

SUPERPRESSURE

LITTLE RICHARD PNEUMATICALLY OPERATED VALVE

44-19730	20K NORMALLY CLOSED
44-19730LS	20K NORMALLY CLOSED & LIMIT SWITCH
44-19730OX	20K NORMALLY CLOSED OXYGEN SERVICE
44-19731	60K NORMALLY CLOSED
44-19731LS	60K NORMALLY CLOSED & LIMIT SWITCH
44-19749-1	100K NORMALLY CLOSED
44-19749-1LS	100K NORMALLY CLOSED & LIMIT SWITCH
44-19790	20K NORMALLY OPEN
44-19790LS	20K NORMALLY OPEN & LIMIT SWITCH
44-19791	60K NORMALLY OPEN
44-19791LS	60K NORMALLY OPEN & LIMIT SWITCH
44-19799-1	100K NORMALLY OPEN
44-19799-1LS	100K NORMALLY OPEN & LIMIT SWITCH

This Manual is for:

Part No. : _____
Sales Order No. : _____
Serial No. : _____
Date Manufactured : _____

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44-197300X

Little Richard 20K PSI Normally Closed-Oxygen Service

52076005700

Air Drive 6"

52076005900

Drive Unit Sub Assembly N/O

52076006000

Driver Unit Sole Assembly

56046002900

Valve Body Assembly

I DESCRIPTION

The Newport Scientific, Inc. Little Richard Valve, is a solenoid operated pneumatic piston type pressure valve. The valve is composed of four major components.

- a valve body assembled for the pressure rating of the Little Richard Valve
- a spring-return assembly, one for normally closed mode, another for normally open mode
- a pneumatic actuator cylinder and piston 6 inches in diameter
- a normally closed three-way solenoid valve

The pneumatic piston actuator uses a low pressure (90 psi) air supply controlled by the normally closed, explosion proof, Class 1, Group D solenoid valve.

When electrically energized, the solenoid valve opens to allow air to enter the actuator piston. The piston is connected to the pressure valve stem by an extension shaft, and a spring keeps the actuator shaft in the normally open (NO) or normally closed (NC) position. When air enters the cylinders, spring tension on the piston is overcome and the valve stem is moved to the fully open or fully closed position. When the solenoid valve is de-energized, the air pressure is vented from the actuator cylinder through the exhaust port of the solenoid, (see assembly drawing), and the spring tension returns the valve stem to its normal position.

APPLICATION

Solenoid valve control of the pneumatic actuator permits the use of the Little Richard Valve for remotely controlled on-off operation, or as a pressure sensitive, contact-type gage in the line. The valve may also be furnished with limit switches for remote indication if the fully open or fully closed positions.

CONSTRUCTION FEATURES

- The structure containing the pneumatic piston actuator and connecting shaft is constructed of heavy-duty aluminum.
- Valve bodies available:
 - 20,000 psi body with 5/16 inch orifice opening
 - 60,000 psi body with 1/8 inch orifice opening
 - 100,000 psi body with 1/16 inch orifice opening
- Valve body material:
 - for 20,000 and 60,000 psi service, 316 stainless steel
 - for 100,000 psi service, 410 stainless steel, heat treated
 - for oxygen service, Monel 400
- All parts exposed to the flowing medium are made of stainless steel, for oxygen service, Monel, and stellite.
- Stems (replaceable) are made of 440C stainless steel, heat treated
 - for oxygen service, stellite #6B
- Valve seat (replaceable):
 - For 20,000 and 60,000 psi service: 410 stainless steel, heat treated
 - For 100,000 psi service: 17-4PH
 - For oxygen service: stellite #25
- All valves are furnished with 416 stainless steel glands, nuts and sleeves

SPECIFICATIONS

COMMON CHARACTERISTICS

OPERATED AIR PRESSURE: 90 psi nominal
AIR CONNECTIONS: 1/4 inch NPT
VALVE STEM TRAVEL: 5/16 inch maximum
VALVE STEM CLOSURE ANGLE: 60 degrees
SOLENOID VALE: Normally closed
ELECTRICAL POWER: 115V, 60Hz, 1-phase
SOLENOID ENCLOSURE: Explosion proof

CHARACTERS THAT VARY BY MODEL

MODELS:	20,000 PSI	60,000 PSI	100,000 PSI
MAXIMUM OPERATING PRESSURE:	20,000 PSI	60,000 PSI	100,000 PSI
OPERATING TEMPERATURE*:	-100°F TO 450°F	-100°F TO 450°F	-20°F TO 300°F
VALVE ORIFICE DIAMETER:	5/16 INCH	1/8 INCH	1/16 INCH
INTAKE TUBING CONNECTION:	9/16 INCH HP**	9/16 INCH	1/4"
DISCHARGE TUBING CONNECTION:	9/16" HP**	9/16" HP**	1/4" HP***

* For 20,000 and 60,000 PSI models, special aluminum foil packing can be used to increase the operating temperature to 1000°F.
** Adapters for 1/4 HP or 3/8 HP are supplied when specified.
*** Inlet/Outlet openings for 9/16 inch OD AMINCO high-flow tubing can be furnished on special order.

II INSTALLATION

IF EQUIPMENT IS RECEIVED IN DAMAGED CONDITION:

Forward an immediate request to the delivering carrier to perform an inspection and prepare a concealed-damage report. Do not destroy container or packing material until contents have been verified. Concurrently report the nature and extent of damage incurred to Newport Scientific, Inc. giving instrument serial and catalog numbers, so that action may be initiated to repair or replace damaged parts or instructions issued for the return of the instrument. Do not return damaged goods to Newport Scientific, Inc. without first securing proper authorization from the Company. The responsibility of Newport Scientific, Inc. ends with delivery to the first carrier; all claims for loss, damage, or non-delivery must be made against the delivering carrier within 10 days of receipt of shipment.

MOUNTING

Mounting dimensions are shown in assembly drawing. Facilities for mounting are provided as follows:

Two 3/8-16 UNC-2 B tapped side mounting holes 3/4 inch deep at the edge of the cylinder flanges on 2-7/8 inch centers.

Four 11/32 inch flange mounting holes on 5-7/8 inch centers at the corners of the cylinder flange

base.

The Little Richard Valve may be mounted in any practical position. Position does not affect operation.

CONNECTIONS

Valves are packed and shipped with gland nuts finger-tight only and must be tightened before being put into service,

Connect appropriate high pressure tubing to be the inlet and discharge ports of the valve body. Tubing gland nuts should be tightened with a torque wrench as follows:

9/16 inch HP connections, tighten nut to 45 ft-lbs, approximately

3/8 inch HP connections, tighten nut to 28 ft-lbs, approximately

1/4 inch HP connections, tighten nut to 15 ft-lbs, approximately

2. Connect 90 psi air supply to the solenoid valve air inlet port.
3. Connect 115V, 60Hz power line to the solenoid valve either through a control switch, or in series with a contact type pressure gage. Use 1/2 inch NPT threaded conduit or electrical connections to solenoid valve when Little Richard Valve is used in hazardous atmosphere or to handle flammable gases or liquids.

CHECKOUT AND ADJUSTMENT

STEM-SEAT SEAL CHECK

Valves are tested by Newport Scientific, Inc. for effective pressure seal. However, in some cases, service conditions require that the stem seat be tighter (i.e., the stem be adjusted slightly longer so that a more positive and effective seal is made to stop the flow of gas or liquid).

To determine the effectiveness of the seat:

1. Operate the valve in the system several times while using low pressure to purge any dirt particles that could cause a faulty seal.
2. Close the valve by energizing the solenoid of a NO valve or de-energize the solenoid of a NC valve. Slowly apply pressure to the system. If leakage occurs, shut off pressure.
3. Open valve by de-energize the solenoid for NO valve or energize solenoid for NC valve.
4. Loosen valve stem lock nut and packing gland nut, and shorten the squared stem by turning it clockwise with a wrench toward the actuator shaft, approximately one full turn.
5. Close valve. Check that stem is free from its valve seat; it will move easily when turned. If stem is not free, open valve and readjust until stem is free and then close valve.
6. Lengthen stem by turning it counterclockwise until it just touches the valve seat. This is the initial position for stem adjustments for both normally open and normally closed valves.
7. Perform procedures in either "To Set Normally Open Valves Only" or "To Set Normally Closed Valves Only" paragraph.

TO SET NORMALLY OPEN VALVES ONLY

1. De-energize solenoid to open valve. Loosen lock nut and lengthen stem counterclockwise out of the piston shaft to a full turn. Tighten stem lock nut and packing gland nut to torque specified in "Connections" paragraph.
2. Test valve for leaks. If leakage occurs, disassemble the valve and inspect stem and seat for damage. Refer to Maintenance section for disassembly procedures.

TO SET NORMALLY CLOSED VALVES ONLY

1. Energize solenoid to open valve and lengthen stem as follows:
 - A. When valve is being used to one half of its maximum pressure rating. Open valve, loosen lock nut and gland nut and lengthen stem by turning stem counterclockwise out of the piston shaft from one half to a full turn.
 - B. When used at maximum pressure rating, more spring force is required to keep valve from leaking. Set valve as follows:

Loosen stem lock nut and packing nut. Because spring force is essentially linear with spring compression, 20,000 psi or 60,000 psi NC valves operating between one half of maximum pressure rating and full pressure rating should have the stem extended TWO full turns (counterclockwise) for each additional 10% increase in working pressure over 50%. For example: at 60% use 2 turns; at 70% use 4 turns, etc.

For 100,000 psi NC valves, the stem should be extended 1½ turns for each 10% over the 50% maximum working pressure (i.e., at 60% use 1½ turns; for 70% use 3 turns, etc). This setting will result in lower spring fatigue rate. Typical settings at maximum rated pressure are:

- **For 20,000 psi NC Valves at maximum pressure rating** – from point of initial valve seat contact, open the valve and extend the stem out of the piston shaft by turning counterclockwise 9½ full turns.

- **For 60,000 psi NC Valves at maximum pressure rating** – from point of initial valve seat contact, open the valve and extend the stem out of the piston shaft by turning the valve stem counterclockwise 10 full turns.

- **For 100,000 psi NC Valves at maximum pressure rating** - from point of initial valve seat contact, open the valve and extend the stem out of the piston shaft by turning counterclockwise 7½ turns.

2. Tighten stem lock nut and packing gland nut to torque specified in paragraph before testing or operating.

NOTE

Even though the stem travel between the open and closed positions may seem inadequate by using the actuator piston only, the added thrust due to line pressure on the stem will provide a full port area opening.

3. Test valve for leaks. If leakage is encountered, disassemble the valve and inspect the valve seat and stem for damage. Refer to Maintenance section for disassembly procedures.

III MAINTENANCE

REPLACEMENT OF VALVE STEM, SEAT, OR PACKING

1. Remove pressure tubing inlet and discharge connections from the valve.
2. Loosen valve-stem lock nut and packing gland nut.
3. Remove the four bolts and spacer stilts from valve body.
4. Unscrew valve stem from air operated piston shaft.
5. Remove stem and/or packing from valve as follows:

20,000 PSI VALVES

- (1) Remove packing nut.
- (2) Pull them from the valve. The 20,000 psi valve stem has a button tip which enables packing and picking followers to be removed by pulling the stem from the valve.
- (3) Replace appropriate stem and/or packing.
- (4) As the valve is reassembled, lubricate the following interfaces with appropriate lubrication.
 - Between valve stem and packing nut.
 - Threads between packing nut and valve body.
 - Threads between removable seat nut and valve body.
- (5) Tighten packing nut and tubing nuts to the following torque values.
 - Seat nut to about 200 ft-lbs.
 - Packing nut to about 50 ft-lbs.
 - Tubing gland nut, 9/16 inch, about 45 ft-lbs.
 - Tubing gland nut, 3/8 inch, about 28 ft-lbs.
 - Tubing gland nut, 1/4 inch, about 15 ft-lbs.

60,000 PSI VALVES

- (1) Remove the packing nut.
- (2) Pull stem out from valve. Stems of 60,000 psi valves have needle thread stems that are easily removed.
- (3) Remove seat nut, removable valve seat and thrust washer.
- (4) Tap the packing out (either direction) with a soft 1/4 inch diameter metal bar.
- (5) Replace appropriate stem and/or packing.
- (6) As the valve is reassembled, lubricate the following interfaces with appropriate lubrication.
 - Between valve stem and packing nut.
 - Threads between packing nut and valve body.
 - Threads between removable seat nut and valve body.
- (7) Tighten packing nut and tubing gland nuts to the following torque values:
 - Valve seat nut to about 200 ft-lbs.
 - Packing nut to about 50 ft-lbs.
 - Tubing gland nut, 9/16 inch, about 45 ft-lbs.
 - Tubing gland nut, 3/8 inch, about 28 ft-lbs.
 - Tubing gland nut, 1/4 inch, about 15 ft-lbs.

100,000 PSI VALVES

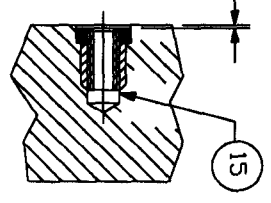
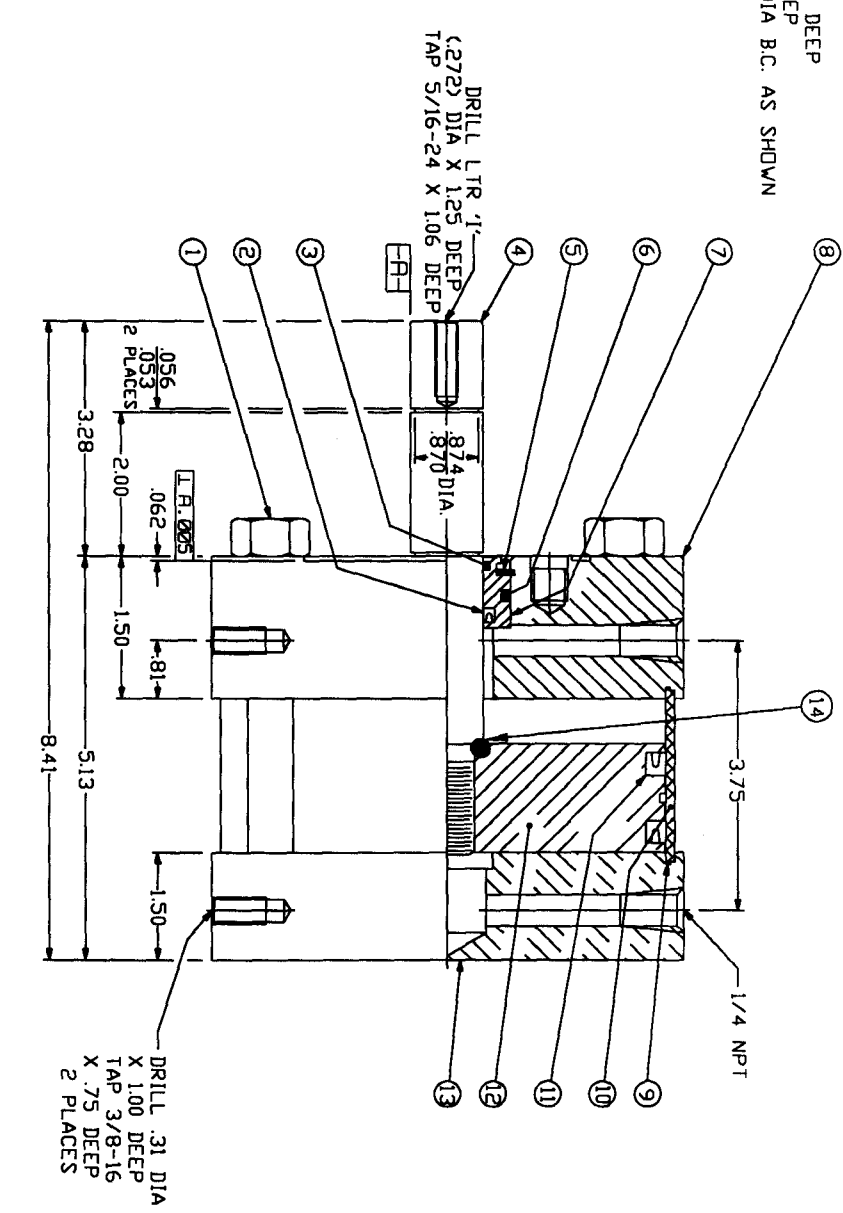
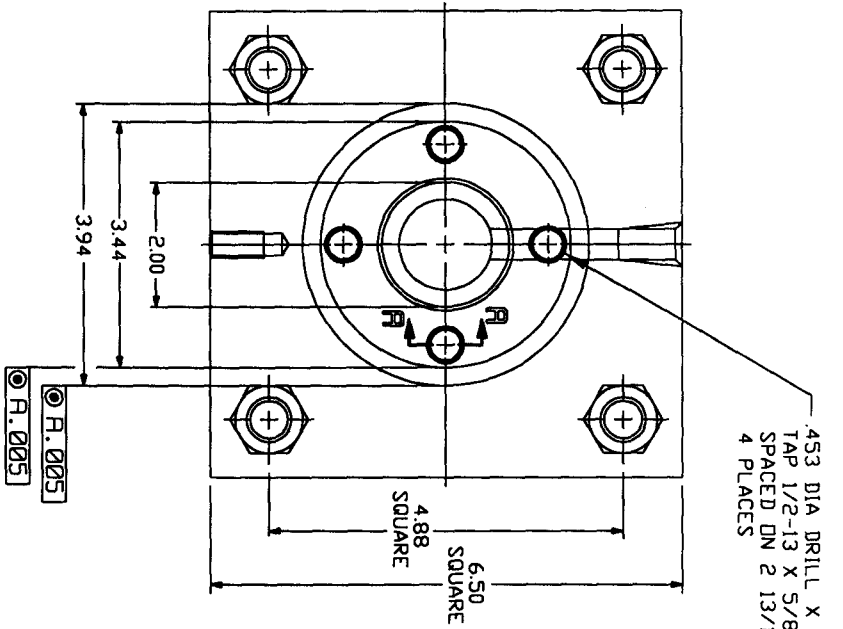
- (1) Remove the packing nut, thrust washer, and the needle-point stem.
- (2) Remove the seat nut, lens ring, and removable valve seat from the other end of the valve body.
- (3) Tap packing out with a soft metal rod, approximately 7/32 inch in diameter.
- (4) Replace packing and/or stem.
- (5) As the valve is re-assembled, lubricate the following interfaces with appropriate lubrication.
 - Between valve stem and packing nut.
 - Threads between packing nut and valve body.
 - Threads between removable seat nut and valve body.
- (6) Tighten nuts to the following torque values:
 - Seat retainer nut to about 200 ft-lbs.
 - Packing nut to about 50 ft-lbs.
 - Tubing gland nut, 9/16 inch, about 75 ft-lbs.
 - Tubing gland nut, 1/4 inch, about 15 ft-lbs.

SPARE PARTS (REFER TO ASSEMBLY DRAWINGS)

	44-19730, -LS 44-19790, -LS	44-19731, -LS 44-19791, -LS	44-19749-1, -LS 44-19799-1, -LS
Stem	56047000300	52085004400	P1624000700
Packing, Standard	44-11471	44-13990	44-19213
Packing (temp. up to 1000°F)	P1620001700	P1620027600	
Seat	56046006200	52085012700	63171001100
Solenoid Valve Thread Lubricant	P0215090600 (Lubriplate 130A)		

OXYGEN SERVICE

	44-197300X		
Stem – Stellite 6B	56046003000		
Packing, Standard	44-11471		
Seat – Stellite 25	56046003300		
Solenoid Valve Thread Lubricant	P0215090600 Krytox GPL 206		



+0.000 CLEARANCE
-0.005 ALLDVAANCE

15 KEYLOCK THREAD INSERT
4 REQUIRED 2 PLACES

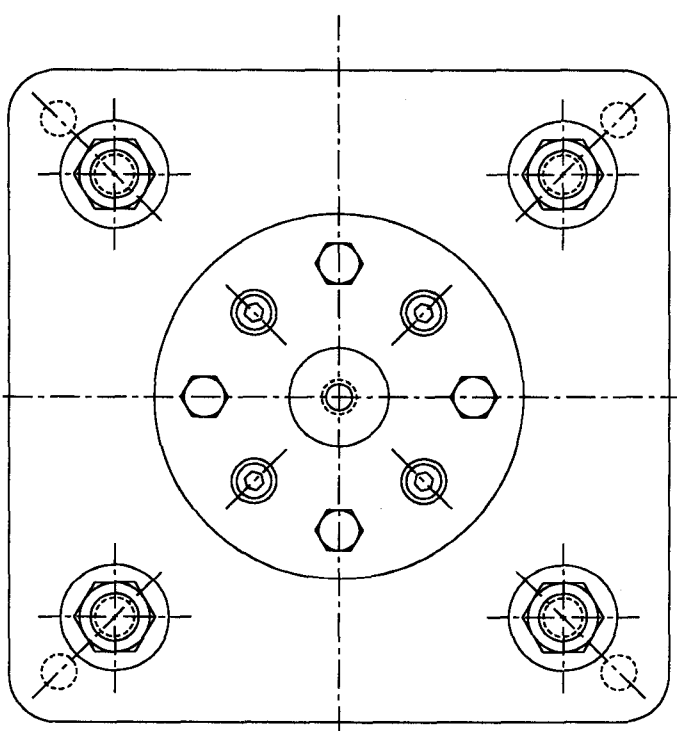
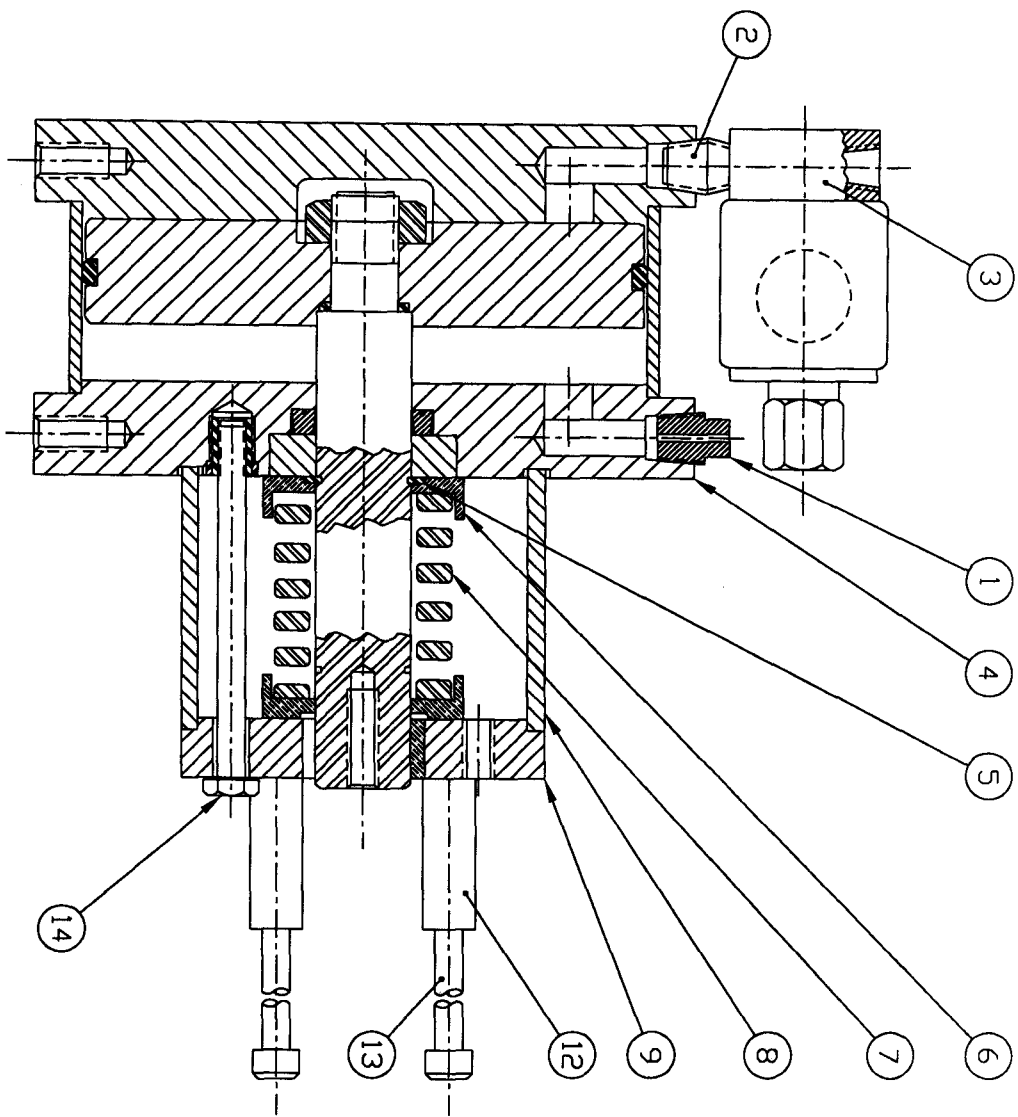
WITH KEYLOCK THREAD INSERTS
INSTALLED

SECTION A-A

NOTE: SEE SHEET #2 OF THIS DRAWING FOR NOTES, MATERIAL LIST, AND REVISIONS

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES		PROPRIETARY	
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DECIMALS ±			
ANGLES ±			
REMOVE ALL BURS AND SHARP EDGES			
DO NOT SCALE THIS DRAWING			
BY	NAME	DATE	FINISH
PREPARED		1/16/87	
CHECKED			
ENGR/ISSN			
APPROVED			
MATERIAL		CODE	TENT. NO.
SEE CHART ON SHEET 2 OF THIS DRAWING		59505	
SCALE FULL		SIZE	PART NO.
		C	52076005700
		WEIGHT	DRAWING NO.
			5752076
		SHEET	1 OF 2

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVED



ITEM	QTY	PART NO.	DESCRIPTION	MATERIAL
14	4	P2121076000	SCR, HEX HD. 5/16-18UNC-2A x 3-3/4 LG.	STEEL
13	4	P2021077600	SCR, SKT. HD. 5/16-18UNC-2A x 4-3/4 LG.	STEEL
12	4	58010001000	SPACER	STEEL
11	N/A	SEE NOTE 1.		
10	N/A	SEE NOTE 1.		
9	1	58010001400	FLANGE, VALVE MOUNTING	
8	1	58010001100	SPACER, TUBULAR	
7	1	P1632007300	SPRING, COMPRESSION-COLOR CODE BRONZE	
6	2	58010001200	RETAINER, SPRING	
5	1	P1620021900	RING, INTERLOCKING, *TRUARC*	
4	1	52076005700	OPERATOR, PNEUMATIC	
3	1	P0215090600	SOLEHEAD	BRASS
2	1	P0202001300	NIPPLE, CLOSE	BRASS
1	1	62037001500	PLUG, VENT	BRASS

NOTES:
 1. LOCATION OF ITEMS 10 & 11 SHOWN ON NEXT ASSEMBLY.

44-19799-1	USED ON
44-19791	
44-19790	

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 TOLERANCES:
 FRACTIONS ±
 DECIMALS ±
 ANGLES ±
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BY: _____ DATE: _____
 CHECKED: _____
 DRAWN: _____
 APPROVED: _____
 MATERIAL: _____

SCALE: NONE WEIGHT: _____ SHEET 1 OF 1

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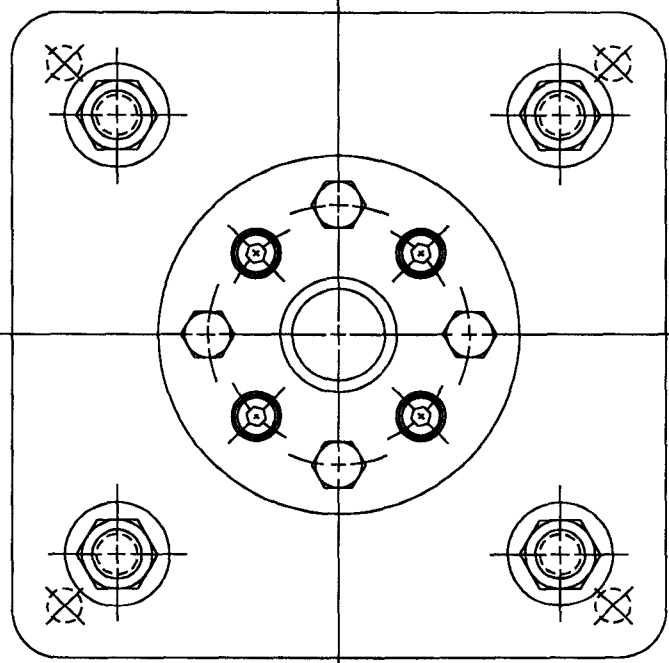
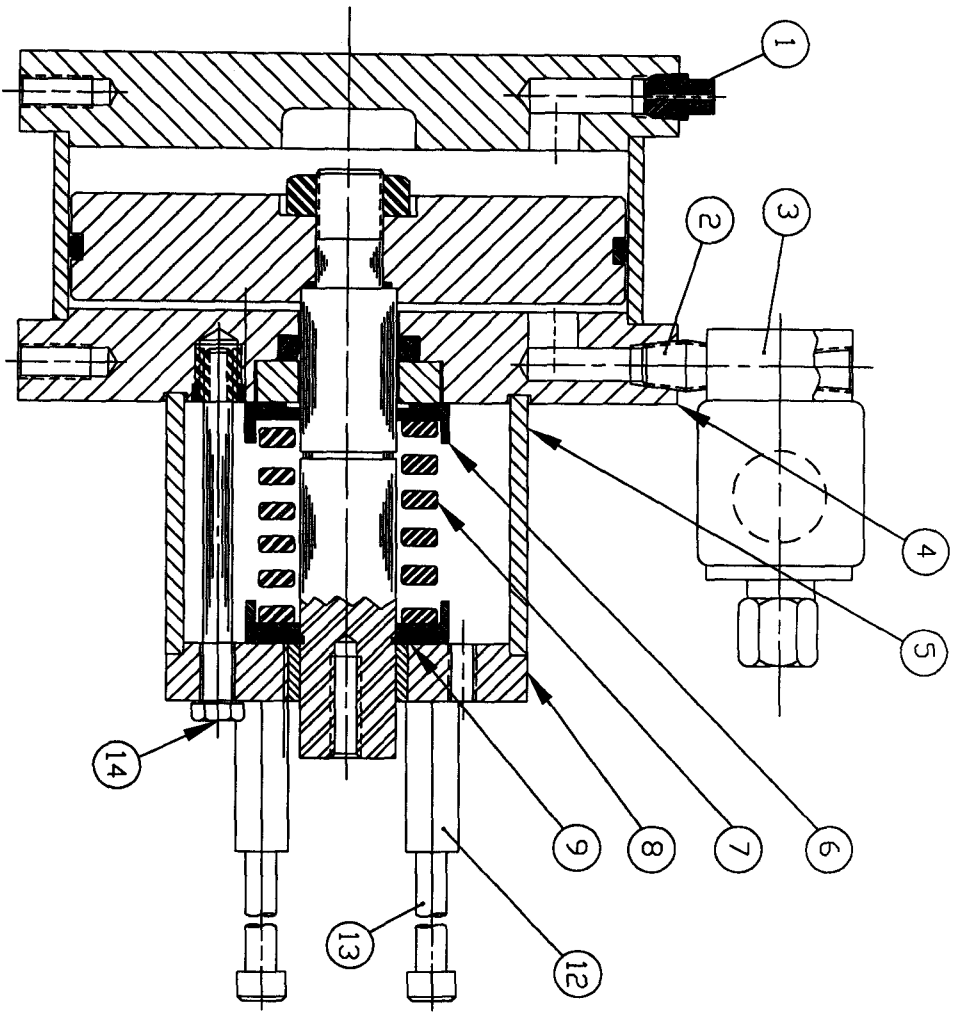
OPERATOR-SUB ASSY-NORMALLY OPEN

44-19799-1
 44-19791
 44-19790

CODE IDENT. NO. 59505
 SIZE C
 PART NO. 52076005900
 DRAWING NO. 5952076

APPLICATION: USED ON

BILL OF MATERIAL



ITEM	QTY.	PART NO.	DESCRIPTION	MATERIAL
14	4	P2121076000	SCR, HEX HD, 5/16-18UNC-2A X 3-3/4 LG.	STEEL
13	4	P2021077600	SCR, SKT. HD, 5/16-18UNC-2A X 4-3/4 LG.	STEEL
12	4	58010001000	SPACER	STEEL
11	—	N/A		
10	—	N/A		
9	1	P1620021900	RING, INTERLOCKING, 'TRUARC'	
8	1	58010001400	FLANGE, VALVE MOUNTING	
7	1	P1632026900	SPRING, COMPRESSION-COLOR CODE SILVER	
6	2	58010001200	RETAINER, SPRING	
5	1	58010001100	SPACER	
4	1	52076005700	AIR DRIVE UNIT	
3	1	P2015090600	SOLENOID, (NORMALLY CLOSED)	BRASS
2	1	P0202001300	NIPPLE, CLOSE	BRASS
1	1	62037001500	PLUG, VENT	BRASS

APPL. ASSY	USED ON
44-19749-1	
44-19731	
44-19730	

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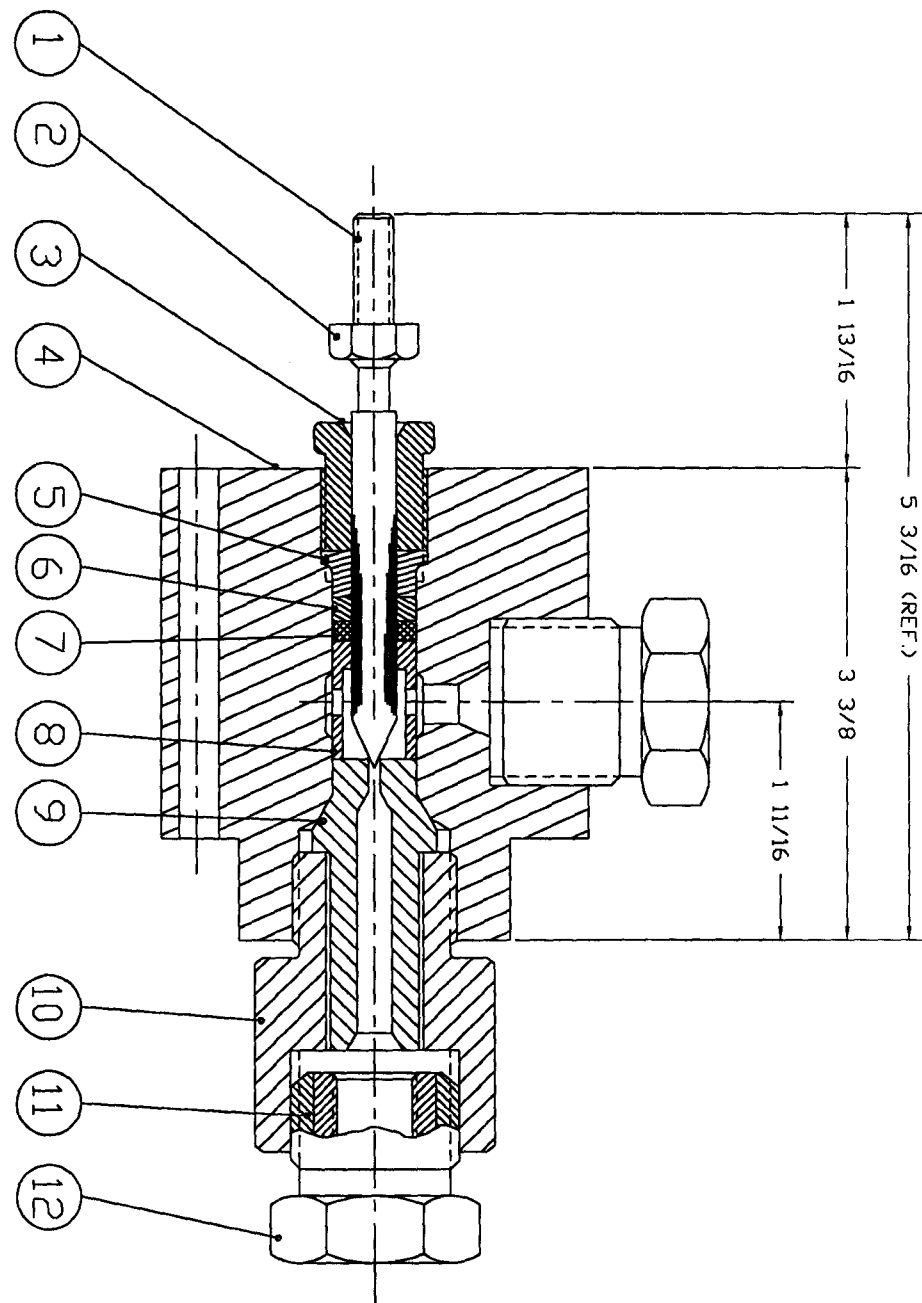
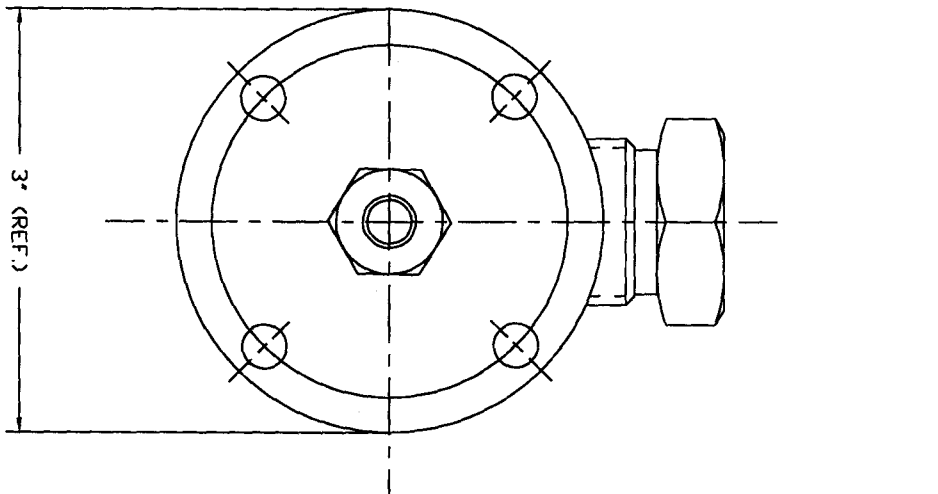
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 CHECKED BY: NAME DATE
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NEWPORT SCIENTIFIC INC. SUPERPRESSURE

TITLE: DRIVE UNIT SUB-ASSY
 NORMALLY CLOSED
 LITTLE RICHARD

CODE DEPT. NO. 59505
 SCALE NONE WEIGHT PART NO. 520760006000
 DRAWING NO. 6052076 SHEET OF



NOTES:
 A. AT ASSEMBLY, LUBRICATE WITH KRYTOX GPL 206 GREASE.

FOLLOWING INTERFACES:
 1. BETWEEN ITEMS 1 AND 3
 2. BETWEEN ITEMS 3 AND 4 (THREADS)
 3. BETWEEN ITEMS 4 AND 10 (THREADS)

B. TIGHTEN PACKING NUT (ITEM - 3) TO A TORQUE OF 50 FT. LBS. APPROX.

C. TIGHTEN GLAND NUTS (ITEM - 12) HAND TIGHT FOR PACKING AND SHIPPING ONLY.

D. TIGHTEN GLAND NUTS (ITEM - 12) TO A TORQUE OF 45 FT. LBS. WITH TUBING INSTALLED.

E. TIGHTEN SEAT NUT (ITEM - 10) TO A TORQUE OF 200 FT. LBS. APPROX.

ITEM	QTY.	DESCRIPTION	PART NO.	MATERIAL
12	2	GLAND NUT	45-11363	416 ST. ST.
11	2	SLEEVE	45-11366	416 ST. ST.
10	1	REMOVABLE SEAT NUT	5604600900	416 ST. ST.
9	1	REMOVABLE VALVE SEAT	5604600300	STELLITE #25
8	1	PACKING FOLLOWER	56046003200	MONEL K 500
7	1	PACKING	44-11471	GLASS FILLED TEFLON
6	1	PACKING FOLLOWER UPPER	56046003100	MONEL K 500
5	1	THRUST SLEEVE	P1602071300	416 ST. ST.
4	1	BODY	56046000700	MONEL 400
3	1	PACKING NUT	57085009402	416 ST. ST.
2	1	NUT/HEX-5/16-24UNF-2A	R1052040700	C. R. S.
1	1	VALVE STEM	56046003000	STELLITE #6B

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TOLERANCES:
 FRACTIONS ±
 DECIMALS ±
 ANGLES ±

REMOVE ALL SHARP AND SQUARE EDGES

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BY: NAME: DATE: 1/20/78

CHECKED: APPROVED: DRAW/DSM

AS PER CHART MATERIAL

SCALE NONE

WEIGHT SHEET OF

FINISH:

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NEWPORT SCIENTIFIC INC.

TITLE: LITTLE RICHARD VALVE VALVE BODY ASS'Y - 20,000 PSI OXYGEN SERVICE

CODE DESIG. NO. 59505

PART NO. 56046002900

DRAWING NO. 2956046

LIST OF MATERIAL