

# **CLUTCH SYSTEM**

# General Description

## CLUTCH SYSTEM

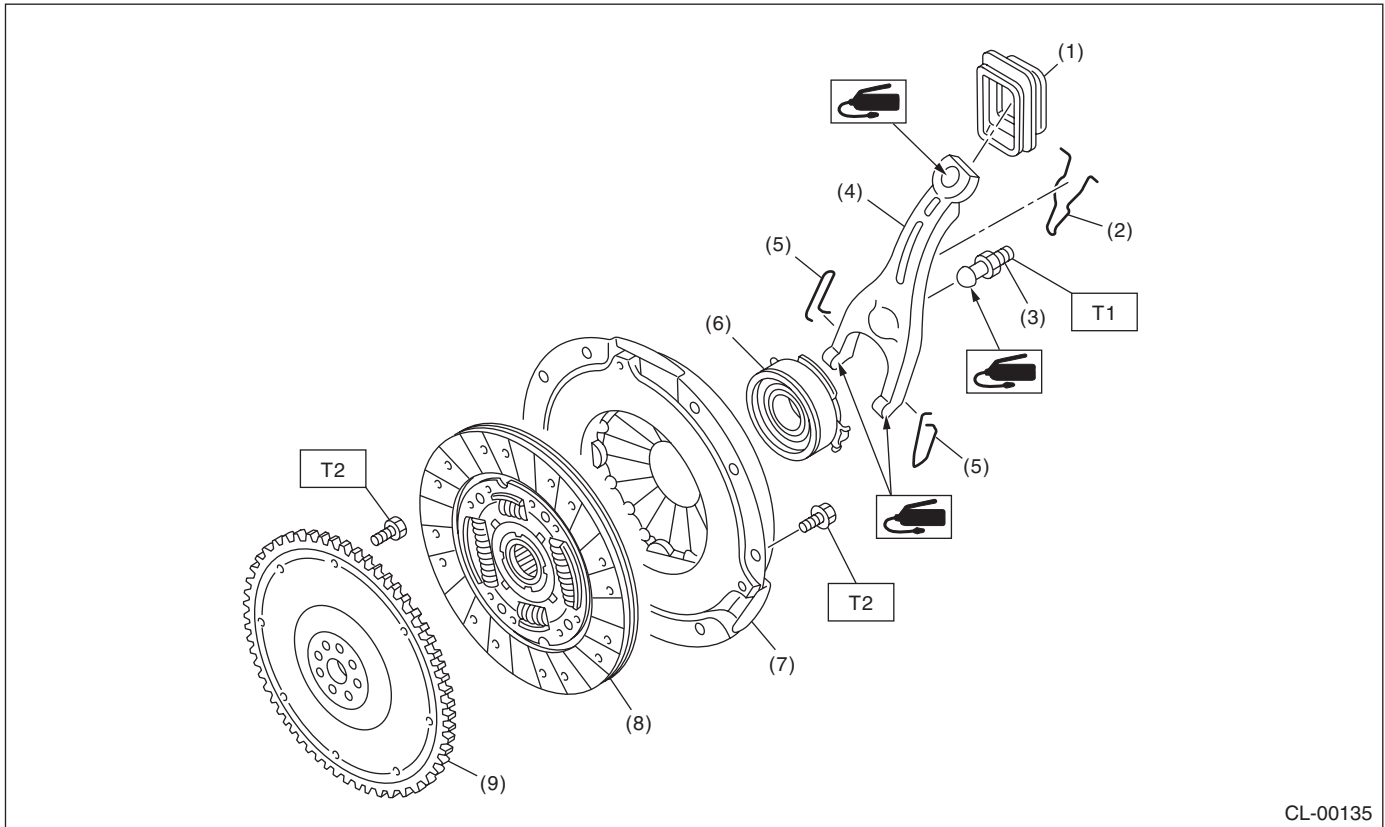
### 1. General Description

#### A: SPECIFICATION

| Model                      |                         |                  | 2.0 L TURBO                           | 2.5 L                                 |                             |
|----------------------------|-------------------------|------------------|---------------------------------------|---------------------------------------|-----------------------------|
| Clutch cover               | Type                    |                  | Pull type                             | Push type                             |                             |
|                            | Diaphragm set load      | kgf (lb)         | 800 (1,764)                           | 580 (1,279)                           |                             |
| Clutch disc                | Facing material         |                  | Woven (Non asbestos)                  |                                       |                             |
|                            | O.D. × I.D. × thickness | mm (in)          | 230 × 150 × 3.5 (9.06 × 5.91 × 0.138) | 225 × 150 × 3.5 (8.86 × 5.91 × 0.138) |                             |
|                            | Spline O.D.             |                  | 25.2 (0.992), (No. of teeth: 24)      |                                       |                             |
| Clutch release lever ratio |                         |                  | 1.7                                   | 1.6                                   |                             |
| Release bearing            |                         |                  | Grease-packed self-aligning           |                                       |                             |
| Clutch pedal               | Full stroke             | mm (in)          | 130 — 135 (5.12 — 5.31)               |                                       |                             |
|                            | Free play               | mm (in)          | 4 — 11 (0.16 — 0.43)                  |                                       |                             |
| Release lever              | Stroke                  |                  | mm (in)                               | 11.1 — 12.5 (0.437 — 0.492)           | 12.1 — 13.5 (0.48 — 0.53)   |
| Clutch disc                | Depth of rivet head     | mm (in)          | Clutch cover side                     | 1.65 — 2.25 (0.065 — 0.089)           | 1.65 — 2.25 (0.065 — 0.089) |
|                            |                         |                  | Fly-wheel side                        | 1.35 — 1.95 (0.053 — 0.076)           | 1.65 — 2.25 (0.065 — 0.089) |
|                            |                         | Limit of sinking | 0.3 (0.012)                           |                                       |                             |
|                            | Limit for deflection    |                  | mm (in)                               | 0.7 (0.028) at R = 110 (4.33)         |                             |

| Model                      |                                |                  | 2.5 L TURBO STi  |
|----------------------------|--------------------------------|------------------|--|
| Clutch cover               | Type                           |                  | Pull type  |
|                            | Diaphragm set load             | kgf (lb)         | 930 (2,050)  |
| Clutch disc                | Facing material                |                  | Woven (Non asbestos)   |
|                            | O.D. × I.D. × thickness        | mm (in)          | Flywheel side: 240 × 160 × 3.2 (9.45 × 6.30 × 0.126)<br>Clutch cover side: 240 × 160 × 3.5 (9.45 × 6.30 × 0.138) |
|                            | Spline O.D.                    | mm (in)          | 25.2 (0.992), (No. of teeth: 24)   |
| Clutch release lever ratio |                                |                  | 1.7  |
| Release bearing            |                                |                  | Grease-packed self-aligning  |
| Clutch pedal               | Full stroke                    | mm (in)          | 130 — 135 (5.12 — 5.31)  |
|                            | Free play                      | mm (in)          | 3 — 13 (0.12 — 0.51)   |
| Release lever              | Stroke                         | mm (in)          | 13.3 — 14.7 (0.524 — 0.579)  |
| Clutch disc                | Depth of rivet head<br>mm (in) | Standard         | Flywheel side: 1.35 — 1.95 (0.053 — 0.077)<br>Clutch cover side: 1.65 — 2.25 (0.065 — 0.089)                     |
|                            |                                | Limit of sinking | 0.3 (0.012)  |
|                            | Limit for deflection           |                  | mm (in)  |

I.D.: Inner diameter O.D.: Outer diameter

**B: COMPONENT****1. CLUTCH ASSEMBLY****• NON-TURBO MODEL**

- |                   |                     |
|-------------------|---------------------|
| (1) Dust cover    | (6) Release bearing |
| (2) Lever spring  | (7) Clutch cover    |
| (3) Pivot         | (8) Clutch disc     |
| (4) Release lever | (9) Flywheel        |
| (5) Clip          |                     |

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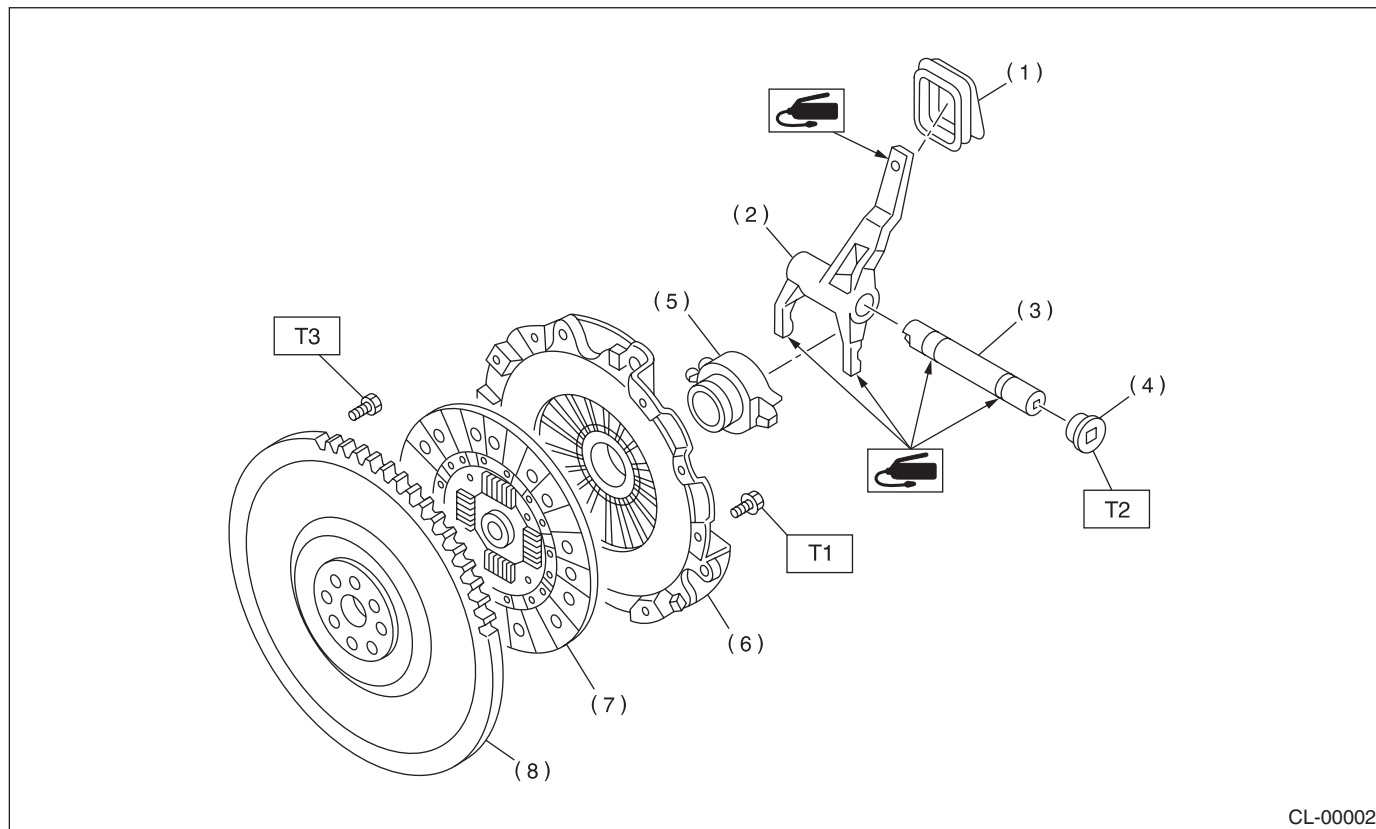
**Tightening torque: N·m (kgf-m, ft-lb)****T1: 16 (1.6, 11.8)****T2: 72 (7.3, 52.8)**

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# General Description

## CLUTCH SYSTEM

### • TURBO MODEL



- (1) Dust cover
- (2) Release lever
- (3) Clutch release lever shaft
- (4) Plug

- (5) Release bearing
- (6) Clutch cover
- (7) Clutch disc
- (8) Flywheel

---

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

**T1: 16 (1.6, 11.8)**

**T2: 44 (4.5, 32.5)**

**T3: Except STi model**

**72 (7.3, 52.8)**

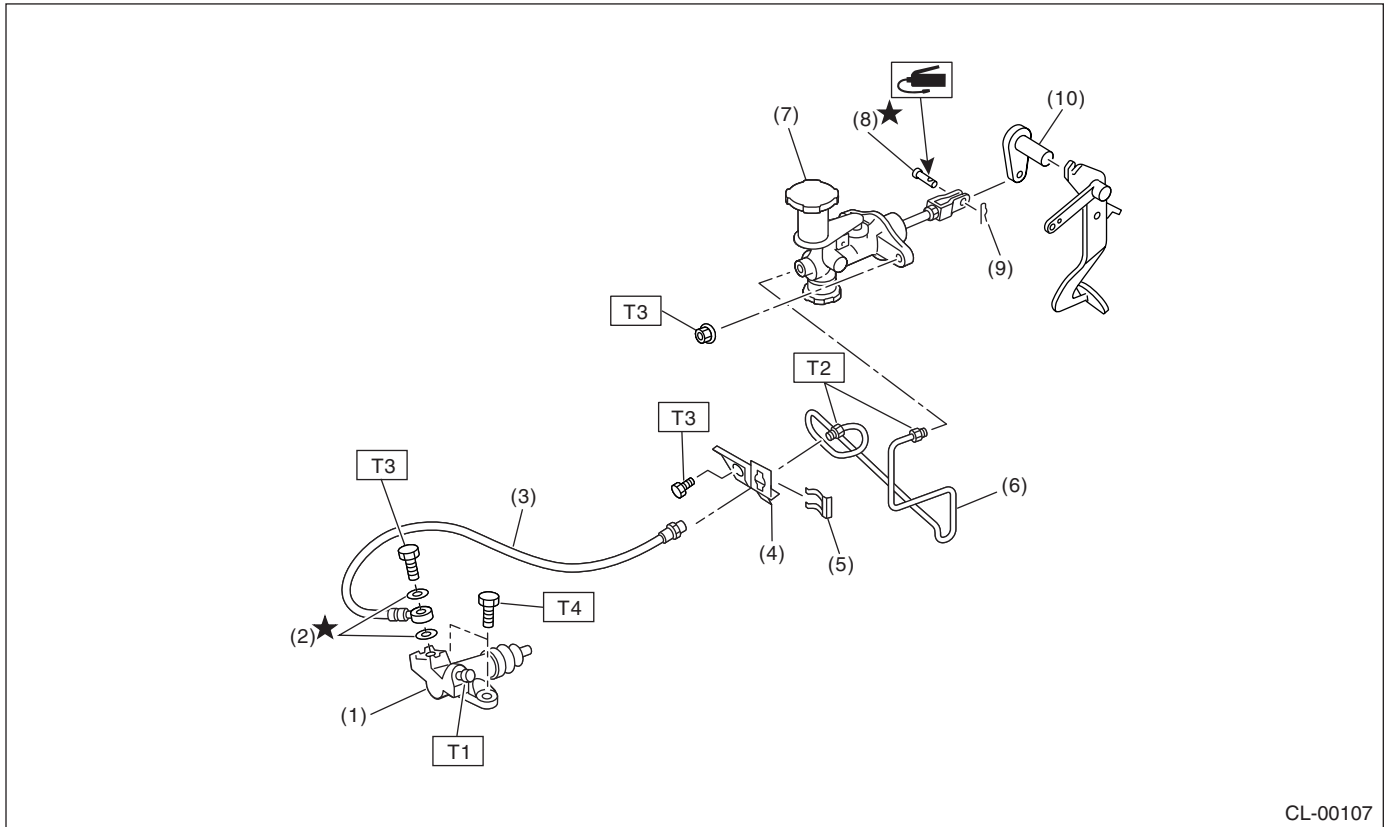
**STi model**

**75 (7.6, 55.3)**

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### 2. CLUTCH PIPE AND HOSE

#### • NON-TURBO MODEL



CL-00107

- |                        |                          |
|------------------------|--------------------------|
| (1) Operating cylinder | (6) Clutch pipe          |
| (2) Washer             | (7) Master cylinder ASSY |
| (3) Clutch hose        | (8) Clevis pin           |
| (4) Bracket            | (9) Snap pin             |
| (5) Clip               | (10) Lever               |

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

**T1: 8 (0.8, 5.9)**

**T2: 15 (1.5, 10.8)**

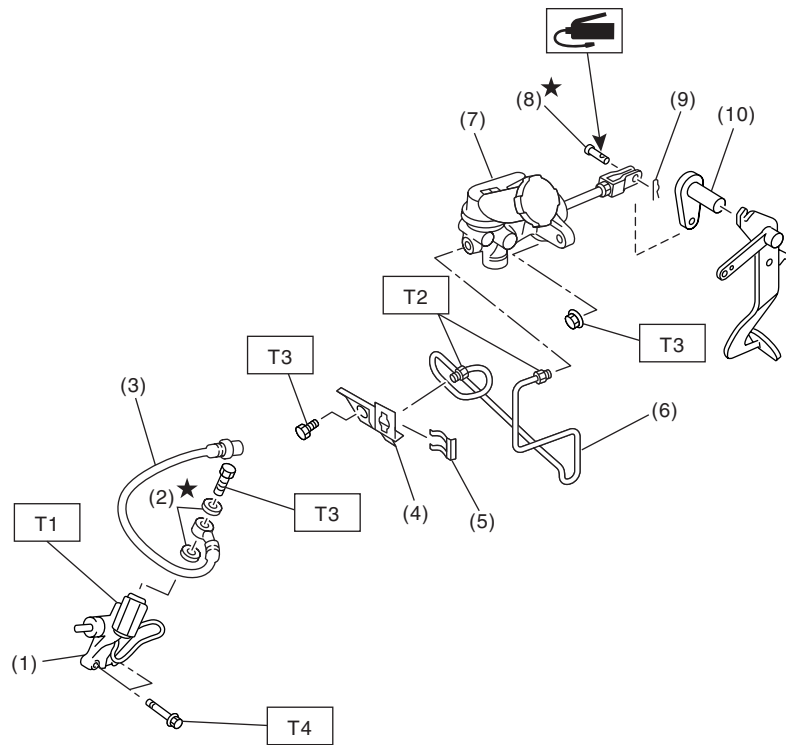
**T3: 18 (1.8, 13.3)**

**T4: 37 (3.8, 27.5)**

# General Description

## CLUTCH SYSTEM

### • TURBO MODEL



CL-00246

- |                        |                          |
|------------------------|--------------------------|
| (1) Operating cylinder | (6) Clutch pipe          |
| (2) Washer             | (7) Master cylinder ASSY |
| (3) Clutch hose        | (8) Clevis pin           |
| (4) Bracket            | (9) Snap pin             |
| (5) Clip               | (10) Lever               |

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

***T1: 8 (0.8, 5.9)***

***T2: 15 (1.5, 10.8)***

***T3: 18 (1.8, 13.3)***

***T4: Except STi model***

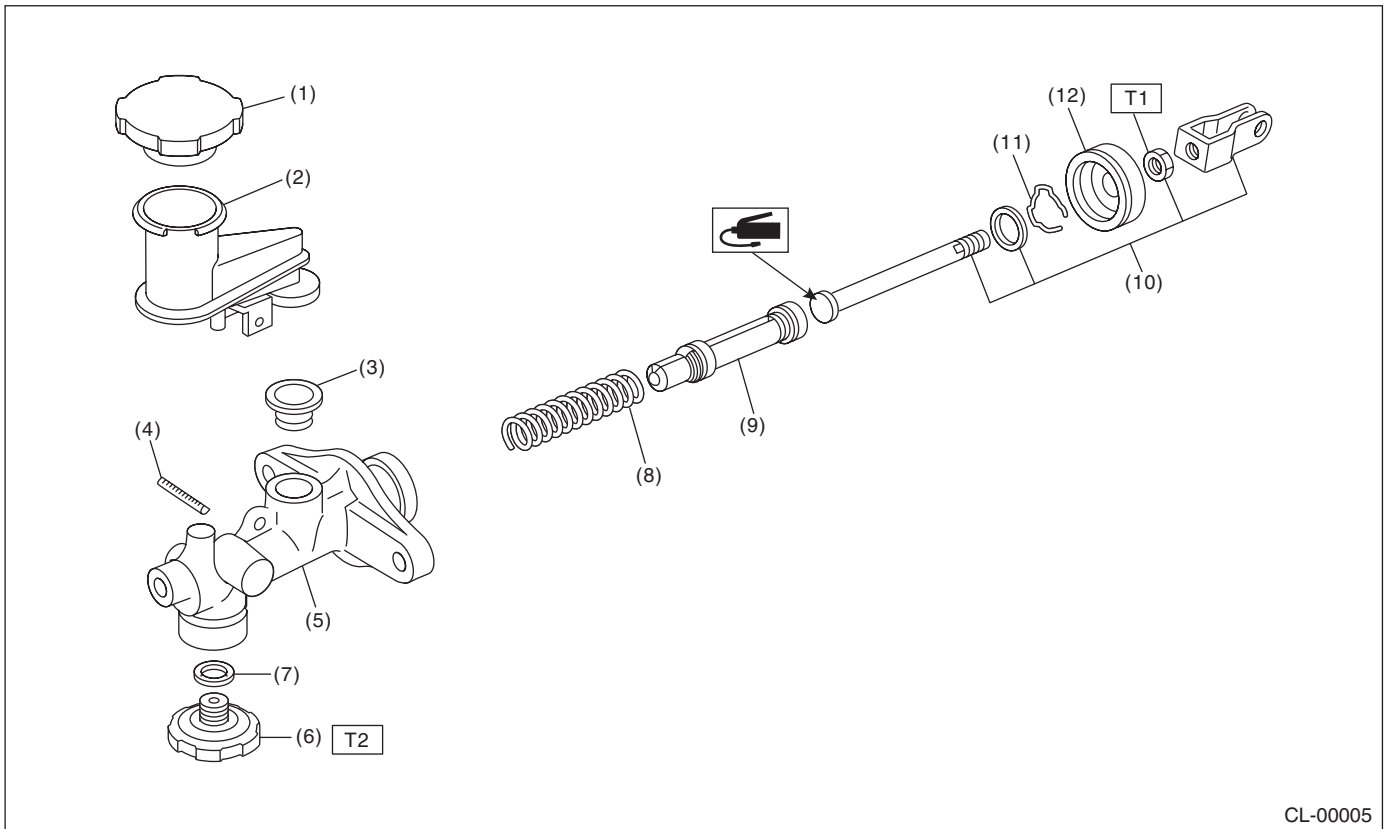
***37 (3.8, 27.5)***

***STi model***

***41 (4.2, 30.2)***

## 3. MASTER CYLINDER

### • NON-TURBO MODEL



- |                     |                       |
|---------------------|-----------------------|
| (1) Reservoir cap   | (7) Gasket            |
| (2) Reservoir tank  | (8) Return spring     |
| (3) Oil seal        | (9) Piston            |
| (4) Straight pin    | (10) Push rod ASSY    |
| (5) Master cylinder | (11) Piston stop ring |
| (6) Clutch damper   | (12) Cylinder boot    |

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

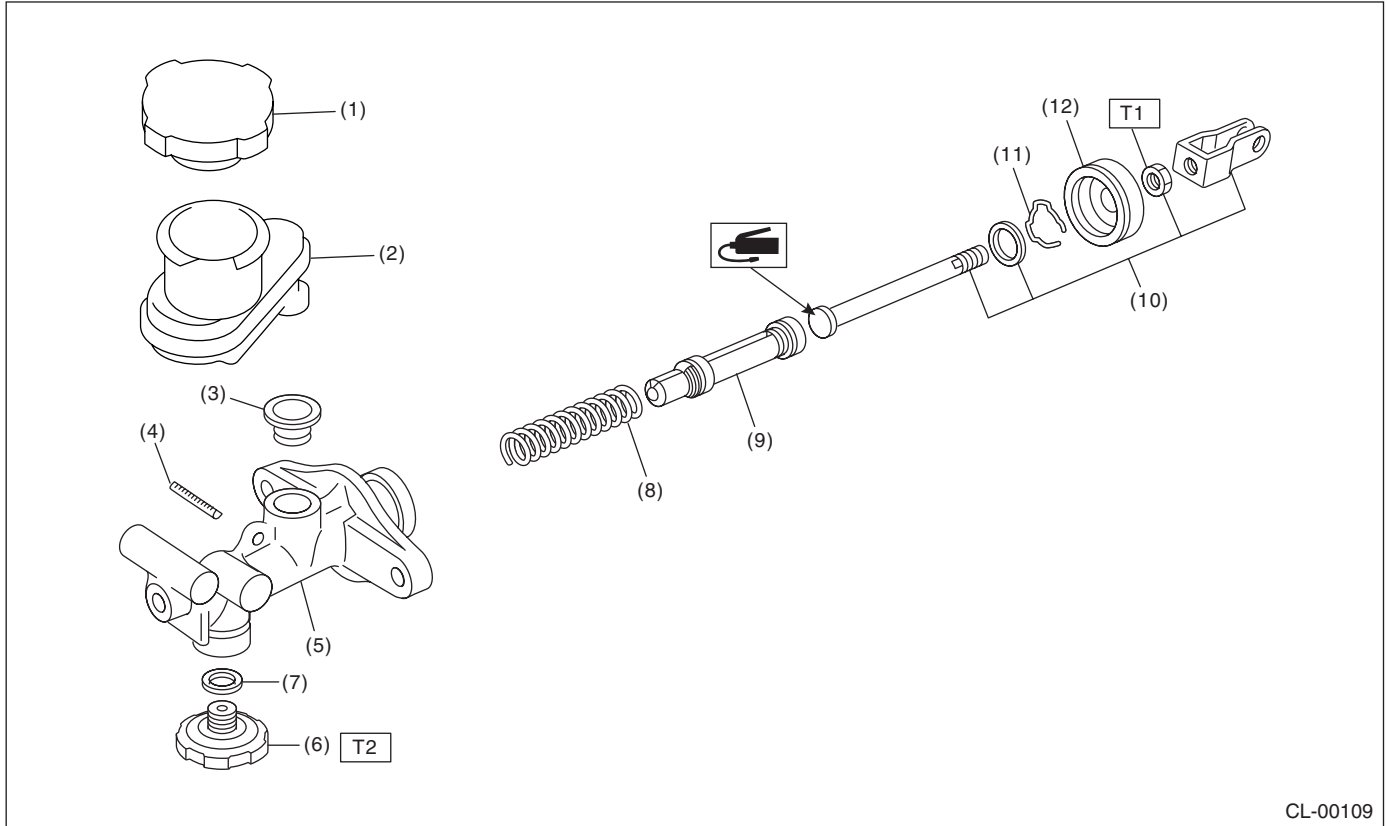
**T1: 10 (1.0, 7)**

**T2: 46.6 (4.75, 34.4)**

# General Description

## CLUTCH SYSTEM

### • TURBO MODEL



- |                     |                       |
|---------------------|-----------------------|
| (1) Reservoir cap   | (7) Gasket            |
| (2) Reservoir tank  | (8) Return spring     |
| (3) Oil seal        | (9) Piston            |
| (4) Straight pin    | (10) Push rod ASSY    |
| (5) Master cylinder | (11) Piston stop ring |
| (6) Clutch damper   | (12) Cylinder boot    |

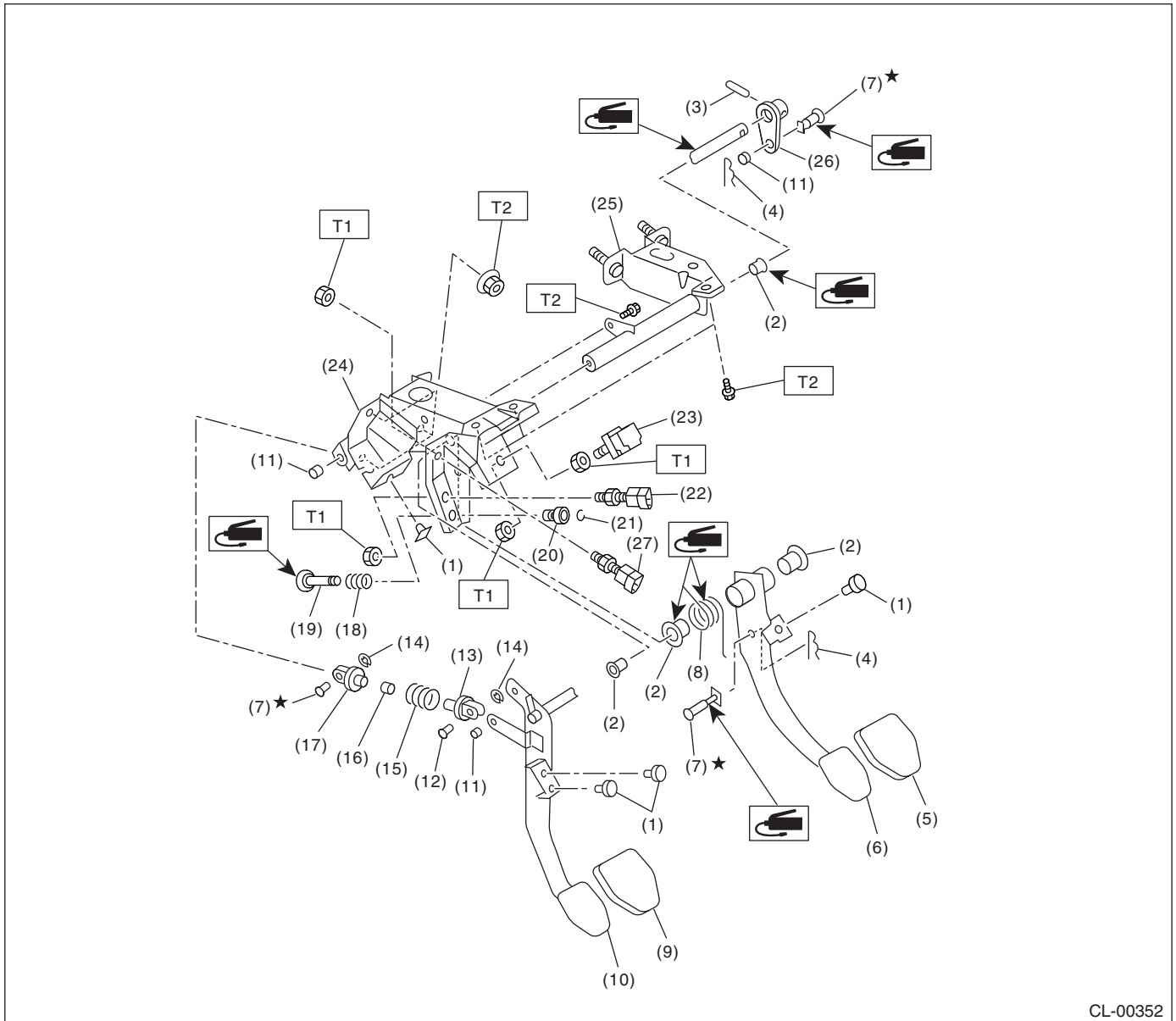
**Tightening torque: N·m (kgf-m, ft-lb)**

**T1: 10 (1.0, 7)**

**T2: 46.6 (4.75, 34.4)**



## 4. CLUTCH PEDAL



CL-00352

- |                        |                                     |  |
|------------------------|-------------------------------------|--|
| (1) Stopper            | (12) Clutch clevis pin              | (23) Stop light switch                 |
| (2) Bushing            | (13) Assist rod A                   | (24) Pedal bracket                     |
| (3) Spring pin         | (14) Clip                           | (25) Clutch master cylinder bracket    |
| (4) Snap pin           | (15) Assist spring                  | (26) Lever                             |
| (5) Brake pedal pad    | (16) Assist bushing                 | (27) Clutch switch (Starter interlock) |
| (6) Brake pedal        | (17) Assist rod B                   |  |
| (7) Clevis pin         | (18) Spring S                       |  |
| (8) Brake pedal spring | (19) Rod S                          |  |
| (9) Clutch pedal pad   | (20) Bushing S                      |  |
| (10) Clutch pedal      | (21) Clip                           |  |
| (11) Bushing C         | (22) Clutch switch (Cruise control) |  |

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**Tightening torque: N·m (kgf-m, ft-lb)**
**T1: 8 (0.8, 5.9)**
**T2: 18 (1.8, 13.3)**


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## General Description

### CLUTCH SYSTEM

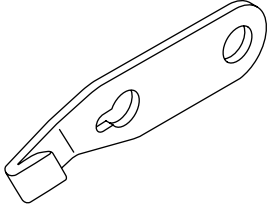
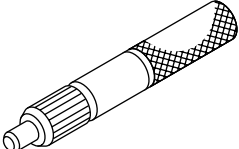
#### C: CAUTION

- Wear work 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 and dirt.
- Before removal, installation or disassembly, be sure to clarify the failure. Avoid unnecessary removal, installation, disassembly and replacement.
- Be careful not to burn yourself, because each part on the vehicle is hot after running.
- Use Subaru genuine fluid, grease etc. or the equivalent. Do not mix fluid, 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 rigid racks at the specified points.
- Apply grease onto sliding or revolution surfaces before installation.
- Before installing O-rings or snap rings, apply sufficient amount of fluid to avoid damage and deformation.
- Before securing a part on a vise, place cushioning material such as wood blocks, aluminum plate, or shop cloth between the part and the vise.
- Keep fluid away from the vehicle body. If any fluid contacts the vehicle body, immediately flush the area with water.

#### D: PREPARATION TOOL

##### 1. SPECIAL TOOL

| ILLUSTRATION  | TOOL NUMBER | DESCRIPTION        | REMARKS   |
|---|-------------|--------------------|---|
|  <p>ST-498497100</p>  | 498497100   | CRANKSHAFT STOPPER | Used for stopping rotation of flywheel when loosening tightening bolt, etc. |
|  <p>ST-499747100</p> | 499747100   | CLUTCH DISC GUIDE  | Used when installing clutch disc to flywheel.                               |

##### 2. GENERAL TOOL

| TOOL NAME      | REMARKS  |
|----------------|--|
| Circuit tester | Used for measuring resistance, voltage and ampere. |
| Dial gauge     | Used for measuring clutch disc run-out.            |
| Depth gauge    | Used for measuring clutch disc wear.               |

## 2. Clutch Disc and Cover

### A: REMOVAL

1) Remove the transmission assembly from vehicle body.

5MT:

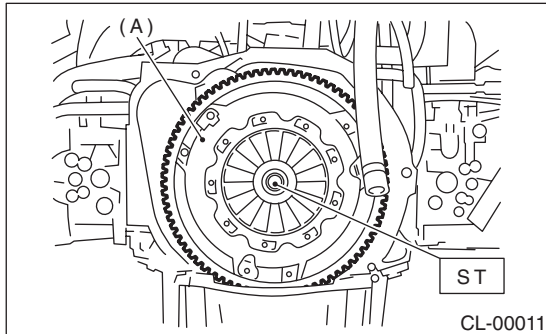
<Ref. to 5MT-27, REMOVAL, Manual Transmission Assembly.>

6MT:

<Ref. to 6MT-34, REMOVAL, Manual Transmission Assembly.>

2) Install the ST on flywheel.

ST 499747100 CLUTCH DISC GUIDE



(A) Clutch cover

3) Remove the clutch cover and clutch disc.

NOTE:

- Take care not to allow oil on the clutch disc facing.
- Do not disassemble the clutch cover and clutch disc.
- Be sure to put alignment marks on the flywheel and clutch cover before removing clutch cover.

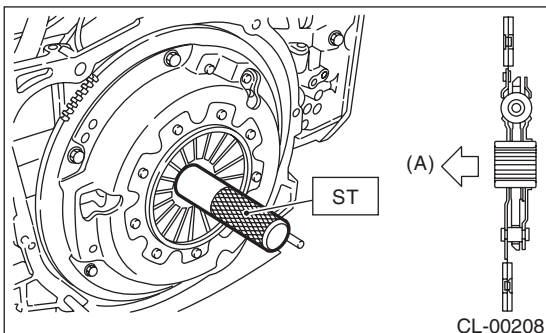
### B: INSTALLATION

1) Insert the ST into clutch disc and install them on the flywheel by inserting the ST end into pilot bearing.

NOTE:

When installing the clutch disc, be careful to its direction.

ST 499747100 CLUTCH DISC GUIDE



(A) Flywheel side

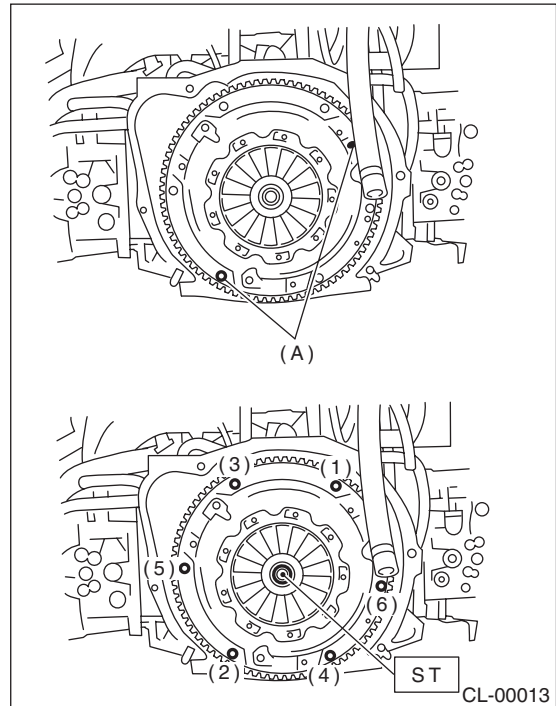
2) Install the clutch cover on flywheel and tighten the bolts to specified torque.

NOTE:

- When reinstalling, align the alignment marks.
- When installing a new clutch cover, position the clutch cover so that there is a gap of 120° or more between "0" marks on the flywheel and clutch cover. ("0" marks indicate the directions of residual unbalance.)
- Note the front and rear of the clutch disc when installing.
- Tighten the clutch cover installing bolts gradually. Each bolt should be tightened to the specified torque in a crisscross order.

**Tightening torque:**

**16 N·m (1.6 kgf-m, 11.8 ft-lb)**



(A) "0" marks

3) Remove the ST.

ST 499747100 CLUTCH DISC GUIDE

4) Install the transmission assembly.

5MT:

<Ref. to 5MT-29, INSTALLATION, Manual Transmission Assembly.>

6MT:

<Ref. to 6MT-36, INSTALLATION, Manual Transmission Assembly.>

# Clutch Disc and Cover

## CLUTCH SYSTEM

### C: INSPECTION

#### 1. CLUTCH DISC

##### 1) Facing wear

Measure the depth of rivet head from the surface of facing. Replace if facings are worn locally or worn down to less than the specified value.

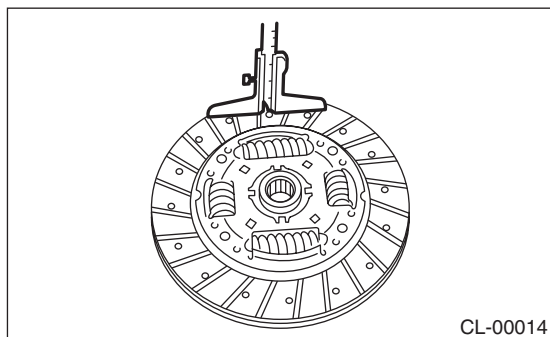
##### Depth of rivet head:

##### Limit of sinking

**0.3 mm (0.012 in)**

##### NOTE:

Do not wash the clutch disc with any cleaning fluid.



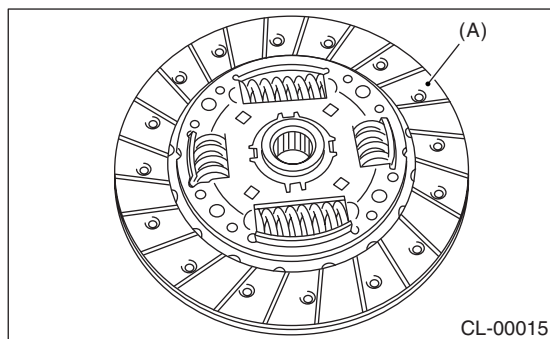
CL-00014

##### 2) Hardened facing

Correct by using emery paper or replace.

##### 3) Oil leakage on facing

Replace the clutch disc and inspect the transmission front oil seal, transmission case mating surface, engine rear oil seal and other points for oil leakage.



CL-00015

(A) Clutch facing

##### 4) Deflection on facing

If deflection exceeds the specified value at the outer circumference of facing, repair or replace.

ST 499747100 CLUTCH DISC GUIDE

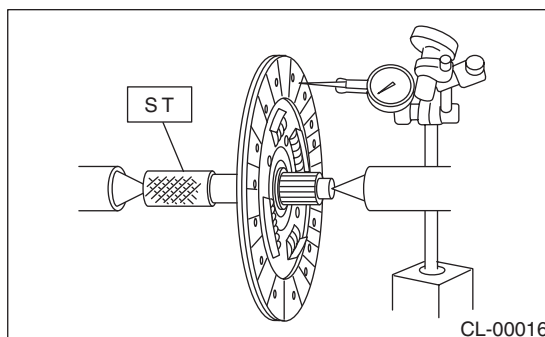
##### Limit for deflection:

##### Except STi model

**0.7 mm (0.028 in) at R = 110 mm (4.33 in)**

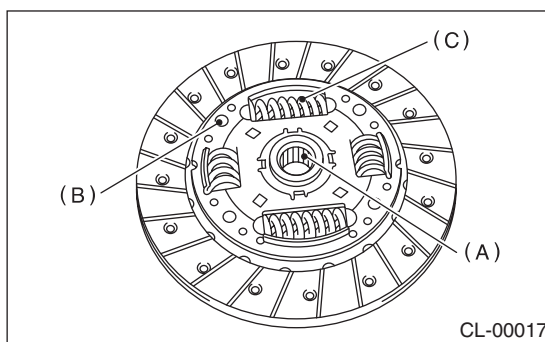
##### STi model

**0.7 mm (0.028 in) at R = 115 mm (4.53 in)**



CL-00016

5) If worn spline, loose rivets or damper spring failure is found, replace the clutch disc.



CL-00017

(A) Spline

(B) Rivet

(C) Damper spring

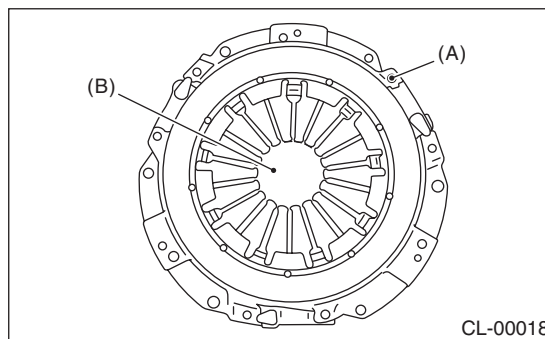
#### 2. CLUTCH COVER

##### NOTE:

Visually check for the following items without disassembling, and replace or repair if defective.

##### 1) Loose thrust rivet

##### 2) Damaged or worn bearing contact area at center of diaphragm spring



CL-00018

(A) Thrust rivet

(B) Diaphragm spring

## 3. Flywheel

### A: REMOVAL

1) Remove the transmission assembly.

5MT:

<Ref. to 5MT-27, REMOVAL, Manual Transmission Assembly.>

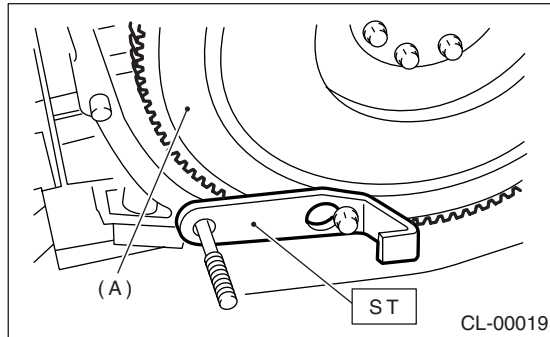
6MT:

<Ref. to 6MT-34, REMOVAL, Manual Transmission Assembly.>

2) Remove the clutch cover and clutch disc. <Ref. to CL-11, REMOVAL, Clutch Disc and Cover.>

3) Using the ST, remove the flywheel.

ST 498497100 CRANKSHAFT STOPPER

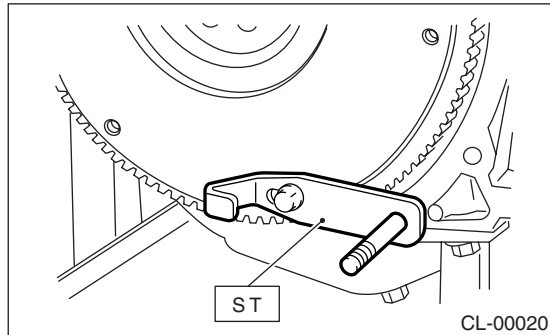


(A) Flywheel

### B: INSTALLATION

1) Install the flywheel and ST.

ST 498497100 CRANKSHAFT STOPPER



2) Tighten the flywheel attaching bolts to the specified torque.

#### NOTE:

Tighten the flywheel installing bolts gradually. Each bolt should be tightened to the specified torque in a crisscross fashion.

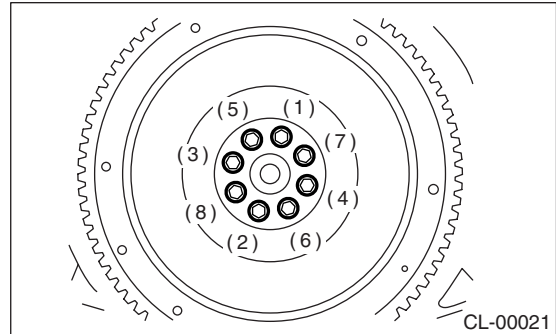
#### Tightening torque:

**Except STi model**

**72 N·m (7.3 kgf-m, 52.8 ft-lb)**

**STi model**

**75 N·m (7.6 kgf-m, 55.3 ft-lb)**



3) Install the clutch disc and cover. <Ref. to CL-11, INSTALLATION, Clutch Disc and Cover.>

4) Install the transmission assembly.

5MT:

<Ref. to 5MT-29, INSTALLATION, Manual Transmission Assembly.>

6MT:

<Ref. to 6MT-36, INSTALLATION, Manual Transmission Assembly.>

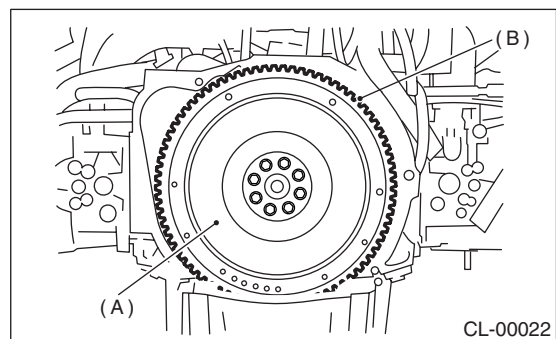
### C: INSPECTION

#### CAUTION:

**Since this bearing is grease sealed and is of a non-lubrication type, do not wash with gasoline or any solvent.**

1) Damage on sliding surface of facing and ring gear

If defective, replace the flywheel.



(A) Flywheel

(B) Ring gear

2) Smoothness of rotation

Rotate the ball bearing applying pressure in thrust direction.

3) If noise or excessive play is noted, replace the flywheel.

### 4. Release Bearing and Lever

#### A: REMOVAL

##### 1. NON-TURBO MODEL

1) Remove the transmission assembly from vehicle body.

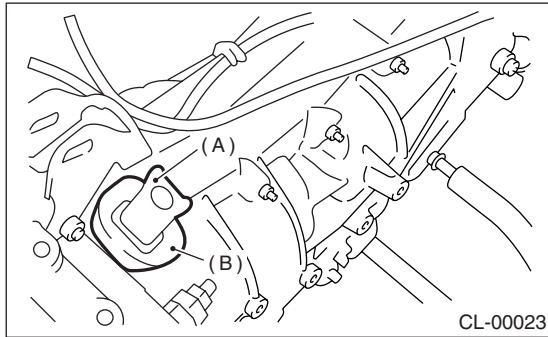
<Ref. to 5MT-27, REMOVAL, Manual Transmission Assembly.>

2) Remove the two clips from clutch release lever and remove the release bearing.

#### CAUTION:

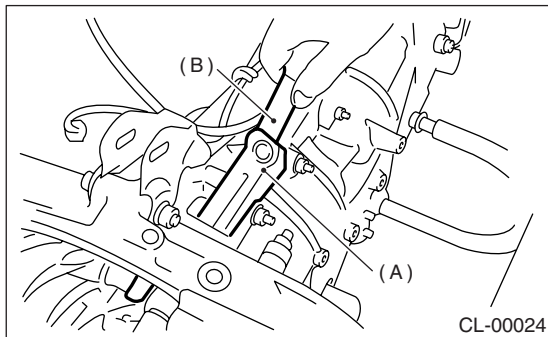
**Be careful not to deform clips.**

3) Remove the dust cover.



(A) Clutch release lever  
(B) Dust cover

4) Remove the lever spring from pivot with a screwdriver by accessing it through clutch housing release lever hole. Then remove the release lever.



(A) Clutch release lever  
(B) Screwdriver

##### 2. TURBO MODEL

1) Remove the transmission assembly from vehicle body.

5MT:

<Ref. to 5MT-27, REMOVAL, Manual Transmission Assembly.>

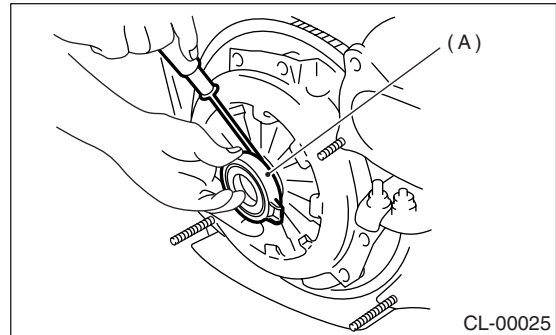
6MT:

<Ref. to 6MT-34, REMOVAL, Manual Transmission Assembly.>

2) Remove the clutch release lever from transmission.

3) Put the clutch release bearing in engine side.

4) Remove the clutch release bearing from the clutch cover using flat-type screwdriver.



(A) Clutch release bearing

#### B: INSTALLATION

##### 1. NON-TURBO MODEL

#### NOTE:

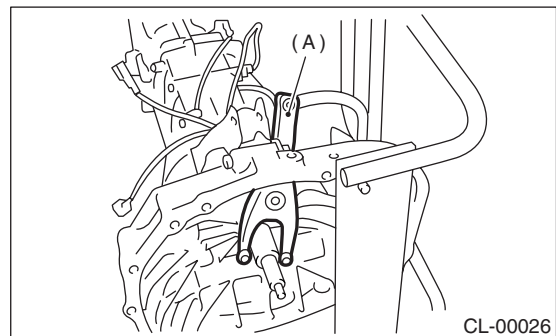
Before or during assembling, lubricate the following points with a light coat of grease.

- Contact surface of lever and pivot
- Contact surface of lever and bearing
- Transmission main shaft spline (Use grease containing molybdenum disulphide.)

1) While pushing the release lever to pivot and twisting it to both sides, fit the lever spring onto the constricted portion of pivot.

#### NOTE:

- Apply grease (SUNLIGHT 2: Part No. 003602010) to the contact point of release lever and operating cylinder.
- Confirm that the lever spring is securely fitted by observing it through the main case hole.

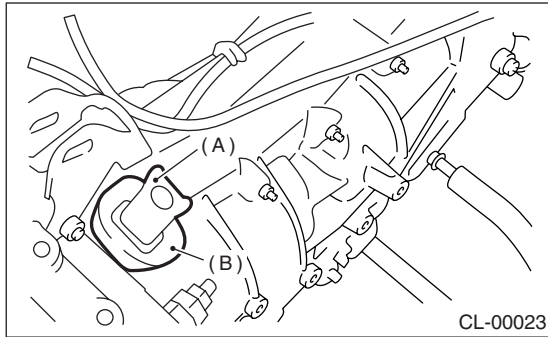


(A) Release lever

2) Install the release bearing and fasten it with two clips.



3) Install the dust cover.



- (A) Release lever
- (B) Dust cover

4) Check smooth movement of the bearing with operating release lever.

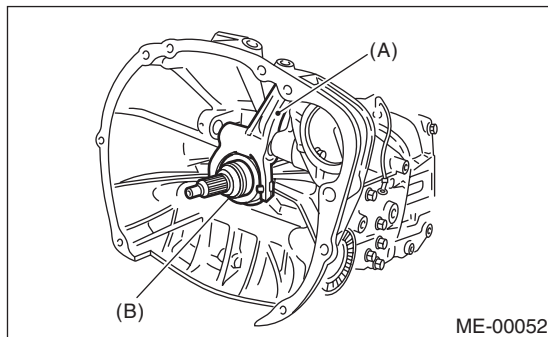
5) Install the transmission assembly.

<Ref. to 5MT-29, INSTALLATION, Manual Transmission Assembly.>

## 2. TURBO MODEL

1) Install the release bearing on transmission.

2) Insert the release fork into release bearing tab.

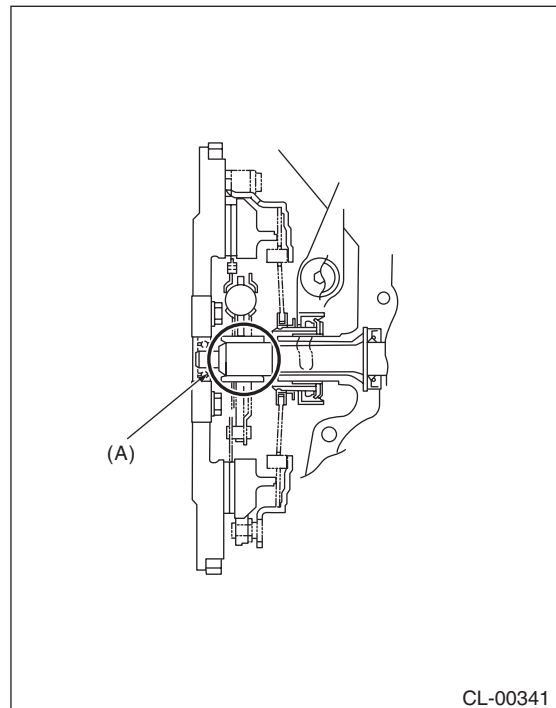


- (A) Release fork
- (B) Release bearing

3) Apply grease to the spline portion.

**Grease:**

**FX2200 (Part No. 000040901)**

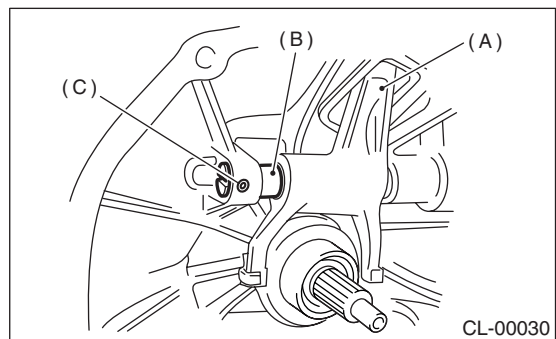


- (A) Spline

4) Insert the release fork shaft into release fork.

**NOTE:**

Make sure the cutout portion of release fork shaft contacts spring pin.



- (A) Release fork
- (B) Release shaft
- (C) Spring pin

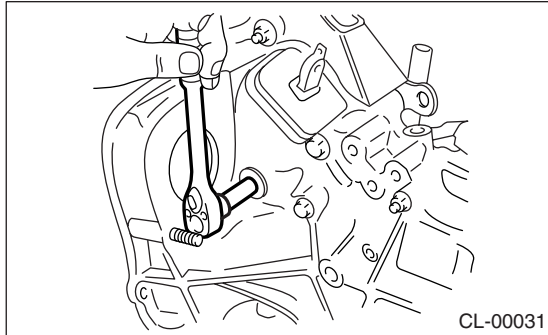
5) Tighten the plug.

# Release Bearing and Lever

## CLUTCH SYSTEM

### Tightening torque:

**44 N·m (4.5 kgf-m, 32.5 ft-lb)**



6) Install the transmission assembly.

5MT:

<Ref. to 5MT-29, INSTALLATION, Manual Transmission Assembly.>

6MT:

<Ref. to 6MT-36, INSTALLATION, Manual Transmission Assembly.>

## C: INSPECTION

### 1. RELEASE BEARING

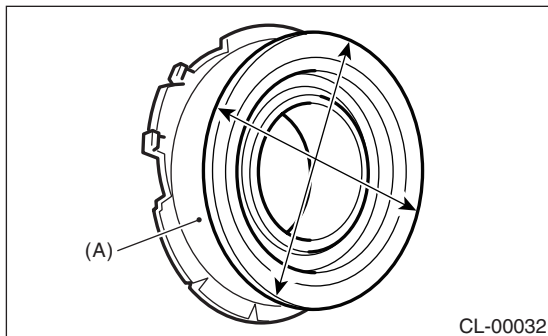
#### NOTE:

Since this bearing is grease sealed and is of a non-lubrication type, do not wash with gasoline or any solvent when servicing the clutch.

1) Check the bearing for smooth movement by applying force in the radial direction.

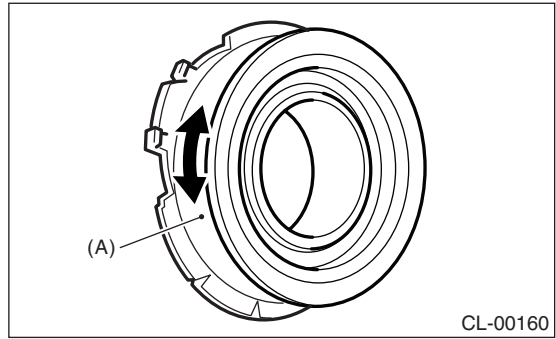
#### Radial direction stroke:

**1.4 mm (0.055 in)**



(A) Bearing case

2) Check the bearing for smooth rotation by applying pressure in the thrust direction.

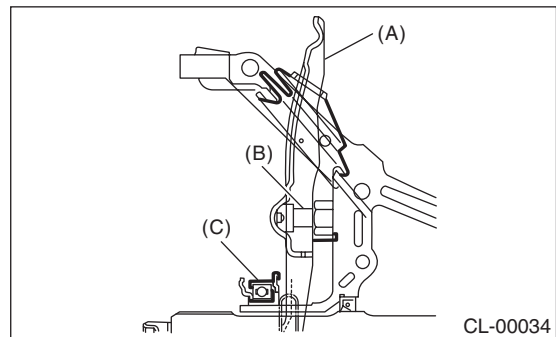


(A) Bearing case

3) Check wear and damage of the bearing case surface contacting with lever.

### 2. RELEASE LEVER

Check the lever pivot portion and the point of contact with release bearing for wear.



(A) Clutch release lever

(B) Pivot

(C) Clutch release bearing



## 5. Operating Cylinder

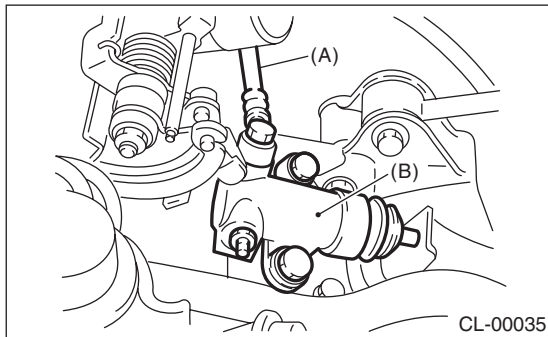
### A: REMOVAL

- 1) Remove the air intake chamber (Non-turbo model). <Ref. to IN(H4SO)-6, REMOVAL, Air Intake Chamber.>
- 2) Remove the intercooler (Turbo model). <Ref. to IN(H4DOTC)-10, REMOVAL, Intercooler.>
- 3) Remove the clutch hose from operating cylinder.

#### CAUTION:

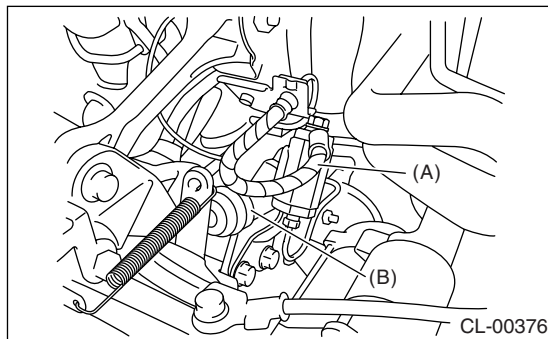
**Cover the hose joint to prevent clutch fluid from flowing out.**

- Non-turbo model



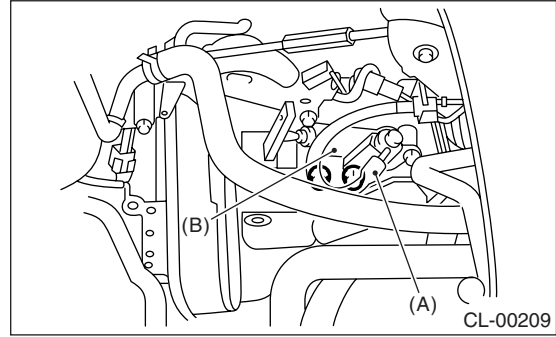
- (A) Clutch hose  
(B) Operating cylinder

- Turbo model (5MT)



- (A) Clutch hose  
(B) Operating cylinder

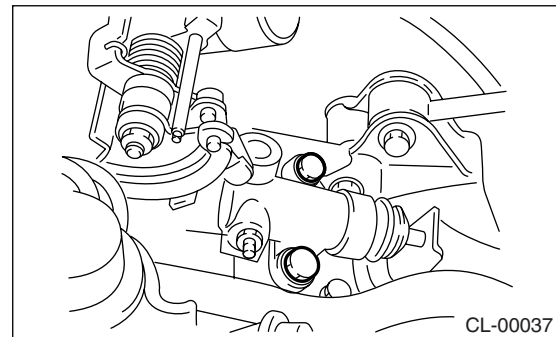
- Turbo model (6MT)



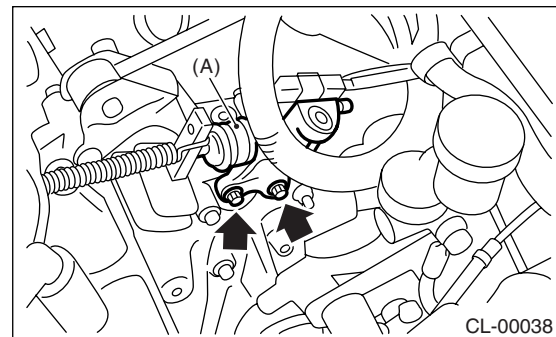
- (A) Clutch hose  
(B) Operating cylinder

- 4) Remove the operating cylinder from transmission.

- Non-turbo model



- Turbo model (5MT)

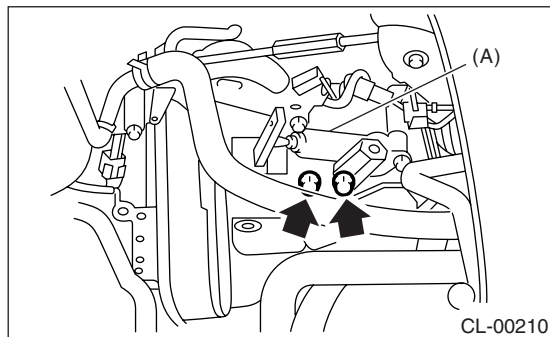


- (A) Operating cylinder

# Operating Cylinder

## CLUTCH SYSTEM

- Turbo model (6MT)



(A) Operating cylinder

## B: INSTALLATION

1) Install in the reverse order of removal.

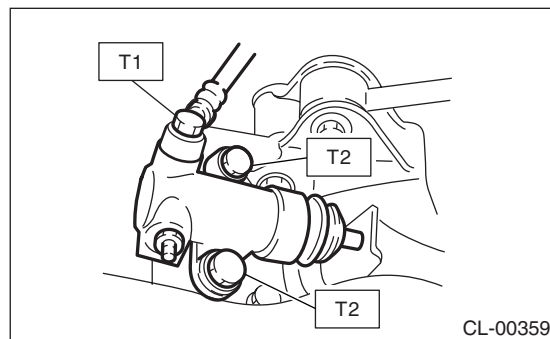
### NOTE:

- Before installing the operating cylinder, apply grease (SUNLIGHT 2: Part No. 003602010) to contact point of the release lever and operating cylinder.
- For turbo model, bleed air with the operating cylinder attached to clutch hose, and then install it to vehicle. <Ref. to CL-24, TURBO MODEL, PROCEDURE, Clutch Fluid Air Bleeding.>
- Non-turbo model

### Tightening torque:

**T1: 18 N·m (1.8 kgf-m, 13.3 ft-lb)**

**T2: 37 N·m (3.8 kgf-m, 27.5 ft-lb)**

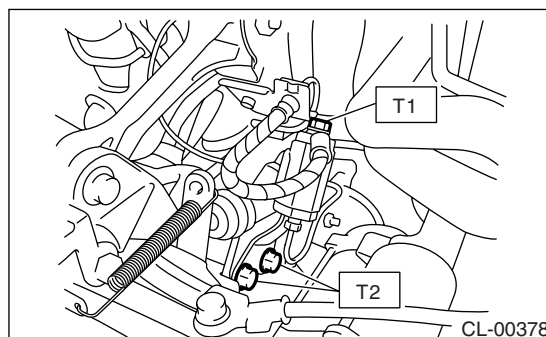


- Turbo model (5MT)

### Tightening torque:

**T1: 18 N·m (1.8 kgf-m, 13.0 ft-lb)**

**T2: 37 N·m (3.8 kgf-m, 27.5 ft-lb)**

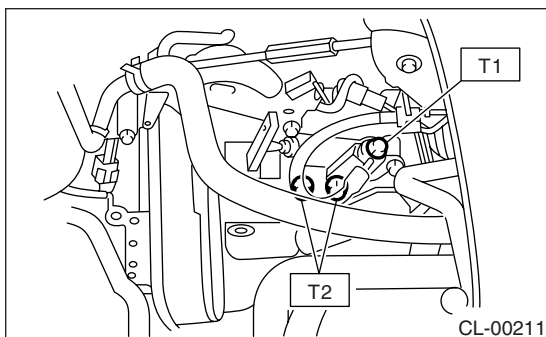


- Turbo model (6MT)

### Tightening torque:

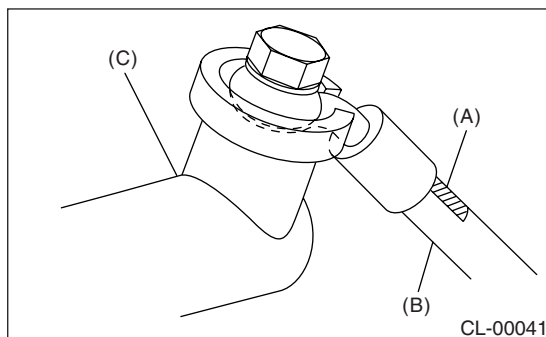
**T1: 18 N·m (1.8 kgf-m, 13.3 ft-lb)**

**T2: 41 N·m (4.2 kgf-m, 30.2 ft-lb)**



### NOTE:

- Be sure to install the clutch hose with the mark side facing upward.
- Be careful not to twist the clutch hose during installation.



- (A) Marking
- (B) Clutch hose
- (C) Operating cylinder

2) After bleeding air from the operating cylinder, ensure that clutch operates properly.  
<Ref. to CL-24, Clutch Fluid Air Bleeding.>

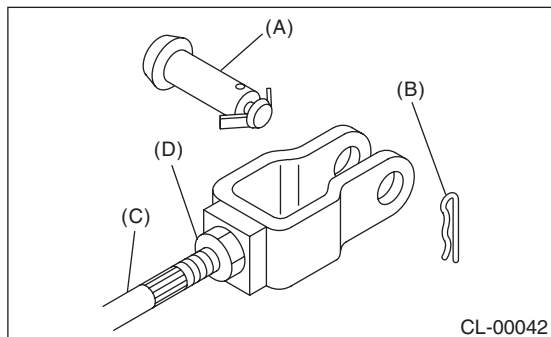
### **C: INSPECTION**

- 1) Check the operating cylinder for damage. If operating cylinder is damaged, replace it.
- 2) Check the operating cylinder for fluid leakage or damage on boot. If any leakage or damage is found, replace the operating cylinder.

## 6. Master Cylinder

### A: REMOVAL

- 1) Thoroughly drain the brake fluid from reservoir tank.
- 2) Remove the snap pin, clevis pin and separate the push rod of master cylinder from clutch pedal.

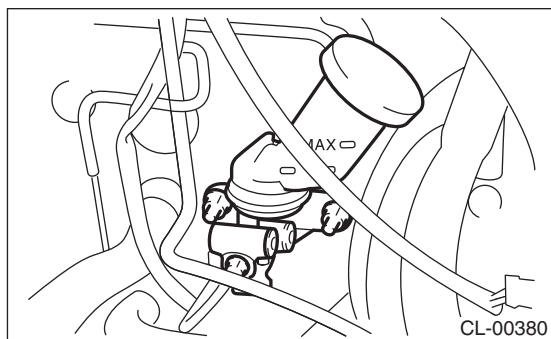


- (A) Clevis pin
- (B) Snap pin
- (C) Push rod
- (D) Lock nut

- 3) Remove the air intake chamber (Non-turbo model). <Ref. to IN(H4SO)-6, REMOVAL, Air Intake Chamber.>
- 4) Remove the intercooler (Turbo model). <Ref. to IN(H4DOTC)-10, REMOVAL, Intercooler.>
- 5) Disconnect the clutch pipe from master cylinder.
- 6) Remove the master cylinder and reservoir tank as a unit.

### CAUTION:

**Be extremely careful not to spill brake fluid. Brake fluid spilt on the vehicle body will harm the paint surface; wipe it off quickly if spilt.**



### B: INSTALLATION

- 1) Install the master cylinder to body, and connect the clutch pipe to master cylinder.

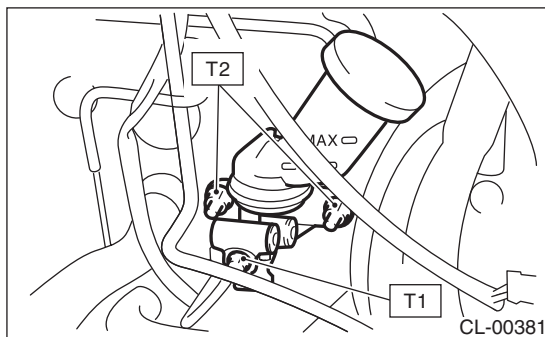
### NOTE:

Check that the pipe is routed properly.

### Tightening torque:

**T1: 15 N·m (1.5 kgf-m, 10.8 ft-lb)**

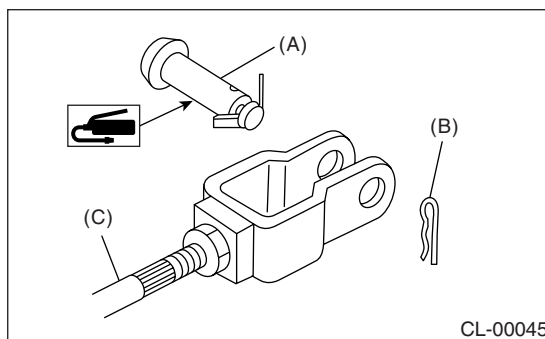
**T2: 18 N·m (1.8 kgf-m, 13.3 ft-lb)**



- 2) Connect the push rod of master cylinder to clutch pedal, and install the clevis pin and snap pin.

### NOTE:

Apply grease to the clevis pin.

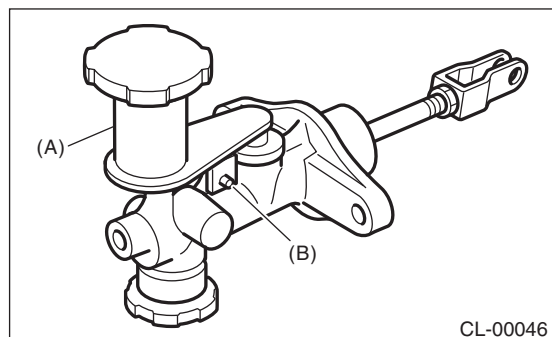


- (A) Clevis pin
- (B) Snap pin
- (C) Push rod

- 3) After bleeding air from the clutch system, ensure that clutch operates properly. <Ref. to CL-24, Clutch Fluid Air Bleeding.>
- 4) Install the air intake chamber (Non-turbo model). <Ref. to IN(H4SO)-6, INSTALLATION, Air Intake Chamber.>
- 5) Install the intercooler (Turbo model). <Ref. to IN(H4DOTC)-10, INSTALLATION, Intercooler.>

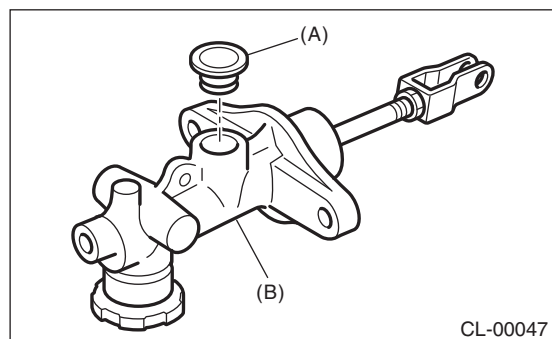
## C: DISASSEMBLY

1) Remove the straight pin and reservoir tank.



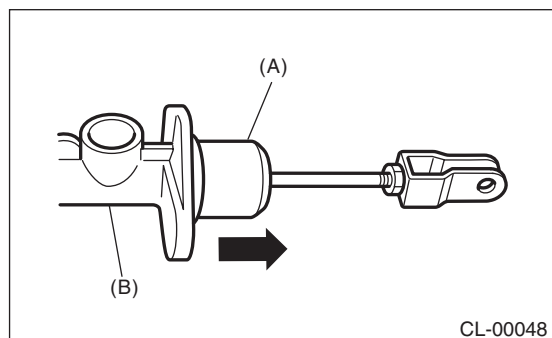
- (A) Reservoir tank
- (B) Straight pin

2) Remove the oil seal.



- (A) Oil seal
- (B) Master cylinder

3) Move the cylinder boot backward.



- (A) Cylinder boot
- (B) Master cylinder

4) Remove the snap ring.

### CAUTION:

**Be careful when removing the snap ring to prevent the rod, washer, piston and return spring from flying out.**

5) Remove the clutch damper.

## D: ASSEMBLY

1) Install the clutch damper. (Turbo model)

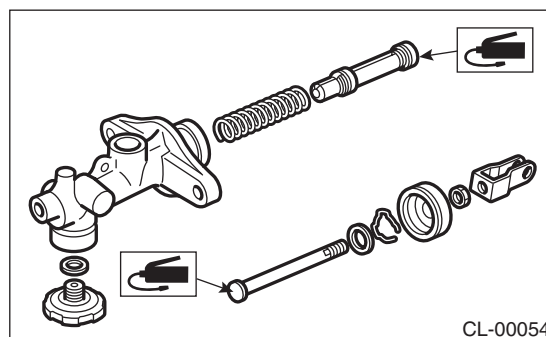
### Tightening torque:

**46.6 N·m (4.75 kgf-m, 34.4 ft-lb)**

2) Apply a coat of grease to the contacting surfaces of the push rod and piston before installation.

### Grease:

**SILICONE GREASE G40M (Part No. 004404003)**



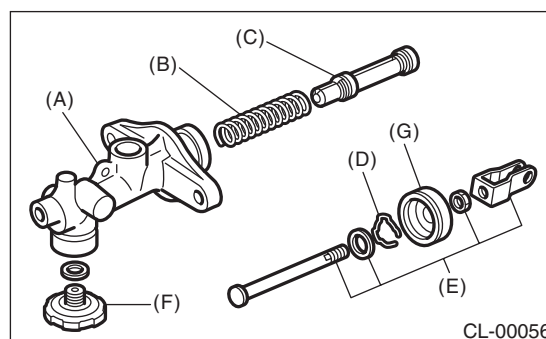
3) Assemble in the reverse order of disassembly.

### Tightening torque:

**10 N·m (1.0 kgf-m, 7 ft-lb)**

## E: INSPECTION

If any damage, deformation, wear, swelling, rust or other faults are found on the cylinder, piston, push rod, fluid reservoir, return spring, gasket, clutch damper, cylinder boot and hose replace the faulty part.



- (A) Master cylinder body
- (B) Return spring
- (C) Piston
- (D) Snap ring
- (E) Push rod ASSY
- (F) Clutch damper
- (G) Cylinder boot

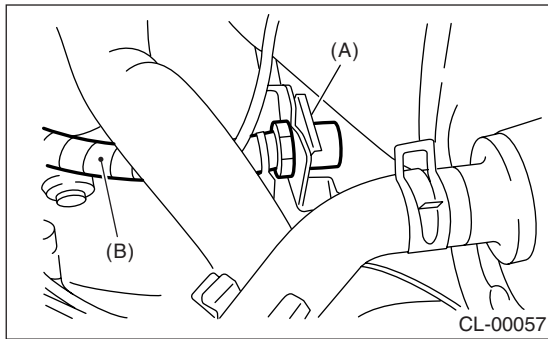
# Clutch Pipe and Hose

## CLUTCH SYSTEM

### 7. Clutch Pipe and Hose

#### A: REMOVAL

- 1) Remove the air intake chamber (Non-turbo model). <Ref. to IN(H4SO)-6, REMOVAL, Air Intake Chamber.>
- 2) Remove the intercooler. (Turbo model)  
<Ref. to IN(H4DOTC)-10, REMOVAL, Intercooler.>
- 3) Drain the clutch fluid. <Ref. to CL-23, Clutch Fluid.>
- 4) Remove the clutch pipe from the clutch hose and master cylinder.
- 5) Pull out the clamp, then remove the clutch hose from bracket.



- (A) Clamp  
(B) Clutch hose

- 6) Remove the hose from operating cylinder.
- 7) Remove the bracket.

#### B: INSTALLATION

Install in the reverse order of removal.

##### NOTE:

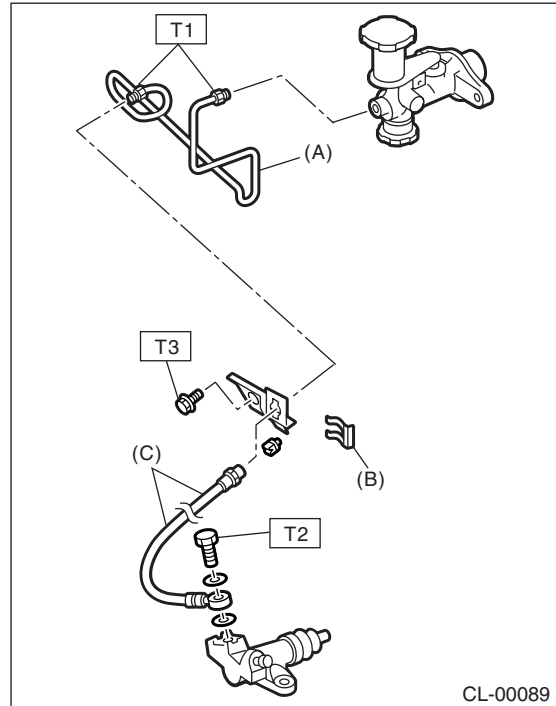
Bleed air of the clutch fluid. <Ref. to CL-24, Clutch Fluid Air Bleeding.>

#### Tightening torque:

**T1: 15 N·m (1.5 kgf-m, 10.8 ft-lb)**

**T2: 18 N·m (1.8 kgf-m, 13.3 ft-lb)**

**T3: 18 N·m (1.8 kgf-m, 13.3 ft-lb)**



- (A) Clutch pipe  
(B) Clip  
(C) Clutch hose

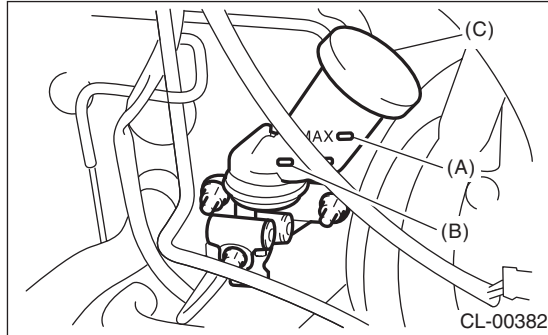
#### C: INSPECTION

Check the pipes and hoses for cracks, breakage, or damage. Check the joints for fluid leakage. If any cracks, breakage, damage or leakage is found, repair or replace the applicable pipe or hose.

### 8. Clutch Fluid

#### A: INSPECTION

- 1) Park the vehicle on a level surface.
- 2) Inspect the fluid level using scale on the outside of the reservoir tank. If the level is below "MIN", add fluid to bring it up to "MAX", and also inspect for leakage.



- (A) Max. level
- (B) Min. level
- (C) Reservoir tank

- 5) Drain all contaminated fluid in the same method as air bleeding.
- 6) Refill the brake fluid before reservoir tank becomes empty, and drain contaminated fluid again.
- 7) Repeat the above procedure until the contaminated fluid is completely drained.

#### B: REPLACEMENT

##### CAUTION:

- The FMVSS No. 116, fresh DOT3 or 4 brake fluid must be used.
- Cover the bleeder with waste cloth, when loosening it, to prevent brake fluid from being splashed over surrounding parts.
- Avoid mixing different brands of brake fluid to prevent degrading the quality of the fluid.
- Be careful not to allow dirt or dust to get into the reservoir tank.

##### NOTE:

- During bleeding operation, keep the clutch reservoir tank filled with brake fluid to eliminate entry of air.
- Clutch pedal operating must be very slow.
- For convenience and safety, it is advisable to have two people working.
- The amount of brake fluid required is approx. 70 m l (2.4 US fl oz, 2.5 Imp fl oz) for total clutch system.

- 1) Remove the air intake chamber. <Ref. to IN(H4SO)-6, REMOVAL, Air Intake Chamber.>
- 2) Either jack-up the vehicle and place a rigid racks under it, or lift-up the vehicle.
- 3) Drain brake fluid from the reservoir tank.
- 4) Refill the reservoir tank with recommended brake fluid.

##### **Recommended brake fluid:**

**FMVSS No. 116, fresh DOT3 or 4 brake fluid**



### 9. Clutch Fluid Air Bleeding

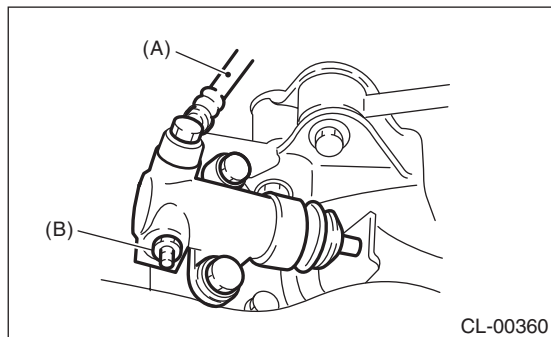
#### A: PROCEDURE

##### 1. NON-TURBO MODEL

###### NOTE:

Bleed air from the oil line with help of a co-worker.

- 1) Remove the air intake chamber. <Ref. to IN(H4SO)-6, REMOVAL, Air Intake Chamber.>
- 2) Fit one end of a vinyl tube into the air bleeder of operating cylinder and put the other end into a brake fluid container.

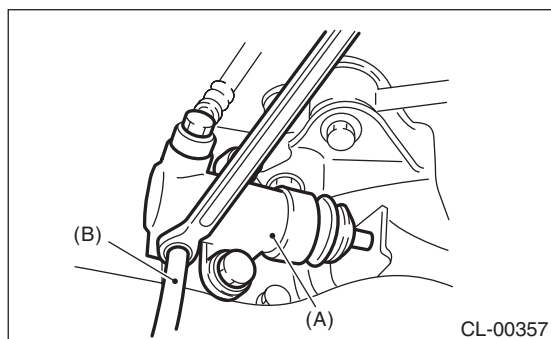


- (A) Clutch hose  
(B) Air bleeder

- 3) Slowly depress the clutch pedal and keep it depressed. Then open the air bleeder to discharge air together with the fluid. Release the air bleeder for 1 or 2 seconds. Next, with the bleeder closed, slowly release the clutch pedal.

###### CAUTION:

**Cover the bleeder with waste cloth when loosening it, to prevent brake fluid from being splashed over surrounding parts.**

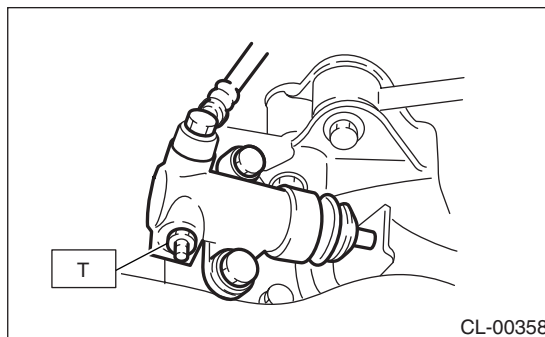


- (A) Operating cylinder  
(B) Vinyl tube

- 4) Repeat the procedure 3), until there are no more air bubbles in the vinyl tube.
- 5) Tighten the air bleeder.

###### Tightening torque:

**T: 8 N·m (0.8 kgf-m, 5.8 ft-lb)**



- 6) After depressing the clutch pedal, make sure that there are no leaks evident in the entire clutch system.
- 7) After bleeding air from the clutch system, ensure that clutch operates properly.
- 8) Install the air intake chamber. <Ref. to IN(H4SO)-6, INSTALLATION, Air Intake Chamber.>

##### 2. TURBO MODEL

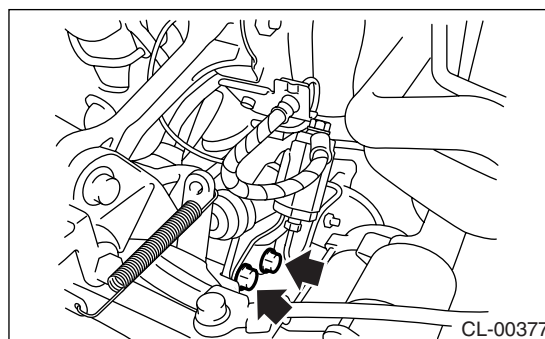
###### NOTE:

Bleed air from the oil line with help of a co-worker.

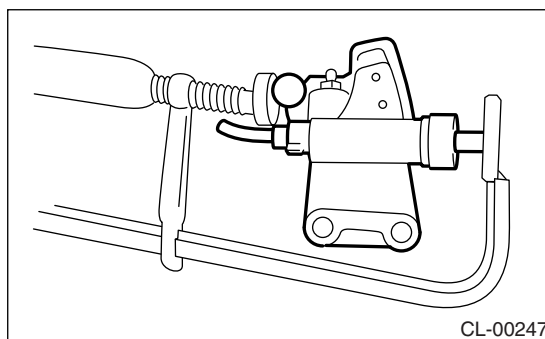
- 1) Remove the operating cylinder.

###### NOTE:

Do not remove the clutch hose.



- 2) Fix the piston with clamp to avoid the piston from jumping out.



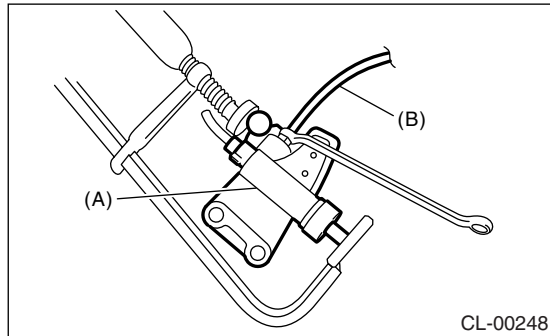
- 3) Fit one end of a vinyl tube into the air bleeder of operating cylinder and put the other end into a brake fluid container.



4) Slowly depress the clutch pedal and keep it depressed. Then open the air bleeder to discharge air together with the fluid. Release the air bleeder for 1 or 2 seconds. Next, with the bleeder closed, slowly release the clutch pedal.

**NOTE:**

Set the air breather screw position higher than the tip of operating cylinder when performing this procedure.



- (A) Operating cylinder  
(B) Vinyl tube

5) Repeat these steps until there are no more air bubbles in the vinyl tube.

**CAUTION:**

**Cover the bleeder with waste cloth when loosening it, to prevent brake fluid from being splashed over surrounding parts.**

6) Tighten the air bleeder.

**Tightening torque:**

**8 N·m (0.8 kgf-m, 5.9 ft-lb)**

7) Install the operating cylinder.

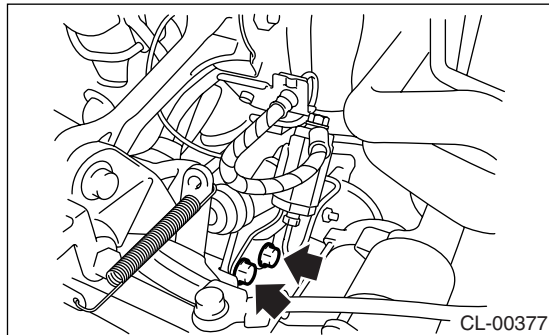
**Tightening torque:**

**5MT model:**

**37 N·m (3.8 kgf-m, 27.5 ft-lb)**

**6MT model:**

**41 N·m (4.2 kgf-m, 30.2 ft-lb)**



8) After depressing the clutch pedal, make sure that there are no leaks evident in the entire system.

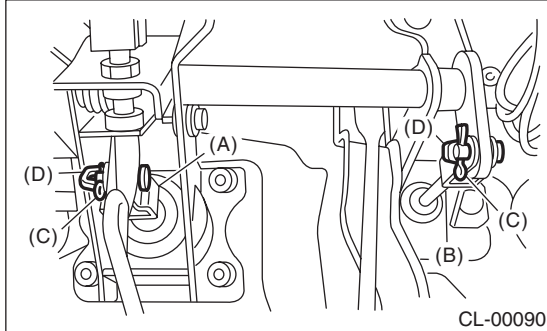
9) After bleeding air from the system, ensure that clutch operates properly.

10) Install the intercooler. <Ref. to IN(H4DOTC)-10, INSTALLATION, Intercooler.>

### 10.Clutch Pedal

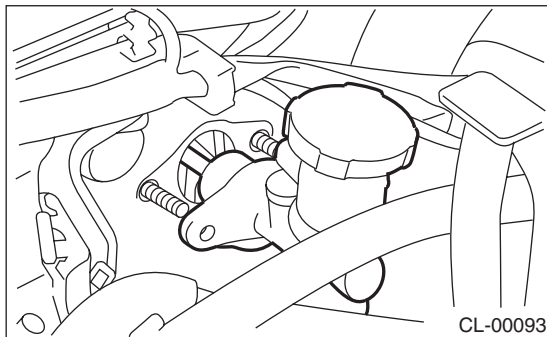
#### A: REMOVAL

- 1) Remove the steering column. <Ref. to PS-24, REMOVAL, Tilt Steering Column.>
- 2) Disconnect the connectors from stop light and clutch switches.
- 3) Remove the snap pins which secure lever to push rod and operating rod.
- 4) Remove the clevis pins which secure lever to push rod and operating rod.



- (A) Operating rod
- (B) Push rod
- (C) Snap pin
- (D) Clevis pin

- 5) Remove the air intake chamber. (Non-turbo model) <Ref. to IN(H4SO)-6, REMOVAL, Air Intake Chamber.>
- 6) Remove the intercooler. (Turbo model) <Ref. to IN(H4DOTC)-10, REMOVAL, Intercooler.>
- 7) Remove the nut which secures clutch master cylinder.



- 8) Remove the bolts and nuts which secure brake and clutch pedals, and remove the pedal assembly.

#### B: INSTALLATION

- 1) Install in the reverse order of removal.

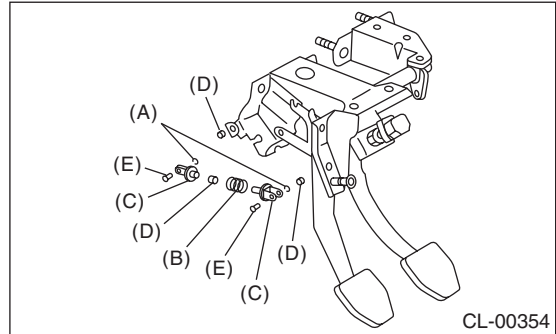
#### CAUTION:

- Be careful not to kink the accelerator cable.
- Always use new clevis pins.

- 2) Adjust the clutch pedal after installation. <Ref. to CL-27, ADJUSTMENT, Clutch Pedal.>

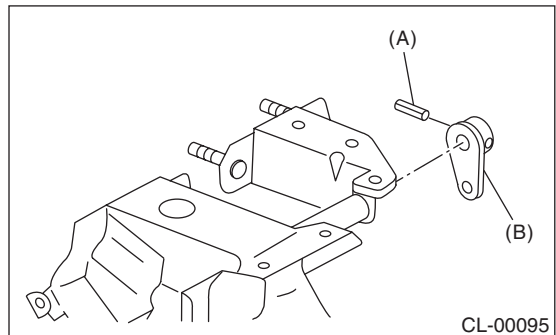
#### C: DISASSEMBLY

- 1) Remove the clips, assist spring, rod and bushing.



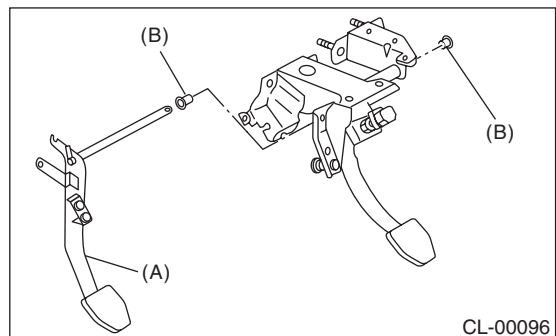
- (A) Clip
- (B) Assist spring
- (C) Assist rod
- (D) Bushing
- (E) Clevis pin

- 2) Remove the spring pin and lever.



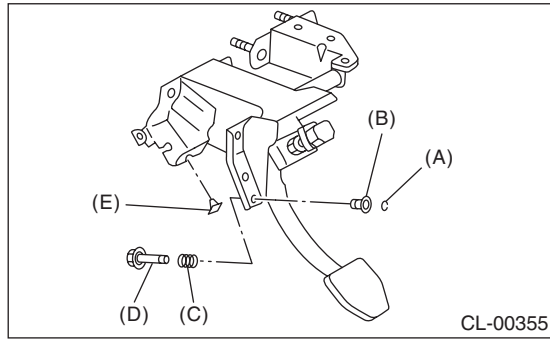
- (A) Pin
- (B) Lever

- 3) Remove the clutch pedal and bushings.



- (A) Clutch pedal
- (B) Bushing

- 4) Remove the stopper, clip, O-ring, rod S, and then remove the spring and bushing S.



- (A) Clip
- (B) Bushing S
- (C) Spring S
- (D) Rod S
- (E) Stopper

- 5) Remove the stoppers from clutch pedal.  
6) Remove the clutch pedal pad. (Non-turbo model)

## D: ASSEMBLY

- 1) Attach the stopper, etc. to pedal bracket temporarily.
- 2) Clean inside of bores of clutch pedal and brake pedal, apply grease, and set bushings into bores.
- 3) Align bores of pedal bracket, clutch pedal and brake pedal, attach the brake pedal return spring, assist rods, spring, and bushing.

### NOTE:

Clean up inside of bushings and apply grease before installing the spacer.

## E: INSPECTION

### 1. CLUTCH PEDAL

Move the clutch pedal pads in the lateral direction with a force of approximately 10 N (1 kgf, 2 lb) to ensure pedal play is in specified range.

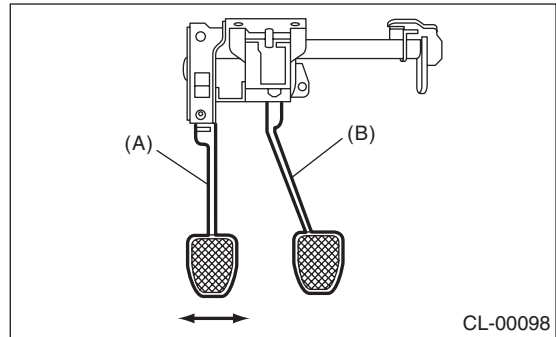
### CAUTION:

**If excessive movement is noted, replace the bushings with new ones.**

### Play of clutch pedal:

#### Service limit

**5.0 mm (0.197 in) or less**



- (A) Clutch pedal
- (B) Brake pedal

## F: ADJUSTMENT

### 1. CLUTCH PEDAL

- 1) Turn the lock nuts until clutch pedal full stroke length is within specifications.

### CAUTION:

**Do not attempt to turn the clutch switch to adjust clutch pedal full stroke length.**

### NOTE:

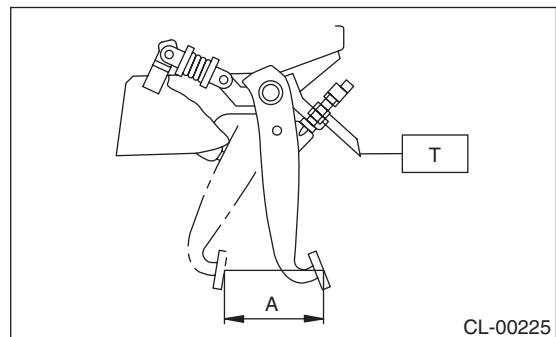
If lock nuts cannot adjust the clutch pedal full stroke length to specifications, turn the master cylinder push rod to adjust it.

#### Clutch pedal full stroke A:

**130 — 135 mm (5.12 — 5.31 in)**

#### Tightening torque (Clutch switch lock nut):

**T: 8 N·m (0.8 kgf-m, 5.9 ft-lb)**

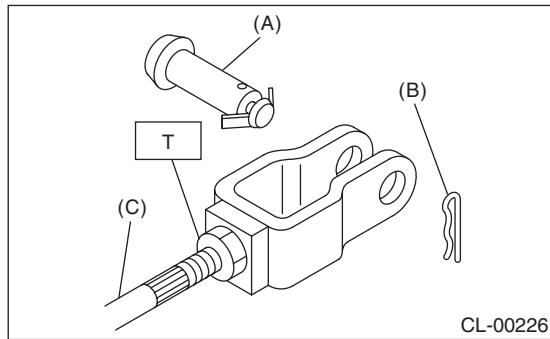


- 2) Turn the master cylinder push rod so that clevis pin moves to the left and then to the right. Clevis pin must move without resistance while it is rattling.

# Clutch Pedal

## CLUTCH SYSTEM

**Tightening torque (Push rod lock nut):**  
**T: 10 N·m (1.0 kgf-m, 7 ft-lb)**



- (A) Clevis pin
- (B) Snap pin
- (C) Push rod

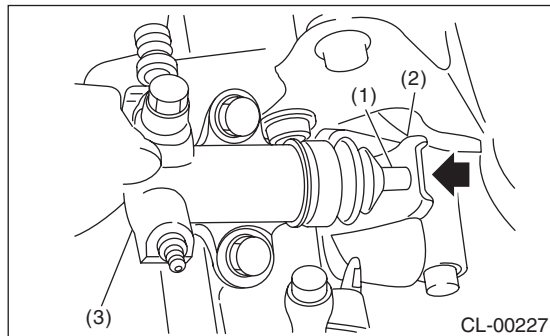
3) Depress and release the clutch pedal two to three times to ensure that clutch pedal and release fork operates smoothly. If the clutch pedal and release fork do not operate smoothly, bleed air from the clutch hydraulic system. <Ref. to CL-24, Clutch Fluid Air Bleeding.>

4) Measure the clutch pedal full stroke length again to ensure that it is within specifications. If it is not, repeat adjustment procedures again from the beginning.

**Clutch pedal full stroke:**  
**130 — 135 mm (5.12 — 5.31 in)**

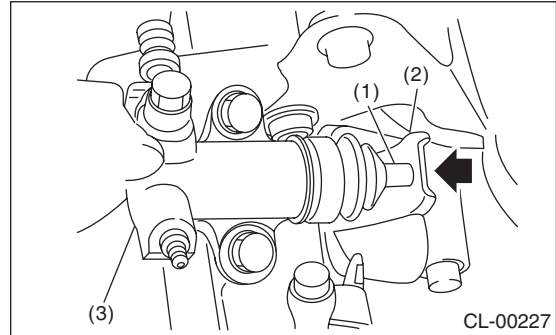
5) Move the clevis pin to the left and then to the right. It should move without resistance while it is rattling. If resistance is felt, repeat adjustment procedures again from the beginning.

6) Push the release lever until operating cylinder push rod retracts. Ensure that clutch fluid level in reservoir tank increases. If the clutch fluid level increases, the hydraulic clutch is properly adjusted; if fluid level does not increase or push rod does not retract, replace the master cylinder with a new one. <Ref. to CL-20, Master Cylinder.>



- (1) Push rod
- (2) Release lever
- (3) Operating cylinder

7) Push the release lever until operating cylinder push rod retracts. Check that the clutch fluid level in reservoir tank increases.



- (1) Push rod
- (2) Release lever
- (3) Operating cylinder

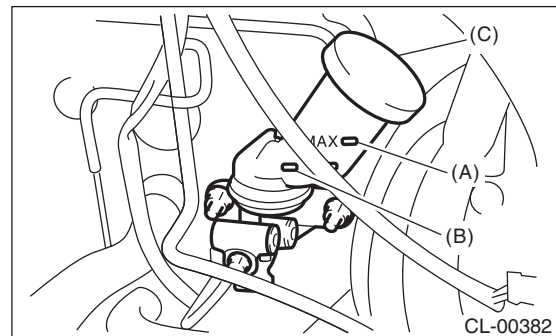
8) If the clutch fluid level increases, hydraulic clutch play is correct.

9) If the clutch fluid level does not increase or push rod does not retract, clutch pedal must be readjusted.

10) Check the fluid level on the outside of the reservoir tank. If the level is below "MIN", add clutch fluid to bring it up to "MAX".

**Recommended clutch fluid:**

**FMVSS No. 116, fresh DOT 3 or DOT 4 brake fluid**



- (A) Max. level
- (B) Min. level
- (C) Reservoir tank

## 11. Clutch Switch

### A: REMOVAL

- 1) Disconnect the ground cable from battery.
- 2) Remove the instrument panel lower cover.
- 3) Disconnect the connector from clutch switch.
- 4) Remove the clutch switch.

### B: INSTALLATION

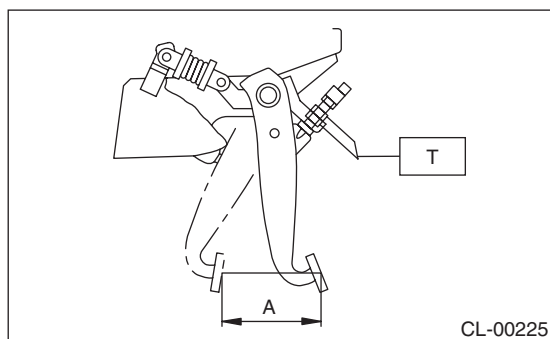
#### 1. CLUTCH SWITCH (CRUISE CONTROL)

- 1) Move the clevis pin of the push rod right and left and hold where it moves smoothly, then measure stroke of clutch pedal.

**Specified clutch pedal full stroke A:**  
**130 — 135 mm (5.12 — 5.31 in)**

**Tightening torque:**

**T: 8 N·m (0.8 kgf-m, 5.9 ft-lb)**



- 2) If the clutch pedal stroke is out of specification, adjust the stroke. <Ref. to CL-27, ADJUSTMENT, Clutch Pedal.>

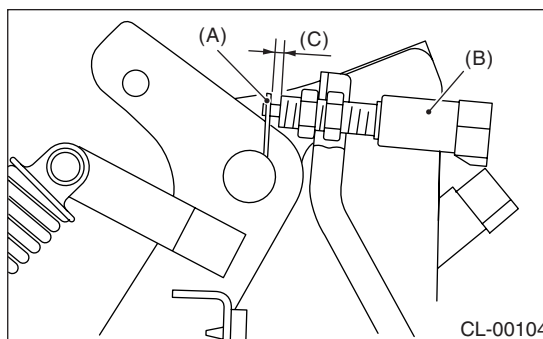
- 3) Connect clutch switch connector.

#### 2. CLUTCH SWITCH (STARTER INTER-LOCK)

- 1) Fully depress the clutch pedal.
- 2) Install the clutch pedal plate and clutch pedal so that the gap between them is 3 — 3.5 mm (0.12 — 0.14 in), and then tighten the lock nut.

**Tightening torque:**

**8 N·m (0.8 kgf-m, 5.9 ft-lb)**



- (A) Plate
- (B) Clutch pedal
- (C) 3 — 3.5 mm (0.12 — 0.14 in)

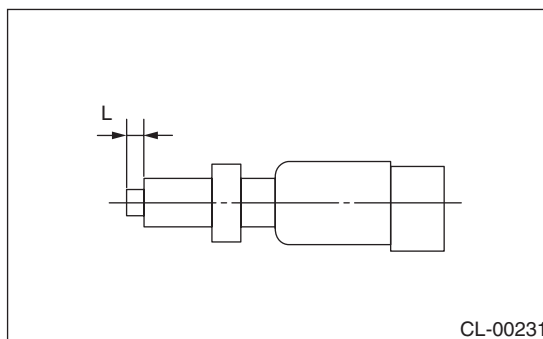
- 3) Connect the clutch switch connector.
- 4) Confirm that the engine does not start when the clutch pedal is released.
- 5) Confirm that the engine starts when the clutch pedal is fully depressed.

### C: INSPECTION

- 1) If the clutch switch (cruise control) does not operate properly (or if it does not stop at the specified position), replace with a new one.

**Specified position L:**

**$2^{+1.5}_{-0} \text{ mm (0.079}^{+0.059}_{-0} \text{ in)}$**



- 2) Check the clutch switch continuity. If the resistance is not as specified, replace the switch.

- (1) Disconnect the clutch switch connector.
- (2) Measure the resistance between 1 and 2 of switch terminal.

**Terminals/Specified resistance**

**When clutch pedal depressed:**

**1 — 2/Less than 1  $\Omega$**

**Terminals/Specified resistance**

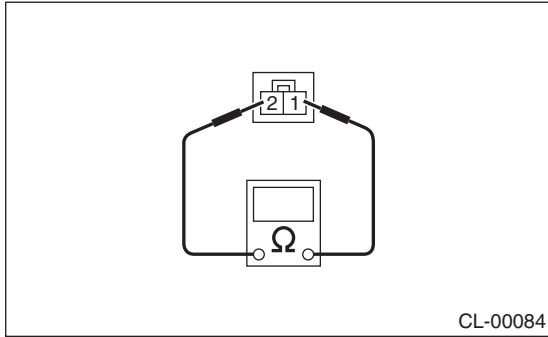
**When clutch pedal not depressed:**

**1 — 2/More than 1 M $\Omega$**

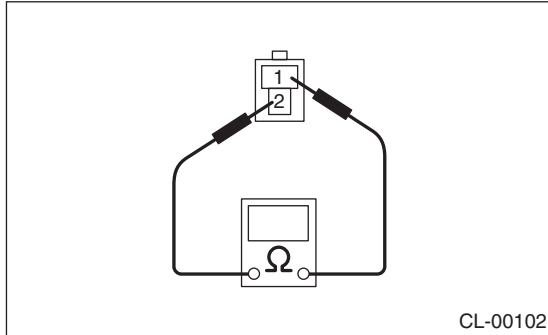
# Clutch Switch

## CLUTCH SYSTEM

- Clutch switch (Cruise control)



- Clutch switch (Starter interlock)

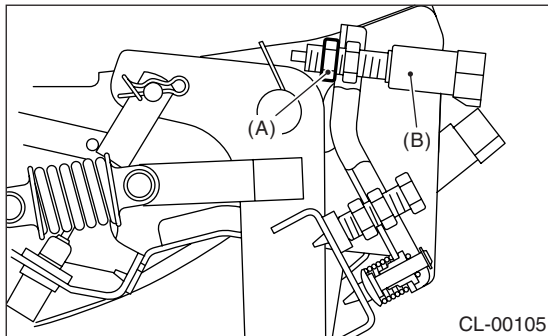


3) Confirm that the engine does not start when the clutch pedal is not depressed. If the engine starts, adjust the clutch switch, and inspect the starter interlock circuit.

4) Confirm that the engine starts when the clutch pedal is fully depressed. If the engine does not start, adjust the clutch switch, and inspect the starter interlock circuit.

### D: ADJUSTMENT

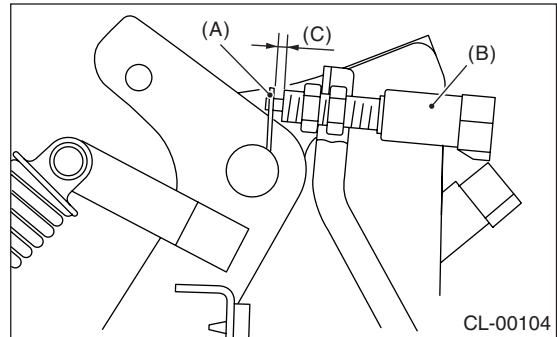
1) Loosen the clutch switch mounting lock nut (Starter interlock).



- (A) Lock nut
- (B) Clutch switch (Starter interlock)

2) Fully depress the clutch pedal.

3) Adjust the clutch pedal plate and clutch switch so that the gap between them is 3 — 3.5 mm (0.12 — 0.14 in).



- (A) Plate
- (B) Clutch switch (Starter interlock)
- (C) 3 — 3.5 mm (0.12 — 0.14 in)

4) Tighten the lock nut.

**Tightening torque:**

**8 N·m (0.8 kgf-m, 5.9 ft-lb)**

## 12.General Diagnostic Table

### A: INSPECTION

#### 1. CLUTCH

| Symptom   | Possible cause                                      | Corrective                         |
|---|---|------------------------------------|
| <b>1. Clutch slippage</b><br>It is hard to perceive clutch slippage in the early stage, but pay attention to the following symptoms <ul style="list-style-type: none"> <li>• Engine speed up when shifting.</li> <li>• High speed driving is impossible; especially rapid acceleration impossible and vehicle speed does not increase in proportion to an increase in engine speed.</li> <li>• Power falls, particularly when ascending a slope, and there is a smell of burning of the clutch facing.</li> <li>• Method of testing: Put the vehicle in stationary condition with parking brake fully applied. Disengage the clutch and shift the transmission gear into the first. Gradually allow the clutch to engage while gradually increasing the engine speed. The clutch function is satisfactory if the engine stalls. However, the clutch is slipping if the vehicle does not start off and the engine does not stall.</li> </ul> | (a) Clutch facing smeared by oil                    | Replace.                           |
|   | (b) Worn clutch facing                              | Replace.                           |
|   | (c) Deteriorated diaphragm spring                   | Replace.                           |
|   | (d) Distorted pressure plate or flywheel            | Correct or replace.                |
|   | (e) Defective release bearing holder                | Correct or replace.                |
| <b>2. Clutch drags.</b><br>As a symptom of this trouble, a harsh scratching noise develops and control becomes quite difficult when shifting gears. The symptom becomes more apparent when shifting into the first gear. However, because much trouble of this sort is due to defective synchronization mechanism, carry out the test as described after. <ul style="list-style-type: none"> <li>• Method of testing: &lt;Ref. to CL-31, CLUTCH, INSPECTION, General Diagnostic Table.&gt;</li> </ul> It may be judged as insufficient disengagement of clutch if any noise occurs during this test.  | (a) Worn or rusty clutch disc hub spline            | Replace the clutch disc.           |
|   | (b) Excessive deflection of clutch disc facing      | Correct or replace.                |
|   | (c) Seized crankshaft pilot needle bearing          | Replace.                           |
|   | (d) Cracked clutch disc facing                      | Replace.                           |
|   | (e) Stuck clutch disc (smeared by oil or water)     | Replace.                           |
| <b>3. Clutch chatters.</b><br>Clutch chattering is an unpleasant vibration to the whole body when the vehicle is just started with clutch partially engaged.  | (a) Adhesion of oil on the facing                   | Replace the clutch disc.           |
|   | (b) Weak or broken torsion spring                   | Replace the clutch disc.           |
|   | (c) Defective facing contact or excessive disc wear | Replace the defective clutch disc. |
|   | (d) Warped pressure plate or flywheel               | Correct or replace.                |
|   | (e) Loose disc rivets                               | Replace the clutch disc.           |
|   | (f) Loose engine mounting                           | Retighten or replace the mounting. |
|   | (g) Improper adjustment of pitching stopper         | Adjustment.                        |
| <b>4. Noisy clutch</b><br>The noise is generated when the clutch is disengaged, engaged, or partially engaged.  | (a) Broken, worn or unlubricated release bearing    | Replace the release bearing.       |
|   | (b) Insufficient lubrication of pilot bearing       | Apply grease.                      |
|   | (c) Loose clutch disc hub                           | Replace the clutch disc.           |
|   | (d) Loose torsion spring retainer                   | Replace the clutch disc.           |
|   | (e) Deteriorated or broken torsion spring           | Replace the clutch disc.           |

## General Diagnostic Table

### CLUTCH SYSTEM

| Symptom   | Possible cause   | Corrective  |
|---|--|---|
| <b>5. Clutch grabs.</b><br>When starting the vehicle with the clutch partially engaged, the clutch engages suddenly and the vehicle jumps instead of making a smooth start. | (a) Grease or oil on facing                            | Replace the clutch disc.  |
|   | (b) Deteriorated cushioning spring                     | Replace the clutch disc.  |
|   | (c) Worn or rusted spline of clutch disc or main shaft | Take off rust, apply grease or replace the clutch disc or main shaft. |
|   | (d) Deteriorated or broken torsion spring              | Replace the clutch disc.  |
|   | (e) Loose engine mounting                              | Retighten or replace the mounting.                                    |
|   | (f) Deteriorated diaphragm spring                      | Replace.  |

## 2. CLUTCH PEDAL

| Trouble   | Corrective action                                |
|---|--|
| Insufficient pedal play                                 | Adjust pedal play.                               |
| Clutch pedal free play insufficient                     | Adjust pedal free play.                          |
| Excessively worn and damaged pedal shaft and/or bushing | Replace the bushing and/or shaft with a new one. |

## 3. DIAGNOSTIC DIAGRAM OF CLUTCH DRAG

| Step   | Check   | Yes  | No   |
|--|---|--|--|
| <b>1 CHECK GEAR NOISE.</b><br>1) Start the engine.<br>2) Disengage the clutch and shift quickly from neutral to reverse in idling condition.   | Is there any abnormal noise from the transmission gear? | Go to step 2.  | Clutch is normal.  |
| <b>2 CHECK GEAR NOISE.</b><br>Disengage the clutch at idle and shift from neutral to reverse within 0.5 — 1.0 seconds.   | Is there any abnormal noise from the transmission gear? | Go to step 3.  | Defective transmission or excessive clutch drag torque. Inspect the pilot bearing, clutch disc, transmission and clutch disc hub spline. |
| <b>3 CHECK GEAR NOISE.</b><br>1) Disengage the clutch at idle and shift from neutral to reverse within 0.5 — 1.0 seconds.<br>2) With the clutch disengaged, shift from N to R, R to N several times. | Is there any abnormal noise from the transmission gear? | Defect in clutch disengaging. Inspect the clutch disc, clutch cover, clutch release, and clutch pedal free play. | Clutch and fly-wheel seizure. Inspect the clutch disc, spline of clutch disc hub.  |