

## 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 SYSTEM****CS****AUTOMATIC TRANSMISSION****4AT****AUTOMATIC TRANSMISSION  
(DIAGNOSTIC)****4AT(H4SO)****AUTOMATIC TRANSMISSION  
(DIAGNOSTIC)****4AT(H4DOTC)****AUTOMATIC TRANSMISSION  
(DIAGNOSTIC)****4AT(H4DOTC 2.5)****MANUAL TRANSMISSION AND  
DIFFERENTIAL****5MT****CLUTCH SYSTEM****CL**

# CLUTCH SYSTEM

# CL

---

	<b>Page</b>
1. General Description .....	2
2. Clutch Disc and Cover .....	16
3. Flywheel .....	19
4. Release Bearing and Lever.....	20
5. Operating Cylinder .....	24
6. Master Cylinder .....	26
7. Clutch Pipe and Hose .....	29
8. Clutch Fluid .....	31
9. Clutch Fluid Air Bleeding.....	32
10. Clutch Pedal.....	34
11. Clutch Switch .....	41
12. General Diagnostic Table.....	42

# General Description

## CLUTCH SYSTEM

### 1. General Description

#### A: SPECIFICATION

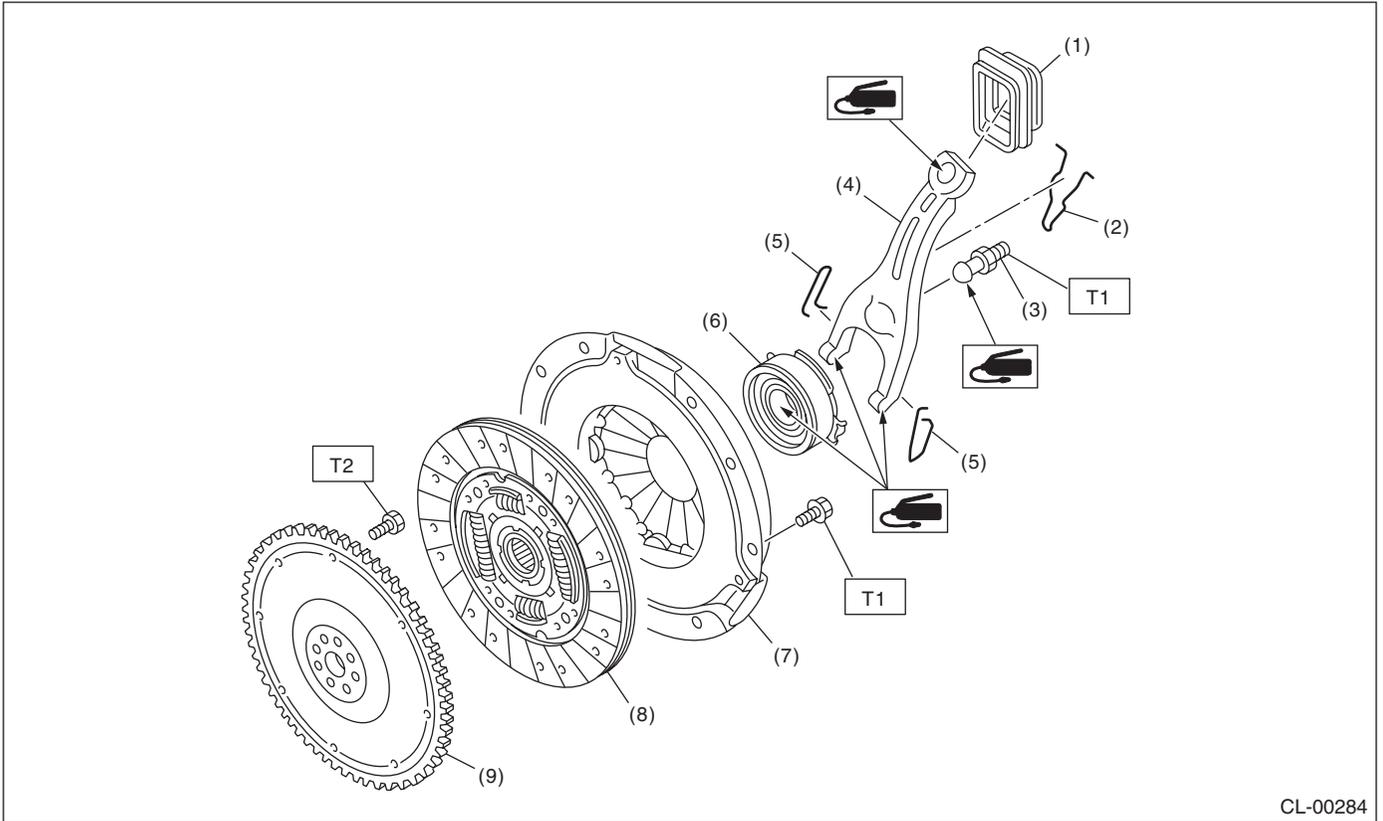
Model		2.0 L Non-turbo, 2.5 L LHD	2.0 L Turbo	2.5 L RHD	2.5 L Turbo
Clutch cover	Type	Push type	Pull type	Push type	Pull type
	Diaphragm set load kgf (lb)	580 (1,279)	700 (1,543)	580 (1,279)	800 (1,764)
Clutch disc	Facing material		Woven (Non asbestos)		
	O.D.×I.D.×Thic kness mm (in)	Flywheel side	225×150×3.5 (8.86×5.91×0.138)	230×155×3.5 (9.06×6.10×0.138)	
		Pressure plate side			
Spline O.D. mm (in)		25.2 (0.992), (No. of teeth: 24)			
Clutch release lever ratio		1.6	1.7	1.6	1.7
Release bearing		Grease-packed self-aligning			
Clutch pedal	Full stroke mm (in)	130 — 135 (5.12 — 5.31)			
	Free play mm (in)	4 — 12 (0.16 — 0.47)	3 — 13 (0.12 — 0.51)	4 — 12 (0.16 — 0.47)	
Clutch disc	Depth of rivet head mm (in)	Standard	1.3 — 1.9 (0.051 — 0.075)		
		Limit of sinking	0.3 (0.012)		
	Limit for run out mm (in)	0.8 (0.031) at R = 110 (4.33)		1.0 (0.039) at R = 110 (4.33)	

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

## B: COMPONENT

### 1. CLUTCH ASSEMBLY

#### • NON-TURBO MODEL



CL-00284

- |                                     |                            |
|-------------------------------------|----------------------------|
| (1) Clutch release lever dust cover | (6) Clutch release bearing |
| (2) Retainer spring                 | (7) Clutch cover           |
| (3) Pivot                           | (8) Clutch disc            |
| (4) Clutch release lever            | (9) Flywheel               |
| (5) Clip                            |                            |

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

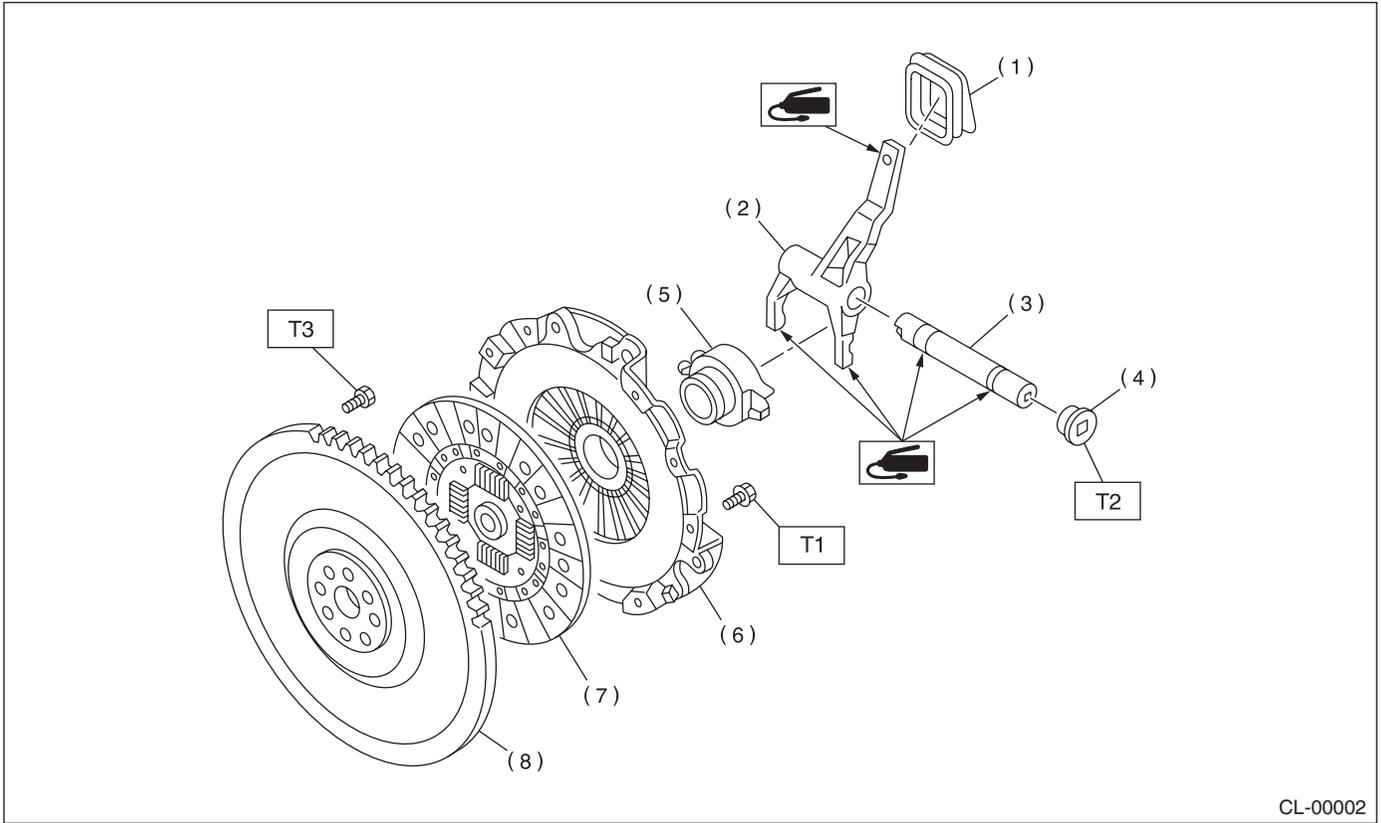
**T1: 16 (1.6, 11.6)**

**T2: 72 (7.3, 52.8)**

# General Description

## CLUTCH SYSTEM

### • TURBO MODEL



- |                                     |                            |
|-------------------------------------|----------------------------|
| (1) Clutch release lever dust cover | (5) Clutch release bearing |
| (2) Clutch release lever            | (6) Clutch cover           |
| (3) Clutch release lever shaft      | (7) Clutch disc            |
| (4) Plug                            | (8) Flywheel               |

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

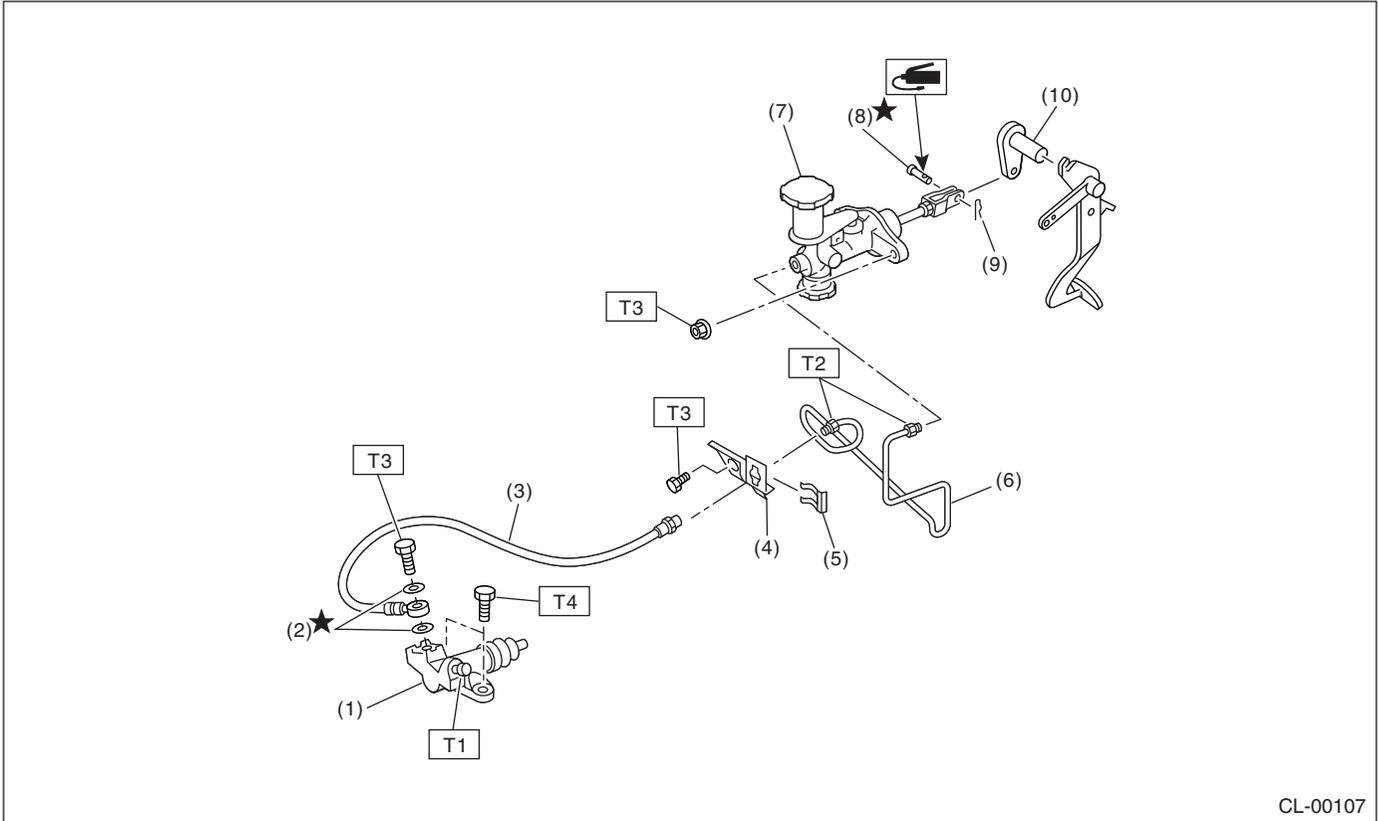
**T1: 16 (1.6, 11.6)**

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

**T3: 72 (7.3, 52.8)**

## 2. CLUTCH PIPE AND HOSE (NON-TURBO MODEL)

### • LHD 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, 5.8)**

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

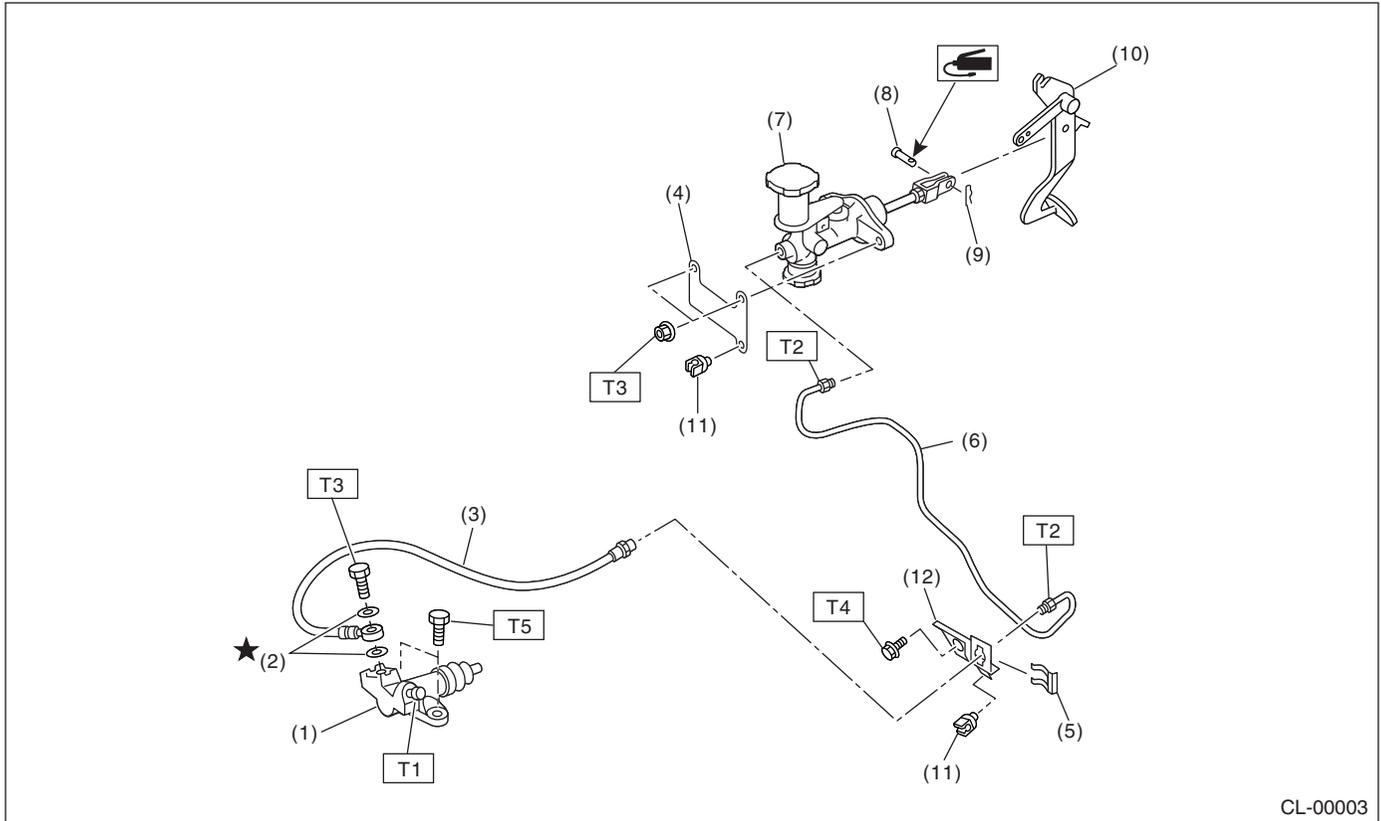
**T3: 18 (1.8, 13.0)**

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

# General Description

## CLUTCH SYSTEM

### • RHD MODEL



- |                        |                          |
|------------------------|--------------------------|
| (1) Operating cylinder | (7) Master cylinder ASSY |
| (2) Washer             | (8) Clevis pin           |
| (3) Clutch hose        | (9) Snap pin             |
| (4) Bracket            | (10) Pedal               |
| (5) Clamp              | (11) Clip                |
| (6) Clutch pipe        | (12) Bracket             |

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

**T1: 8 (0.8, 5.8)**

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

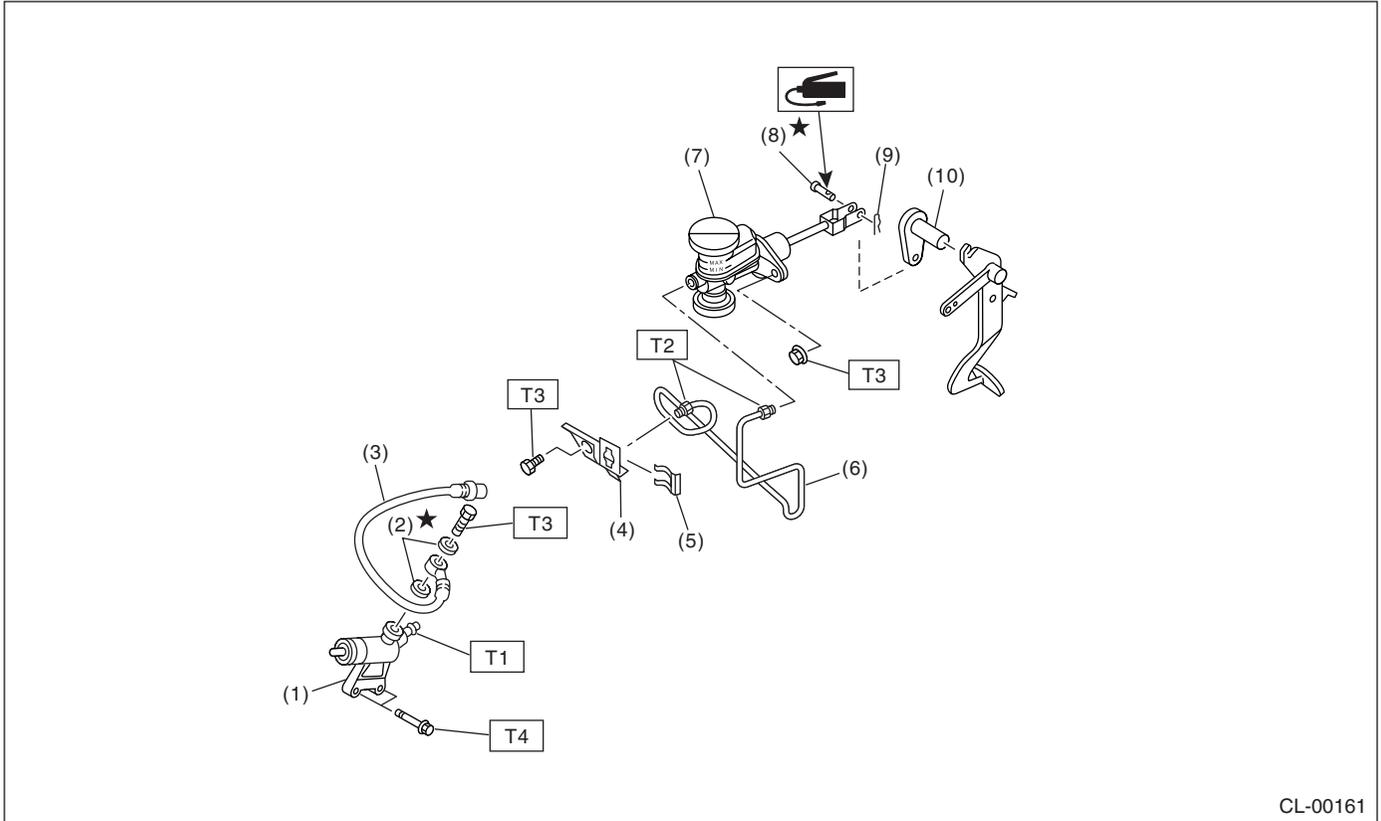
**T3: 18 (1.8, 13.0)**

**T4: 25 (2.5, 18.1)**

**T5: 37 (3.8, 27.5)**

## 3. CLUTCH PIPE AND HOSE (TURBO MODEL)

### • LHD MODEL



CL-00161

- |                        |                          |
|------------------------|--------------------------|
| (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, 5.8)***

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

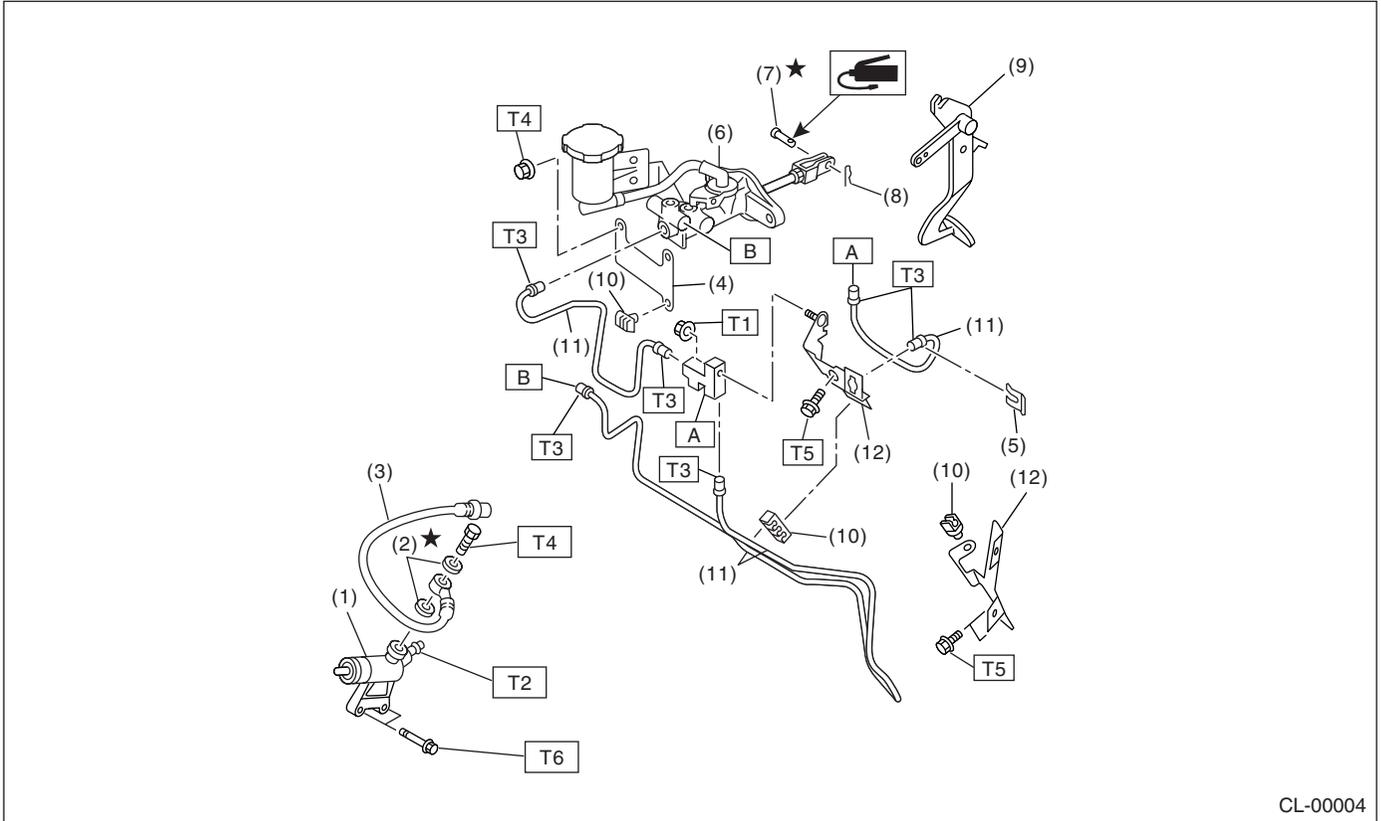
***T3: 18 (1.8, 13.0)***

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

# General Description

## CLUTCH SYSTEM

### • RHD MODEL



CL-00004

- |                          |                  |
|--------------------------|------------------|
| (1) Operating cylinder   | (7) Clevis pin   |
| (2) Washer               | (8) Snap pin     |
| (3) Clutch hose          | (9) Pedal        |
| (4) Bracket              | (10) Clip        |
| (5) Clamp                | (11) Clutch pipe |
| (6) Master cylinder ASSY | (12) Bracket     |

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

**T1: 7.5 (0.76, 5.53)**

**T2: 8 (0.8, 5.8)**

**T3: 15 (1.5, 10.8)**

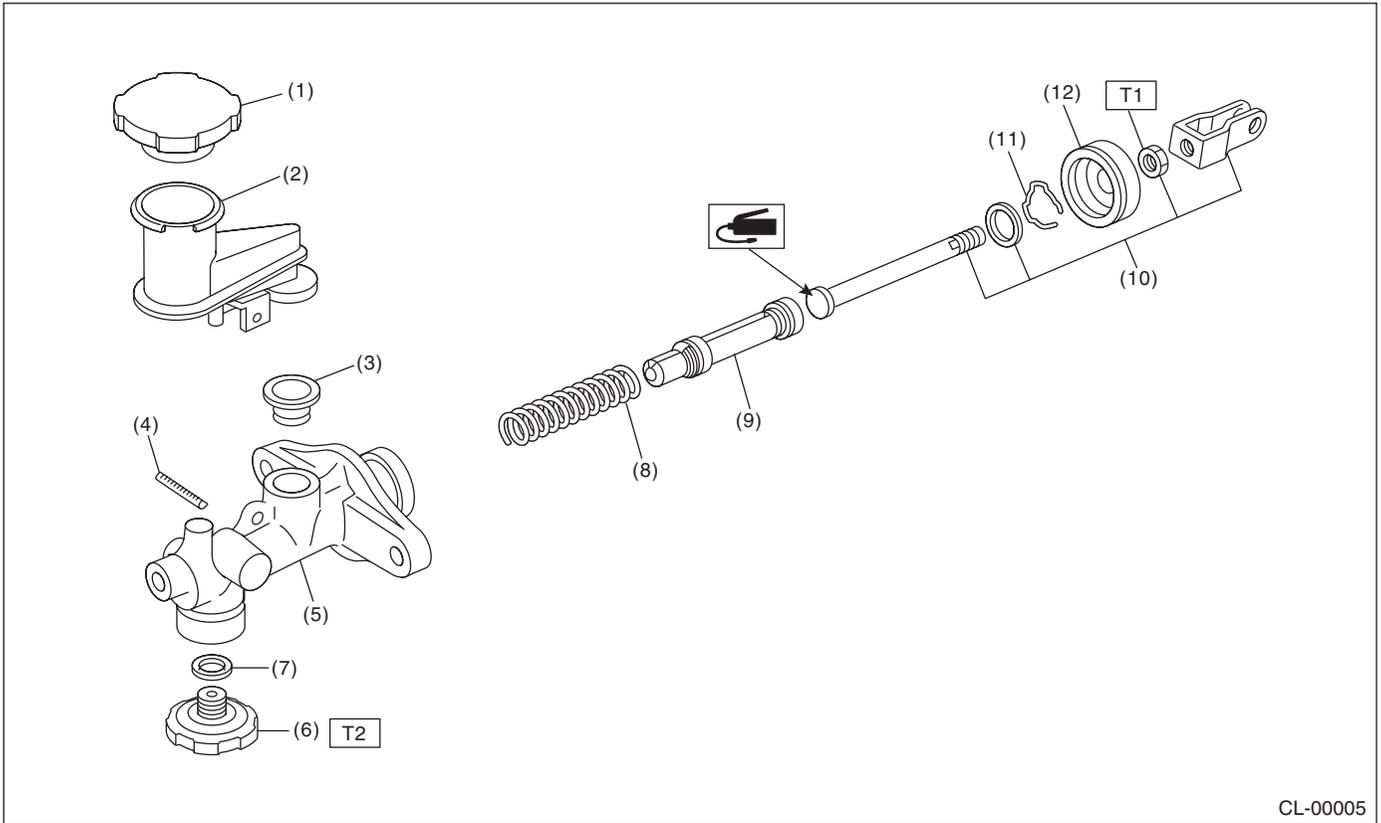
**T4: 18 (1.8, 13.0)**

**T5: 25 (2.5, 18.1)**

**T6: 37 (3.8, 27.5)**

## 4. MASTER CYLINDER

### • NON-TURBO MODEL



CL-00005

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

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

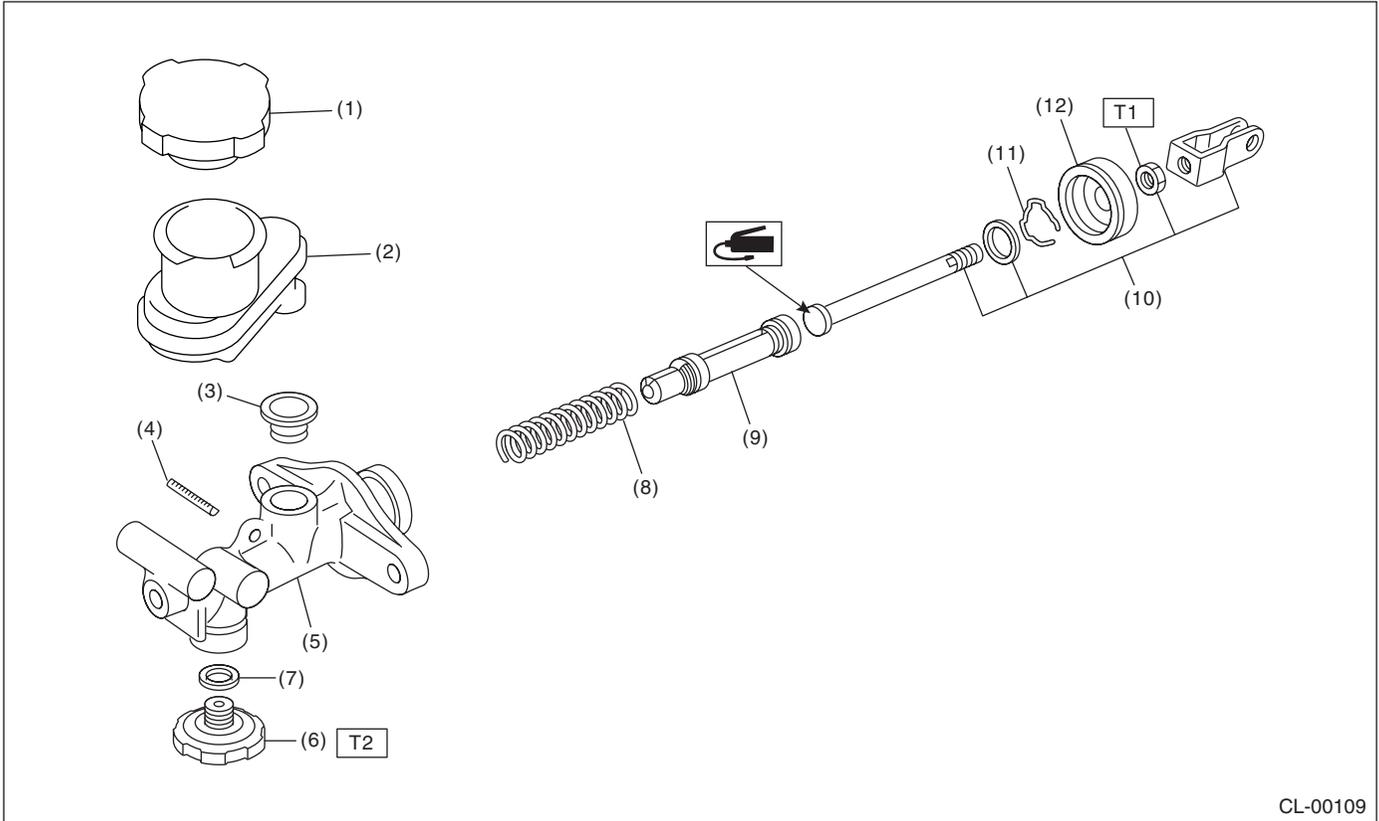
**T1: 10 (1.0, 7)**

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

# General Description

## CLUTCH SYSTEM

### • LHD TURBO MODEL



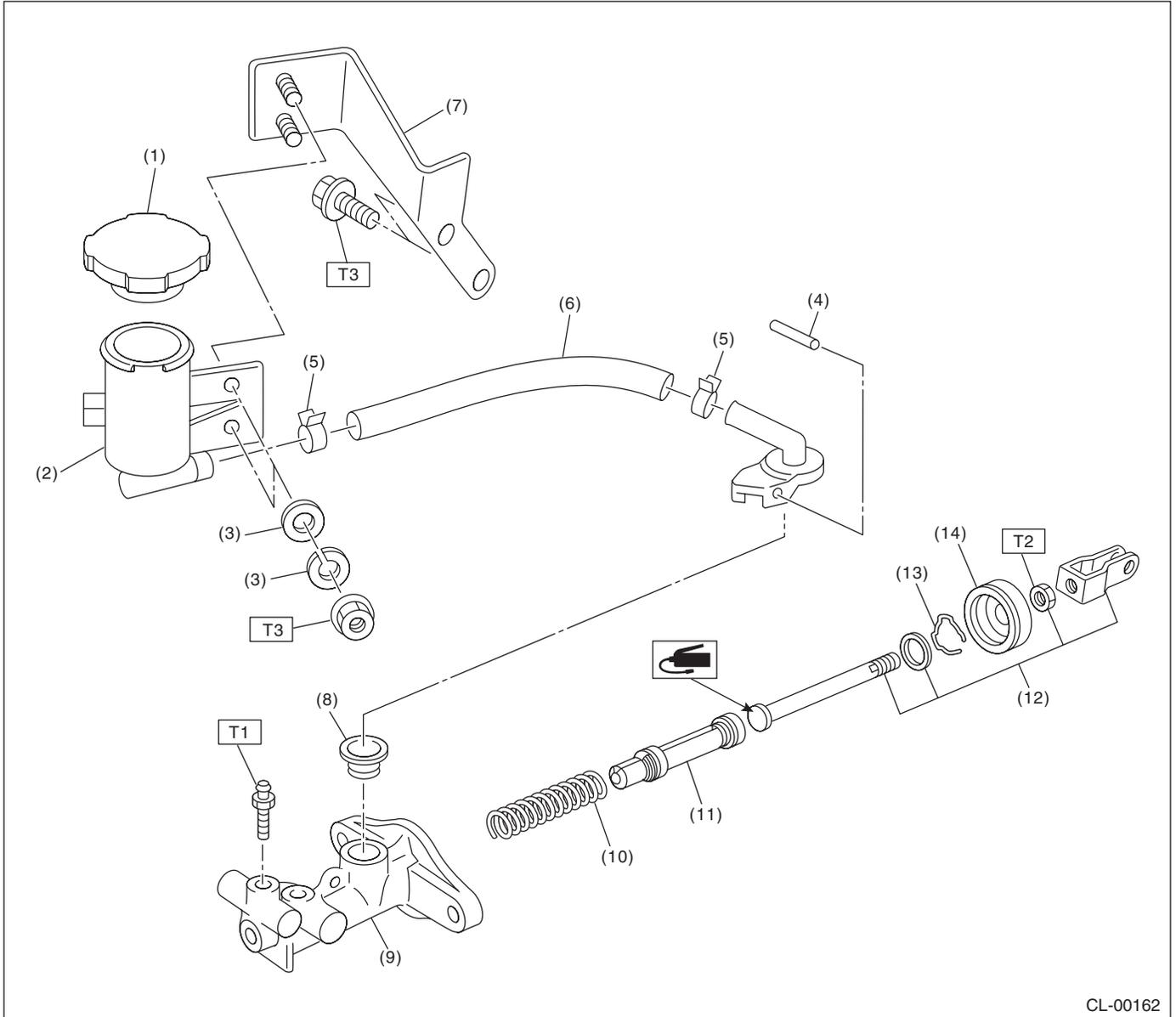
- |                     |                       |
|---------------------|-----------------------|
| (1) Reservoir cap   | (7) Gasket            |
| (2) Reservoir tank  | (8) Return spring     |
| (3) Oil seal        | (9) Piston            |
| (4) Straight pin    | (10) Push rod         |
| (5) Master 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)**

• RHD TURBO MODEL



CL-00162

- |                            |                       |
|----------------------------|-----------------------|
| (1) Reservoir cap          | (8) Oil seal          |
| (2) Reservoir tank         | (9) Master cylinder   |
| (3) Washer                 | (10) Return spring    |
| (4) Straight pin           | (11) Piston           |
| (5) Clip                   | (12) Push rod         |
| (6) Hose                   | (13) Piston stop ring |
| (7) Reservoir tank bracket | (14) Cylinder boot    |

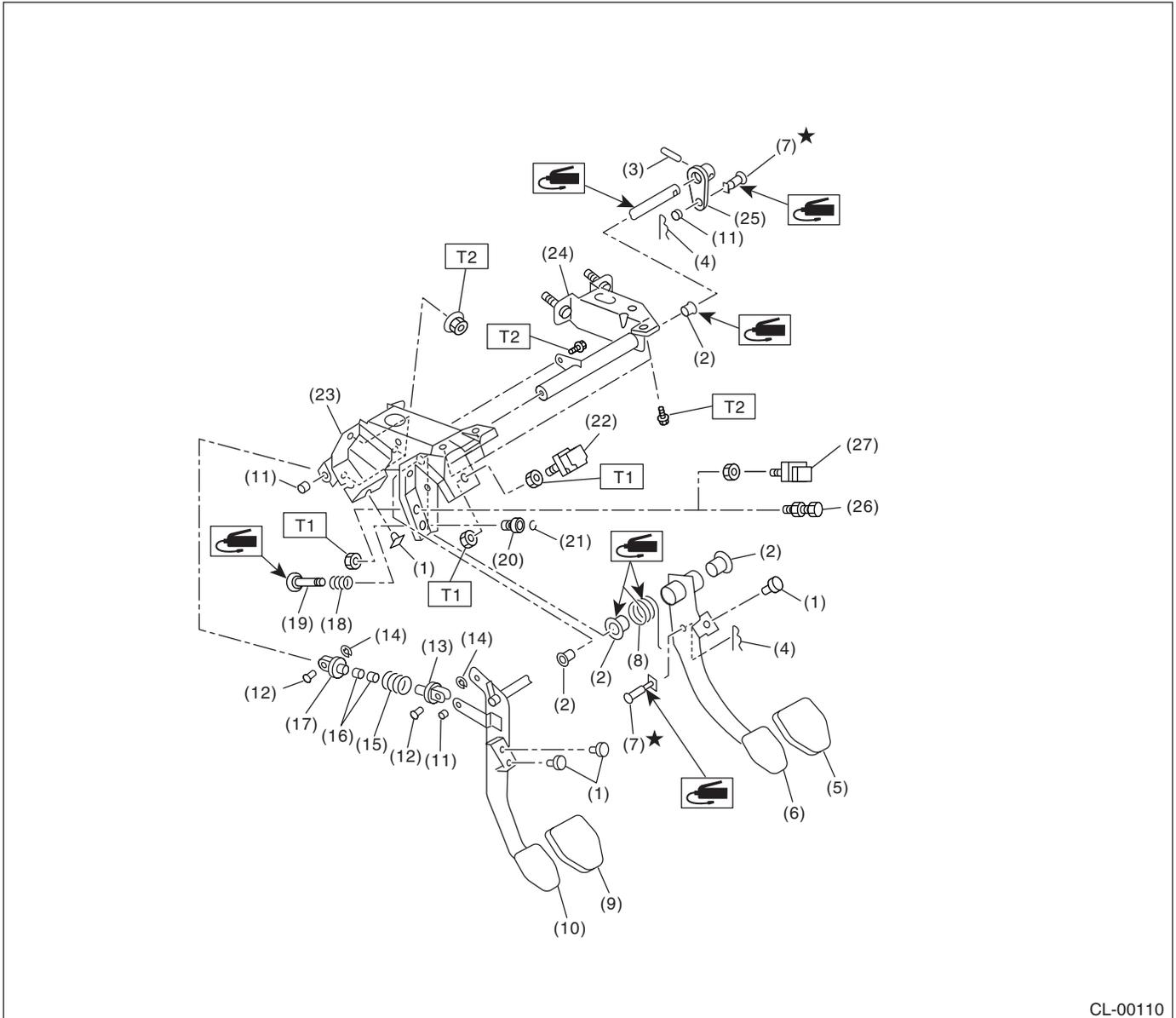
**Tightening torque: N·m (kgf·m, ft·lb)**  
**T1: 8 (0.8, 5.8)**  
**T2: 10 (1.0, 7)**  
**T3: 18 (1.8, 13.0)**

# General Description

## CLUTCH SYSTEM

### 5. CLUTCH PEDAL

#### • LHD MODEL



CL-00110

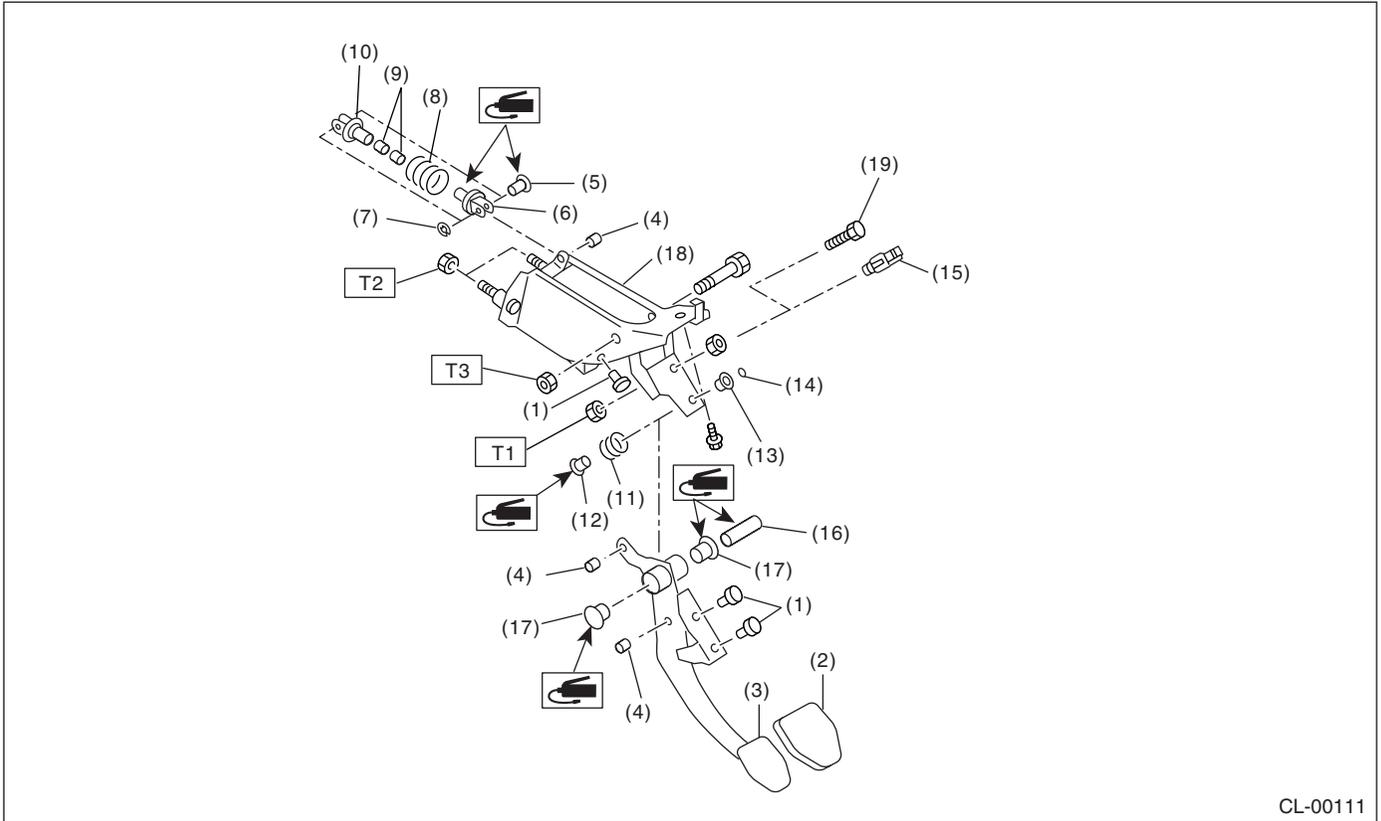
- |                        |                        |   |
|------------------------|------------------------|---|
| (1) Stopper            | (12) Clutch clevis pin | (23) Pedal bracket                                    |
| (2) Bushing            | (13) Assist rod A      | (24) Clutch master cylinder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

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

**T1: 8 (0.8, 5.8)**

**T2: 18 (1.8, 13.0)**

### • RHD MODEL



- (1) Stopper
- (2) Clutch pedal pad
- (3) Clutch pedal
- (4) Bushing
- (5) Clutch clevis pin
- (6) Assist rod A
- (7) Clip
- (8) Assist spring
- (9) Assist bushing

- (10) Assist rod B
- (11) Spring A
- (12) Rod S
- (13) Bushing B
- (14) Clip
- (15) Clutch switch (Model with cruise control system)
- (16) Spacer

- (17) Bushing
- (18) Pedal bracket
- (19) Adjusting bolt

---

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

**T1: 8 (0.8, 5.8)**

**T2: 18 (1.8, 13.0)**

**T3: 30 (3.1, 22.4)**

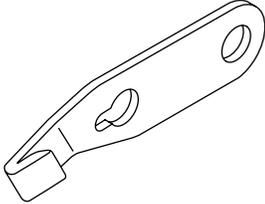
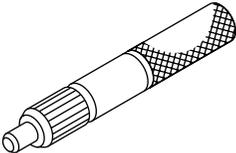
---

#### **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.
- 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
  ST-498497100	498497100	CRANKSHAFT STOPPER	Used for stopping rotation of flywheel when loosening tightening bolt, etc.
  ST-499747100	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 disk run-out.

# Clutch Disc and Cover

## CLUTCH SYSTEM

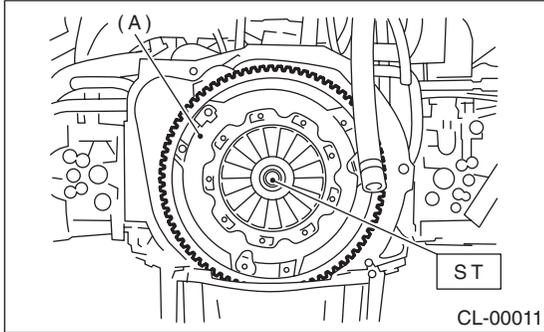
### 2. Clutch Disc and Cover

#### A: REMOVAL

1) Remove the transmission assembly from vehicle body. <Ref. to 5MT-32, REMOVAL, Manual Transmission Assembly.>

2) Install the ST on flywheel.

ST 499747100 CRANKSHAFT STOPPER



(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 either the clutch cover or clutch disc.

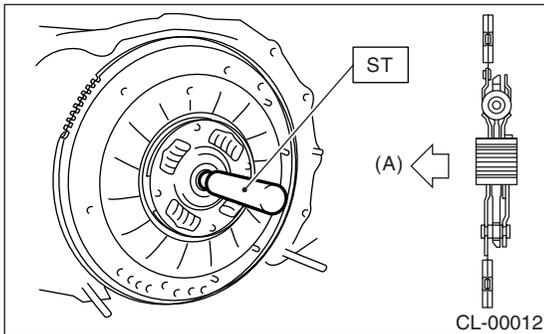
#### B: INSTALLATION

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

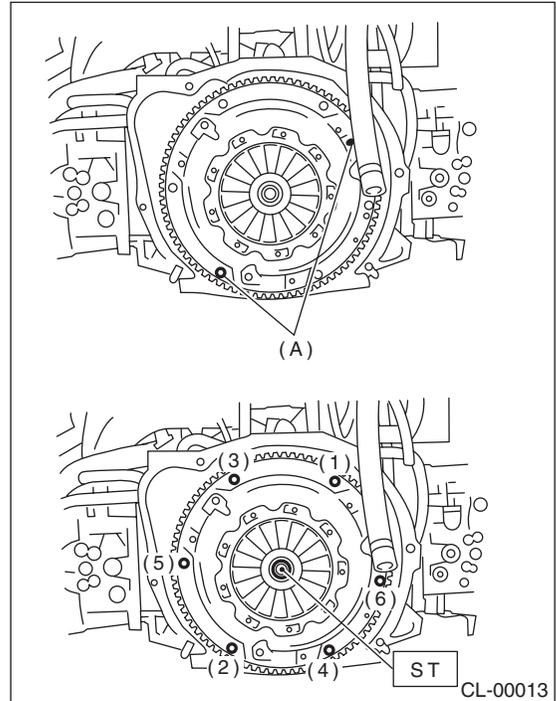
2) Position "0" marks on clutch cover and flywheel 120° apart, and then tighten the clutch cover installation bolts diagonally.

#### NOTE:

- "0" marks indicate the directions of residual unbalance.
- Temporarily tighten the bolts by hand. Each bolt should be tightened to the specified torque in a crisscross fashion.

#### Tightening torque:

**16 N·m (1.6 kgf·m, 11.6 ft·lb)**



(A) "0" marks

3) Remove the ST.

ST 499747100 CLUTCH DISC GUIDE

4) Install the transmission assembly. <Ref. to 5MT-36, INSTALLATION, Manual Transmission Assembly.>

## 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.

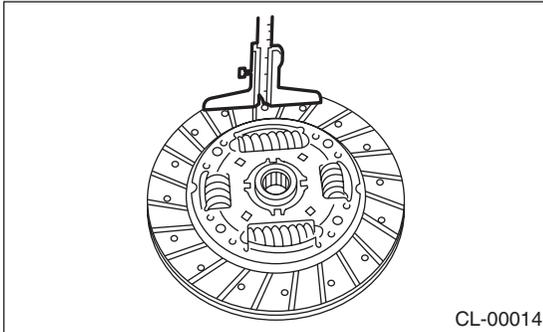
#### Depth of rivet head:

##### Limit of sinking

**0.3 mm (0.012 in)**

#### NOTE:

Do not wash the clutch disc with any cleaning fluid.

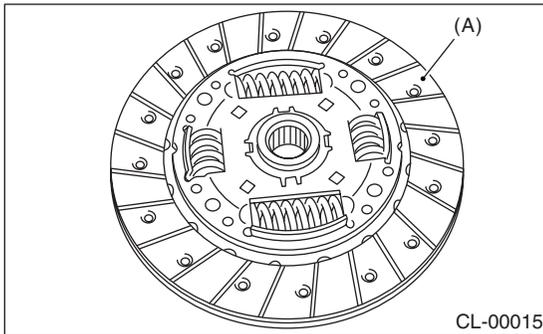


#### 2) Hardened facing

Correct by using emery paper or replace.

#### 3) Oil soakage 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.



(A) Clutch facing

#### 4) Run out on facing

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

ST 499747100 CLUTCH DISC GUIDE

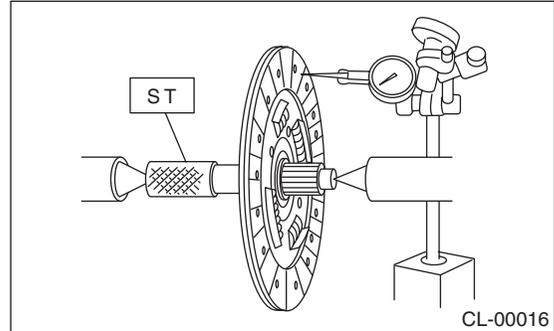
#### Limit for run out:

**2.0 L Non-Turbo model and LHD 2.5 L Non-Turbo model:**

**0.8 (0.031 in) mm at R = 110 mm (4.33 in)**

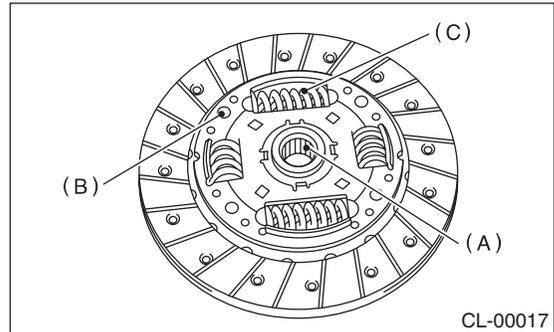
**Turbo model and RHD 2.5 L Non-Turbo model:**

**1.0 (0.039 in) mm at R = 110 mm (4.33 in)**



#### 5) Worn spline, loose rivets and torsion spring failure.

Replace defective parts.



(A) Spline

(B) Rivet

(C) Torsion spring

# Clutch Disc and Cover

## CLUTCH SYSTEM

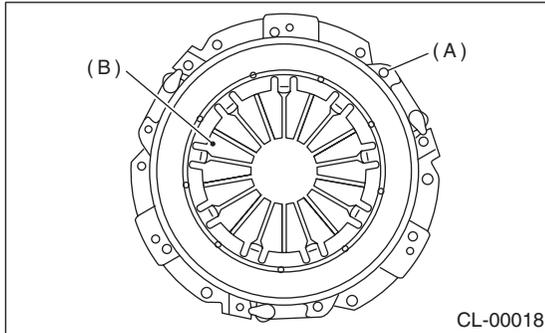
---

### 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.

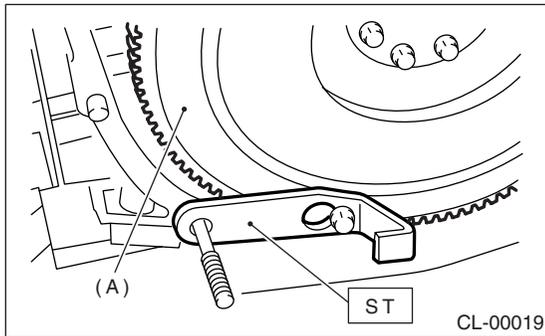


- (A) Thrust rivet
- (B) Diaphragm spring

## 3. Flywheel

### A: REMOVAL

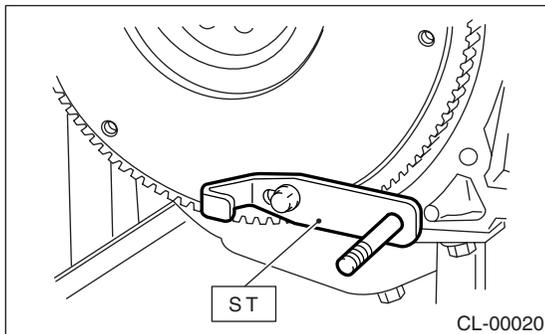
- 1) Remove the transmission assembly. <Ref. to 5MT-32, REMOVAL, Manual Transmission Assembly.>
- 2) Remove the clutch cover and clutch disc. <Ref. to CL-16, REMOVAL, Clutch Disc and Cover.>
- 3) Using the ST, remove the flywheel.  
ST 498497100 CRANKSHAFT STOPPER



(A) Flywheel

### B: INSTALLATION

- 1) Install the flywheel and ST.  
ST 498497100 CRANKSHAFT STOPPER



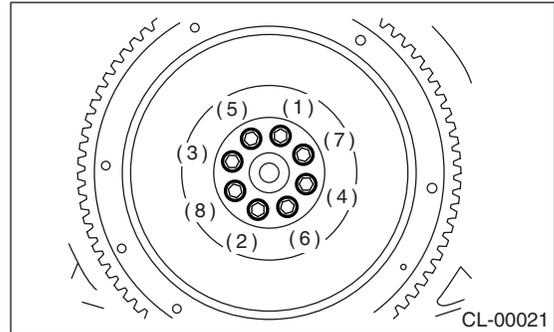
- 2) Tighten the flywheel attaching bolts to the specified torque.

#### NOTE:

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

#### Tightening torque:

**72 N·m (7.3 kgf-m, 52.8 ft-lb)**



- 3) Install the clutch disc and cover. <Ref. to CL-16, INSTALLATION, Clutch Disc and Cover.>

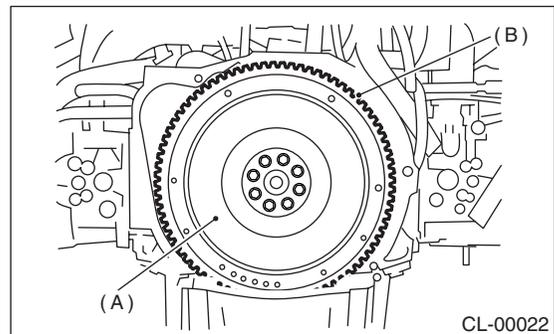
- 4) Install the transmission assembly. <Ref. to 5MT-36, INSTALLATION, Manual Transmission Assembly.>

### 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 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

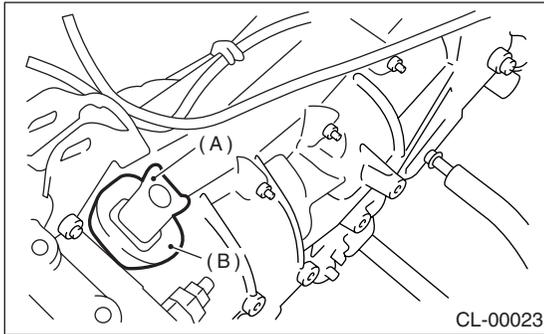
#### 1. NON-TURBO MODEL

- 1) Remove the transmission assembly from vehicle body.  
<Ref. to 5MT-32, REMOVAL, Manual Transmission Assembly.>
- 2) Remove the two clips from clutch release lever and remove the release bearing.

#### CAUTION:

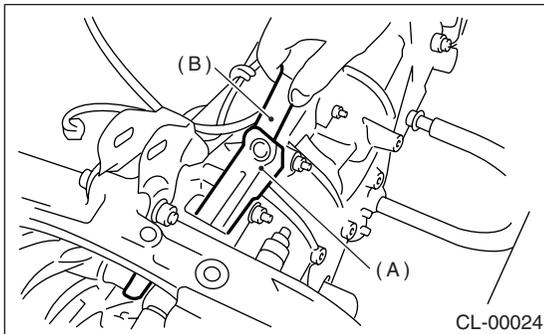
**Be careful not to deform clips.**

- 3) Remove the release lever dust cover.



- (A) Clutch release lever
- (B) Release lever dust cover

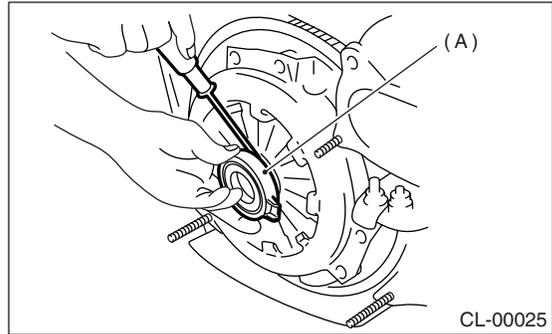
- 4) Remove the release lever retainer spring from release lever pivot with a screwdriver by accessing it through clutch housing release lever hole. Then remove the release lever.



- (A) Clutch release lever
- (B) Screwdriver

#### 2. TURBO MODEL

- 1) Remove the transmission assembly from vehicle body. <Ref. to 5MT-32, 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 tip screwdriver.



- (A) Clutch release bearing

## B: INSTALLATION

### 1. NON-TURBO MODEL

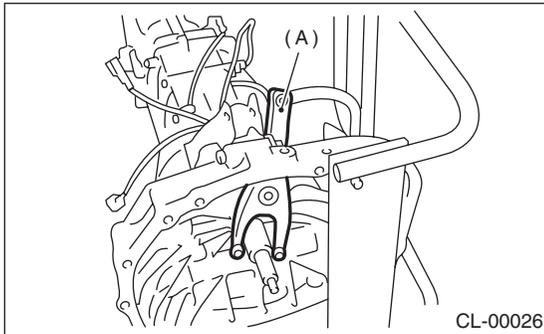
1) Before assembly, lubricate the following points with a coat of grease.

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

2) While pushing the fork to pivot and twisting it to both sides, fit the retainer spring onto the constricted portion of pivot.

Apply grease (SUNLIGHT 2: Part No. 003602010) to the contact point of release lever and operating cylinder.

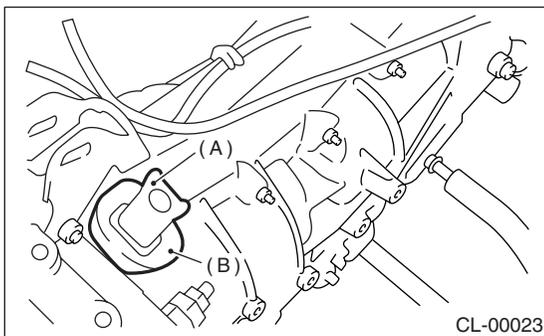
3) Confirm that the retainer spring is securely fitted by observing it through the main case hole.



(A) Release lever

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

5) Install the release lever dust cover.



(A) Release lever  
(B) Release lever dust cover

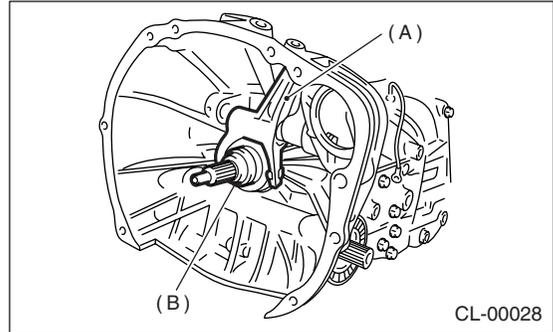
6) Verify that the bearing moves smoothly with operating release fork.

7) Install the transmission assembly.

<Ref. to 5MT-36, INSTALLATION, Manual Transmission Assembly.>

### 2. TURBO MODEL

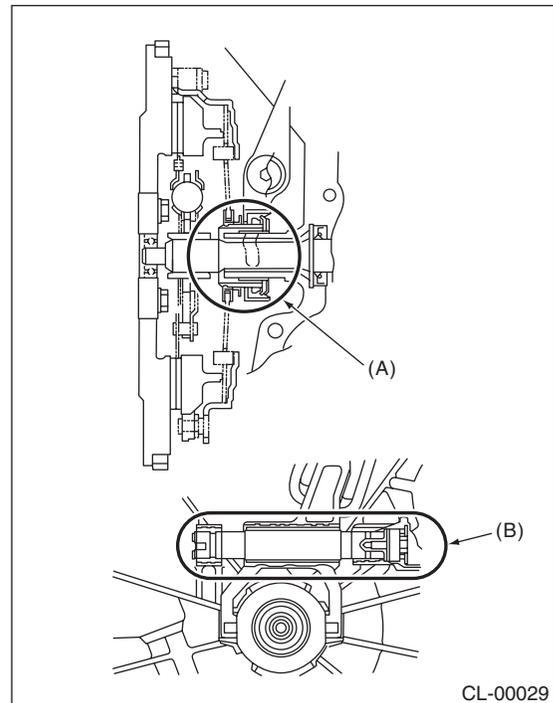
- 1) Install the release bearing on transmission.
- 2) Insert the release fork into release bearing tab.



(A) Release fork  
(B) Release bearing

3) Apply grease to the specified points:

- Spline FX2200 (Part No. 000040901)
- Shaft SUNLIGHT 2 (Part No. 003602010)



(A) Spline (FX2200)  
(B) Shaft (SUNLIGHT 2)

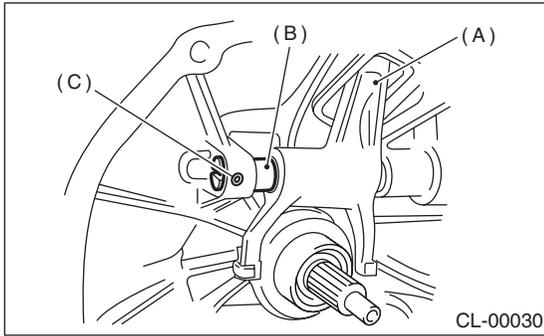
# Release Bearing and Lever

## CLUTCH SYSTEM

4) Insert the release fork shaft into release fork.

**NOTE:**

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

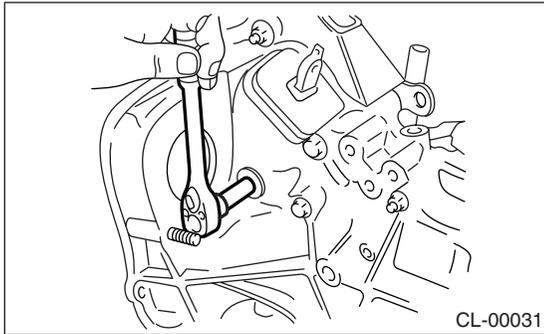


- (A) Release fork
- (B) Release shaft
- (C) Spring pin

5) Tighten the plug.

**Tightening torque:**

**44 N·m (4.5 kgf-m, 32.5 ft-lb)**



6) Move the release fork to ensure that release bearing and release fork move smoothly.

7) Install the transmission assembly. <Ref. to 5MT-36, INSTALLATION, Manual Transmission Assembly.>

## C: INSPECTION

### 1. RELEASE BEARING

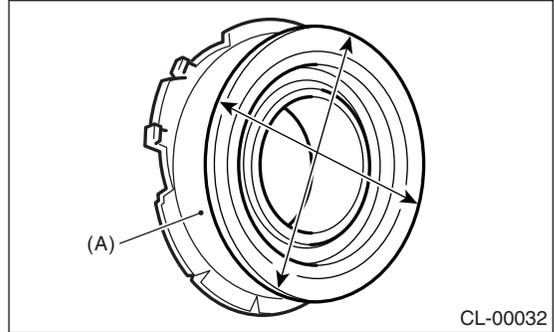
**CAUTION:**

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.

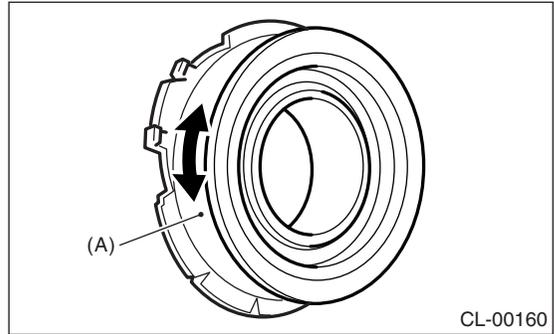
**Radial direction stroke:**

**1.6 mm (0.063 in)**



- (A) Bearing case

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

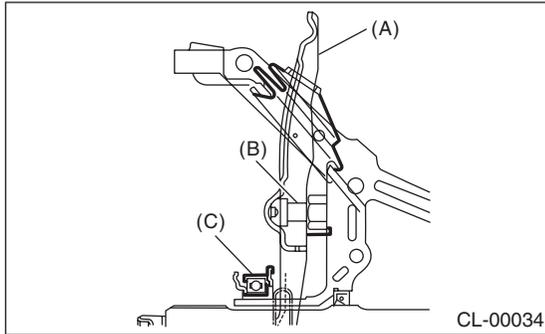


- (A) Bearing case

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 case for wear.



- (A) Clutch release lever
- (B) Pivot
- (C) Clutch release bearing

### 5. Operating Cylinder

#### A: REMOVAL

1) Remove the air cleaner case and air intake duct (Non-turbo model). <Ref. to IN(H4SO)-6, REMOVAL, Air Cleaner Case.> <Ref. to IN(H4SO)-7, REMOVAL, Air Intake Duct.>

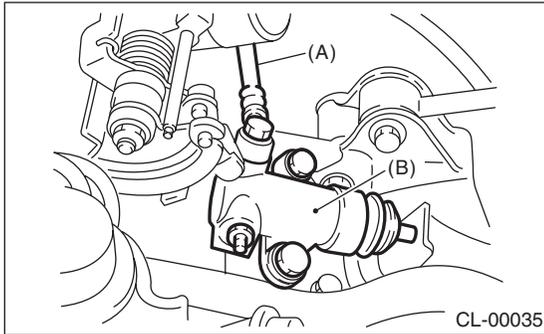
2) Remove the intercooler (Turbo model). <Ref. to IN(H4DOTC)-10, REMOVAL, Intercooler.>

3) Remove the clutch hose from operating cylinder.

#### NOTE:

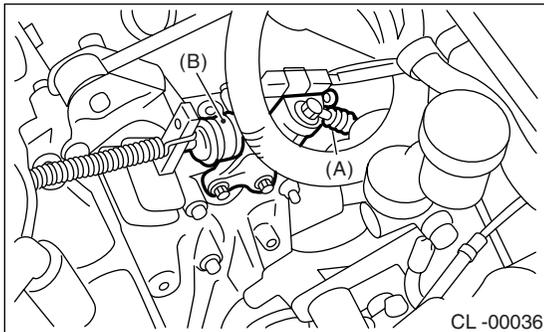
Cover the hose joint to prevent clutch fluid from flowing out.

- NON-TURBO model



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

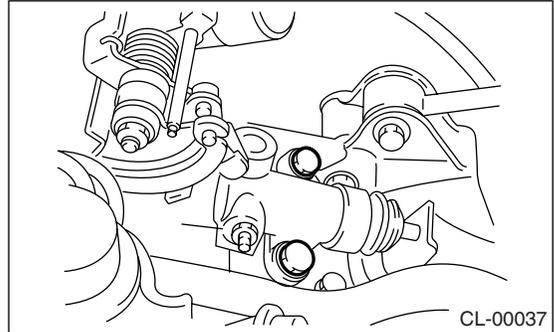
- TURBO model



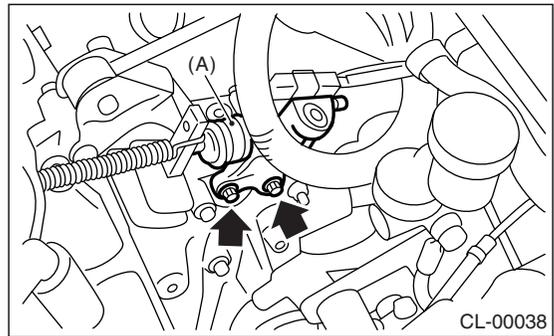
- (A) Clutch hose
- (B) Operating cylinder

4) Remove the operating cylinder from transmission.

- NON-TURBO model



- TURBO model



- (A) Operating cylinder

## B: INSTALLATION

1) Apply grease (SUNLIGHT 2: Part No. 003602010) to the contact point of the release lever and operating cylinder.

2) Install in the reverse order of removal.

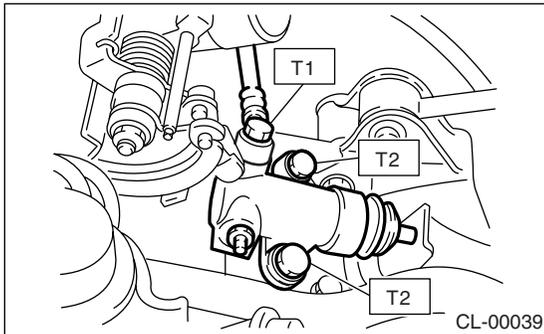
Before installing the operating cylinder, apply grease (SUNLIGHT 2: Part No. 003602010) to contact point of the release lever and operating cylinder.

### Tightening torque:

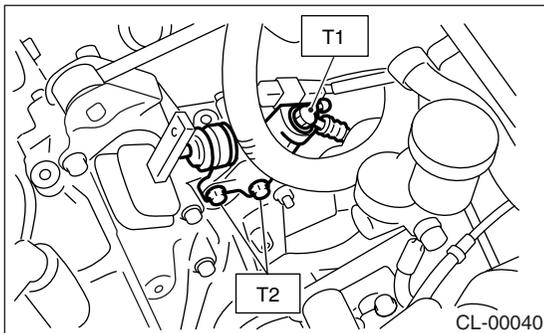
**T1: 18 N·m (1.8 kgf-m, 13.0 ft-lb)**

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

- NON-TURBO model

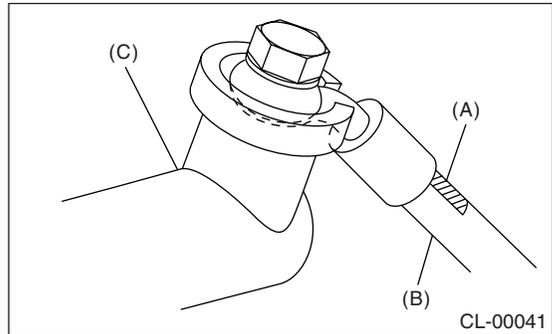


- TURBO model



### 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

3) After bleeding air from the operating cylinder, ensure that clutch operates properly.  
<Ref. to CL-32, 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.

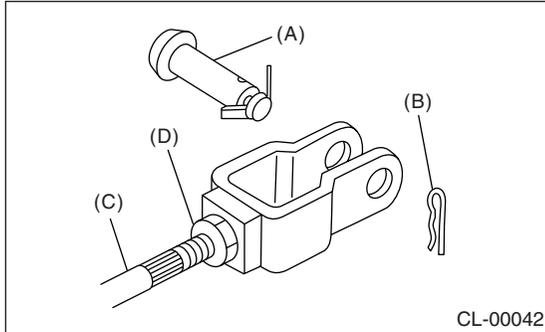
# Master Cylinder

## CLUTCH SYSTEM

### 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.

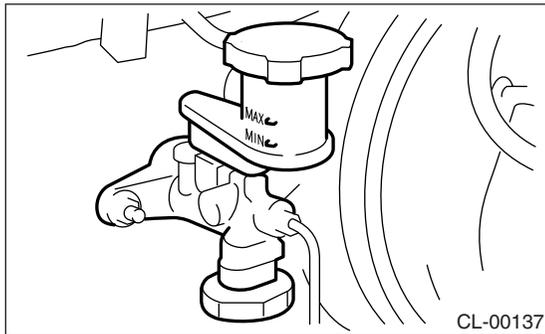


- (A) Clevis pin
- (B) Snap pin
- (C) Push rod
- (D) Push rod lock nut

- 3) Remove the air cleaner case and air intake duct (Non-turbo model). <Ref. to IN(H4SO)-6, REMOVAL, Air Cleaner Case.> <Ref. to IN(H4SO)-7, REMOVAL, Air Intake Duct.>
- 4) Remove the intercooler (Turbo model). <Ref. to IN(H4DOTC)-10, REMOVAL, Intercooler.>
- 5) Remove the clutch pipe from master cylinder.
- 6) Remove the master cylinder with reservoir tank.

#### 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 install the clutch pipe to master cylinder.

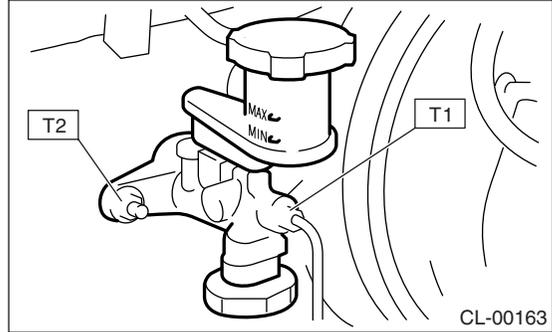
#### NOTE:

Check that the pipe is routed properly.

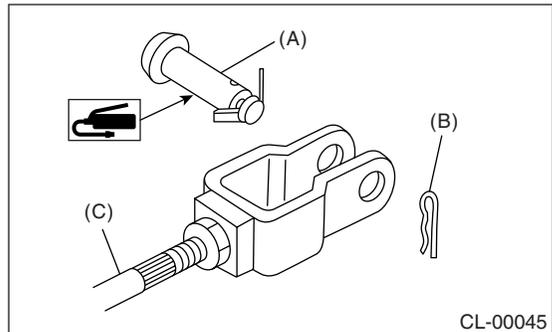
#### Tightening torque:

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

**T2: 18 N·m (1.8 kgf·m, 13.0 ft·lb)**



- 2) Apply a coat of grease to the clevis pin.
- 3) Connect the push rod of master cylinder to clutch pedal, and install the new clevis pin and snap pin.



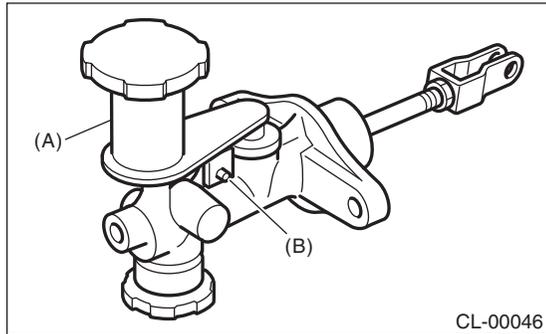
- (A) Clevis pin
- (B) Snap pin
- (C) Push rod

- 4) After bleeding air from the system, ensure that clutch operates properly. <Ref. to CL-32, Clutch Fluid Air Bleeding.>
- 5) Install the air cleaner case and air intake duct (Non-turbo model). <Ref. to IN(H4SO)-6, INSTALLATION, Air Cleaner Case.> <Ref. to IN(H4SO)-7, INSTALLATION, Air Intake Duct.>
- 6) Install the intercooler (Turbo model). <Ref. to IN(H4DOTC)-11, INSTALLATION, Intercooler.>

## C: DISASSEMBLY

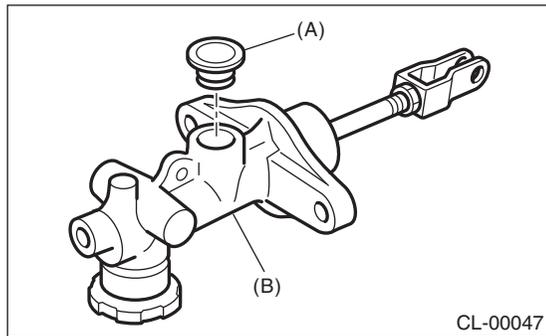
### 1. EXCEPT RHD TURBO MODEL

1) Remove the straight pin and reservoir tank.



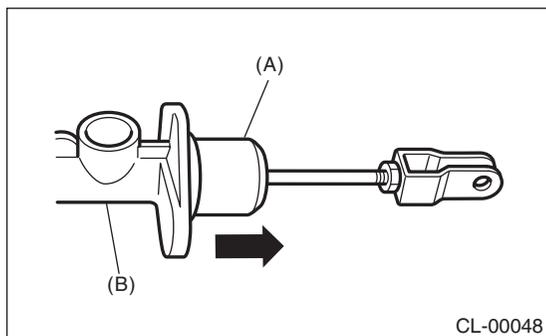
- (A) Reservoir tank
- (B) Straight pin

2) Remove the oil seal.



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

3) Move the cylinder boot backward.



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

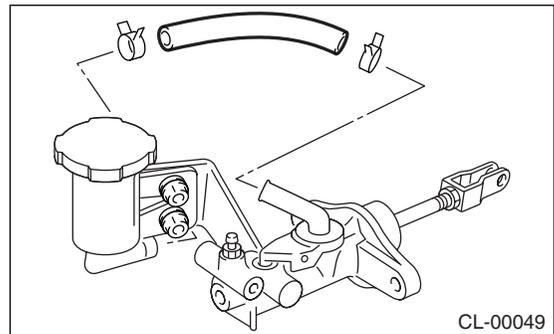
4) Remove the stop ring.

#### CAUTION:

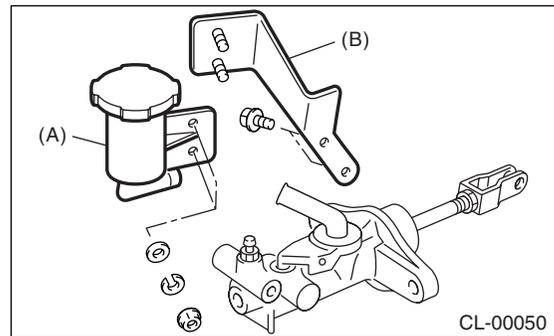
Be careful when removing the stop ring to prevent the rod, washer, piston and return spring from flying out.

### 2. RHD TURBO MODEL

1) Remove the hose.

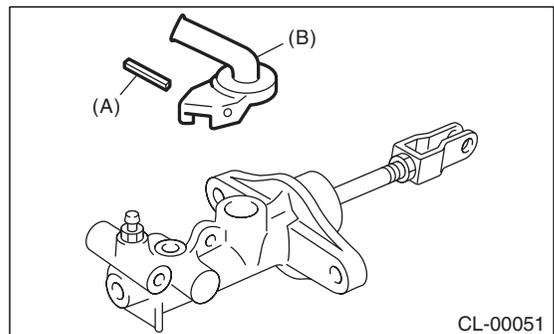


2) Remove the reservoir tank and bracket.



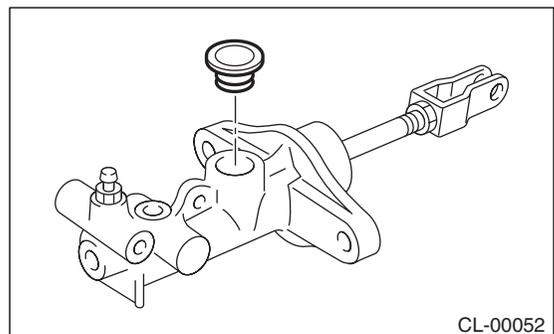
- (A) Reservoir tank
- (B) Bracket

3) Remove the straight pin and adapter.



- (A) Straight pin
- (B) Adapter

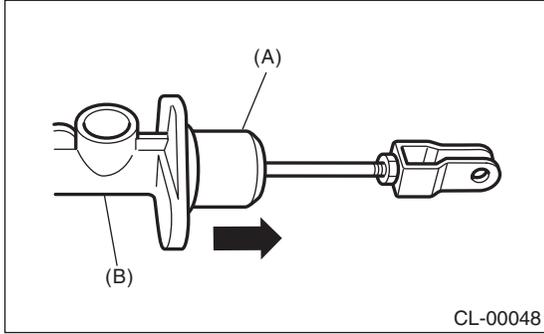
4) Remove the oil seal.



# Master Cylinder

## CLUTCH SYSTEM

5) Move the cylinder boot backward.



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

6) Remove the stop ring.

### CAUTION:

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

7) Remove the air bleeder.

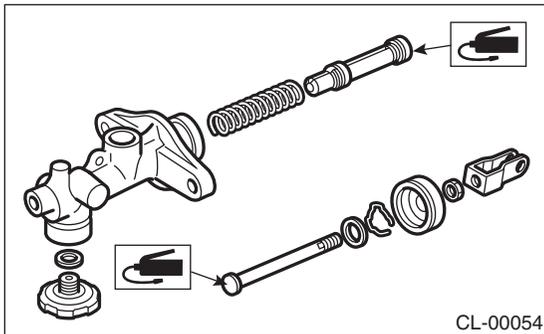
## D: ASSEMBLY

### 1. EXCEPT RHD TURBO MODEL

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

#### Grease:

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



2) To assemble the master cylinder, reverse the sequence of disassembly procedure.

#### Tightening torque:

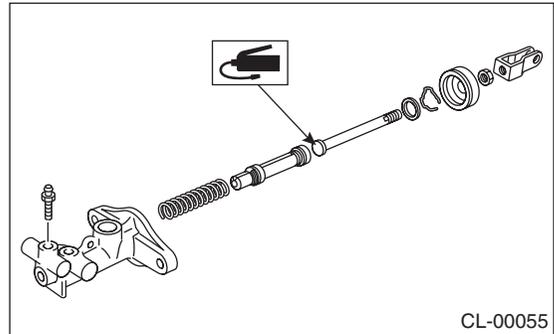
**10 N·m (1.0 kgf·m, 7 ft·lb)**

### 2. RHD TURBO MODEL

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

#### Grease:

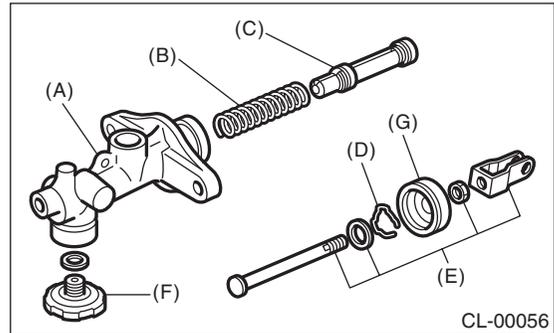
**SILICONE GREASE G40M (Part No. 004404003)**



2) Assemble in the reverse order of disassembly.

## 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, cylinder boot and hose replace the faulty part.



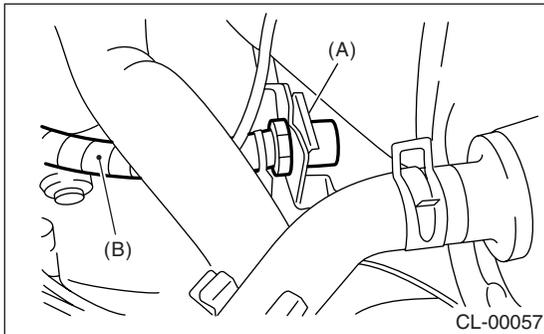
- (A) Master cylinder body
- (B) Return spring
- (C) Piston
- (D) Stop ring
- (E) Rod ASSY
- (F) Clutch damper
- (G) Cylinder boot

## 7. Clutch Pipe and Hose

### A: REMOVAL

#### 1. EXCEPT RHD TURBO MODEL

- 1) Remove the air cleaner case and air intake chamber.
- 2) Drain the clutch fluid. <Ref. to CL-31, Clutch Fluid.>
- 3) Remove the clutch pipe from the clutch hose and master cylinder.
- 4) Pull out the clamp, then remove the clutch hose from bracket.

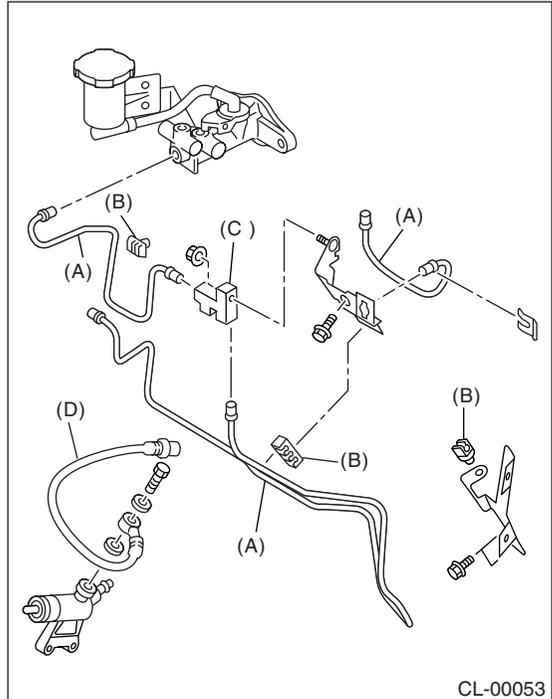


- (A) Clamp
- (B) Clutch hose

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

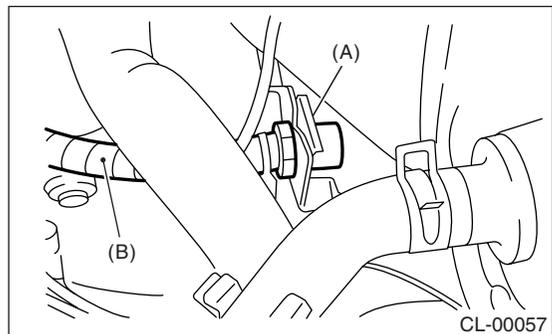
#### 2. RHD TURBO MODEL

- 1) Remove the intercooler. <Ref. to IN(H4DOTC)-10, REMOVAL, Intercooler.>
- 2) Drain the clutch fluid. <Ref. to CL-31, Clutch Fluid.>
- 3) Remove the clutch pipe from the master cylinder, connector and clutch hose.



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

- 4) Pull out the clamp, then remove the clutch hose from bracket.



- (A) Clamp
- (B) Clutch hose

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

# Clutch Pipe and Hose

## CLUTCH SYSTEM

### B: INSTALLATION

#### 1. EXCEPT RHD TURBO MODEL

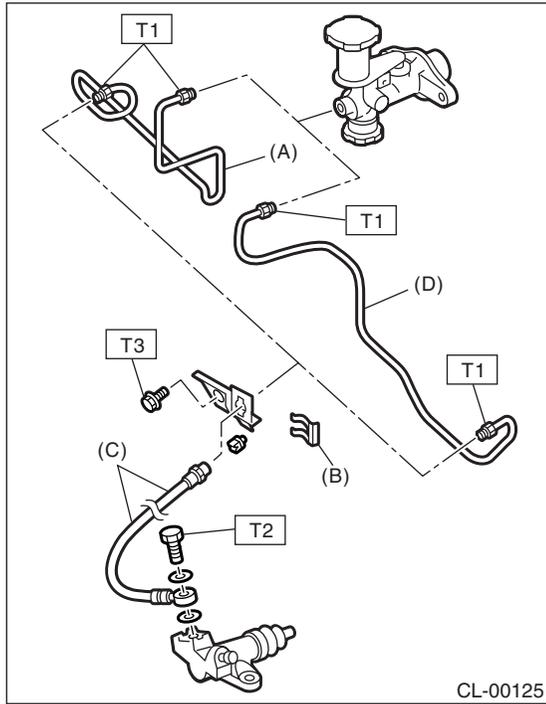
Install in the reverse order of removal.

##### Tightening torque:

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

**T2: 18 N·m (1.8 kgf-m, 13.0 ft-lb)**

**T3: 25 N·m (2.5 kgf-m, 18.1 ft-lb)**



- (A) Clutch pipe (LHD model)
- (B) Clip
- (C) Clutch hose
- (D) Clutch pipe (RHD model)

#### 2. RHD TURBO MODEL

Install in the reverse order of removal.

##### Tightening torque:

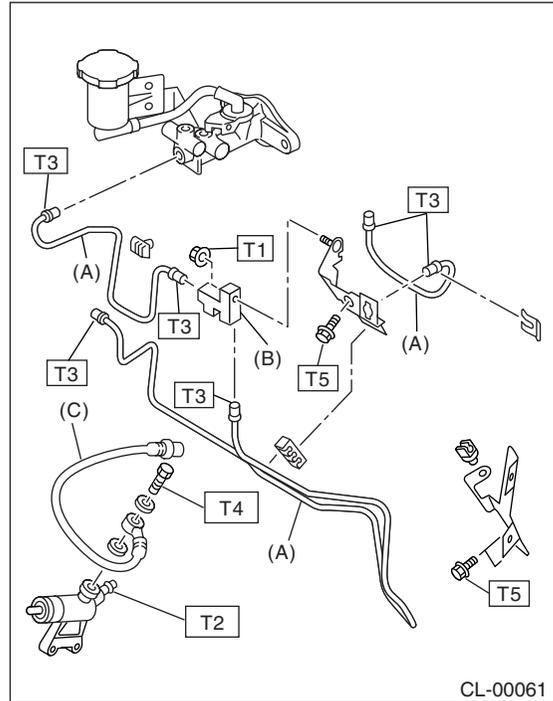
**T1: 7.5 N·m (0.76 kgf-m, 5.53 ft-lb)**

**T2: 8 N·m (0.8 kgf-m, 5.8 ft-lb)**

**T3: 15 N·m (1.5 kgf-m, 10.8 ft-lb)**

**T4: 18 N·m (1.8 kgf-m, 13.0 ft-lb)**

**T5: 25 N·m (2.5 kgf-m, 18.1 ft-lb)**



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

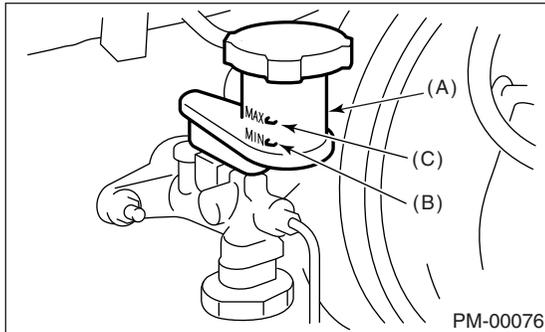
### C: INSPECTION

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) Reservoir tank
- (B) MIN level
- (C) MAX level

### B: REPLACEMENT

#### CAUTION:

- The FMVSS No. 116, fresh DOT3 or DOT4 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:

- For convenience and safety, it is advisable to have two men working.
- 1) Remove the air cleaner case and air chamber.
  - 2) Either jack-up the vehicle and place a rigid rack under it, or lift-up the vehicle.
  - 3) Draw out the brake fluid from reservoir tank with syringe.
  - 4) Refill the reservoir tank with new recommended brake fluid.

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

**FMVSS No. 116, fresh DOT3 or DOT4 brake fluid**

- 5) Drain 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.

## 9. Clutch Fluid Air Bleeding

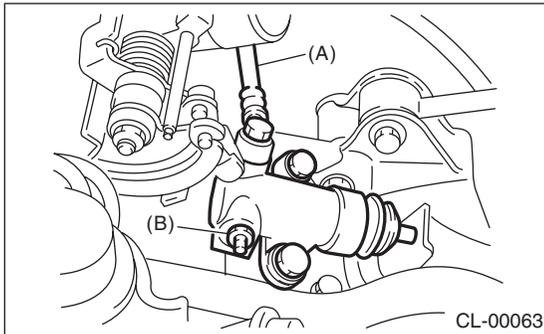
### A: PROCEDURE

#### 1. NON-TURBO MODEL

**NOTE:**

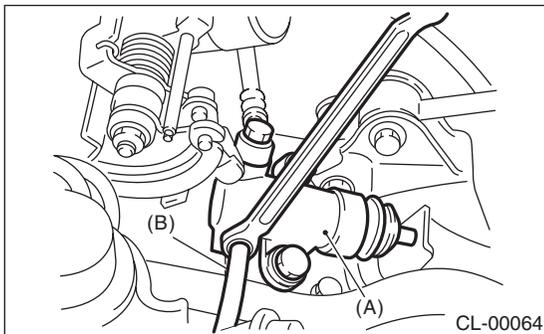
Bleed air from the oil line with help of co-worker.

- 1) Remove the air cleaner case and air intake duct. <Ref. to IN(H4SO)-6, REMOVAL, Air Cleaner Case.> <Ref. to IN(H4SO)-7, REMOVAL, Air Intake Duct.>
- 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.



(A) Operating cylinder  
(B) Vinyl tube

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

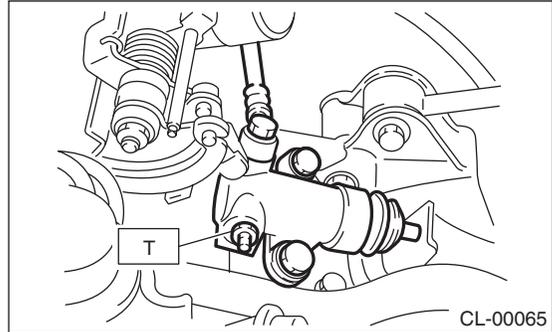
**CAUTION:**

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

- 5) Tighten the air bleeder.

**Tightening torque:**

**T: 8 N·m (0.8 kgf·m, 5.8 ft·lb)**



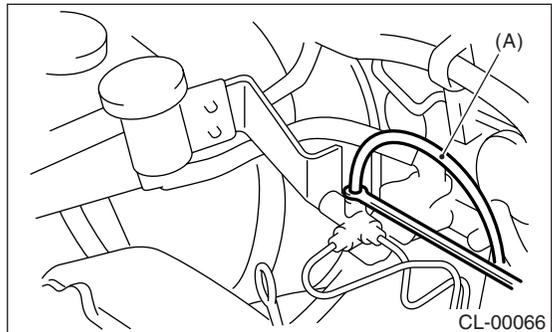
- 6) After depressing the clutch pedal, make sure that there are no leaks evident in the entire system.
- 7) After bleeding air from the system, ensure that clutch operates properly.

#### 2. TURBO MODEL

**NOTE:**

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

- 1) Remove the intercooler. <Ref. to IN(H4DOTC)-11, INSTALLATION, Intercooler.>
- 2) Fit one end of a vinyl tube into the air bleeder of master cylinder and put the air bleeder of other end into a brake fluid container. (RHD turbo model)
- 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. (RHD turbo model)



(A) Vinyl tube

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

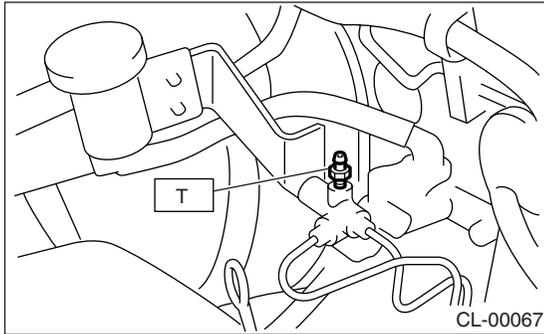
**CAUTION:**

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

5) Tighten the air bleeder. (RHD turbo model)

**Tightening torque:**

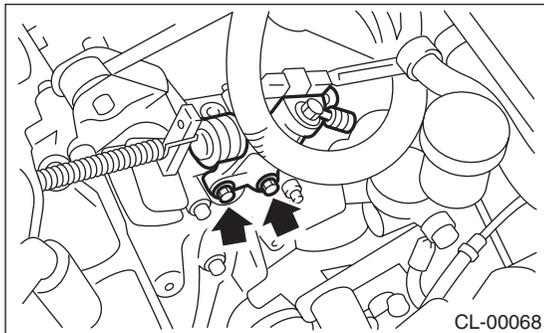
**T: 8 N·m (0.8 kgf-m, 5.8 ft-lb)**



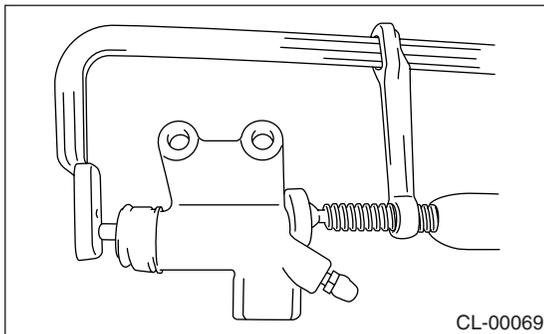
6) Remove the operating cylinder.

**NOTE:**

Do not remove the clutch hose.



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



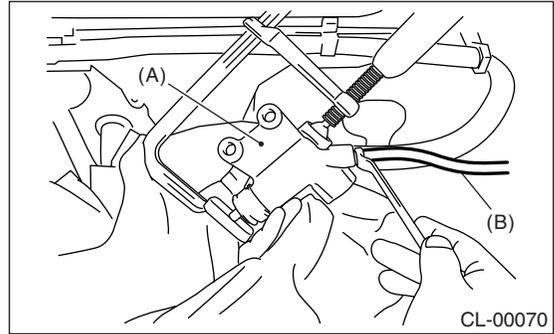
8) Fit one end of a vinyl tube into the air bleeder of operating cylinder and put the other end into a brake fluid container.

9) 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 part higher than tip of operating cylinder when performing this procedure.



(A) Operating cylinder

(B) Vinyl tube

10) 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.**

11) Tighten the air bleeder.

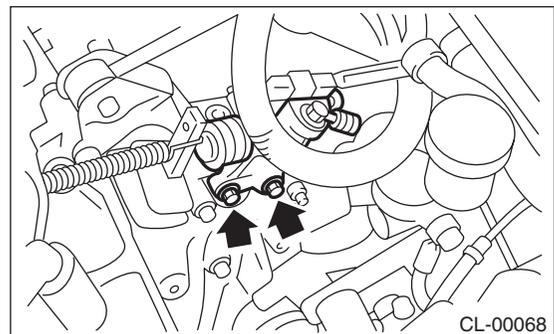
**Tightening torque:**

**T: 8 N·m (0.8 kgf-m, 5.8 ft-lb)**

12) Install the operating cylinder.

**Tightening torque:**

**T: 37 N·m (3.8 kgf-m, 27.5 ft-lb)**



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

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

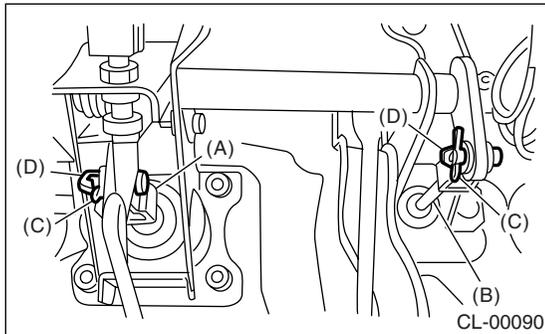
15) Install the intercooler. <Ref. to IN(H4DOTC)-11, INSTALLATION, Intercooler.>

## 10. Clutch Pedal

### A: REMOVAL

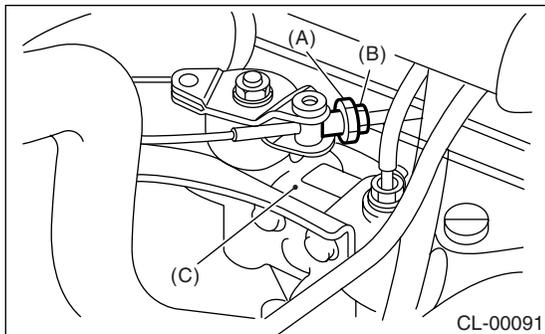
#### 1. LHD MODEL

- 1) Remove the steering column. <Ref. to PS-26, REMOVAL, Tilt Steering Column.>
- 2) Disconnect the connectors from stop light switch and clutch switch.
- 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 accelerator pedal. <Ref. to SP(H4SO)-4, REMOVAL, Accelerator Pedal.>
- 6) Remove the air cleaner case and intake duct. (Non-turbo model) <Ref. to IN(H4SO)-6, REMOVAL, Air Cleaner Case.> <Ref. to IN(H4SO)-7, REMOVAL, Air Intake Duct.>
- 7) Remove the intercooler. (Turbo model) <Ref. to IN(H4DOTC)-10, REMOVAL, Intercooler.>
- 8) Remove the PHV adjusting nut and lock nut. (Model with hill holder)

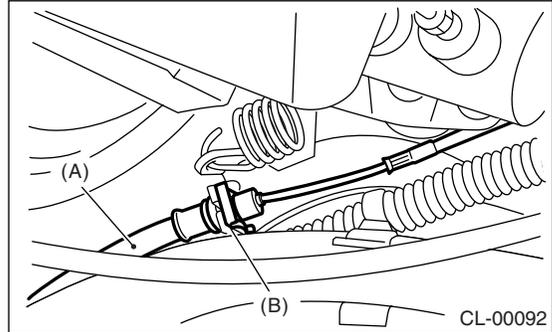


- (A) Adjusting nut
- (B) Lock nut
- (C) PHV

- 9) Remove the cable clamp, and disconnect the PHV cable from PHV. (Model with hill holder)

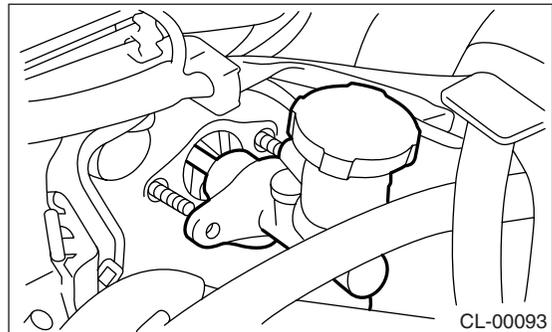
#### CAUTION:

Carefully protect the boot and inner cable from damage when disconnecting the PHV cable.



- (A) PHV cable
- (B) Clamp

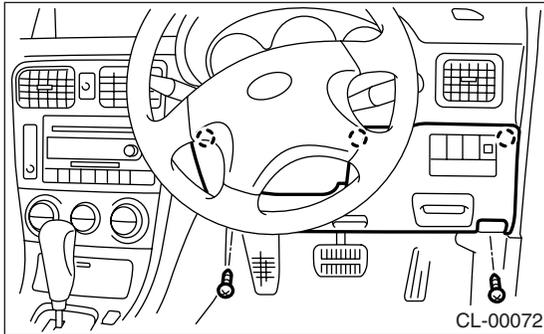
- 10) Remove the nut which secures clutch master cylinder.



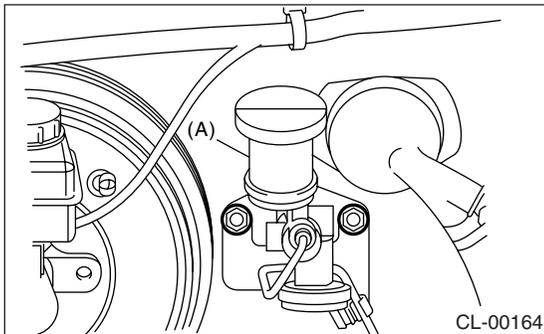
- 11) Remove the bolts and nuts which secure brake and clutch pedals, and remove the pedal assembly.

## 2. RHD MODEL

- 1) Disconnect the ground cable from battery.
- 2) Loosen the screws and clips, and then remove the lower cover.

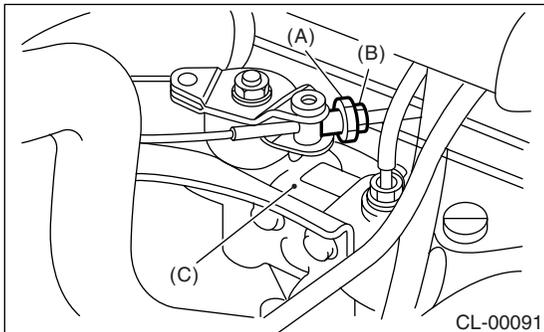


- 3) Disconnect the clutch switch connector. (Model with cruise control system)
- 4) Remove the snap pin connecting clutch pedal and clutch master cylinder rod, and then pull the clevis pin out.
- 5) Remove the clutch master cylinder mounting nut.



(A) Master cylinder

- 6) Remove the PHV adjusting nut and the lock nut. (Model with hill holder)

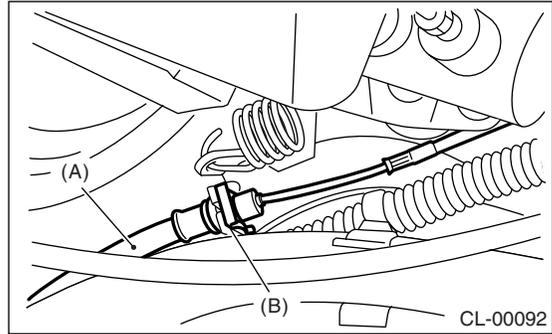


(A) Adjusting nut  
(B) Lock nut  
(C) PHV

- 7) Remove the cable clamp, and disconnect the PHV cable from PHV. (Model with hill holder)

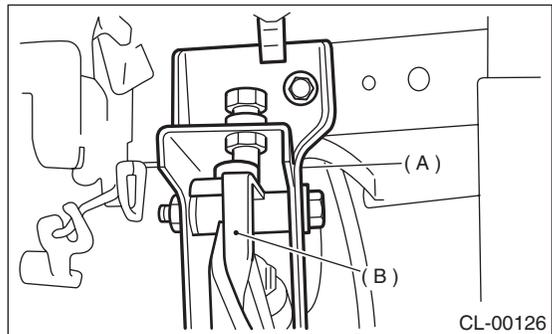
### CAUTION:

Carefully protect the boot and inner cable from damage when disconnecting the PHV cable.



(A) PHV cable  
(B) Clamp

- 8) Remove the clutch pedal bracket.



(A) Clutch pedal bracket  
(B) Clutch pedal

## B: INSTALLATION

- 1) Install the clutch pedal bracket.

### Tightening torque:

**18 N·m (1.8 kgf-m, 13.0 ft-lb)**

- 2) Install the clutch master cylinder mounting nut.

### Tightening torque:

**18 N·m (1.8 kgf-m, 13.0 ft-lb)**

- 3) Insert the new clevis pin to assist rod A, and then install the snap pin.

### NOTE:

Apply a coat of grease to the clevis pin.

- 4) Adjust the stroke amount of clutch pedal. <Ref. to CL-37, ADJUSTMENT, Clutch Pedal.>

- 5) Adjust the hill holder (Model with hill holder). <Ref. to BR-57, ADJUSTMENT, Hill Holder.>

- 6) Connect the clutch switch connector. (Model with cruise control system)

- 7) Install the instrument panel lower cover.

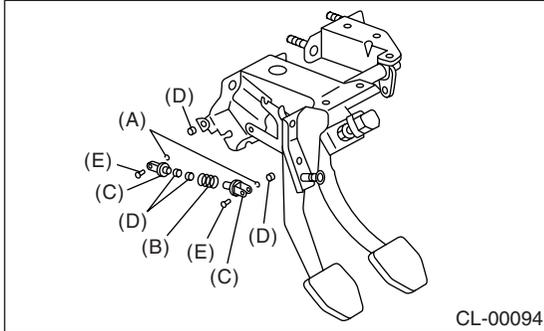
# Clutch Pedal

## CLUTCH SYSTEM

### C: DISASSEMBLY

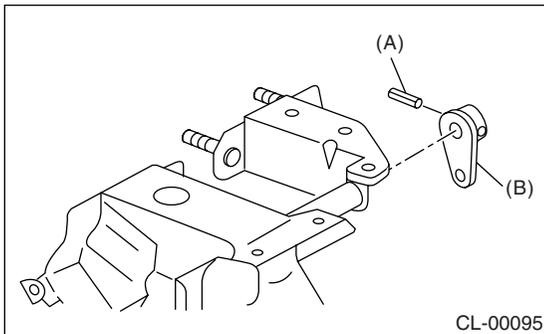
#### 1. LHD MODEL

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



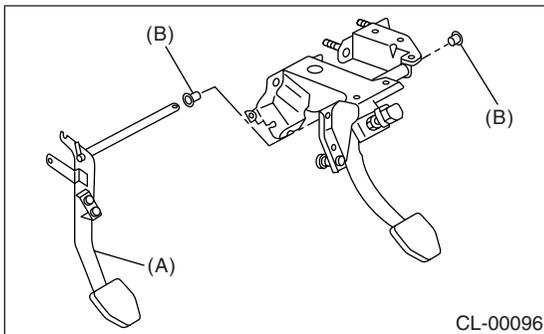
- (A) Clip
- (B) Assist spring
- (C) Assist rod
- (D) Bushing
- (E) Clevis pin

2) Remove the spring pin and lever.



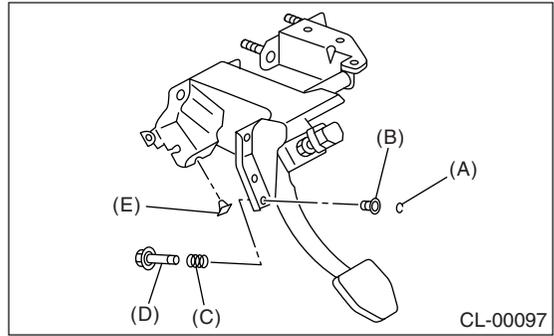
- (A) Pin
- (B) Lever

3) Remove the clutch pedal and bushings.



- (A) Clutch pedal
- (B) Bushing

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



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

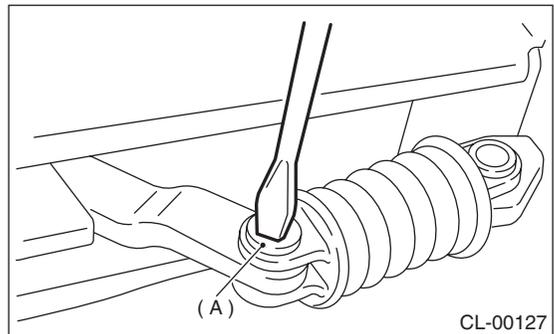
5) Remove the stoppers from clutch pedal.

6) Remove the clutch pedal pad.

#### 2. RHD MODEL

1) Remove the clutch switch. (Model with cruise control)

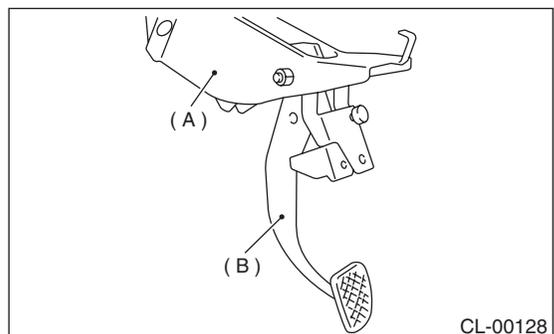
2) Remove the clip, then pull out the clevis pin.



- (A) Clevis pin

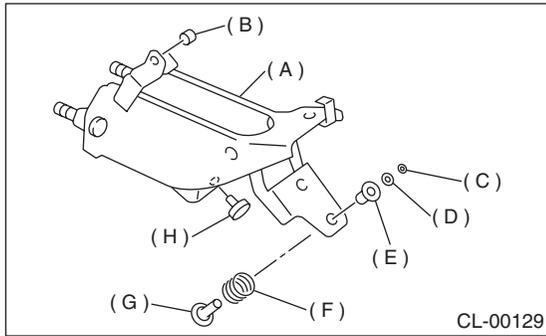
3) Remove the assist rod, spring and bushing.

4) Remove the clutch pedal from clutch pedal bracket.



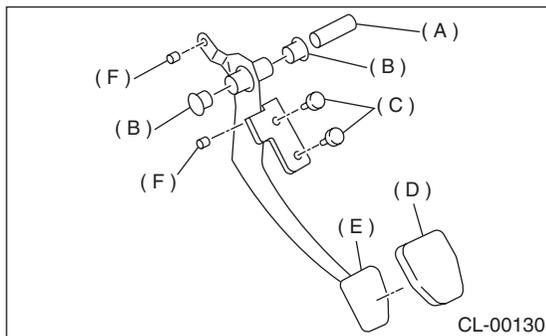
- (A) Clutch pedal bracket
- (B) Clutch pedal

5) Remove the following parts (B to H) from clutch pedal bracket (A) as shown in the figure.



- (A) Clutch pedal bracket
- (B) Bushing C
- (C) Clip
- (D) O-ring
- (E) Bushing S
- (F) Spring S
- (G) Rod S
- (H) Bushing

6) Remove the spacer, bushing and pedal pad from clutch pedal.



- (A) Spacer
- (B) Bushing
- (C) Bushing
- (D) Pedal pad
- (E) Clutch pedal
- (F) Bushing C

## 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.

- 4) Install the hill holder cable to clutch pedal.

## E: INSPECTION

### 1. CLUTCH PEDAL

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

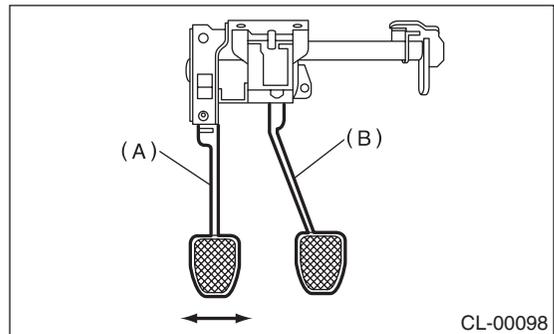
### NOTE:

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

### Deflection of clutch pedal:

#### Service limit

**2.0 mm (0.079 in) or less**



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

## F: ADJUSTMENT

### 1. LHD MODEL

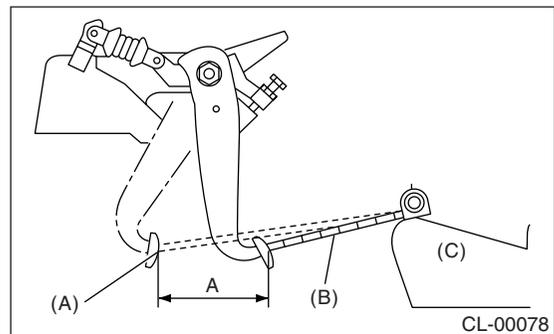
- 1) Measure the full stroke amount of clutch pedal.

### NOTE:

- Measure the length between seat cushion front end and center portion of clutch pedal.
- Slide the seat at seventh notch from first notch.

### Specified clutch pedal full stroke: A

**130 — 135 mm (5.12 — 5.31 in)**



- (A) Clutch (Full stroke condition)
- (B) Scale
- (C) Seat

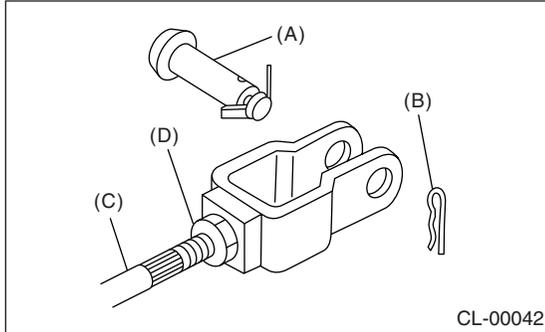
# Clutch Pedal

## CLUTCH SYSTEM

2) If not as specified, loosen the clutch stopper nut to adjust it.

**Tightening torque (Clutch stopper nut):**  
**8 N-m (0.8 kgf-m, 5.8 ft-lb)**

3) Loosen the push rod lock nut.

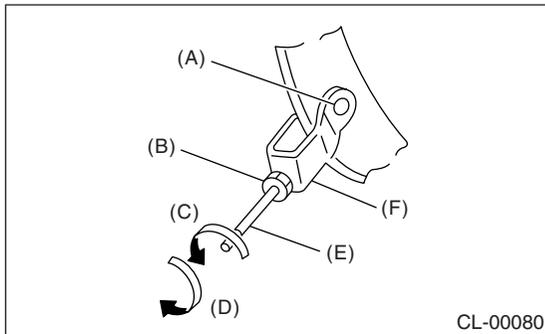


- (A) Clevis pin
- (B) Snap pin
- (C) Push rod
- (D) Push rod lock nut

4) Turn the push rod to adjust.

(1) Ensure that the clutch pedal contacts stopper bolt, when releasing the clutch pedal.

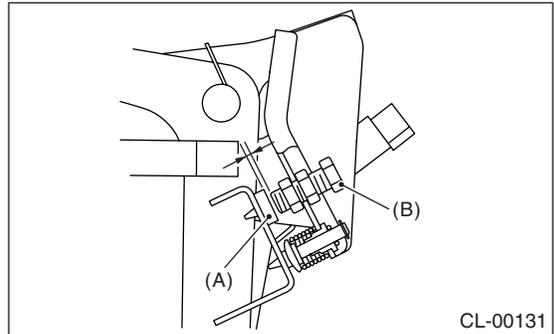
(2) Ensure that the clutch pedal contacts clutch pedal bracket stopper, when fully depressing the clutch pedal.



- (A) Clevis hole
- (B) Push rod lock nut
- (C) Lengthening direction
- (D) Shortening direction
- (E) Push rod
- (F) U shaped bracket

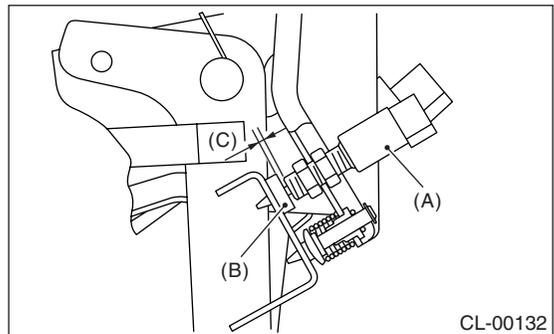
5) Turn the push rod clockwise to shorten until clearance is made at stopper bolt or clutch switch.

- Model without cruise control



- (A) Stopper
- (B) Stopper bolt

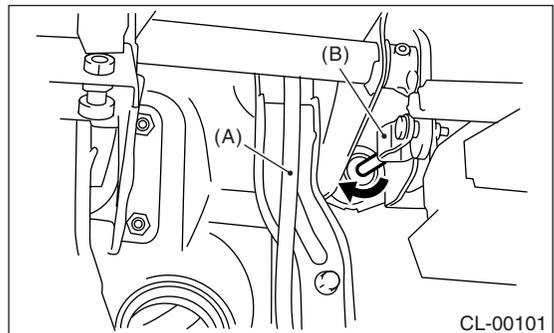
- Model with cruise control



- (A) Clutch switch
- (B) Stopper
- (C) Clearance

6) Turn the push rod counter clockwise to lengthen until clutch pedal contacts to stopper bolt.

7) Turn the push rod further 270° counterclockwise to lengthen (arrow direction as shown in the figure).



- (A) Accelerator pedal
- (B) Clevis

8) Move the clevis pin in lateral direction to ensure it moves smoothly.

9) Tighten the push rod lock nut.

**Tightening torque :**

**10 N·m (1.0 kgf·m, 7.2 ft·lb)**

10) Measure the full stroke amount of clutch pedal again.

**Specified clutch pedal full stroke: A**

**130 — 135 mm (5.12 — 5.31 in)**

11) Install the clutch switch. <Ref. to CL-41, INSTALLATION, Clutch Switch.>

## 2. RHD MODEL

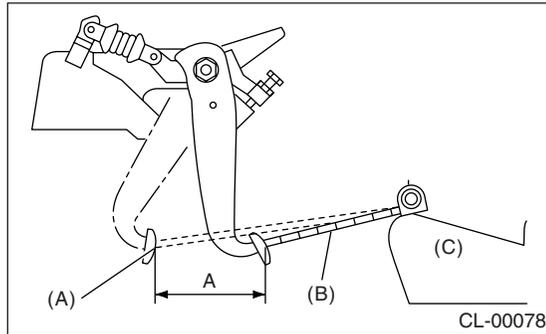
1) Measure the full stroke amount of clutch pedal.

**NOTE:**

- Measure the length between seat cushion front end and center portion of clutch pedal.
- Slide the seat at seventh notch from first notch.

**Specified clutch pedal full stroke: A**

**125 — 130 mm (4.92 — 5.12 in)**



- (A) Clutch (Full stroke condition)
- (B) Scale
- (C) Seat

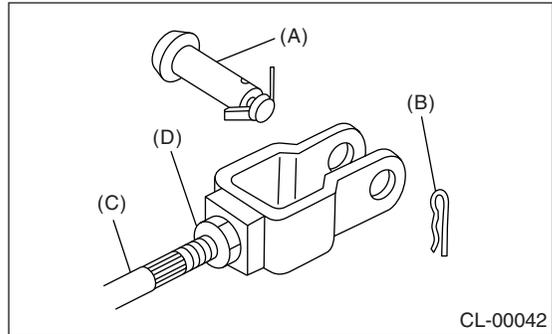
2) If not as specified, loosen the clutch stopper nut to adjust it.

**Tightening torque (Clutch stopper nut):**

**8 N·m (0.8 kgf·m, 5.8 ft·lb)**

3) If the stroke amount can not be adjusted by stopper nut, remove the clutch switch. <Ref. to CL-41, REMOVAL, Clutch Switch.>

4) Loosen the push rod lock nut.

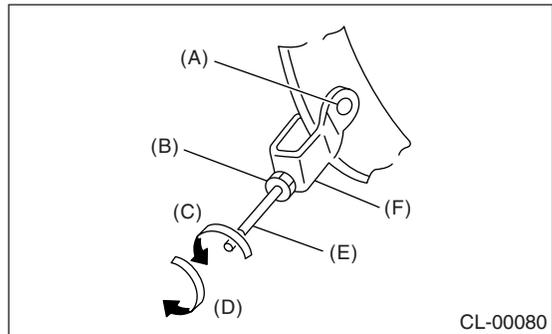


- (A) Clevis pin
- (B) Snap pin
- (C) Push rod
- (D) Push rod lock nut

5) Turn the push rod to adjust.

(1) Ensure that the clutch pedal contacts stopper bolt, when releasing the clutch pedal.

(2) Ensure that the clutch pedal contacts clutch pedal bracket stopper, when fully depressing the clutch pedal.



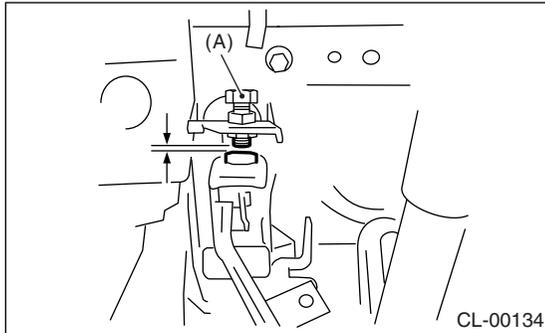
- (A) Clevis hole
- (B) Push rod lock nut
- (C) Lengthening direction
- (D) Shortening direction
- (E) Push rod
- (F) U shaped bracket

# Clutch Pedal

## CLUTCH SYSTEM

---

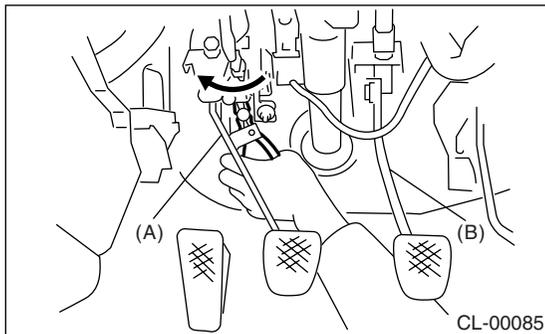
6) Turn the push rod clockwise to shorten until clearance is made at stopper bolt or clutch switch.



(A) Stopper bolt

7) Turn the push rod counter clockwise to lengthen until clutch pedal contacts to stopper bolt.

8) Turn the push rod further 270° counterclockwise to lengthen (arrow direction as shown in the figure).



(A) Clutch pedal

(B) Brake pedal

9) Move the clevis pin in lateral direction to ensure it moves smoothly.

10) Tighten the push rod lock nut.

### **Tightening torque :**

**10 N·m (1.0 kgf·m, 7.2 ft·lb)**

11) Measure the full stroke amount of clutch pedal again.

### **Specified clutch pedal full stroke: A**

**125 — 130 mm (4.92 — 5.12 in)**

12) Install the clutch switch. <Ref. to CL-41, INSTALLATION, Clutch Switch.>

## 11. Clutch Switch

### A: REMOVAL

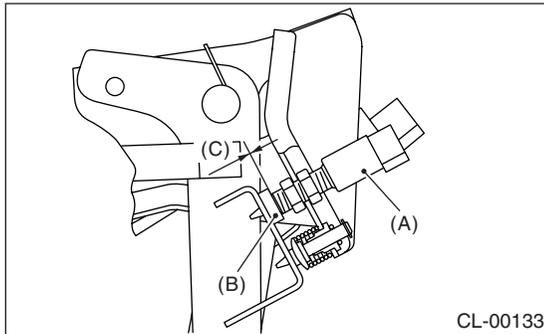
- 1) Disconnect the ground cable from battery.
- 2) Remove the instrument panel lower cover.
- 3) Disconnect the connector from clutch switch.
- 4) Remove the clutch switch.

### B: INSTALLATION

- 1) Install the clutch switch and clutch pedal stopper so that the gap between them is 0 mm (0 in).

#### Tightening torque:

**8 N·m (0.8 kgf-m, 5.8 ft-lb)**

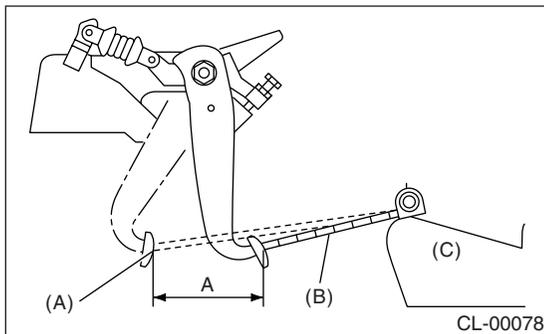


- (A) Clutch switch
- (B) Stopper
- (C) 0 mm (0 in)

- 2) Measure stroke of clutch pedal.

#### Specified clutch pedal full stroke: A

**130 — 135 mm (5.12 — 5.31 in)**



- (A) Clutch (Full stroke condition)
- (B) Scale
- (C) Seat

- 3) If the clutch pedal stroke is out of specification, adjust the stroke. <Ref. to CL-37, ADJUSTMENT, Clutch Pedal.>

- 4) Connect clutch switch connector.

### C: INSPECTION

Check the clutch switch continuity. If continuity 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

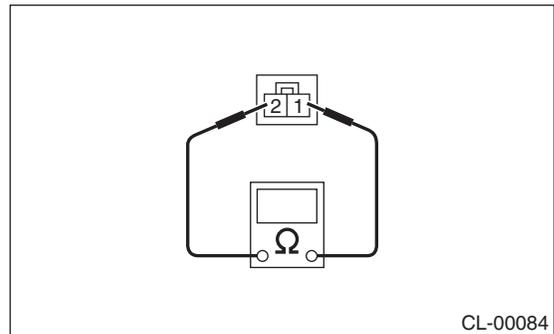
**When clutch pedal depressed:**

**1 — 2/Less than 1 Ω**

#### Terminals/Specified resistance

**When clutch pedal not depressed:**

**1 — 2/More than 1 MΩ**



### D: ADJUSTMENT

Refer to “ADJUSTMENT” for clutch pedal. <Ref. to CL-37, ADJUSTMENT, Clutch Pedal.>

# General Diagnostic Table

CLUTCH SYSTEM

## 12. General Diagnostic Table

### A: INSPECTION

#### 1. CLUTCH

Symptom	Possible cause	Corrective
<p>1. Clutch slippage. It is hard to perceive clutch slippage in the early stage, but pay attention to the following symptoms</p> <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	Replace.
	(e) Defective release bearing holder	Replace.
<p>2. Clutch drags. 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.</p> <ul style="list-style-type: none"> <li>• Method of testing: &lt;Ref. to CL-43, DIAGNOSTIC DIAGRAM OF CLUTCH DRAG, INSPECTION, General Diagnostic Table.&gt;</li> </ul> <p>It may be judged as insufficient disengagement of clutch if any noise occurs during this test.</p>	(a) Worn or rusty clutch disc hub spline	Replace the clutch disc.
	(b) Excessive deflection of clutch disc facing	Replace.
	(c) Malfunction of crankshaft pilot bearing	Replace.
	(d) Cracked clutch disc facing	Replace.
	(e) Stuck clutch disc (smeared by oil or water)	Replace.
<p>3. Clutch chatters. Clutch chattering is an unpleasant vibration to the whole body when the vehicle is just started with clutch partially engaged.</p>	(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 worn	Replace the clutch disc deflection.
	(d) Warped pressure plate or flywheel	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.

# General Diagnostic Table

CLUTCH SYSTEM

Symptom	Possible cause	Corrective
4. Noisy clutch Examine whether 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	Replace.
	(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.
5. Clutch grabs. 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> 1) Start the engine. 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> 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> 1) Disengage the clutch at idle and shift from neutral to reverse within 0.5 — 1.0 seconds. 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.

# General Diagnostic Table

CLUTCH SYSTEM

---