Hydraulic Pressure Testing

TLB890 Backhoe Loaders
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For further information on the subject matter detailed within this training booklet, please refer to Terex United Kingdom Limited, Maintenance Manuals, Operators Manuals and Product Parts Books.

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Please refer to TEREX Specification Sheets or consult Factory Representatives to ensure that information is current.
A hydraulic pressure test kit is available, part number 6108395M91. This test kit contains adaptors specifically designed for access to test ports.

**WARNING**
Do not work on or around hydraulic systems without wearing safety glasses. Failure to follow this instruction, may result in personal injury.

**CAUTION**
If serious hydraulic pump failure is suspected, do not run the hydraulic pump for longer than is absolutely necessary to determine its condition. If metal fragments are found in the hydraulic pump outlet port, suction screen and/or return oil filter. DO NOT restart the hydraulic pump. Replace the hydraulic suction/return filters, replace the pump, clean the hydraulic reservoir and complete hydraulic system. Failure to follow this instruction, may result in further damage to the hydraulic system.

**NOTICE**
Hydraulic gauges will have a + or - 5% tolerance, testing at 200 bar it is possible to have a 10 bar discrepancy in the readings. Allow for this if using two separate gauges, use the same gauge for all tests, if at all possible.
TLB890 Backhoe Loader

TLB890 Backhoe Loader Hydraulic Test Procedure

The basic testing steps to follow are:-

1. Check the Inlet Compensator Pressure. 18-20 bar @ 1800rpm
2. Check the Main Relief Valve Pressure. 250 bar
3. Check the Unloader Valve Pressure @ 1800rpm. 207 (-0 +7 bar)
4. Steering at full lock @ 1800rpm. 175-180 bar

Reasons or faults that can be found.

1. Points faults related to the Flow Share.
2. Lack of Force in the Hydraulics.
3. Lack of Speed in the Hydraulics.
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All tests to be carried out with the machine at hydraulic oil operating temperature approximately 50 – 60 degrees C and the engine set to 1800 rpm.

Inlet Flow Compensating Valve.

Note. Hydraulic gauge to be fitted to the Backhoe Hydraulic Control Valve.

Fit a low pressure hydraulic gauge (0-40 bar) to the 9/16” gauge connection in the underside of the Backhoe Hydraulic Control Valve.

DO NOT OPERATE ANY HYDRAULIC SERVICE

Start the engine and set @ 1800 rpm with the hydraulic oil at working temperature, approximately 50–60 degrees C, test the Inlet Compensator Valve pressure.

Select single pump mode. Make sure the indicator light on the rocker pump flow control switch is illuminated. By selecting single pump mode, the hydraulic system is not influenced by the outer hydraulic pump or Unloader Valve. If the indicator light is not illuminated, depress the rocker switch to the right hand side located on the operators side instrument console.

The Inlet Compensator Valve pressure should be 20 bar (-0 + 1 bar).

Stop the engine and relieve stored hydraulic pressure, before adjusting.

Add or remove shims in the Inlet Compensator as required.

Stop the engine and relieve stored hydraulic pressure, before removing hydraulic gauges on completion of tests.

Main Pressure Relief Valve
Inlet Compensator Valve
The Principle behind Pressure Testing the Inlet Compensator before the Main Pressure Relief Valve

Hydraulic Pressure Gauge

Inlet Compensator Valve 20 bar

Pressure Relief Valve 230 bar

Inlet comp. 20 bar + PRV 230 bar = Main Relief Valve 250 bar

If the Inlet Compensator is either higher or lower, then this directly effects the Main Pressure Relief Valve pressure as both valves are in series.

NOTE: 80 Series machines are the ONLY units to be 250Bar MPRV
Main Pressure Relief Valve.

Replace the hydraulic pressure gauge with a high pressure gauge (0-400 bar) after carrying out the Inlet Compensator Valve test procedure.

Select single pump mode. Make sure the indicator light single pump is ‘on’ the hydraulic pumps flow control rocker switch. By selecting single pump mode, the hydraulic system is not influenced by the outer hydraulic pump or Unloader Valve. If the indicator light is not illuminated, depress the rocker switch located on the operators side instrument console.

Start the engine and set @ 1800 rpm with the hydraulic oil at working temperature, approximately 50–60 degrees C, test the hydraulic pressure Main Relief Valve.

Operate the stabiliser legs fully, one at a time, to operate the hydraulic Main Pressure Relief Valve (Carried out on this service first as the leg spools do not have separate relief valve / anti cavitation valves in their own section).

The pressure should be 250 bar.

Adjust the main Pressure Relief Valve as required.

Operate every valve control service, one by one, in both directions, to obtain results.

The pressure readings should be 250 bar. Caution if the unit is fitted with auxiliary circuits (extender, hammer etc.) as they may have there own MPV.

- If you have a pressure difference in one direction only, this could be the Anti Shock Valve in that service. Swap the service Anti Cavitation Valves / Service Relief Valves over and see if the fault changes direction.

- If it is in both directions the fault is in the Inlet Compensating Valve (Regulating Valve) area.

Stop the engine and relieve stored hydraulic pressure, before adjusting, removing gauges and on completion of tests.
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TLB890 Hydraulic Testing – Gear Pump / Mechanical Controls

Unloader Valve Testing

Fit a 9/16” test fitting here.

With this we test the unloader relief valve 207 bar.

*(release one pump back to tank)*

The same procedure as current models, use the bucket or boom cylinders.
Unloader Valve Pressure Testing

With the engine stopped and pressure drained from the hydraulic system.

Remove the pressure test port plug marked M1 on the loader Valve. Install a 9/16” test adapter. Attach a 0 - 400 bar hydraulic pressure gauge.

Select two pump mode. Make sure the indicator light on the two pump flow control rocker switch is not illuminated. This indicates that full flow from both hydraulic pumps is provided. If the indicator light is illuminated on single pump, depress the rocker switch to the left hand side, located on the operators side instrument console, to engage two pump mode.

Start the engine and raise the engine speed to 1800rpm.

Also Still using your main pressure relief valve pressure gauge.

**Note.** Make certain you have plenty of headroom before carrying out this test.

With the backhoe locked in the transport position, open the bucket out until only approximately 70 - 80mm of cylinder rod is exposed, then continue slowly to open the bucket. Watch both pressure gauges together.

Open the bucket SLOWLY M1 pressure will increase gradually while the bucket opens out, until the pressure reaches the setting of the unloader relief valve.

The pressure will slowly increase until at 207bar the pressure is released back to the oil reservoir by the Unloader Pressure Relief Valve. The maximum pressure indicated on the pressure gauge, before zero pressure is indicated. The other gauge will continue up to the main pressure relief valve setting (250bar) is reached.

The unloader pressure reading should be 207 bar (-0 +7 bar). Do this test 2 - 3 times, making sure to reset at 70-80mm of cylinder rod each time. Take the average pressure reading.

Stop the engine and relieve stored hydraulic pressure, before repair or removing gauges and on completion of tests.

**Note:** This test can also be carried out using the loader bucket cylinder.
Steering Pressure Relief Valve – Gear Pump

Using the ¾” male x female test union adapter connected into the priority valve on the hydraulic pump.

Attach a 0-400 bar hydraulic pressure gauge.

With the engine set @ 1800 rpm and the hydraulic oil at operating temperature.

Turn the steering wheel to full left hand lock and record the indicated hydraulic pressure.

Turn the steering wheel to full right hand lock and record the indicated hydraulic pressure.

The pressure reading should be 175 ± 7bar.

If the hydraulic pressure reading is not to specification, adjust the pressure relief valve in the Orbitrol Steering Valve.

Stop the engine and relieve stored hydraulic pressure, before adjusting, removing gauges and on completion of tests.

Note.
Rexroth Special tool part # E35:/36064 is required to adjust the orbitrol.
+1 turn = +26.6 bar
Steering Pressure Relief Valve – Piston Pump

Using a 9/16" test union adapter connected into the Loader valve at position M on the end.

Attach a 0-400 bar hydraulic pressure gauge.

With the engine set @ 1800 rpm and the hydraulic oil at operating temperature.

Turn the steering wheel to full left hand lock and record the indicated hydraulic pressure.

Turn the steering wheel to full right hand lock and record the indicated hydraulic pressure.

The pressure reading should be 175 ± 7 bar.

If the hydraulic pressure reading is not to specification, adjust the pressure relief valve in the Orbitrol Steering Valve.

Stop the engine and relieve stored hydraulic pressure, before adjusting, removing gauges and on completion of tests.

Note.
Rexroth Special tool part # E35:/36064 is required to adjust the orbitrol.
+1 turn = +26.6 bar
## TLB890 Backhoe Loader

### Notes:

<table>
<thead>
<tr>
<th>Part No.</th>
<th>Description</th>
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<tbody>
<tr>
<td>6195793M91</td>
<td>7/16” Test point union</td>
</tr>
<tr>
<td>6195794M91</td>
<td>9/16” Test point union</td>
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<tr>
<td>6195795M91</td>
<td>¾” Union &amp; test point</td>
</tr>
<tr>
<td>6195796M91</td>
<td>1 1/16” Union &amp; test point</td>
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The unloader relief valve can also be tested on the other hydraulic cylinders, however as they are fitted with cushioning the reaction is slower to create.

If you have any difficulty contact our Technical Help Desk at cov.servicedesk@terex.com