

CLUTCH SYSTEM

CL

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GENERAL DESCRIPTION

CLUTCH SYSTEM

1. General Description

A: SPECIFICATIONS

Item		Non-TURBO model	TURBO model
Clutch cover	Type	Push type	Pull type
	Diaphragm set load kg (lb)	580 (1,276)	800 (1,764)
Clutch disc	Facing material		Woven (Non asbestos)
	O.D. × I.D. × thickness mm (in)	Flywheel side	230 × 155 × 3.5 (9.06 × 6.10 × 0.1)
		Pressure plate side	230 × 155 × 3.2 (9.06 × 6.10 × 0.126)
	Spline O.D. mm (in)		25.2 (0.992), (No. of teeth: 24)
Clutch release lever ratio		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 — 13 (0.16 — 0.51)	
Clutch disc	Depth of rivet head mm (in)	Standard	1.65 — 2.25 (0.065 — 0.089)
		Limit of sinking	0.3 (0.012)
	Limit for deflection mm (in)		0.8 (0.031) at R = 107 (4.21)

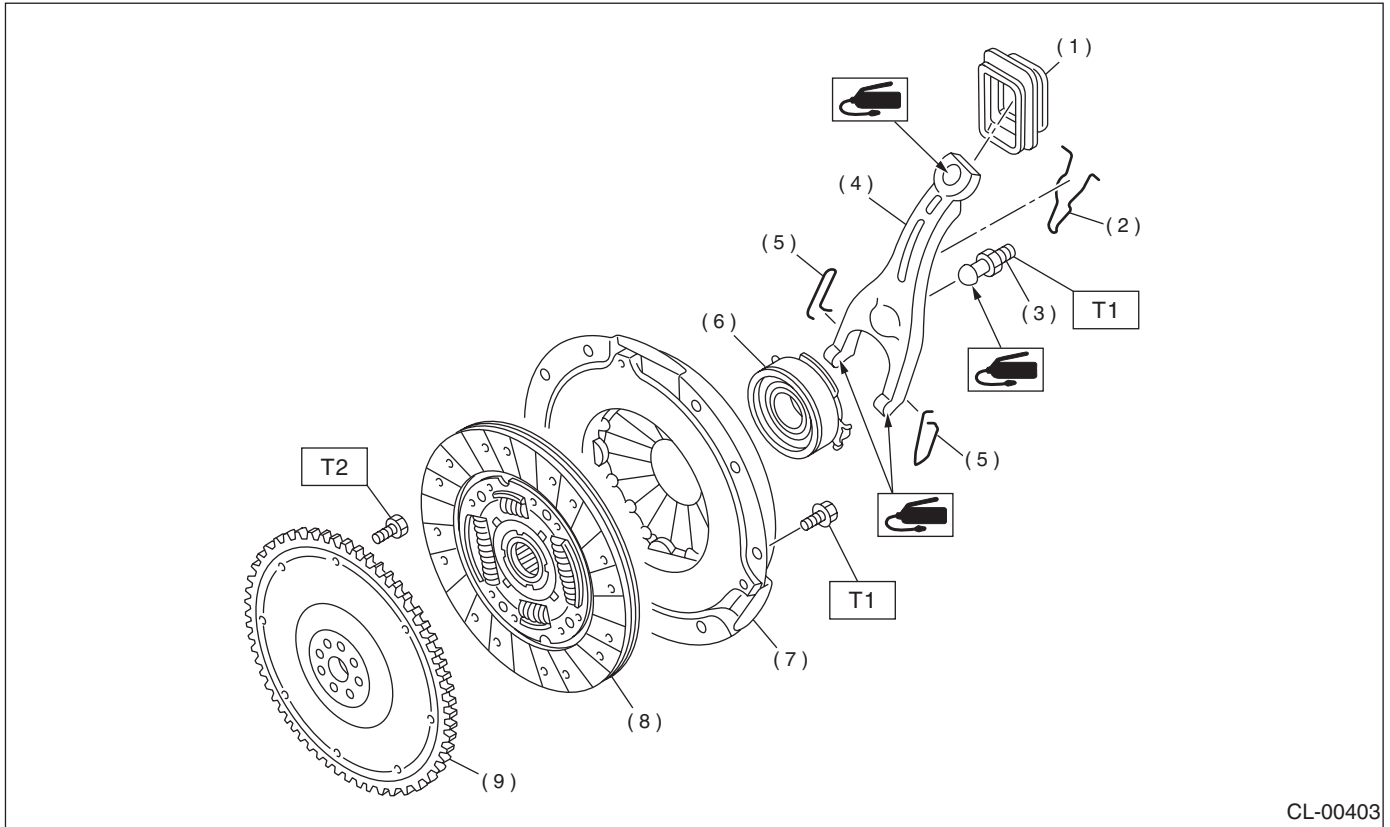
I.D.: Inner diameter

O.D.: Outer diameter

B: COMPONENT

1. CLUTCH ASSEMBLY

• Non-TURBO model



- | | |
|--------------------------|----------------------------|
| (1) 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)

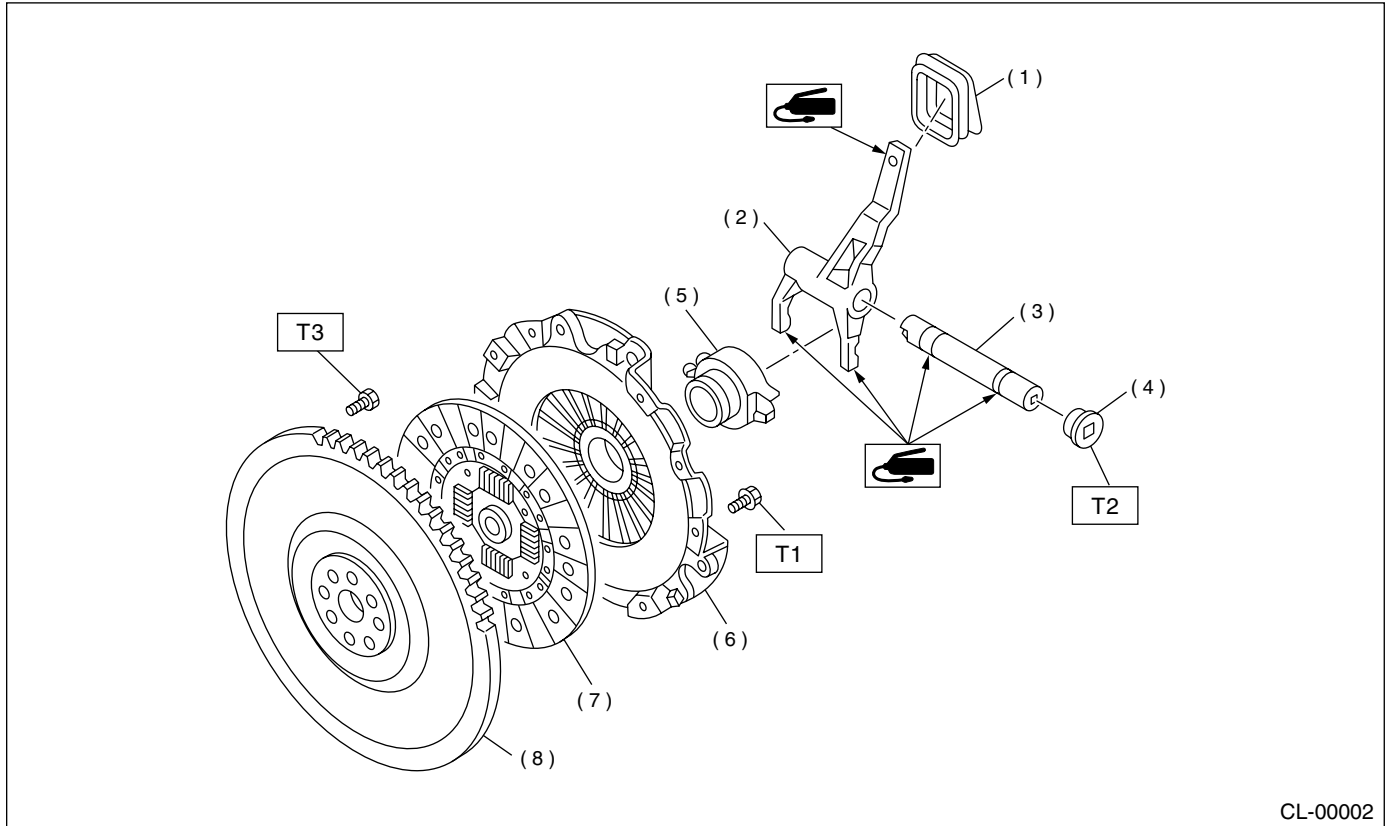
T1: 16 (1.6, 11.8)

T2: 72 (7.3, 52.8)

GENERAL DESCRIPTION

CLUTCH SYSTEM

• TURBO model

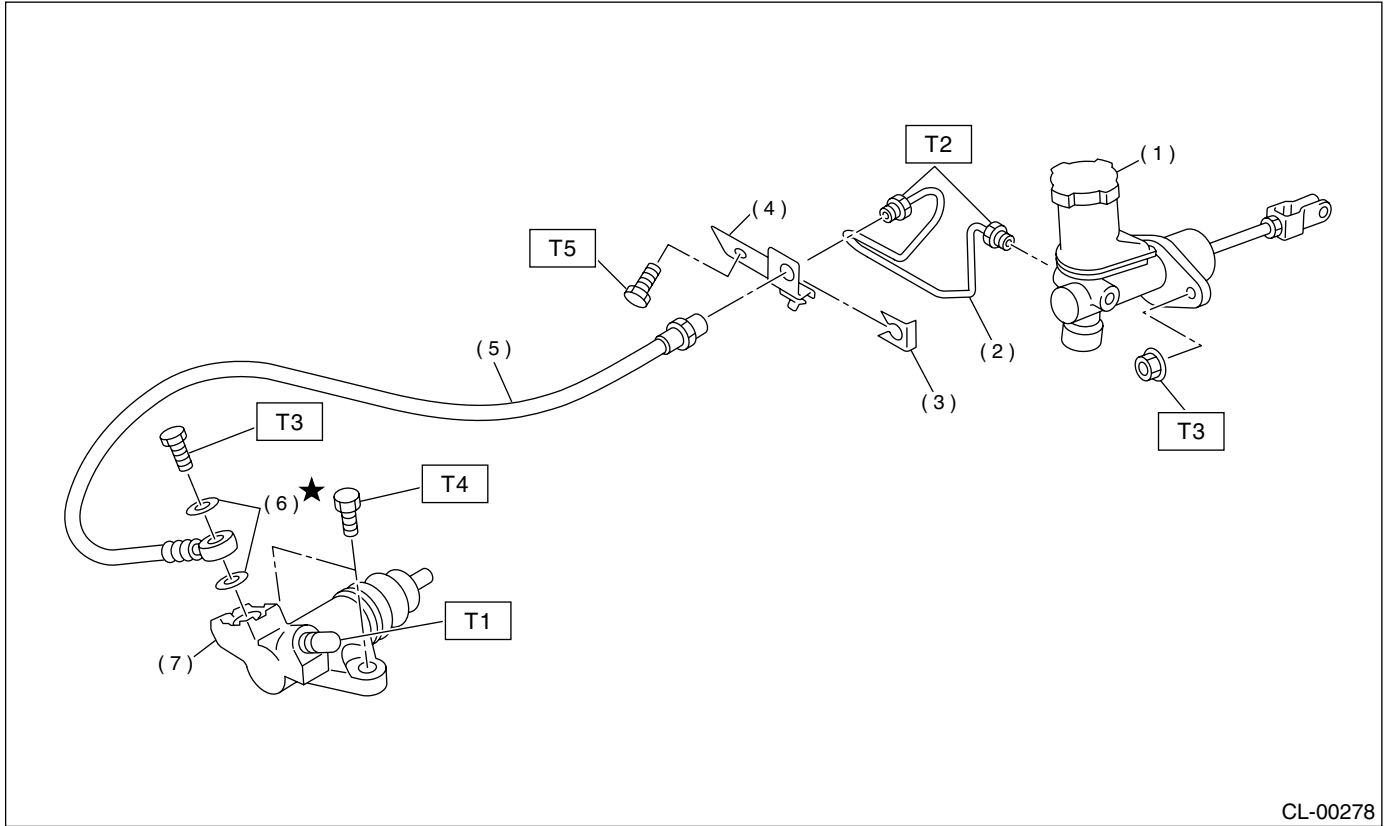


- | | |
|--------------------------|----------------------------|
| (1) Dust cover | (5) Clutch release bearing |
| (2) Clutch release lever | (6) Clutch cover |
| (3) Clutch release shaft | (7) Clutch disc |
| (4) Plug | (8) Flywheel |

Tightening torque: N·m (kgf·m, ft·lb)**T1: 16 (1.6, 11.8)****T2: 44 (4.5, 32.5)****T3: 72 (7.3, 52.8)**

2. CLUTCH PIPE AND HOSE

• Non-TURBO model



CL-00278

- | | |
|--------------------------|------------------------|
| (1) Master cylinder ASSY | (6) Washer |
| (2) Clutch pipe | (7) Operating cylinder |
| (3) Clip | |
| (4) Bracket | |
| (5) Clutch hose | |

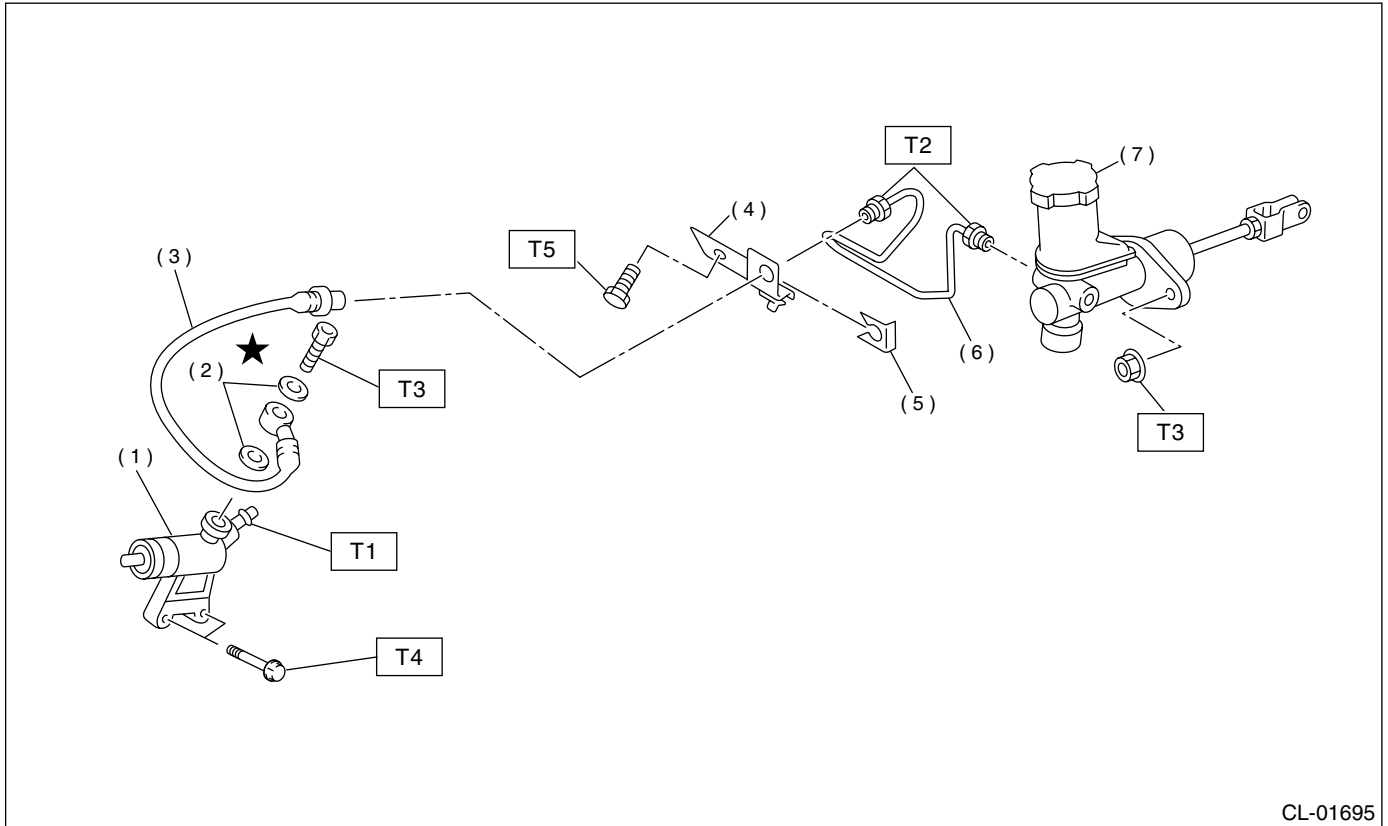
Tightening torque: N·m (kgf-m, ft-lb)

- T1: 7.8(0.8, 5.8)**
T2: 15 (1.5, 10.8)
T3: 18 (1.8, 13.0)
T4: 37 (3.8, 27.5)
T5: 25 (2.5, 18.1)

GENERAL DESCRIPTION

CLUTCH SYSTEM

• TURBO model



- | | |
|------------------------|--------------------------|
| (1) Operating cylinder | (5) Clip |
| (2) Washer | (6) Pipe |
| (3) Clutch hose | (7) Master cylinder ASSY |
| (4) Bracket | |

Tightening torque: N·m (kgf-m, ft-lb)

T1: 7.8 (0.8, 5.8)

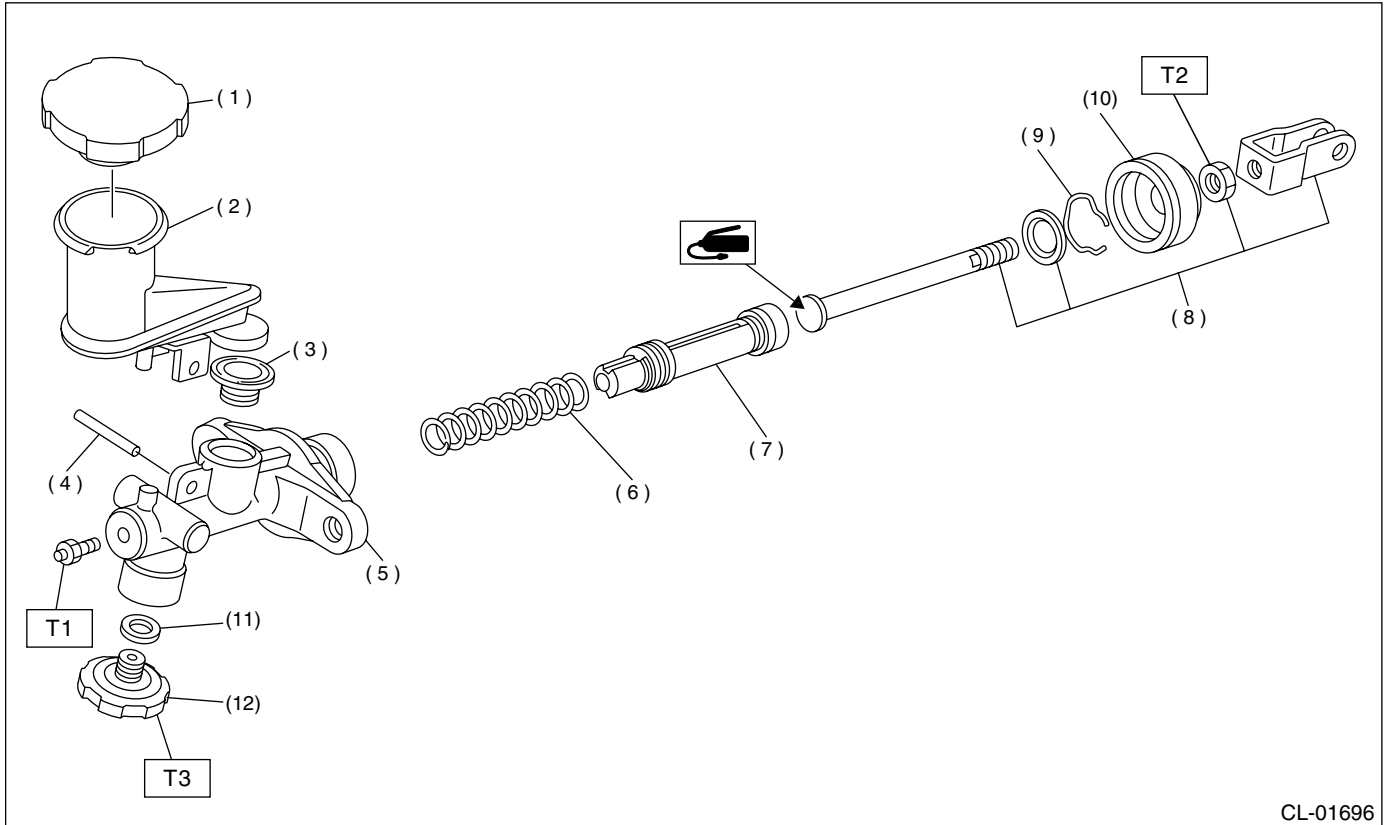
T2: 15 (1.5, 10.8)

T3: 18 (1.8, 13.0)

T4: 37 (3.8, 27.5)

T5: 25 (2.5, 18.1)

3. MASTER CYLINDER



CL-01696

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

Tightening torque: N·m (kgf·m, ft·lb)

T1: 8 (0.8, 5.8)

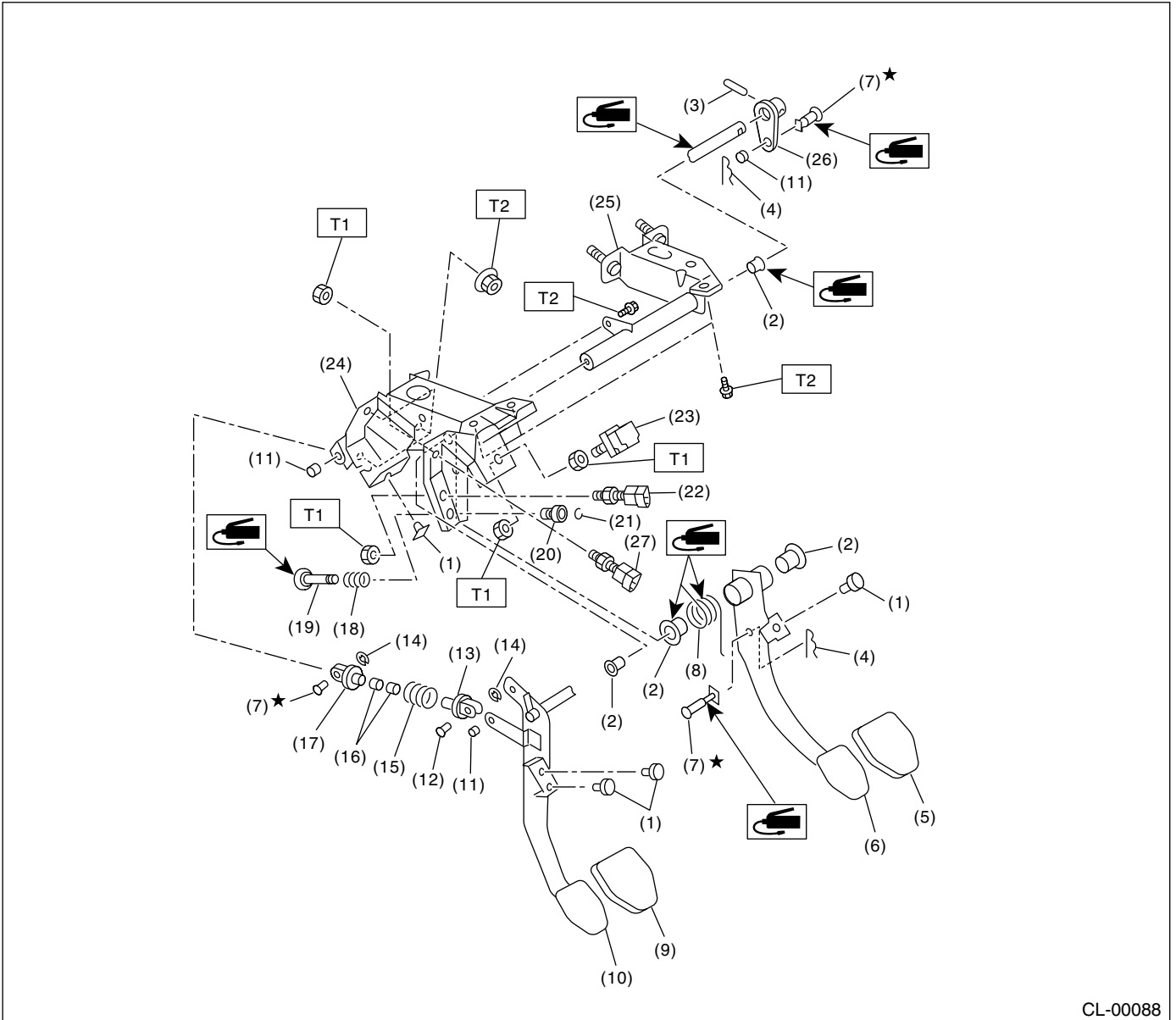
T2: 10 (1.0, 7)

T3: 46.6 (4.8, 34)

GENERAL DESCRIPTION

CLUTCH SYSTEM

4. CLUTCH PEDAL



CL-00088

- | | | |
|------------------------|-------------------------------------|--|
| (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) | |

Tightening torque: N·m (kgf·m, ft·lb)

T1: 8 (0.8, 5.8)

T2: 18 (1.8, 13.0)

C: CAUTION

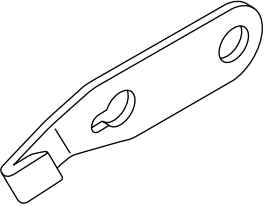
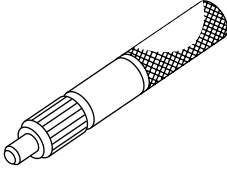
- Wear working clothing, including a cap, protective goggles, and protective shoes during operation.
- Remove contamination including dirt and corrosion before removal, installation or disassembly.
- Keep the disassembled parts in order and protect them from dust or dirt.
- Before removal, installation or disassembly, be sure to clarify the failure. Avoid unnecessary removal, installation, disassembly, and replacement.
- Be careful not to burn your hands, 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 safety stands at the specified points.
- Apply grease onto sliding or revolution surfaces before installation.
- Before installing O-rings or snap rings, apply sufficient amount of 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.

GENERAL DESCRIPTION

CLUTCH SYSTEM

D: PREPARATION TOOL

1. SPECIAL TOOLS

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 PURPOSE TOOLS

TOOL NAME	REMARKS
Circuit Tester	Used for measuring resistance, voltage and ampere.
Dial Gauge	Used for measuring clutch disk run-out.

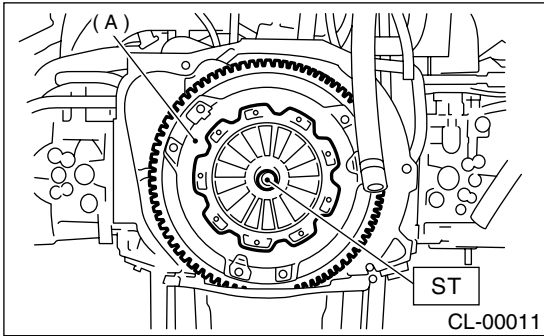
2. Clutch Disc and Cover

A: REMOVAL

1) Remove the transmission assembly from vehicle body. <Ref. to 5MT-28, 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.

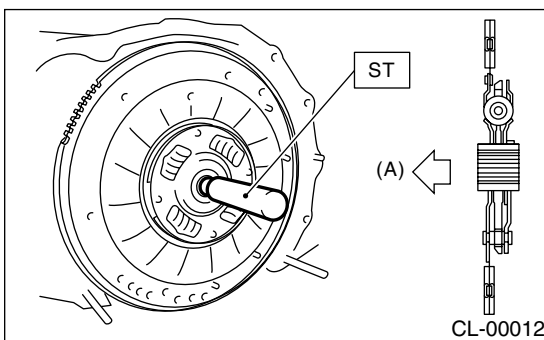
B: INSTALLATION

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

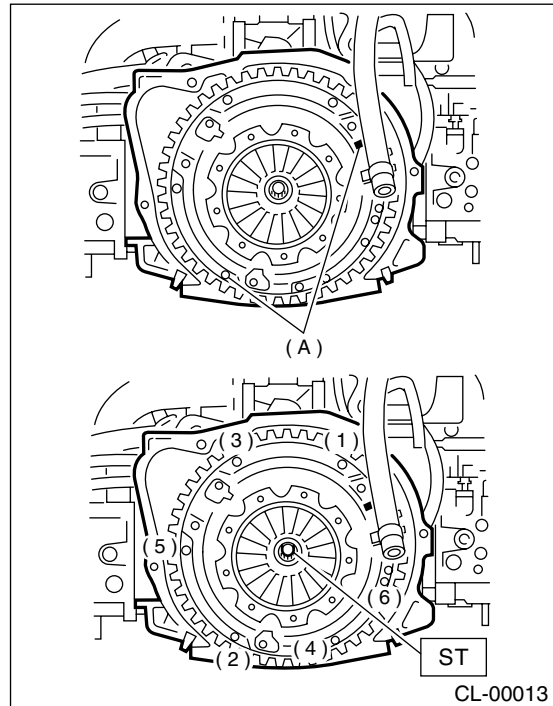
2) Position "0" marks on clutch cover and flywheel 120° apart, and then tighten the clutch cover installation bolts diagonally.

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, 11.8 ft·lb)



(A) "0" marks

3) Remove the ST.

ST 499747100 CLUTCH DISC GUIDE

4) Install the transmission assembly. <Ref. to 5MT-31, 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.

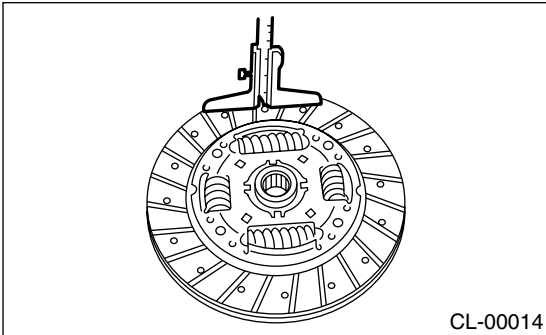
Depth of rivet head:

Limit of sinking

0.3 mm (0.012 in)

NOTE:

Do not wash the clutch disc with any cleaning fluid.

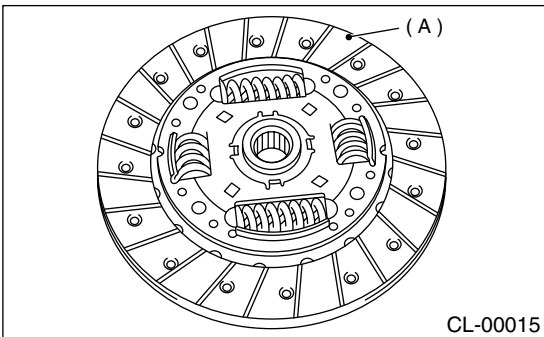


2) Hardened facing

Correct by using emery paper or replace.

3) Oil soakage on facing

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



4) Deflection on facing

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

ST 499747100 CLUTCH DISC GUIDE

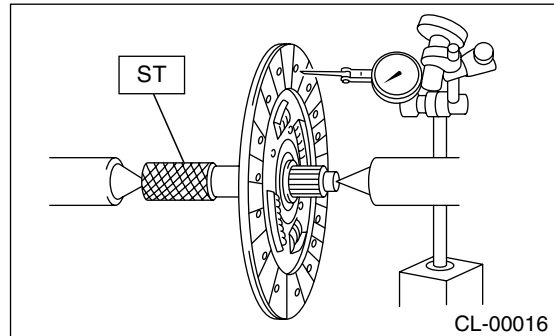
Limit for deflection:

Non-TURBO model;

0.8 mm (0.031 in) at R = 107 mm (4.21 in)

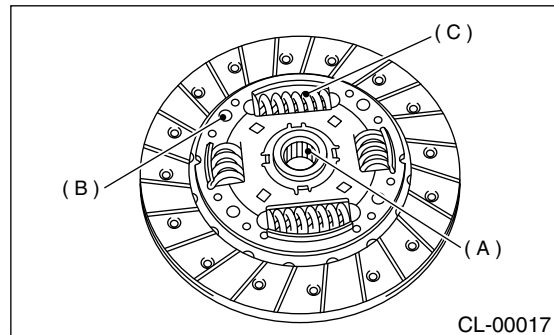
TURBO model;

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



5) Worn spline, loose rivets and torsion spring failure

If defective, replace clutch disc.



(A) Spline

(B) Rivet

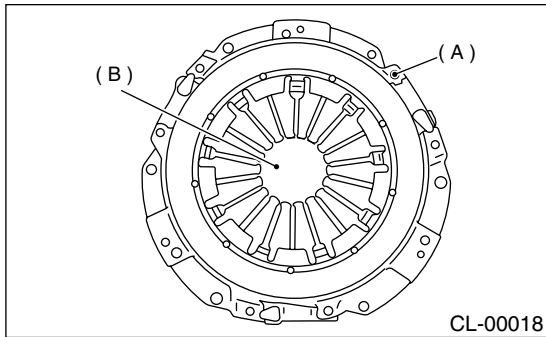
(C) Torsion spring

2. CLUTCH COVER

NOTE:

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

- 1) Loose thrust rivet.
- 2) Damaged or worn bearing contact area at center of diaphragm spring.



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

FLYWHEEL

CLUTCH SYSTEM

3. Flywheel

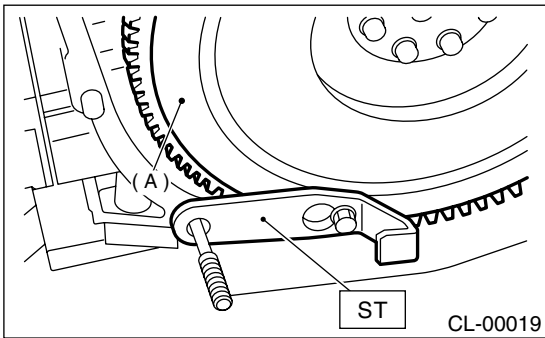
A: REMOVAL

1) Remove the transmission assembly. <Ref. to 5MT-28, 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

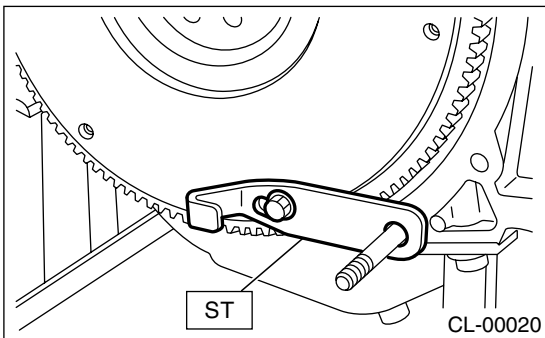


(A) Flywheel

B: INSTALLATION

1) Install the flywheel and ST.

ST 498497100 CRANKSHAFT STOPPER



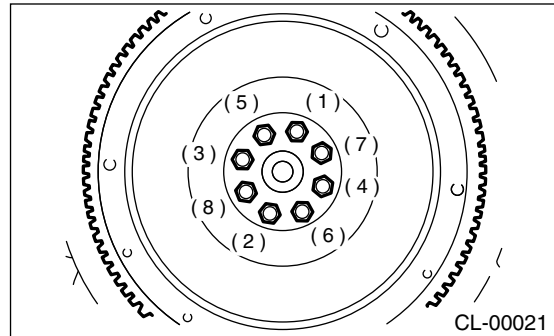
2) Tighten the flywheel attaching bolts to the specified torque.

NOTE:

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

Tightening torque:

72 N·m (7.3 kgf-m, 52.8 ft-lb)



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

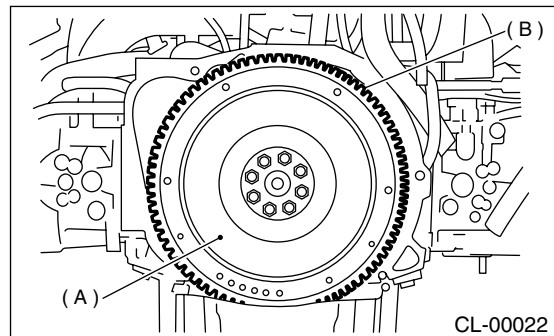
4) Install the transmission assembly. <Ref. to 5MT-31, INSTALLATION, Manual Transmission Assembly.>

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, sliding surface 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

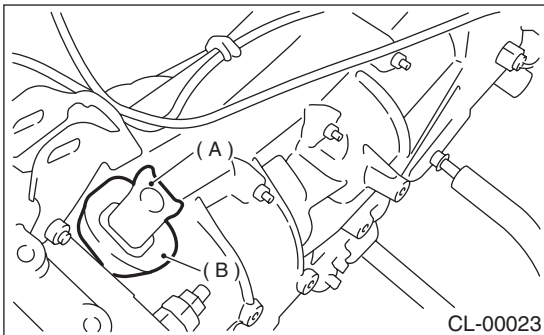
1. NON-TURBO MODEL

- 1) Remove the transmission assembly from vehicle body. <Ref. to 5MT-28, REMOVAL, Manual Transmission Assembly.>
- 2) Remove the two clips from clutch release lever and remove the release bearing.

CAUTION:

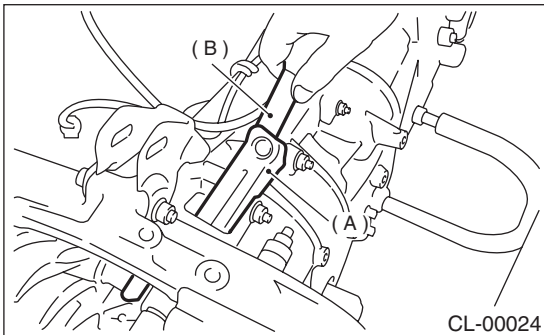
Be careful not to deform clips.

- 3) Remove the dust cover.



- (A) Clutch release lever
- (B) Dust cover

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

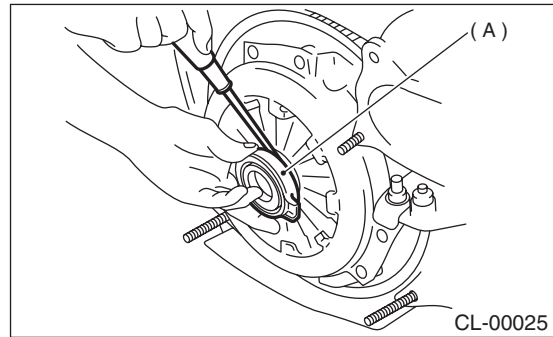


- (A) Clutch release lever
- (B) Screwdriver

2. TURBO MODEL

- 1) Remove the transmission assembly from vehicle body. <Ref. to 5MT-28, 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.

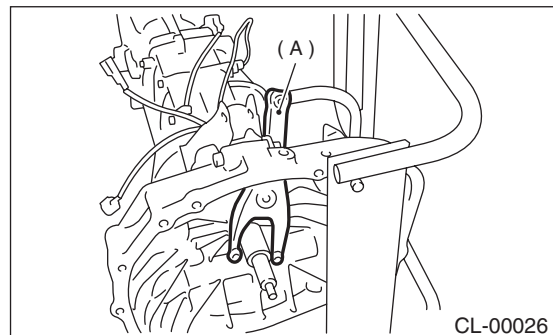


- (A) Clutch release bearing

B: INSTALLATION

1. NON-TURBO MODEL

- 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 disulphide.)
 - 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 (KOPR-KOTE: P/N 003603001) to the contact point of release lever and operating cylinder.
- 3) Confirm that the retainer spring is securely fitted by observing it through the release lever hole.



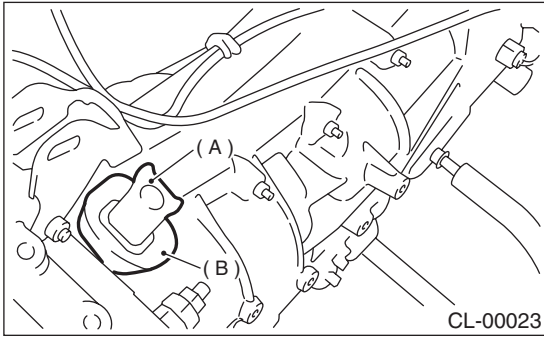
- (A) Release lever

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

RELEASE BEARING AND LEVER

CLUTCH SYSTEM

5) Install the release lever dust cover.



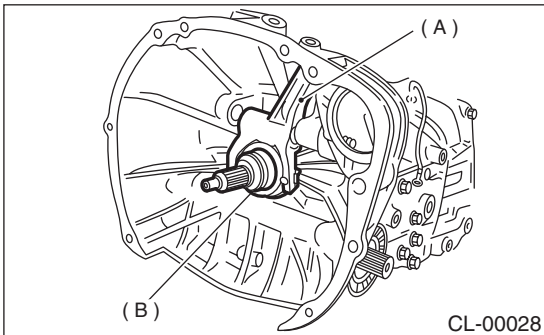
- (A) Release lever
- (B) Dust cover

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

7) Install the transmission assembly. <Ref. to 5MT-31, INSTALLATION, Manual Transmission Assembly.>

2. TURBO MODEL

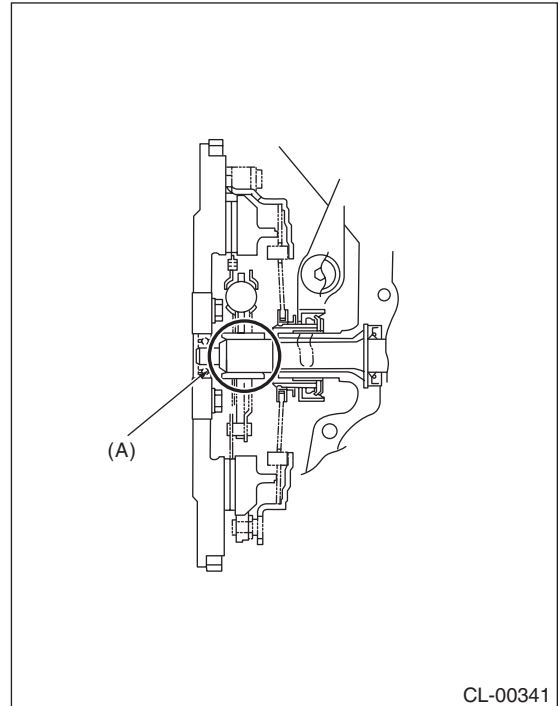
- 1) Install the release bearing on transmission.
- 2) Insert the release fork into release bearing tab.



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

3) Apply grease to the specified points:

Grease:
NICHIMORI N-130

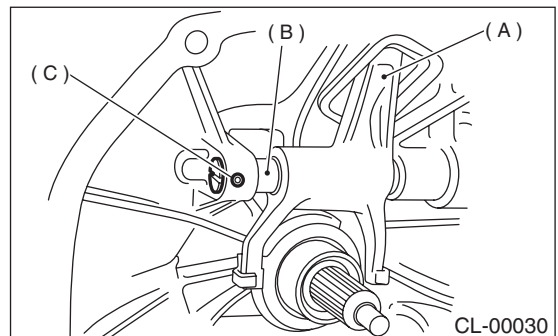


- (A) Spline

4) Insert the fork shaft into release fork.

NOTE:

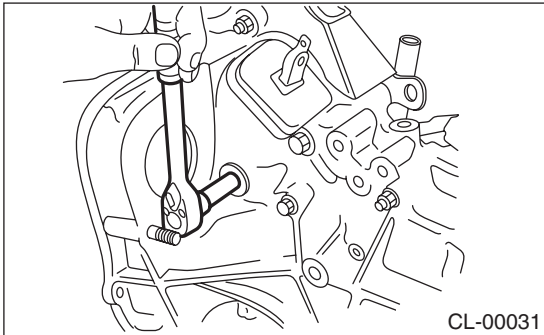
Make sure the cutout portion of fork shaft contacts spring pin.



- (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) Install the transmission assembly.
 <Ref. to 5MT-31, INSTALLATION, Manual Transmission Assembly.>

C: INSPECTION

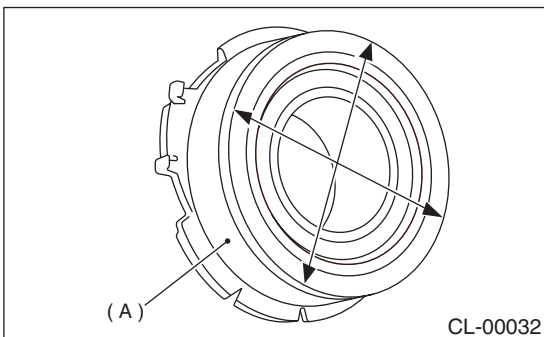
1. RELEASE BEARING

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.

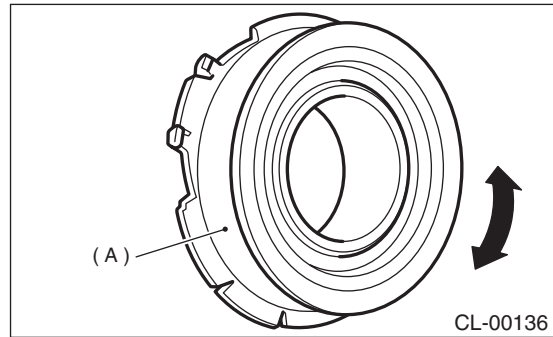
1) Check the bearing for smooth movement by applying force in the radial direction.

Radial direction stroke:
1.6 mm (0.063 in)



(A) Bearing case

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

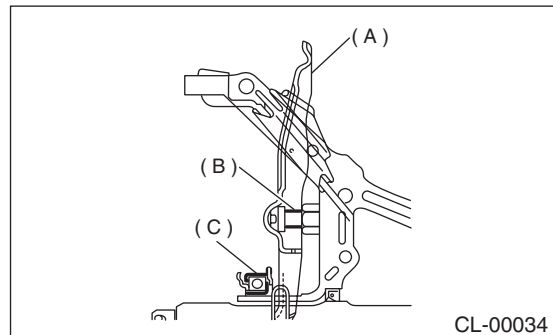


(A) Bearing case

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

2. RELEASE LEVER

1) 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

OPERATING CYLINDER

CLUTCH SYSTEM

5. Operating Cylinder

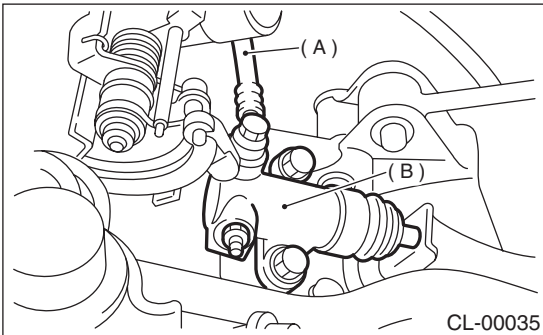
A: REMOVAL

- 1) Remove the air cleaner case and air intake duct. (Except U5 model) <Ref. to IN(H4SO)-5, REMOVAL, Air Cleaner Case.> and <Ref. to IN(H4SO)-6, REMOVAL, Air Intake Duct.>
- 2) Remove the air intake chamber and air intake duct. (U5 model) <Ref. to IN(H4SO U5)-6, REMOVAL, Air Intake Chamber.> and <Ref. to IN(H4SO U5)-7, REMOVAL, Air Intake Duct.>
- 3) Remove the intercooler. <Ref. to IN(H4DOTC)-10, REMOVAL, Intercooler.>
- 4) Remove the clutch hose from operating cylinder.

NOTE:

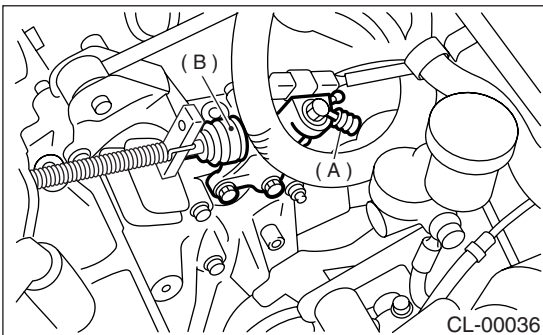
Cover the hose joint to prevent clutch fluid from flowing out.

- Non-TURBO model



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

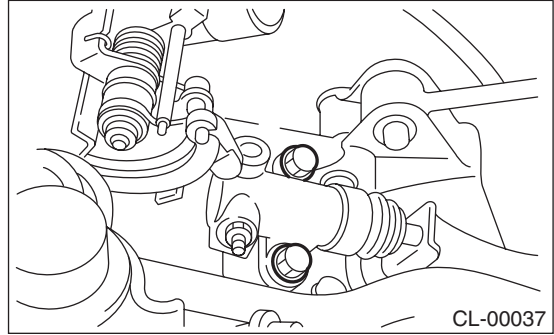
- TURBO model



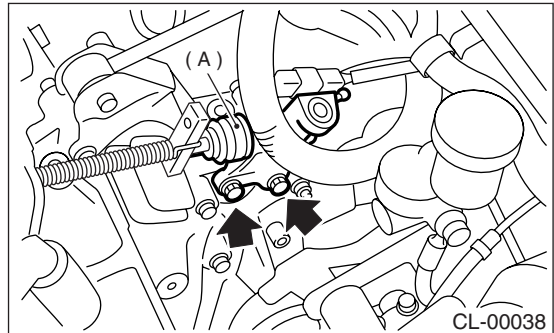
- (A) Clutch hose
- (B) Operating cylinder

- 5) Remove the operating cylinder from transmission.

- Non-TURBO model



- TURBO model



B: INSTALLATION

- 1) Install in the reverse order of removal.

NOTE:

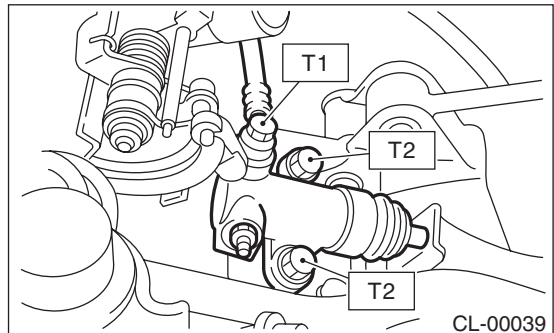
Before installing the operating cylinder, apply grease (KOPR-KOTE: P/N 003603001) to contact point of the release lever and operating cylinder.

Tightening torque:

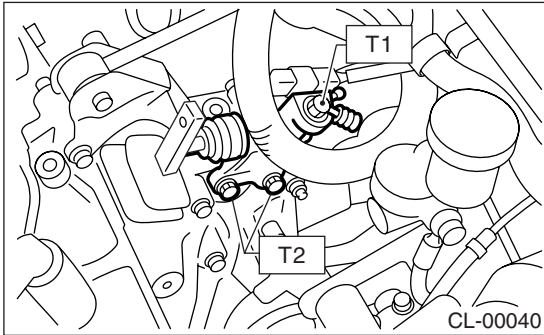
T1: 18 N·m (1.8 kgf-m, 13.0 ft-lb)

T2: 37 N·m (3.8 kgf-m, 27.5 ft-lb)

- Non-TURBO model



- TURBO model



2) After bleeding air from the operating cylinder, ensure that clutch operates properly. <Ref. to CL-25, 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.

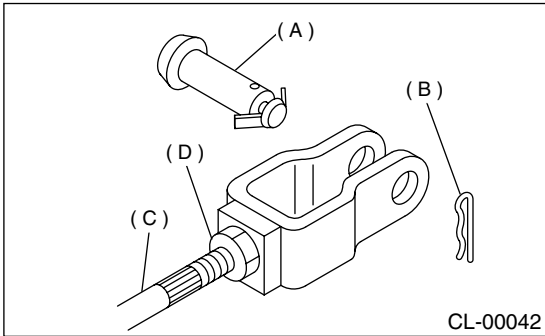
MASTER CYLINDER

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.



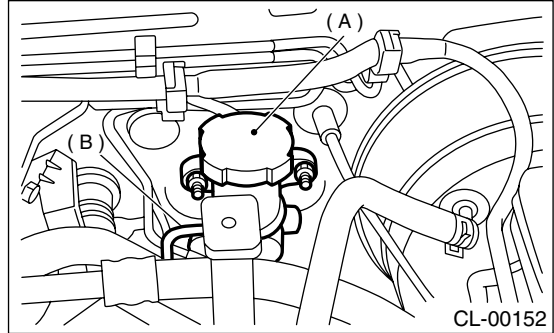
- (A) Clevis pin
- (B) Snap pin
- (C) Push rod
- (D) Lock nut

- 3) Remove the air cleaner case and air intake duct. (Except U5 model) <Ref. to IN(H4SO)-5, REMOVAL, Air Cleaner Case.> and <Ref. to IN(H4SO)-6, REMOVAL, Air Intake Duct.>
- 4) Remove the air intake chamber and air intake duct. (U5 model) <Ref. to IN(H4SO U5)-6, REMOVAL, Air Intake Chamber.> and <Ref. to IN(H4SO U5)-7, REMOVAL, Air Intake Duct.>
- 5) Remove the intercooler. <Ref. to IN(H4DOTC)-10, REMOVAL, Intercooler.>
- 6) Remove the clutch pipe from master cylinder.

- 7) 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; immediately flush it away with water, and then wipe it off if spilt.



- (A) Master cylinder
- (B) Clutch pipe

B: INSTALLATION

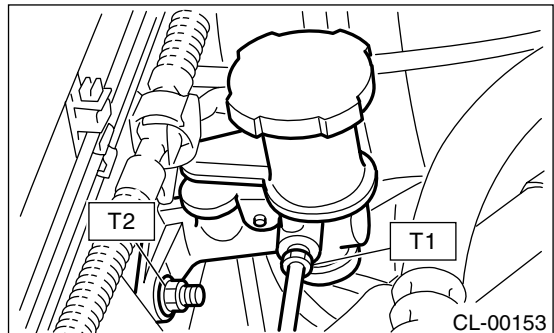
- 1) Install the master cylinder to body, and install the clutch pipe to master cylinder.

NOTE:

Check that the pipe is routed properly.

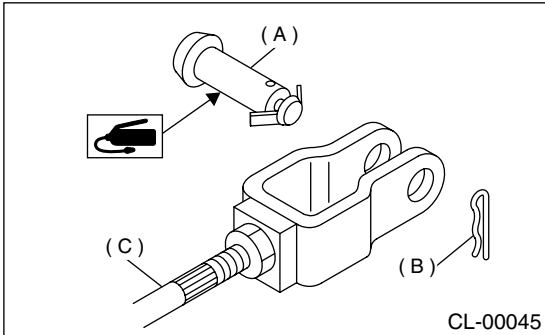
Tightening torque:

- 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.

5) Adjust the clutch pedal. <Ref. to CL-29, ADJUSTMENT, Clutch Pedal.>

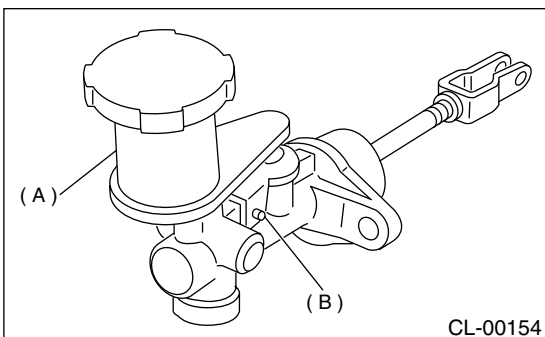
6) Install the air cleaner case and air intake duct. (Except U5 model) <Ref. to IN(H4SO)-5, INSTALLATION, Air Cleaner Case.> and <Ref. to IN(H4SO)-6, INSTALLATION, Air Intake Duct.>

7) Install the air intake chamber and air intake duct. (U5 models) <Ref. to IN(H4SO U5)-6, INSTALLATION, Air Intake Chamber.> and <Ref. to IN(H4SO U5)-7, INSTALLATION, Air Intake Duct.>

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

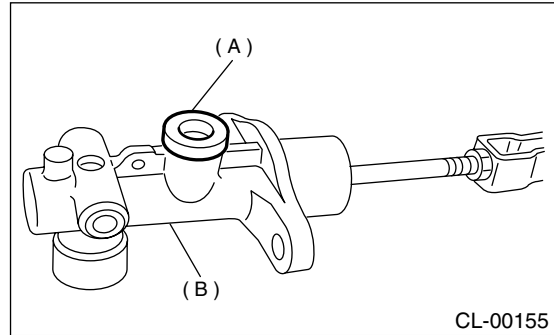
C: DISASSEMBLY

1) Remove the straight pin and reservoir tank.



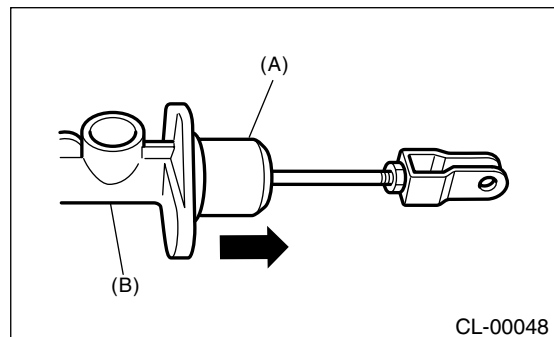
- (A) Reservoir tank
- (B) Straight pin

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 stop 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. (Turbo model)

MASTER CYLINDER

CLUTCH SYSTEM

D: ASSEMBLY

1) Install the clutch damper. (Turbo model)

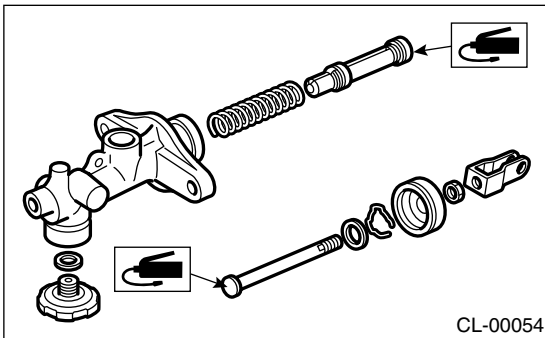
Tightening torque:

46.6 N·m (4.8 kgf·m, 34 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)



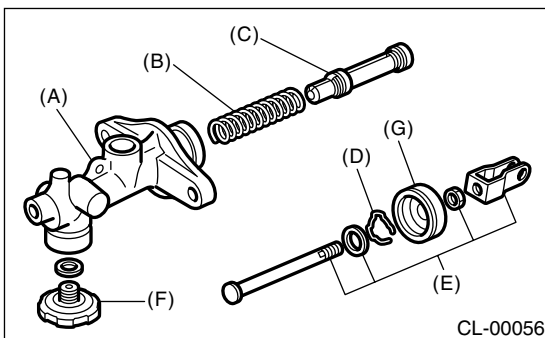
3) To assemble the master cylinder, reverse the sequence of disassembly procedure.

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, cylinder boot and hose replace the faulty part.

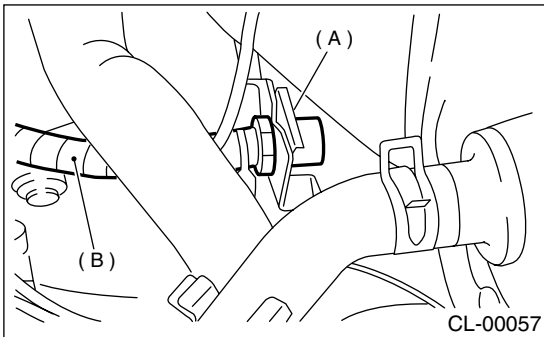


- (A) Master cylinder body
- (B) Return spring
- (C) Piston
- (D) Stop ring
- (E) Rod ASSY
- (F) Clutch damper
- (G) Cylinder boot

7. Clutch Pipe and Hose

A: REMOVAL

- 1) Remove the air cleaner case and air intake duct. (Except U5 model) <Ref. to IN(H4SO)-5, REMOVAL, Air Cleaner Case.> and <Ref. to IN(H4SO)-6, REMOVAL, Air Intake Duct.>
- 2) Remove the air intake chamber and air intake duct. (U5 models) <Ref. to IN(H4SO U5)-6, REMOVAL, Air Intake Chamber.> and <Ref. to IN(H4SO U5)-7, REMOVAL, Air Intake Duct.>
- 3) Remove the intercooler. (TURBO model) <Ref. to IN(H4DOTC)-10, REMOVAL, Intercooler.>
- 4) Drain the clutch fluid. <Ref. to CL-24, REPLACEMENT, Clutch Fluid.>
- 5) Remove the clutch pipe from the clutch hose and master cylinder.
- 6) Pull out the clamp, then remove the clutch hose from bracket.



- (A) Clamp
- (B) Clutch hose

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

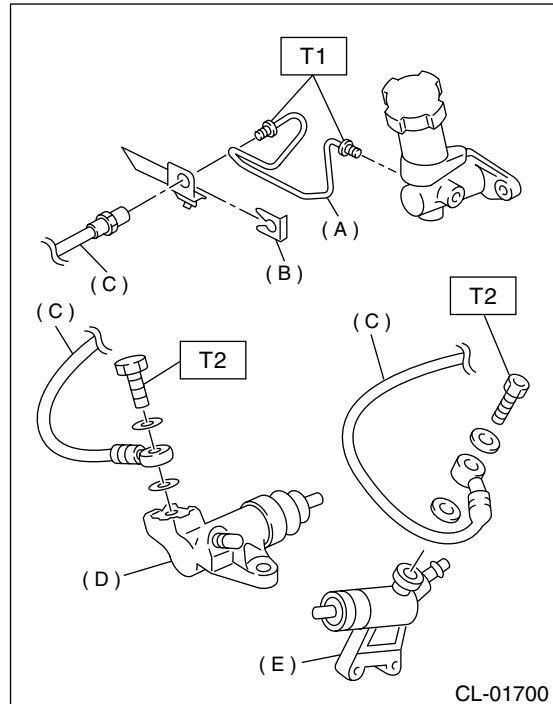
B: INSTALLATION

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)



- (A) Clutch pipe
- (B) Clip
- (C) Clutch hose
- (D) Master cylinder (Non-TURBO model)
- (E) Master cylinder (TURBO model)

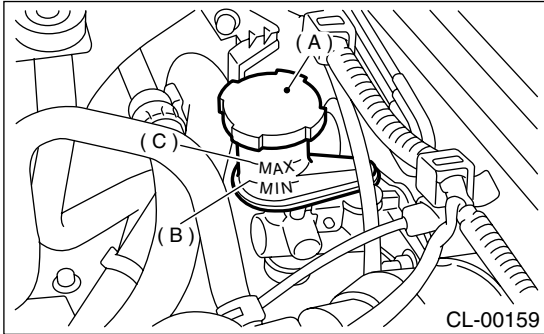
C: INSPECTION

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 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 duct.
 - 2) Draw out the brake fluid from reservoir tank with syringe.
 - 3) Refill the reservoir tank with recommended brake fluid.

Recommended brake fluid:

FMVSS No. 116, fresh DOT3 brake fluid

- 4) Drain fluid in the same method as air bleeding.
- 5) Refill the brake fluid before reservoir tank becomes empty, and drain contaminated fluid again.
- 6) 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.

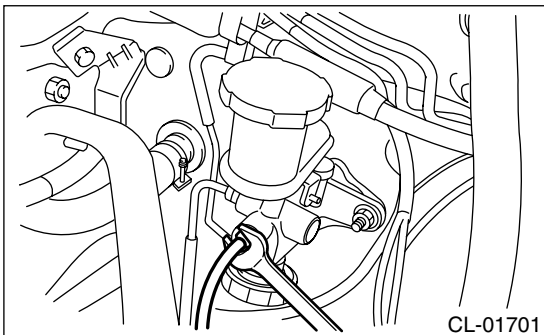
1) Remove the air cleaner case and air intake duct. (Except U5 model) <Ref. to IN(H4SO)-5, REMOVAL, Air Cleaner Case.> and <Ref. to IN(H4SO)-6, REMOVAL, Air Intake Duct.>

2) Remove the air intake chamber and air intake duct. (U5 model) <Ref. to IN(H4SO U5)-6, REMOVAL, Air Intake Chamber.> and <Ref. to IN(H4SO U5)-7, REMOVAL, Air Intake Duct.>

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

4) Slowly depress the clutch pedal and keep it. 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 brake pedal.



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

CAUTION:

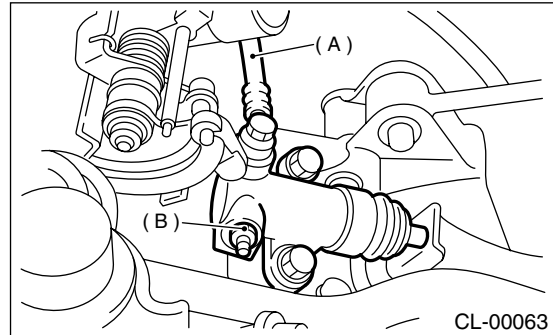
Cover the bleeder with waste cloth when loosening it, to prevent brake fluid from being splashed over surrounding parts.

6) Tighten the air bleeder.

Tightening torque:

8 N·m (0.8 kgf-m, 5.8 ft-lb)

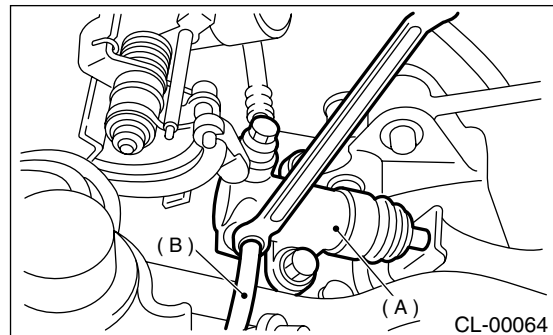
7) Fit one end of a vinyl tube into the air bleeder of operating cylinder and put the other end into a brake fluid container.



(A) Clutch hose
(B) Air bleeder

8) 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

CLUTCH FLUID AIR BLEEDING

CLUTCH SYSTEM

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

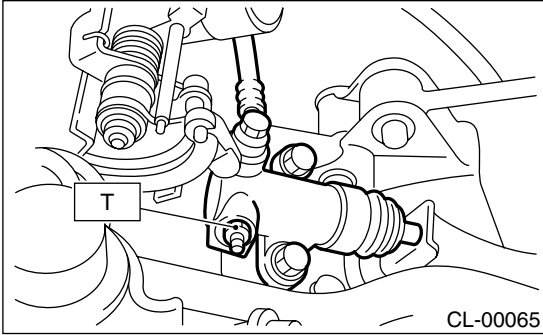
CAUTION:

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

10) Tighten the air bleeder.

Tightening torque:

T: 8 N·m (0.8 kgf-m, 5.8 ft-lb)



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

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

2. TURBO MODEL

NOTE:

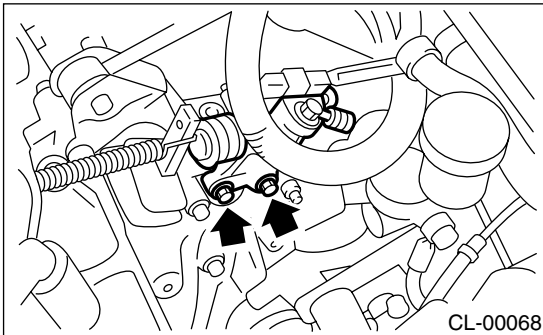
Bleed air from the oil line with help of a co-worker.

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

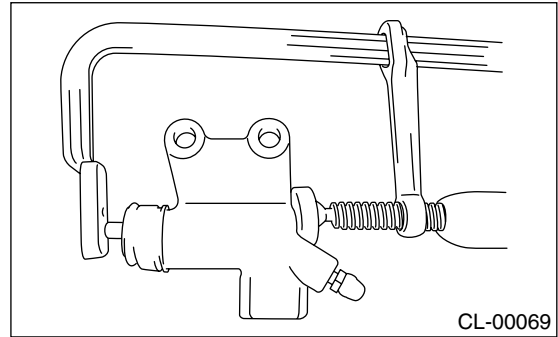
2) Remove the operating cylinder.

NOTE:

Do not remove the clutch hose.



3) Fix the piston with clamp to avoid the piston from jumping out of cylinder.



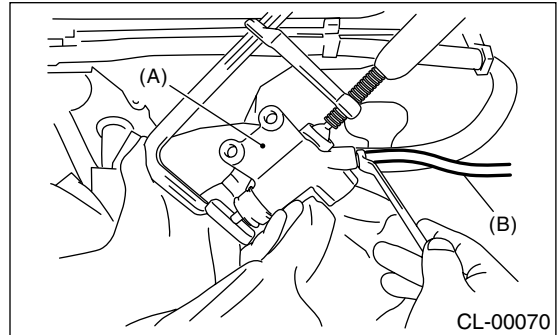
4) Fit one end of a vinyl tube into the air bleeder of operating cylinder and put the other end into a brake fluid container.

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



(A) Operating cylinder

(B) Vinyl tube

6) 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.

7) Tighten the air bleeder.

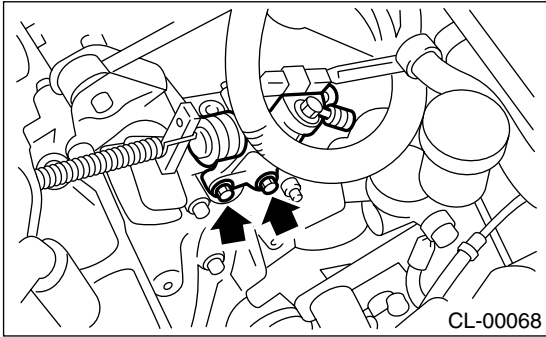
Tightening torque:

T: 8 N·m (0.8 kgf-m, 5.8 ft-lb)

8) Install the operation cylinder.

Tightening torque:

T: 37 N·m (3.8 kgf-m, 27.5 ft-lb)



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

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

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

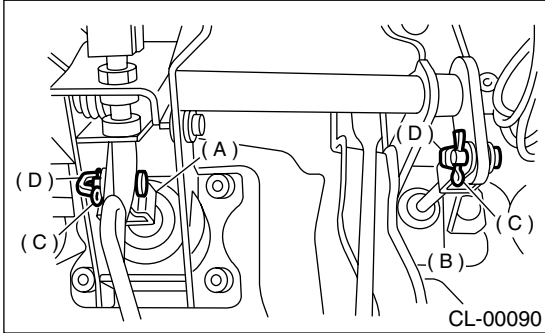
CLUTCH PEDAL

CLUTCH SYSTEM

10. Clutch Pedal

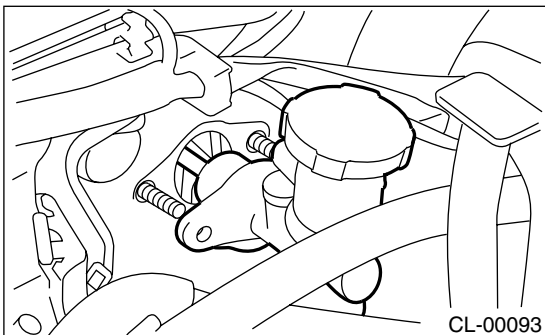
A: REMOVAL

- 1) Remove the steering column. <Ref. to PS-21, 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 accelerator pedal. <Ref. to SP(H4SO)-3, REMOVAL, Accelerator Pedal.>
- 6) Remove the air intake chamber and air intake duct. (U5 model) <Ref. to IN(H4SO U5)-6, REMOVAL, Air Intake Chamber.> and <Ref. to IN(H4SO U5)-7, REMOVAL, Air Intake Duct.>
- 7) Remove the air cleaner case and intake duct. (Except U5 model) <Ref. to IN(H4SO)-5, REMOVAL, Air Cleaner Case.> and <Ref. to IN(H4SO)-6, REMOVAL, Air Intake Duct.>
- 8) Remove the intercooler. (TURBO model) <Ref. to IN(H4DOTC)-10, REMOVAL, Intercooler.>
- 9) Remove the nut which secures clutch master cylinder.



- 10) 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.

Tightening torque:

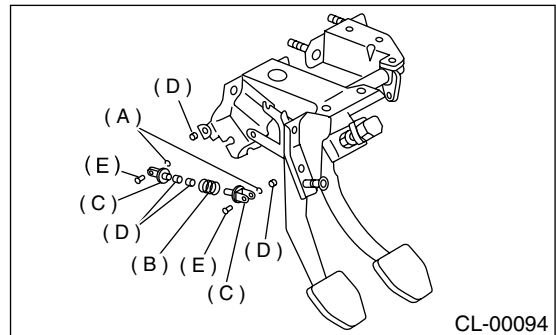
18 N·m (1.8 kgf-m, 13.0 ft-lb)

NOTE:

- Be careful not to kink the accelerator cable.
 - Always use new clevis pins.
- 2) Adjust the clutch pedal after installation. <Ref. to CL-29, ADJUSTMENT, Clutch Pedal.>
 - 3) Adjust the clutch switch (starter interlock). <Ref. to CL-33, ADJUSTMENT, Clutch Switch.>

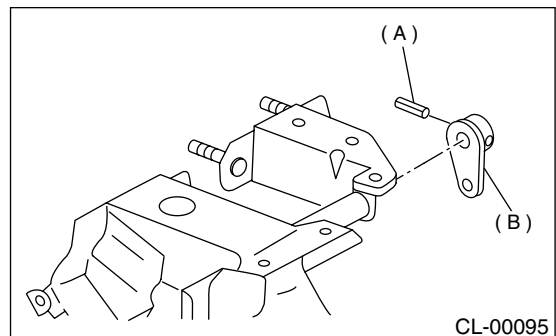
C: DISASSEMBLY

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



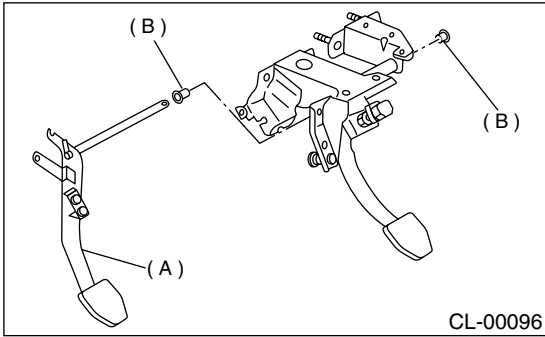
- (A) Clip
- (B) Assist spring
- (C) Assist rod
- (D) Bushing
- (E) Clevis pin

- 2) Remove the spring pin and lever.



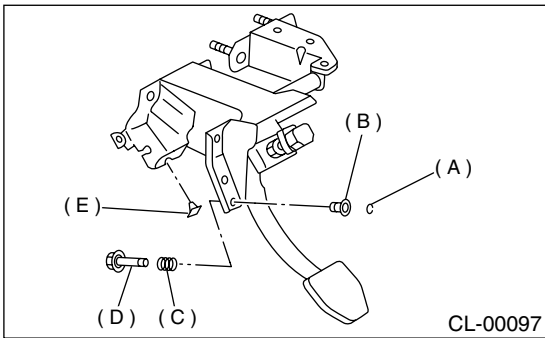
- (A) Pin
- (B) Lever

3) Remove the clutch pedal and bushings.



- (A) Clutch pedal
- (B) Bushing

4) Remove the stopper, clip, 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.

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.

Grease:

SUNLIGHT No.2 (Part No. 003602010) or equivalent

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 approx. 10 N (1 kgf, 2 lb) to ensure pedal deflection is in specified range.

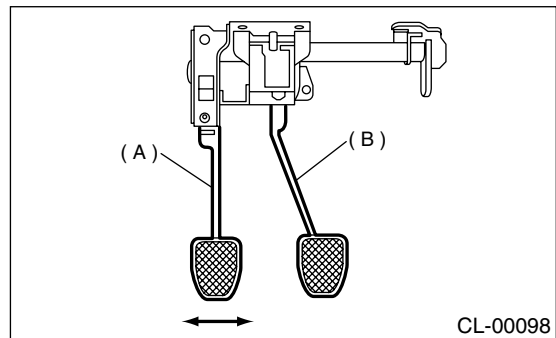
NOTE:

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

Deflection of clutch pedal:

Service limit

5.0 mm (0.197 in) or less



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

F: ADJUSTMENT

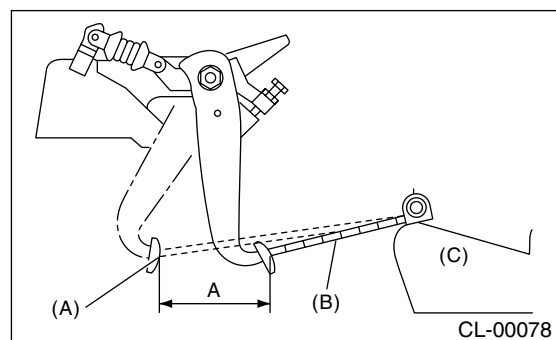
1) Measure the full stroke amount of clutch pedal.

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

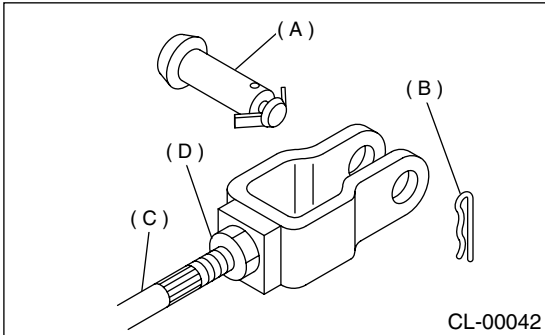
CLUTCH PEDAL

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.

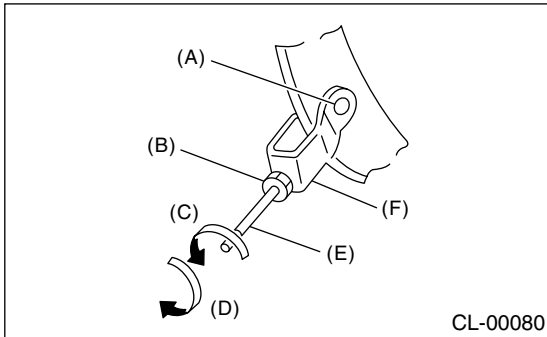


- (A) Clevis pin
- (B) Snap pin
- (C) Push rod
- (D) Push rod lock nut

4) Turn the push rod to adjust.

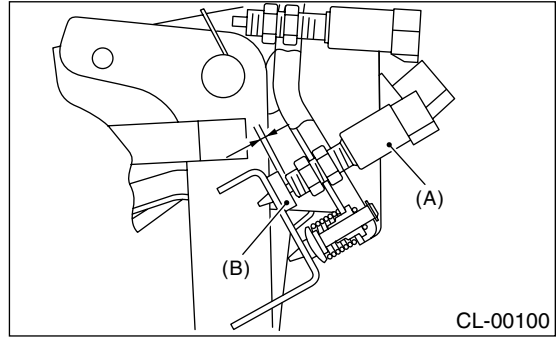
(1) Ensure that the clutch pedal contacts stopper bolt, when releasing the clutch pedal.

(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

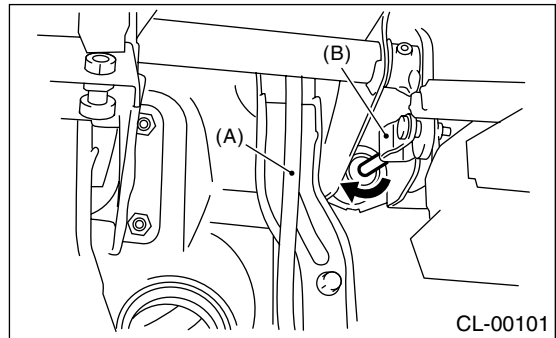
5) Turn the push rod clockwise to shorten until clearance is made at clutch switch.



- (A) Clutch switch
- (B) Stopper

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

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 start switch. <Ref. to CL-32, INSTALLATION, Clutch Switch.>

CLUTCH SWITCH

CLUTCH SYSTEM

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.

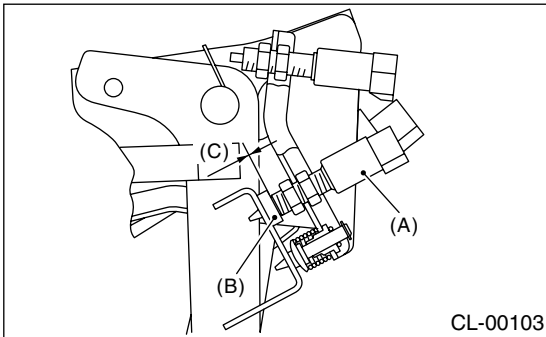
B: INSTALLATION

1. CLUTCH SWITCH (WITH CRUISE CONTROL)

- 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)

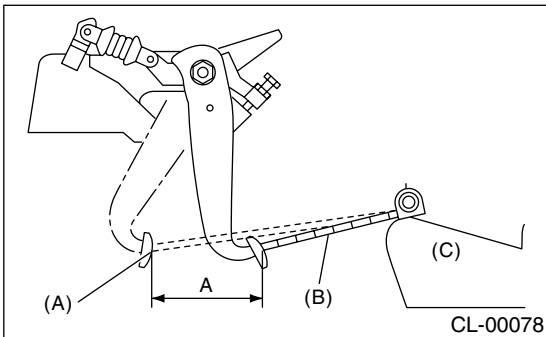


- (A) Clutch switch
- (B) Stopper
- (C) 0 mm (0 in)

- 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-29, ADJUSTMENT, Clutch Pedal.>

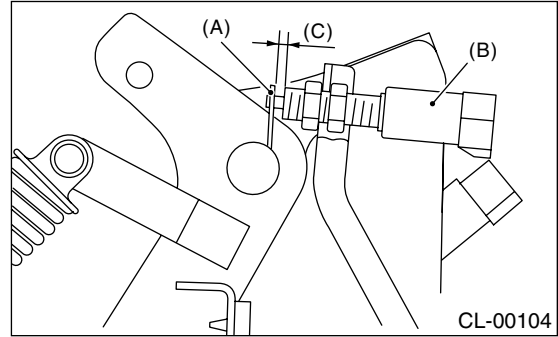
- 4) Connect clutch switch connector.

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, 13.0 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) Confirm that the engine does not start when the clutch pedal is released. If the engine starts, adjust the clutch switch and inspect the starter interlock circuit.
- 2) 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.
- 3) 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:

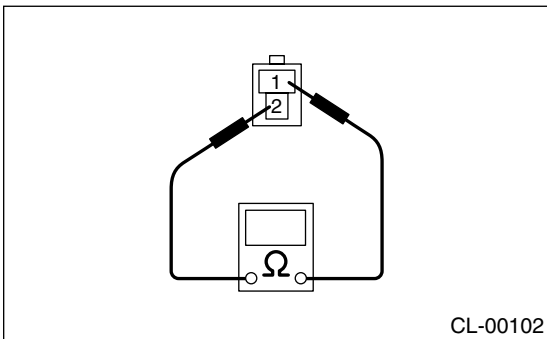
1 — 2/Less than 1 Ω

Terminals/Specified resistance

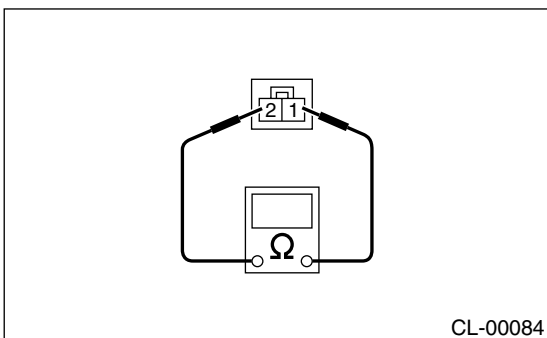
When clutch pedal not depressed:

1 — 2/More than 1 M Ω

Clutch switch (Starter interlock)

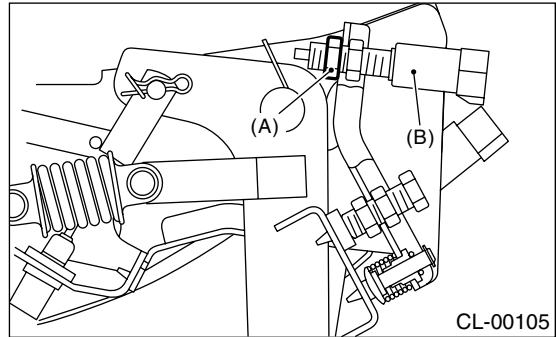


Clutch switch (Cruise control)



D: ADJUSTMENT

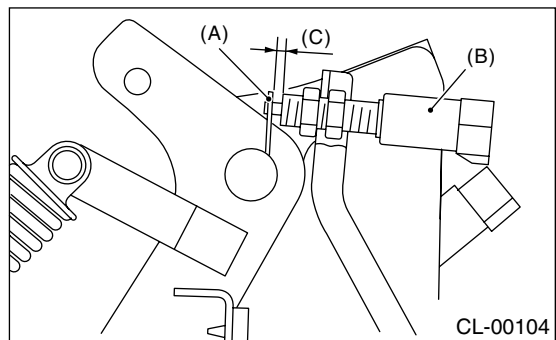
- 1) Loosen the clutch switch mounting lock nut (Starter interlock).



(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 (Clutch stopper nut):

8 N·m (0.8 kgf·m, 13.0 ft·lb)

GENERAL DIAGNOSTIC TABLE

CLUTCH SYSTEM

12. General Diagnostic Table

A: INSPECTION

1. CLUTCH

Symptom	Possible cause	Corrective action
<p>1. Clutch slippage.</p> <p>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"> • Engine speed up when shifting. • High speed driving is impossible; especially rapid acceleration impossible and vehicle speed does not increase in proportion to an increase in engine speed. • Power falls, particularly when ascending a slope, and there is a smell of burning of the clutch facing. • 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. 	(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.
<p>2. Clutch drags.</p> <p>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"> • Method of testing: <Ref. to CL-35, DIAGNOSTIC DIAGRAM OF CLUTCH DRAG, INSPECTION, General Diagnostic Table.> <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) Sticked clutch disc (smeared by oil or water)	Replace.
<p>3. Clutch chatters.</p> <p>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	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.
<p>4. Noisy clutch</p> <p>Examine whether the noise is generated when the clutch is disengaged, engaged, or partially engaged.</p>	(a) Broken, worn or unlubricated release bearing	Replace the release bearing.
	(b) Insufficient lubrication of pilot bearing	Replace the clutch disc.
	(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 action
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
1 CHECK GEAR NOISE. 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.
2 CHECK GEAR NOISE. 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.
3 CHECK GEAR NOISE. 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

MEMO: