

Log Splitter Hydraulic Troubleshooting

Log Splitter Hydraulic Troubleshooting

Test Kit # 759-3742

Test Kit Components. See Figure 1.

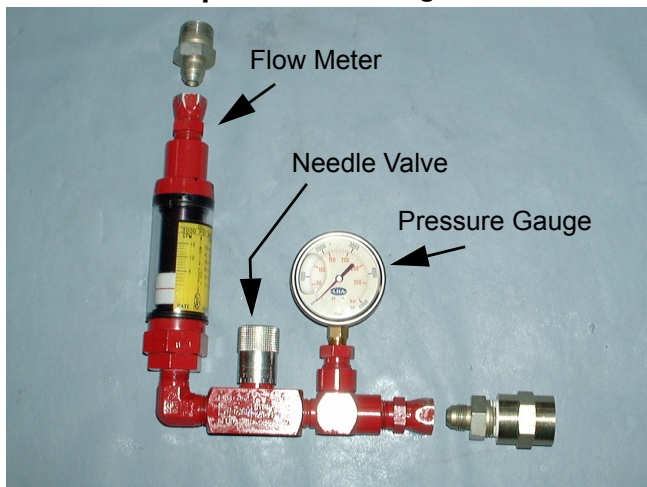


Figure 1

IMPORTANT: The following test kit information and systematic questioning allows diagnoses of the hydraulic log splitter. Proper testing and maintenance procedures provide safe and effective methods to do these tests. Use the blank lines "_____" to verify a performed step or record a test result. Make certain all the test results are recorded, there will be a need to refer back to them throughout this test.

General Inspection

IMPORTANT: Always disconnect the spark plug wire from the spark plug and ground it to the engine block when the log splitter is not being run.

1. As a standard service procedure, replace the hydraulic oil filter._____. See Figure 1.

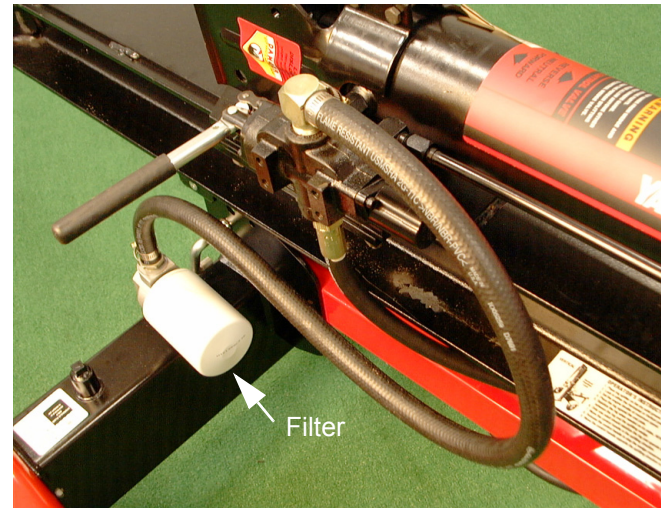


Figure 1

NOTE: When installing the hydraulic oil filter, lubricate the seal with hydraulic fluid, rotate the filter clockwise by hand until it is snug and complete the installation by rotating the filter 1/8 of a turn clockwise beyond the snug position.

2. Check the fluid level and add (or remove) fluid as required._____

NOTE: Check with the owner to find out what fluid is being used in the hydraulic log splitter. DO NOT mix hydraulic fluids. See Figure 2.

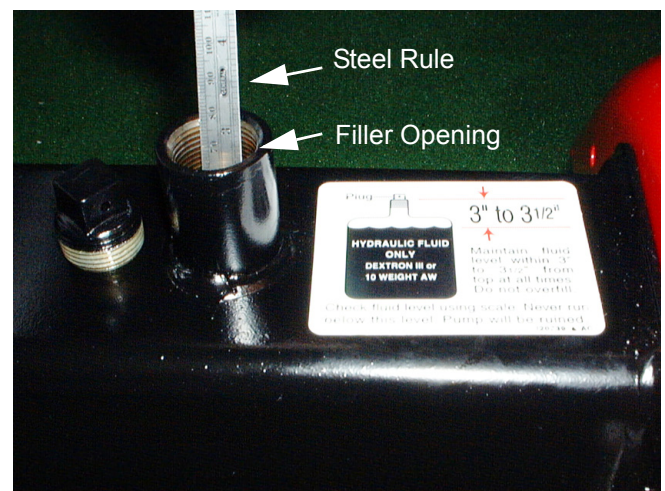


Figure 2

Log Splitter Hydraulic Troubleshooting

3. Inspect the coupler assembly between the engine and the pump in the following sequence: See Figure 3.

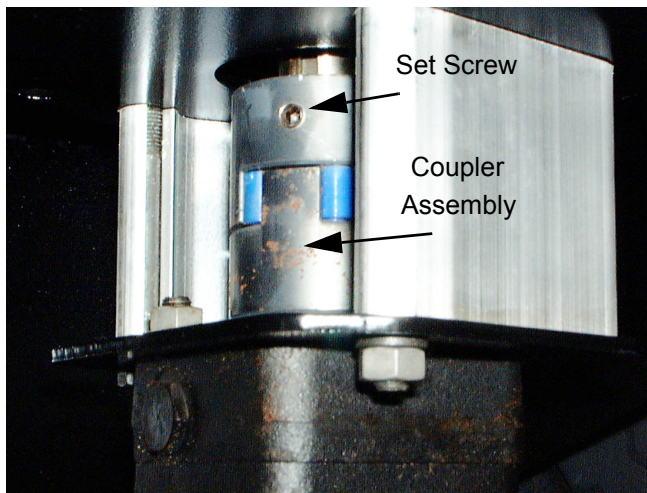


Figure 3

NOTE: Make certain the spark plug wire has been removed from the spark plug, and it is grounded to the engine block. Simply grasp the coupling assembly by hand and make certain the engine crankshaft and pump input shaft rotates with the coupling.

4. Make certain the set screws in the upper and lower coupling halves are tight using an 1/8" allen wrench. _____

NOTE: Remove and loctite the set screws if they are loose.

5. Make certain there is a square key between the engine crankshaft and the upper coupling half. _____ See Figure 4.

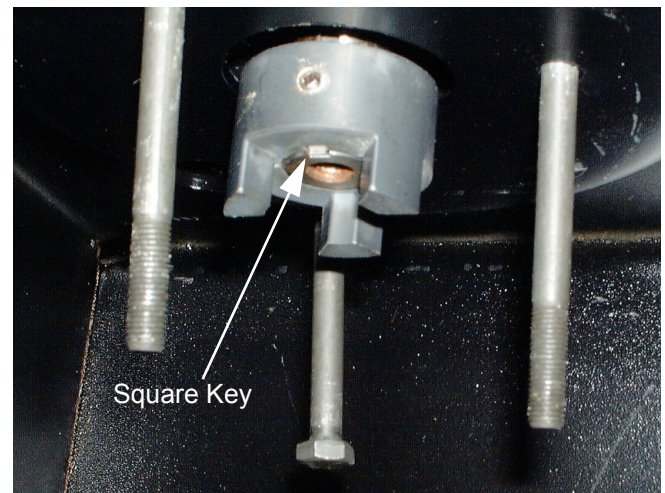


Figure 4

6. Make certain there is a half-moon key between the pump input shaft and the lower coupling half. _____ See Figure 5.

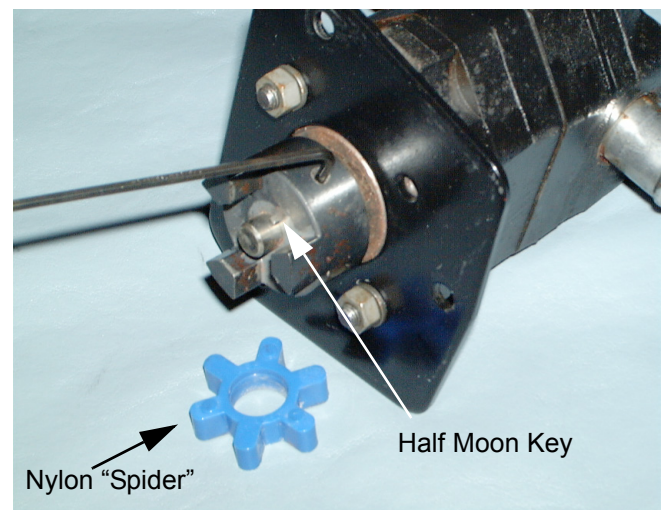


Figure 5

NOTE: Refer to the Flexible Coupler Adjustment Section for instructions.

7. Make certain there is a nylon "spider" insert between the upper and lower coupling halves. _____

Log Splitter Hydraulic Troubleshooting

8. Loosen the hose clamp securing the suction hose to the hydraulic gear pump using a 5/16" socket or a flat-blade screw driver. See Figure 6.

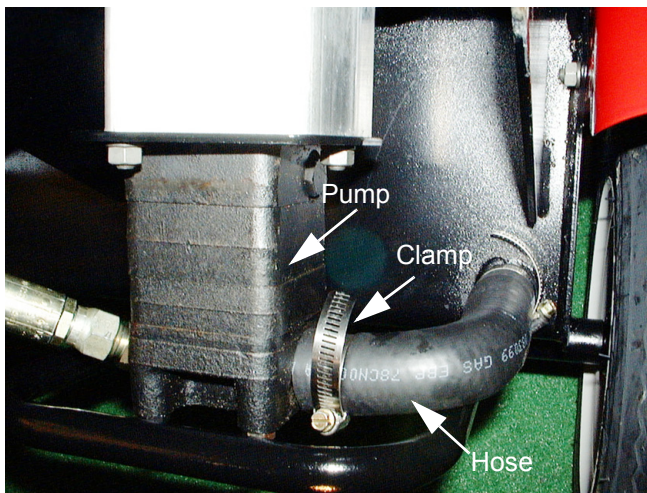


Figure 6

12. Start the engine and verify that the engine is operating between 3500 and 3600 RPM using a tachometer.____ See Figure 8.

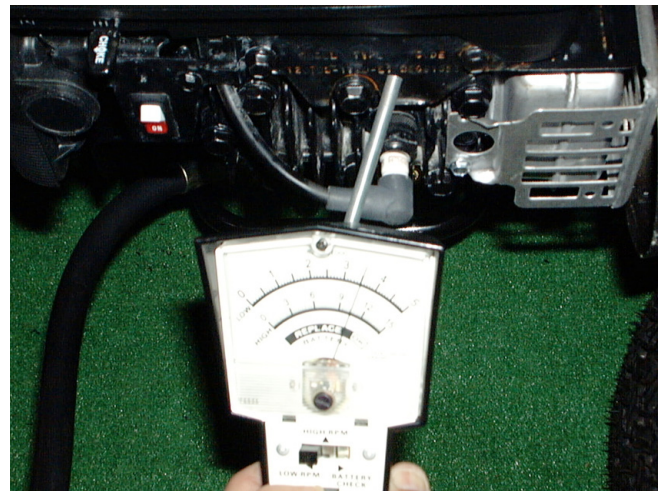


Figure 8

9. Momentarily remove the suction hose from the bottom of the pump and lower it into an oil drain container, making certain there is sufficient flow from the reservoir.____ See Figure 7.

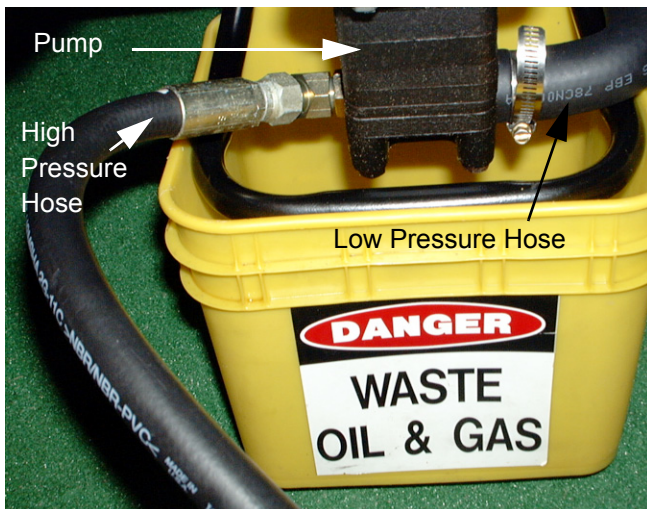


Figure 7

NOTE: See the engine service manual for correct RPM specifications and procedures.

13. Shut the engine off.

Pump Troubleshooting

1. Latch the log splitter in the horizontal position.____ See Figure 1.

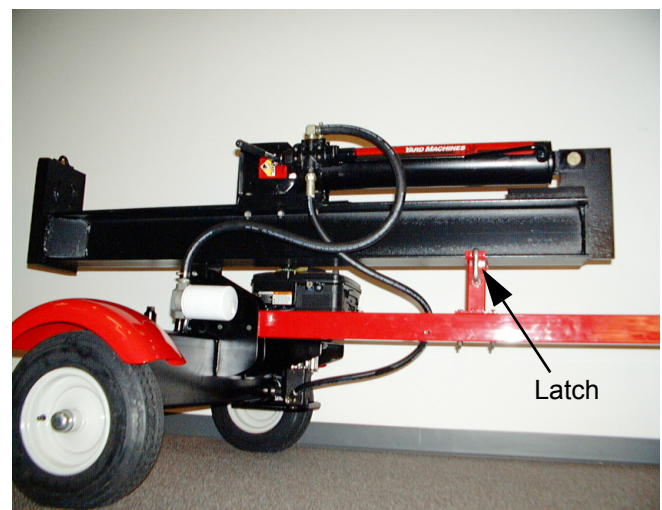


Figure 1

10. Quickly reconnect the suction hose and secure it in place using a 5/16" socket.____
11. Check the fluid level and replace the lost fluid.____

Log Splitter Hydraulic Troubleshooting

2. With the log splitter off, cycle the control valve forward and rearward several times to relieve any pressure in the hydraulic system. ____ See Figure 2.



Figure 2

3. Remove the high pressure hydraulic hose from the inlet port of the control valve using channel locks and a (1 and 1/8") wrench. ____

NOTE: Make certain that any dirt or debris is removed from the hydraulic connections before they are loosened.

4. Set the high pressure hydraulic hose into an oil drain container.

Test Kit Installation Procedures

NOTE: The pressure gauge side of the test kit connects to the pump's high pressure hydraulic hose, and the flow gauge side of the test kit connects to the inlet port of the control valve. See Figure 1.

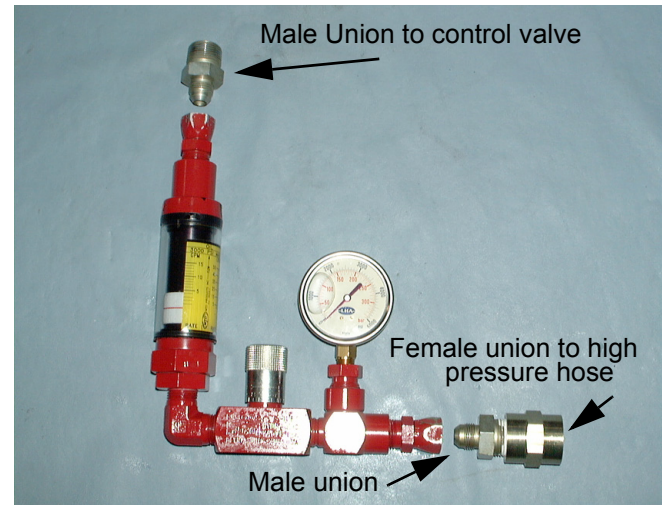


Figure 1

Control Valve to Flow Meter Connector

1. Secure the male union to the inlet side of the control valve using a 1-1/8" wrench and a large adjustable wrench to hold the control valve. ____
2. Secure the male union to the flow meter connector using a 1-1/8" wrench and a 7/8" wrench. ____ See Figure 2.

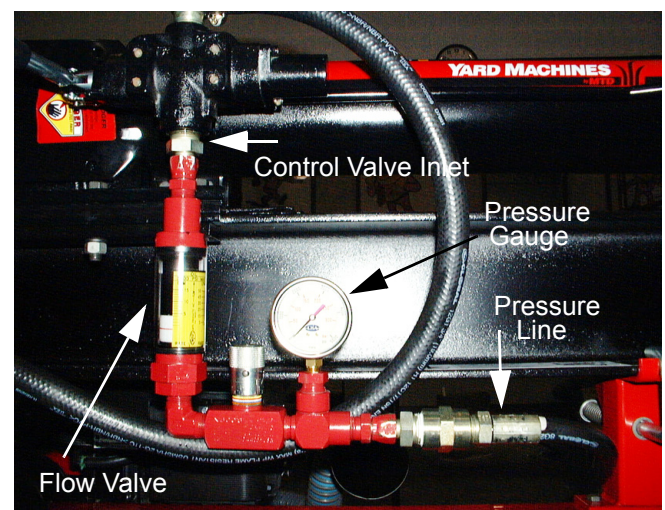


Figure 2

Log Splitter Hydraulic Troubleshooting

High Pressure Hydraulic Hose to Pressure Gauge Connector

1. Secure the male union, female union, and high pressure hydraulic hose connector to the pressure gauge connector using a 1-1/8" wrench, 1-1/16" wrench, 7/8" wrench, and a large adjustable wrench. _____
2. Double check all connectors and make certain they are tight before performing the test procedures. _____

Test Procedures

IMPORTANT: When instructed to close the needle valve, extreme caution must be exercised. Leaving the needle valve closed can blow seals and damage the log splitter. See Figure 1.

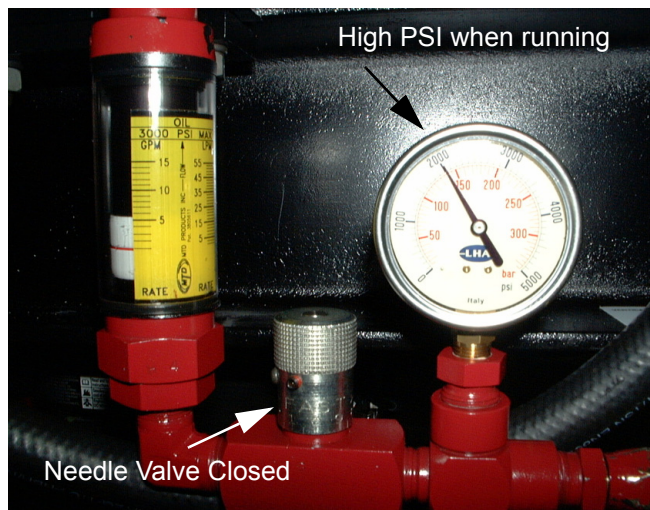


Figure 1

1. Open the needle valve completely by turning the knob counter-clockwise. _____

NOTE: The needle valve **MUST** be open before starting the log splitter. Depending on the needle

valve that is used on the test kit, the GOLD ring below the needle valve knob will be exposed, or the number "4" will be showing on the center indicator. See Figure 2.

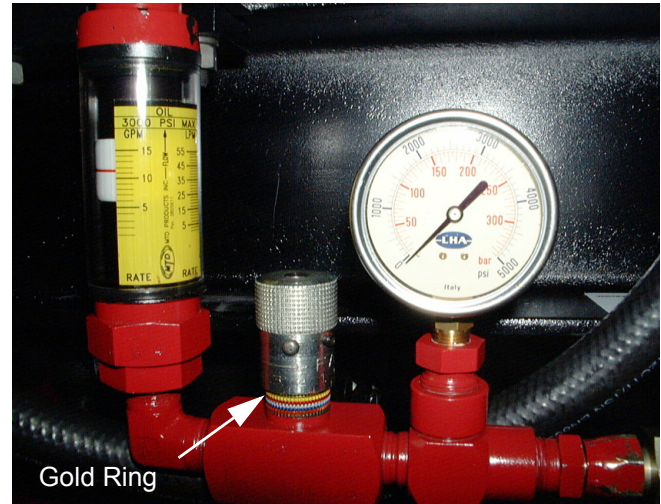


Figure 2

2. Start the engine and move the throttle (if equipped) to fast. _____

NOTE: Most log splitters do not have a throttle control, they are set to run at full throttle at all times.

Log Splitter Hydraulic Troubleshooting

3. Check the engine RPM with a tachometer and make certain the engine is running between 3500 and 3600 RPM.____ See Figure 3.

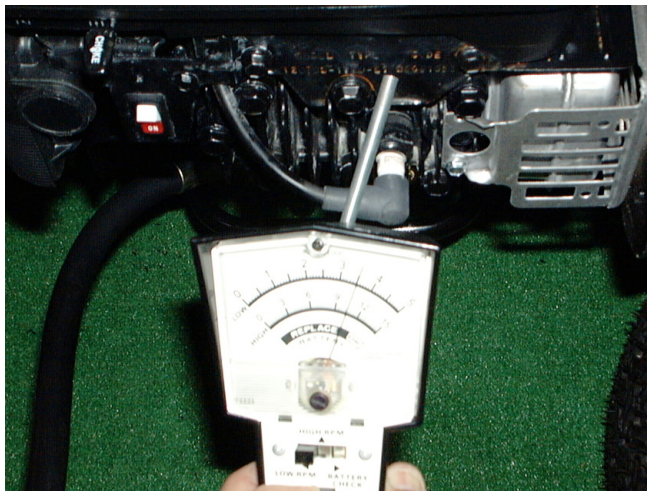


Figure 3

NOTE: If the engine is not running to specifications, the test results will not be valid. See the engine service manual to correct the engine RPM.

4. The log splitter must be run for a short time to bring the hydraulic fluid up to 130 degrees Fahrenheit before continuing this test.____
5. Record the GPM of the fluid flow at the flow meter.____ See Figure 4.

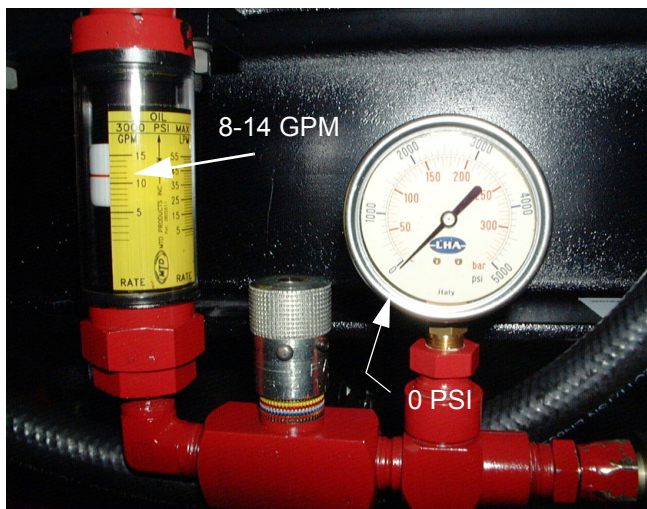


Figure 4

NOTE: The flow meter should read between 8 and 14 GPM (gallons-per-minute) if the pump is operating correctly.

6. Record the pressure of the fluid at the pressure gauge.____

NOTE: The pressure gauge should read 0 PSI (pounds-per-square-inch) if the pump is operating correctly.

7. Slowly close the needle valve clockwise until the engine begins to labor.____
8. Continue to close the needle valve slowly until the high volume check valve closes and the engine RPM returns to normal.____ See Figure 5.

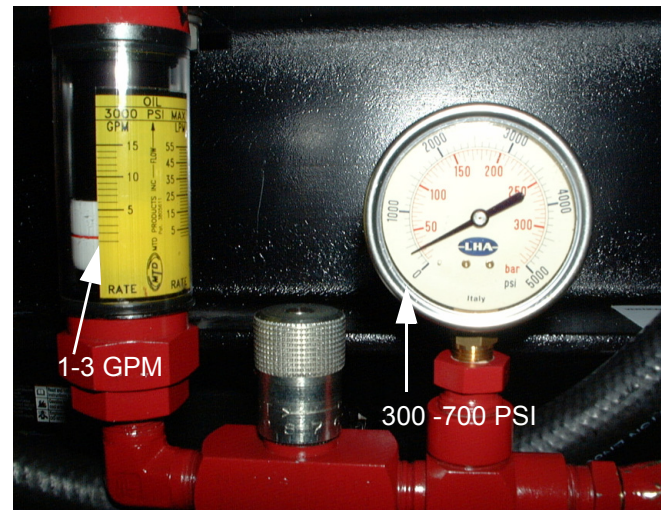


Figure 5

9. Record the PSI.____

NOTE: The PSI reading should be between 300 and 700 PSI.

10. Record the GPM.____

NOTE: The GPM reading should be between 1 and 3 GPM.

IMPORTANT: If the check valve does not close, the engine will bog down and stall. (REPLACE THE PUMP).

11. If all the recorded data meets the specifications above, proceed.____

CAUTION: The next test requires the needle valve to be almost fully closed. It must be opened immediately after recording the test results to avoid damage.____

Log Splitter Hydraulic Troubleshooting

Final Pump Pressure Test

1. Continue to close the needle valve slowly until the flow gauge reads approximately 1 GPM.____ See Figure 1.

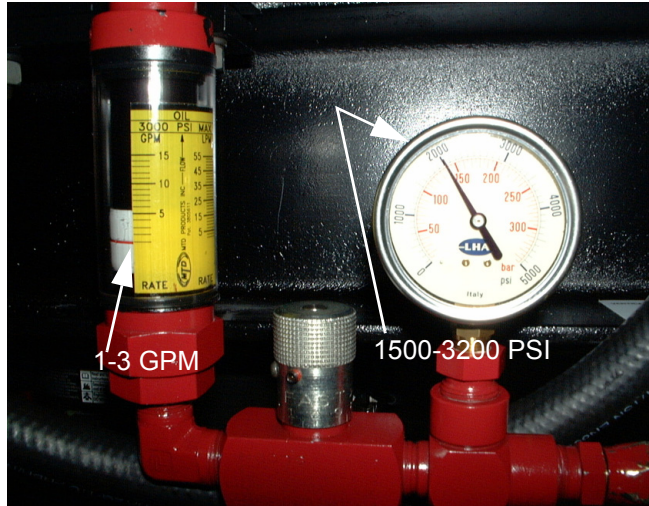


Figure 1

NOTE: DO NOT close the needle valve fully. This is the main pressure hose, and the pump does not have a relief valve.

2. Record the PSI.____ This is PSI "A"
NOTE: The PSI "A" should be between 1500 and 3200 PSI.
3. Record the GPM.____ This is GPM "A"
NOTE: The GPM "A" should be approximately 1 GPM.
4. Immediately open the needle valve.____
NOTE: Damage to the pump can be avoided by opening the needle valve immediately after recording the test results.
5. If the PSI reading is below 1500 PSI and the GPM is above 1 to 2, the pump is defective. (REPLACE THE PUMP).
6. Shut the log splitter off.
7. If all the recorded data meets the specifications above, perform the following section.

Control Valve and Hydraulic Cylinder Troubleshooting

NOTE: This section is to be used after the General Inspection and Pump Troubleshooting sections have been performed.____

- Scan the Final Pump Pressure Test section and enter the recorded test result from PSI "A"____ and GPM "A"____

Test Procedures

1. Make certain the needle valve is fully open.____ See Figure 1.

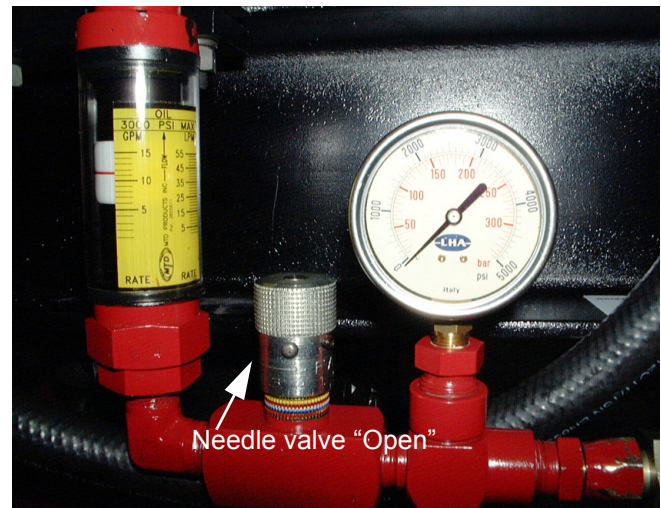


Figure 1

2. Start the log splitter.____
3. Move the control valve handle to the forward position until the wedge assembly is at the end of its travel.____ See Figure 2.

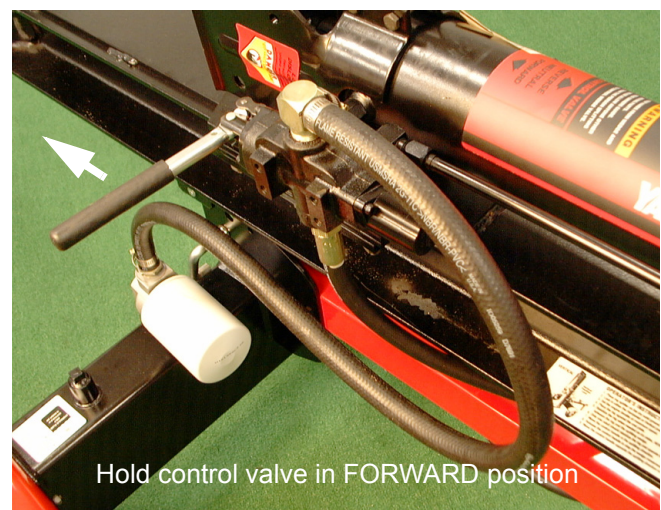


Figure 2

4. Hold the control valve handle in the forward position.

Log Splitter Hydraulic Troubleshooting

5. Record the PSI. _____ (This is PSI "B") See Figure 3.

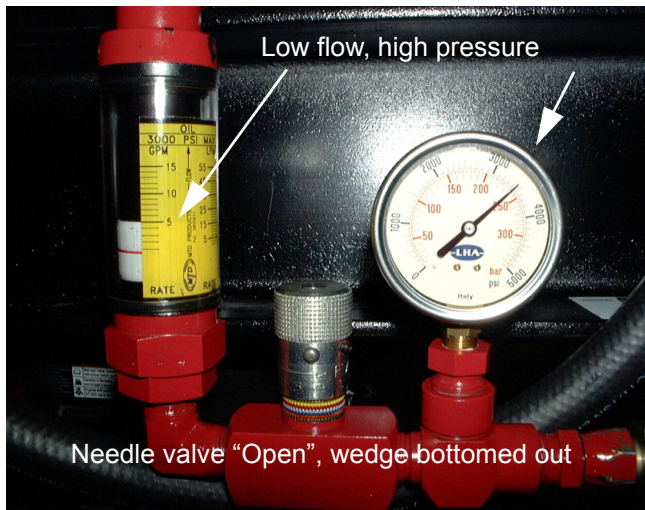


Figure 3

NOTE: The PSI "B" recorded should be equal to or GREATER than the PSI "A" recorded earlier in the Pump Troubleshooting section - Final Pump Pressure Test.

6. Record the GPM. _____ (This is GPM "B")
7. Enter the recorded test results from GPM "A" _____ and GPM "B" _____
8. If the recorded GPM "B" is equal to or LESS than the (GPM "A") recorded earlier in the Pump Troubleshooting section - Final Pump Pressure Test, the hydraulic fluid flow is correct.
9. If the recorded GPM "B" is GREATER than the (GPM "A") recorded earlier in the Pump Troubleshooting section - Final Pump Pressure Test, there may be a problem with the control valve, pressure relief valve, or hydraulic cylinder.
10. Enter the recorded test results from PSI "A" _____ and PSI "B" _____
11. If the (PSI "B") is equal to or greater than the recorded (PSI "A") in the Final Pump Pressure Test, the hydraulic system is functioning correctly.
12. If the (PSI "B") is less than the recorded (PSI "A") in the Final Pump Pressure Test, there may be a problem with the control valve, pressure relief valve or hydraulic cylinder. Continue through this section to determine which part is faulty.

13. Move the control valve to reverse and retract the wedge assembly.
14. Shut the log splitter off and relieve the pressure in the hydraulic system by cycling the control valve handle forward to reverse several times.
15. Remove the test kit from the log splitter using a 7/8" wrench, 1-1/8", 1-1/16" and a large adjustable wrench.

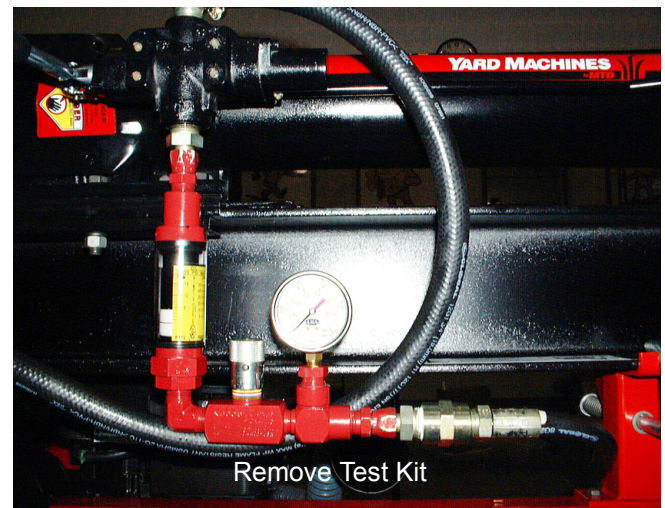


Figure 4

16. Install the high pressure hydraulic hose in the inlet port of the control valve using a 1-1/16" wrench and channel locks. See Figure 5.

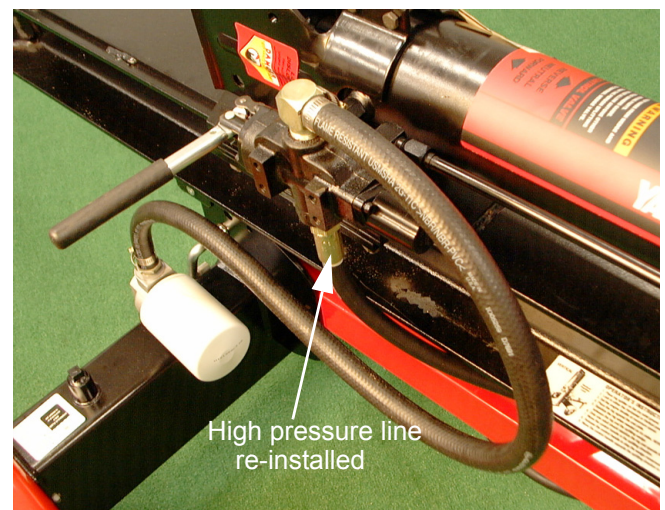


Figure 5

Log Splitter Hydraulic Troubleshooting

Control Valve, Pressure Relief Valve and Hydraulic Cylinder Testing

1. Make certain the wedge assembly is in the fully retracted position. _____ See Figure 1.



Figure 1

2. Place the log splitter in the vertical position and lock it in. _____
3. Remove the steel hydraulic tube that connects from the rear port of the hydraulic cylinder to the 90 degree fitting on the control valve using two 7/8" wrenches. _____ See Figure 2.



Figure 2

Install the Test Kit in the following sequence

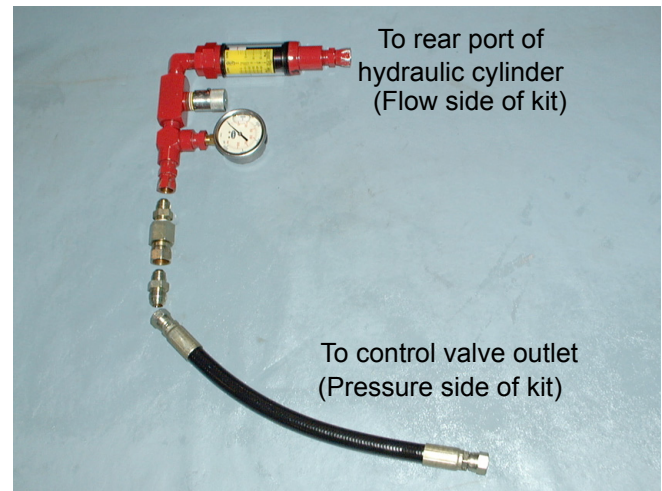


Figure 1

NOTE: The pressure gauge side of the test kit connects to the control valve, and the flow gauge side of the test kit connects to the rear port of the hydraulic cylinder.

Rear Cylinder Port to Flow Meter Connector.

1. Secure the flow gauge connector directly to the rear port of the hydraulic cylinder using a 7/8" wrench. _____

Log Splitter Hydraulic Troubleshooting

Control Valve 90 Degree Fitting to Pressure Gauge Connector:

1. Secure the male to female union, male union and small high pressure hydraulic hose to the pressure gauge connector using a 1-1/8" wrench, 1-1/16" wrench, 7/8" wrench, and a large adjustable wrench. _____
2. Double check all connectors and make certain they are tight before performing the test procedures. _____
3. Secure the open end of the small high pressure hydraulic hose to the 90 degree fitting on the control valve using two 7/8" wrenches.

Test Procedures

IMPORTANT: When instructed to close the needle valve, extreme caution must be exercised. Leaving the needle valve closed for more than a few seconds can blow seals and damage the log splitter.

1. Scan the above section and enter the recorded test result from PSI "B" _____
2. Rotate the needle valve counter-clockwise to the completely open position. _____
3. Start the engine and move the throttle (if equipped) to fast. _____

NOTE: Most log splitters do not have a throttle control, they are set to run at full throttle.

4. Move the control valve handle to the forward position until the wedge assembly is at the end of its travel. _____
5. Hold the control valve handle in the forward position and begin to close the needle valve.

6. Momentarily close the needle valve completely, record the PSI gauge and immediately open the needle valve back up. _____ See Figure 1.

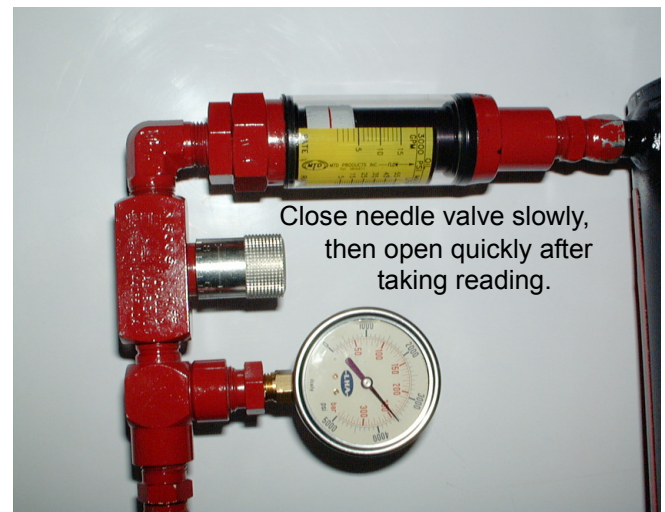


Figure 1

CAUTION: This step must be performed very quickly or damage may occur to the hydraulic system.

7. Record the PSI. _____ This is (PSI "C").
8. Enter the recorded test results from PSI "B" _____ and PSI "C" _____
9. If the recorded PSI "C" is equal to the PSI recorded earlier (PSI "B"), the pressure relief valve is functioning correctly. _____
10. If the recorded PSI "C" is equal to the PSI recorded earlier (PSI "B"), but exceeds the 3200 PSI limit, the Pressure Relief Valve Adjustment section must be performed to lower the PSI. _____
11. If the recorded PSI "C" is below the PSI recorded earlier (PSI "B"), the Pressure Relief Valve Adjustment section must be performed in an attempt to bring the PSI back into the correct specifications before condemning the control valve.
12. Shut the log splitter off. _____

Log Splitter Hydraulic Troubleshooting

Pressure Relief Valve Adjustment

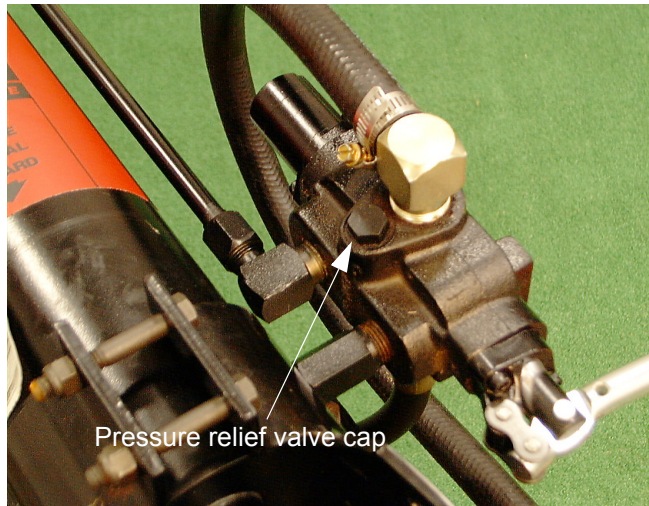


Figure 1

IMPORTANT: This adjustment is extremely sensitive. Slowly turn the adjustment screw one eighth of a turn at time and recheck the pressure.

1. Enter the recorded test results from PSI "B" _____
2. Rotate the needle valve counter-clockwise to the completely open position. _____
3. Remove the hex bolt covering the pressure relief valve using a 5/8" wrench.
4. Inspect the "O" ring on the hex bolt for damage or wear. _____
5. Mark the orientation of the adjustment screw on the outer housing using a flashlight and a sharp object.

6. Depending on the log splitter pressure, turn the adjustment screw clockwise or counterclockwise 1/8 of a turn using a flat-blade screw driver. See Figure 2.

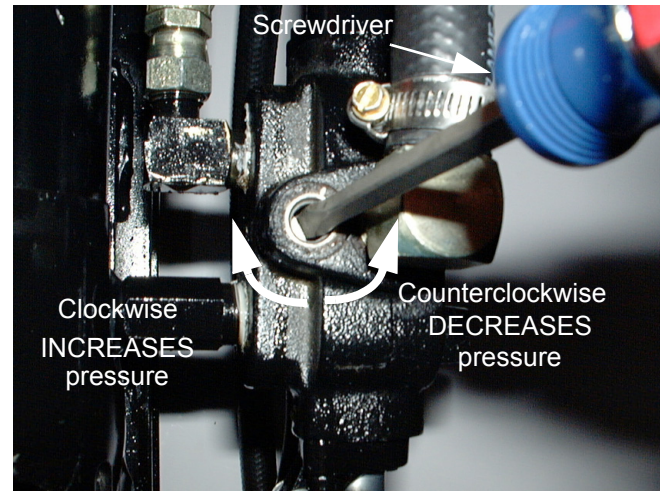


Figure 2

NOTE: Turning the adjustment screw clockwise increases the pressure. Turning the adjustment screw counter-clockwise decreases the pressure.

7. Start the engine and move the throttle (if equipped) to fast. _____
NOTE: Most log splitters do not have a throttle control, they are set to run fast all the time.
8. Move the control valve handle to the forward position until the wedge assembly is at the end of its travel. _____

Log Splitter Hydraulic Troubleshooting

9. Hold the control valve handle in the forward position and begin to close the needle valve. See Figure 3.

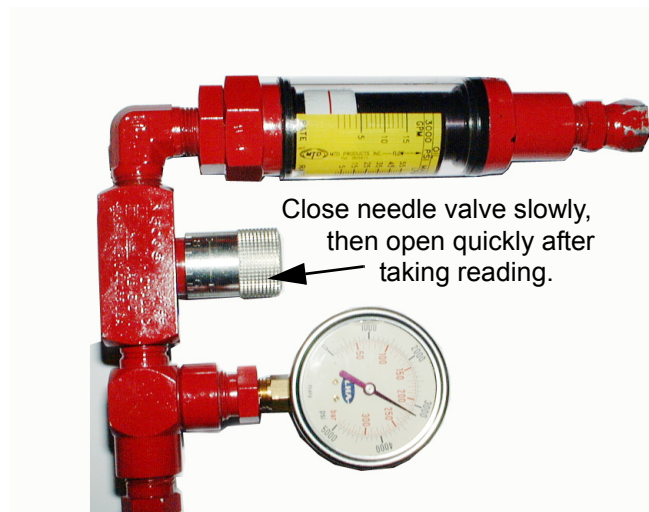


Figure 3

10. Momentarily close the needle valve completely, record the PSI gauge and immediately open the needle valve back up. _____

CAUTION: This step must be performed very quickly or damage may occur to the hydraulic system.

11. Record the PSI. _____ The new pressure reading is (and replaces the previous reading) (PSI "C").
12. Enter the recorded test results from PSI "B" _____ and the new PSI "C" _____
13. If the recorded PSI "C" is equal to the PSI recorded earlier (PSI "B"), the pressure relief valve is functioning correctly, and this is now the Final PSI "C". _____ Continue to the Hydraulic Cylinder Troubleshooting section.
14. If the recorded PSI "C" is equal to the PSI recorded earlier (PSI "B"), but exceeds the 3200 PSI limit, the Pressure Relief Valve Adjustment section must be performed to lower the PSI. _____
15. If the recorded PSI "C" is below the PSI recorded earlier (PSI "B"), the Pressure Relief Valve Adjustment section must be performed in an attempt to bring the PSI back into the correct specifications before condemning the control valve.
16. Shut the log splitter off.

17. Repeat the above section and continue to make eighth turn adjustments until the correct pressure relief specifications have been achieved.

NOTE: Always shut the log splitter off when making adjustments.

18. If the pressure relief valve has been adjusted to the correct specifications, the control valve is good. Perform the Hydraulic Cylinder Troubleshooting section.
19. If the pressure relief valve will not adjust to the correct specifications, REPLACE THE CONTROL VALVE. See Figure 4.



Figure 4

20. Shut the log splitter off.

Hydraulic Cylinder Troubleshooting.

IMPORTANT: This section is to be performed after all the other Test Kit sections have been performed.

1. Enter the recorded test results from the reading Final PSI "C" _____.

Log Splitter Hydraulic Troubleshooting

2. Rotate the needle valve counter-clockwise to the completely open position.____ See Figure 5.

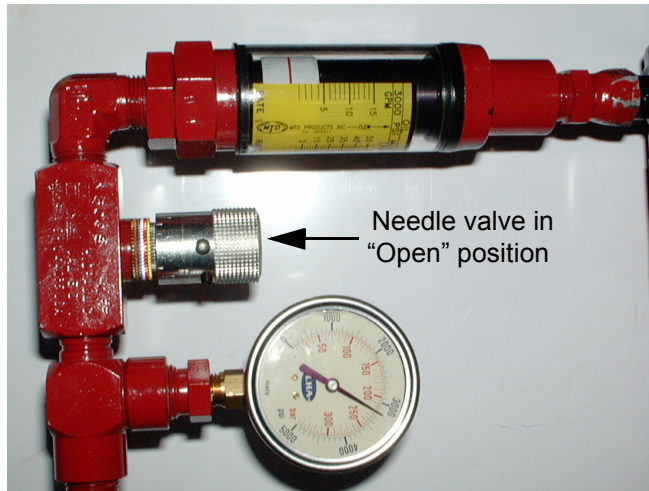


Figure 5

3. Start the engine and move the throttle (if equipped) to fast.____
NOTE: Most log splitters do not have a throttle control, they are set to run at full throttle.
4. Move the control valve handle to the forward position until the wedge assembly is at the end of its travel.____
5. Hold the control valve handle in the forward position.
6. Record the PSI.____ (This is PSI "D")
7. Record the GPM.____
8. Enter the recorded test results from Final PSI "C"____ and PSI "D"____
9. If the recorded PSI "D" is EQUAL to the PSI recorded earlier (PSI "C"), and the recorded GPM is between 0 and 1, the cylinder is good.
10. If the recorded PSI "D" is LESS than the PSI recorded earlier Final (PSI "C"), and the recorded GPM is 2 to 3 or more, the hydraulic cylinder needs to be repaired.

NOTE: Seal kits are available from your parts suppliers. See Figure 6.



Figure 6

11. Replace the hydraulic cylinder ONLY if repairs are not possible.
12. Remove the hydraulic log splitter test kit using a 7/8" wrench, 1 - 1/16" wrench, 1 - 1/8" wrench, and a large adjustable wrench.____
13. Install the steel hydraulic tube that connects from the rear port of the hydraulic cylinder to the 90 degree fitting on the control valve using two 7/8" wrenches.____