

**Proven Solutions for the Global Compression Industry™**

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# 1. CPI Model P55 Pump

The CPI Model P55 Pump series features heavy duty metering, precision, and self-lubricating pumps capable of pumping small amounts of mineral or synthetic oil to machinery injection points at pressures up to 7500 psi. For Professional use only.

## Styles and Materials

Vacuum  
Pressure  
Gravity

Standard pump model materials are steel, stainless, and aluminum with protective finishes where applicable. Stainless pump model materials are 300 series stainless with specific steel and aluminum wetted components. Elastomeric components for all pump models are FKM material.

## Maximum Working Pressures

3/16" Models: 7500 psi (51.7 MPa, 517 bar)  
1/4" Models: 6500 psi (44.8 MPa, 448 bar)  
3/8" Models: 3500 psi (24.1 MPa, 241 bar)

## Certifications



## Features

- ATEX Zone 1 certified
- Corrosion resistant finish for long term environmental exposure
- Precision check valves for consistent, long-life performance
- Improved mating between the cylinder assembly and rocker arm extends life and ensures consistent output
- Precision cylinder assembly with improved materials and precision clearances
- Purge port to aid air bleeding and ease of start-up
- Single piece sight glass eliminates vacuum leaks and incorrect adjustments
- Enhanced sealing of output regulator shaft eliminates water ingress and minimizes sunlight and environmental degradation
- Output regulator locknut and pump mounting bolts have integrated seals to eliminate water ingress and oil leakage
- Output regulator locknut maintains pump stroke adjustment and does not loosen
- CPI 1/8 ORB port eliminates the need for sealant when used with CPI ORB fittings (1/8 NPT compatible)
- Upgraded gaskets which optimize compression set and reduce loss of bolt torque
- Serviceable piston and cylinder assembly

## 2. Warnings

This equipment installation and operation may include electrical, mechanical, hydraulic, and potentially hazardous location gas environments. Be aware of the potential risks at the job site and any applicable protocols, procedures, codes, and regulations.



### WARNINGS



#### HYDRAULIC EQUIPMENT

High-pressure fluid from dispensing device, hose leaks, or ruptured components will pierce skin. This may look like just a cut, but it is a serious injury that can result in amputation. Get immediate medical treatment.




- Follow job site hydraulic protocols, procedures, codes, and regulations.
- Do not point dispensing device at anyone or at any part of the body.
- Do not put your hand over the fluid outlet.
- Do not stop or deflect leaks with your hands, body, glove, or rag.
- Relieve system hydraulic pressure before servicing hydraulic equipment.
- Properly install and tighten all fluid connections before operating the equipment.
- Hydraulic pressure relief devices are recommended in all hydraulic systems.
- A maintenance schedule is recommended. Replace worn or damaged parts immediately.



#### MECHANICAL EQUIPMENT

Misuse can cause death or serious injury.

- Follow job site mechanical equipment protocols, procedures, codes, and regulations.
- This product is typically used in the vicinity of reciprocating or rotating equipment. Be aware of the site hazards and potential for injury.
- Do not operate the equipment when fatigued or under the influence of drugs or alcohol.
- Follow site protocol for Lock Out Tag Out or similar procedures when working on equipment.
- Ensure all equipment is rated and approved for the environment in which you are using it.
- Do not exceed the maximum working pressure or temperature rating of the lowest rated system component.
- Do not alter or modify equipment. Alterations or modifications may void agency approvals and create safety hazards.
- Use fluids and solvents that are compatible with equipment wetted parts.
- A maintenance schedule is recommended. Replace worn or damaged parts immediately.

	<p><b>FIRE AND EXPLOSION HAZARD</b></p> <p>When flammable fluids or gases are present in the work area, be aware that flammable fumes can ignite or explode.</p> <ul style="list-style-type: none"> <li>• Follow job site fire safety protocols, procedures, codes, and regulations.</li> <li>• Use equipment only in well ventilated areas.</li> <li>• Eliminate all ignition sources, and keep work area free of debris, including rags and spilled or open containers of hazardous materials.</li> <li>• Ground all applicable equipment in the work area.</li> <li>• Keep a working fire extinguisher in the work area.</li> </ul>
	<p><b>PERSONAL PROTECTIVE EQUIPMENT</b></p> <p>Wear appropriate protective equipment when at the job site to help prevent injuries.</p> <ul style="list-style-type: none"> <li>• Follow job site PPE protocols, procedures, codes, and regulations.</li> <li>• Typical PPE may include eye protection, hearing protection, hand and foot protection, head protection, and flame-resistant clothing (FRC).</li> <li>• Portable monitors that detect dangerous gases may be recommended for the job site.</li> <li>• Respirators may also be required for unsafe atmospheric conditions.</li> </ul>
	<p><b>ELECTRICAL GROUNDING</b></p> <ul style="list-style-type: none"> <li>• This equipment must be grounded to reduce the risk of static sparking.</li> <li>• Follow job site grounding protocols, procedures, codes, and regulations.</li> </ul>

### 3. Pressure Relief Procedure

This type of pump is a positive displacement design with no internal pressure relief device. A pressure relief device (i.e., POPR™, rupture disc, etc.) must be installed downstream from the pump to prevent an over pressure condition and damage to the lubrication system.

1. Shut off motor or power source and ensure the cam actuating the pump has ceased operation.
2. If installed, close oil supply valve located upstream from pump.
3. If installed, open drain valve located downstream from pump.
4. Slowly crack open applicable fluid line fittings to relieve pressure in the hydraulic system.
5. Safely remove pump from lubricator box.

## 4. Pump Installation

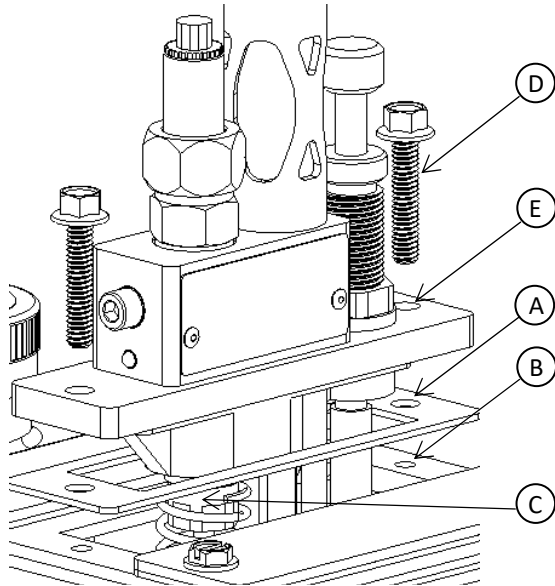


Fig. 1

1. Ensure pump mounting surface on reservoir is clean and free of previous sealing materials.
2. Place pump gasket on reservoir cover plate and align gasket holes (A) with reservoir bolt holes (B).
3. It is an option to install the pump using RTV (room temperature vulcanizing) sealant. Both the lubricator cover plate and pump can be installed using RTV sealant without impacting the performance or output of the pump. Ensure the sealing surfaces are clean and free of any previous sealant.
4. Align the pump with the roller side of the rocker arm and pump cylinder (C) located above the lubricator camshaft and install the pump into the lubricator. Install the pump mounting bolts (D) through the pump bolt holes (E) and snug both bolts to seat the pump. Torque both mounting bolts to the specified torque (See **Torque Specifications**).
5. The pump must not be put into a bind during the installation and seating process since this can result in damage to the pump or lubricator internal components. Do not use just one mounting bolt to seat the pump and create a binding condition during installation.
  - a. Manually seat the pump to the reservoir while installing both mounting bolts.
  - b. Alternately tighten both mounting bolts to walk the pump into a seated position.
  - c. Adjust the output regulator to the pump shut off condition prior to installation into the reservoir. This will allow the pump to seat fully without binding and can also be performed while the lubricator is operating.
6. Pumps with vacuum suction tubes typically need minor maneuvering to correctly seat the pump into the lubricator. The pump should seat easily into the lubricator with the only potential resistance being the compression of the piston return spring. If resistance to installation is experienced or the pump doesn't easily seat, ensure correct alignment and no foreign objects are inside the lubricator.
7. It is possible to install the pump backwards, especially when using power tools to install and torque the mounting bolts (D). Backwards installation will exhibit higher resistance than normal and vacuum models will have immediate damage to the suction tube assembly. If the lubricator is rotated with any pump model installed backwards, damage will likely occur to both the pump and lubricator components.
8. Install the inlet and outlet tube fittings per the application. CPI recommends the use of the CPI 1/8 ORB tube fittings to ensure a leak free installation. Industry standard 1/8 NPT fittings can be used with sealant, but NPT fittings with short thread engagement may not create an adequate seal into the ORB geometry.
9. Pump removal is the opposite of the installation procedure.

## 5. Pump Priming

### Vacuum Models

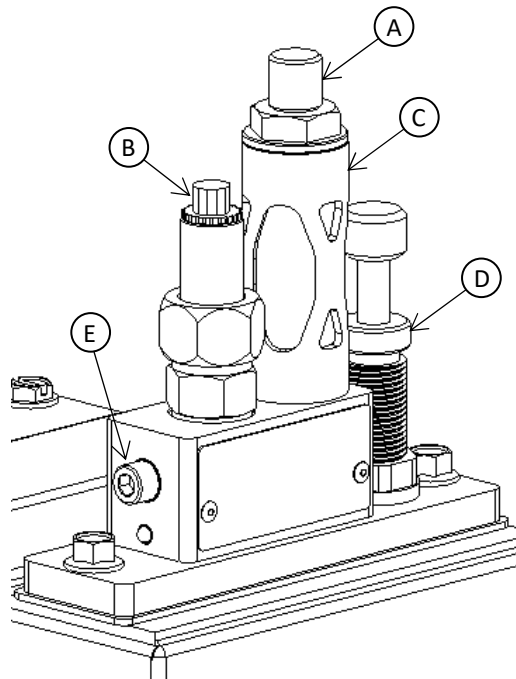


Fig. 2

1. Fill lubricator with appropriately filtered oil.
2. Remove vent screw (A) and outlet plug (B). Discard outlet plug (B).
3. Fill sight glass (C) to top with appropriately filtered oil.
4. Connect lube line and fitting to pump outlet. CPI recommends using a CPI ORB fitting (i.e., Part Number: 65005000042MCOR, 65005000042TAOR, etc.).
5. Loosen purge screw (E).
6. Open lube line at injection point, or applicable downstream location, to allow lube line bleeding.
7. Manually pump output regulator (D) until oil expelled from purge port is free of air.  
**Note:** The output regulator can be depressed by hand to generate approximately 500 psi. DO NOT apply excessive force or impact to the output regulator with a tool to build hydraulic pressure. This will potentially damage the rocker arm, piston, and output regulator. Use a CPI Purge Gun (Part Number: 650050000382510) to connect to the applicable lubrication system port and prime the lube system.
8. Maintain oil in the sight glass (C) to prevent pulling air into the pump cylinder.
9. Tighten purge screw (E) to specified torque (See **Torque Specifications**).
10. Manually pump output regulator (D) until oil expelled from injection point, or applicable downstream location, is free of air.
11. Close lube line at injection point or applicable downstream location.
12. Fill sight glass (C) to middle of window. Reinstall vent screw (A) and finger tighten. The oil level in the sight glass will drop slightly while the pump generates a vacuum.
13. Clean excess oil on pump.
14. Pump is ready for operation and output adjustment.
15. Periodic re-filling of oil in the sight glass may be required depending on oil type and operating conditions.

## Pressure Models

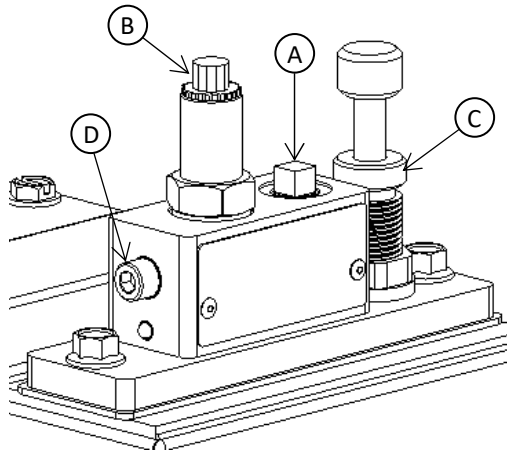


Fig. 3

1. Fill lubricator with appropriately filtered oil.
2. Remove and discard inlet plug (A) and outlet plug (B).
3. If the pump is equipped with a removable filter screen, this screen can come out of the installed position during shipping. The screen is installed in a pocket in the inlet passage under inlet plug (A). Confirm that the filter screen is seated correctly in the pocket before installing the inlet fitting. The filter screen will stay in the pocket during normal operation.
4. Connect lube lines and fittings to pump inlet and outlet. CPI recommends using CPI ORB fittings (i.e., Part Number: 65005000042MCOR, 65005000042TAOR, etc.).
5. Supply oil to the pump inlet. If the oil supply is provided by operating the compressor, do not operate the compressor prior to filling and bleeding all lubrication lines. Use a CPI Purge Gun (Part Number: 650050000382510) to connect to the applicable lubrication system port and prime the lube system.  
**Note:** See **Pump Specifications** for maximum inlet pressure.
6. Open lube line at injection point, or applicable downstream location, to allow lube line bleeding.
7. Loosen purge screw (D).
8. Manually pump output regulator (C) until oil expelled from purge port is free of air.  
**Note:** The output regulator can be depressed by hand to generate approximately 500 psi. DO NOT apply excessive force or impact to the output regulator with a tool to build hydraulic pressure. This will potentially damage the rocker arm, piston, and output regulator. Use a CPI Purge Gun (Part Number: 650050000382510) to connect to the applicable lubrication system port and prime the lube system.
9. Tighten purge screw (D) to specified torque (See **Torque Specifications**).
10. Manually pump output regulator (C) until oil expelled from injection point, or applicable downstream location, is free of air.
11. Close lube line at injection point or applicable downstream location.
12. Clean excess oil on pump.
13. Pump is ready for operation and output adjustment.



## Gravity Models

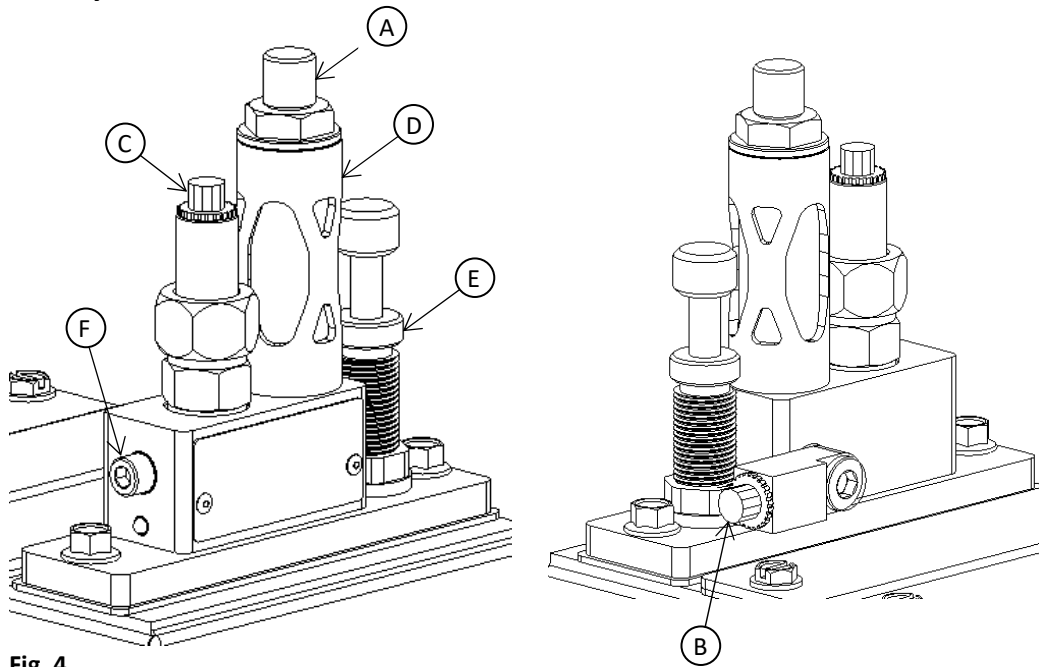


Fig. 4

1. Fill lubricator with appropriately filtered oil.
2. Remove vent screw (A), inlet plug (B), and outlet plug (C). Discard inlet plug (B) and outlet plug (C).
3. Fill sight glass (D) to top with appropriately filtered oil. Reinstall vent screw (A) and finger tighten.
4. Connect lube line and gravity pump installation kit fitting(s) to pump inlet. If installed, open oil supply valve and allow oil to flow into sight glass. The oil level will rise until the pressure stabilizes. The oil level must be below the drip point in order to count drops.  
**Note:** See **Pump Specifications** for maximum inlet pressure.
5. Connect lube line and fitting to pump outlet. CPI recommends using a CPI ORB fitting (i.e., Part Number: 65005000042MCOR, 65005000042TAOR, etc.).
6. Loosen purge screw (F).
7. Open lube line at injection point, or applicable downstream location, to allow lube line bleeding.
8. Manually pump output regulator (E) until oil expelled from purge port is free of air.  
**Note:** The output regulator can be depressed by hand to generate approximately 500 psi. **DO NOT** apply excessive force or impact to the output regulator with a tool to build hydraulic pressure. This will potentially damage the rocker arm, piston, and output regulator. Use a CPI Purge Gun (Part Number: 650050000382510) to connect to the applicable lubrication system port and prime the lube system.
9. Tighten purge screw (F) to specified torque (See **Torque Specifications**).
10. Manually pump output regulator (E) until oil expelled from injection point, or applicable downstream location, is free of air.
11. Close lube line at injection point or applicable downstream location.
12. Clean excess oil on pump.
13. Pump is ready for operation and output adjustment.
14. Periodic adjustment of oil in the sight glass may be required depending on oil type and operating conditions. The oil level will rise over time until the drip tube is covered, and drops can no longer be counted. Close the oil supply valve and loosen the vent screw (A) to allow the oil level in the sight glass to drop while operating. When the desired oil level is reached, tighten the vent screw (A), and open the oil supply valve.

## 6. Pump Output Adjustment

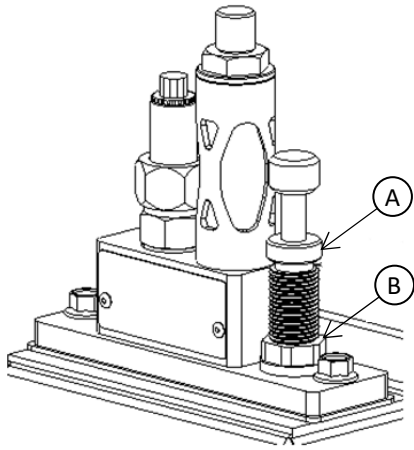


Fig. 5

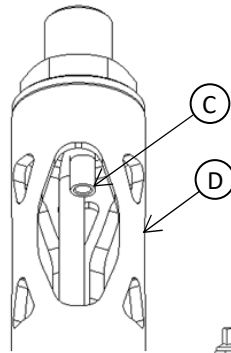


Fig. 6

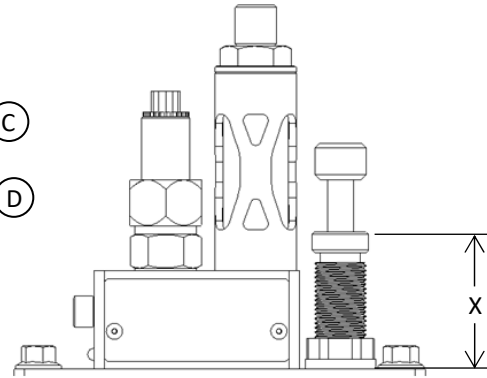


Fig. 7

Pump volume is controlled by the output regulator screw (A). Turning the output regulator screw (A) changes the length of the piston stroke, which changes the pump discharge volume.

1. Loosen output regulator locknut (B).
2. Turn output regulator screw (A):
  - a. Counterclockwise: increases discharge volume
  - b. Clockwise: decreases discharge volume

Adjustment	Dimension X (Fig. 7)
Fully Open	1.75 in. (44.5 mm)
Shut Off	0.75 in. (19.1 mm)

Table 1

3. For Vacuum and Gravity Models:
  - With the lubricator operating, count the drops from the drip tube (C) falling into the sight glass (D) for one minute. See **Calculating Output Capacity** to determine the amount of oil discharged by the pump.
- For Pressure Models:
  - Pressure fed pumps typically feed a divider block system. Adjust the pump for the correct divider block cycle time. Otherwise, the volumetric output must be measured at the applicable lube point.
4. Tighten output regulator locknut (B) to specified torque (See **Torque Specifications**) when desired flow rate is achieved.

**Note:** The output regulator stem will typically not move up and down during operation. The internal seals will hold the stem in the upmost position. Put light finger pressure on the output regulator stem to follow the rocker arm movement. It is recommended to manually raise the stem to the upmost position when priming is complete to ensure full piston travel, ensure correct pump output adjustment, and maintain optimal sealing performance.

## 7. Technical Information

### Pump Specifications

All pumps are factory tested and will contain residual oil inside the pump. Contact CPI for the SDS, if needed.

P55 Pump Technical Data		
Maximum Working Pressure	Imperial Units	Metric Units
3/16" Models	7500 psi	51.7 MPa, 517 bar
1/4" Models	6500 psi	44.8 MPa, 448 bar
3/8" Models	3500 psi	24.1 MPa, 241 bar
Cracking Pressure	10 ± 4.4 psi	69 ± 30 kPa
Maximum Inlet Pressure - Varies by Pump Model		
Gravity Models	60 psi	0.4 MPa, 3.4 bar
Pressure Models	200 psi	1.4 MPa, 14 bar
Inlet / Outlet Size	CPI 1/8 ORB (1/8 NPT Compatible)	
Temperature Rating	-20°F to 190°F	-29°C to 88°C
Camshaft Speed	4 to 30 rpm	
Maximum Cam Lift - Varies by Pump Model		
Roller Rocker Arm	1/2 Inch Maximum	
Dragging Rocker Arm	3/8 Inch Maximum	
Installation Angle Pressure Models	0° to 35°	
Lubricant Type	Mineral and Synthetic Oils	
Lubricant Viscosities	Saybolt Viscosities SUS @ 100°F 90 – 5000 SUS @ 210°F 40 – 250	Kinematic Viscosities cSt @ 40°C 20 – 1000 cSt @ 100°C 4 – 50
Minimum Pump Oil Supply Filtration	125 micron, 100 U.S. mesh	

**Table 2**

All pumps are factory tested and will contain residual oil inside the pump. Contact CPI for the SDS, if needed.

### Torque Specifications

Component	Imperial Units	Metric Units
Pump Mounting Bolts	90 ± 10 in-lbs	10 ± 1 Nm
Purge Screw	90 ± 10 in-lbs	10 ± 1 Nm
Sight Glass Assembly	60 ± 10 in-lbs	7 ± 1 Nm
Sight Glass Vent Screw	Finger Tight	Finger Tight
Output Regulator Locknut	20 ± 5 ft-lbs	27 ± 7 Nm
Discharge Connector	35 ± 5 ft-lbs	47 ± 7 Nm
Discharge Connector Union Nut	30 ± 5 ft-lbs	41 ± 7 Nm
CPI ORB Fitting or 1/8 NPT Fitting	12 ± 2 ft-lbs	16 ± 3 Nm
Pump Cylinder	3/16: 30 ± 3 ft-lbs 1/4: 30 ± 3 ft-lbs 3/8: 15 ± 2 ft-lbs	3/16: 40 ± 4 Nm 1/4: 40 ± 4 Nm 3/8: 20 ± 3 Nm

**Table 3**

## Pump Output Curves

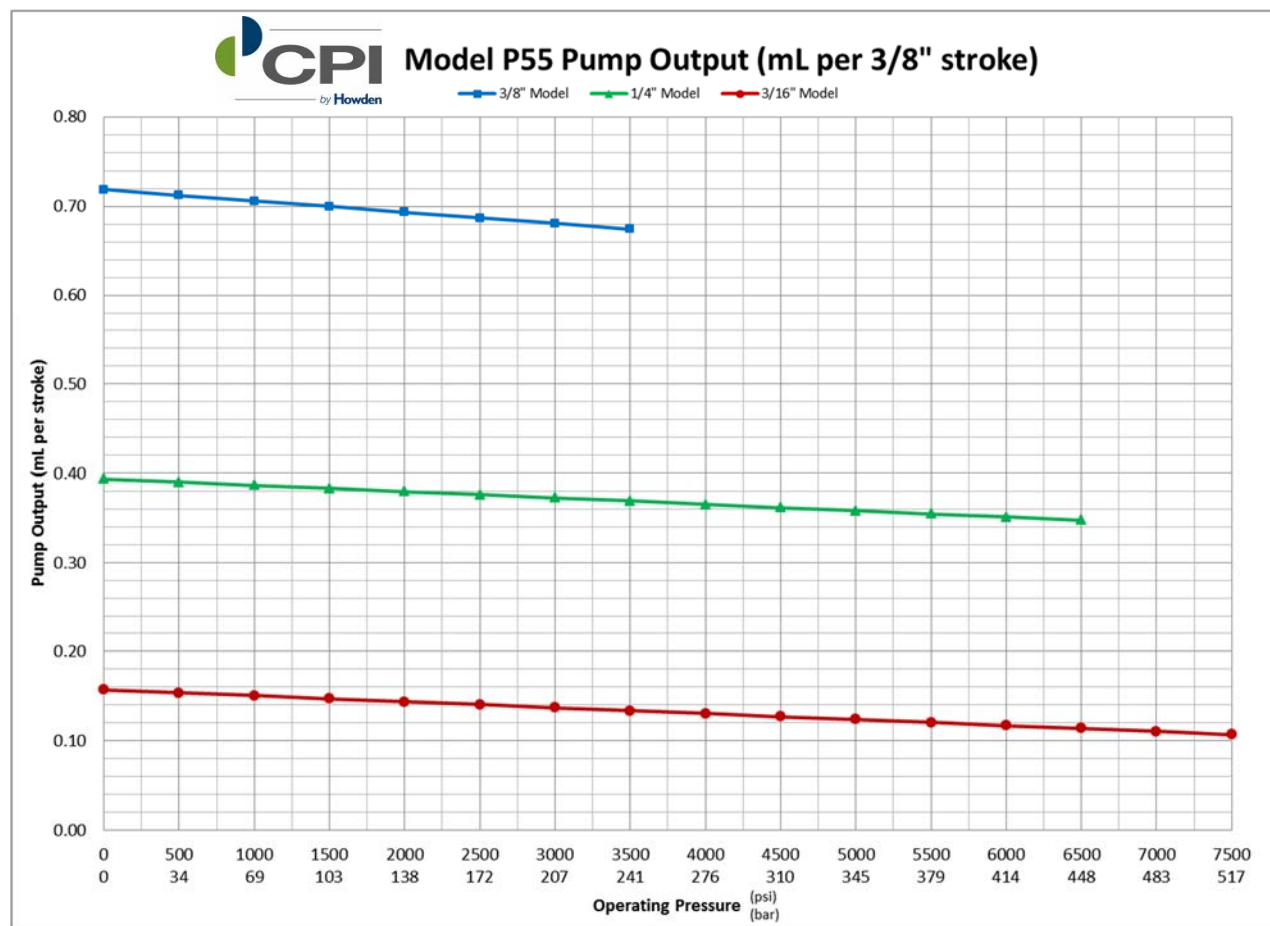


Fig. 8 \*Note: Pump output curves apply to pump models with 65018XXXXXXXXXX part numbers.

P55 pumps meet or exceed the published output curves. Operating and application conditions may impact the lubrication system performance and efficiency. Oil cleanliness and conditions may affect pump life and long-term pump output. Monitor pump performance to develop a preventative maintenance schedule for optimal lubrication system life. Contact CPI for help with troubleshooting or improving the performance of your lubrication system.

## Oil Drop Data

Oil drop size varies based on drip tube size, drip tube shape, oil viscosity, oil temperature, oil flow rate and chamber pressure or vacuum. The CPI pump features a precision drip tube to minimize the variation of drip tube size and shape. The range of oil viscosity, oil temperature and pump oil flow rate (based on camshaft rpm and piston size) provide too many combinations to publish sight glass drops per volumetric output. Table 4 shows the variation of sight glass drops between two oil viscosities and the three pump piston sizes for a fixed camshaft RPM and oil temperature. **When using drop counts to set lubrication rates, the most accurate method is verifying, per the application, the correct dispensed amount of lubricant and the correlating drop count (drops per minute) per pump.** Use Table 5 values for initial calculations. Use the average of multiple pump cycles, when counting drops to set lubrication rates, for a more accurate pump output setting.

**Example of Sight Glass Drop Variation for Two Different Oils and Three CPI Pump Sizes**  
**5 RPM Camshaft, 1000 PSI (69 Bar) Discharge Pressure, 3/8 Cam Lift, 75°F (24°C) Oil Temperature**

	Light Oil (SAE 30W Engine Oil)			Medium Oil (SAE 140 Gear Oil)		
	3/16 Pump	1/4 Pump	3/8 Pump	3/16 Pump	1/4 Pump	3/8 Pump
Drops Per Piston Stroke	4	9	16	3	8	*NA
Drops Per cc / ml	27	24	22	23	22	*NA
Drops Per Liter	27,000	24,000	22,000	23,000	22,000	*NA
Drops Per Pint (USA)	12,776	11,356	10,410	10,883	10,410	*NA

**Table 4** \*Note: 3/8 Pump created a stream of oil where drops could not be distinguished or counted.

**Sight Glass Drops – Values for Initial Oil Calculations**

Per cc / mL	Per Liter	Per Pint
25	25000	11830

**Table 5**

## Calculating Pump Output Capacity

Refer to **Regulating Pump Output**, **Pump Output Curves**, and **Oil Drop Data**. Then use the following equations to calculate pump output:

### Calculations Using mL per Stroke (Typically Pressure Models)

$$\text{Pints Per Day (PPD)} = (\text{mL per stroke}) \times (\text{pump strokes per minute}) \times 3.043$$

$$\text{Liters Per Hour (LPH)} = (\text{mL per stroke}) \times (\text{pump strokes per minute}) \times 0.06$$

### Calculations Using Drop Count (Typically Vacuum and Gravity Models)

$$\text{Pints Per Day (PPD)} = \frac{(\text{drops per minute}) \times 1440}{\text{drops per pint}}$$

$$\text{Liters Per Hour (LPH)} = \frac{(\text{drops per minute}) \times 60}{\text{drops per liter}}$$

### Reference Calculations

$$\text{pump strokes per minute} = \frac{\text{motor speed (rpm)}}{\text{gear ratio}}$$

### Example Calculation

The following example shows how to calculate PPD for a 1/4" pump operating at 3,500 psi with a 1725 rpm electric motor and a 200:1 lubricator gear ratio.

$$\text{Pints Per Day (PPD)} = (\text{mL per stroke}) \times (\text{pump strokes per minute}) \times 3.043$$

$$\text{Pints Per Day (PPD)} = (0.34 \text{ mL per stroke}) \times \left( \frac{1725 \text{ rpm}}{200:1} \right) \times 3.043 = \mathbf{8.92 \text{ PPD}}$$

## Pump Dimensions

Dim.	Description	Inches	Millimeters	Reference
A	Pump Body Length	5.00	127.0	Fig. 9
B	Mounting Hole Spacing (Clearance for 1/4-20 Screw)	4.406	111.9	Fig. 9
C	Pump Body Width	1.39	35.3	Fig. 9
D	Pressure Inlet to Mounting Hole	2.03	51.6	Fig. 9
E	Pump Outlet to Mounting Hole	3.16	80.3	Fig. 9
F	Vacuum Inlet to Mounting Surface	4.75	120.4	Fig. 11
G	Vacuum & Gravity Outlet to Mounting Surface	3.37	85.6	Fig. 11
H	Top of Vacuum & Gravity Pump to Mounting Surface	4.75	119.9	Fig. 11
I	Gravity Banjo Fitting Pivot Point to Mounting Hole	1.63	41.4	Fig. 9
J	Gravity Banjo Fitting Pivot Point to Mounting Surface	0.68	17.1	Fig. 12
K	Banjo Fitting Inlet Height from Banjo Fitting Pivot Point	1.08	27.3	Fig. 12
L	Pressure Inlet to Mounting Surface	1.50	38.1	Fig. 13
M	Pressure Outlet to Mounting Surface	2.65	67.3	Fig. 13

Table 6

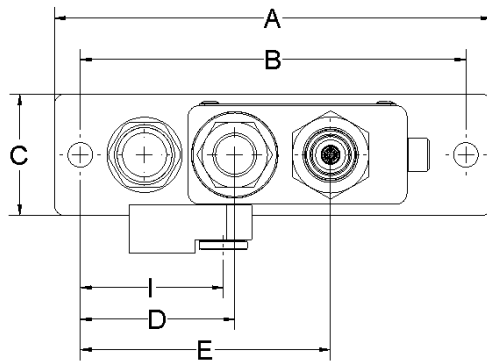


Fig. 9: Pump Top View

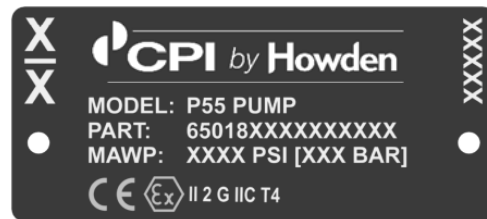


Fig. 10: P55 Pump Tag Example

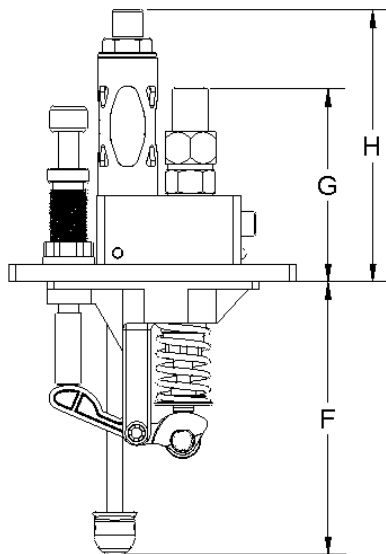


Fig. 11: Vacuum Pump

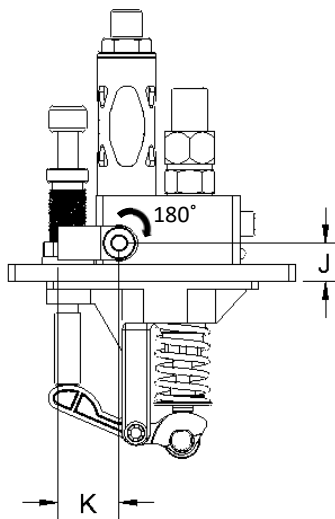


Fig. 12: Gravity Pump

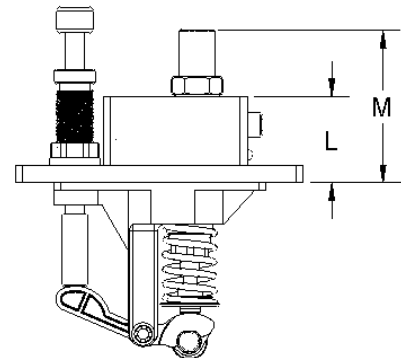


Fig. 13: Pressure Pump

## 8. Troubleshooting

Problem	Cause	Solution
Pump does not flow, or it has low flow	Pump stroke is adjusted to this condition	See <b>Adjusting the Pump</b> . Adjust the pump stroke for desired output.
	Pump is air locked	Bleed trapped air by loosening the purge screw until air free oil flows from purge screw port.
	Oil supply is inadequate	Ensure oil supply is continuous and free of trapped air.
	Oil supply filters or strainers are dirty or clogged	Clean all oil supply filters and strainers. If the pump is equipped with a strainer, check and clean strainer.
	Pump internal check valves are clogged with debris	Flushing the pump with oil to dislodge the debris is rarely successful. Typically, the pump must be replaced. Install adequate oil supply filters to prevent debris from entering the pump.
	Pump outlet lube line is obstructed	Disconnect pump outlet lube line to ensure that the problem is with the pump itself. If the pump outputs adequate oil, the problem could be downstream from the pump.
	Lubricator is not working correctly	Ensure the lubricator is functioning correctly and the cam is in good condition. Any problem that affects the pump rocker arm and piston travel will impact pump output.
Pump is unable to generate desired output pressure	Pump piston and cylinder have excessive wear	If operating conditions or time in service have impacted the precision clearances between the piston and cylinder, the pump could be leaking oil internally or into the lubricator. The piston and cylinder can be replaced, or the pump should be replaced.
	Pump internal check valves are no longer working	Replace pump.
	Issue is related to pump having no flow or low flow	Review all issues related to a pump with no flow or low flow above.
Oil syphons through pump when pump is not operating	Inlet pressure exceeds outlet pressure	Install a check valve downstream of the pump with a cracking pressure higher than the inlet pressure.
Sight glass oil level remains constant, and no drops appear from the drip tube	Pump stroke is incorrectly adjusted	See <b>Adjusting the Pump</b> . Adjust the pump stroke for desired output.
	Camshaft speed is too low	See <b>Pump Specifications</b> for the recommended camshaft speeds. Contact CPI if the application is outside the recommended speed range.
	Pump is air locked	Bleed trapped air by loosening the purge screw until air free oil flows from purge screw port.
	Pump internal check valves are no longer working	Replace pump.
Sight glass oil level runs dry	Leak in sight glass seals resulting in loss of vacuum	Replace sight glass or replace pump.
	Restriction in drip tube or suction tube	Clean pump suction tube strainer. Check suction tube and drip tube for blockage and clean as needed.

Table 7

## 9. Appendix – Pump Output Tables

### 3/16" CPI P55 PUMP MODELS

- ALL VALUES FOR A LUBRICATOR WITH 0.375" CAM LIFT
- MAX PUMP OUTPUT IS 100% OF PISTON STROKE
- MIN PUMP OUTPUT IS 20% OF PISTON STROKE

LOW VISCOSITY OIL (SAE 30W, ISO 100)																
3/16" PUMP DROPS PER CC / ML																
27																
3/16" PUMP DROPS PER LITER																
27,000																
3/16" PUMP DROPS PER USA PINT																
12,776																

MEDIUM VISCOSITY OIL (SAE 140W GEAR OIL, ISO 460)																
3/16" PUMP DROPS PER CC / ML																
23																
3/16" PUMP DROPS PER LITER																
23,000																
3/16" PUMP DROPS PER USA PINT																
10,883																



#### 3/16" PUMP OPERATING AT A LOWER OUTLET PRESSURE (≤ 2000 PSI, 138 BAR)

	CAMSHAFT RPM																
	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
PINTS PER DAY	MAX OUTPUT																
	1.8	2.3	2.7	3.2	3.7	4.1	4.6	5.0	5.5	5.9	6.4	6.8	7.3	7.8	8.2	8.7	9.1
	MIN OUTPUT																
	0.4	0.5	0.5	0.6	0.7	0.8	0.9	1.0	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8	1.9
LITERS PER DAY	MAX OUTPUT																
	0.86	1.08	1.30	1.51	1.73	1.94	2.16	2.38	2.59	2.81	3.02	3.24	3.46	3.67	3.89	4.10	4.32
	MIN OUTPUT																
	0.17	0.22	0.26	0.30	0.35	0.39	0.43	0.48	0.52	0.56	0.60	0.65	0.69	0.73	0.78	0.82	0.86
DROPS PER MINUTE WITH LOW VISCOSITY OIL	MAX OUTPUT																
	16	20	24	28	32	36	40	45	49	53	57	61	65	69	73	77	81
	MIN OUTPUT																
	3	4	5	6	6	7	8	9	10	11	11	12	13	14	15	16	17
DROPS PER MINUTE WITH MEDIUM VISCOSITY OIL	MAX OUTPUT																
	14	17	21	24	28	31	34	38	41	45	48	52	55	59	62	66	69
	MIN OUTPUT																
	3	3	4	5	6	6	7	8	8	9	10	10	11	12	13	14	15
	MAX OUTPUT																
	97	101	105	109	113	117	121	124	127	130	133	136	139	142	145	148	151
	MIN OUTPUT																
	20	21	22	23	23	24	24	25	25	26	26	27	27	28	28	29	30

#### 3/16" PUMP OPERATING AT THE MAXIMUM RATED PRESSURE (7500 PSI, 517 BAR)

	CAMSHAFT RPM																
	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
PINTS PER DAY	MAX OUTPUT																
	1.2	1.5	1.8	2.1	2.4	2.7	3.0	3.3	3.7	4.0	4.3	4.6	4.9	5.2	5.5	5.8	6.1
	MIN OUTPUT																
	0.2	0.3	0.4	0.4	0.5	0.5	0.6	0.7	0.7	0.8	0.9	0.9	1.0	1.0	1.1	1.2	1.3
LITERS PER DAY	MAX OUTPUT																
	0.58	0.72	0.86	1.01	1.15	1.30	1.44	1.58	1.73	1.87	2.02	2.16	2.30	2.45	2.59	2.74	2.88
	MIN OUTPUT																
	0.12	0.14	0.17	0.20	0.23	0.26	0.29	0.32	0.35	0.37	0.40	0.43	0.46	0.49	0.52	0.55	0.58
DROPS PER MINUTE WITH LOW VISCOSITY OIL	MAX OUTPUT																
	11	13	16	19	22	24	27	30	32	35	38	40	43	46	49	51	54
	MIN OUTPUT																
	2	3	3	4	4	5	5	6	6	7	8	8	9	9	10	10	11
DROPS PER MINUTE WITH MEDIUM VISCOSITY OIL	MAX OUTPUT																
	9	11	14	16	18	21	23	25	28	30	32	34	37	39	41	44	46
	MIN OUTPUT																
	2	2	3	3	4	4	5	5	6	6	6	7	7	8	8	9	9
	MAX OUTPUT																
	57	60	62	64	67	69	71	73	75	77	79	81	83	85	87	89	91
	MIN OUTPUT																
	13	13	14	15	16	16	17	18	18	19	20	20	21	21	22	22	23

- OUTPUT VALUES PROVIDED ARE APPLICABLE ONLY TO CPI P55 PUMP MODELS WITH 65018XXXXXXX PART NUMBERS.
- OUTPUT VALUES PROVIDED ARE A REFERENCE TO AID THE DESIGN OF LUBRICATION SYSTEMS AND THE SELECTION OF SYSTEM COMPONENTS.
- THE P55 MODEL PUMP IS A POSITIVE DISPLACEMENT PUMP AND THE OUTPUT VALUES PROVIDED FOR PINTS PER DAY AND LITERS PER DAY REFLECT THE PUMP ACCURACY AND EFFICIENCY.
- CPI RECOMMENDS OPERATING WITHIN THE DEFINED OUTPUT RANGES FOR CONSISTENT AND LONG TERM PERFORMANCE. OPERATING OUTSIDE THESE DEFINED RANGES IS AT THE DISCRETION OF THE END USER.
- OIL DROP COUNT IN A SIGHT GLASS IS NOT A PRECISION MEASUREMENT DUE TO MANY VARIABLES.
- OIL DROP SIZE VARIES BASED ON DRIP TUBE SHAPE, DRIP TUBE DIAMETER, DRIP TUBE SIZE, OIL TEMPERATURE, OIL FLOW RATE, PUMP PISTON SIZE, SIGHT GLASS VACUUM OR PRESSURE LEVELS AMONG OTHER FACTORS.
- THE DROPS PER MINUTE DATA PROVIDED IS BASED ON PRODUCT TESTING AND IS A REFERENCE TO AID THE INSTALLATION AND COMMISSION OF LUBRICATION SYSTEMS.



## 1/4" CPI P55 PUMP MODELS

- ALL VALUES FOR A LUBRICATOR WITH 0.375" CAM LIFT
- MAX PUMP OUTPUT IS 100% OF PISTON STROKE
- MIN PUMP OUTPUT IS 20% OF PISTON STROKE

LOW VISCOSITY OIL (SAE 30W, ISO 100)	
1/4" PUMP DROPS PER CC / ML	24
1/4" PUMP DROPS PER LITER	24,000
1/4" PUMP DROPS PER USA PINT	11,356

MEDIUM VISCOSITY OIL (SAE 140W GEAR OIL, ISO 460)	
1/4" PUMP DROPS PER CC / ML	22
1/4" PUMP DROPS PER LITER	22,000
1/4" PUMP DROPS PER USA PINT	10,410



### 1/4" PUMP OPERATING AT A LOWER OUTLET PRESSURE (≤ 2000 PSI, 138 BAR)

CAMSHAFT RPM	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	
PINTS PER DAY	MAX OUTPUT	4.7	5.9	7.1	8.3	9.5	10.7	11.9	13.1	14.2	15.4	16.6	17.8	19.0	20.2	21.4	22.5	23.7	24.9	26.1	27.3	28.5	29.7	30.9	32.0	33.2	34.4	35.6
	MIN OUTPUT	0.9	1.2	1.4	1.7	1.9	2.1	2.4	2.6	2.8	3.1	3.3	3.6	3.8	4.0	4.3	4.5	4.7	5.0	5.2	5.5	5.7	5.9	6.2	6.4	6.6	6.9	7.1
LITERS PER DAY	MAX OUTPUT	2.25	2.81	3.37	3.93	4.49	5.05	5.62	6.18	6.74	7.30	7.86	8.42	8.99	9.55	10.11	10.67	11.23	11.79	12.36	12.92	13.48	14.04	14.60	15.16	15.72	16.29	16.85
	MIN OUTPUT	0.45	0.56	0.67	0.79	0.90	1.01	1.12	1.24	1.35	1.46	1.57	1.68	1.80	1.91	2.02	2.13	2.25	2.36	2.47	2.58	2.70	2.81	2.92	3.03	3.14	3.26	3.37
DROPS PER MINUTE WITH LOW VISCOSITY OIL	MAX OUTPUT	37	47	56	66	75	84	94	103	112	122	131	140	150	159	168	178	187	197	206	215	225	234	243	253	262	271	281
	MIN OUTPUT	7	9	11	13	15	17	19	21	22	24	26	28	30	32	34	36	37	39	41	43	45	47	49	51	52	54	56
DROPS PER MINUTE WITH MEDIUM VISCOSITY OIL	MAX OUTPUT	34	43	51	60	69	77	86	94	103	112	120	129	137	146	154	163	172	180	189	197	206	214	223	232	240	249	257
	MIN OUTPUT	7	9	10	12	14	15	17	19	21	22	24	26	27	29	31	33	34	36	38	39	41	43	45	46	48	50	51

### 1/4" PUMP OPERATING AT THE MAXIMUM RATED PRESSURE (6500 PSI, 448 BAR)

CAMSHAFT RPM		4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
PINTS PER DAY	MAX OUTPUT	4.1	5.2	6.2	7.2	8.3	9.3	10.3	11.4	12.4	13.5	14.5	15.5	16.6	17.6	18.6	19.7	20.7	21.7	22.8	23.8	24.8	25.9	26.9	27.9	29.0	30.0	31.0
	MIN OUTPUT	0.8	1.0	1.2	1.4	1.7	1.9	2.1	2.3	2.5	2.7	2.9	3.1	3.3	3.5	3.7	3.9	4.1	4.3	4.6	4.8	5.0	5.2	5.4	5.6	5.8	6.0	6.2
LITERS PER DAY	MAX OUTPUT	1.96	2.45	2.94	3.43	3.92	4.41	4.90	5.39	5.88	6.36	6.85	7.34	7.83	8.32	8.81	9.30	9.79	10.28	10.77	11.26	11.75	12.24	12.73	13.22	13.71	14.20	14.69
	MIN OUTPUT	0.39	0.49	0.59	0.69	0.78	0.88	0.98	1.08	1.18	1.27	1.37	1.47	1.57	1.66	1.76	1.86	1.96	2.06	2.15	2.25	2.35	2.45	2.55	2.64	2.74	2.84	2.94
DROPS PER MINUTE WITH LOW VISCOSITY OIL	MAX OUTPUT	33	41	49	57	65	73	82	90	98	106	114	122	131	139	147	155	163	171	180	188	196	204	212	220	228	237	245
	MIN OUTPUT	7	8	10	11	13	15	16	18	20	21	23	24	26	28	29	31	33	34	36	38	39	41	42	44	46	47	49
DROPS PER MINUTE WITH MEDIUM VISCOSITY OIL	MAX OUTPUT	30	37	45	52	60	67	75	82	90	97	105	112	120	127	135	142	150	157	165	172	180	187	194	202	209	217	224
	MIN OUTPUT	6	7	9	10	12	13	15	16	18	19	21	22	24	25	27	28	30	31	33	34	36	37	39	40	42	43	45

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- OIL DROP COUNT IN A SIGHT GLASS IS NOT A PRECISION MEASUREMENT DUE TO MANY VARIABLES.
- OIL DROP SIZE VARIES BASED ON DRIP TUBE SHAPE, DRIP TUBE DIAMETER, DRIP TUBE SIZE, OIL VISCOSITY, OIL TEMPERATURE, OIL FLOW RATE, PUMP PISTON SIZE, SIGHT GLASS VACUUM OR PRESSURE LEVELS AMONG OTHER FACTORS.
- THE DROPS PER MINUTE DATA PROVIDED IS BASED ON PRODUCT TESTING AND IS A REFERENCE TO AID THE INSTALLATION AND COMMISSION OF LUBRICATION SYSTEMS.

## 3/8" CPI P55 PUMP MODELS

- ALL VALUES FOR A LUBRICATOR WITH 0.375" CAM LIFT
- MAX PUMP OUTPUT IS 100% OF PISTON STROKE
- MIN PUMP OUTPUT IS 20% OF PISTON STROKE

LOW VISCOSITY OIL (SAE 30W, ISO 100)	
3/8" PUMP DROPS PER CC / ML	22
3/8" PUMP DROPS PER LITER	22,000
3/8" PUMP DROPS PER USA PINT	10,410

MEDIUM VISCOSITY OIL (SAE 140W GEAR OIL, ISO 460)	
3/8" PUMP DROPS PER CC / ML	N/A*
3/8" PUMP DROPS PER LITER	N/A*
3/8" PUMP DROPS PER USA PINT	N/A*



### 3/8" PUMP OPERATING AT A LOWER OUTLET PRESSURE (≤ 2000 PSI, 138 BAR)

		4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30		
CAMSHAFT RPM																														
PINTS PER DAY	MAX OUTPUT	8.6	10.8	13.0	15.1	17.3	19.4	21.6	23.8	25.9	28.1	30.2	32.4	34.6	36.7	38.9	41.1	43.2	45.4	47.5	49.7	51.9	54.0	56.2	58.3	60.5	62.7	64.8		
	MIN OUTPUT	1.7	2.2	2.6	3.0	3.5	3.9	4.3	4.8	5.2	5.6	6.0	6.5	6.9	7.3	7.8	8.2	8.6	9.1	9.5	9.9	10.4	10.8	11.2	11.7	12.1	12.5	13.0		
LITERS PER DAY	MAX OUTPUT	4.09	5.11	6.13	7.16	8.18	9.20	10.22	11.25	12.27	13.29	14.31	15.34	16.36	17.38	18.40	19.43	20.45	21.47	22.49	23.52	24.54	25.56	26.58	27.60	28.63	29.65	30.67		
	MIN OUTPUT	0.82	1.02	1.23	1.43	1.64	1.84	2.04	2.25	2.45	2.66	2.86	3.07	3.27	3.48	3.68	3.89	4.09	4.29	4.50	4.70	4.91	5.11	5.32	5.52	5.73	5.93	6.13		
DROPS PER MINUTE WITH LOW VISCOSITY OIL	MAX OUTPUT	62	78	94	109	125	141	156	172	187	203	219	234	250	266	281	297	312	328	344	359	375	390	406	422	437	453	469		
	MIN OUTPUT	12	16	19	22	25	28	31	34	37	41	44	47	50	53	56	59	62	66	69	72	75	78	81	84	87	91	94		
DROPS PER MINUTE WITH MEDIUM VISCOSITY OIL	MAX OUTPUT	* THE 3/8" PUMP WITH MEDIUM VISCOSITY OIL CREATED A STREAM OF OIL WHERE DROPS COULD NOT BE DISTINGUISHED OR COUNTED.																												
	MIN OUTPUT																													

### 3/8" PUMP OPERATING AT THE MAXIMUM RATED PRESSURE (3500 PSI, 241 BAR)

CAMSHAFT RPM	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30		
PINTS PER DAY	MAX OUTPUT	8.0	10.0	12.1	14.1	16.1	18.1	20.1	22.1	24.1	26.1	28.1	30.1	32.1	34.1	36.2	38.2	40.2	42.2	44.2	46.2	48.2	50.2	52.2	54.2	56.2	58.2	60.3	
	MIN OUTPUT	1.6	2.0	2.4	2.8	3.2	3.6	4.0	4.4	4.8	5.2	5.6	6.0	6.4	6.8	7.2	7.6	8.0	8.4	8.8	9.2	9.6	10.0	10.4	10.8	11.2	11.6	12.1	
LITERS PER DAY	MAX OUTPUT	3.80	4.75	5.70	6.65	7.60	8.55	9.50	10.45	11.40	12.36	13.31	14.26	15.21	16.16	17.11	18.06	19.01	19.96	20.91	21.86	22.81	23.76	24.71	25.66	26.61	27.56	28.51	
	MIN OUTPUT	0.76	0.95	1.14	1.33	1.52	1.71	1.90	2.09	2.28	2.47	2.66	2.85	3.04	3.23	3.42	3.61	3.80	3.99	4.18	4.37	4.56	4.75	4.94	5.13	5.32	5.51	5.70	
DROPS PER MINUTE WITH LOW VISCOSITY OIL	MAX OUTPUT	58	73	87	102	116	131	145	160	174	189	203	218	232	247	261	276	290	305	319	334	348	363	377	392	407	421	436	
	MIN OUTPUT	12	15	17	20	23	26	29	32	35	38	41	44	46	49	52	55	58	61	64	67	70	73	75	78	81	84	87	
DROPS PER MINUTE WITH MEDIUM VISCOSITY OIL	MAX OUTPUT	* THE 3/8" PUMP WITH MEDIUM VISCOSITY OIL CREATED A STREAM OF OIL WHERE DROPS COULD NOT BE DISTINGUISHED OR COUNTED.																											
	MIN OUTPUT																												

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- OIL DROP COUNT IN A SIGHT GLASS IS NOT A PRECISION MEASUREMENT DUE TO MANY VARIABLES.
- OIL DROP SIZE VARIES BASED ON DRIP TUBE SHAPE, DRIP TUBE DIAMETER, DRIP TUBE SIZE, PUMP PISTON SIZE, SIGHT GLASS VACUUM OR PRESSURE LEVELS AMONG OTHER FACTORS.
- THE DROPS PER MINUTE DATA PROVIDED IS BASED ON PRODUCT TESTING AND IS A REFERENCE TO AID THE INSTALLATION AND COMMISSION OF LUBRICATION SYSTEMS.

## 10. Contact Information



**For further technical support please contact:**

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