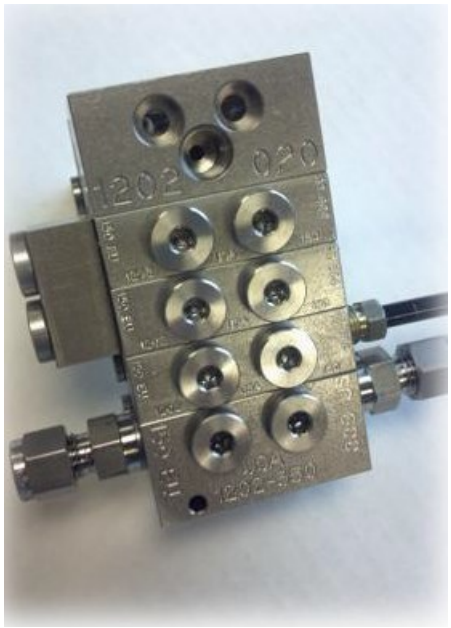
CENTRALIZED LUBRICATION SYSTEMS

SERIES PROGRESSIVE, DIVIDER VALVE SYSTEM INSTALLATION and TROUBLESHOOTING GUIDE



APPLICABLE TO ALL SERIES PROGRESSIVE, DIVIDER VALVE SYSTEMS

MADE IN AMERICA

DIVIDER VALVE SYSTEM INSTALLATION AND TROUBLESHOOTING GUIDE

INSTALLATION TIPS

1) **GENERAL** – Review lubrication layout and associated drawings before proceeding with installation.

2) **DIVIDER VALVES:**
   a) Locate and mount on **FLAT, ACCESSABLE** surface in an area near to the points being served.
   b) Be sure every divider valve assembly has the minimum number (3) of required working sections.

3) **LUBE POINTS:** Pre-lubricate **EACH** lube point, making sure that all points accept lubricant before connecting lines.

4) **LINES:**
   a) Tube, hose or pipe sizes are dependent upon the divider valve system being installed. Consult Lubrication Scientifics, LLC for an application specific recommendation.
   b) Clean and chamfer (ID & OD) all tubing before installing.
   c) Install with a minimum amount of fittings and bends.
   d) Connect master divider valve to the pump.
   e) Connect secondary divider valve outlets to proper lube points, per the system schematic.
   f) WARNING: Do not block divider valve outlets that are designed to be used as this will cause a system blockage.
   g) WARNING: Be sure every **"T"** type valve has an outlet being used from **BOTH** sides and every **"S"** type valve has one **WORKING** outlet and one **PLUGGED** outlet.

5) **RESERVOIR/PUMP:** Locate in accessible area and mount in vertical position.

6) **SOLENOID VALVES, FLOW CONTROLS, AND GAUGES:**
   a) Locate and mount in proper position directly below reservoir/pump.
   b) Connect supply lines.
   c) Adjust pump output as required.

7) **SYSTEM CONTROL PANEL:**
   a) Locate in accessible area.
   b) Shock mount panel with **SYSTEM CONDITION** lights in an area visible to machine operator.
   c) Connect supply line.
   d) Set pressure switches and program timer/controller as required.

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INSTALLATION TIPS

8) **FILLING/PURGING SYSTEM:**

a) Fill reservoir with **FILTERED** lubricant.

b) Fill and purge system, per Steps 1, 2 and 3 below.

For systems with **SECONDARY** divider valves or **SINGLE** divider valve systems:

STEP 1: Install line from valve outlet to lube point.
Do not tighten termination connection.
Remove divider valve, alternate outlet (Front Port) cap for lube point being filled/purged.
Using a hand pump containing **FILTERED** lubricant, pump lubricant until the specific lube point is receiving air-free lubricant.
Disconnect hand pump, tighten the terminating connection, and replace the alternate outlet cap.

REPEAT STEP 1 for all lube points.

STEP 2: For systems with **SECONDARY** divider valves being fed by a **MASTER** divider valve.
After **COMPLETING** fill/purge procedure for **ALL** lube points, proceed, as follows:
Install line from **MASTER** divider valve to the **SECONDARY** divider valve.
Do not tighten connection at the **SECONDARY** divider valve inlet.
Remove **MASTER** divider valve, alternate outlet (Front Port) cap corresponding to the **SECONDARY** divider valve being filled/purged.
Using a hand pump containing **FILTERED** lubricant, pump lubricant until the **SECONDARY** divider valve inlet is receiving air-free lubricant.
Disconnect hand pump, tighten the **SECONDARY** inlet connection, and replace the alternate outlet cap.

REPEAT STEP 2 for all SECONDARY divider valves.

STEP 3: For purging air from **PUMP** to inlet of **MASTER** divider valve, including single divider valve systems.

Install line from **PUMP** outlet to the **MASTER** divider valve **INLET**. Do not tighten connection at the **MASTER** divider valve **INLET**.
Using the manual run function, cycle the pump until air free lubricant flows from the **MASTER** divider valve **INLET** connection.
Tighten the **MASTER** divider valve **INLET** connection while the pump continues to cycle and lubricant continues to flow out the inlet connection.

The System is now ready for operation.

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SYSTEM TROUBLESHOOTING CHART

Trouble	Possible Cause	Recommended Action
General	a. Leaking or disconnected system components.	a. **Inspect**, all line ad component connections. **Tighten** connections and/ or **Replace** damaged lines and components, as required.
Low or No pressure	a. Defective gauge.	a. **Replace** with **tested** gauge.
	b. Low or empty reservoir.	b. **Fill/Purge** reservoir, per above procedure.
	c. System air-bound.	c. **Purge ENTIRE** system, per above.
	d. Inoperative pump.	d. Check air/hydraulic/electric power to pump. If pump **has** air/hydraulic/ electric power and pump **fails** to build pressure against resistance **REPLACE** pump.
High pressure	a. Blockage in system.	a. Locate **system blockage** or high pressure source by following procedures, per section below.
Pump is not cycling or stops before lube event is completed.	a. Blocked system filter.	a. **Change** or **clean** filter/filter element.
	b. Air in pump.	b. **Purge,** per above.
	c. Low lubricant level.	c. **Fill** reservoir, per above.
	d. Pump failure.	d. **Replace** pump.
	e. Loss of power source to pump.	e. **Restore** air/hydraulic/electric **energy** to pump.
Noisy Pump	a. Loose or worn pump parts.	a. **Tighten** all bolts and nuts to the **proper torque**. **Replace** worn parts.
	b. Filter plugged or dirty.	b. **Change/clean** filter or element.
	c. Air leaking into system.	c. **Fill/purge** reservoir, per above. Check all system connections and **tighten/replace**, as required.
Output is low	a. Pump has worn parts.	a. **Replace/rebuild** pump.
Frequent blow out of rupture discs.	a. System blockage after pump.	a. Locate **system blockage** or high pressure by following procedures, per section below
	b. Blow out disc pressure rating is too low for system pressure	b. Install **higher pressure** blowout disc.
Rapid fluctuation on pressure gauge	a. Pump flow adjustment.	a. Reduce pump stroking speed.

Blockages in a series progressive lubrication system are generally caused by the following conditions:

1) **CRUSHED lines between components in the system.**
2) **A BLOCKED lubricant injection point in the system.**
3) **An improperly installed CHECK VALVE or FITTING in the system.**
4) **A DIVIDER VALVE, within the system, is failing to cycle.**

INSPECT ALL LINES AND TIGHTEN ALL CONNECTIONS BEFORE PROCEEDING WITH LOCATING A BLOCKAGE.

DIRT or FOREIGN DEBRIS is the ENEMY of a series progressive lubrication system. ALL SERVICE WORK should be done under the CLEANEST CONDITIONS possible.

DIVIDER VALVE SYSTEM INSTALLATION AND TROUBLESHOOTING GUIDE

TROUBLESHOOTING BLOCKAGES IN A SERIES PROGRESSIVE LUBRICATION SYSTEM

Blockages in a series progressive lubrication system are generally caused by the following conditions:

1) **CRUSHED** lines between components in the system.
2) **A BLOCKED** lubricant injection point in the system.
3) An improperly installed **CHECK VALVE** or **FITTING** in the system.
4) **A DIVIDER VALVE**, within the system, is **failing to cycle**.

INSPECT ALL LINES AND TIGHTEN ALL CONNECTIONS BEFORE PROCEEDING WITH LOCATING A BLOCKAGE.

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PROCEDURE FOR FINDING BLOCKAGES

MASTER DIVIDER VALVE, STEP 1:

A: Obtain a manual pump with a working gauge.
B: Fill with CLEAN, FILTERED lubricant (same as used in system).
C: Connect to INLET of the MASTER divider valve and SLOWLY operate pump.
D: If the MASTER divider valve will not cycle below 1500 PSI, proceed to STEP 2.

If MASTER divider valve CYCLES SMOOTHLY, check feedback notification device (limit switch, proximity switch, etc.) and the wiring connections back to the system control panel. If the feedback device and wiring are good, troubleshoot the system controller.

MASTER DIVIDER VALVE, STEP 2:

With RESET INDICATORS installed in the FRONT (alternate outlet) ports of the divider valve.

A: With manual pump still connected to MASTER divider valve inlet, increase gauge pressure to 2000 PSI. Visually look at the PIN located on the end of each RESET INDICATOR. The RESET INDICATOR with the EXTENDED PIN indicates that the blockage is DOWNSTREAM of this outlet. If NO pins are EXTENDED, then the blockage is in the MASTER divider valve and it must either be replaced or disassembled and cleaned, per DIVIDER VALVE DISASSEMBLY and CLEANING PROCEDURE, as provided below.

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PROCEDURE FOR FINDING BLOCKAGES (cont'd)

MASTER DIVIDER VALVE, STEP 2 (cont'd):

Without RESET INDICATORS installed in the FRONT (alternate outlet) ports of the divider valve.

A: With manual pump still connected to MASTER divider valve inlet, increase gauge pressure to 2000 PSI. Working from the top of the divider valve assembly, one at a time, REMOVE the FRONT cap and slowly cycle the manual pump AFTER each cap is removed. If there is a PSI drop and the MASTER divider valve cycles freely after a cap is removed, the blockage is DOWNSTREAM of that outlet. If the MASTER divider valve fails to cycle after ALL caps have been removed, then the blockage is in the MASTER divider valve and it must either be replaced or disassembled and cleaned, per DIVIDER VALVE DISASSEMBLY and CLEANING PROCEDURE, as provided below.

SECONDARY DIVIDER VALVE, STEP 3:

A: From STEP 1 above, connect the pump to the MASTER divider valve FRONT (alternate outlet) port, which is connected to the SECONDARY divider valve being tested.

B: Remove ALL FRONT (alternate outlet) caps from the SECONDARY divider valve.

C: SLOWLY operate manual pump. If lubricant flows freely from EACH of the FRONT (alternate outlet) ports of the SECONDARY divider valve, the blockage IS NOT in the SECONDARY divider valve or its SUPPLY LINE. If lubricant DOES NOT flow freely from EACH of the FRONT (alternate outlet) ports of the SECONDARY divider valve, the blockage IS IN the SECONDARY divider valve or its SUPPLY LINE. To eliminate the SUPPLY LINE, as the cause of the BLOCKAGE, remove the supply line connection from the INLET of the SECONDARY divider valve. Slowly operate the pump. If lubricant flows freely from the SUPPLY LINE, then proceed to SECONDARY DIVIDER VALVE, STEP 4. If lubricant DOES NOT flow freely from the SUPPLY LINE, replace the SUPPLY LINE.

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PROCEDURE FOR FINDING BLOCKAGES (cont'd)

SECONDARY DIVIDER VALVE, STEP 4:

With RESET INDICATORS installed in the FRONT (alternate outlet) ports of the divider valve.

A: With manual pump still connected to SECONDARY divider valve inlet, increase gauge pressure to 2000 PSI. Visually look at the PIN located on each the end of each RESET INDICATOR. The RESET INDICATOR with the EXTENDED PIN indicates that the blockage is DOWNSTREAM of this outlet. If NO pins are EXTENDED, then the blockage is in the SECONDARY divider valve and it must either be replaced or disassembled and cleaned, per DIVIDER VALVE DISASSEMBLY and CLEANING PROCEDURE, as provided below.

SECONDARY DIVIDER VALVE, STEP 4 (cont'd):

Without RESET INDICATORS installed in the FRONT (alternate outlet) ports of the divider valve.

A: With manual pump still connected to SECONDARY divider valve inlet, Increase gauge pressure to 2000 PSI. Working from the top of the divider valve assembly, one at a time, REMOVE the FRONT cap and slowly cycle the manual pump AFTER each cap is removed. If there is a PSI drop and the SECONDARY divider valve cycles freely after a cap is removed, the blockage is DOWNSTREAM of that outlet. If the SECONDARY divider valve fails to cycle after ALL caps have been removed, then the blockage is in the SECONDARY divider valve and it must either be replaced or disassembled and cleaned, per DIVIDER VALVE DISASSEMBLY and CLEANING PROCEDURE, as provided below.

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DIVIDER VALVE DISASSEMBLY PROCEDURE

DIRT or FOREIGN DEBRIS is the ENEMY of a series progressive lubrication system. ALL SERVICE WORK should be done under the CLEANEST CONDITIONS possible.

1) Before disassembling any divider valve, make a schematic of the divider valve assembly. (Example: INLET-20S-10T-05S-END)
2) Remove the piston bore closure plugs from ALL valves.
3) Using a BRASS or PLASTIC rod, try to move each piston back and forth with HAND PRESSURE only.
4) If ALL pistons move freely, replace the piston bore closure caps, loosen the valve mounting bolts, and retighten, per the Lubrication Scientifics torque specifications for the specific divider valve product being serviced.
5) If ANY piston FAILS to move freely, replace that valve section and tighten per the Lubrication Scientifics torque specifications for the specific divider valve product being serviced.
6) If MULTIPLE pistons FAIL to move freely, replace the entire divider valve assembly.

If DIRT or FOREIGN DEBRIS is found in ANY divider valve or divider valve assembly, replacing the valve or assembly will only be a TEMPORARY fix. The root cause of the contamination must be removed from the system.

1) The system FILTRATION should be INSPECTED and the filter elements REPLACED.
2) If there is NO system FILTRATION, it MUST BE ADDED to the system.
3) The LUBRICANT RESERVOIR must be emptied and cleaned. Reservoir FILLING PROCEDURE must be REVIEWED and altered, as required.
4) REMOVE and PURGE all TUBE LINES to prevent previously introduced contamination from causing further damage to the system.