Telescoping Cylinder - Remove and Install

S/N - 3RN4015-UP
S/N - 3PN2027-UP
S/N - 5WM6021-UP

Removal Procedure

<table>
<thead>
<tr>
<th>Table 1</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Required Tools</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Tool</th>
<th>Part Number</th>
<th>Part Description</th>
<th>Qty</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>4C-6486</td>
<td>Stand</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>8S-7631</td>
<td>Tube</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>4C-6562</td>
<td>Pin</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>8S-8048</td>
<td>Saddle</td>
<td>1</td>
</tr>
</tbody>
</table>

Start By:

A. Release the pressure in the telescoping cylinder. Refer to Disassembly and Assembly, "Load Control Valve (Telescoping Cylinder) - Remove".
B. Disconnect the hydraulic oil lines for the boom. Refer to Disassembly and Assembly, "Hydraulic Oil Lines (Boom) - Remove".

⚠️ WARNING ⚠️

Personal injury or death can result from improper lifting or blocking.
When a hoist or jack is used to lift any part or component, stand clear of the area. Be sure the hoist or jack has the correct capacity to lift a component. Install blocks or stands before performance of any work under a heavy component.

Approximate weights of the components are shown. Clean all surfaces where parts are to be installed.

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**WARNING**

Personal injury can result from hydraulic oil pressure and hot oil.

Hydraulic oil pressure can remain in the hydraulic system after the engine has been stopped. Serious injury can be caused if this pressure is not released before any service is done on the hydraulic system.

Make sure all of the work tools have been lowered to the ground, and the oil is cool before removing any components or lines. Remove the oil filler cap only when the engine is stopped, and the filler cap is cool enough to touch with your bare hand.

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**NOTICE**

Care must be taken to ensure that fluids are contained during performance of inspection, maintenance, testing, adjusting and repair of the product. Be prepared to collect the fluid with suitable containers before opening any compartment or disassembling any component containing fluids.

Refer to Special Publication, NENG2500, "Caterpillar Tools and Shop Products Guide" for tools and supplies suitable to collect and contain fluids on Caterpillar products.

Dispose of all fluids according to local regulations and mandates.

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1. Put identification marks on all lines, on all hoses, and on all tubes for installation purposes. Plug all lines, all hoses, and all tubes in order to prevent fluid loss and help keep contaminants from entering the system.
2. Loosen two retaining nuts (1) and disconnect two tubes (2). Move two tubes (2) aside in order to remove two tubes (3) from telescoping cylinder (4).

3. Remove cotter pin (5) and chain pin (6) in order to disconnect retraction chain (8) from chain anchor (7). Lay retraction chain (8) on the bottom of the boom section.
4. Install plate (9), four bolts (10), and four washers (11) onto telescoping cylinder (4). Attach a suitable sling to telescoping cylinder (4) and to a suitable lifting device in order to support the telescoping cylinder. Loosen two lock bolts (12) and use a suitable punch to remove pin (13) out of pulley (14).

5. Remove pulley (14).

6. Remove two set screws (15) and use a suitable punch in order to remove shaft (16) from chain anchor (17).
7. Remove four bolts (18), four washers (19), and two plates (20) which retain telescoping cylinder (4). Use the lifting device and withdraw telescoping cylinder (4) from the boom.

8. Withdraw telescoping cylinder (4) approximately halfway out of the boom and use Tooling (A) to support the rear of the telescoping cylinder. Move the sling to the center of telescoping cylinder (4) and continue to withdraw the telescoping cylinder from the boom. The weight of telescoping cylinder (4) is approximately 285 kg (628 lb).

**Disassembly and Assembly Procedure**

**Table 2**

<table>
<thead>
<tr>
<th>Tool</th>
<th>Part Number</th>
<th>Part Description</th>
<th>Qty</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>9U-7868</td>
<td>Spanner Wrench</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>9U-7870</td>
<td>Screw</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>121-8872</td>
<td>Foot</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>9X-6032</td>
<td>Bolt</td>
<td>4</td>
</tr>
</tbody>
</table>
Remove the External Cylinder Components

1. Remove chain pin (19) and two cotter pins in order to detach one end of chain (15) from anchor (18). Remove chain pin (17) and two cotter pins in order to detach the other end of chain (15) from rod (16). Carefully remove chain (15) through bracket (4). Remove rod (16) from tray (5).
2. Remove five clamps (14) and five rubber strips (13) in order to release tray (12) from telescoping cylinder (5).

3. Remove bolt (11), the sleeve and the washer in order to withdraw pin (9) from bracket (4). Remove pulley (7) and two spacers (8) from bracket (4).

4. Remove the wear pad or the roller from the bracket.

The wear pad is installed on TH63 & TH83 machines.

a. Remove two bolts (2), two nuts (3) and the washers in order to remove wear pad (1) from bracket (4).

b. Remove two cotter pins (24), two washers (23), pin (22), and roller (21).
5. Remove four bolts (6) and the washers in order to remove bracket (4) from telescoping cylinder (5).

**Install the External Cylinder Components**

1. Install the wear pad or the roller onto the bracket.

![Diagram](Illustration 12)

The wear pad is installed on TH63 & TH83 machines.

a. Install wear pad (1) and secure the wear pad onto bracket (4) with two bolts (2), two nuts (3) and the washers.

![Diagram](Illustration 13)

The roller is installed on the TH103 machines.

2. Install roller (21), pin (22), two washers (23) and two cotter pins (24).

3. Apply a small amount of Tooling (C) onto four bolts (6). Install bracket (4) onto telescoping cylinder (5) and secure the bracket in position with four bolts (6) and the washers.
4. Install pulley (7), two spacers (8), pin (9) and grease fitting (10). Apply a small amount of Tooling (C) onto bolt (11). Secure pin (9) onto bracket (4) with bolt (11), the sleeve and the washer. Apply Tooling (D) into grease fitting (10).

5. Use five clamps (14) and five rubber strips (13) in order to secure tray (12) onto telescoping cylinder (5).

6. Lay rod (16) onto tray (12). Use chain pin (17) and two cotter pins to attach one end of chain (15) onto rod (16). Thread the other end of chain (15) through bracket (4). Use chain pin (19) and two cotter pins to attach the other end of chain (15) onto anchor (18).
7. Secure the opposite end of rod (15) to the rod of telescoping cylinder (5) with cable tie (20). Remove cable tie (20) after installation.

Disassembly and Assembly of the Cylinder

1. Firmly secure the cylinder onto a bench. Remove the locking screw for the end cover. Use tooling (A) and a suitable wrench in order to remove the end cover and install the end cover.

2. Firmly secure the rod onto Tooling (B). Remove the locking screw for the piston. Use Tooling (B) to remove the piston and install the piston.

3. Refer to Specifications, "Telescoping Cylinder" for the required torque value.

Installation Procedure
1. Inspect all parts and clean all parts. If any parts are damaged or worn use new Caterpillar parts for replacement.

2. Attach a suitable sling around the center of telescoping cylinder (4) and to a suitable lifting device. Use the lifting device to install telescoping cylinder (4) into the boom as far as possible and then use Tooling (A) to support the rear of the telescoping cylinder. The weight of telescoping cylinder (4) is approximately 285 kg (628 lb).
3. Attach the sling to the rear of telescoping cylinder (4). Use the lifting device and continue to install telescoping cylinder (4) into the boom.

4. Position telescoping cylinder (4) in the rear of the boom. Install two plates (20), four bolts (18), and four washers (19). Do not remove the sling but continue to support telescoping cylinder (4).

5. Align chain anchor (17) and use a suitable punch to install shaft (16). Install two set screws (15).
6. Position pulley (14) in order to install pin (13). Apply a small amount of Tooling (B) to two lock bolts (12) and tighten the two lock bolts. Remove four bolts (10), four washers (11), plate (9), and the sling.

7. Align retraction chain (8) with chain anchor (7) in order to install chain pin (6) and cotter pin (5).
8. Install two tubes (3) into telescoping cylinder (4). Connect two tubes (2) and tighten two retaining nuts (1).

End By:

a. Connect the hydraulic oil lines for the boom. Refer to Disassembly and Assembly, "Hydraulic Oil Lines (Boom) - Install".

b. Reset the load control valve. Refer to Disassembly and Assembly, "Load Control Valve (Telescoping Cylinder) - Install".