



NFPA Style Hydraulic Rod Clamps
RCH SERIES ROD LOCKS



FEATURES AND BENEFITS

The AMLOK® Rod Clamp has been developed to provide power-off clamping of rods and shafts. The type RCH Rod Clamps are actuated by a spring/collet mechanism and unclamped by hydraulic pressure. These rod clamps are designed to clamp components after the motion has stopped and to hold the position securely as long as the forces do not exceed the table values. For braking applications, contact the factory.

For air applications, call or visit www.ame.com for a pneumatic AMLOK® RLN catalog.

When the potential for personal injury exists, or when life is in danger, SITEMA Safety Catchers are to be used. SITEMA catalogs are available upon request.

The mountings of the RCH AMLOK® Rod Clamp have been designed to apply to standard heavy duty NFPA-style MF1 cylinders. The standard housing can be mounted to any machine structure or be custom-designed to suit your application.

FUNCTION

The AMLOK® Rod Clamp consists of an alloy steel housing containing a special locking mechanism actuated by a set of disc springs. The clamp is unlocked when hydraulic pressure actuates a piston that compresses the disc springs, and releases the locking device.

Since the locking of the AMLOK® Rod Clamp is accomplished mechanically and unlocked by hydraulic pressure, loss of hydraulic pressure to the rod clamp will cause the unit to lock.

The holding force depends upon the rod diameter

and the amount of hydraulic pressure (PSI) available for unclamping. The AMLOK® is preset at the factory to release at the specified hydraulic pressure. The available holding forces are listed in the Technical Data chart and can be multiplied by adding additional AMLOK® clamps to the same rod. Also, special SITEMA Safety Catchers and Locking Units can be provided to suit your needs.

AMLOK® Rod Clamps are designed for locking reciprocating motions only. Special units are also available for both rotating and reciprocating motions.

APPLICATION GUIDELINES

When attached to cylinders, longer cylinder rods must be specified. The AMLOK® Rod Clamp requires a full rod diameter for the entire length "L" of the clamp. Add a minimum of "L" length for a Rod Extension to allow for the length of the AMLOK®.

Recommended rod tolerances are cited in the Technical Data chart. Shafts consisting of commercial hard-chrome plated, polished rods are recommended. If the shaft has to support extreme stresses, e.g. in case of frequent switching operations, braking out of the movement, releasing under load or exposure to dirt, a hardened surface is necessary. If only securing the shaft (without relative movement in clamped condition) is required, an ordinary steel shaft will be sufficient.

The contact surfaces and bores to which the AMLOK® is clamped must be square and concentric to each other to avoid binding of the rod or excess wear. AMLOK® Rod Clamps can be an integral part of your housing. We can provide mating components for your special applications.

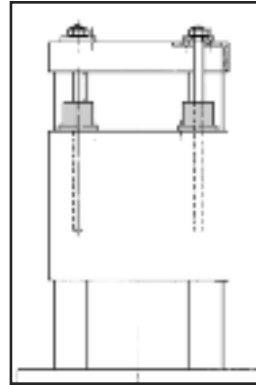
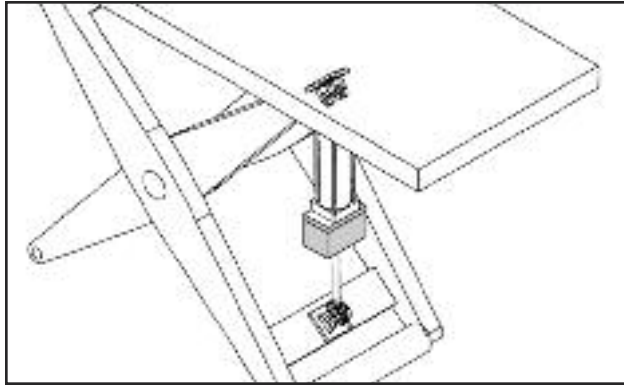
The AMLOK® is designed for zero side loads. When side loads are acting on the cylinder rod, make sure that the rod is guided sufficiently in bearings to avoid side loads on the locking mechanism. This is especially important at higher cylinder rod speeds to avoid overheating the clamping device due to excessive friction with the rod.

AMLOK® Rod Clamps type RCH have provisions to mount one proximity switch to indicate "unlocked" condition. Please see page 7 for specifications.

Each AMLOK® Rod Clamp is tested by Advanced Machine. Test results are available upon request.

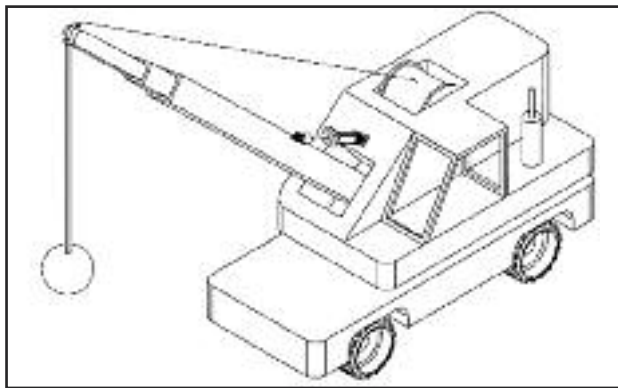
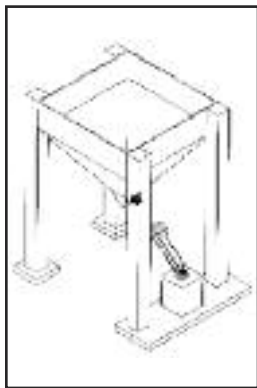
When properly applied, the AMLOK RCH units are warranted to be free from defects of materials and workmanship for a period of one (1) year from date of shipment or one (1) million cycles, whichever comes first.

APPLICATIONS



CLAMP/UNCLAMP RESPONSE TIME

The AMLOK® clamps in 100msec and unclamps in 100msec, for a total cycle time of 200msec. These response times were calculated with a fast response solenoid valve located at the lock port and zero back pressure.



MAXIMUM CYCLES PER SECOND

Theoretically, an AMLOK® Rod Clamp can cycle five times per second. However, since an AMLOK® is designed to average one million cycles, frequent and repetitive cycling will reach 1,000,000 cycles in a shorter time.

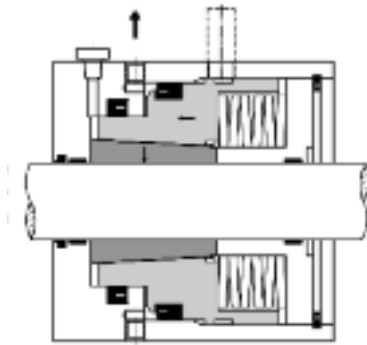
1. Lift table lock & hold in case of loss of hydraulic pressure, hose breakage, etc.
2. Lock & hold platen or machine component in position in case of hydraulic pressure loss, "E" stop, etc.
3. Lock & hold gate valve in position.
4. Lock & hold a boom in case of loss of hydraulic pressure, hose breakage, etc.

OTHER APPLICATIONS INCLUDE

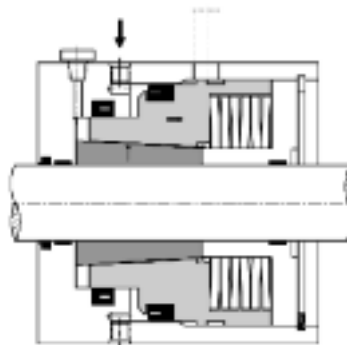
- > Injection molding machines
- > Hydraulic presses
- > Amusement equipment
- > Theatrical equipment (platforms)
- > Paper handling equipment
- > Machine tools; presses, vertical heads, rams, platforms
- > Fixturing (machine tools)
- > Automation equipment
- > Anti-drift applications
- > Scissors lift tables
- > Printing equipment
- > Heavy-duty earth moving equipment
- > Industrial processing equipment
- > Mining applications
- > Municipal vehicles and equipment; i.e. public works, fire, gas, electric, and cable vehicles
- > Locking spherical valves in piston hydro power generating plants
- > Any application where holding the cylinder in place is desirable
- > Positioning; height adjustment of winch installations and rollers; securing of adjusting drives; holding of solenoids, piston rods, and spacers

TECHNICAL DATA

HOW AMLOK® TYPE RCH ROD CLAMP WORKS

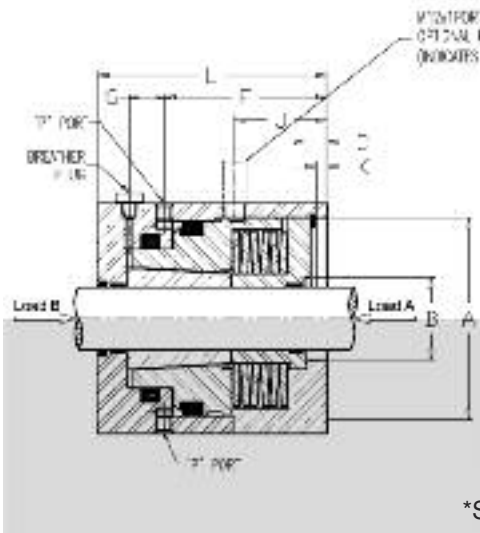


CLAMPED
> Hydraulic pressure off

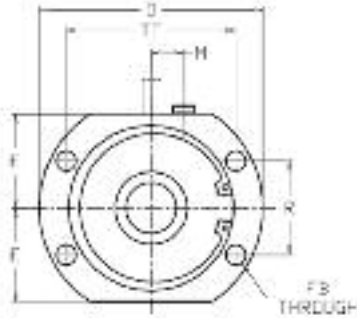


UNCLAMPED
> Hydraulic pressure at minimum
> Release pressure not

FOR HEAD RECTANGULAR FLANGE MOUNT (NFPA MF1 OR MF5)



Note: Contact Advanced Machine for other mounting styles.

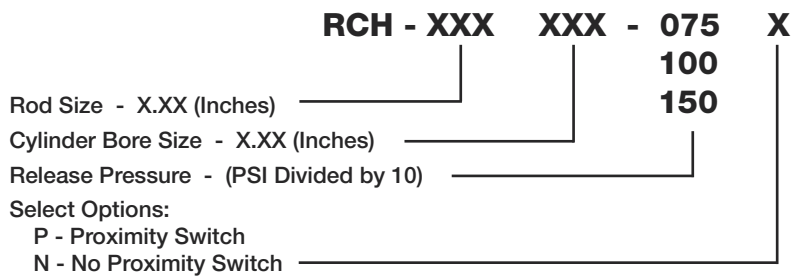


Style for sizes .885 x 1.50 through 2.00 x 5.00

*Shaded areas 3.00 x 7.00 sizes and larger.

AMLOK® - Oil Volume			Weight	AMLOK® - Oil Volume			Weight
Part Number	volume to cycle			Part Number	volume to cycle		
	cm ³	in ³	cm ³		in ³		
RCH-.062 X 1.50	6	0.4	11.5	RCH-1.75 X 3.25	30	1.8	65.1
RCH-1.00 X 1.50	6	0.4	10.5	RCH-1.75 X 4.00	39	2.4	75.5
RCH-1.00 X 2.00	16	1.0	20.8	RCH-2.00 X 5.00	39	2.4	114.0
RCH-1.00 X 2.50	16	1.0	31.0	RCH-2.50 X 6.00	129	7.9	270.0
RCH-1.37 X 2.00	10	0.6	20.0	RCH-3.00 X 7.00	145	8.8	380.0
RCH-1.37 X 2.50	16	1.0	30.2	RCH-3.50 X 8.00	181	11.0	550.0
RCH-1.37 X 3.25	30	1.8	66.0	RCH-4.00 X 8.00	230	14.0	530.0

ORDERING INSTRUCTIONS



Example: RCH - 100 250 - 150 N

1.00" Rod - 2.50" Cylinder Bore
1500 PSI Release Pressure
No Proximity Switch

*Movement in Load A direction is zero.
Movement in Load B direction is .012" maximum when clamp is fully locked.*

TECHNICAL DATA

Rod Dia. ²	Rod Dia. Tolerance ³	Cylinder Bore	AMLOK® Part No.	Min. Release Pressure	Max. Holding	D ±.03	L ±.03	E ±.015	R ±.005	TF ±.005	FB ±.015	B ±.015	A ±.015	K ±.015	C ±.03	F ±.03	G ±.03	J ±.03	M ±.03	Port
.625	+.000 -.003	1.50	062 150-075	750	1100	4.37	3.55	1.63	1.625	3.437	.44	1.25	2.48	.23	.38	2.13	.75	.79	.78	SAE 4
			062 150-100	1000	1800															
			062 150-150	1500	2250															
1.000	+.000 -.003	1.50	100 150-075	750	1200	4.37	3.45	1.75	1.625	3.437	.44	1.63	2.76	.23	.50	1.88	.87	.79	.78	SAE 4
			100 150-100	1000	2000															
			100 150-150	1500	2300															
1.000	+.000 -.003	2.00	100 200-075	750	2900	5.37	4.37	2.25	2.050	4.125	.56	1.63	3.74	.23	.35	2.90	.85	1.00	0	SAE 4
			100 200-100	1000	5200															
			100 200-150	1500	5600															
1.000	+.000 -.003	2.50	100 250-075	750	2900	5.98	5.12	2.50	2.550	4.625	.56	1.63	4.13	.23	.50	3.40	1.00	1.50	0	SAE 4
			100 250-100	1000	5200															
			100 250-150	1500	6000															
1.375	+.000 -.003	2.00	137 200-075	750	2700	5.37	4.65	2.25	2.050	4.125	.56	2.13	3.74	.23	.50	3.00	1.00	1.50	0	SAE 4
			137 200-100	1000	2700															
			137 200-150	1500	5200															
1.375	+.000 -.003	2.50	137 250-075	750	2700	5.98	5.12	2.50	2.550	4.625	.56	2.13	4.13	.23	.50	3.50	.90	1.50	0	SAE 4
			137 250-100	1000	5200															
			137 250-150	1500	6000															
1.375	+.000 -.003	3.25	137 325-075	750	8200	7.75	6.50	3.25	3.250	5.875	.69	2.13	5.70	.28	.45	4.50	1.10	2.60	0	SAE 4
			137 325-100	1000	11500															
			137 325-150	1500	16000															
1.750	+.000 -.003	2.50	175 250-075	750	3500	6.00	5.91	2.50	2.55	4.630	.56	2.38	4.33	.32	.70	3.90	.96	2.44	.78	SAE 4
			175 250-120	1200	5200															
			175 250-200	2000	7500															
1.750	+.000 -.003	3.25	175 325-075	750	8200	7.75	6.50	3.25	3.250	5.875	.69	2.50	5.70	.30	.63	4.67	.93	2.60	0	SAE 4
			175 325-100	1000	11500															
			175 325-150	1500	16000															
1.750	+.000 -.003	4.00	175 400-075	750	8200	8.38	6.50	3.50	3.820	6.375	.69	2.50	6.10	.34	.50	4.375	1.225	2.20	0	SAE 4
			175 400-100	1000	12000															
			175 400-150	1500	17000															
2.000	+.000 -.003	3.25	200 325-075	750	8200	7.75	6.50	3.25	3.250	5.875	.69	2.68	5.70	.29	.58	4.50	1.10	2.60	0	SAE 4
			200 325-100	1000	11500															
			200 325-150	1500	16000															
2.000	+.000 -.003	5.00	200 500-075	750	8200	11.25	6.50	3.50	4.950	8.187	.94	2.75	6.10	.34	.50	4.375	1.225	2.20	0	SAE 4
			200 500-100	1000	12000															
			200 500-150	1500	17000															
2.500	+.000 -.003	4.00	250 400-075	750	6000	7.68	7.10	3.50	3.813	6.375	.69	3.14	6.10	.35	.56	4.77	1.23	3.0	.91	SAE 4
			250 400-100	1000	8000															
			250 400-150	1500	15000															
2.500	+.000 -.003	6.00	250 600-075	750	30000	12.75	9.00	5.00	5.730	9.437	1.06	3.25	8.85	.38	.75	3.625	1.125	3.00	0	SAE 4
			250 600-100	1000	36000															
			250 600-150	1500	50000															
3.000	+.000 -.003	6.00	300 600-075	750	17000	12.75	9.00	5.00	5.730	9.437	1.06	3.88	-	-	.38	4.88	1.1	3.11	0	SAE 8
			300 600-100	1000	22500															
3.000	+.000 -.003	7.00	300 700-075	750	30000	14.75	10.00	6.50	6.580	10.625	1.19	3.88	-	-	.75	7.325	1.375	4.73	0	SAE 8
			300 700-100	1000	36000															
			300 700-150	1500	50000															
3.500	+.000 -.003	8.00	350 800-075	750	40000	16.14	11.50	7.00	7.500	11.812	1.31	4.38	-	-	.90	8.93	1.32	5.35	0	SAE 10
			350 800-100	1000	55000															
			350 800-150	1500	80000															
4.000	+.000 -.005	8.00	400 800-075	750	40000	16.14	11.50	7.00	7.500	11.812	1.31	4.88	-	-	.90	8.875	1.365	5.35	0	SAE 10
			400 800-100	1000	55000															
			400 800-150	1500	80000															

1 Maximum hydraulic release pressure: 3000 psi.

2 Other sizes available upon request.

3 Rod tolerances that exceed these limits will affect the holding force.

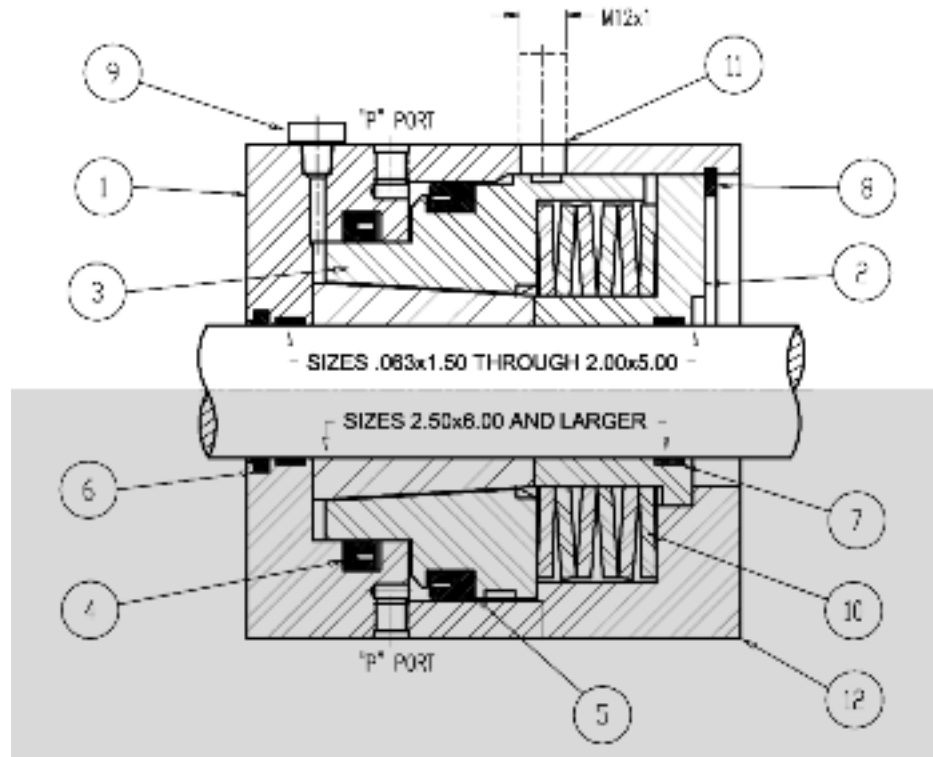
4 Holding forces are based on dry or mineral-oil lubricated shafts.

Dimensions are subject to change without notice.

RCH ASSEMBLY INSTRUCTIONS

1. Temporarily connect a flexible hose to a release pressure port of the AMLOK® Rod Clamp and apply specified hydraulic release pressure.
2. Line up the counter-bored end toward the mounting surface of the hydraulic cylinder or housing and slide the rod clamp over the rod to be clamped.
3. Align mounting holes, proximity switch, hydraulic pressure and breather plug to the proper location.
4. Release hydraulic pressure.
5. Bolt AMLOK® to cylinder or other mounting surface.
6. Pressurize the Rod Clamp to the specified release pressure. **(Units must be completely bled of air prior to use unless hydraulic circuit includes a SIT-EMMEA-4 air bleed. See page 7.)**
7. Release and pressurize several times. With the specified release pressure, the rod should move freely through the AMLOK®.
8. If the rod does not move freely, check the squareness of the housing and cylinder contact surface and correct if needed.

*Shaded areas 2.50 x 6.00 sizes and larger.



#	DESCRIPTION	Quantity	#	DESCRIPTION	Quantity
1	Housing	1	7	Wear Ring	2
2	Retainer (sizes .063x1.50 2.00x5.00)	1	8	Retainer Ring	1
3	Clamping Ring	1	9	Breather Plug - 1/8 NPT	1
4	Seal	1	10	Disc Springs	4-8
5	Seal	1	11	Proximity Switch (Optional)	1
6	Wiper	1	12	Retainer (sizes 2.5x6.00 & larger)	1

NOTE: When assembling the AMLOK® Rod Clamp, take precaution not to induce side loading.

ACTUATION & CIRCUIT RECOMMENDATIONS

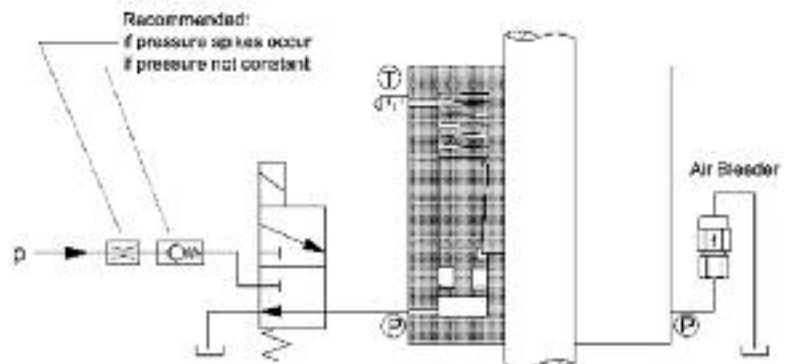
In most applications, the circuit suggested in the drawing is used. During every operational cycle, the 3-way valve is actuated electrically and releases the locking unit. In power failure, emergency stop, etc. the locking unit secures the rod and holds the load. In case the pressure fails, the load is secured in the same way.

To avoid possible problems, the shaft should not be moved unless the proximity switch indicates "unclamped".

If pressure (p) is not sufficiently constant (e.g. "pressure drop" when lowering movement begins), we recommend installing a check valve in the "p" port as shown in the diagram.

Pressure spikes above rated pressure can sometimes be reduced by a snubber orifice upstream of the check valve.

To assure no air is trapped in hydraulic chamber, installation of the SIT-EMMEA-4 Air Bleed must be installed as shown in sample circuit.



AMLOK® PROXIMITY SWITCH SETTING INSTRUCTIONS

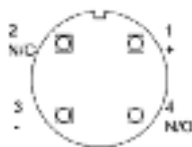
1. Set the AMLOK® to the unclamped "pressure applied" position.
2. Screw the proximity switch (incl. Lock tooth washer) into the designated M12 x 1 proximity switch hole, until it contacts the piston flange.
3. Unscrew (back off) the proximity switch approximately 1 turn. While holding the proximity switch in the set position, tighten the locking nut using 15 ft. lbs. of torque. Final adjustment may be necessary to achieve desired results.
4. With the electrical power in the off position, connect the electrical wiring per the wiring diagram supplied with the switch. After the electrical power has been turned on, the proximity switch should indicate that the AMLOK® is in the unclamped position.

Note: Insure that the electrical power has been turned off before making adjustments. The locking nut should be tightened to a maximum of 15ft. lbs. of torque to prevent damage to the internal components of the switch.

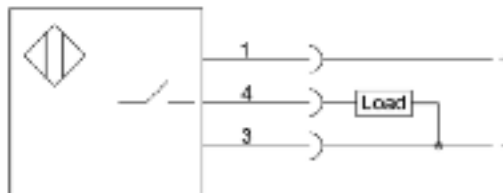


SPECIFICATIONS FOR OPTIONAL PROXIMITY SWITCH (INDICATES 'UNCLAMPED' POSITION)

View of Male Connector pins:



Wiring Connections:
PNP Normally Open



SIT-EMMEA-4 AIR BLEED

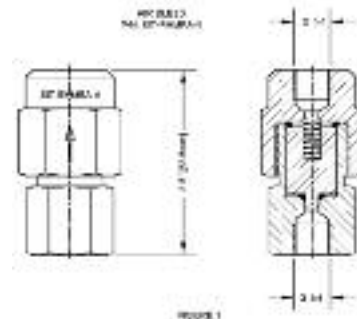
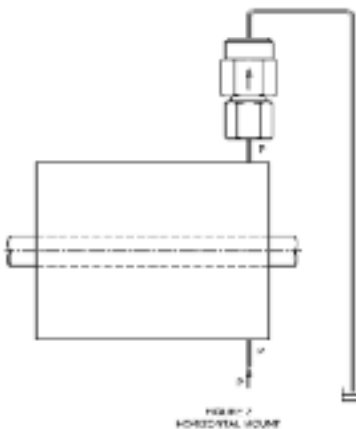
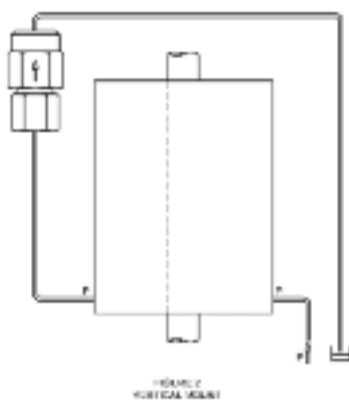
NOTE

It is important that all the air be bled from the AMLOK® piston area. The AMLOK® is designed with a short piston travel to give it a fast response time. Trapped air, especially with fast acting short stroke pistons at high pressure can cause ignition of the air-oil mixture, causing mini explosions (dieseling) to occur which will cut and crack seals.

To avoid this occurrence, it is recommended to install an automatic air bleed valve, (Fig. 1), between the AMLOK® and the oil reservoir. The automatic air bleed valve should be installed in either P port, whichever

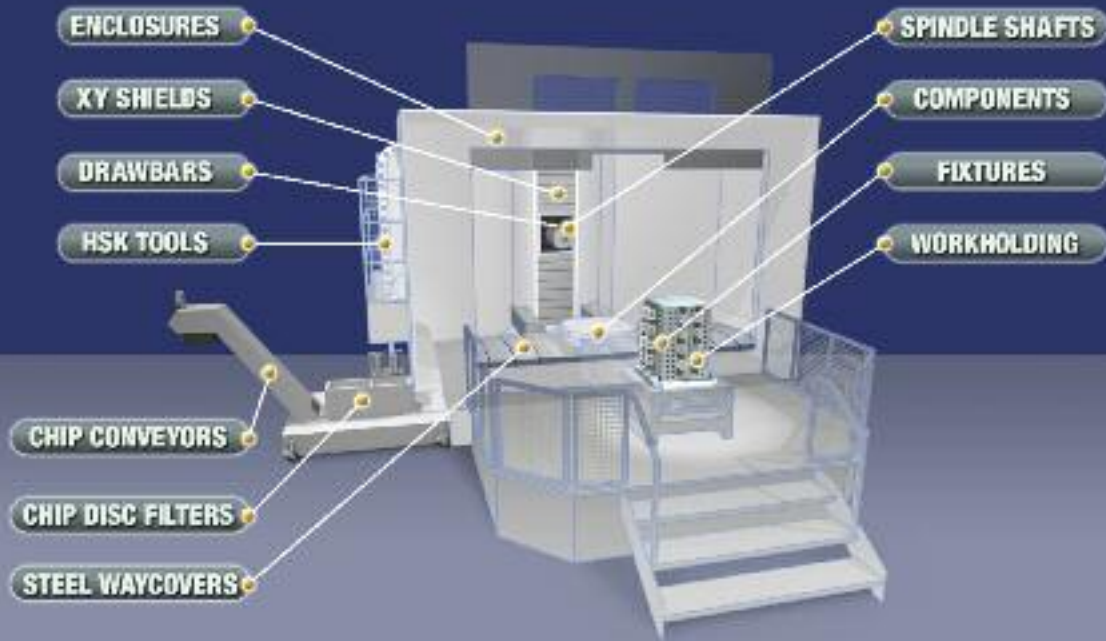
is the highest. The automatic air bleed valve opens slightly each time the AMLOK® is depressurized and allows air to escape to the reservoir. See (Fig. 2) and (Fig. 3) for typical mounting arrangements of the automatic bleed valve.

It is important to install the air bleed valve as near as possible and above piston chamber of the AMLOK® and that no back pressure over 30 PSI (2 bar) remain in the line while the AMLOK® is locked. See sample circuit page 6.



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