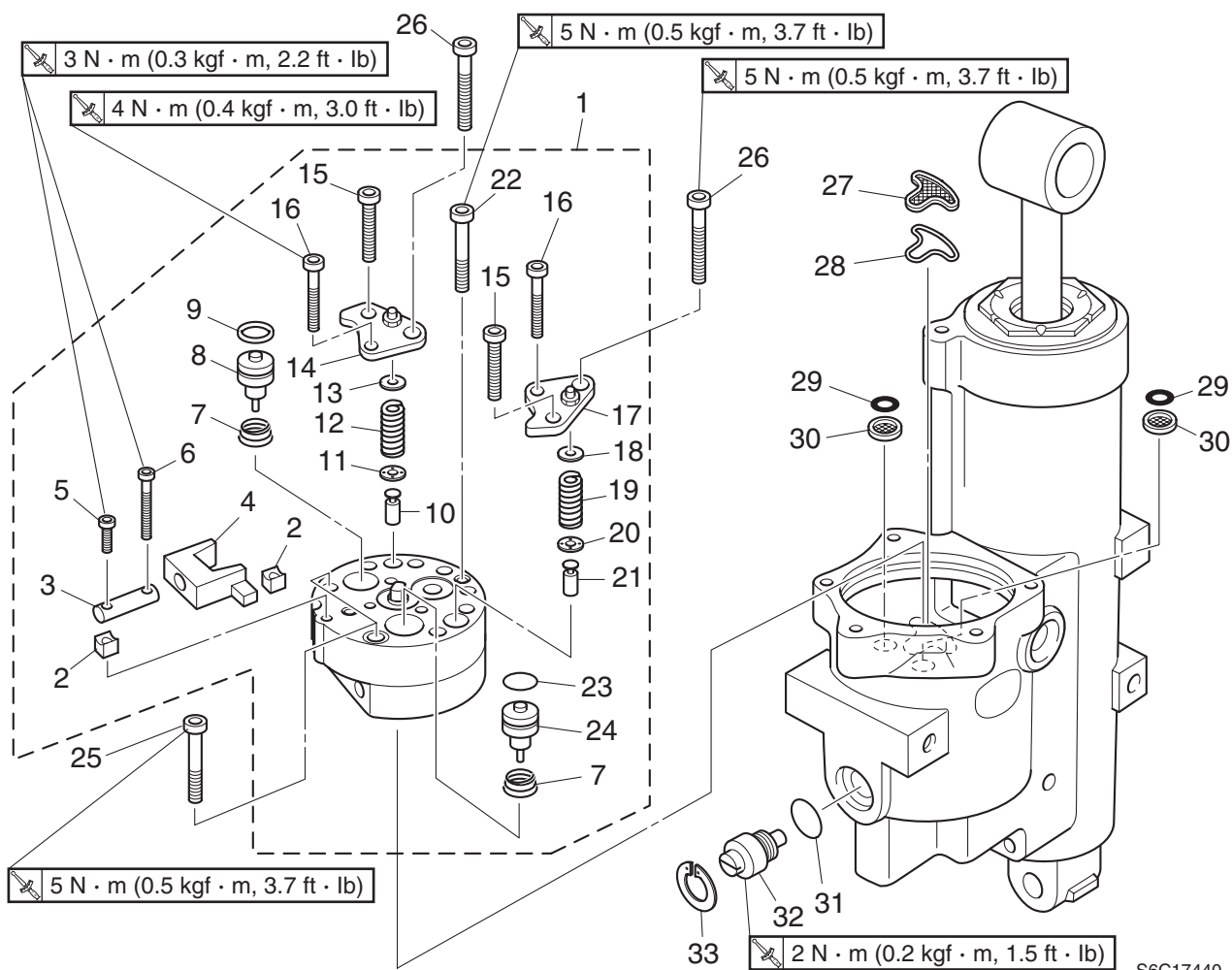


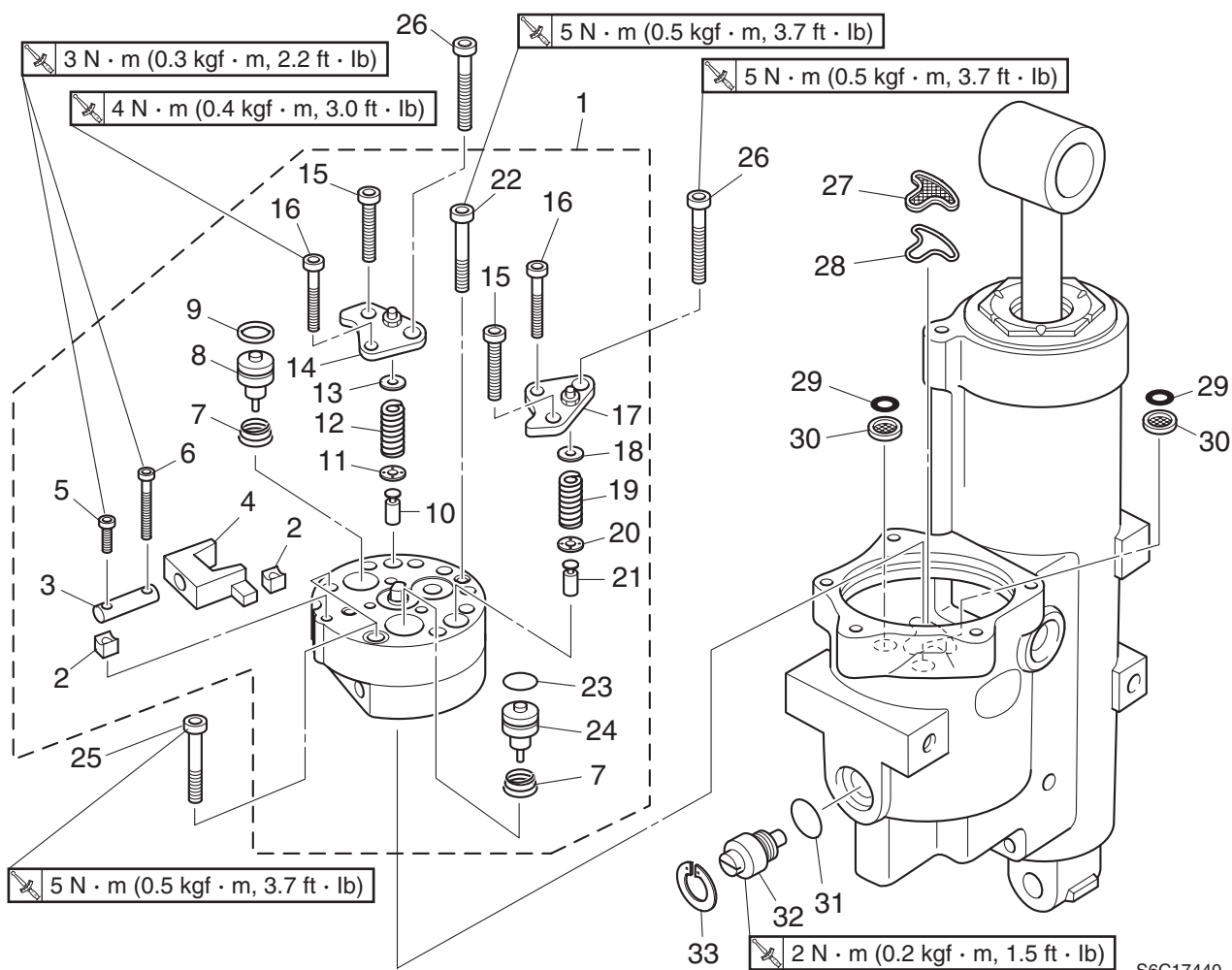
## Gear pump



S6C17440

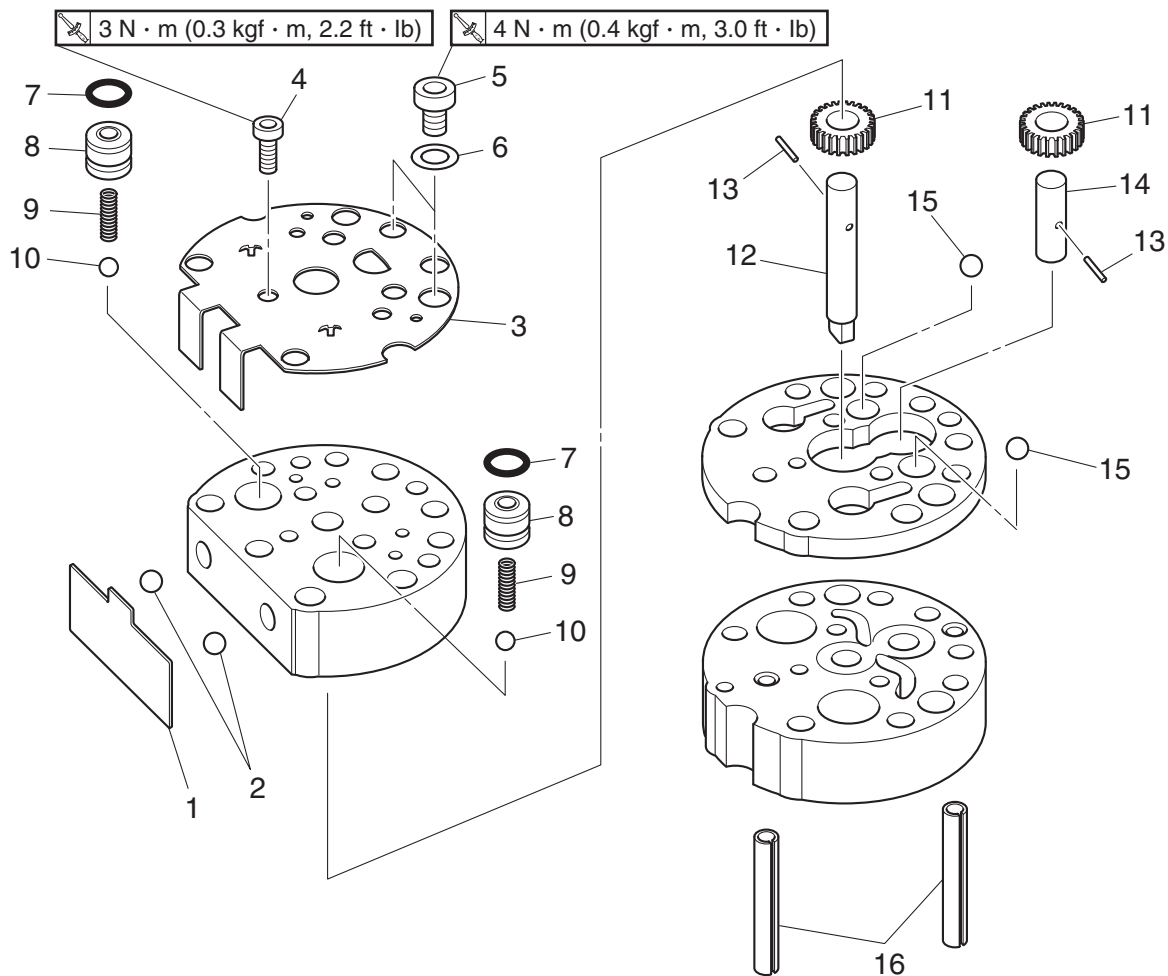
No.	Part name	Q'ty	Remarks
1	Gear pump assembly	1	
2	Spacer	2	
3	Pin	1	
4	Lever	1	
5	Bolt	1	M3 × 16 mm
6	Bolt	1	M3 × 35 mm
7	Spring	2	
8	Shuttle piston	1	
9	Backup ring	1	
10	Down-relief valve seat	1	
11	Washer	1	
12	Spring	1	
13	Washer	1	
14	Cap	1	
15	Bolt	2	M5 × 30 mm
16	Bolt	2	M4 × 30 mm
17	Cap	1	

7



S6C17440

No.	Part name	Q'ty	Remarks
18	Washer	1	
19	Spring	1	
20	Washer	1	
21	Up-relief valve seat	1	
22	Bolt	2	M5 × 25 mm
23	O-ring	1	<b>Not reusable</b>
24	Shuttle piston	1	
25	Bolt	2	M5 × 45 mm
26	Bolt	2	M5 × 50 mm
27	Filter	1	
28	Plate	1	
29	O-ring	2	<b>Not reusable</b>
30	Filter	2	
31	O-ring	1	<b>Not reusable</b>
32	Manual valve	1	
33	Circlip	1	

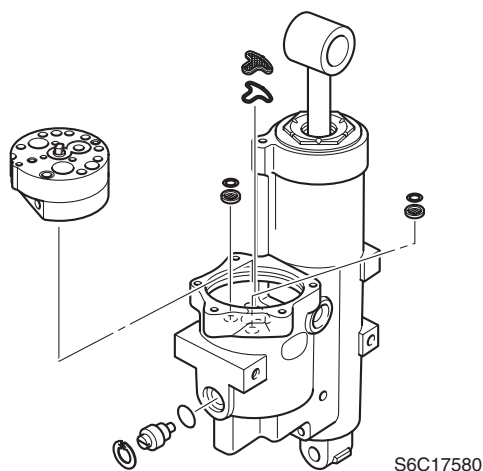


S6C17450

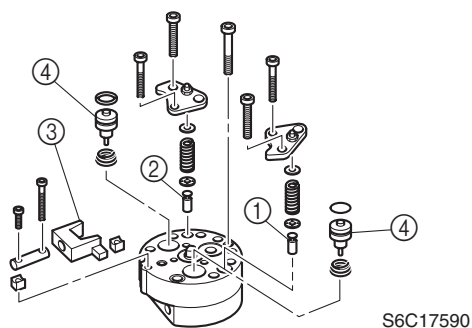
No.	Part name	Q'ty	Remarks
1	Manual release spring	1	
2	Ball	2	
3	Bracket	1	
4	Bolt	1	M3 × 5 mm
5	Bolt	2	M5 × 6 mm
6	Washer	2	
7	O-ring	2	Not reusable
8	Adapter	2	
9	Spring	2	
10	Ball	2	
11	Gear	2	
12	Drive shaft	1	
13	Pin	2	
14	Driven shaft	1	
15	Ball	2	
16	Pin	2	

## Disassembling the gear pump

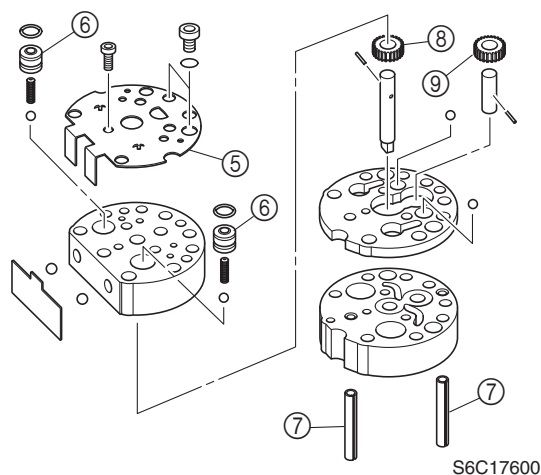
1. Remove the manual valve, then the gear pump and filters.



2. Remove the relief valve seat caps, then the up-relief valve seat ① and down-relief valve seat ②.
3. Remove the lever ③, then the shuttle pistons ④.



4. Remove the gear pump bracket ⑤, then the adapters ⑥.
5. Remove the pins ⑦, then the drive gear ⑧ and driven gear ⑨.

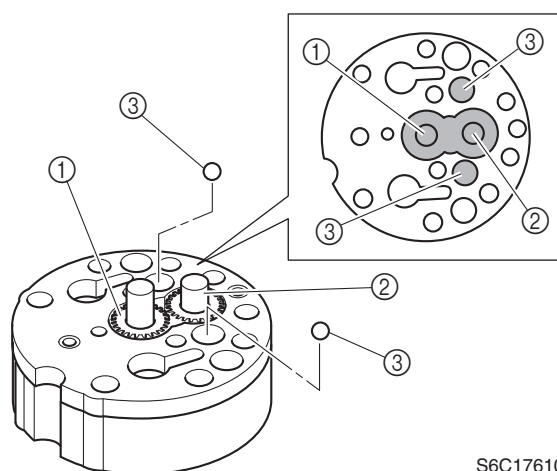


## Checking the gear pump

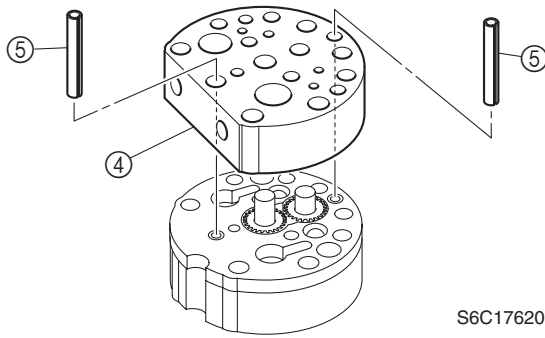
1. Clean all the pistons and balls, and then check them for damage or wear. Replace if necessary.
2. Check the filters for damage or clogs. Replace if necessary.
3. Check the drive gear and driven gear for damage or wear. Replace the gear pump assembly if necessary.

## Assembling the gear pump

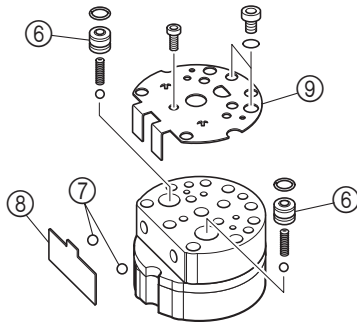
1. Install the drive gear ① and driven gear ② into the gear pump housing.
2. Install the balls ③ into the gear pump housing.



3. Install the gear pump cover ④, then the pins ⑤.

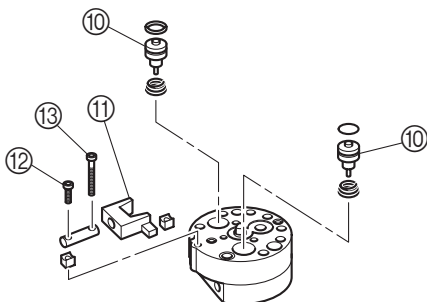


4. Install the adapters ⑥ into the gear pump cover.
5. Install the balls ⑦ into the gear pump cover with the manual release spring ⑧.
6. Install the gear pump bracket ⑨ by installing the bolts, and then tighten them to the specified torques.



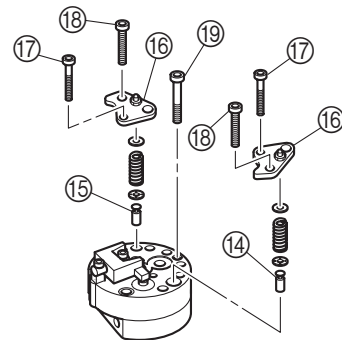
**Gear pump bracket bolt (M3):**  
3 N·m (0.3 kgf·m, 2.2 ft·lb)  
**Gear pump bracket bolt (M5):**  
4 N·m (0.4 kgf·m, 3.0 ft·lb)

7. Install the shuttle pistons ⑩, then the lever ⑪.
8. Tighten bolts ⑫ and ⑬ to the specified torque.



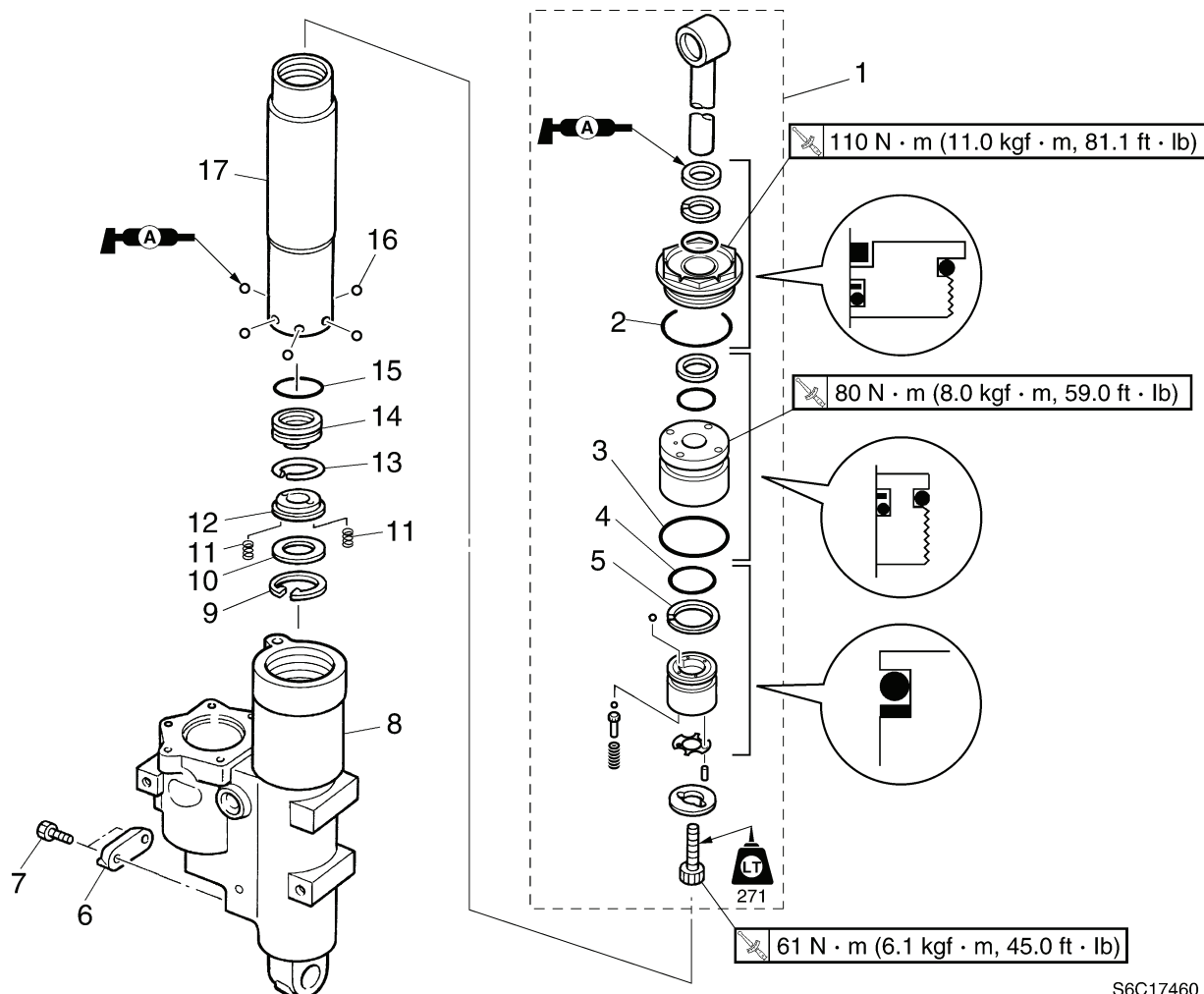
**Lever bolt (M3) ⑫, ⑬:**  
3 N·m (0.3 kgf·m, 2.2 ft·lb)

9. Install the up-relief valve seat ⑭ and down-relief valve seat ⑮.
10. Install the relief valve seat caps ⑯ by installing bolts ⑰ and ⑱, then tightening them to the specified torques.
11. Tighten the bolts ⑲ to the specified torque.



**Relief valve seat cap bolt (M4) ⑰:**  
4 N·m (0.4 kgf·m, 3.0 ft·lb)  
**Relief valve seat cap bolt (M5) ⑱:**  
5 N·m (0.5 kgf·m, 3.7 ft·lb)  
**Gear pump housing bolt ⑲:**  
5 N·m (0.5 kgf·m, 3.7 ft·lb)

# Tilt cylinder and trim cylinder

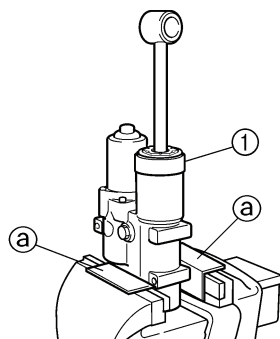


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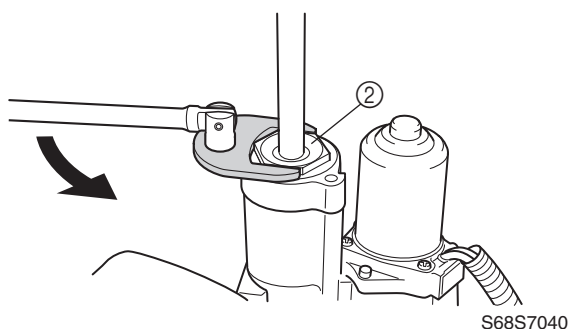
No.	Part name	Q'ty	Remarks
1	Tilt piston assembly	1	
2	O-ring	1	<b>Not reusable</b>
3	O-ring	1	<b>Not reusable</b>
4	O-ring	1	<b>Not reusable</b>
5	Backup ring	1	
6	Anode	1	
7	Bolt	1	M6 × 25 mm
8	Trim cylinder	1	
9	Circlip	1	
10	Plate	1	
11	Spring	2	
12	Cylinder base	1	
13	Circlip	1	
14	Free piston	1	
15	O-ring	1	<b>Not reusable</b>
16	Ball	6	
17	Tilt cylinder	1	

## Disassembling the trim cylinder

1. Hold the power trim and tilt unit ① in a vise using aluminum plates ② on both sides.



2. Loosen the trim cylinder end screw ②, and then remove it.



### ⚠ WARNING

Make sure that the ram is fully extended before removing the end screw.

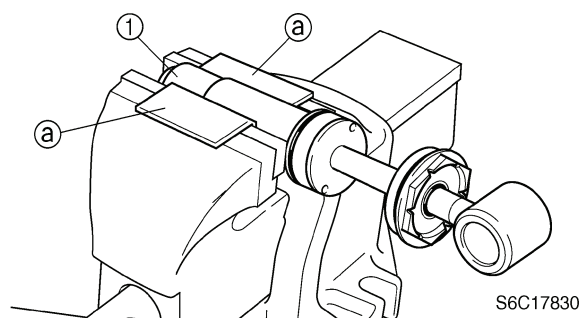


Cylinder-end screw wrench:  
YB-06588

3. Drain the power trim and tilt fluid.

## Disassembling the tilt cylinder

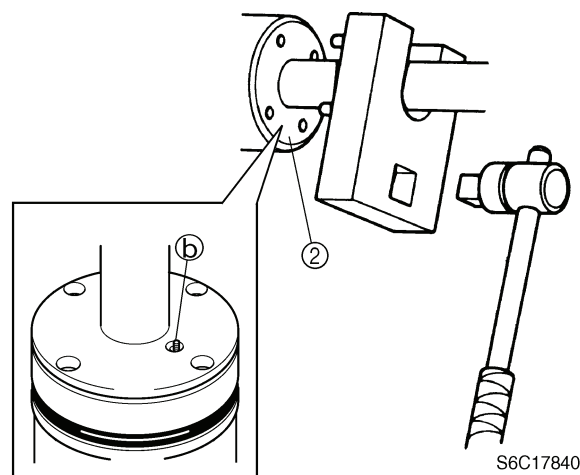
1. Hold the tilt cylinder ① in a vise using aluminum plates ② on both sides.



### NOTE:

Place the tilt cylinder in the vise horizontally.

2. Loosen the tilt cylinder end screw ②, and then remove it.



### CAUTION:

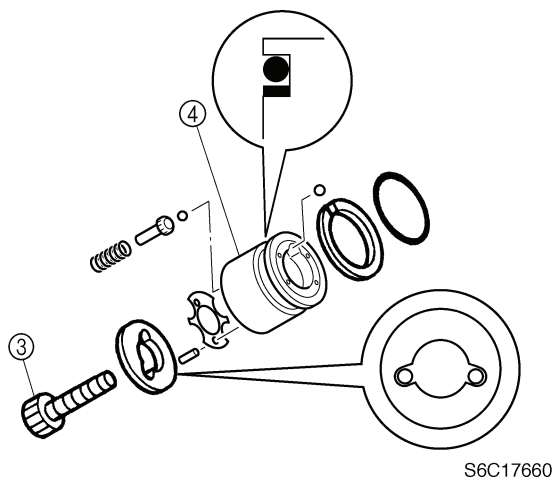
Do not damage the check valve ③ when loosening the end screw.



Trim cylinder wrench: YB-06175-2B

3. Hold the tilt ram end in a vise using aluminum plates on both sides.

- Remove the bolt ③, then the tilt piston ④.

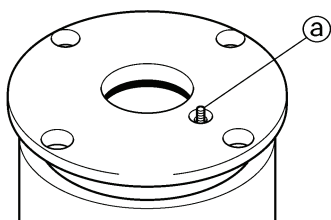


### Checking the tilt cylinder and trim cylinder

- Check the inner walls of the trim cylinder and tilt cylinder for scratches. Replace if necessary.
- Check the outer surface of the tilt piston and free piston for scratches. Replace if necessary.
- Check the tilt ram for bends or excessive corrosion. Polish with 400- to 600-grit sandpaper if there is light rust or replace if necessary.

### Checking the valves

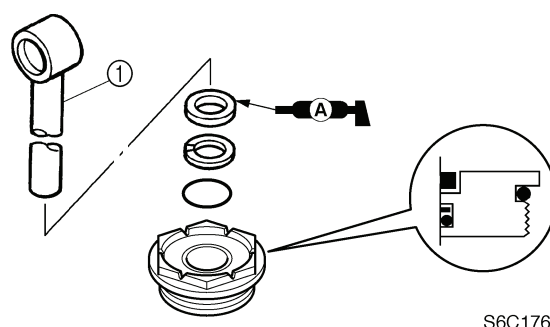
- Check the operation of the check valve ① of the tilt cylinder end screw and check the valve for dirt or residue. Clean if necessary.



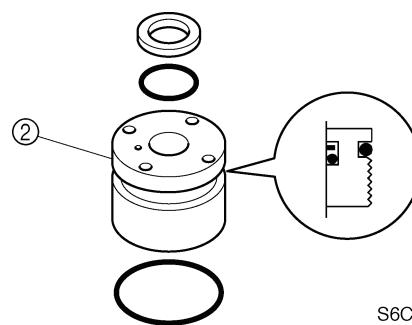
- Check the operation of the absorber valve and check the valve for dirt or residue. Clean if necessary.

### Assembling the tilt cylinder

- Install new O-rings into the trim cylinder end screw.
- Install a new dust seal into the trim cylinder end screw.
- Install the tilt ram ① into the trim cylinder end screw.



- Install the backup ring and new O-rings into the tilt cylinder end screw ②.

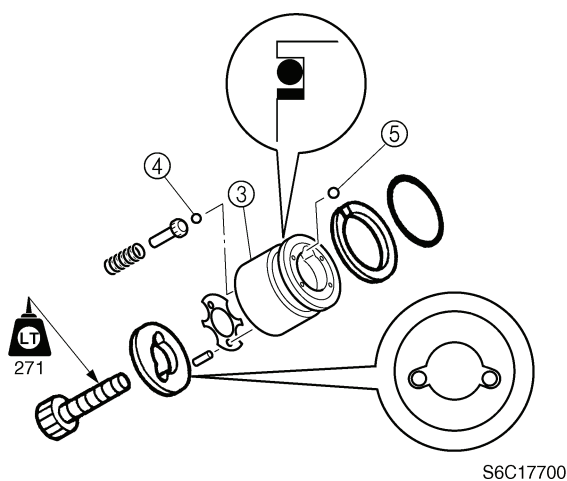


- Install the tilt cylinder end screw onto the tilt ram.
- Install the backup ring and new O-ring into the tilt piston ③.
- Install balls ④ and ⑤, absorber valve pin, spring, pins, plate, and washer into the tilt piston.
- Hold the tilt ram end in a vise using aluminum plates on both sides.



## Tilt cylinder and trim cylinder

9. Install the tilt piston to the tilt ram by installing the bolt, then tightening it to the specified torque.

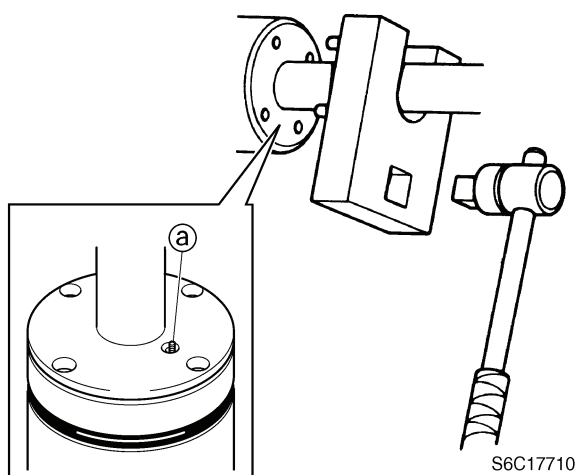


Tilt piston bolt:  
61 N·m (6.1 kgf·m, 45.0 ft·lb)

10. Install the tilt ram into the tilt cylinder.
11. Hold the tilt cylinder in a vise using aluminum plates on both sides.

**NOTE:** \_\_\_\_\_  
Place the tilt cylinder in the vise horizontally.

12. Install the tilt cylinder end screw, and then tighten it to the specified torque.



### CAUTION:

Do not damage the check valve (a) when tightening the end screw.

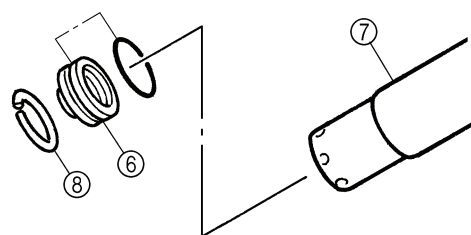


Trim cylinder wrench: YB-06175-2B

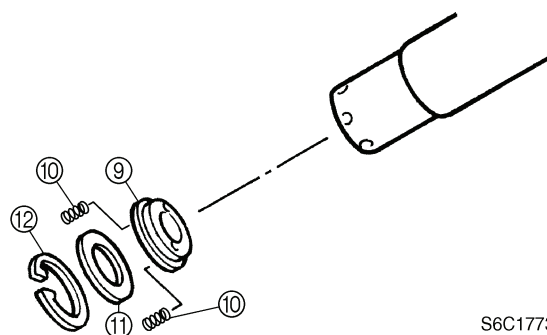


Tilt cylinder end screw:  
80 N·m (8.0 kgf·m, 59.0 ft·lb)

13. Install the free piston (6) into the tilt cylinder (7) with the circlip (8).



14. Install the cylinder base (9), springs (10), and plate (11) into the tilt cylinder with the circlip (12).



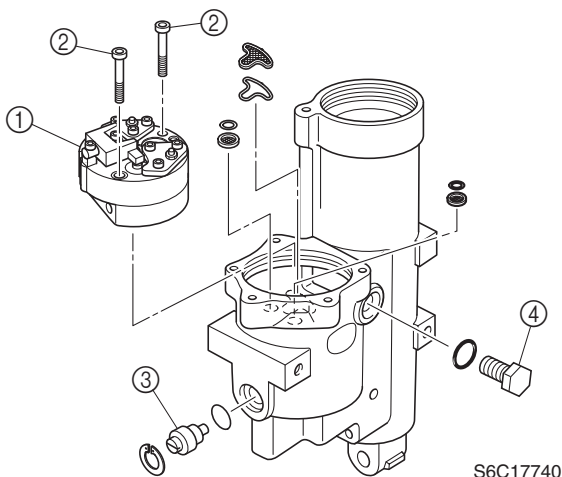
## Assembling the power trim and tilt unit

1. Hold the trim cylinder in a vise using aluminum plates on both sides.

7

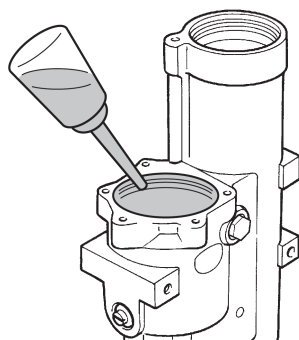


2. Install the filters and gear pump assembly ① by installing the bolts ②, then tightening them to the specified torque.
3. Install the manual valve ③ and reservoir cap ④.



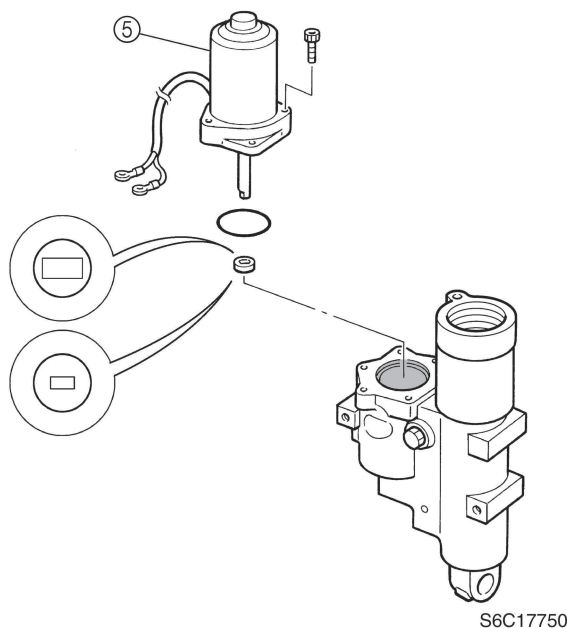
Gear pump bolt ②:  
5 N·m (0.5 kgf·m, 3.7 ft·lb)  
Reservoir cap ④:  
7 N·m (0.7 kgf·m, 5.2 ft·lb)

4. Fill the reservoir with the recommended fluid to the correct level as shown.



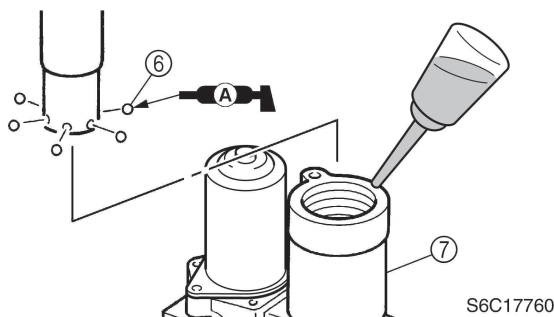
Recommended power trim and tilt fluid:  
ATF Dexron II

5. Install the new O-ring, joint, and power trim and tilt motor ⑤ by installing the bolts, then tightening them to the specified torque.



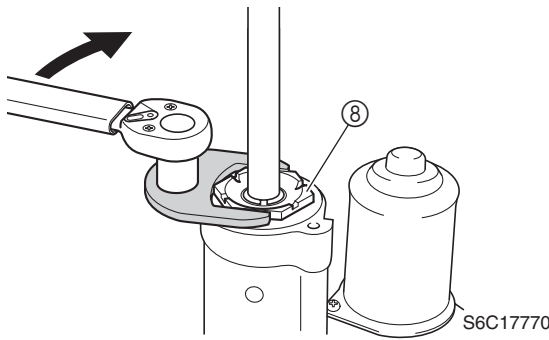
PTT motor bolt:  
4 N·m (0.4 kgf·m, 3.0 ft·lb)


6. Add fluid of the recommended type to the first level at the bottom of the trim cylinder.
7. Install the balls ⑥ into the tilt cylinder, and then insert the tilt cylinder into the trim cylinder ⑦.




**NOTE:** \_\_\_\_\_  
Apply grease to the balls to prevent them from falling off.

8. Install the trim cylinder end screw ⑧, and then tighten it to the specified torque.

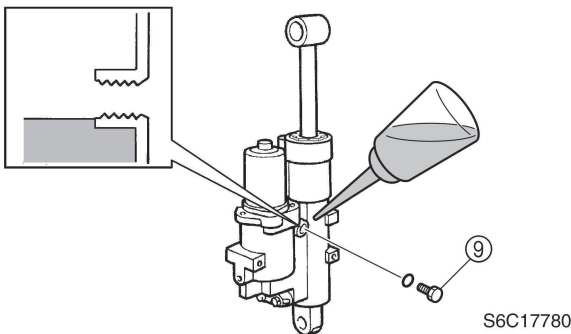


 **Cylinder-end screw wrench:**  
YB-06588

 **Trim cylinder end screw (8):**  
110 N·m (11.0 kgf·m, 81.1 ft·lb)

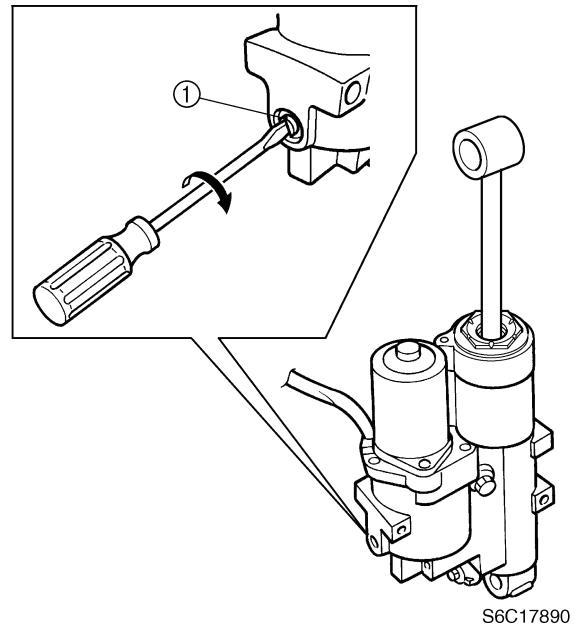
9. Fully extend the tilt rod, and then add sufficient fluid of the recommended type to the correct level.


10. Install the reservoir cap (9).



## Bleeding the power trim and tilt unit

1. Tighten the manual valve (1) by turning it clockwise.




 **Manual valve (1):**  
2 N·m (0.2 kgf·m, 1.5 ft·lb)


2. Place the power trim and tilt unit in an upright position.
3. Remove the reservoir cap, and then check the fluid level in the reservoir.

**NOTE:** \_\_\_\_\_  
If the fluid is at the correct level, the fluid should overflow out of the filler hole when the reservoir cap is removed.

4. If necessary, add sufficient fluid of the recommended type until it overflows out of the filler hole.

 **Recommended power trim and tilt fluid:**  
ATF Dexron II

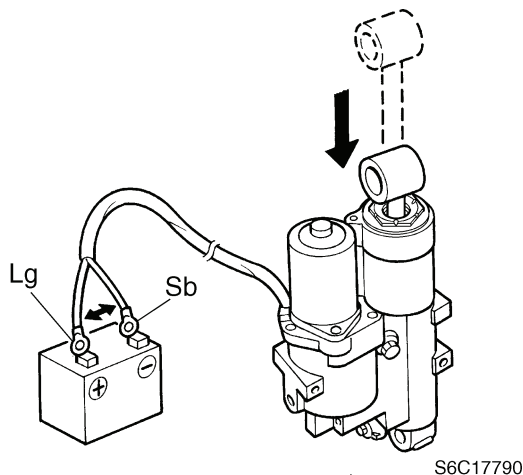
5. Install the reservoir cap, and then tighten it to the specified torque.

 **Reservoir cap:**  
7 N·m (0.7 kgf·m, 5.2 ft·lb)



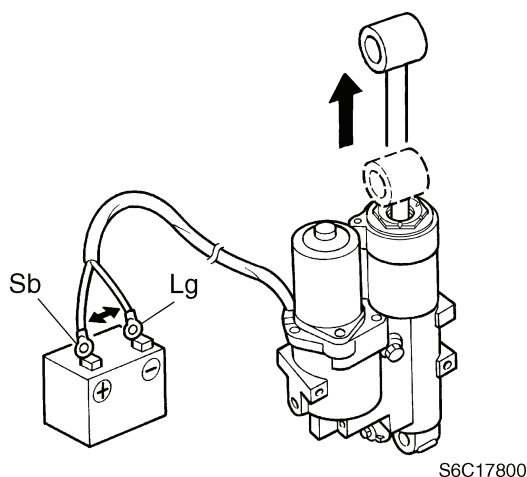
## Bracket unit

- Connect the PTT motor leads to the battery terminals to fully retract the tilt ram.



Ram	PTT motor lead	Battery terminal
Down	Light green (Lg)	⊕
	Sky blue (Sb)	⊖

- Reverse the PTT motor leads between the battery terminals to fully extend the tilt ram.



Ram	PTT motor lead	Battery terminal
Up	Sky blue (Sb)	⊕
	Light green (Lg)	⊖

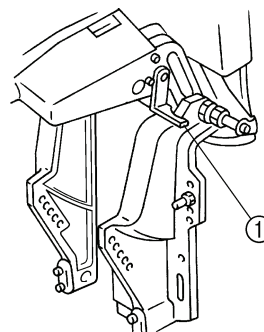
### NOTE:

- Repeat this procedure so that the tilt ram goes up and down four or five times (be sure to wait a few seconds before switching the leads).
- If the ram does not move up and down easily, push and pull on the ram to assist operation.

- Check the fluid level when the tilt ram is fully extended. Add sufficient fluid if necessary.

### Installing the power trim and tilt unit

- Fully tilt the outboard motor up, and then support it with the tilt stop lever ①.



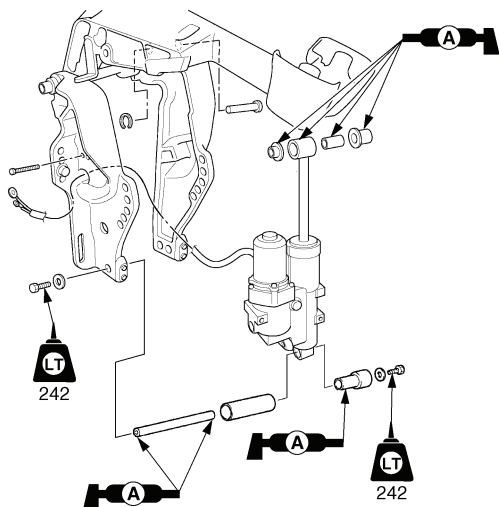
### CAUTION:

**After tilting the outboard motor up, be sure to support it with the tilt stop lever.**

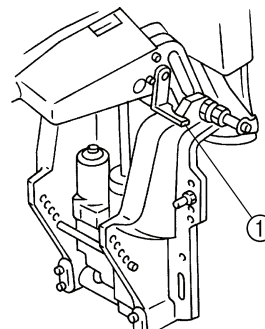
- Install the collars.
- Lift the power trim and tilt unit up, and then install the upper mounting shaft.
- Install the circlip.
- Install the lower mounting shaft, and then tighten the bolts.
- Route the PTT motor leads through the hole, and then install the plastic tie.
- Connect the ground lead to the bottom of the power trim and tilt unit, and then tighten the bolt.

## Tilt cylinder and trim cylinder

- Support the outboard motor with the tilt stop lever ①.



S6C17850U



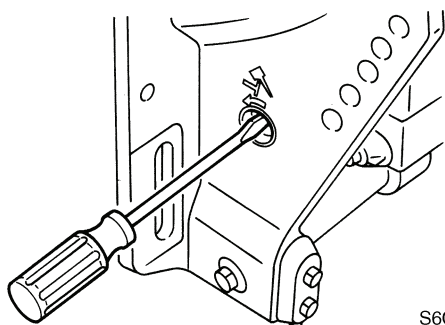
S62Y3530

### **⚠ WARNING**

After tilting up the outboard motor, be sure to support it with the tilt stop lever. Otherwise, the outboard motor could suddenly lower if the power trim and tilt unit should lose fluid pressure.


## Bleeding the power trim and tilt unit (built-in)

- Fully turn the manual valve counterclockwise.



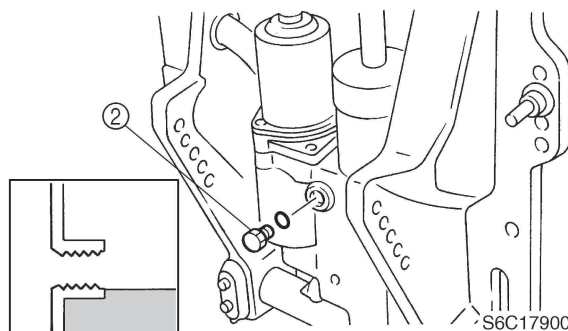
S6C17880

- Fully tilt the outboard motor up, and then release it to let it lower by its own weight four to five times.
- Tighten the manual valve by turning it clockwise.

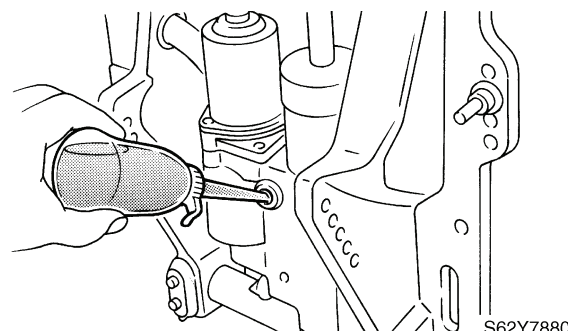
	Manual valve: 2 N·m (0.2 kgf·m, 1.5 ft·lb)
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- Let the fluid settle for 5 minutes.
- Push and hold the power trim and tilt switch in the up position to check that the outboard motor is fully tilted up.

- Remove the reservoir cap ②, and then check the fluid level in the reservoir.



S6C17900



S62Y7880

### **NOTE:**

If the fluid is at the correct level, the fluid should overflow out of the filler hole when the reservoir cap is removed.