LEE IMH 5.5mm AIR BLEED ORIFICE

The Lee Company's Industrial Hydraulics Group (IMH) introduces the newest solution to the problem of removing trapped air in hydraulic systems with the introduction of our 5.5mm Air Bleed Orifice. Trapped air in hydraulic systems can cause issues with performance as air is compressible, whereas hydraulic fluid is not. Trapped air causes slower system reaction times or a "spongy feel". The traditional way to remove trapped air is to drill a small hole, approximately ø 0.5 mm, in the manifold allowing this air to escape back to the sump, eliminating its effect on system performance. This drilled hole also allows hydraulic fluid to flow out of the system resulting in significant hydraulic loss, inefficient system performance and wasted energy. In today's environment, technology is pushing for higher system efficiencies, reduced weight and size, and increases in system pressures. This makes reducing these system losses even more critical.

Our new Air Bleed Orifice is a novel solution to removing this trapped air while keeping hydraulic losses to a minimum. The Air Bleed utilizes a small precision flow orifice, with an integrated 25 µm safety screen for contamination protection, that allows trapped air to escape. It is small enough to restrict most hydraulic fluid from passing, minimizing system losses. The reduction in system losses enables designers to optimize system component sizing, leading to improved efficiencies, reduction in weight and lower costs.

The new Air Bleed'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.

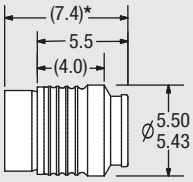
- 100% Flow Tested
  - – Consistent Performance
- Integral Safety Screens
  - – Ensures Reliability
- Small Precision Flow Orifice
  - – Removes Trapped Air
  - – Reduces System Losses by up to 99%

ACTUAL SIZE

Forward (As Installed)

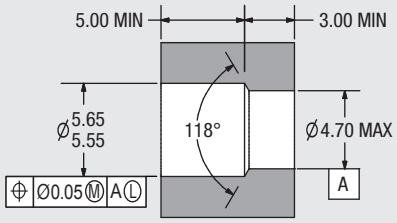
Reverse (As Installed)

AIR BLEED FORWARD FLOW

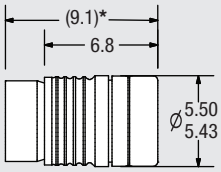


METERED FLOW DIRECTION

INSTALLATION HOLE

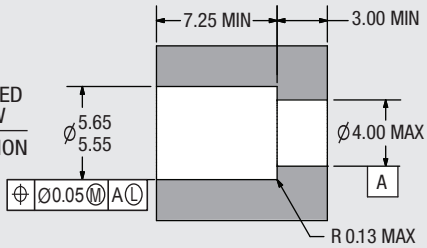


AIR BLEED REVERSE FLOW



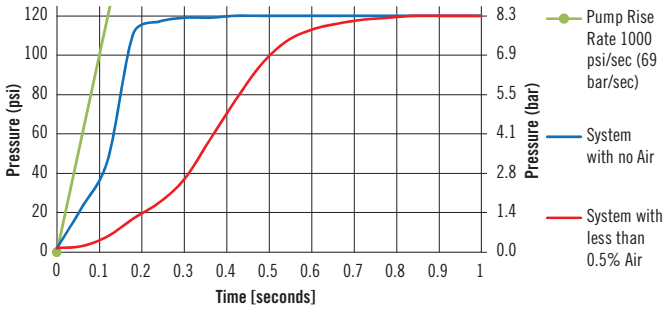
METERED FLOW DIRECTION

INSTALLATION HOLE



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

EXAMPLE OF A HYDRAULIC SYSTEM'S REACTION TIME
With and Without Trapped Air



CALCULATED HYDRAULIC LOSS			
PRESSURE (Bar)	0.5mm DRILLED HOLE (~ml/min)	100,000 LOHM† MODEL (ml/min)	180,000 LOHM† MODEL (ml/min)
5	350	6.3	3.5
10	500	9.4	5.2
20	700	13.5	7.5
40	1000	19.5	10.9

All flows specified on hydraulic fluid at 80°F.

The chart above shows the difference in the hydraulic loss at different pressures between Lee's Air Bleed Orifices vs. a drilled hole.

FLOW DIRECTION	PART NUMBER	LOHM RATE
Reverse	RHGR4030100S	100,000
	RHGR4030180S	180,000
Forward	RHGF4030100S	100,000
	RHGF4030180S	180,000

† *Lohm is a measure of flow resistance. See back page for more information.*

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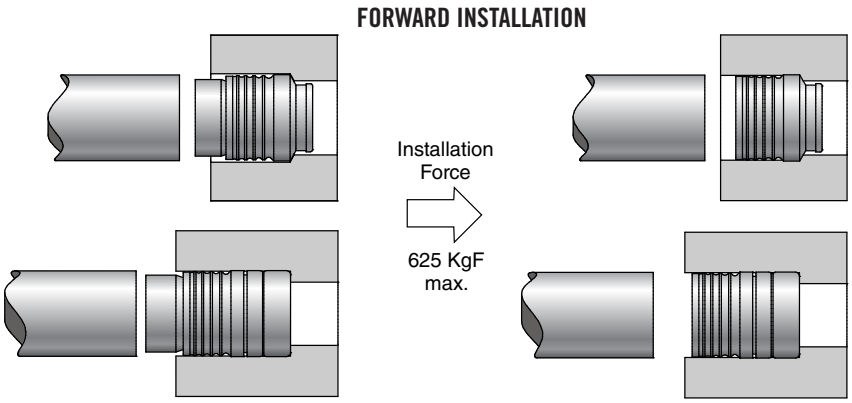
LEE IMH 5.5mm AIR BLEED ORIFICE

SIMPLE TO INSTALL

Simple to install, the new Air Bleed Orifice uses Lee's field-proven insert principle that provides secure retention and eliminates the need for threads or O-rings. To install, simply insert the Air Bleed into a drilled installation hole. Drive the expansion pin flush to within 0.25mm (0.010") above flush of the Orifice body to seal and lock the component in place. Use a maximum installation force of 625 KgF (1,380 lbs. force). The installation tool can bottom on the insert body with no consequence. Lee Installation Tool part number CCRT0900120S is available.



LOHM LAWS (Liquids)

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.

When using the Lohm system, you can forget about coefficients of discharge and dimensional tolerances on drilled holes. These factors are automatically compensated for in the Lohm calculations, and confirmed by testing each component to establish flow tolerances. The resistance to flow of any fluid control component can be expressed in Lohms.

The Lohm has been selected so that a 1 Lohm restriction will permit a flow of 100 gallons per minute of water with a pressure drop of 25 psi at a temperature of 80° F.

LIQUID FLOW FORMULA

The following formulas are presented to extend the use of the Lohm laws to many different liquids, operating over a wide range of pressure conditions.

These formulas introduce compensation factors for liquid density and viscosity. They are applicable to any liquid of known properties, with minimum restrictions on pressure levels or temperature.

The units constant (K) eliminates the need to convert pressure and flow parameters to special units.

Volumetric Flow Units $L = \frac{KV}{I}\sqrt{\frac{H}{S}}$

Gravimetric Flow Units $L = \frac{KV}{w}\sqrt{HS}$

NOMENCLATURE

- L = Lohms
- S = Specific gravity*
- H = Differential pressure
- V = Viscosity compensation factor**
- I = Liquid flow rate: Volumetric
- w = Liquid flow rate: Gravimetric
- K = Units Constant – Liquid (see chart below)
- *S = 1.0 for water at 80°F.
- **V = 1.0 for water at 80°F.

(For other fluids and temperatures, contact your Lee Sales Engineer or visit us at www.leeimh.com).

LIQUID FLOW – UNITS CONSTANT K

VOLUMETRIC FLOW UNITS

	Pressure Units		
Flow Units	psi	bar	kPa
GPM	20	76.2	7.62
L/min	75.7	288	28.8
ml/min	75700	288000	28800
in^3/min	4620	17600	1760

GRAVIMETRIC FLOW UNITS

	Pressure Units		
Flow Units	psi	bar	kPa
PPH	10000	38100	3810
gm/min	75700	288000	28800

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