LEE IMH VENT VALVE - 558 SERIES INSERT

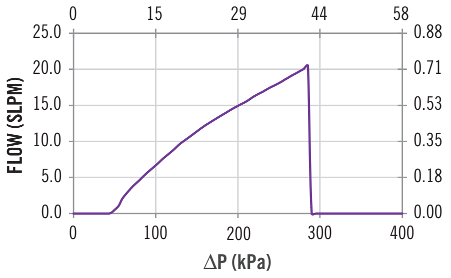
The Lee Company introduces the new 558 Series Vent Valve, specifically designed to remove trapped air in hydraulic systems. Air can become trapped in a hydraulic system during an initial green run, a key off event, or after maintenance or repair. This air can interfere with system startup/priming, cause slower system reaction times or a “spongy feel”, or produce NVH (noise, vibration, harshness) problems. Traditionally, trapped air was removed by hand bleeding the system or by drilling a hole in the manifold to allow the air to escape back to the sump. However, hand bleeding the system results in downtime and reduced productivity, and the drilled hole method allows hydraulic fluid to continuously flow out of the system, causing significant hydraulic losses, inefficient system performance, and wasted energy. Modern technology is pushing for higher system efficiencies, greater productivity, and reduced weight and size which makes eliminating these losses more critical.

Our new 558 Series Vent Valve is a novel solution for removing trapped air while minimizing hydraulic losses. The vent valve is a normally closed valve which prohibits air from being drawn back into a system during shutdown. During startup, the system pressure increases and opens the vent valve, allowing any trapped air to start venting. The valve then closes as the system approaches its operating pressure, which eliminates further hydraulic losses. Our unique solution for removing this unwanted air will enable system designers to optimize system component sizing, leading to improved efficiencies, reduced weight, and lower costs.

The new vent valve’s compact size, superior performance, and ease of installation make it ideal for high-volume applications in automotive, off-road, and other industrial hydraulic systems.

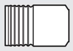
ΔP vs. Flow on Air

Typical Flow Curve for 290 kPa Valve



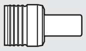
- Vents Flow Over a Specific Pressure Differential
  - Eliminates Trapped Air
  - Improves System Efficiencies
  - Eliminates Wasted Energy
- Integral Safety Screen
  - Blocks Rogue Contamination
  - Ensures Reliability
  - Simplifies Assembly
- All Stainless Steel Construction
  - Compatible with Most Fluids
- Forward and Reverse Flow Versions
  - Design Flexibility

ACTUAL SIZE
Vent Reverse



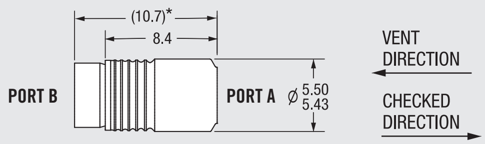
(As Installed)

ACTUAL SIZE
Vent Forward

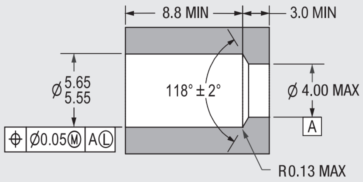


(As Installed)

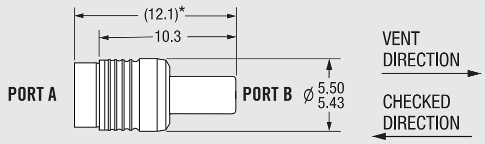
VENT VALVE REVERSE FLOW



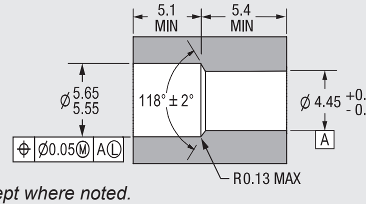
REVERSE INSTALLATION HOLE



VENT VALVE FORWARD FLOW



FORWARD INSTALLATION HOLE



**LOA before installation. All dimensions in millimeters, except where noted.*

FLOW / VENT DIRECTION	PART NUMBER	CRACKING / OPENING PRESSURE	VALVE FLOW POINT			SHUT OFF PRESSURE
			MIN. FLOW (SLPM) REF.	AT (kPa)	MAX. LOHM* RATE	
REVERSE	CCVR5530120S	10 ± 5 kPa (1.5 ± 0.7 psid)	5	60 ±10	1100	120 ± 30 kPa (17.4 ± 4.4 psid)
	CCVR5530290S	50 ± 30 kPa (7.3 ± 4.4 psid)	10	200 ±10		290 ± 60 kPa (42.1 ± 8.7 psid)
	CCVR5530540S	100 ± 30 kPa (14.5 ± 4.4 psid)	17	400 ±10		540 ± 120 kPa (78.3 ± 17.4 psid)
FORWARD	CCVF5530120S	10 ± 5 kPa (1.5 ± 0.7 psid)	5	60 ±10		120 ± 30 kPa (17.4 ± 4.4 psid)
	CCVF5530290S	50 ± 30 kPa (7.3 ± 4.4 psid)	10	200 ±10		290 ± 60 kPa (42.1 ± 8.7 psid)
	CCVF5530540S	100 ± 30 kPa (14.5 ± 4.4 psid)	17	400 ±10		540 ± 120 kPa (78.3 ± 17.4 psid)

**Lohm is a measure of flow resistance. See reverse for more information.*

PERFORMANCE

- Valves are normally closed. Vent flow is from Port A to Port B over a specified pressure range (from the cracking/opening pressure to the shut off pressure range).
- Cracking/opening pressure is the pressure at which vent flow begins.
- Shut off pressure is the pressure at which the valve closes, stopping vent flow.
- Maximum working pressure: 28 MPa (4060 psid) (checked direction)
  4 MPa (580 psid) (vent direction)
- Materials: Stainless steel • Screen size: 125 micron absolute • All flows specified on air.

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THE LEE COMPANY

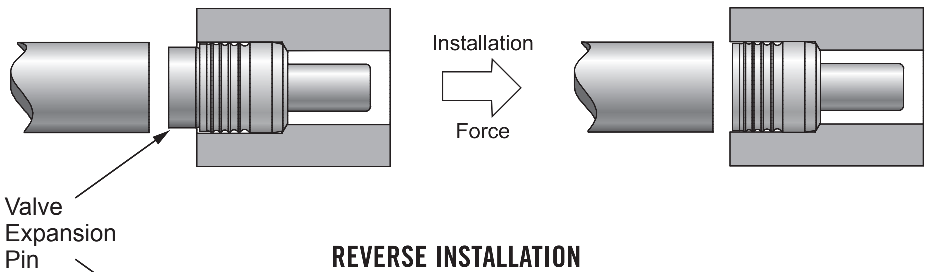
LEE IMH VENT VALVE - 558 SERIES INSERT

SIMPLE TO INSTALL

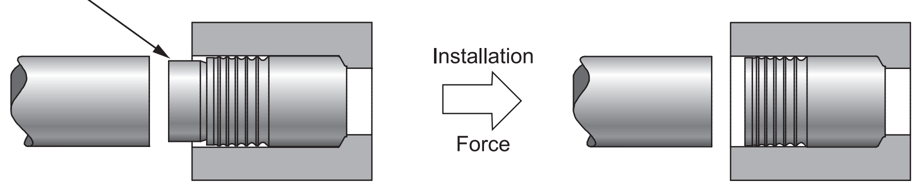
The new vent valve uses our field-proven Lee Insert Principle that provides secure retention and eliminates the need for threads or O-rings. To install, simply insert the vent valve into a drilled installation hole, as shown. Drive the expansion pin flush to within 0.25 mm (0.010 of an inch) above flush of the insert body to seal and lock the component in place.

Use a maximum installation force of 625 KgF (1380 lbs. force). The installation tool can bottom on the insert body with no consequence. Lee Installation Tool part number CCRT0900120S is available. For more information contact your local Lee Sales Engineer.

FORWARD INSTALLATION



REVERSE INSTALLATION



LOHM LAWS (Gases)

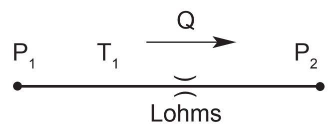
Every engineer will be interested in our simple system of defining the fluid resistance of Lee hydraulic components. Just as the Ohm is used in the electrical industry, we find that we can use a liquid Ohm or "Lohm" to good advantage on all hydraulic computations.

The Lohm Laws extend the definition of Lohms for gas flow at any pressure and temperature, and with any gas. The formulas work well for all gases because they are corrected for the specific gas, and for the flow region and incompressibility of low pressure gases.

The Lohm has been selected so that a 100 Lohm restriction will permit a flow of 250 standard liters per minute of nitrogen at a temperature of 59°F, and an upsteam pressure of 90 psia discharging to atmosphere.

$$L = \frac{K f_T P_1}{Q}$$ (Sonic region) i.e. $P_1 / P_2 \geq 1.9$

$$L = \frac{2 K f_T \sqrt{\Delta P \, P_2}}{Q}$$ (Subsonic region) i.e. $P_1 / P_2 < 1.9$



GAS FLOW – UNITS CONSTANT K

To eliminate the need to convert pressure and flow parameters into specific units such as "psia" and "std L/min.", the table below lists values of the Units Constant "K", which is used in the Gas Flow Lohm Formulas:

VOLUMETRIC FLOW UNITS							
Abs. Pres	psia			Bar		kPa	mm. Hg
Flow	SLPM	SCFM	in³/min	SLPM	SCFM	SLPM	mL/min
He	771	27.2	47,100	11,200	395	112	14,900
N_2	276	9.73	16,800	4000	141	40.0	5330
Air	271	9.56	16,500	3930	139	39.3	5230
O_2	257	9.08	15,700	3730	132	37.3	4970
CO_2	213	7.52	13,000	3090	109	30.9	4110

For more information on Lohms, contact your local Lee Sales Engineer or visit us at www.leeimh.com.

NOMENCLATURE

- L = Lohms
- K = Units constant – gas (see chart on left)
- f_T = Temperature correction factor
- P_1 = Upstream absolute pressure
- P_2 = Downstream absolute pressure
- Q = Gas flow rate
- ΔP = $P_1 - P_2$

1. Compute the P_1 / P_2 pressure ratio.
2. Select the correct formula for the flow region.
3. Look up the value of "K" for the gas.
4. Determine the temperature correction factor, " f_T".
   f_T = 1.0 at room temperature (70°F)

$$f_T = \sqrt{\frac{530}{T\,(°F) + 460}}$$

5. Use the formula to solve for the unknown.

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