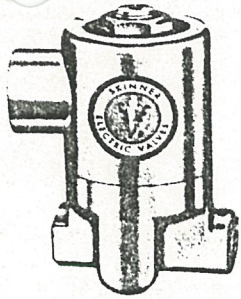


**PARTS PRICE LIST for**  
**Two-Way R Series, High Pressure Solenoid Valves**  
**R2H Normally Closed — XR2H Normally Closed, Explosion-proof**



The parts listed in this Price List apply only to standard valves listed in the General Catalog.

**HOW TO ORDER PARTS**

1. INCLUDE VALVE CATALOG NUMBER AND VOLTAGE (ON NAMEPLATE)
2. PART NUMBER AND DESCRIPTION
3. QUANTITY

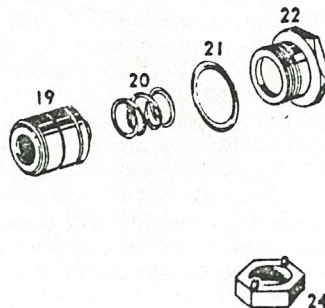
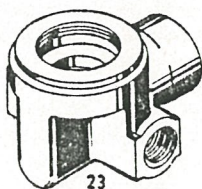
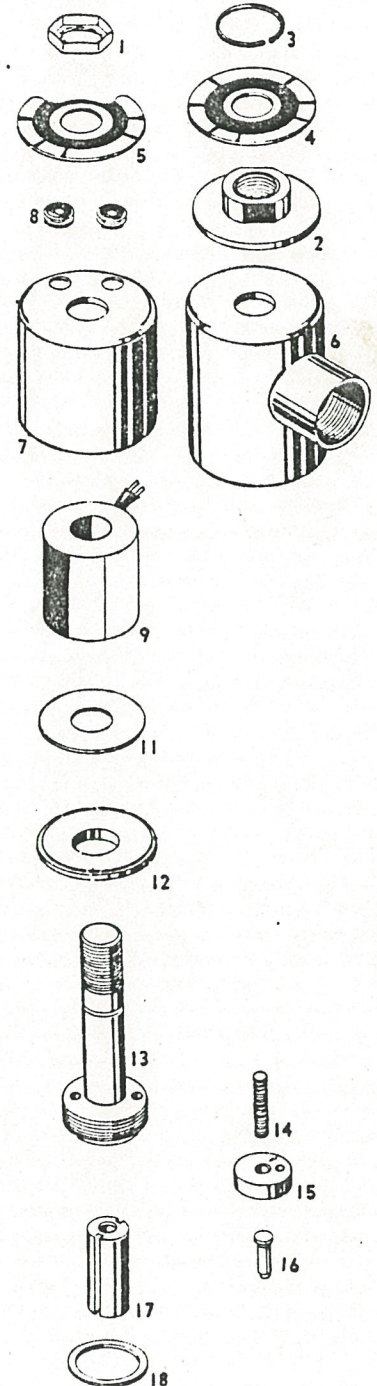
List Prices are subject to standard discounts. Parts may not be combined for discount purposes.

Skinner reserves the right to change prices and/or discounts without notice.

Terms: — Net 30 days  
 F. O. B. New Britain, Connecticut

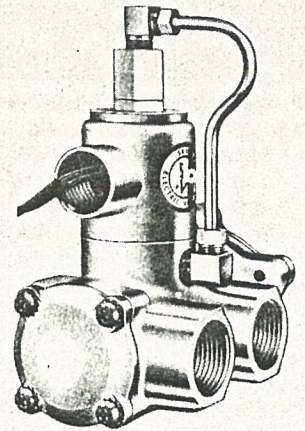
Minimum Invoice Charge — \$5.00 Net

Fig. No.	Skinner Part No.		Description	List Price Each	
	R2H	XR2H		R2H	XR2H
1	V5-174		Housing Nut	\$ .20	\$
2		X5-114	Housing Nut		1.40
3		X5-155	Snap Ring for Nameplate		.15
4	V5-4	X5-4	Nameplate for Conduit Housing	.30	.30
5	V5-3		Nameplate for Grommet Housing	.30	
6	M3-130M	XM3-15M	Housing, 1/2" NPT Conduit	2.50	6.00
7	M3-136M		Housing, Grommet	1.90	
8	V5-118		Grommets ( 2 required)	.05	
9			Coil (See Coil Parts Price List)		
11	V5-3054	V5-3054	Washer Coil	.10	.10
12	M3-105M	M3-105M	Flux Plate	.50	.50
NS	V5-3036	V5-3036	Spring Washer	.25	.25
13	M2-106	XM2-106	Sleeve Assembly	4.50	5.50
14	V5-1122	V5-1122	Plunger Spring	.30	.30
15	V5-2985	V5-2985	Guide	3.15	3.15
16	V5-511	V5-511	Pilot	1.30	1.30
17	V5-192	V5-192	Armature	1.95	1.95
18	V5-113	V5-113	Flange Seal	.20	.20
19	R15-004	R15-004	Piston Assembly	4.95	4.95
20	R04-001	R04-001	Piston Spring	.30	.30
21	V1-2017	V1-2017	O-Ring	.30	.30
22	R16-001	R16-001	Cap	.85	.85
23			Body (Seldom required. Consult Skinner)		
24	V0-233	V0-233	Spanner Wrench Nut (For Removing or Installing Sleeve Assembly)	.30	.30



# PARTS LIST

For Three-Way L Series  
3/4" Orifice—3/4" NPTF



The parts listed apply only to standard valves listed in the General Catalog.

### HOW TO ORDER PARTS:

1. INCLUDE VALVE CATALOG NUMBER AND VOLTAGE (ON NAMEPLATE)
2. PART NUMBER AND DESCRIPTION
3. QUANTITY

For prices, refer to parts price list C2. 2. 5 and coil parts price list C16. 3. 1.

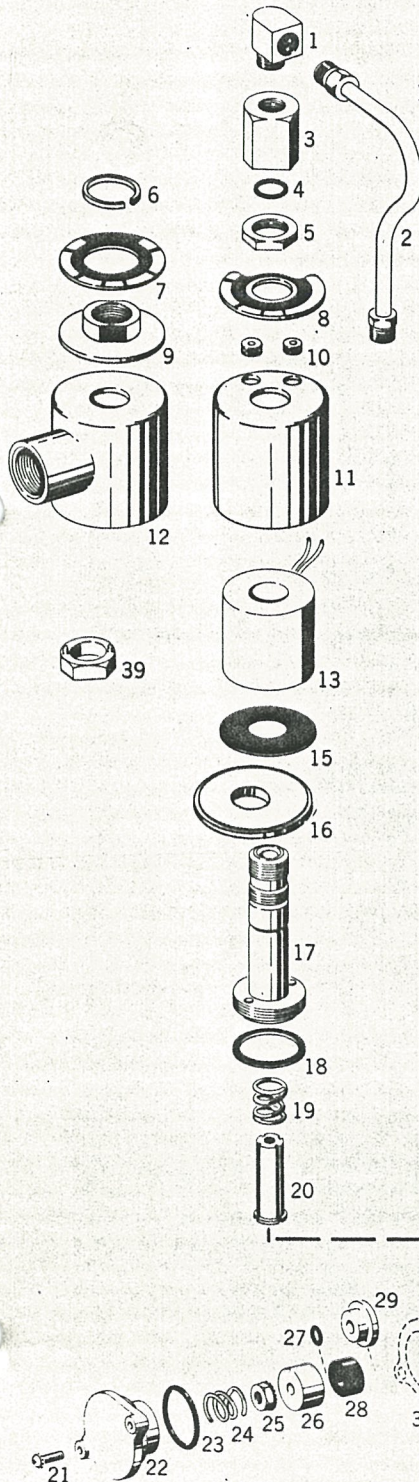


Fig. No.	Skinner Part No.		Description
	L	XL	
1	L22-002	L22-002	Elbow Fitting (2 required)
2	L99-009	L52-009	Tube and Fittings
3	V5-903	V5-903	Adapter, Sleeve
4	V3-116	V3-116	Adapter, Seal
5	V5-114		Housing, Nut
6		X5-155	Snap Ring for Nameplate
7	V5-4	X5-4	Nameplate for Conduit-type Housing
8	V5-3		Nameplate for Grommet-type Housing
9		X5-114	Housing Nut
10	V5-118		Grommets (2 required)
11	M3-136M		Housing, Grommet Type
12	M3-130M	XM3-15M	Housing, 1/2" NPT Conduit Type
13			Coil (See Coil Parts Price List)
15	V5-3054	V5-3054	Washer, Coil
16	M3-105M	M3-105M	Flux Plate
NS	V5-3036	V5-3036	Spring Washer
17	M3-219	XM3-13	Sleeve Assembly
18	V5-113	V5-113	Flange Seal
19	V5-3810	V5-3810	Plunger Spring
20	V5-1335	V5-1335	Plunger Assembly
21	L99-002	L99-002	Screw and Lockwasher (4 required)
22	L16-020	L16-020	Cover
23	V1-2028	V1-2028	O-Ring
24	L04-001	L04-001	Spring, Spindle
25	L99-006	L99-006	Nut and Lockwasher (2 required)
26	L13-006	L13-006	Retainer, Seal
27	V1-2010	V1-2010	O-Ring, Spindle
28	L17-002	L17-002	Seal, Orifice (2 required)
29	L10-002	L10-002	Snubber, Spindle
30	L10-006	L10-006	Spindle
31	L13-007	L13-007	Retainer, Seal
32, 33,			
34	L12-014	L12-014	Diaphragm Assembly
35	L11-004	L11-004	Retainer, Diaphragm
36	L16-034	L16-034	Cover, Diaphragm
37	L99-007	L99-007	Screw and Lockwasher (6 required)
38			Body (Seldom Required, Consult Skinner)
39	V0-233	V0-233	Wrench Nut, for removing or installing Sleeve Assembly

# SPRAY-LUBE SYSTEMS

60.18  
 NC-601  
 November, 1978  
 Supersedes May, 1974  
 Replaces NC-602, NC-603, NC-604, NIP-603

## APPLICATION

A spray lube system provides a method of applying cutting oils or working compounds to one or more points for metal cutting, grinding, milling, etc. operations. The system may also be used to lubricate conveyor chains, slides and ways, or wherever a constant spray of lubricant is required.

## FEATURES

- Reservoir can be mounted at any convenient location.
- Spray control valve contains separate liquid and air controls. Final mixing of liquid and air takes place at spray nozzle near the point of application.
- Optional solenoid valve can be installed to automatically start and stop lubrication when machine power is turned on and off.
- Services 1 to 18 lubrication points. Two thru 18 point lubrication accomplished with addition spray control valves. Up to 18 valves can be manifolded together with optional manifold kit.

## SPECIFICATIONS

### FILTER-REGULATOR, MODEL B12-218-M3LA

1/4" PTF inlet and outlet ports, 1/4" PTF gauge ports, 5 to 125 psig (.3 to 8.6 bar) outlet pressure adjustment range\*, relieving type diaphragm, polycarbonate bowl with guard, manual drain, 50 micron element, Model 18-013-209 outlet pressure gauge.

\*Outlet pressure adjustment range is not minimum or maximum pressure range. Regulators can be adjusted to zero psig outlet pressure and, generally, to pressures in excess of that specified. The use of the regulator to control pressures outside of the specified range is not recommended.

### RESERVOIR, TYPE 15-002 & 15-052

1/4" PTF inlet and outlet ports, 1 or 2-qt., 2 or 5-gal. reservoirs with oil filter, liquid level sight glass and manual drain. The 2 and 5-gal reservoirs are ASME rated. Reservoirs are available with an adjustable vent air agitator for use with oils that have a tendency to separate or settle out.

### SPRAY CONTROL VALVE, TYPE 15-003

Separate 1/4" PTF liquid and air ports, 3/8" (914.4 mm) oil supply tube, tube-within-a-tube construction, external 1/4" OD aluminum tube conveys air, internal polyethylene tube conveys oil, available with a fan or conical spray pattern nozzle.

## MAXIMUM RATED CONDITIONS

FILTER-REGULATOR INLET PRESSURE: 150 psig (10.3 bar)  
 OPERATING TEMPERATURE: 125°F (52°C)

The maximum rated conditions stated above apply when the spray lube system consists of the components specified in this publication. If components other than those specified in this publication are used, maximum rated conditions for the system must be determined from the maximum rated conditions for the individual components.

## WARNING

THESE UNITS ARE INTENDED FOR USE IN INDUSTRIAL COMPRESSED AIR SYSTEMS ONLY. THEY MUST NOT BE USED WHERE PRESSURE OR TEMPERATURE MAY EXCEED MAXIMUM RATED CONDITIONS.

THE POLYCARBONATE PLASTIC BOWL USED ON THE FILTER-REGULATOR CAN BE DAMAGED AND POSSIBLY BURST IF EXPOSED TO SUCH SUBSTANCES AS CERTAIN SOLVENTS, STRONG ALKALIES, COMPRESSOR OILS CONTAINING AROMATIC HYDROCARBONS OR SYNTHETIC OILS. FUMES OF THESE SUBSTANCES IN CONTACT WITH THE BOWL EXTERNALLY OR INTERNALLY, CAN ALSO RESULT IN DAMAGE. CLEAN WITH WARM WATER ONLY.

USE METAL BOWL IN APPLICATIONS WHERE THE FILTER-REGULATOR MIGHT BE EXPOSED TO SUBSTANCES INCOMPATIBLE WITH POLYCARBONATE.

BEFORE USING WITH FLUIDS OTHER THAN AIR, FOR NON-INDUSTRIAL APPLICATIONS, OR FOR LIFE SUPPORT SYSTEMS CONSULT C. A. NORGREN CO. FOR APPROVAL.

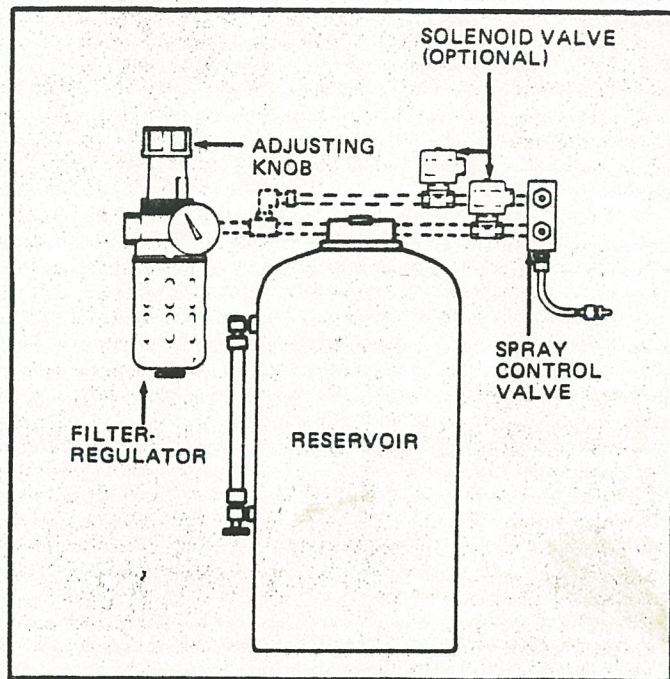


Figure 1. Typical Spray Lube System

## ORDER TABLE

COMPONENT	ORDER NUMBER	
Filter-Regulator	B12-218-M3LA	
Reservoir	w/o Agitator	w/Agitator
1-Qt.	15-002-007	15-002-013
2-Qt.	15-002-008	15-002-014
2-Gal.	15-052-002	15-052-015
5-Gal.	15-052-001	15-052-016
Spray Control Valve	15-003-001	
Conical Spray Pattern	15-003-002	
Fan Spray Pattern		

## ACCESSORIES

Filter-Regulator Mounting Bracket & Nut	.5514-04
Reservoir Mounting Bracket	
1-Qt. Res.; ordered with res.	18-001-014
1-Qt. Res.; ordered separately	18-001-015
2-Qt. Res.; ordered with res.	18-001-008
2-Qt. Res.; ordered separately	18-001-009
Reservoir Mounting Strap	
2-Gal. Res.	18-001-056
5-Gal. Res.	18-001-039
Solenoid Valve (1/4" PTF ports, two-way, normally closed)	
110 Volts, 50/60 HZ.	18-014-001
220 Volts, 50/60 HZ.	18-014-002
Spray Control Valve Manifold Kits*	
2 valve kit	15-006-001
4 valve kit	15-006-002
8 valve kit	15-006-003
12 valve kit	15-006-004
18 valve kit	15-006-005

\*Kits used for multiple point application to manifold up to 18 spray control valves. The kits contain materials for manifolding, but not spray control valves. See Figure 2.

**NORGREN**  
 LITTLETON, COLORADO



## OPERATION

A typical spray lube system consists of a filter-regulator, a reservoir and a spray control valve (Figure 1). Additional spray control valves may be added to the system to provide multiple point lubrication. Up to four spray control valves may be manifolded together with the optional manifold kit (see "ACCESSORIES" and Figure 2).

Air enters the filter-regulator where solid and liquid particles are removed from the air stream and output pressure is regulated from 5 to 125 psig. Outlet pressure is controlled by the filter-regulator adjusting knob. Clockwise rotation increases and counterclockwise rotation decreases outlet pressure.

Clean, regulated air is conveyed thru separate lines to the spray control valve and to the reservoir. The reservoir is pressurized and oil under pressure flows to the control valve. On reservoirs equipped with an adjustable vent air agitator, air is fed to the bottom of the reservoir and is bled out at the top at a controlled rate to produce constant agitation of the liquid.

The control valve adjustments provide individual metering of liquid and air. Air and liquid are carried separately from the control valve to the nozzle by a tube-within-a-tube. At the nozzle, oil and air are mixed and discharged.

## INSTALLATION

1. System piping should be same size as port threads.
2. Install filter-regulator in airline in upright position (filter bowl down) with arrow in direction of air flow. Plug any unused ports.
3. Install reservoir downstream from filter-regulator in upright position with arrow in direction of air flow. The reservoir must be accessible for filling and draining. Do not use air line piping to support weight of 2 and 5-gallon reservoirs.
4. Mount the spray control valve on the machine within 36" (914.4 mm) of application point. Two .22" (5.6mm) holes are provided in the control valve body for mounting. Position spray nozzle as close as possible to point of application to reduce over spray.
5. Install optional solenoid valves so spray lube system is energized and de-energized with the machine. Install the solenoid valves downstream from the reservoir. If solenoid valves are installed upstream of reservoir, system pressure trapped in the reservoir will force oil out thru nozzle when the machine is turned off.

## ADJUSTMENT

1. Before turning on system pressure:
  - Turn filter-regulator adjusting knob all the way counterclockwise (ccw).
  - Turn AIR and LIQUID adjustments on control valve clockwise (cw) to fully closed position.
  - Optional solenoid valves (if installed) must be open.
  - Turn optional air vent agitator on reservoir ccw to fully closed position.
2. Turn on system pressure, then turn filter-regulator adjustment knob cw to obtain 30 psig outlet pressure.
  - Turn knob cw to increase, ccw to decrease outlet pressure. To avoid minor readjustment after making a change in filter-regulator pressure setting, always approach the desired pressure from a lower pressure. When reducing from a higher to a lower setting, first reduce to some pressure less than that desired and then increase to the desired point.

## NOTE

The 30 psig listed above is only a recommended starting point. Filter-regulator output pressure may be increased or decreased as required to obtain the optimum pressure for your application. The adjusted operating pressure should not be less than 5 psig nor more than 125 psig. See SPECIFICATIONS.

3. If the reservoir is equipped with an adjustable air vent agitator, open vent on top of reservoir sufficiently to accomplish agitation of oil.
4. Open AIR and LIQUID adjustments on spray control valve. When liquid begins to flow from the nozzle, turn the AIR and LIQUID adjustments to give the desired spray. A fine spray may be obtained with small quantities of oil and large quantities of air; a coarse spray may be obtained with large quantities of oil and small quantities of air.
5. If spray lube system is not equipped with solenoid valves, turn AIR and LIQUID adjustments fully cw to shut off system. If optional solenoid valves are installed between the reservoir and control valve, the spray lube system will shut off simultaneously with the machine.

## MAINTENANCE

**FILTER-REGULATOR:** See NIP-408  
**RESERVOIR:** (FIGURE 4)

To service the reservoir, shut off the air supply to reservoir and reduce reservoir pressure to 0 psig. Reservoir can be disassembled without removal from air line.

Unscrew and remove fill plug (7 or 29), gasket (8 or 30), screws (2), gasket (9), reservoir tank (18), siphon tube (5) and gasket (4).

If reservoir is equipped with air agitator, unscrew and remove vent valve (19), agitator tube (20) and gasket (21).

Clean all parts using soap and water. Dry parts and blow out internal passages in head (3) using clean, dry compressed air. The filter (6) may be unscrewed from siphon tube (5) for cleaning. Optional air agitator tube (20) may also be disassembled for cleaning. Exercise care when unscrewing agitator tube head (22) from tube (23) to prevent spring (27) from ejecting ball (26).

Inspect each part carefully. Replace any damaged parts.

At reassembly, tighten siphon tube (5) and agitator tube (20) until snug only. Torque screws (2) evenly to 20-to-30 inch pounds.

## SPRAY CONTROL VALVE (FIGURE 3)

To service the spray control valve, shut off air and liquid supply to valve and reduce inlet and outlet pressures to 0 psig.

Unscrew and remove glands (4) and needles (2, 6), then clean parts using soap and water. Inspect valve seats in body (15) and surface of needles (2, 6) which contact seats for scratches or abrasive marks. Replace any damaged parts. At reassembly apply a small, even wipe coat of Dow Corning 55M silicone grease (or equivalent) to O-ring (3, 7).

## REPAIR PARTS

**FILTER-REGULATOR:** See NIP-408

### RESERVOIR PARTS (FIGURE 4)

1. Nut, Siphon Tube	1049-01
2. Screw, Head (set of 6)	1374-02
3. Head	Not Normally Serviced
4. Gasket, Siphon Tube	1802-01
5. Tube Assy, Siphon	
1-Qt.	1091-04
2-Qt.	1091-03
2-Gal.	1042-03
5-Gal.	1042-15
6. Filter, Siphon Tube	1048-01
7. Fill Plug (Includes item 8)	
2- & 5-Gal.	1207-02
8. Gasket, Fill Plug	
2- & 5-Gal.	1961-01
9. Gasket, Reservoir	1029-01
10. Bracket, Oil Level Gauge, Upper	Not Normally Serviced
11. Packing (2 req'd)	See "Repair Kits"
12. Nut (2 req'd)	See "Repair Kits"
13. Gauge, Glass	See "Repair Kits"
14. Guard (2 req'd)	See "Repair Kits"
15. Ball, Float	See "Repair Kits"
16. Bracket, Oil Level Gauge, Lower	Not Normally Serviced
17. Valve, Drain	684-01
18. Tank, Reservoir	Not Normally Serviced
19. Valve, Vent	684-01
20. Tube, Agitator (Includes items 21 thru 28)	
1-Qt.	1069-03
2-Qt.	1069-04
2-Gal.	1069-01
5-Gal.	1069-12
21. Gasket, Agitator Tube	1802-01
22. Head, Agitator Tube	1071-01
23. Tube	
1-Qt.	1070-03
2-Qt.	1070-04
2-Gal.	1070-01
5-Gal.	1070-07
24. O-ring	421-01
25. Washer	1811-01
26. Ball	1004-01
27. Spring	1075-01
28. Spring Rest	1072-01
29. Fill Plug, 1- & 2-Qt. (Includes item 30)	1206-50
30. Gasket, Fill Plug, 1- & 2-Qt.	1956-01

### SPRAY CONTROL VALVE PARTS (FIGURE 3)

1. Plug, Pipe	2338-08
2. Needle, Air Control (Includes item 3)	1080-02
3. O-ring	706-01
4. Gland, Needle (2 req'd) (Includes item 5)	1083-02
5. Gasket	1956-01
6. Needle, Liquid Control (Includes item 7)	1079-03
7. O-ring	706-01
8. Adapter, Tube	1087-01
9. Adapter	1081-01
10. Nut, Tube (2 req'd)	1061-01
11. Sleeve, Tube (2 req'd)	1060-01
12. Tubing, Polyethylene	
38" Long	2129-02
Bulk Roll (Specify length desired)	2129-03
13. Tubing, Aluminum, 35" Long	2-01
14. Nozzle, Conical Spray	1090-02
Nozzle, Fan Spray	1082-02
15. Body	1078-01

**REPAIR KITS**

Oil Level Sight Gauge (Contains items 11 thru 15)

1-Qt. Reservoir	2272-02
2-Qt. Reservoir	2273-04
2- & 5-Gal. Reservoir	2274-01

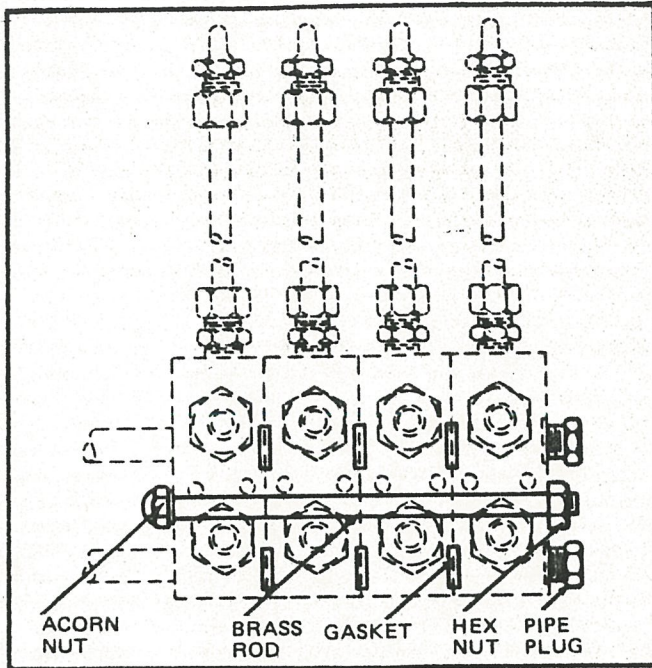
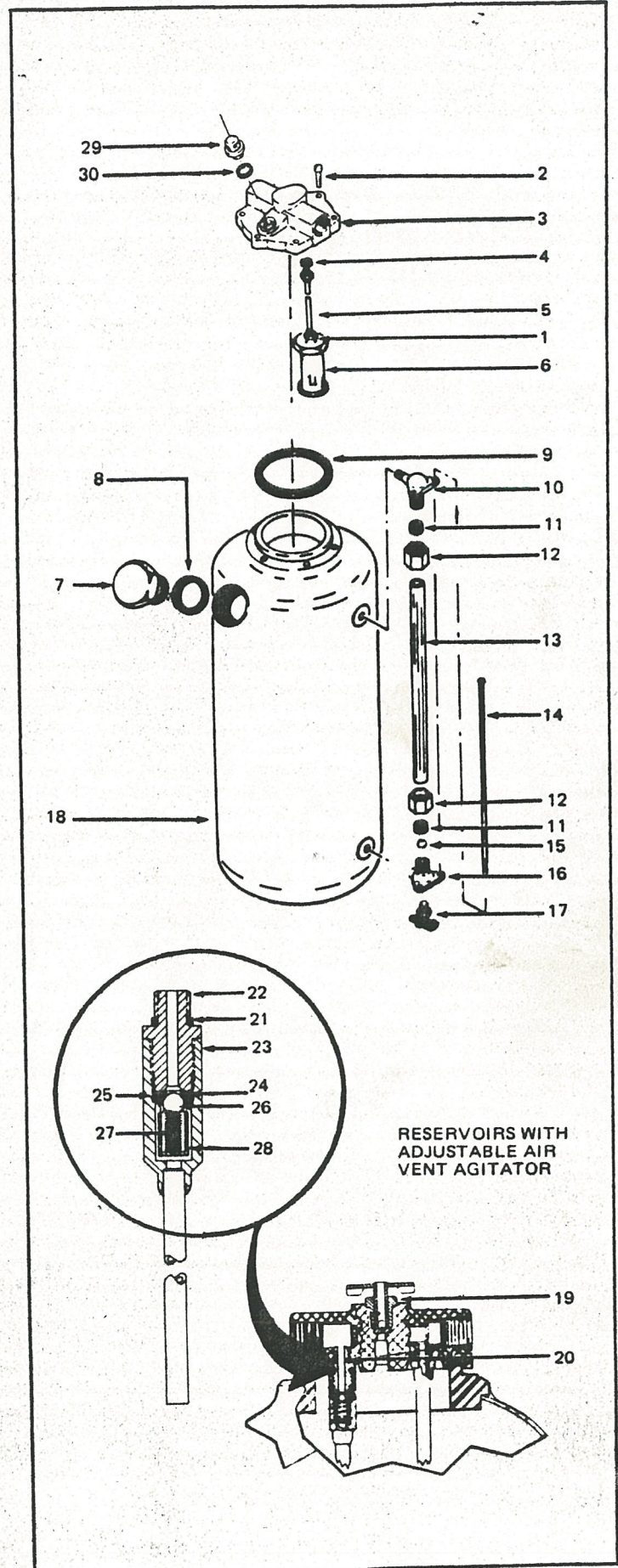
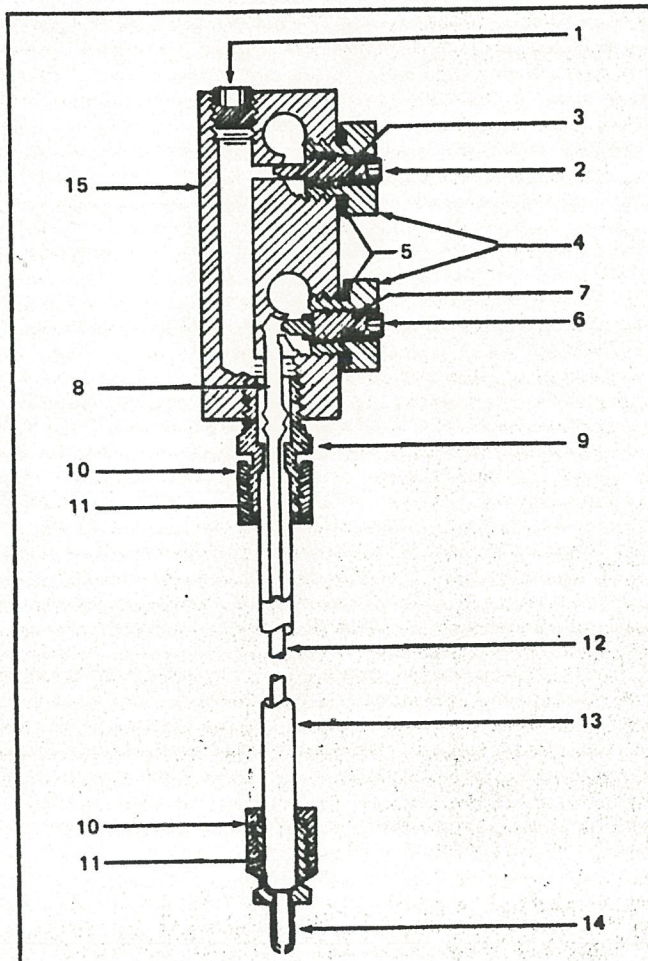
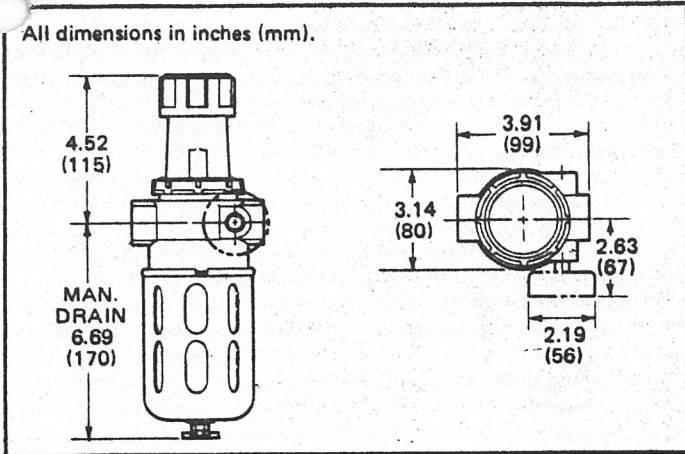


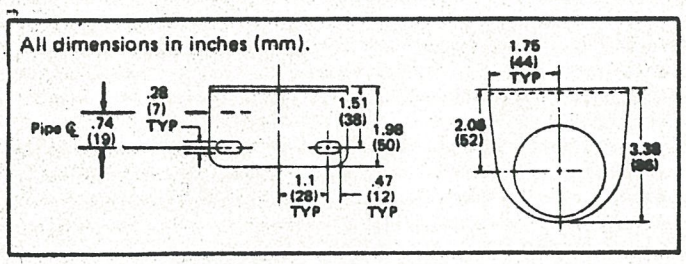
Figure 2. Spray Control Valve Manifold Kit



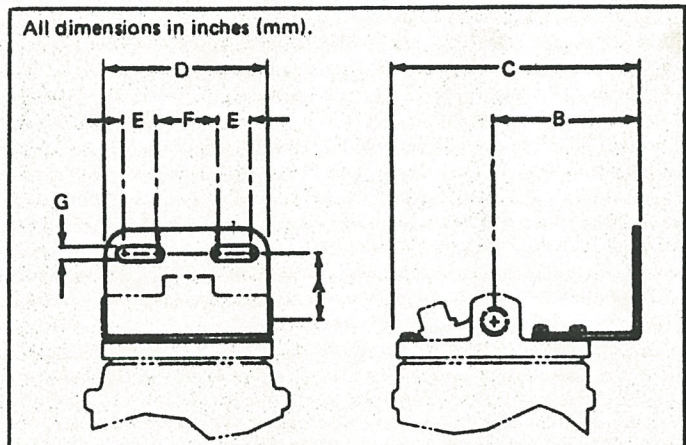
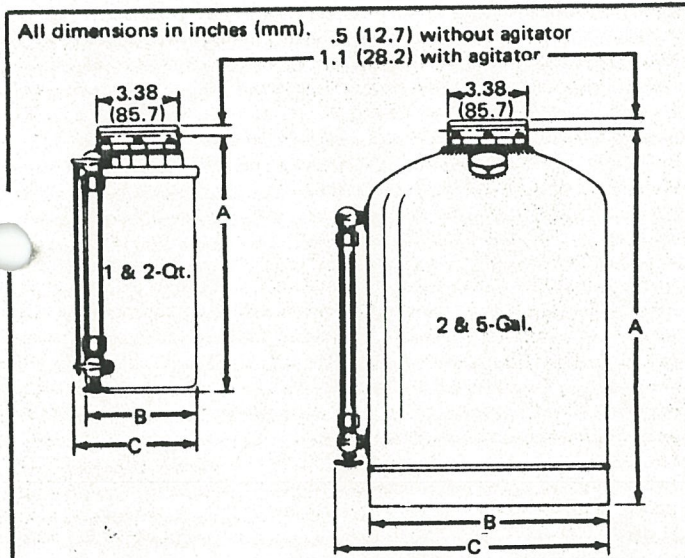
# DIMENSIONS



Filter-Regulator



Filter-Regulator Mounting Bracket

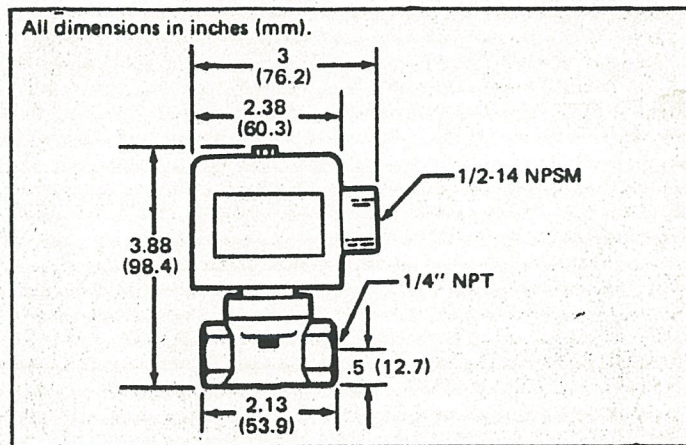


RES. CAP.	DIMENSIONS - Inches (mm)						
	A	B	C	D	E	F	G
1-Qt	1.44 (36.5)	2.25 (57.2)	4.19 (106.4)	3.25 (82.6)	.63 (15.8)	1.25 (31.8)	.33 (8.3)
2-Qt	1.44 (36.5)	2.94 (74.6)	5.25 (133.4)	3.25 (82.6)	.63 (15.8)	1.25 (31.8)	.33 (8.3)

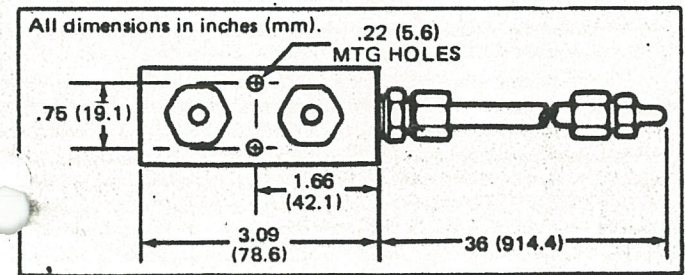
Reservoir Mounting Bracket

RESERVOIR CAPACITY	DIMENSIONS - Inches (mm)		
	A	B	C
1-Qt	7.75 (196.9)	3.75 (95.3)	4.88 (123.8)
2-Qt	10.00 (254.0)	4.31 (109.5)	5.44 (138.1)
2-Gal.	18.00 (457.2)	6.63 (168.3)	7.94 (201.6)
5-Gal.	21.25 (539.8)	10.25 (360.4)	11.56 (293.7)

Reservoir



Solenoid Valve



Spray Control Valve

**C. A. NORGREN CO.**  
LITTLETON, COLORADO 80120 / 303-794-2611

# SOLENOID PILOT VALVES

# MINI KING MANIFOLD MOUNTED PLUG IN PILOT

- plug-in
- modular manifold mounted for simplified installation
- fast response – bubble-tight sealing
- single solenoid – only 3 moving parts
- pilot interchangeable with SPEED-KINGS

### FUNCTION:

The MINI-KING 4-way valve is a single-solenoid valve especially suited for operating small-bore cylinders or piloting larger valves. On applications where cylinders of 2" bore or less are used, the MINI-KING provides an ideal low-cost control.

### FEATURES:

MINI-KINGS are available for continuous electrical energization. Manual override and indicator light are optional features. All ports are 1/4" NPTF. Indicator light available for 120 AC only.

### ENGINEERING DATA:

Service: Air, inert gas.  
Pressure: Cv – .14 Cyl. Part "A" .33 Cyl. Port "B"

### CURRENT CONSUMPTION:

120 V – 60 Hz .29 AMP Inrush .18 AMP Holding  
110 V – 50 Hz .32 AMP Inrush .22 AMP Holding

### HOW TO ORDER:

1. Valve –  
Select valve model number from table below. To complete the valve descriptions, specify voltage and hertz.  
For example: Order N215-23001 120 V – 60 Hz Valve

VALVE DESCRIPTION	STANDARD SERVICE		SPECIAL SERVICE	
	WITH OVERRIDE	LESS OVERRIDE	WITH OVERRIDE	LESS OVERRIDE
Basic	N215-23001	N215-21001	N215-23003	N215-21003
w/Indicator Light for 120-AC	N215-29001	N215-27001	N215-29003	N215-27003
for Other Than 120-AC	N215-26001	N215-24001	N215-26003	N215-24003

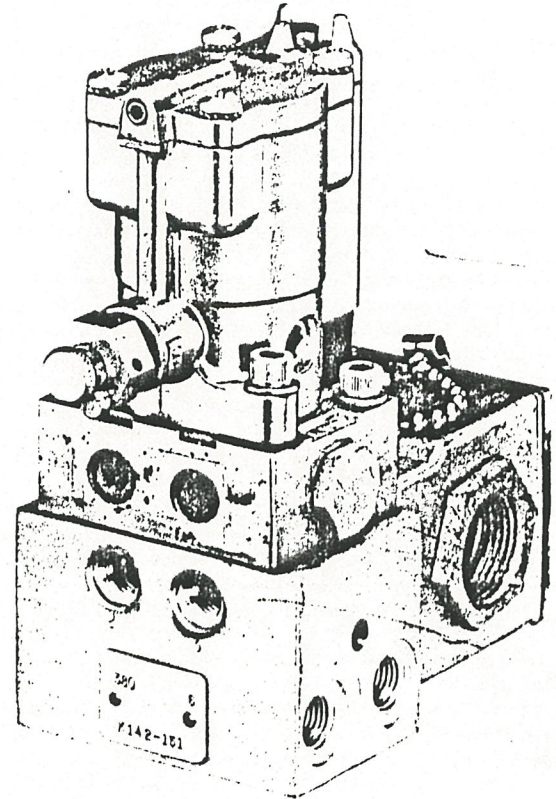
2. Modular Manifold – Select number of stations desired from chart below.

For dimensional data, see Page 159.

MANIFOLD ASSEMBLY	NUMBER OF STATIONS	INSTALLATION KIT*	REPAIR KIT STD. SERVICE	REPAIR KIT SPECIAL SERVICE
K142-151	1	-	K352-061 (1)	K352-261 (1)
K142-152	2	K122-052	K352-061 (2)	K352-261 (2)
K142-153	3	K122-053	K352-061 (3)	K352-261 (3)
K142-154	4	K122-054	K352-061 (4)	K352-261 (4)
K142-155	5	K122-055	K352-061 (5)	K352-261 (5)

( ) = Quantity Required

\* = Installation Kit Included in Manifold Assembly



# MINI-KING MANIFOLD MOUNTED PLUG IN PILOT PARTS DATA

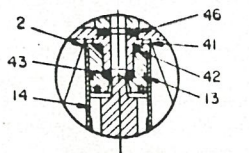
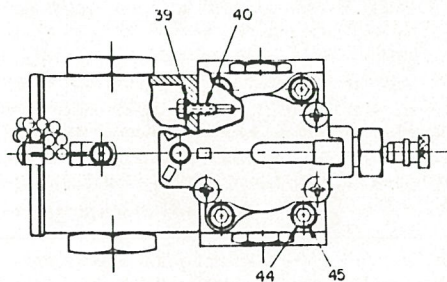
# SOLENOID PILOT VALVES

ITEM NO.	PART NO.	DESCRIPTION
1	K112-074	Body (1/16 Orifice) N.O.
	K112-037	Body (3/32 Orifice) N.O.
	K112-038	Body (1/8 Orifice) N.O.
2	K423-005	Top Seat (1/16 Orifice)
	K423-006	Top Seat (3/32 Orifice)
	K423-004	Top Seat (1/8 Orifice)
	K423-010	Top Seat (Spec. Service)
3	K443-009	Sleeve
• 4	H142-13	Seal
• 5	K183-001	Gasket
6	K053-216	Body
7	H142-07	Seal (2)
8	K033-004	End Cap
• 9	H134-24	O-Ring
• 10	K183-020	Gasket
11	K282-001	Shuttle Assembly
12	K323-005	Top Plate
• 13	H249-69	O-Ring
• 14	K343-002	Plunger (Stand. Service)
	K343-001	Plunger (Spec. Service)
15	K473-001	Spring
16	H100-60	Cap Screw (2)
17	H175-12	Washer (2)
18	H074-07	Plug (2)
19	K033-003	End Cap
20	K313-003	Piston
21	H129-01	Packer
22	K062-016	Cover Assembly (Stand. Service)
	K062-032	Cover Assembly (Spec. Service)
23	H147-01	Shock Pad (3)
24	H191-05	Indicator Light
25	K663-003	Seal

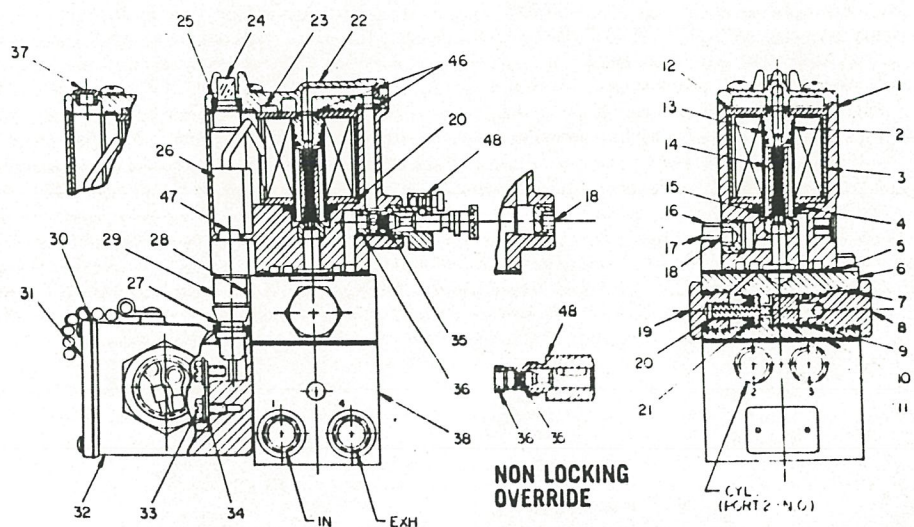
ITEM NO.	PART NO.	DESCRIPTION
26	K593-125 (115v-60Hz) (110v-50Hz)	Coil (for Indicator Light)
	K593-081	Coil 230v - 60 Hz
	K593-048	Coil 6v D.C.
	K593-055	Coil 12v D.C.
	K593-060	Coil 24 D.C.
27	H027-44	Plug
28	H104-04	Screw (2)
29	K603-001	Retaining Clamp
30	K183-079	Gasket
31	K062-030	Cover Assembly
32	K203-061	Housing
33	H114-06	Screw (2)
34	K372-002	Grounding Strip Assembly
• 35	H134-62	O-Ring
• 36	H134-58	O-Ring
37	K333-010	Plug
38	K253-131	Manifold
39	H142-65	Seal (2)
40	H114-07	Screw (2)
41	K213-005	Insert
• 42	H134-13	O-Ring
• 43	H134-73	O-Ring
44	H175-12	Washer (2)
45	H100-55	Screw (2)
• 46	H142-01	Seal (2)
47	H027-15	Connector
48	K152-003	Lock-Type Override
	K162-001	Non-Lock Override

**Notes:**

1. ( ) Quantity Req'd.
2. • Parts included in Field Service Instruction K352-061
3. For Special Service order Field Service Instruction K352-261



**FOR SPECIAL SERVICE  
PILOTS ONLY**





**Single-Solenoid, Plug-In Pilot-Operated Valve**

**SPEED KING® SK-200 SERIES 4-WAY**

**SUB-BASE TYP 1/4" NPT**

**FUNCTION:**

4-way directional control used to operate a double-acting cylinder. For 2-way, 3-way and multi-pressure use, see Page 46.

When electrical signal is applied, valve shifts, extending cylinder or actuator. Upon removal or loss of electrical signal, cylinder returns to the normal position.

On sub-base mounted valves, manual over-rides and indicator lights are supplied as standard.

All electrical connections are made in the sub-base or manifold. Built-in plugs complete the electrical circuit between the valve and base. Solenoid leads are tagged for easy identification.

**TEMPERATURE**—Maximum ambient temperature:

Continuous Service: Standard Pilots .....	100°F.
Special Service Pilots .....	125°F.
Intermittent Service: All Pilots .....	125°F.
Minimum Ambient Temperature .....	0°F.

**LUBRICATION:** For best results and service life, use clean, moisture-free, lubricated air.

**Cv FLOW RATINGS:**

See Page 85 for Ratings.

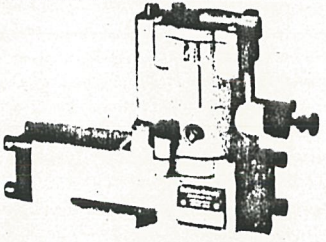
**CURRENT CONSUMPTION:**

120V-60 Hertz — .29 amp. Inrush; .18 amp. Holding
110V-50 Hertz — .32 amp. Inrush; .22 amp. Holding

**HOW TO ORDER:**

1. **VALVE**—Select the valve model number from table below. To complete valve description, add the solenoid Voltage and Hertz. For example: Order L445-29-102 120V 60Hz Valve.
2. **SUB-BASE or MODULAR MANIFOLD**—Select by port size from table below.
3. **TIME DELAY**—If time delay of valve shift is desired, consult page 45 describing PNEUMATIC TIME DELAY MODULES.
4. To order valves assembled to bases see page 39.

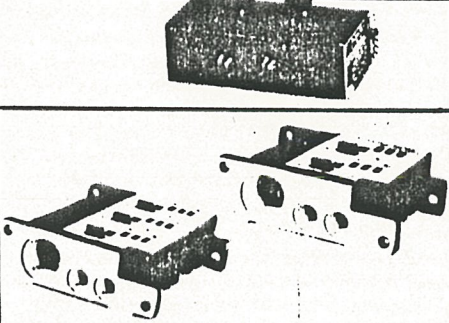
**VALVE MODEL NUMBER.** Less Sub-Base or Manifold (Order Sub-Base or Modular Manifold Separately)

	DESCRIPTION		MODEL NUMBERS
	VALVE (FOR 120V AC) LESS BASE WITH	LOCKING OVERRIDE	L445-29-102
		NON-LOCKING OVERRIDE	L445-28-102
	VALVE (FOR OTHER THAN 120V AC) LESS BASE WITH*	LOCKING OVERRIDE	L445-23-102
NON-LOCKING OVERRIDE		L445-22-102	
<b>BE SURE TO SPECIFY VOLTAGE AND HERTZ</b>			

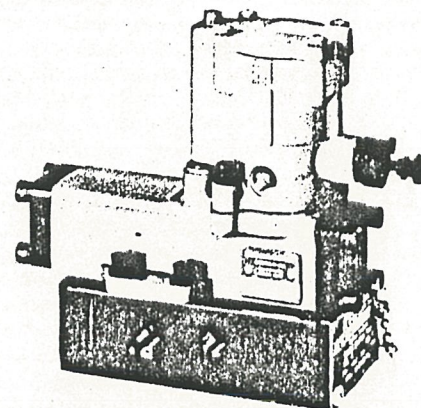
FOR SPECIAL SERVICE PILOTS, CHANGE THE LAST DIGIT IN VALVE MODEL NUMBERS FROM 2 TO 4.  
FOR DESCRIPTION OF SPECIAL SERVICE PILOTS, SEE PAGE 4.

\*PILOT INDICATOR LIGHTS ARE NOT AVAILABLE FOR OTHER THAN 120VAC.

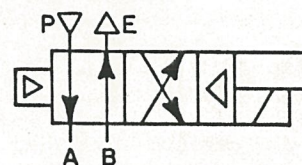
**SUB-BASE AND MODULAR MANIFOLD MODEL NUMBERS.** (Valve to base mounting bolts are included.)

	DESCRIPTION	CYLINDER PORTS	INLET	EXHAUST	CONDUIT	MODEL NUMBERS
	SUB-BASE	¼" NPTF	¼" NPTF	¾" NPTF	½" NPT	K022-097
	TWO STATION MANIFOLD	¼" NPTF	½" NPTF	½" NPTF	1¼" NPT	K142-077 †
	THREE STATION MANIFOLD	¼" NPTF	½" NPTF	½" NPTF	1¼" NPT	K142-076 †
<b>MANIFOLDS HAVE SIDE &amp; BOTTOM CYLINDER PORTS</b>		† INCLUDES ONE K122-007 BOLT & SEAL KIT FOR ASSEMBLING TWO MANIFOLDS TOGETHER.				

FOR REMOTE OPERATED VALVES: CHANGE THE FOURTH DIGIT FROM 5 TO 4: SEE PAGE 4.  
: CHANGE THE SIXTH DIGIT TO 1.



**GRAPHIC SYMBOL:**



**PRESSURE LIMITATIONS:**

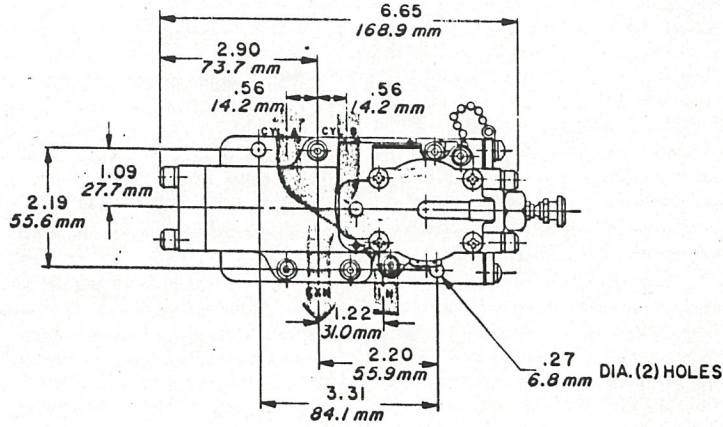
AIR	35-140 PSI
OTHER	CONSULT SCHRADER BELLOWS

**SUB-BASE TYPE**  
**1/4" NPTF**

**SPEED KING® SK-200 SERIES**  
**4-WAY**

**Seal Kit No.**  
**Standard Service K352-150**  
**Special Service K352-350**

**DIMENSIONAL DATA / PARTS LIST**

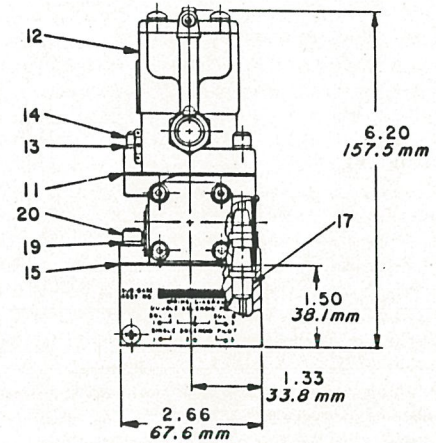
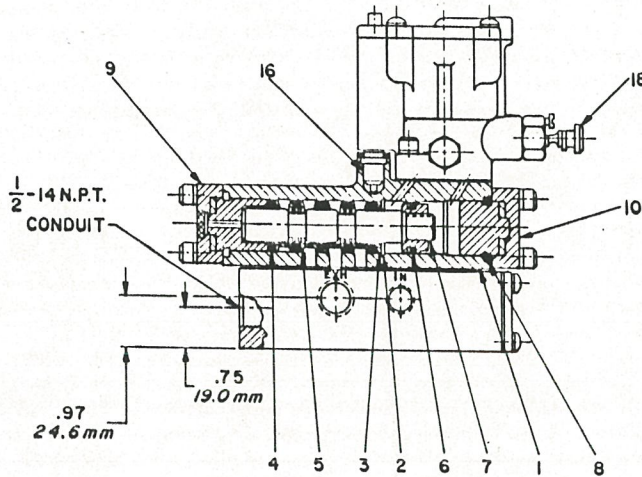


Top view indicates flow-through valve with solenoid de-energized.

For normal valve operation, over-ride must be in "out" position.

Overrides may be field converted to locking or non-locking.

SEE PAGE 40 FOR  
MANIFOLD DIMENSIONAL DATA.



**PARTS LIST**

**• PARTS INCLUDED IN SEAL KIT**

See Page 44 for Pilot Valve Parts

KEY	PART NO.	PART NAME	KEY	PART NO.	PART NAME	KEY	PART NO.	PART NAME								
1	K032-031	Body Sub-Assy.	10	K092-060	End Cap Sub-Assy.	13	H175-12	Lock Washer								
2	H090-03	Retaining Ring	• 11	K183-001	Gasket	14	H100-60	Cap Screw								
3	K453-006	Spacer	12	<table border="1"> <tr> <td>Standard Service Pilot</td> <td>Special Service Pilot</td> <td></td> </tr> <tr> <td>K175-3035</td> <td>K185-3025</td> <td>Pilot with Over-Ride (Other than 120-AC)</td> </tr> <tr> <td>K175-9035</td> <td>K185-9025</td> <td>Pilot with Over-Ride and Indicator Light (120-AC Only)</td> </tr> </table>	Standard Service Pilot	Special Service Pilot		K175-3035	K185-3025	Pilot with Over-Ride (Other than 120-AC)	K175-9035	K185-9025	Pilot with Over-Ride and Indicator Light (120-AC Only)	• 15	K183-054	Gasket
Standard Service Pilot	Special Service Pilot															
K175-3035	K185-3025	Pilot with Over-Ride (Other than 120-AC)														
K175-9035	K185-9025	Pilot with Over-Ride and Indicator Light (120-AC Only)														
• 4	H135-88	O-Ring	16	H027-17	Contact Plug & Conn. Assy.											
5	K453-005	Spacer	17	H027-19	Connector & Wire Assy.											
	H145-08	Seal	18	K152-003	Over-Ride Assy.											
7	K232-018	Plunger Sub-Assy.	19	H100-59	Cap Screw											
• 8	H142-16	Seal	20	H175-12	Lock Washer											
9	K092-059	End Cap Sub-Assy.														

# SOLENOID PILOT VALVES

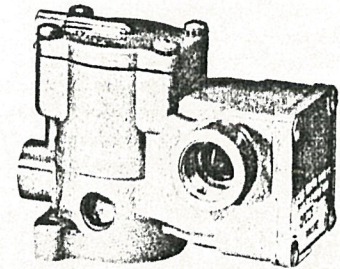
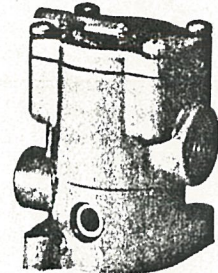
# STANDARD DUTY

Standard Duty Pilots are designed to handle most applications up to 600 cycles per minute. Pilots are available with 1/16", 3/32", or 1/8" orifices. The largest orifice provides the highest flow and fastest response; however, the smallest orifice permits the highest operating pressure. Pilots should generally be selected with the largest orifice size that will handle the operating pressure required. For operating pressures, see chart on Page 136.

Standard Duty Pilot Valves can be used for 2-way or 3-way normally open or normally closed service. They are designed for use with air, vacuum or inert gas. Pilots may be ordered for "Direct Pipe Ported" or "Manifold Mounting." All ports are tapped 1/4" NPTF. Coils are available for most AC or DC voltages. Specify voltage and hertz when ordering.

### ENGINEERING DATA:

Service: Air, Inert Gas, Vacuum.  
 Cycle Speed: Maximum 600 Cycles per Minute.  
 Current Consumption @ 120V-60Hz: .29 amp. Inrush; .18 amp. Holding  
 @ 110V-50Hz: .32 amp. Inrush; .22 amp. Holding



### SERVICE LIMITATIONS:

**TEMPERATURE**—Maximum ambient temperature, continuous service:  
 Standard Pilots ..... 100°F.  
 Special Service Pilots ..... 125°F.  
 Maximum ambient temperature, intermittent service:  
 All Pilots ..... 125°F.  
 Minimum ambient temperature\* ..... 0°F.

\*In below-freezing ambient temperatures, it is important that a suitable lubricant be reasonably moisture-free.

### HOW TO ORDER:

Select Valve Model Number and add Solenoid Voltage and Hertz. For example, K055-7005 120V-60Hz/110V-50Hz. When specifying Sub-base type, list Sub-base or Modular Manifold separately.

VALVE DESCRIPTION	PILOT OPTIONS	ORIFICE SIZE	CV	STANDARD SERVICE		SPECIAL SERVICE		VACUUM SERVICE
				2-WAY	3-WAY	2-WAY ▲	3-WAY	
N.C. DIRECT PIPE PORTED	w/Junction Box for 115-AC	1/16"	.12	K055-7005	K055-7005	K075-7019	K075-7019	K055-7043
		3/32"	.21	K055-7015	K055-7019			
		1/8"	.22	K055-7037	K055-7041			
	w/Junction Box for Other Than 115-AC	1/16"	.12	K055-4005	K055-4005	K075-4019	K075-4019	
		3/32"	.21	K055-4015	K055-4019			
		1/8"	.22	K055-4037	K055-4041			
	Without Junction Box	1/16"	.12	K055-1005	K055-1005	K075-1019	K075-1019	
		3/32"	.21	K055-1015	K055-1019			
		1/8"	.22	K055-1037	K055-1041			
N.C. SUB-BASE MOUNTED	w/Junction Box for 115-AC	1/16"	.11	K065-7005	K065-7005	K085-7019	K085-7019	K065-7045
		3/32"	.15	K065-7015	K065-7019			
		1/8"	.15	K065-7037	K065-7041			
	w/Junction Box for Other Than 115-AC	1/16"	.11	K065-4005	K065-4005	K085-4019	K085-4019	
		3/32"	.15	K065-4015	K065-4019			
		1/8"	.15	K065-4037	K065-4041			
	Without Junction Box	1/16"	.11	K065-1005	K065-1005	K085-1019	K085-1019	
		3/32"	.15	K065-1015	K065-1019			
		1/8"	.15	K065-1037	K065-1041			

▲ - See port identification chart for special service 2-way valve.

VALVE DESCRIPTION	PILOT OPTIONS	ORIFICE SIZE	CV	STANDARD SERVICE	SPECIAL SERVICE	VACUUM SERVICE
N.O. DIRECT PIPE PORTED	w/Junction Box for 115-AC	1/16"	.10	K055-7007	K075-7023	K055-7041
		3/32"	.18	K055-7023		
		1/8"	.21	K055-7043		
	w/Junction Box for Other Than 115-AC	1/16"	.10	K055-4007	K075-4023	
		3/32"	.18	K055-4023		
		1/8"	.21	K055-4043		
N.O. SUB-BASE MOUNTED	w/Junction Box for 115-AC	1/16"	.10	K055-1007	K075-1023	K055-1041
		3/32"	.18	K055-1023		
		1/8"	.21	K055-1043		
	w/Junction Box and Override for 115-AC	1/16"	.11	K065-7007	K085-7023	
		3/32"	.15	K065-7023		
		1/8"	.19	K065-7043		
w/Junction Box for Other Than 115-AC	1/16"	.11	K065-9007	K085-9023		
	3/32"	.15	K065-9023			
	1/8"	.19	K065-9043			
N.O. SUB-BASE MOUNTED	w/Junction Box for 115-AC	1/16"	.11	K065-4007	K085-4023	K065-4041
		3/32"	.15	K065-4023		
		1/8"	.19	K065-4043		
	w/Junction Box and Override for Other Than 115-AC	1/16"	.11	K065-6007	K085-6023	
		3/32"	.15	K065-6023		
		1/8"	.19	K065-6043		
Without Junction Box and Without Override	1/16"	.11	K065-1007	K085-1023		
	3/32"	.15	K065-1023			
	1/8"	.19	K065-1043			
Without Junction Box but with Override	1/16"	.11	K065-3007	K085-3023		
	3/32"	.15	K065-3023			
	1/8"	.19	K065-3043			

### PORT IDENTIFICATION:

N.C.	PORT 1	PORT 2	PORT 3
PRESSURE SERVICE	3-way	Inlet	Cylinder
	2-way	Outlet	Exhaust
VACUUM SERVICE	3-way	Pump	Device
	2-way	Pump	Device

N.O.	PORT 1	PORT 2	PORT 3
PRESSURE SERVICE	3-way	Exhaust	Cylinder
	2-way	Plugged	Inlet
VACUUM SERVICE	3-way	Open	Device
	2-way	Plugged	Pump

Use pipe plug H074-07 for 2-way service.

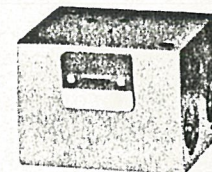
CYLINDER PORTS	INLET	EXHAUST	MODEL NUMBER
Sub-base	1/4"	1/4"	K022-098



SUB-BASE—K022-098

Manifold Assemblies (1/4" NPTF)	No. of Stations
K142-075	1
K142-124	2
K142-125	3
K142-126	4
K142-127	5

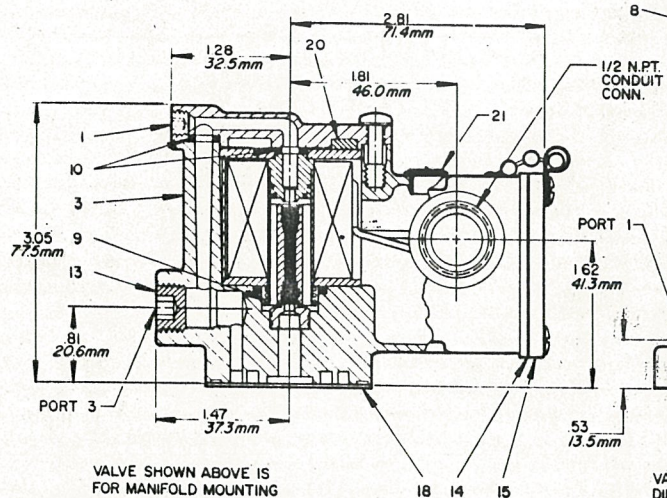
NOTE: Assemblies include installation kits which include seals and tie rods.



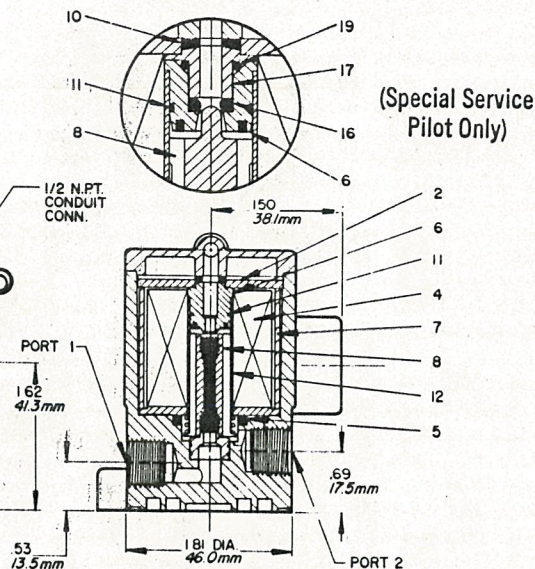
- On multiple station assembly, specify pilot valve model as assembled facing port #2 (Cyl.) from left to right.
- Maximum pressure through any manifold assembly will be determined by the maximum pressure rating of the lowest rated pilot valve in the series.
- For dimensional information, see page 154.

# STANDARD DUTY DIMENSIONAL/PARTS DATA

# SOLENOID PILOT VALVES



VALVE SHOWN ABOVE IS FOR MANIFOLD MOUNTING



VALVE SHOWN ABOVE IS FOR DIRECT PIPE CONNECTION

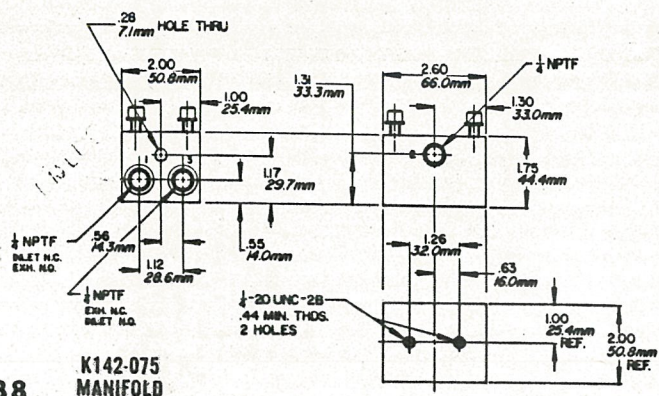
## • Parts included in Standard Seal Kit No. K352-166

KEY	PART NUMBER	PART NAME	
1	K062-012	Cover Assy.	
	K062-015	Cover Assy. (Special Service)	
	K323-005	Top Plate	
3	<b>Manifold Mounted</b>		
	With Junction Box	Without Junction Box	
	K112-073	K112-071	Body Assembly (1/16 Orifice) N.C.
	K112-051	K112-031	Body Assembly (1/16 Orifice) N.O.
	K112-052	K112-032	Body Assembly (1/16 Orifice)
	K112-050	K112-033	Body Assembly (1/8 Orifice)
	<b>Direct Pipe Ported</b>		
	With Junction Box	Without Junction Box	
	K112-070	K112-068	Body Assembly (1/16 Orifice) N.C.
K112-054	K112-034	Body Assembly (1/16 Orifice) N.O.	
K112-055	K112-035	Body Assembly (1/16 Orifice)	
K112-053	K112-036	Body Assembly (1/8 Orifice)	
*4	K593-025	Coil 120V-60Hz/110V-50Hz	
	K593-035	Coil 230V 60Hz	
	K593-041	Coil 460V 60Hz	
	K593-003	Coil 6V DC	
	K593-010	Coil 12V DC	
	K593-014	Coil 24V DC	
	K593-041	Coil 115V DC	
	K593-036	Coil 230V DC	

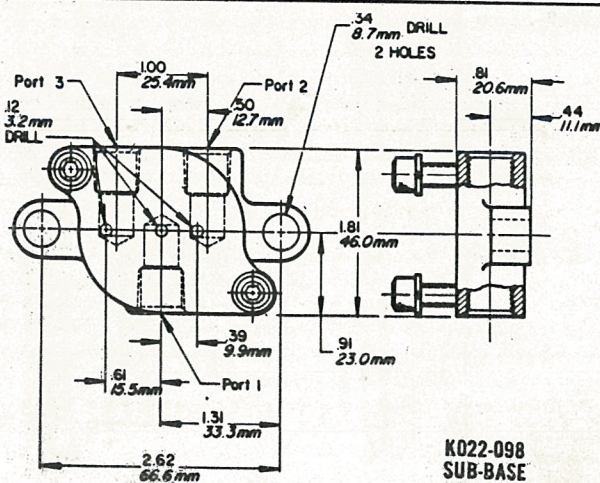
## For Special Service order Seal Kit No. K352-366

KEY	PART NUMBER	PART NAME
• 5	H142-13	Seal
6	K423-005	Top Seat (1/16 Orifice)
	K423-006	Top Seat (1/16 Orifice)
	K423-004	Top Seat (1/8 Orifice)
7	K423-010	Top Seat (Special Service Pilot)
	K443-009	Split Sleeve
8	•K343-002	Plunger - Standard Service
8	K343-001	Plunger - Special Service
	K473-001	Spring N.O. Valve
9	K473-002	Spring N.C. Valve
•10	H142-01	Seal
•11	H249-69	O-Ring
12	K272-004	Sleeve Assembly
13	H074-07	Pipe Plug
•14	K183-047	Cover Gasket
15	K062-004	Junction Box Cover Assembly
•16	H134-73	O-Ring
17	K213-005	Insert
•18	K183-001	Gasket
•19	H134-13	O-Ring
20	H147-01	Shock Pad
21	K333-011	Plug
	H191-02	Light (Not Shown)
	H181-27	Light Connector (Not Shown)

\* NOTE: Standard Coil Leads are 19" Long. All others are specials.



K142-075  
MANIFOLD



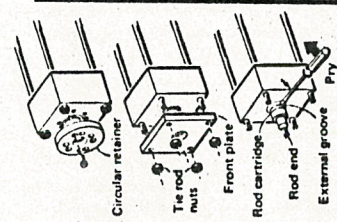
K022-098  
SUB-BASE



# CYLINDER MAINTENANCE DATA

## TO REPLACE TUBE END SEALS

- Remove tie rod nuts at end of cylinder.
- Remove head and cap from cylinder.
- Discard used seal, and clean all parts thoroughly, including inside of tube and grooves in head and cap.
- All R2, LR2 & HR2 Tube Seals supplied are of the new style Teflon design. Although they are not dimensionally the same as the old gasket tube seal, they can be used with existing tube and end caps.
- When installing Continuous-Ring Type Seal for Series R2, LR2 & HR2 1-1/2 thru 5" bore, avoid stretching seal. Apply enough petroleum jelly so that seal stays in position in groove of head or cap.
- When installing Non-Continuous-Ring Type Seal for Series R2, LR2 & HR2 6" bore & up, and for N2, N3, LN3, N5, N7 series all bore sizes, insert seal with



- Caution to avoid stretching. (See fig. 2 & 3).
- Be sure to butt ends of seal together as you begin to seal into groove.
- Hold the ends together and in place with one finger, while seating the rest of the seal with your other hand.
- Avoid stretching, twisting, or pulling seal when sealing it in the groove.
- Make certain seal is seated fully into groove, and against outer groove diameter.
- Reassemble cylinder. Tighten Tie Rod Nuts hand tight only.
- Torque Tie Rod Nuts in order shown in Fig. 1-1-2-3-4 See chart at bottom of page for proper torque.
- Re-check torque in same order.

Screen Size	1/4" - 20	3/16" - 18	3/8" - 16	7/16" - 14	5/8" - 11	3/4" - 10
Torque (ft/lb)	18	34	53	80	270	370

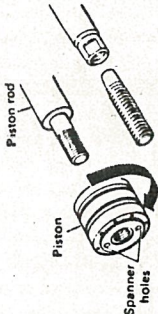
## PISTON AND ROD END STUD —LOCTITE METHOD

- Heat piston and rod to 400°-450° F.
- Disassemble while hot using spanner wrench.
- Remove piston by turning counterclockwise.

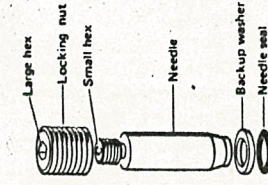
## TO REMOVE ROD END STUD FROM ROD

- Heat rod end stud to 400°-450° F.
- Unthread while hot.

NOTE: Loctite is recommended for use in the temperature range of -65° to 300° F.



ASSEMBLE PARTS WITHIN 3 MINUTES AFTER APPLICATION OF LOCTITE



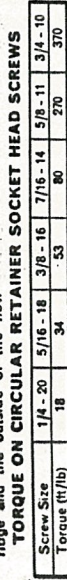
## NEEDLE AND BALL CHECK VALVES

- Remove existing needle valve assembly by first loosening large hex 1 or 2 turns to relieve pressure. Then back out small hex until full assembly is removed. Pull out existing backup washer and needle seal from the recess and discard all parts.
- Insert replacement needle valve assembly using large hex to thread it into the needle valve recess.
- After valve assembly has been fully threaded into recess and locked securely, use small hex to adjust needle for desired flow, thus controlling

## ROD CARTRIDGE SEALS AND TUBE END SEALS

### TO REPLACE ROD CARTRIDGE SEALS

- In almost all cases there is a circular retainer at the head end, remove the seal head screws which retain it. Otherwise, remove tie rod nuts, onto the rod.
- Remove circular retainer or front plate which contains rod cartridge.
- Remove rod cartridge. To overcome friction, insert screwdriver in external groove. Pry carefully, (see illustration).
- Clean cartridge recess in the head.
- Lubricate the inside of the rod cartridge and the outside of the new cartridge on circular retainer socket head screws.



## TO REPLACE BALL CHECK VALVE ASSEMBLY

- Remove and discard existing ball-check valve assembly from cylinder.
- Install replacement ball and strike it against the shoulder in the check valve recess. Then lightly grease anti-extrusion washer and spring so they will adhere to retainer nut when installing.
- Use standard internal socket wrench to securely seat the retainer nut. Ball-check valve assembly should be flush with cylinder head and cap surface when fully seated.

NOTE: On HR2, N2, N5 and N7 hydraulic cylinders there is no ball check spring.

## CYLINDER RATINGS AND TORQUE VALUES

Cylinder (inches)	HR2-LR2-HR2			N2-N5-N7-N3-LN3		
	Heavy Duty Factor	Design Yield (Psi)	Heavy Duty Service	Design Yield (Psi)	Design Yield (Psi)	Heavy Duty Service
1-1/2	1500	1875	3000	2150	2150	3000
2	1500	1875	3000	2150	2150	3000
2-1/2	1500	1875	3000	2150	2150	3000
3	1500	1875	3000	2150	2150	3000
3-1/4	1500	1875	3000	2150	2150	3000
4	1500	1875	3000	2150	2150	3000
5	1500	1875	3000	2150	2150	3000
6	1500	1875	3000	2150	2150	3000
7	1500	1875	3000	2150	2150	3000
8	1500	1875	3000	2150	2150	3000
10	1500	1875	3000	2150	2150	3000
12	1500	1875	3000	2150	2150	3000
14	1500	1875	3000	2150	2150	3000
16	1500	1875	3000	2150	2150	3000
18	1500	1875	3000	2150	2150	3000
20	1500	1875	3000	2150	2150	3000

\*The LR2, LN3 & LN4 for 200 p.s.i. are service maximum based on minimum yield point of weakest component and standard piston rod diameter size. (The above values are for lubricated threads and lubricated nut contact faces.

## CAUTION TO AVOID STRETCHING

(See fig. 2 & 3).

Be sure to butt ends of seal together as you begin to seal into groove.

Hold the ends together and in place with one finger, while seating the rest of the seal with your other hand.

Avoid stretching, twisting, or pulling seal when sealing it in the groove.

Make certain seal is seated fully into groove, and against outer groove diameter.

Reassemble cylinder. Tighten Tie Rod Nuts hand tight only.

Torque Tie Rod Nuts in order shown in Fig. 1-1-2-3-4 See chart at bottom of page for proper torque.

Re-check torque in same order.

If cylinder is to be subjected to temperatures higher than 300 degrees F, use serrated pin to lock piston to rod.

Loctite will completely cure in 24 hours at room temperature.

NOTE: Where end of threads are concealed (such as Retainer nut) use Loctite grade "T" primer after cleaning. Allow to dry for 5-7 minutes. Apply Loctite grade AV. Assemble and torque parts within 3 minutes. Allow parts to cure for 30 minutes before testing.

Loctite is not effective above 300 degrees F. If cylinder is to be subjected to temperatures higher than 300 degrees F, use serrated pin to lock piston to rod.

## WARRANTY

Our products are warranted for 1 year from date of shipment to be free from defects in workmanship and materials. Our limit of liability under this warranty (which excludes all other warranties, either express or implied) is limited to replacing, free of charge, the particular item which our inspection discloses to have been defective at time of shipment. Inspection may be at the place of installation and use or, at our plant if its return to us at our expense is requested. Notice of alleged defect and opportunity for inspection must be given us within 1 year from date of shipment.

The seller hereby certifies that the prices and terms of the applicable schedule of the above listed components are the lowest obtainable under the applicable requirements of the Buy American Act of 1933, and that the products and/or services covered by this invoice have been produced in full compliance with the requirements of the Fair Labor Standards Act of 1938, as amended.

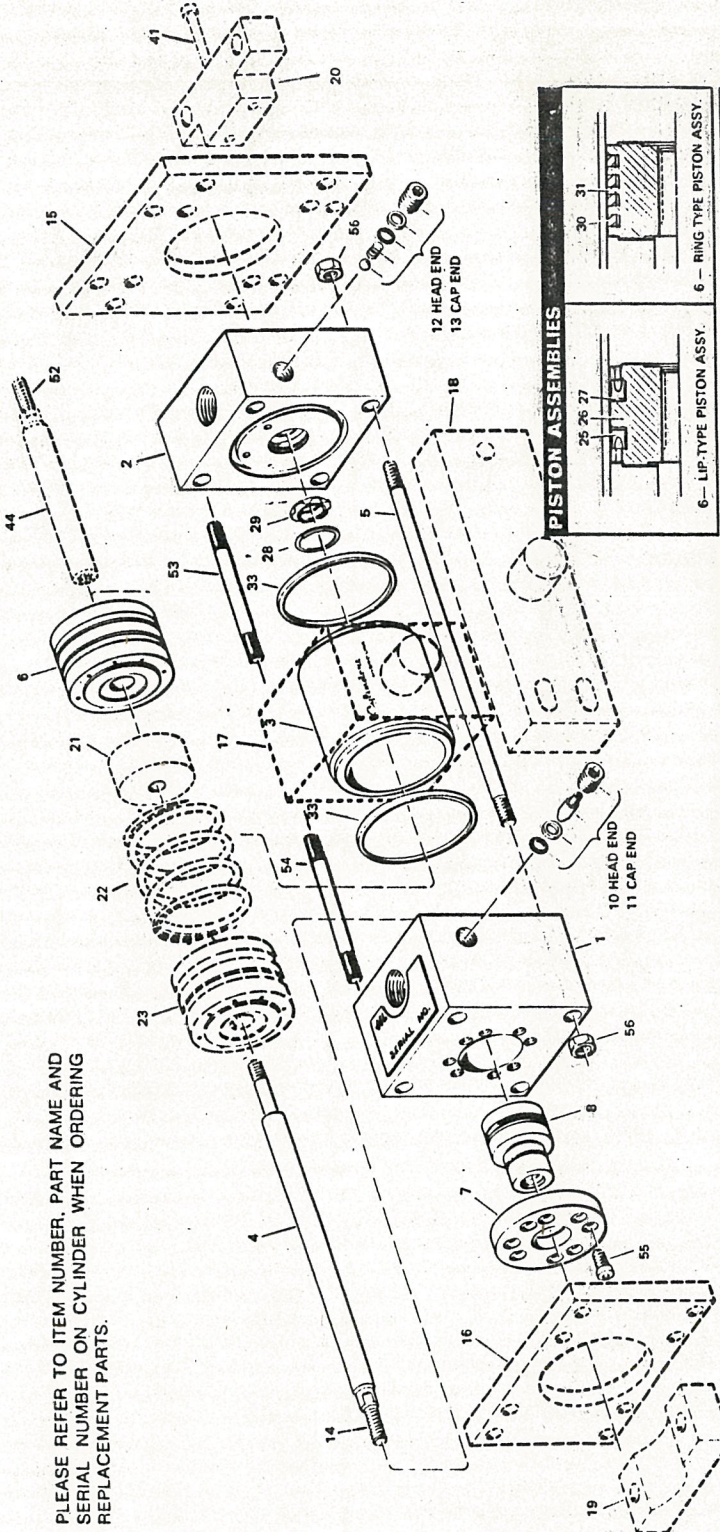


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# HYDROLINE PARTS LIST

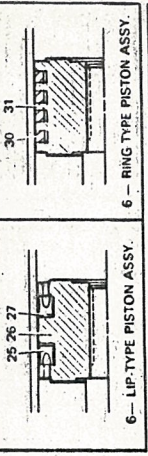
ITEM	QTY	PART NAME	PART NO.
1		Head	
2		Cap	
3		Tube	
4		Piston Rod	
5		Tie Rods	
6		Piston Assembly	
7		Retainer Plate	
8		Cartridge Assembly	
9		Head Cushion Spud	
10		Head Needle Assy	
11		Cap Needle Assy	
12		Head Ball Ck. Assy	
13		Cap Ball Ck. Assy	
14		Rod End Stud	
15		Flange	
16		Flange	
17		Intermed Trunnion	
18		Trunnion Bar	
19		Mounting Lug - Head	
20		Mounting Lug - Cap	
21		Stop Tube	
22		Spring	
23		Stop Tube Piston	
24		Cap Cushion Spud	
25		Lip Type Piston Seal	
26		Lip Type Piston	
27		Piston Seal Washer	
28		Soap Ring	
29		Flushing Cap Insert	
30		Piston Ring	
31		Ring Type Piston	
32		O-Ring	
33		Tube Seals	
34		O-Ring	
35		Rod Wiper	
36		Rod Bearing	
37		Back-Up Washer	
38		O-Ring	
39		Rod Seal Washer	
40		Rod Seal	
41		Soc Hd Cap Screws	
42		CU Rod Seal	
43		Metallic Scraper	
44		Piston Rod	
45		Rod End Coupler	
46		Female Clevis	
47		Female Eye	
48		Clevis Bracket	
49		Pivot Pin	
50		Eye Bracket	
51		Swivel Eye Bracket	
52		Rod End Stud	
53		Cap Tie Rods	
54		Head Tie Rods	
55		Soc Hd Cap Screws	
56		Tie Rod Nuts	
57		Self Aligning Coupling	
58			
59			
60			
61			
62			
63		Rod Seal Kit	
64		Piston Seal Kit	

# HYDROLINE CYLINDER PARTS CALLOUT

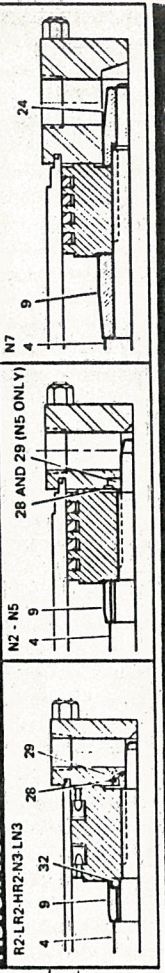


PLEASE REFER TO ITEM NUMBER, PART NAME AND SERIAL NUMBER ON CYLINDER WHEN ORDERING REPLACEMENT PARTS.

### PISTON ASSEMBLIES



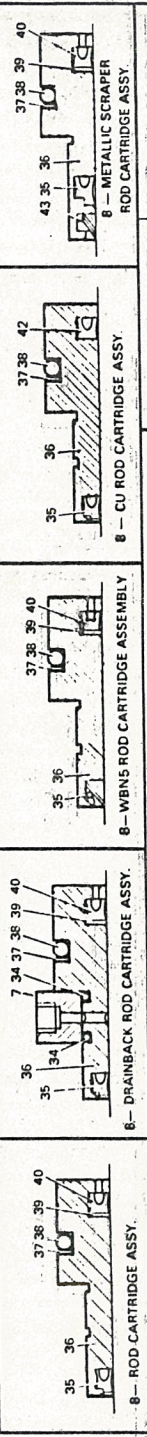
### PISTON ROD AND CUSHION ASSEMBLIES



### PISTON SEAL KIT

CONSISTING OF:		ROD SEAL KIT	
RING TYPE	LIP TYPE	ITEMS	ITEMS
30	25	35	39
33	27	37	40
	33		

### ROD CARTRIDGE ASSEMBLIES



### MOUNTING ACCESSORIES



The part numbers and information given on this page refer to the HYDRO-LINE cylinder listed

MODEL:	ROD DIA:
BORE:	ROD STYLE:
STROKE:	CUSHIONS:
SERIAL NO.:	