever

A: REMOVAL

- 1) Set the vehicle on the lift.
- 2) Remove gear shift knob.
- 3) Disconnect ground terminal from battery.
- 4) Remove console box. <Ref. to EI-24, REMOVAL, Console Box.>
- 5) Remove boot plate from body.

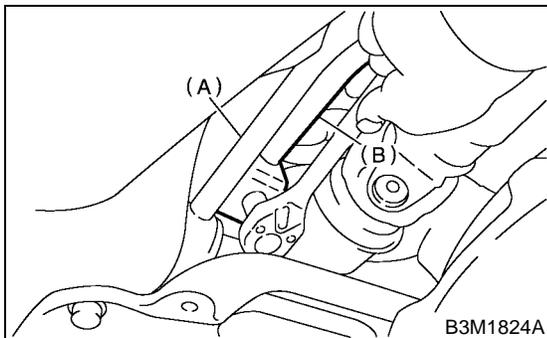


- 6) Lift-up the vehicle.
- 7) Remove rear exhaust pipe and muffler.
- 8) Remove heat shield cover. (If equipped)
- 9) Remove stay from transmission bracket.



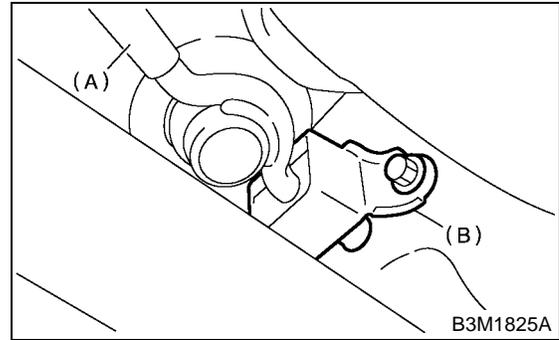
- (A) Stay
- (B) Transmission bracket

- 10) Remove rod from joint.



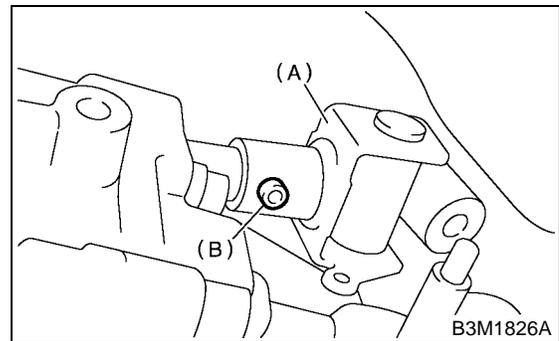
- (A) Stay
- (B) Rod

- 11) Remove cushion rubber from body.



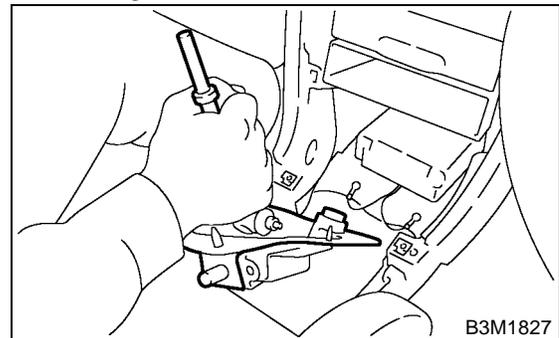
- (A) Rod
- (B) Cushion rubber

- 12) Remove joint and then extract straight pin.



- (A) Joint
- (B) Straight pin

- 13) Lower the vehicle.
- 14) Remove gear shift lever.

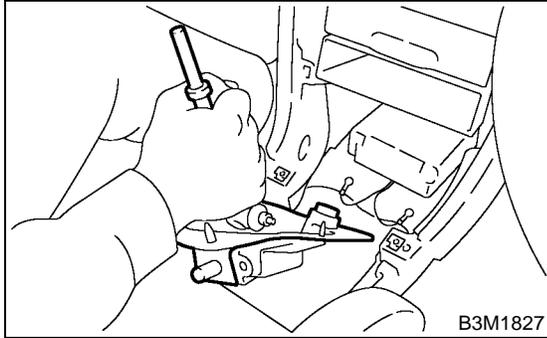


B: INSTALLATION

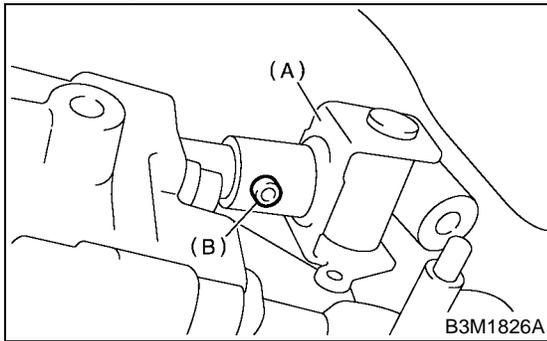
- 1) Install the joint to the transmission and secure with the straight pin.
- 2) Insert gear shift lever from room side.

NOTE:

After inserting rod and stay, temporarily put them onto transmission mount.

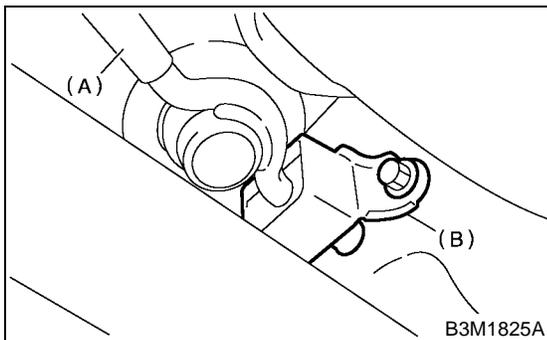


- 3) Lift-up the vehicle.
- 4) Install joint to shifter arm.
- 5) Insert straight pin.



- 6) Mount cushion rubber on the body.

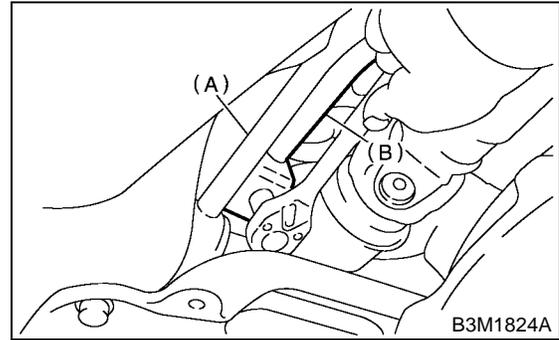
Tightening torque:
18 N·m (1.8 kgf·m, 13.0 ft·lb)



- (A) Cushion rubber
- (B) Stay

- 7) Connect rod to the joint.

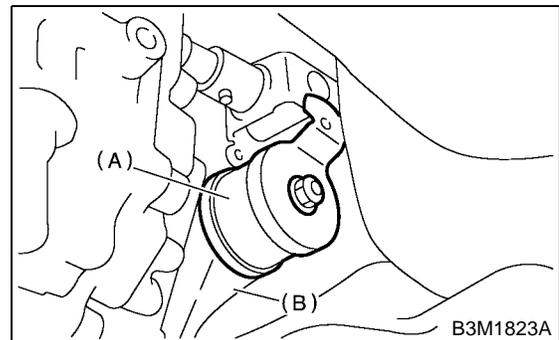
Tightening torque:
18 N·m (1.8 kgf·m, 13.0 ft·lb)



- (A) Stay
- (B) Rod

- 8) Connect stay to transmission bracket.

Tightening torque:
18 N·m (1.8 kgf·m, 13.0 ft·lb)



- (A) Stay
- (B) Transmission bracket

- 9) Install heat shield cover. (If equipped)
- 10) Install rear exhaust pipe and muffler.
- 11) Lower the vehicle.
- 12) Install boot plate to body.

Tightening torque:
7.5 N·m (0.76 kgf·m, 5.5 ft·lb)

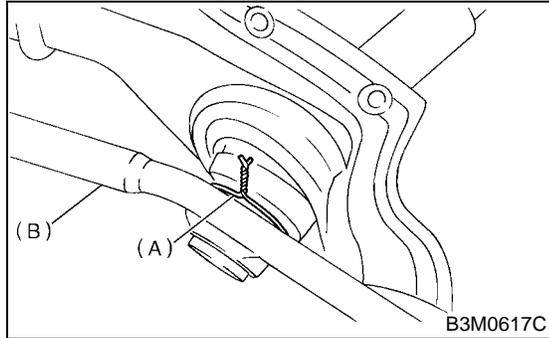
- 13) Install consol box. <Ref. to EI-24, INSTALLATION, Console Box.>

MT GEAR SHIFT LEVER

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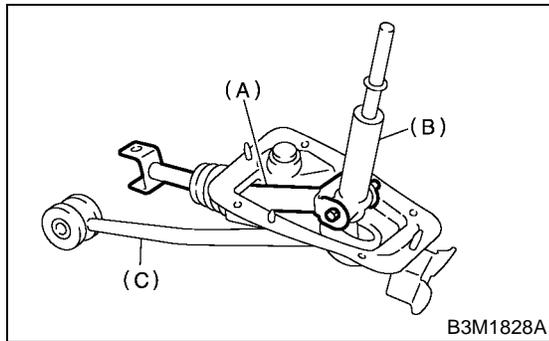
C: DISASSEMBLY

1) Disassemble locking wire.



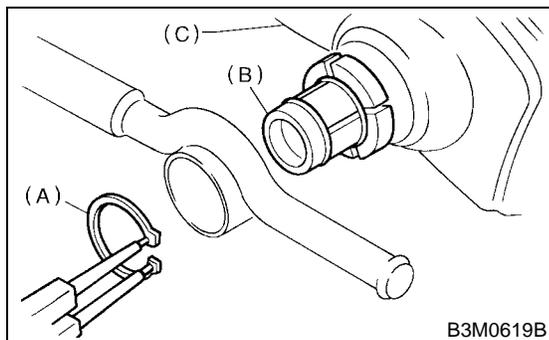
- (A) Locking wire
- (B) Stay

2) Remove rod from gear shift lever.



- (A) Rod
- (B) Gear shift lever
- (C) Stay

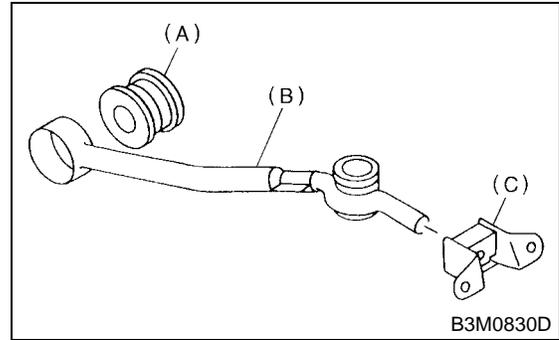
3) Remove snap ring from bush D, then disconnect stay.



- (A) Snap ring
- (B) Bushing D
- (C) Boot

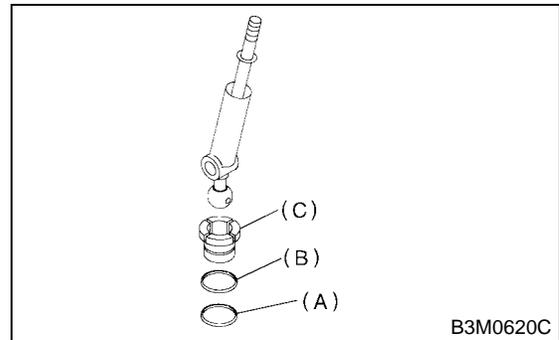
4) Remove boot from gear shift lever.

5) Remove bush and cushion rubber from stay.



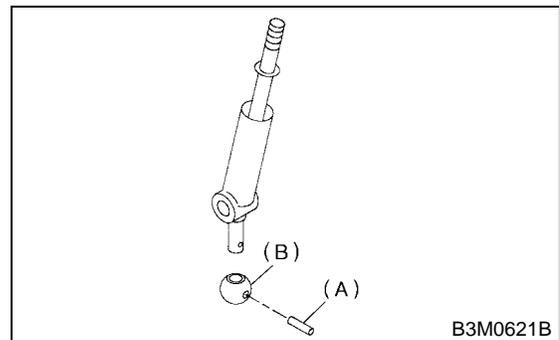
- (A) Bushing
- (B) Stay
- (C) Cushion rubber

6) Remove O-ring, then disconnect bush D.



- (A) O-ring A
- (B) O-ring B
- (C) Bushing D

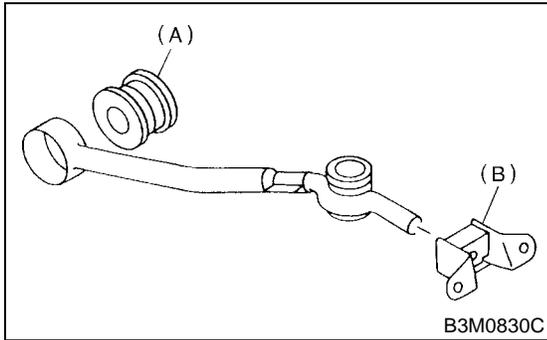
7) Draw out straight pin, then remove bush C from gear shift lever.



- (A) Straight pin
- (B) Bushing C

D: ASSEMBLY

- 1) Clean all parts before assembly.
- 2) Mount the bushing B and cushion rubber on the stay.

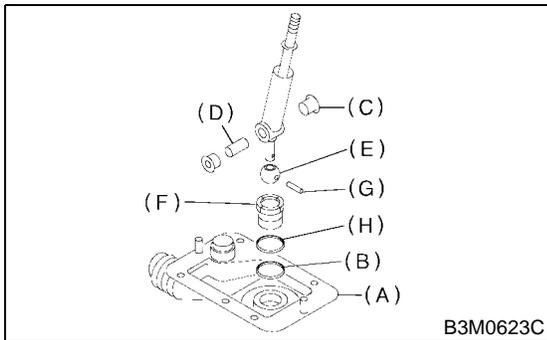


- (A) Bushing
- (B) Cushion rubber

- 3) Mount each part; boot, O-ring, bush A, spacer, bush B, bush D and straight pin on the gear shift lever.

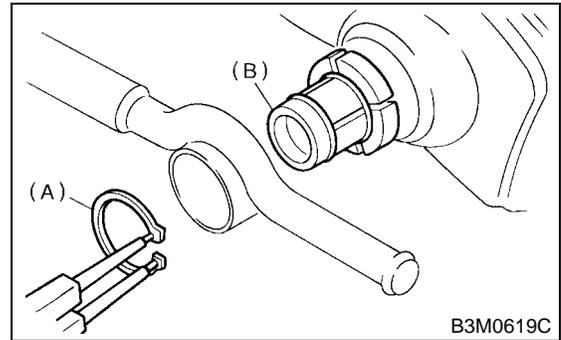
CAUTION:

- Always use new O-rings.
- Apply grease [DNIGHTIGHT LYW No. 2 or equivalent] to the inner and side surfaces of the bushing when installing the spacer.



- (A) Boot
- (B) O-ring B
- (C) Bushing A
- (D) Spacer
- (E) Bushing C
- (F) Bushing D
- (G) Straight pin
- (H) O-ring A

- 4) Insert the gear shift lever into the boot hole.
- 5) Install snap ring and stay to the bushing D.

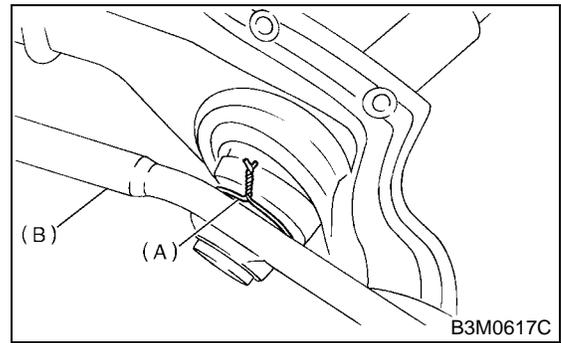


- (A) Snap ring
- (B) Bushing D

- 6) Tighten with locking wire to the extent that the boot will not come off.

CAUTION:

Always use new locking wire.

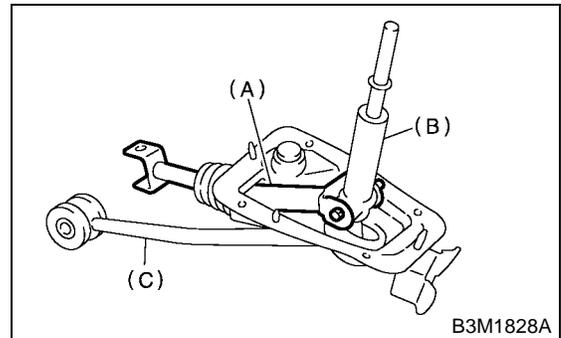


- (A) Locking wire
- (B) Stay

- 7) Insert the rod into the boot hole.
- 8) Connect rod to gear shift lever.

Tightening torque:

11.8 N·m (1.2 kgf·m, 8.7 ft·lb)



- (A) Rod
- (B) Shift lever
- (C) Stay

MT GEAR SHIFT LEVER

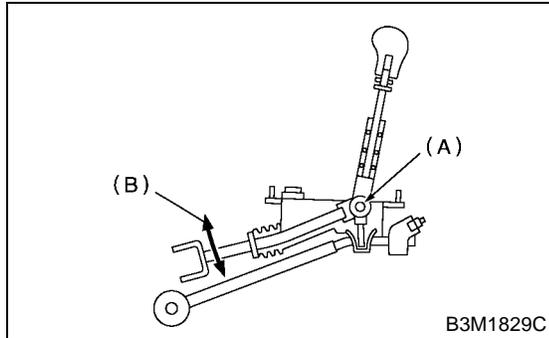
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9) Check the swing torque of the rod in relation to the gear shift lever.

If the torque exceeds the specification, replace bushing or retighten nuts.

Rocking torque:

0.7 N·m (0.07 kgf·m, 0.5 ft·lb) or less

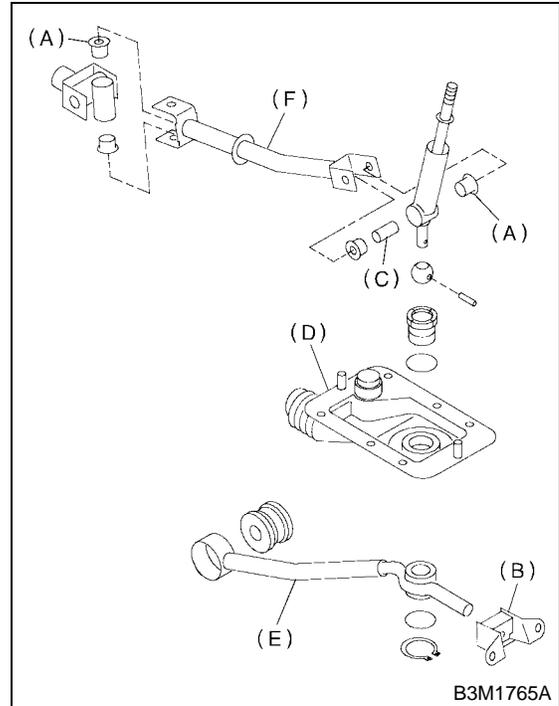


- (A) Center of rotation
- (B) Swing torque

10) Check that there is no excessive play and that parts move smoothly.

E: INSPECTION

1) Check each part (bushing A, cushion rubber, spacer, boot, stay and rod, etc.) for deformation, damage and wear. Repair or replace any defective part. Determine defective parts by comparing with new parts.



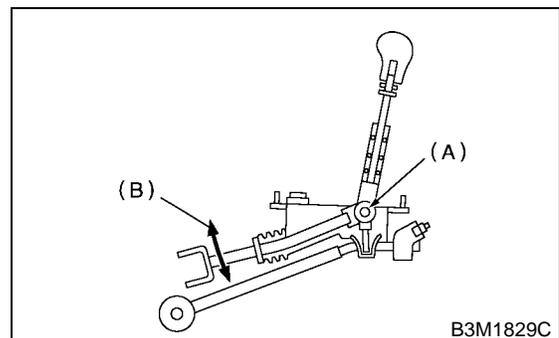
- (A) Bushing A
- (B) Cushion rubber
- (C) Spacer
- (D) Boot
- (E) Stay
- (F) Rod

2) Check the swing torque of the rod in relation of the gear shift lever.

If the torque exceeds the specification, replace bushing or retighten nuts.

Rocking torque:

0.7 N·m (0.07 kgf·m, 0.5 ft·lb) or less

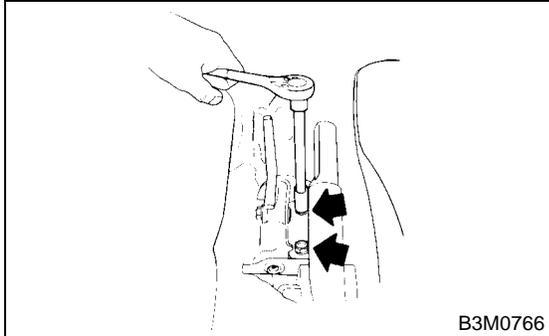


- (A) Center of rotation
- (B) Swing torque

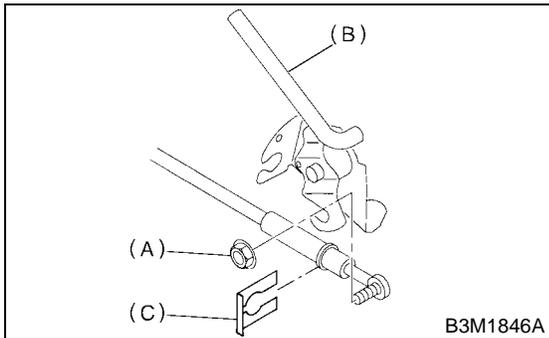
5. MT Drive Select Lever

A: REMOVAL

- 1) Apply parking brake and place chocks to hold wheels.
- 2) Disconnect ground terminal from battery.
- 3) Set drive select lever to HI position.
- 4) Remove the drive select lever knob.
- 5) Remove console box. <Ref. to EI-24, Console Box.>
- 6) Remove the bolt installing drive select lever assembly on body.



- 7) Remove nut, clamp and then disconnect the cable from drive select lever assembly.



- (A) Nut
- (B) Drive select lever
- (C) Clamp

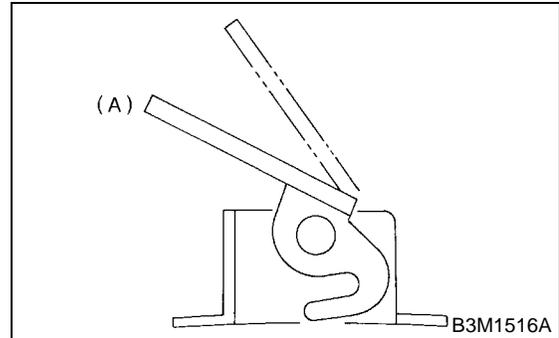
B: INSTALLATION

- 1) Install drive select lever.

Tightening torque:

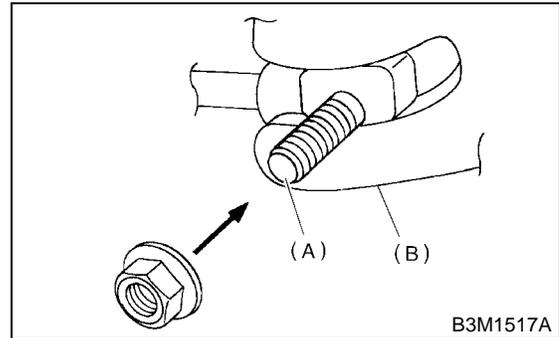
18 N·m (1.8 kgf·m, 13.0 ft·lb)

- 2) Set drive select lever to HI position.



- (A) HI position

- 3) Be sure to insert cable end bolt into lever arm slit.



- (A) Cable end bolt
- (B) Lever arm

- 4) Tighten nut where cable end bolt comes to a stop.

Tightening torque:

18 N·m (1.8 kgf·m, 13.0 ft·lb)

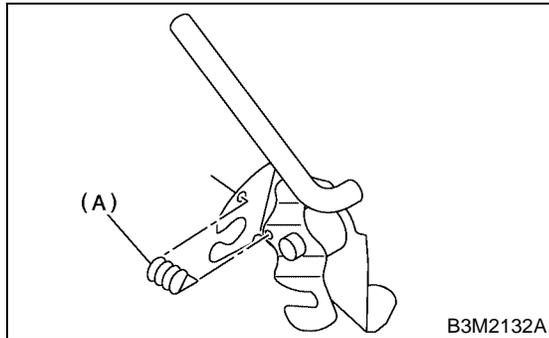
- 5) Install in the reverse order of removal.

MT DRIVE SELECT LEVER

CONTROL SYSTEMS

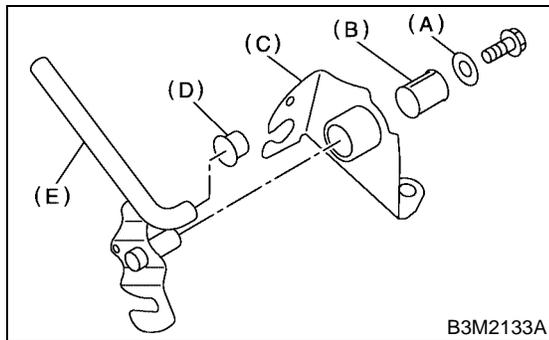
C: DISASSEMBLY

1) Remove spring.



(A) Spring

2) Remove lever, cap and bushing.



(A) Washer
(B) Bushing
(C) Plate
(D) Cap
(E) Lever

D: ASSEMBLY

1) Assemble in the reverse order of disassembly.

Tightening torque:

18 N·m (1.8 kgf·m, 13.0 ft·lb)

2) Make sure the select lever moves smoothly.

E: INSPECTION

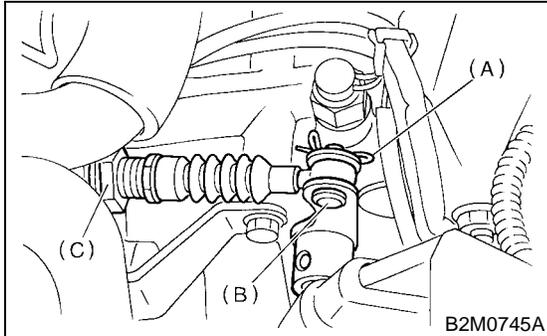
1) Make sure the select lever moves smoothly. If it does not move smoothly, repair or replace it.

2) Make sure the drive select lever is not damaged. If it is damaged, repair or replace it.

6. Drive Select Cable

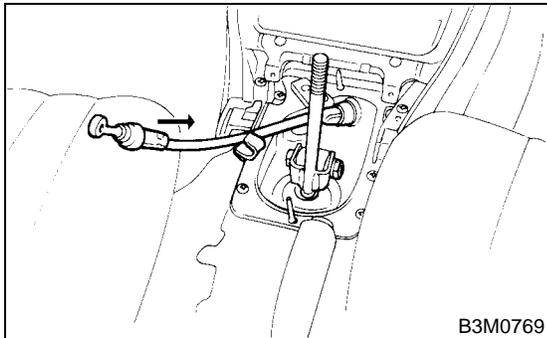
A: REMOVAL

- 1) Remove the drive select lever. <Ref. to CS-17, REMOVAL, MT Drive Select Lever.>
- 2) Remove intake duct. <Ref. to IN(SOHC)-7, Air Intake Duct.>
- 3) Remove air cleaner case. <Ref. to IN(SOHC)-6, Air Cleaner Case.>
- 4) Remove snap ring and clevis pin.
- 5) Loosen the nut and disconnect the cable from cable bracket.



- (A) Snap ring
- (B) Clevis pin
- (C) Nut

- 6) Remove cable from the under side of vehicle.



B: INSTALLATION

- 1) Install in the reverse order of removal.
- 2) Make sure the drive select lever operates properly.

C: INSPECTION

- 1) Make sure to move transmission to HI or LO position by moving the drive select lever. If it doesn't, adjust the cable.<Ref. to CS-19, ADJUSTMENT, Drive Select Cable.>
- 2) Make sure cable operates smoothly. If it catches or fails to work properly, repair or replace it.
- 3) Check cable for damage.

D: ADJUSTMENT

- 1) Set the drive select lever to HI position.
- 2) Remove the drive select lever knob.
- 3) Remove console box. <Ref. to EI-24, Console Box.>
- 4) Loosen the nut.
- 5) Make sure transmission is in HI position. If isn't, pull on cable to put transmission in HI position.
- 6) Tighten the nut in the location where the cable end bolt stops naturally.

Tightening torque:

18 N·m (1.8 kgf·m, 13.0 ft·lb)

- 7) Make sure to move transmission to HI or LO position by moving the drive select lever. If it doesn't, readjust cable.

GENERAL DIAGNOSTIC

CONTROL SYSTEMS

7. General Diagnostic

A: INSPECTION

Symptom	Possible cause	Remedy
1. Select lever	(1) Starter does not run.	Adjust select cable and inhibitor switch, or inspect circuit.
	(2) Back-up light does not light up.	Adjust select cable and inhibitor switch, or inspect circuit.