

CLUTCH SYSTEM

General Description

CLUTCH SYSTEM

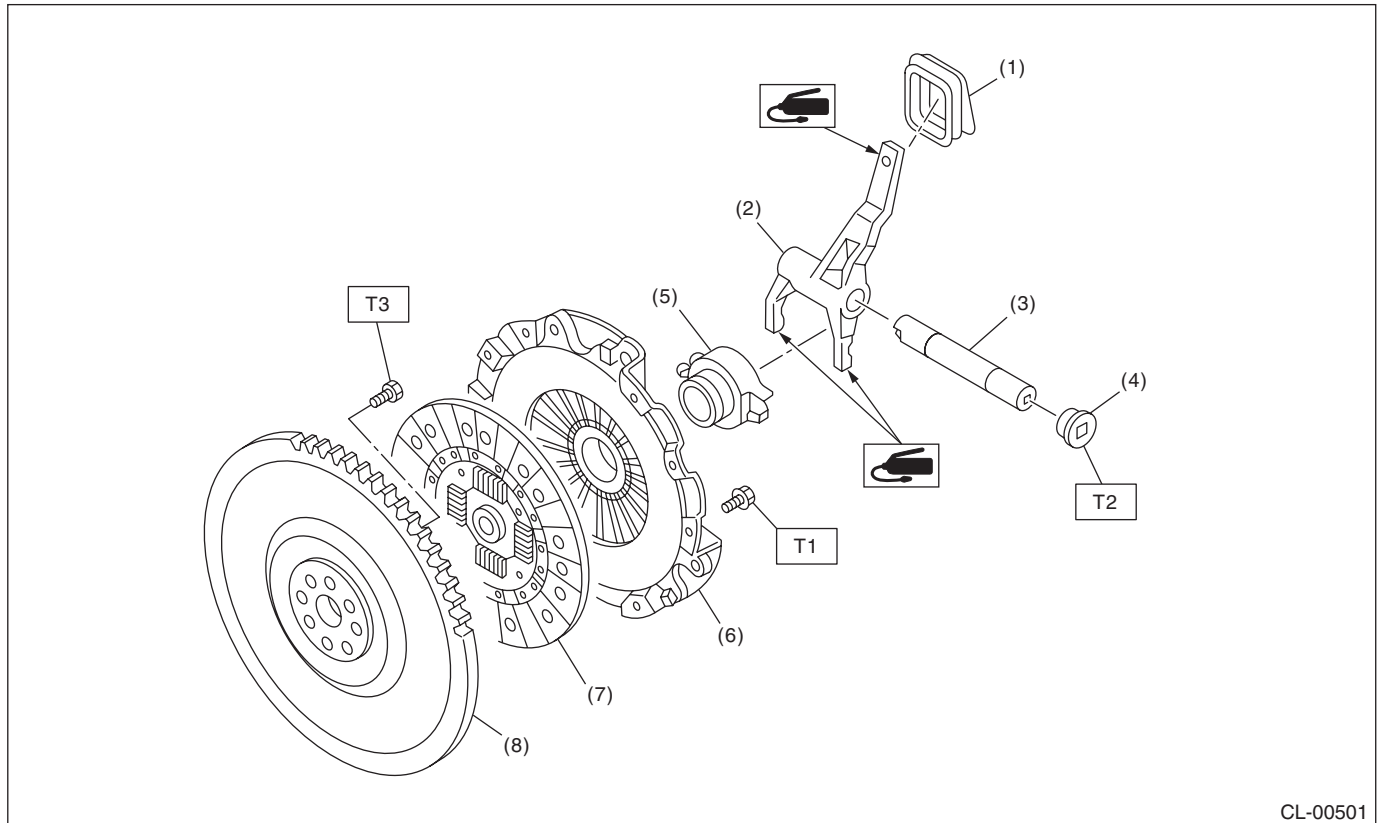
1. General Description

A: SPECIFICATION

Model		2.5 L Turbo STI	
Transmission type		6MT	
Clutch cover	Type	Pull type	
	Diaphragm set load	N (kgf, lbf)	9,120 (930, 2051)
Clutch disc	Facing material		Woven (Non-asbestos)
	O.D. × I.D. × thickness mm (in)	Clutch cover side	240 × 160 × 3.5 (9.45 × 6.30 × 0.138)
		Flywheel side	240 × 160 × 3.2 (9.45 × 6.30 × 0.126)
	Spline outer diameter mm (in)		25.2 (0.992), (Number of teeth: 24)
	Depth of rivet head mm (in)	Clutch cover side	1.65 — 2.25 (0.065 — 0.089)
		Flywheel side	1.35 — 1.95 (0.053 — 0.077)
Limit of sinking		0.3 (0.012)	
Deflection limit mm (in)		0.7 (0.028) at R = 115 (4.53)	
Release bearing		Grease-packed self-aligning	
Clutch pedal	Full stroke	mm (in)	130 — 135 (5.12 — 5.31)
	Free play	mm (in)	3 — 13 (0.12 — 0.51)
Flywheel	Type	Conventional	

B: COMPONENT

1. CLUTCH ASSEMBLY



CL-00501

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

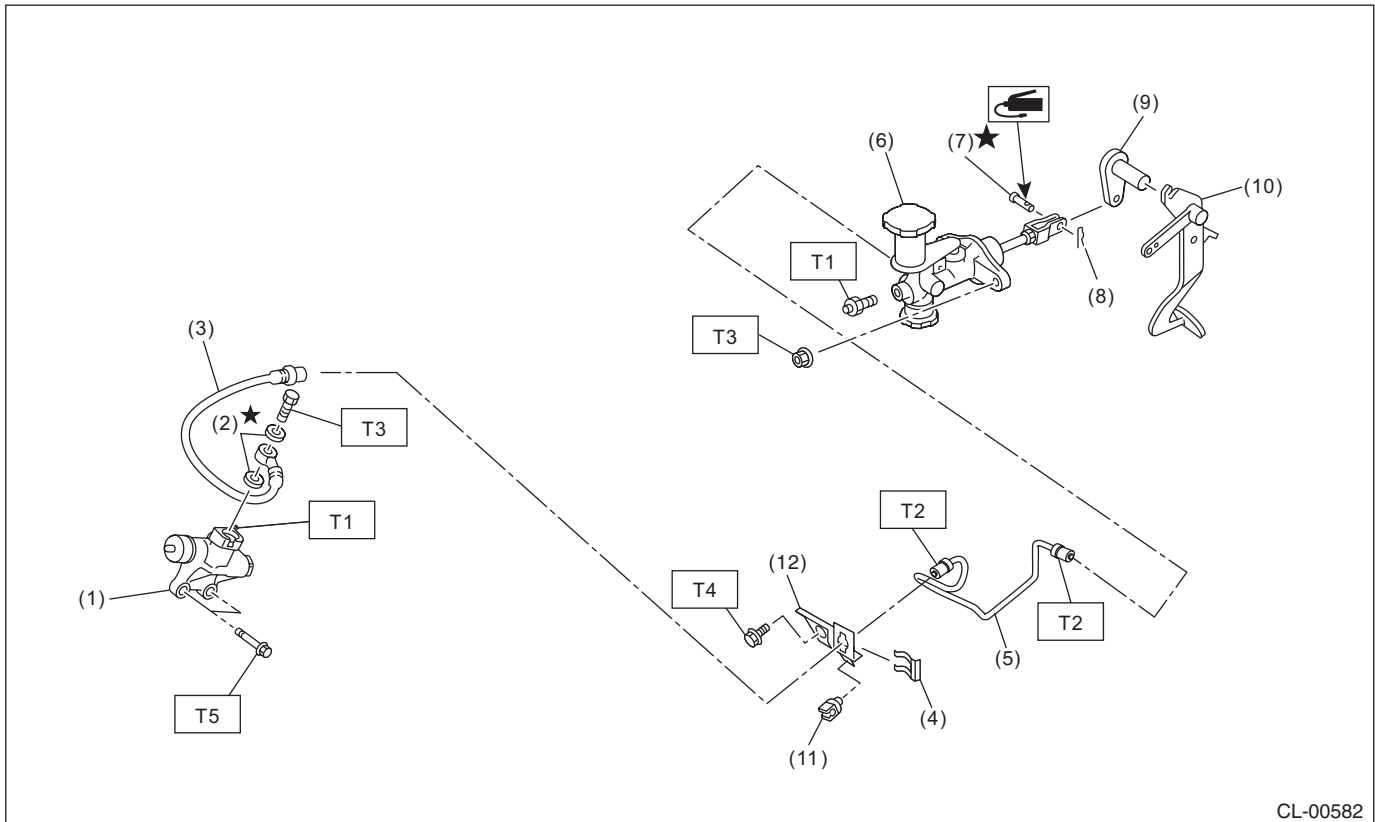
Tightening torque: N·m (kgf·m, ft·lb)

T1: 16 (1.6, 11.8)

T2: 48 (4.9, 35.4)

T3: 75 (7.6, 55.3)

2. CLUTCH PIPE AND HOSE



CL-00582

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

Tightening torque:N·m (kgf·m, ft·lb)

T1: 8 (0.8, 5.9)

T2: 15 (1.5, 11.1)

T3: 18 (1.8, 13.3)

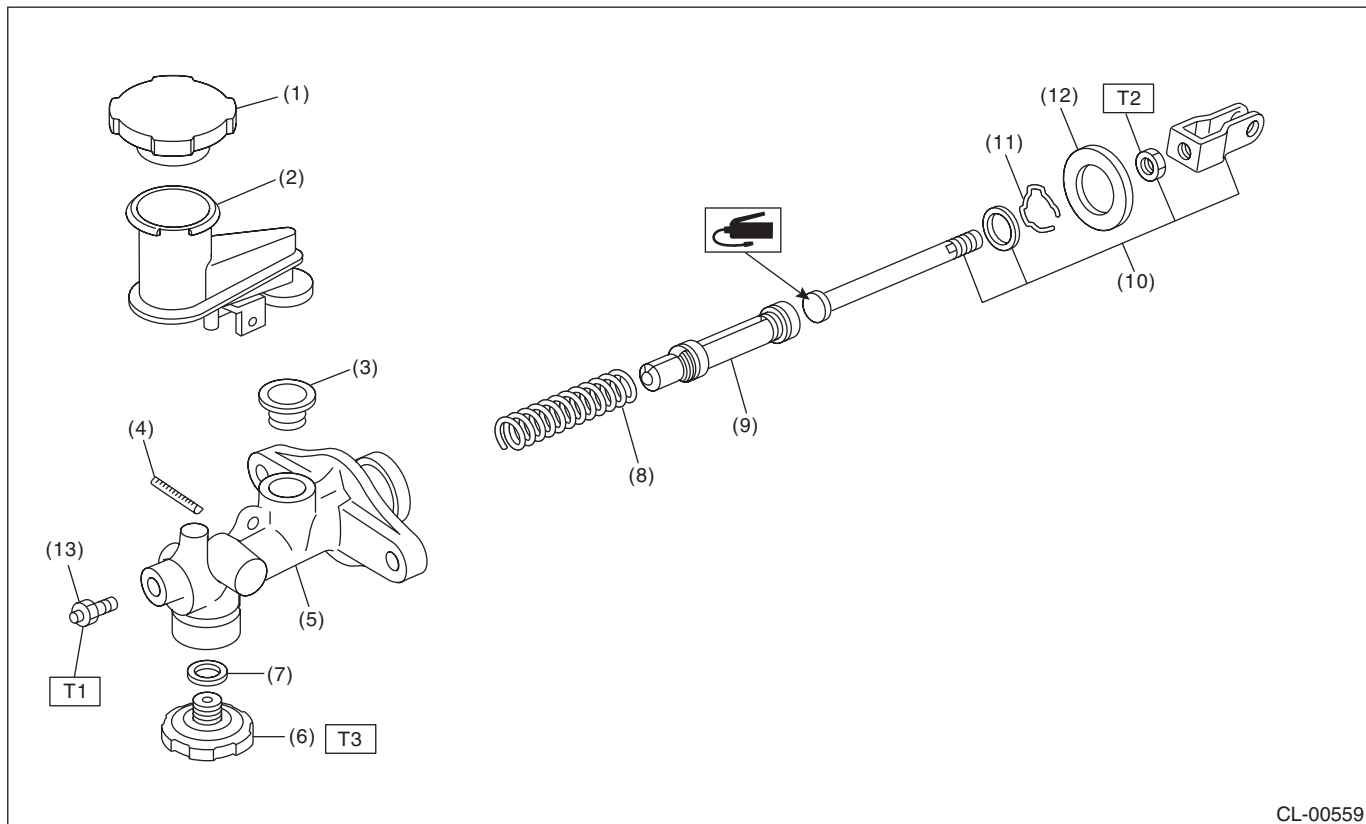
T4: 25 (2.5, 18.4)

T5: 41 (4.2, 30.2)

General Description

CLUTCH SYSTEM

3. MASTER CYLINDER



- (1) Reservoir cap
- (2) Reservoir tank
- (3) Oil seal
- (4) Straight pin
- (5) Master cylinder
- (6) Clutch damper

- (7) Gasket
- (8) Return spring
- (9) Piston
- (10) Push rod ASSY
- (11) Piston stop ring
- (12) Seat

- (13) Breather screw

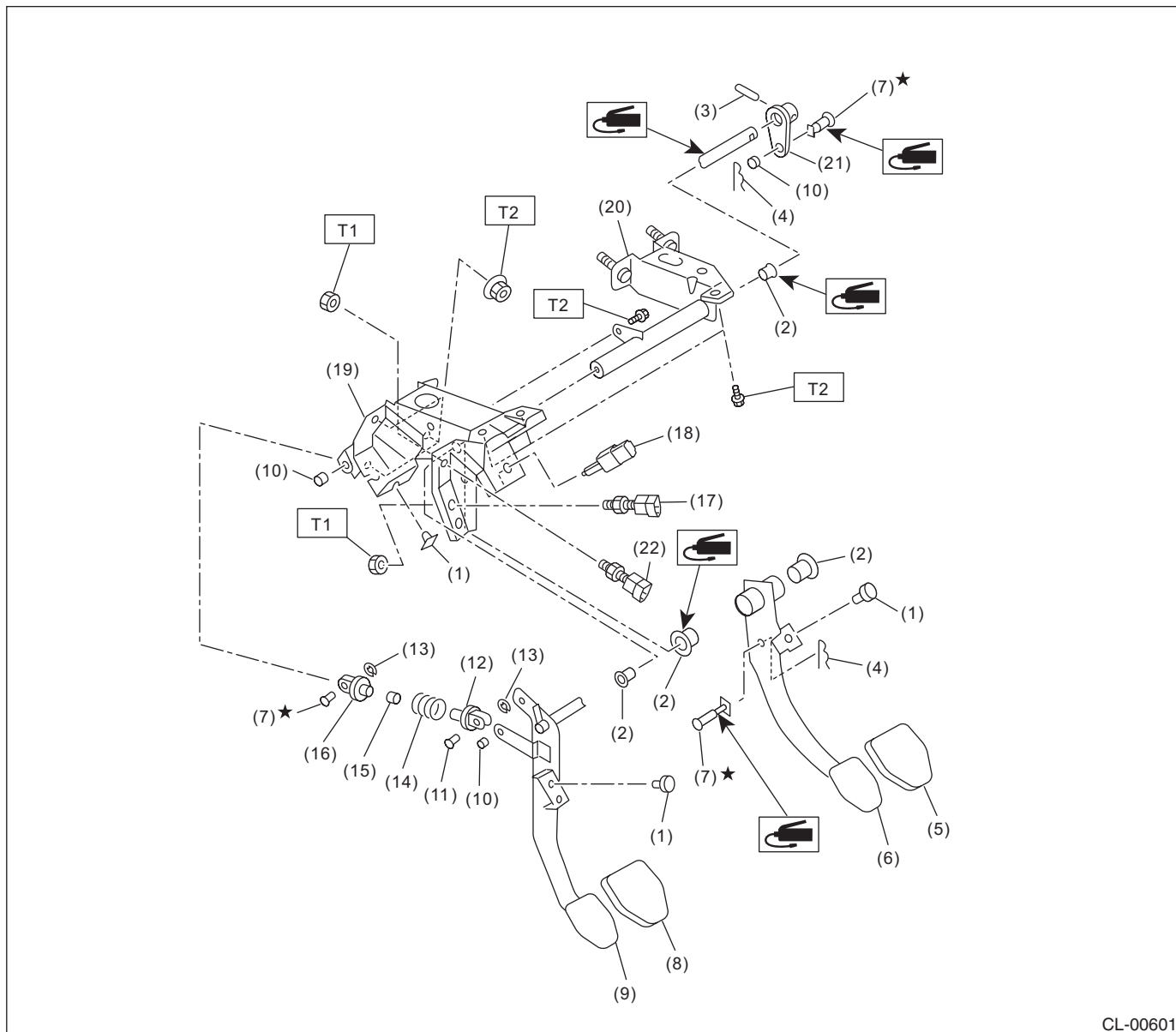
Tightening torque: N·m (kgf·m, ft·lb)

T1: 8 (0.8, 5.9)

T2: 10 (1.0, 7.4)

T3: 46.6 (4.8, 34.4)

4. CLUTCH PEDAL



CL-00601

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

Tightening torque: N·m (kgf·m, ft·lb)

T1: 8 (0.8, 5.9)

T2: 18 (1.8, 13.3)

General Description

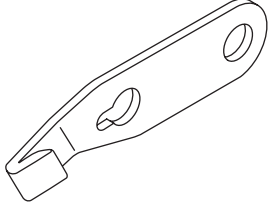
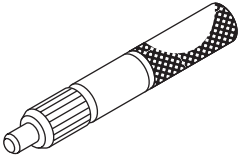
CLUTCH SYSTEM

C: CAUTION

- Wear appropriate work clothing, including a cap, protective goggles and protective shoes when performing any work.
- Remove contamination including dirt and corrosion before removal, installation or disassembly.
- Keep the disassembled parts in order and protect them from dust and dirt.
- Before removal, installation or disassembly, be sure to clarify the failure. Avoid unnecessary removal, installation, disassembly and replacement.
- Vehicle components are extremely hot after driving. Be wary of receiving burns from heated parts.
- Use SUBARU genuine fluid, grease etc. or equivalent. Do not mix fluid, grease, etc. of different grades or 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 revolving surfaces before installation.
- Before installing O-rings or snap rings, apply sufficient amount of fluid to avoid damage and deformation.
- Before securing a part in a vise, place cushioning material such as wood blocks, aluminum plate or cloth between the part and the vise.
- Keep fluids 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 the flywheel.
 ST-499747100	499747100	CLUTCH DISC GUIDE	Used when installing the clutch disc to the flywheel.

2. GENERAL TOOL

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

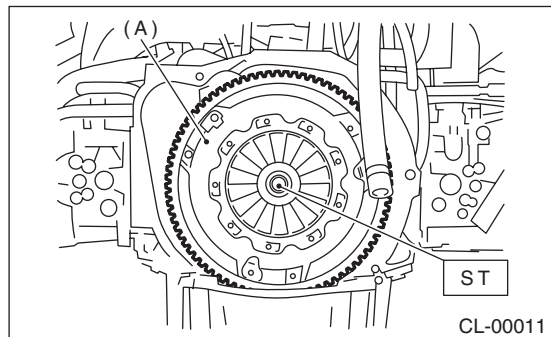
2. Clutch Disc and Cover

A: REMOVAL

1) Remove the transmission assembly from vehicle body. <Ref. to 6MT-32, REMOVAL, Manual Transmission Assembly.>

2) Attach the ST on the flywheel.

ST 499747100 CLUTCH DISC GUIDE



(A) Clutch cover

3) Remove the clutch cover and clutch disc.

NOTE:

- Take care not to allow oil to touch the clutch disc face.
- Do not disassemble the clutch cover or clutch disc.

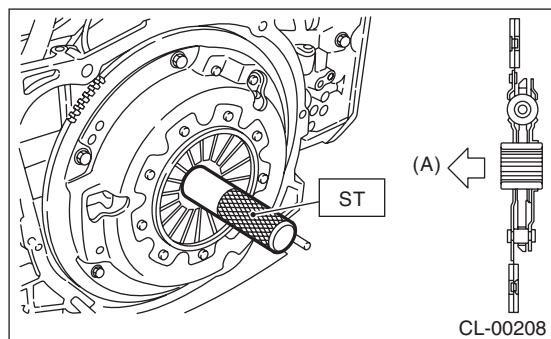
B: INSTALLATION

1) Insert the ST into the clutch disc and attach to the flywheel by inserting the ST end into pilot bearing.

NOTE:

When installing the clutch disc, be careful to attach in the correct direction.

ST 499747100 CLUTCH DISC GUIDE



(A) Flywheel side

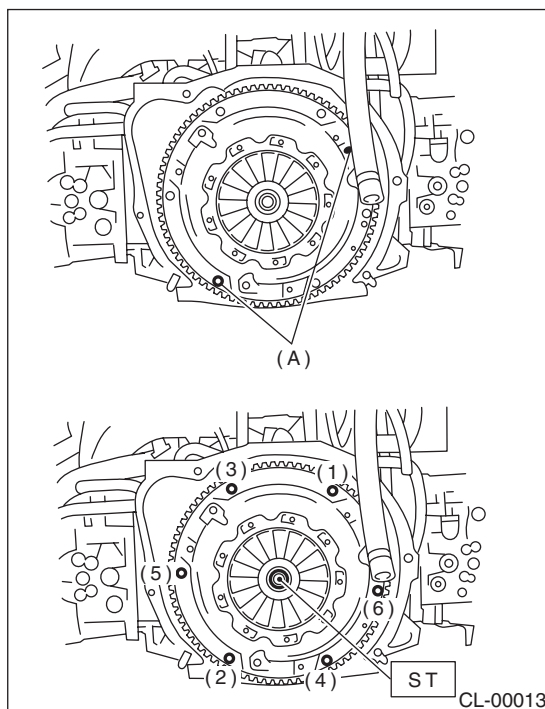
2) Install the clutch cover to the flywheel and tighten the bolts to the specified torque.

NOTE:

- When installing the clutch cover to the flywheel, position the clutch cover so that the distance between unbalance marks (● paint marks) is at least 120°. (The unbalance marks ● indicate the directions of residual unbalance.)
- Note the front and rear of the clutch disc when installing.
- Temporarily tighten the bolts by hand. Each bolt should be tightened to the specified torque in a crisscross order.

Tightening torque:

16 N·m (1.6 kgf-m, 11.8 ft-lb)



(A) Unbalance mark (paint)

3) Remove the ST.

ST 499747100 CLUTCH DISC GUIDE

4) Install the transmission assembly. <Ref. to 6MT-34, INSTALLATION, Manual Transmission Assembly.>

Clutch Disc and Cover

CLUTCH SYSTEM

C: INSPECTION

1. CLUTCH DISC

1) Facing wear

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

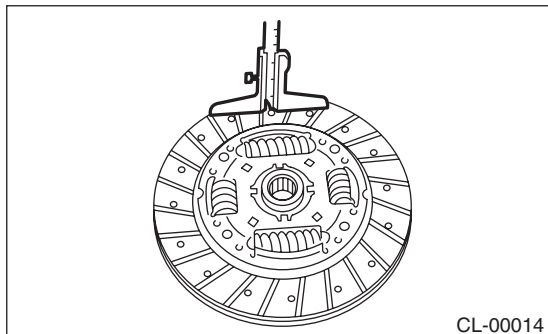
Depth to rivet head:

Limit of sinking

0.3 mm (0.012 in)

NOTE:

Do not wash the clutch disc with any type of cleaning fluid.

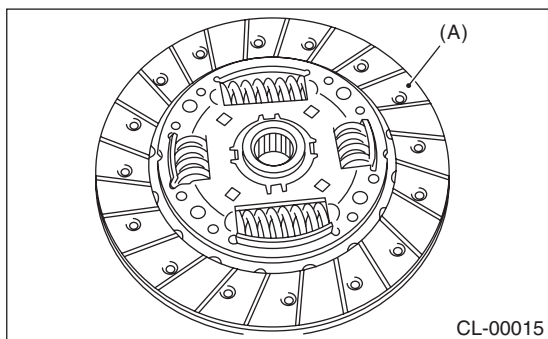


2) Hardened facing

Replace the clutch disc.

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 locations for oil leakage.



(A) Clutch facing

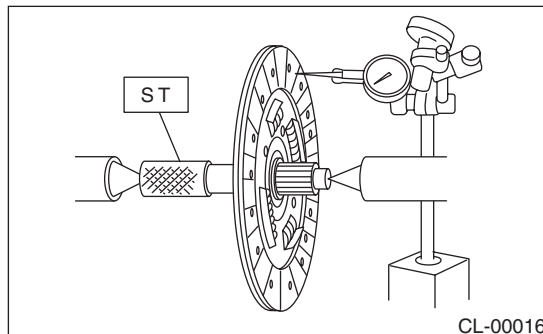
4) Deflection on facing

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

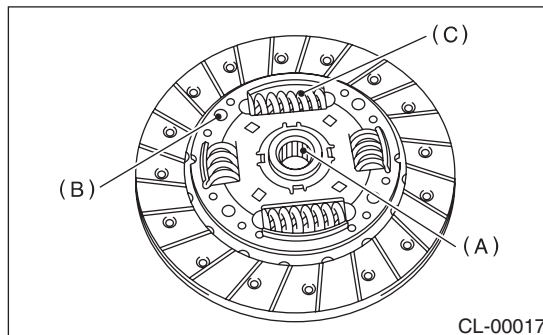
ST 499747100 CLUTCH DISC GUIDE

Limit for deflection:

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



5) If there is spline wear, loose rivets, failed damper springs, etc., replace the clutch disc.



(A) Spline

(B) Rivet

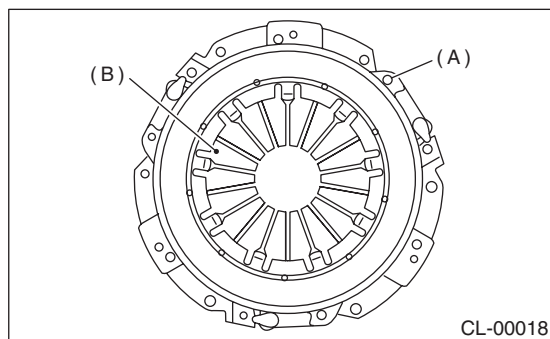
(C) Damper spring

2. CLUTCH COVER

NOTE:

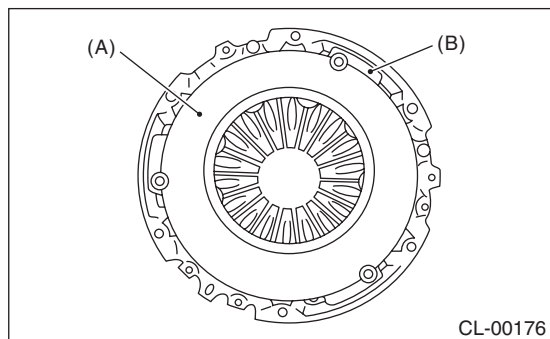
Visually check the following items without disassembling, and replace or repair if defective.

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



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

- 3) Damaged or worn disc contact surface of the pressure plate
- 4) Loose strap plate installation area
- 5) Worn diaphragm sliding area



- (A) Pressure plate
- (B) Strap plate

Flywheel

CLUTCH SYSTEM

3. Flywheel

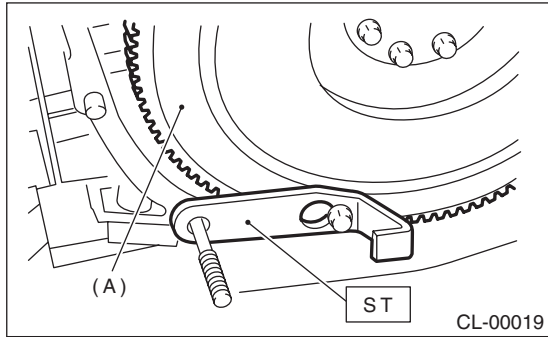
A: REMOVAL

1) Remove the transmission assembly. <Ref. to 6MT-32, REMOVAL, Manual Transmission Assembly.>

2) Remove the clutch cover and clutch disc. <Ref. to CL-7, REMOVAL, Clutch Disc and Cover.>

3) Using the ST, remove the flywheel.

ST 498497100 CRANKSHAFT STOPPER

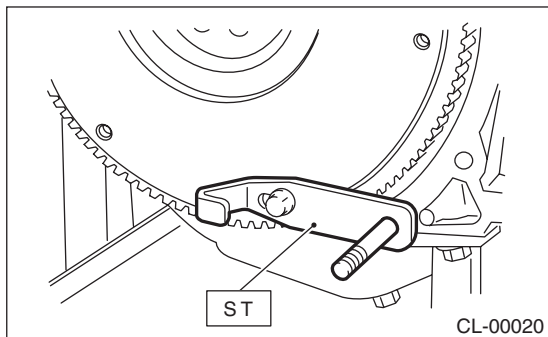


(A) Flywheel

B: INSTALLATION

1) Install the flywheel and ST.

ST 499747100 CRANKSHAFT STOPPER



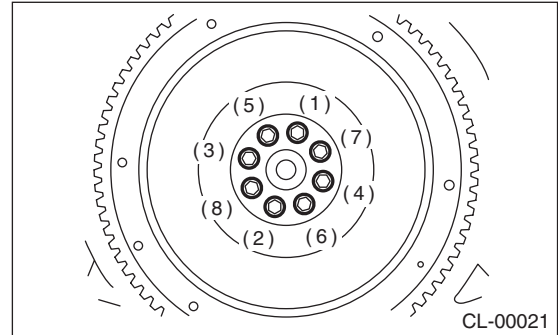
2) Tighten the flywheel mounting bolts to the specified torque.

NOTE:

Tighten the flywheel attachment bolts gradually. Each bolt should be tightened to the specified torque in crisscross order.

Tightening torque:

75 N·m (7.6 kgf-m, 55.3 ft-lb)



3) Install the clutch disc and cover. <Ref. to CL-7, INSTALLATION, Clutch Disc and Cover.>

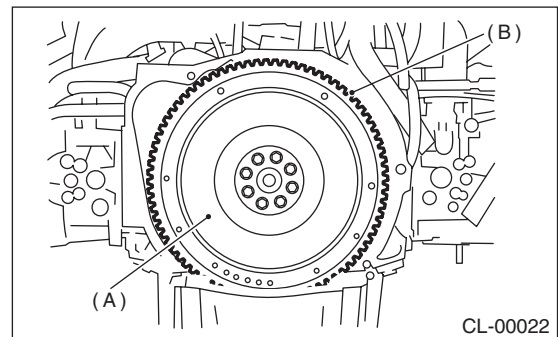
4) Install the transmission assembly. <Ref. to 6MT-32, REMOVAL, Manual Transmission Assembly.>

C: INSPECTION

CAUTION:

Because this bearing is grease-sealed and is a non-lubrication type, do not wash with gasoline or solvents.

1) If there is damage or defectiveness in the facing sliding surface or ring gear, replace the flywheel.



(A) Flywheel

(B) Ring gear

2) Smoothness of rotation

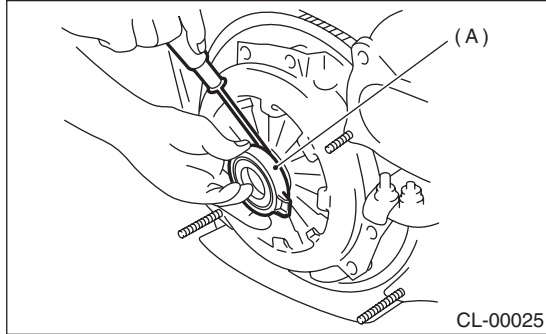
Rotate the ball bearing while applying pressure in the thrust direction.

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

4. Release Bearing and Lever

A: REMOVAL

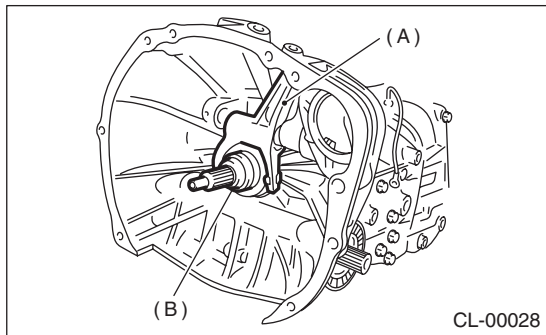
- 1) Remove the transmission assembly from vehicle body. <Ref. to 6MT-32, REMOVAL, Manual Transmission Assembly.>
- 2) Remove the release lever from the transmission.
- 3) Using a flat tip screwdriver, remove the release bearing from the clutch cover.



(A) Release bearing

B: INSTALLATION

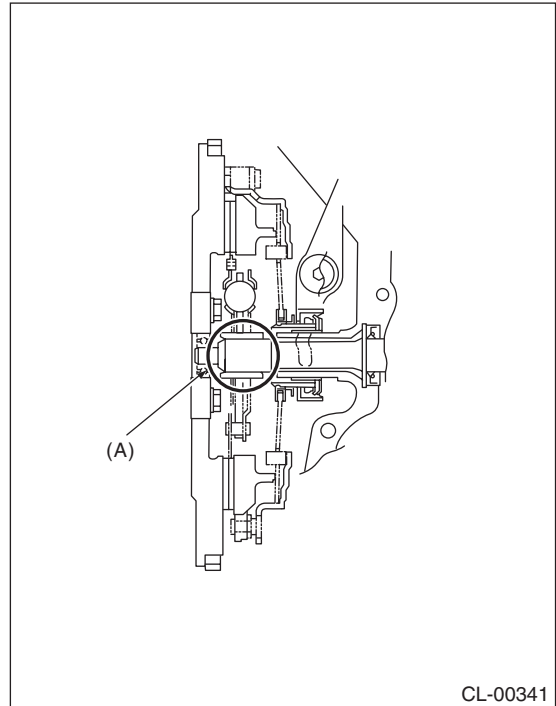
- 1) Attach the release bearing to the transmission.
- 2) Insert the release lever into the release bearing tab.



(A) Release lever
(B) Release bearing

- 3) Apply grease to splines.

Grease:
NICHIMOLY N-130

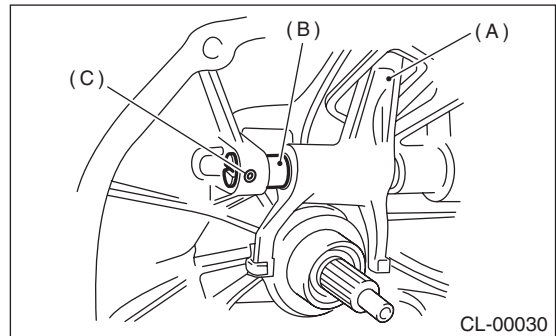


(A) Spline

- 4) Insert the release lever shaft into the release lever.

NOTE:

Make sure the cut portion of the release lever shaft comes into contact with the spring pin.



(A) Release lever
(B) Release lever shaft
(C) Spring pin

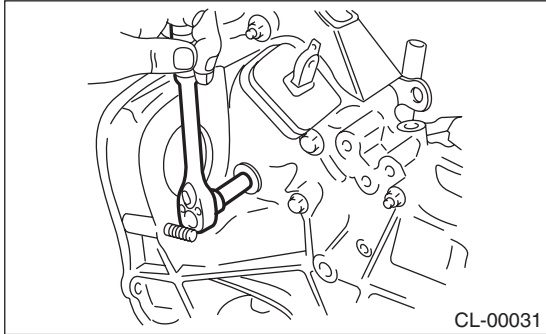
Release Bearing and Lever

CLUTCH SYSTEM

5) Tighten the plug.

Tightening torque:

48 N·m (4.9 kgf·m, 35.4 ft·lb)



6) Check the bearing for smooth movement by operating the release lever.

7) Install the transmission assembly. <Ref. to 6MT-34, INSTALLATION, Manual Transmission Assembly.>

C: INSPECTION

1. RELEASE BEARING

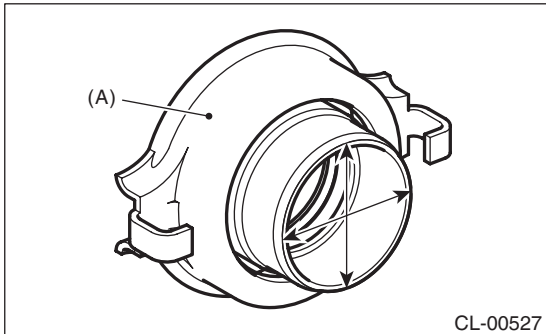
CAUTION:

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

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

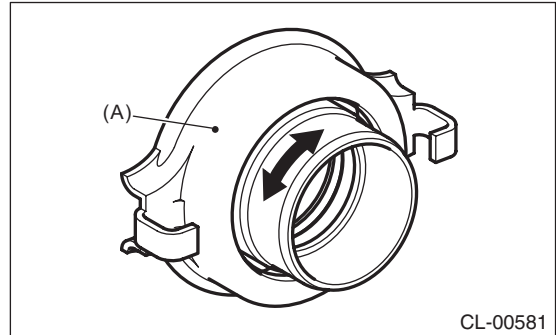
Radial direction stroke:

1.6 mm (0.063 in)



(A) Bearing case

2) While applying force to the bearing in the rotational direction, check the bearing for smooth rotation.

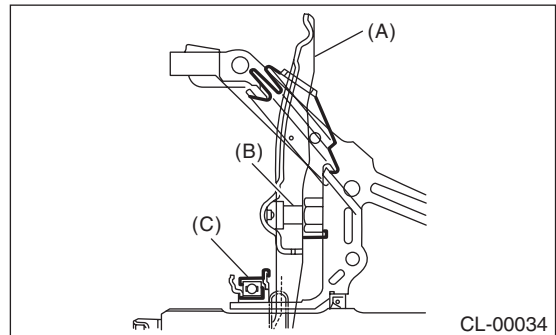


(A) Bearing case

3) Check for wear and damage at the bearing case surface in contact with the lever.

2. RELEASE LEVER

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



- (A) Release lever
- (B) Pivot
- (C) Release bearing

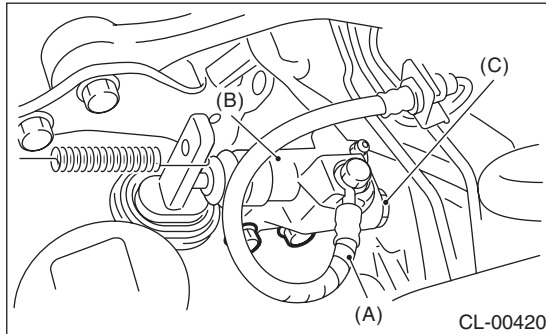
5. Operating Cylinder

A: REMOVAL

- 1) Remove the intercooler. <Ref. to IN(STI)-11, REMOVAL, Intercooler.>
- 2) Disconnect the clutch hose from the operating cylinder.

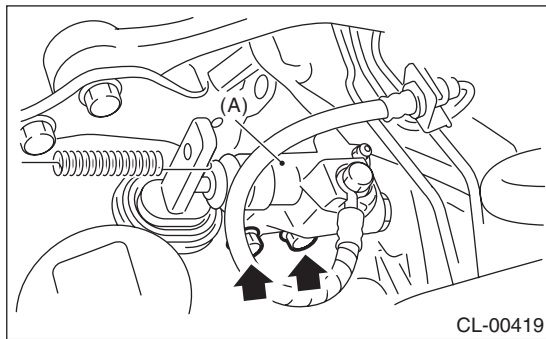
CAUTION:

- Cover the hose joint to prevent the clutch fluid from flowing out.
- Do not loosen or remove the cap bolt.



- (A) Clutch hose
- (B) Operating cylinder
- (C) Cap bolt

- 3) Remove the operating cylinder from the transmission.



- (A) Operating cylinder

B: INSTALLATION

- 1) Install in the reverse order of removal.

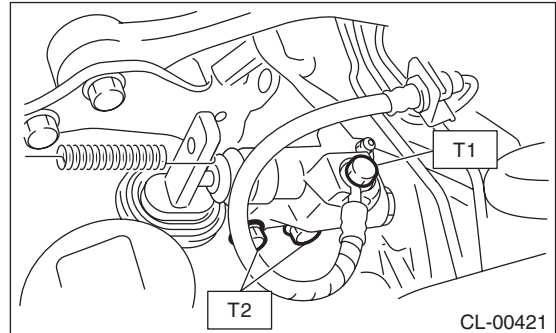
NOTE:

Before installing the operating cylinder, apply grease (KOPR-KOTE: Part No. 003603001) to the contact point of the release lever and operating cylinder.

Tightening torque:

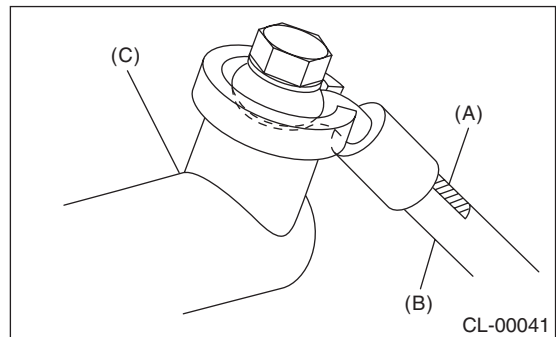
T1: 18 N·m (1.8 kgf-m, 13.3 ft-lb)

T2: 41 N·m (4.2 kgf-m, 30.2 ft-lb)



NOTE:

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



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

- 2) After bleeding air from the operating cylinder, ensure that the clutch operates properly. <Ref. to CL-18, 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 the boot. If any leakage or damage is found, replace the operating cylinder.

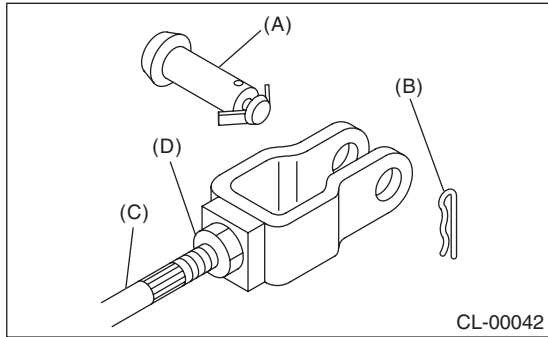
Master Cylinder

CLUTCH SYSTEM

6. Master Cylinder

A: REMOVAL

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

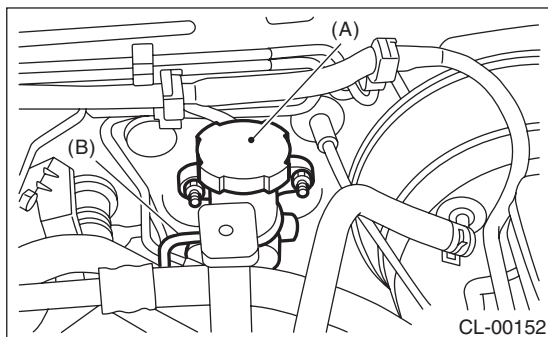


- (A) Clevis pin
- (B) Snap pin
- (C) Push rod
- (D) Lock nut

- 3) Remove the intercooler. <Ref. to IN(STI)-11, REMOVAL, Intercooler.>
- 4) Remove the clutch pipe from the master cylinder.
- 5) Remove the master cylinder and reservoir tank as a unit.

CAUTION:

Be careful not to spill the brake fluid. Brake fluid spilled on the vehicle body will harm the paint surface; wash it off with water and wipe clean quickly if spilled.



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

B: INSTALLATION

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

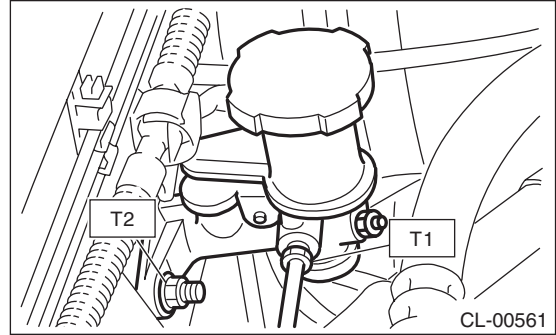
NOTE:

Check that the pipe is routed properly.

Tightening torque:

T1: 15 N·m (1.5 kgf-m, 11.1 ft-lb)

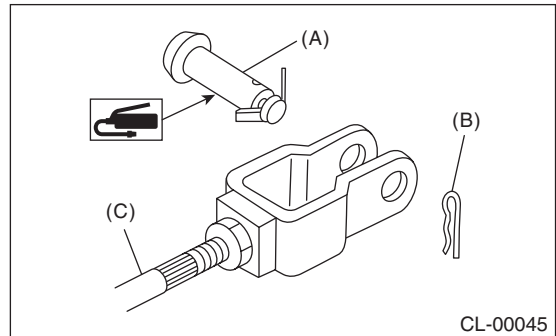
T2: 18 N·m (1.8 kgf-m, 13.3 ft-lb)



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

NOTE:

Apply grease to the clevis pin.



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

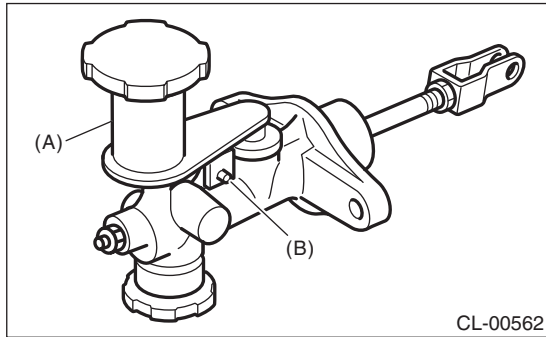
- 3) After bleeding air from the clutch system, ensure that the clutch operates properly.

<Ref. to CL-18, Clutch Fluid Air Bleeding.>

- 4) Install the intercooler. <Ref. to IN(STI)-12, INSTALLATION, Intercooler.>

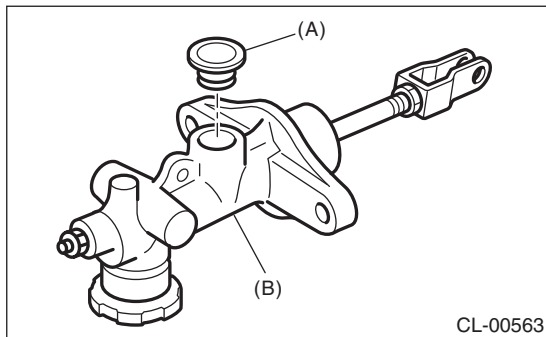
C: DISASSEMBLY

1) Remove the straight pin and reservoir tank.



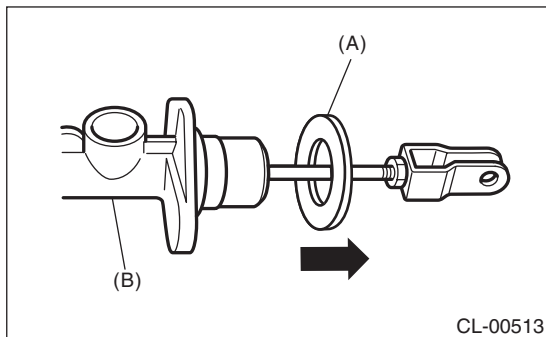
- (A) Reservoir tank
- (B) Straight pin

2) Remove the oil seal.



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

3) Move the seat towards the rear.



- (A) Seat
- (B) Master cylinder

4) Remove the snap ring.

CAUTION:

When removing the snap ring, be careful to prevent the rod, washer, piston and return spring from coming out.

5) Remove the clutch damper.

D: ASSEMBLY

1) Install the clutch damper.

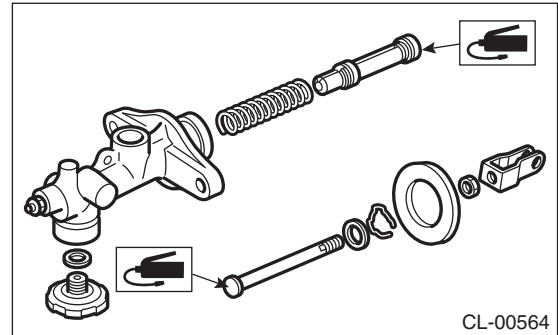
Tightening torque:

46.6 N·m (4.8 kgf-m, 34.4 ft-lb)

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

Grease:

SILICONE GREASE G40M (Part No. 004404003)



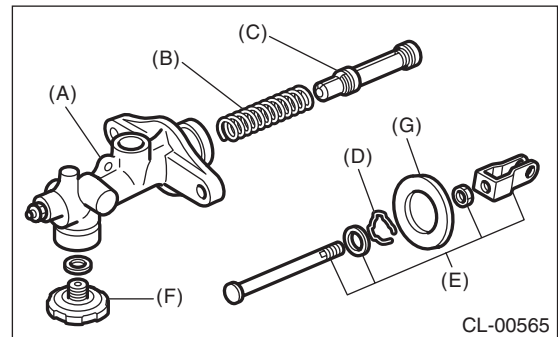
3) Assemble in the reverse order of disassembly.

Tightening torque:

10 N·m (1.0 kgf-m, 7.4 ft-lb)

E: INSPECTION

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



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

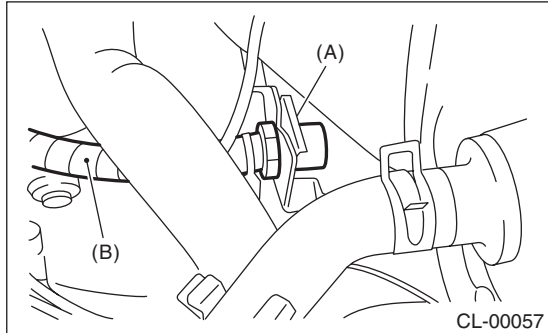
Clutch Pipe and Hose

CLUTCH SYSTEM

7. Clutch Pipe and Hose

A: REMOVAL

- 1) Remove the intercooler. <Ref. to IN(STI)-11, REMOVAL, Intercooler.>
- 2) Drain the clutch fluid. <Ref. to CL-17, Clutch Fluid.>
- 3) Disconnect the clutch pipe from the clutch hose and master cylinder.
- 4) Pull out the clamp, then remove the clutch hose from the bracket.



- (A) Clamp
- (B) Clutch hose

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

B: INSTALLATION

Install in the reverse order of removal.

NOTE:

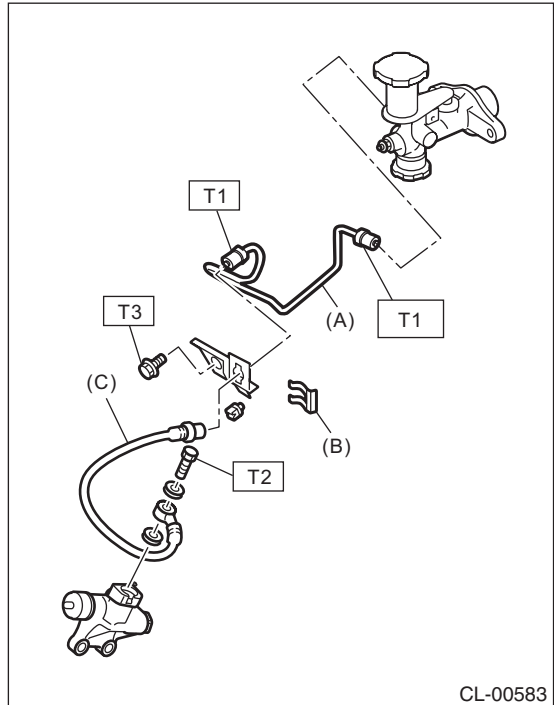
Bleed air from the clutch fluid. <Ref. to CL-18, Clutch Fluid Air Bleeding.>

Tightening torque:

T1: 15 N·m (1.5 kgf-m, 11.1 ft-lb)

T2: 18 N·m (1.8 kgf-m, 13.3 ft-lb)

T3: 25 N·m (2.5 kgf-m, 18.4 ft-lb)



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

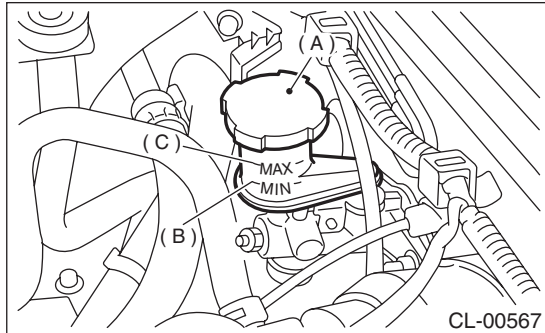
C: INSPECTION

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

8. Clutch Fluid

A: INSPECTION

- 1) Park the vehicle on a level surface.
- 2) Inspect the fluid level using the 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:

- Use new FMVSS No. 116 DOT3 or DOT4 brake fluid.
- Cover the breather with cloth to prevent brake fluid from being splashed on surrounding parts when loosening the breather.
- Avoid mixing different brands of brake fluid to prevent the quality of fluid from degrading.
- Be careful not to allow dirt or dust to enter the reservoir tank.

NOTE:

- During bleeding operation, keep the clutch reservoir tank filled with brake fluid to prevent entry of air.
 - Clutch pedal must be operated very slowly.
 - Bleed air from the oil line with help of a co-worker.
 - The amount of brake fluid required is approximately 70 m³ (2.4 US fl oz, 2.5 Imp fl oz) for total clutch system.
- 1) Remove the intercooler. <Ref. to IN(STI)-11, REMOVAL, Intercooler.>
 - 2) Drain the brake fluid from the reservoir tank.
 - 3) Refill the reservoir tank with recommended brake fluid.

Recommended brake fluid:

New FMVSS No. 116 DOT3 or DOT4 brake fluid

- 4) If necessary, bleed air from the clutch fluid. <Ref. to CL-18, Clutch Fluid Air Bleeding.>

Clutch Fluid Air Bleeding

CLUTCH SYSTEM

9. Clutch Fluid Air Bleeding

A: PROCEDURE

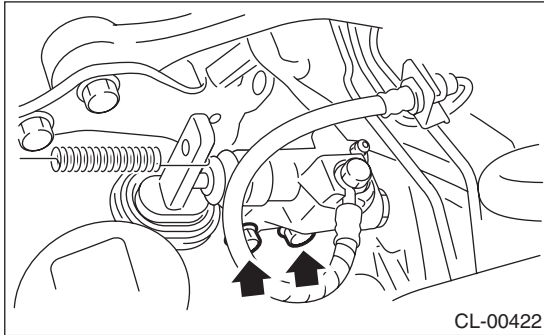
NOTE:

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

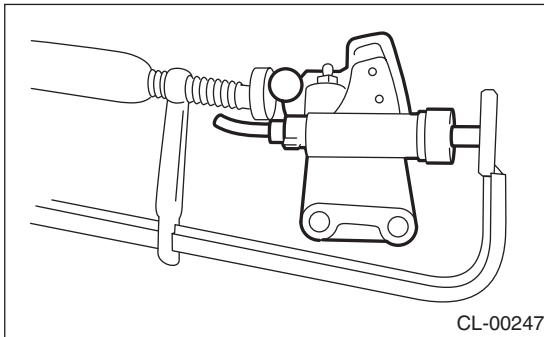
- 1) Remove the intercooler. <Ref. to IN(STI)-11, REMOVAL, Intercooler.>
- 2) Remove the operating cylinder.

NOTE:

Do not remove the clutch hose.



- 3) Hold the piston with a clamp to prevent piston from popping out.



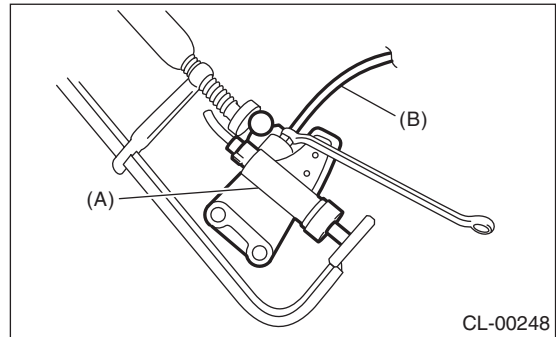
- 4) Fit one end of a vinyl tube into the air bleeder of the operating cylinder, and put the other end into a brake fluid container.

- 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:

When performing this procedure, place the screw portion of the air bleeder higher than the end of operating cylinder.



- (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 cloth to prevent brake fluid from being splashed on surrounding parts when loosening the bleeder.

- 7) Tighten the air bleeder.

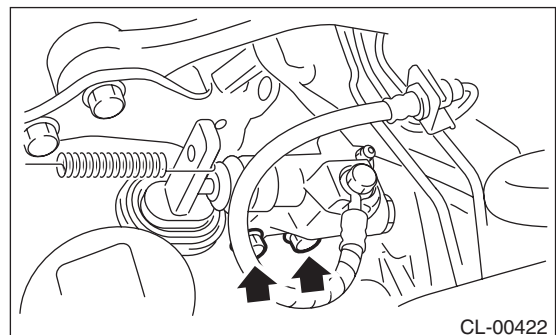
Tightening torque:

8 N·m (0.8 kgf-m, 5.9 ft-lb)

- 8) Install the operating cylinder.

Tightening torque:

41 N·m (4.2 kgf-m, 30.2 ft-lb)



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

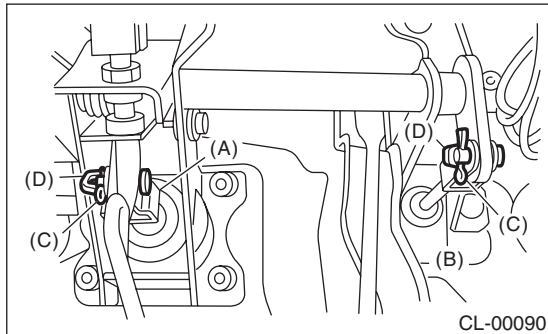
10) After bleeding the air from clutch system, ensure that the clutch operates properly.

- 11) Install the intercooler. <Ref. to IN(STI)-12, INSTALLATION, Intercooler.>

10. Clutch Pedal

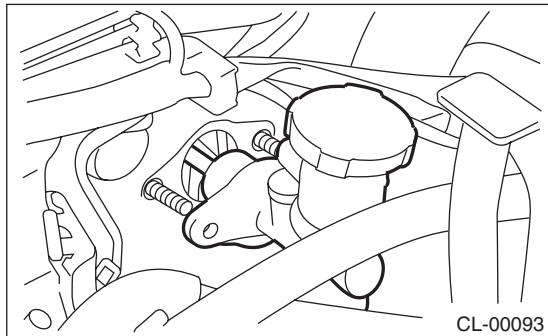
A: REMOVAL

- 1) Disconnect the battery ground cable from the battery.
- 2) Remove the steering column. <Ref. to PS-15, REMOVAL, Steering Column.>
- 3) Disconnect the connector from the stop light switch and clutch switch.
- 4) Remove the snap pins from clevis pins which secure the lever to the push rod and operating rod.
- 5) Pull out the clevis pins which secures the lever to the push rod and operating rod.



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

- 6) Remove the intercooler. <Ref. to IN(STI)-11, REMOVAL, Intercooler.>
- 7) Remove the nut which secures the clutch master cylinder.



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

B: INSTALLATION

- 1) Install in the reverse order of removal.

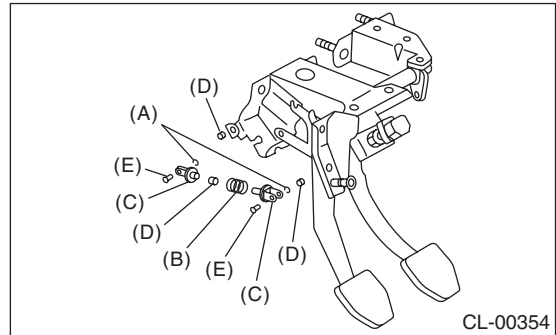
CAUTION:

Always use a new clevis pin.

- 2) Adjust the clutch pedal after installation. <Ref. to CL-20, ADJUSTMENT, Clutch Pedal.>
- 3) Adjust the clutch switch (starter interlock). <Ref. to CL-24, ADJUSTMENT, Clutch Switch.>

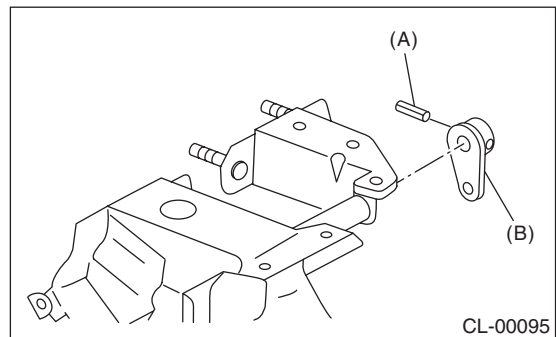
C: DISASSEMBLY

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



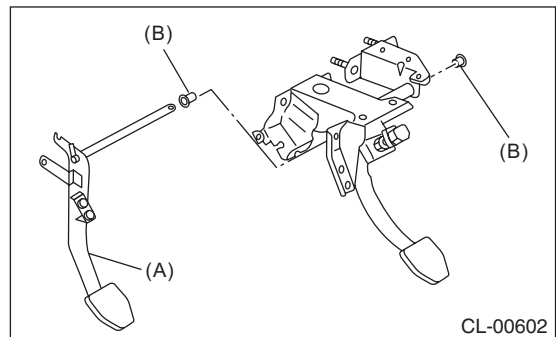
- (A) Clip
- (B) Assist spring
- (C) Assist rod
- (D) Bushing
- (E) Clevis pin

- 2) Remove the spring pin and lever.



- (A) Pin
- (B) Lever

- 3) Remove the clutch pedal and bushings.

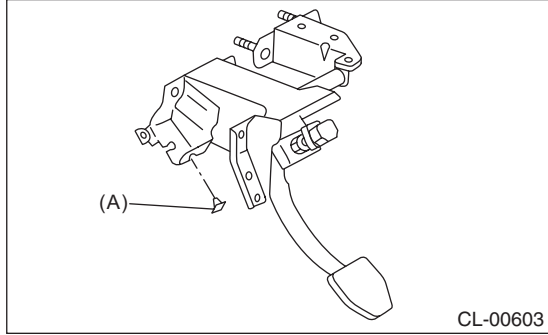


- (A) Clutch pedal
- (B) Bushing

Clutch Pedal

CLUTCH SYSTEM

4) Remove the stopper from the clutch pedal.



(A) Stopper

D: ASSEMBLY

- 1) Install the stopper, etc., temporarily to the pedal bracket.
- 2) Clean the clutch pedal and brake pedal bushing holes, apply grease, and install the bushings.
- 3) Align the holes of the pedal bracket, clutch pedal and brake pedal, and install the brake pedal return spring, assist rod, spring and bushing.

NOTE:

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

E: INSPECTION

Move the clutch pedal pads in the lateral direction with a force of approximately 10 N (1 kgf, 2 lbf) to check that the clutch pedal deflection is within the service limit.

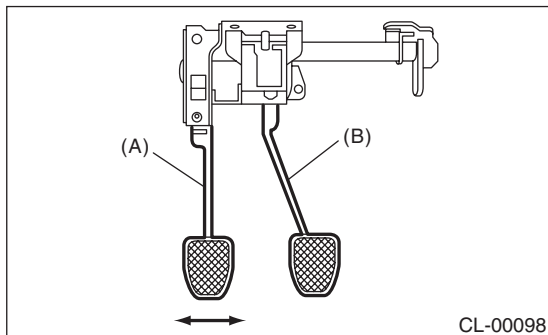
CAUTION:

If the play exceeds the service limit, replace the bushing with a new part.

Deflection of the clutch pedal:

Service limit

4.0 mm (0.157 in) or less



(A) Clutch pedal
(B) Brake pedal

F: ADJUSTMENT

1) Turn the lock nut until the full stroke of clutch pedal becomes within the specification.

CAUTION:

When adjusting the full stroke of clutch pedal, do not turn the clutch switch.

NOTE:

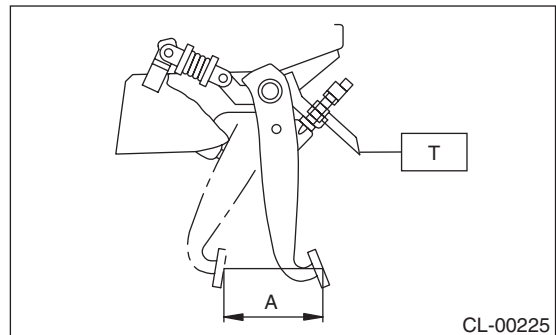
If the lock nut cannot adjust the full stroke of clutch pedal to the specified value, adjust it by turning the master cylinder push rod.

Clutch pedal full stroke A:

130 — 135 mm (5.12 — 5.31 in)

Tightening torque (Clutch switch lock nut):

T:8 N·m (0.8 kgf·m, 5.9 ft·lb)

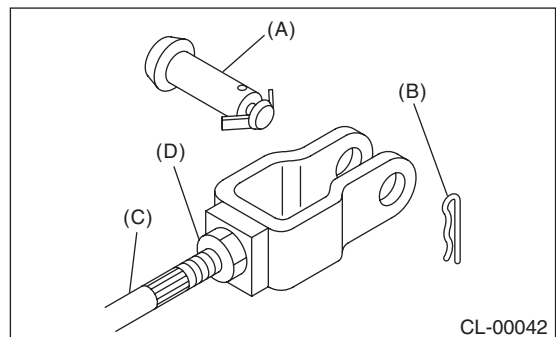


2) If the full stroke is not within the specified range, adjust it by loosening the clutch switch lock nut.

Tightening torque:

8 N·m (0.8 kgf·m, 5.9 ft·lb)

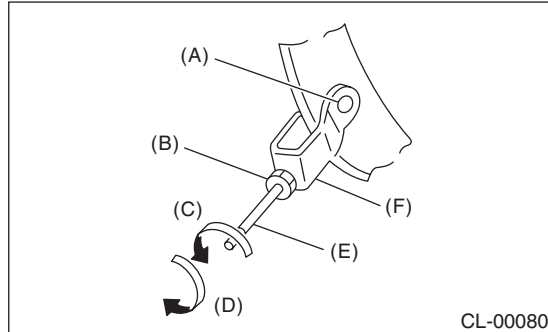
3) Loosen the push rod lock nuts.



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

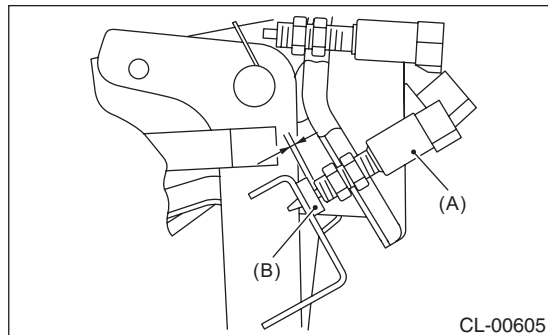
4) Rotate the push rod to adjust.

- (1) Make sure that the clutch pedal contacts the clutch switch side when the pedal is released.
- (2) Make sure that the clutch pedal contacts the clutch pedal bracket stopper when the clutch pedal is at the maximum stroke position.



- (A) Clevis hole
- (B) Push rod lock nut
- (C) In the shorter direction
- (D) In the longer direction
- (E) Push rod
- (F) Clevis

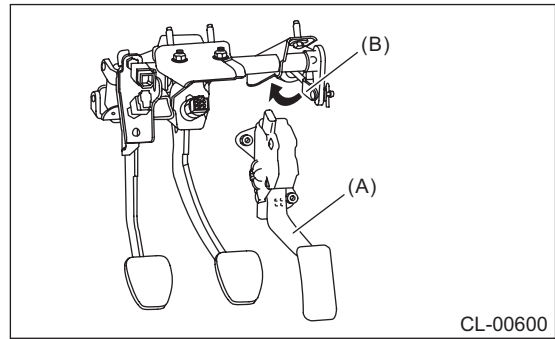
5) Turn the push rod to shorten until a clearance is gained on the clutch switch side.



- (A) Clutch switch
- (B) Stopper

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

7) Turn further in the direction that will shorten the push rod (arrow direction shown in figure) by 270°.



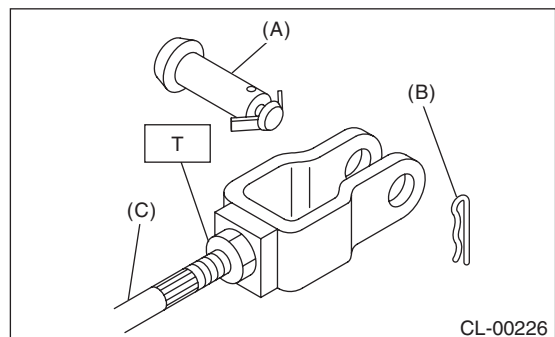
- (A) Accelerator pedal
- (B) Clevis

8) Check that the clevis pin moves smoothly by moving it in the left and right directions.

9) Tighten the push rod lock nut.

Tightening torque (Push rod lock nut):

T:10 N·m (1.0 kgf·m, 7.4 ft·lb)



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

10) Depress and release the clutch pedal two or three times to ensure that the clutch pedal and release lever operate smoothly. If the clutch pedal and release lever do not operate smoothly, bleed air from the clutch hydraulic system. <Ref. to CL-18, Clutch Fluid Air Bleeding.>

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

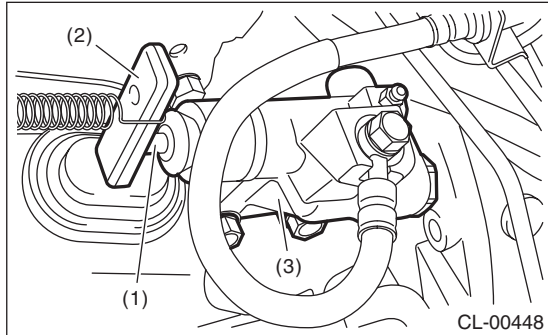
Clutch pedal full stroke:

130 — 135 mm (5.12 — 5.31 in)

Clutch Pedal

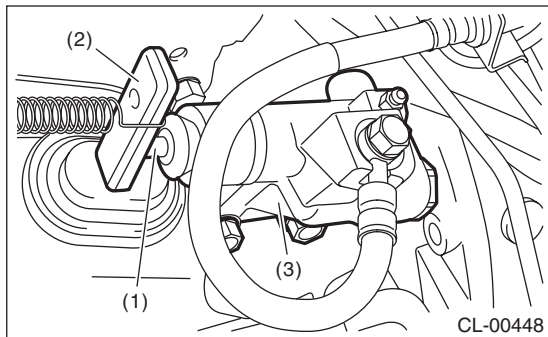
CLUTCH SYSTEM

12) Push the release lever until the operating cylinder push rod retracts. Make sure that the clutch fluid level in the reservoir tank increases. If the clutch fluid level increases, the hydraulic clutch is properly adjusted; If the fluid level does not increase or the push rod does not retract, replace the master cylinder with a new part. <Ref. to CL-14, Master Cylinder.>



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

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



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

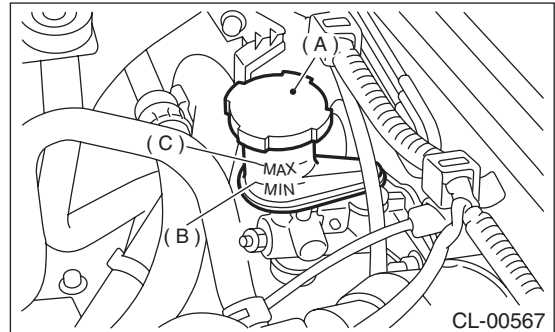
14) If the clutch fluid level increases, hydraulic clutch play is correct.

15) If the clutch fluid level does not increase or push rod does not retract, readjust the clutch pedal.

16) Check the fluid level using the scale on the outside of the reservoir tank. If the level is below "MIN", fill fluid up to "MAX" level.

Recommended clutch fluid:

New FMVSS No. 116 DOT3 or DOT4 brake fluid



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

11. Clutch Switch

A: REMOVAL

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

B: INSTALLATION

1. CLUTCH SWITCH (CRUISE CONTROL)

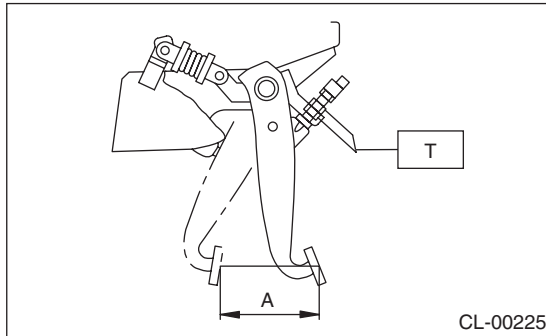
- 1) Move the clevis pin of push rod to left and right, retain it at the position where it moves smoothly, and measure the clutch pedal stroke.

Clutch pedal full stroke A:

130 — 135 mm (5.12 — 5.31 in)

Tightening torque:

T: 8 N·m (0.8 kgf-m, 5.9 ft-lb)



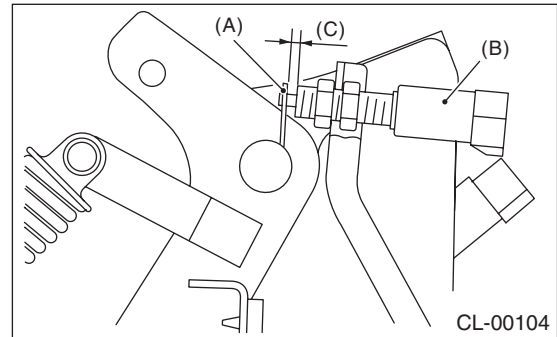
- 2) If the clutch pedal stroke is out of specification, adjust the stroke. <Ref. to CL-20, ADJUSTMENT, Clutch Pedal.>
- 3) Connect the clutch switch connector.

2. CLUTCH SWITCH (STARTER INTERLOCK)

- 1) Fully depress the clutch and hold it.
- 2) Install the clutch pedal plate and clutch switch so that the gap between them is 1.1 — 2.1 mm (0.04 — 0.08 in), and then tighten the lock nut.

Tightening torque:

8 N·m (0.8 kgf-m, 5.9 ft-lb)



- (A) Plate
- (B) Clutch switch (Clutch start)
- (C) 1.1 — 2.1 mm (0.04 — 0.08 in)

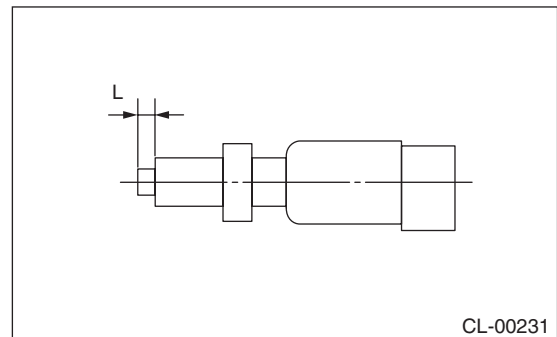
- 3) Connect the clutch switch connector.
- 4) Make sure that engine does not start with clutch pedal not depressed.
- 5) Make sure that engine starts with clutch pedal fully depressed.

C: INSPECTION

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

Specified position L:

$2^{+1.5}/_0$ mm ($0.079^{+0.059}/_0$ in)



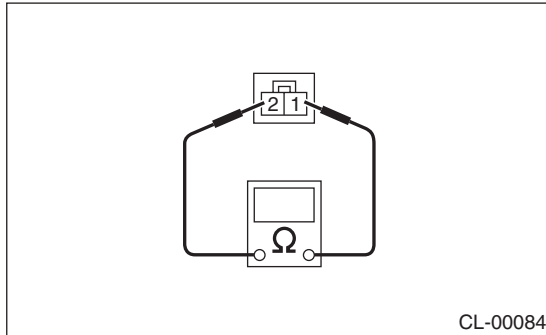
Clutch Switch

CLUTCH SYSTEM

2) Check the clutch switch for continuity. If continuity is not within the standard value, replace the switch.

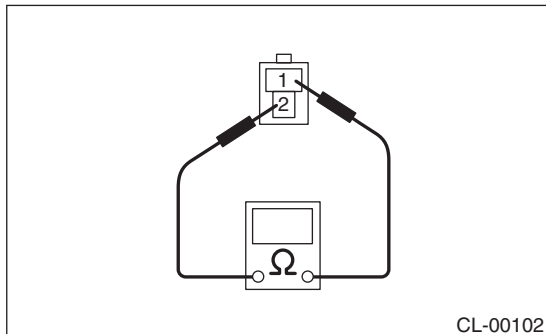
- (1) Disconnect the clutch switch connector.
 - (2) Measure the resistance between terminal 1 and 2 of the switch.
- Clutch switch (Cruise control)

Condition	Terminal No.	Specified resistance
When clutch pedal is depressed	No. 1 — No. 2	1 M Ω or more
When the clutch pedal is not depressed	No. 1 — No. 2	Less than 1 Ω



- Clutch switch (Starter interlock)

Condition	Terminal No.	Specified resistance
When clutch pedal is depressed	No. 1 — No. 2	Less than 1 Ω
When the clutch pedal is not depressed	No. 1 — No. 2	1 M Ω or more

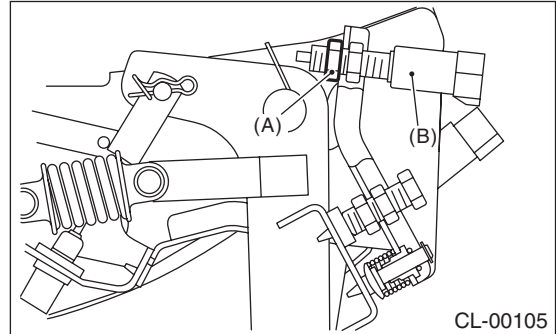


3) Make sure that engine does not start with clutch pedal not depressed. If the engine starts, adjust the clutch switch and inspect the clutch start circuit.

4) Make sure that engine starts with clutch pedal fully depressed. If the engine does not start, adjust the clutch switch and inspect the clutch start circuit.

D: ADJUSTMENT

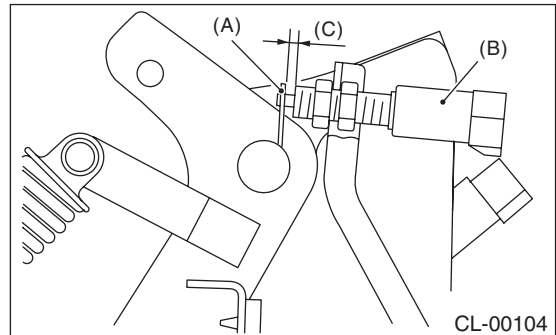
1) Loosen the lock nut of clutch switch (clutch start).



- (A) Lock nut
- (B) Clutch switch (Clutch start)

2) Fully depress the clutch and hold it.

3) Adjust the gap of the clutch pedal plate and the clutch switch to be 1.1 — 2.1 mm (0.04 — 0.08 in).



- (A) Plate
- (B) Clutch switch (Clutch start)
- (C) 1.1 — 2.1 mm (0.04 — 0.08 in)

4) Tighten the lock nut.

Tightening torque:
8 N·m (0.8 kgf·m, 5.9 ft·lb)

12. General Diagnostic Table

A: INSPECTION

1. CLUTCH

Symptom	Possible cause	Corrective action
<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"> • Engine speeds up when shifting. • High-speed driving is not possible; especially rapid acceleration is not possible and vehicle speed does not increase in proportion to the increase in engine speed. • Power drops particularly when ascending a slope, and there is a burning smell of the clutch plate. • Method of testing: Park the vehicle and fully apply the parking brake. Disengage the clutch and shift the transmission gear into the 1st. Gradually increase the engine speed while gradually allowing the clutch to engage. The clutch function is satisfactory if the engine stalls. However, the clutch is slipping if the vehicle does not move forward and the engine does not stall. 	(a) Oil on the clutch face	Replace.
	(b) Worn clutch face	Replace.
	(c) Deteriorated diaphragm spring	Replace.
	(d) Warped pressure plate or flywheel	Correct or replace.
	(e) Defective release bearing holder	Correct or replace.
<p>2. Clutch drags. As a symptom of this trouble, a harsh scratching noise occurs and control becomes difficult when shifting gears. The symptom becomes more apparent when shifting into the 1st gear. However, because most trouble of this sort is due to a defective synchronization mechanism, perform the following tests.</p> <ul style="list-style-type: none"> • Method of testing: <Ref. to CL-26, DIAGNOSTIC DIAGRAM OF CLUTCH DRAG, INSPECTION, General Diagnostic Table.> <p>The problem is caused by insufficient disengagement of the clutch if an abnormal noise occurs during this test.</p>	(a) Worn or rusty clutch disc hub spline	Replace the clutch disc.
	(b) Excessive deflection of clutch disc face	Correct or replace.
	(c) Stuck crankshaft pilot needle bearing	Replace.
	(d) Cracked clutch disc face	Replace.
	(e) Stuck clutch disc (smeared by oil or water)	Replace.
<p>3. Clutch chatters. Clutch chattering is an unpleasant vibration to the whole vehicle when the vehicle is just started with clutch partially engaged.</p>	(a) Adhesion of oil on the clutch face	Replace the clutch disc.
	(b) Weak or broken damper spring	Replace the clutch disc.
	(c) Poor contact of the disc surface or excessively worn disc	Replace the faulty clutch disc.
	(d) Warped pressure plate or flywheel	Correct or replace.
	(e) Loose disc rivets	Replace the clutch disc.
	(f) Loose engine mounting	Retighten or replace mounting.
	(g) Improper adjustment of the pitching stopper	Adjust.

General Diagnostic Table

CLUTCH SYSTEM

Symptom	Possible cause	Corrective action
4. Noisy clutch Examine whether the noise is generated the clutch is disengaged, engaged, or partially engaged.	(a) Broken, worn or insufficiently lubricated release bearing	Replace the release bearing.
	(b) Insufficient lubrication of the pilot bearing	Replace the pilot bearing.
	(c) Loose clutch disc hub	Replace the clutch disc.
	(d) Loose damper spring retainer	Replace the clutch disc.
	(e) Deteriorated or broken damper spring	Replace the clutch disc.
5. Clutch grabs suddenly. 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 clutch disc or main shaft.
	(d) Deteriorated or broken damper spring	Replace the clutch disc.
	(e) Loose engine mounting	Retighten or replace mounting.
	(f) Deteriorated diaphragm spring	Replace.

2. CLUTCH PEDAL

Symptom	Corrective action
Insufficient pedal play	Adjust the free play of the pedal.
Insufficient clutch pedal free play	Adjust the free play of the pedal.
Excessively worn and damaged pedal shaft and/or bushing	Replace the bushing or shaft with a new part.

3. DIAGNOSTIC DIAGRAM OF CLUTCH DRAG

Step	Check	Yes	No
1 CHECK GEAR NOISE. 1) Start the engine. 2) Depress the clutch pedal at idle and shift from neutral to reverse quickly.	Is there any abnormal noise from the transmission gear?	Go to step 2.	Clutch is normal.
2 CHECK GEAR NOISE. Depress the clutch pedal 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 pilot bearing, clutch disc, transmission and clutch disc hub spline.
3 CHECK GEAR NOISE. 1) Depress the clutch pedal at idle and shift from neutral to reverse within 0.5 — 1.0 seconds. 2) With the clutch pedal depressed, shift from neutral to reverse, reverse to neutral several times.	Is there any abnormal noise from the transmission gear?	Inadequate clutch disengage. Inspect the clutch disc, clutch cover, clutch release, and clutch pedal free play.	Clutch and fly-wheel seizure. Inspect the clutch disc and the spline of the clutch disc hub.