Perform Testing and Adjusting, "Visual Inspection" before you service the suspension cylinders.

The machine must be on level ground when you inspect the suspension cylinder charge. The truck body must be empty. Coast the machine to a gentle stop without using the brakes.

When the front suspension cylinders are properly charged, the left front suspension shows less chrome than the right front suspension cylinder. The weight of the cab causes the difference.

Note: Both suspension cylinders must be charged at the same time. If only one suspension cylinder needs servicing, perform the procedure on both suspension cylinders.

Check the Height of the Front Suspension Cylinders

1. Measure the height of both front suspension cylinders.
2. Record the measured height of both front suspension cylinders.
3. Compare the current recorded height of the front suspension cylinders to the previous recorded height of the front suspension cylinders.

Note: The suspension height will be different for each machine.
Purge the Suspension Cylinder of Oil and of Nitrogen

Table 1

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
<th>Qty</th>
</tr>
</thead>
<tbody>
<tr>
<td>175-5507</td>
<td>Nitrogen Charging Group</td>
<td>1</td>
</tr>
<tr>
<td>175-7410</td>
<td>Nitrogen Charging Fitting Gp</td>
<td>1</td>
</tr>
<tr>
<td>1S-8938</td>
<td>Charging Chuck</td>
<td>2</td>
</tr>
</tbody>
</table>

Note: When you work with the 238-9928 Valve As, two 1S-8938 Charging Chucks will be needed.

**WARNING**

Personal injury or death can result from sudden suspension cylinder movement.

Sudden movement, up or down, can cause the clearance above your head to change rapidly.

Read all warning labels on the suspension cylinders before servicing. Do not check the oil in the suspension cylinder until all the nitrogen pressure has been released.

Do not, under any condition, remove valves, cover or plugs from the cylinder unless the rod is fully retracted and all the nitrogen pressure is released.

Do not stand under the machine when testing or adjusting the suspension cylinders.

**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 Dealer Service Tool Catalog" for tools and supplies suitable to collect and contain fluids on Caterpillar products.
Dispose of all fluids according to local regulations and mandates.

Illustration 1  g01673613

(1) Valve cap
(2) Charging valve
1. Remove valve caps (1) from the charging valves (2) that are located on each of the front suspension cylinders.

2. Turn the tee handles on the 1S-8938 Chucks counterclockwise in order to ensure that charging valves (2) will not open during installation.

3. Install the charging hoses to charging valves (2) with the 1S-8938 Chucks. The charging hoses will be used to drain oil into an approved container.
4. Turn the swivel nut counterclockwise on charging valves (2) to open the charging valves (2).

5. Turn the tee handles on the 1S-8938 Chucks clockwise to open the charging valves (2). Oil and nitrogen will flow through the charging valves (2). When the suspension cylinders have bottomed completely, leave the chucks in position for five minutes. The pressure in the suspension cylinders will equalize.

**Setting Up For Measurement**

Illustration 3  
g01673774

(3) Reference line  
(4) Top edge of the axle  
(5) Reference line

1. Position a steel ruler or a thin strip of sheet metal on both of the suspension cylinders in order to measure the rod extension. A magnet can be used in order to mount the measuring tool. Possible magnets include the magnetic plug for the final drive and the magnetic base for a dial indicator. The measuring tool should extend downward. The measuring tool should be parallel to the centerline of the suspension cylinder.

2. Create reference line (3) on the steel ruler. Reference line (3) should line up with the top edge of the axle (4).

3. Create reference line (5) in order to indicate the guideline for the oil charging procedure. Reference line (5) should be 25.4 mm (1.00 inch) below reference line (3).
One **FT1680** Gauge Block (6) is required for each suspension cylinder. These gauge blocks are required for correct service of the front suspension cylinders.

Measure the difference between the outside ambient temperature and the temperature of the service shop. If this temperature difference is greater than 11°C (20°F), you will also need to use shims. Add 3.2 mm (0.125 inch) of shims for each 5.5°C (10°F) of temperature difference.

**Example**

**Note:** Estimate the temperature difference to the nearest (10°F).

Temperature of the service shop ... (50°F)
Outside ambient temperature ... (−40°F)

Difference in temperatures

\[
10°C (50°F) - (-40°C (-40°F)) = 50°C (90°F)
\]

Shim thickness:

\[
50°C (90°F) \times 3.2 \text{ mm (0.125 inch)} \div 5.5°C (10°F) = 29.1 \text{ mm (1.125 inch)}
\]

Dimension for the nitrogen charging procedure

170.0 mm (6.69 inch) + 29.1 mm (1.125 inch) = 199.1 mm (7.81 inch)

**Oil Charging Procedure**

<table>
<thead>
<tr>
<th>Tools Needed</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Part Number</strong></td>
</tr>
<tr>
<td>---</td>
</tr>
</tbody>
</table>
This pump is optional.

**WARNING**

Personal injury or death can result from sudden suspension cylinder movement.

Sudden movement, up or down, can cause the clearance above your head to change rapidly.

Read all warning labels on the suspension cylinders before servicing. Do not check the oil in the suspension cylinder until all the nitrogen pressure has been released.

Do not, under any condition, remove valves, cover or plugs from the cylinder unless the rod is fully retracted and all the nitrogen pressure is released.

Do not stand under the machine when testing or adjusting the suspension cylinders.

**Note:** Use SAE 10W oil with the current service classification for the oil charging procedure.

1. Ensure that the cylinders have been purged of nitrogen and oil. The collapsed rod length is 17.2 mm (0.68 inch).
Pressure tap on the retarder control and secondary brake valve

**Note:** Construct an appropriate charging hose from the 8T-5320 Hydraulic Test Group. Connect the charging hose to the 1S-8938 Chuck.

2. Connect charging hose to the pressure tap. Refer to Illustration 5 in order to view the location of the pressure tap. The retarder control and secondary brake valve is located on the frame inside the left front strut.

3. Connect 1S-8938 Chuck to charging valve (2).

4. Start the machine.

5. Apply the manual retarder.

6. Turn the tee handle on the 1S-8938 Chuck clockwise to open the charging valves (2).

7. Turn the swivel nut counterclockwise on charging valve (2) to open the charging valves (2).

8. Inject oil into the suspension cylinder until the correct reference dimension is reached. The reference dimension was determined in the "Setting Up For Measurement" section. If necessary, purge the air from the oil by opening the second charging valve (2). Add oil until oil flows through the second charging valve (2) without air in order to ensure proper performance of the cylinder.

9. Turn tee handles on the 1S-8938 Chuck counterclockwise to close the charging valves (2).

10. Turn the swivel nut clockwise on charging valve (2) to close the charging valves (2).

11. Disengage the manual retarder.

12. Shut off the machine.

**Note:** After the charge pressure has returned to zero, use the quick couplers to remove the charging hoses.

### Oil Charging Procedure That Uses The Optional 9U-5617 Oil Refill Pump

#### Table 3

<table>
<thead>
<tr>
<th>Qty</th>
<th>Part Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>9U-5617</td>
<td>Oil Refill Pump</td>
</tr>
<tr>
<td>2</td>
<td>1S-8938</td>
<td>Charging Chucks</td>
</tr>
</tbody>
</table>
WARNING

Personal injury or death can result from sudden suspension cylinder movement.

Sudden movement, up or down, can cause the clearance above your head to change rapidly.

Read all warning labels on the suspension cylinders before servicing. Do not check the oil in the suspension cylinder until all the nitrogen pressure has been released.

Do not, under any condition, remove valves, cover or plugs from the cylinder unless the rod is fully retracted and all the nitrogen pressure is released.

Do not stand under the machine when testing or adjusting the suspension cylinders.
Correct oil level

(3) Reference line

(4) Reference line on the cylinder

(5) Reference line for the oil charging procedure

(6) Reference line for the nitrogen charging procedure

(7) Reference line for the nitrogen charging procedure

Note: Use SAE 10W oil with a service classification of CH for the oil charging procedure.

1. The charging hoses and the **1S-8938** Chucks should be connected to charging valves (2). Open the shutoff valves. Adjust the air pressure on the regulator. The air pressure must not exceed 860 kPa (125 psi).

2. Turn the check valves on the **1S-8938** Chucks clockwise to open the charging valves (2).

3. Turn the swivel nut counterclockwise on charging valve (2) to open the charging valves (2).

4. Inject the oil into the suspension cylinder until reference line (5) lines up with reference line (4) on the cylinder.

5. Close the shutoff valves. Turn off the air pressure at the regulator. Turn the check valves on the **1S-8938** Chuck counterclockwise to close the charging valves (2).

6. Turn the swivel nut clockwise to close the charging valves (2).
Note: If one suspension cylinder reaches reference line (5) before the other suspension cylinder, close the shutoff valve for that suspension cylinder. Continue injecting oil into the other suspension cylinder until the reference line (4) on the cylinder lines up with reference line (5).

7. After the pressure has returned to zero, use the quick couplers to remove the charging hoses. If the quick couplers are not available, you may need to remove the 1S-8938 Chucks.

Nitrogen Charging Procedure

Table 4

<table>
<thead>
<tr>
<th>Tools Needed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Part Number</td>
</tr>
<tr>
<td>175-5507</td>
</tr>
<tr>
<td>175-7410</td>
</tr>
<tr>
<td>FT-1680</td>
</tr>
<tr>
<td>1S-8938</td>
</tr>
</tbody>
</table>

WARNING

Dry nitrogen is the only gas approved for use in the suspension cylinders. Charging the suspension cylinders with oxygen gas will cause an explosion. This danger will not happen if nitrogen cylinders with standard CGA (Compressed Gas Association, Inc.) Number 580 Connections are used.

When you order nitrogen gas, be sure that the cylinders are equipped with CGA No. 580 Connections. Do not use color codes or other methods of identification to tell the difference between nitrogen cylinders and oxygen cylinders.

Never use an adapter to connect your nitrogen charging group to a valve outlet used on both nitrogen, oxygen or other gas cylinders. Be sure you use dry nitrogen (99.8% purity).

1. Attach the 175-5507 Nitrogen Charging Group and the 175-7410 Nitrogen Charging Fitting Gp to the machine. Use the quick couplers or the charging valves at each suspension cylinder.

   Note: To prevent oil flow into the charging hoses, do not open the charging valves at this time.

2. Adjust the nitrogen regulator in order to provide 3620 kPa (525 psi) for the 773F, and 3720 kPa (540 psi) for the 775F. For the 773G, and the 775G adjust the nitrogen regulator to 3720 kPa (540 psi).
3. Turn the tee handles on the 1S-8938 Chucks clockwise to open the charging valves (2). Nitrogen will flow to the charging valves (2).

4. Open the shutoff valves in order to allow nitrogen to flow to the 1S-8938 Chucks.

---

**NOTICE**

To protect the wiper seals on the front suspension cylinders from damage when the gauge blocks are inserted, make sure the gauge blocks include the chamfer.

---

5. Allow nitrogen into the suspension cylinder until gauge block (6) and any required shims can be inserted between the axle and the suspension cylinder. Lower the nitrogen pressure until the housing of the strut is resting on gauge block (6).

**Note:** If one suspension cylinder has extended to the correct amount before the other suspension cylinder, close the shutoff valve for that suspension cylinder. Continue allowing nitrogen into the other suspension cylinder until the correct extension has been reached.

6. Turn the tee handles on the 1S-8938 Chucks counterclockwise.

7. Turn the swivel nut clockwise on charging valves (2) to closes the charging valves (2).


9. Install valve caps (1) on charging valves (2).

10. Tighten valve caps (1) to a torque between 2 N·m (18 lb in) to 3 N·m (27 lb in).

11. Start the machine.
12. In order to remove gauge blocks (6), raise the truck body and turn the steering wheel so that the front wheels move. The suspension cylinders should raise. When the suspension cylinders are not resting on gauge blocks (6), remove gauge blocks (6).

13. Operate the machine through a load and a dump cycle.

14. Verify that the correct exposed rod dimension is achieved. The correct amount is 170 mm (6.7 inch) plus any required shims. Record this measurement. Use these recorded measurements as a reference when you inspect the front suspension cylinders for correct ride height.

   **Note:** When the front suspension cylinders are properly charged, the left front suspension shows less rod than the right front suspension cylinder. The difference is due to the weight of the cab.

Operate the machine for several load cycles after the machine has been properly charged. Some of the exposed chrome length will be clean because of the wiper seals. Measure this length for each suspension cylinder. Record this measurement. Use these recorded dimensions as a reference when you inspect the front suspension cylinder.

The normal height of a charged suspension cylinder will be less than the height of the gauge block.

When the front suspension cylinders are properly charged, the left front suspension cylinder shows less chrome than the right front suspension cylinder. The difference is due to the weight of the cab.

**Worksheets**

**Table 5**

<table>
<thead>
<tr>
<th>Model Of The Machine</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Serial Number</td>
<td>Service Meter Hours</td>
</tr>
<tr>
<td>Component Damage</td>
<td></td>
</tr>
</tbody>
</table>

**Table 6**

<table>
<thead>
<tr>
<th>Front Suspension Cylinders</th>
<th>Left</th>
<th>Right</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oil Leaks</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nitrogen Leaks</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pin to Pin Dimension (1)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(1) The distance between the center of the top mounting pin and the center of the lower mounting pin.

**Table 7**

<table>
<thead>
<tr>
<th>Temperature Compensation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Temperature In The Service Shop</td>
</tr>
<tr>
<td>Outside Temperature</td>
</tr>
<tr>
<td>---------------------</td>
</tr>
</tbody>
</table>

(1) If the temperature difference is greater than 11°C (20°F), multiply the temperature difference by 2.54 mm (0.10 inch). Then, divide this amount by 5.5°C (10°F).