

**KEITH**  
MANUFACTURING CO

# WORKHORSE

KEITH Manufacturing Co.

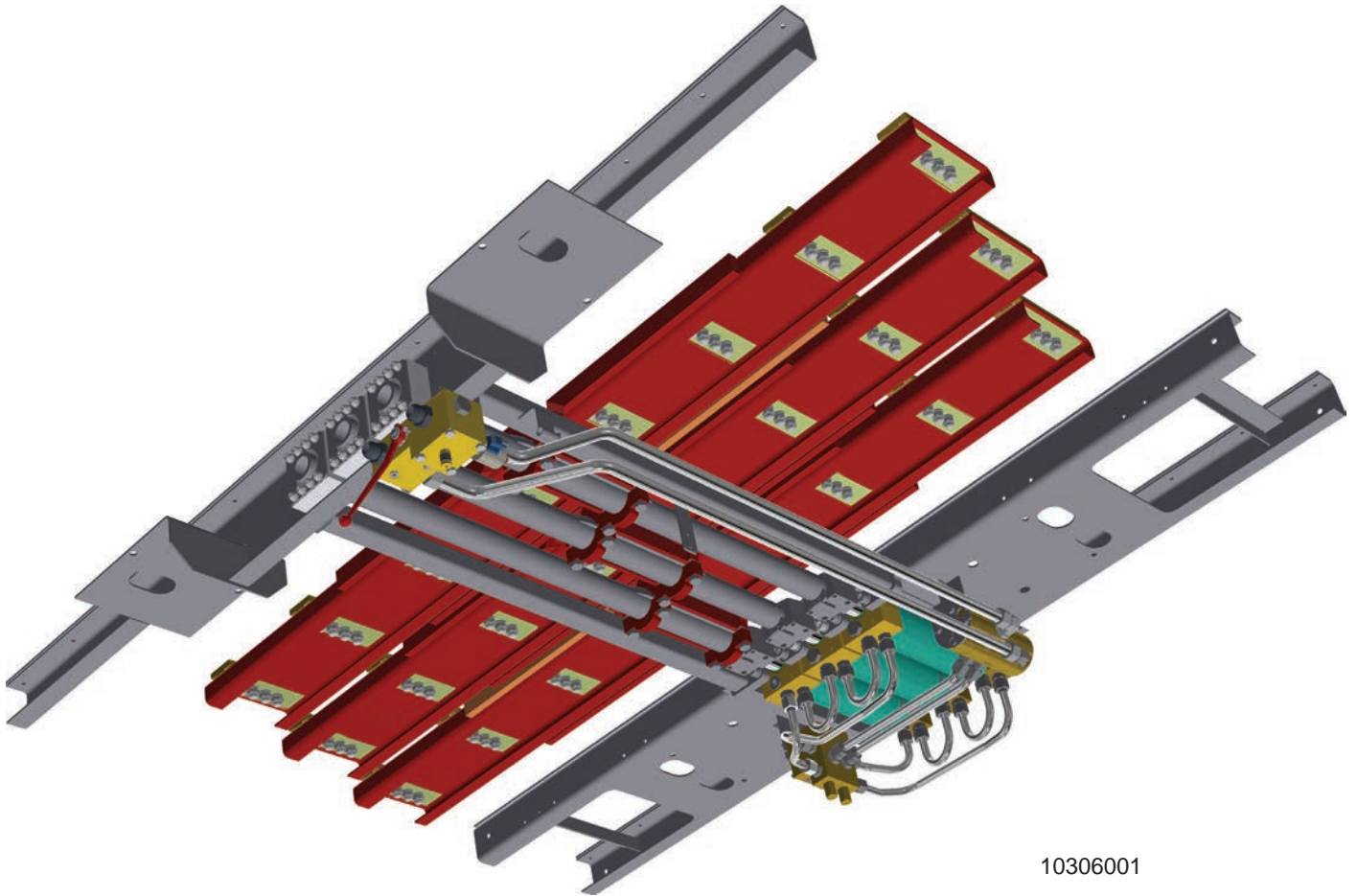
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10306001



## PARTS CATALOG

Original Instructions

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Not all parts or services available in all regions. Some components may only be sold assembled or in kits. Contact your regional office for information on available parts and services.

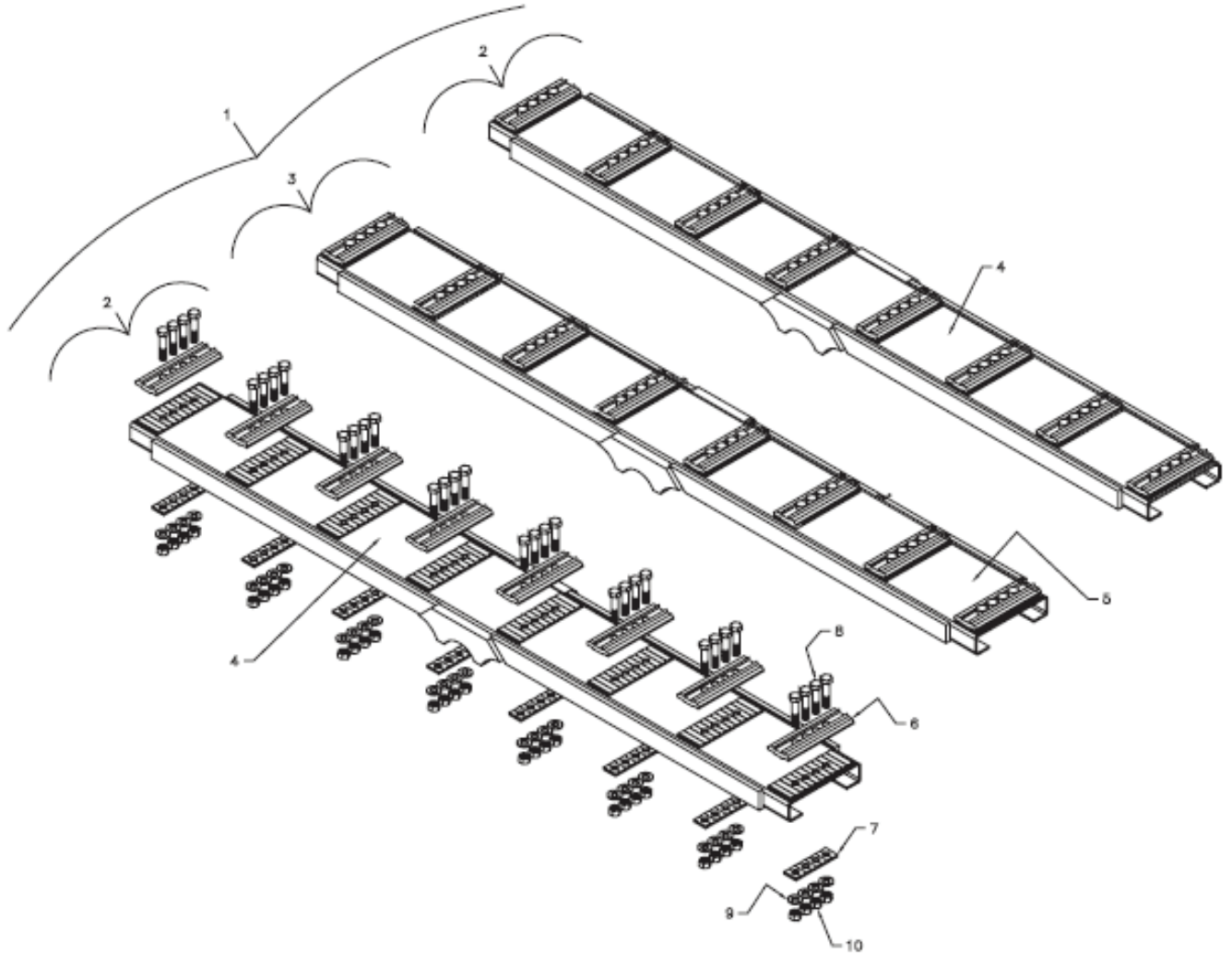
## Service Information

- Use hydraulic oil or Vaseline to lubricate seals. Do NOT use grease.
- Do NOT use Teflon tape on any hydraulic components.
- When welding on drive frame, ground specifically to what you are welding on, otherwise it can short across component assemblies damaging seals and gaskets.
- KEITH sells flow meters, pressure testers for troubleshooting and several tools to aid in rebuilding components and drives.

KEITH Mfg. fabricates many standard drive systems, included in this parts catalog, and also fabricates custom drive systems, too numerous to include, therefore KEITH requires the following information from your drive system to ensure we provide you with most accurate information. Please have the following information readily available before contacting KEITH for support:

- Model Number (Located on the Serial Plate of the drive unit)
- Serial Number (Located on the Serial Plate on the drive unit)
- Quantity & length of floor slats
- Vehicle make and unit installer

## Cross-Drive Assembly with Kwik Klamp® System



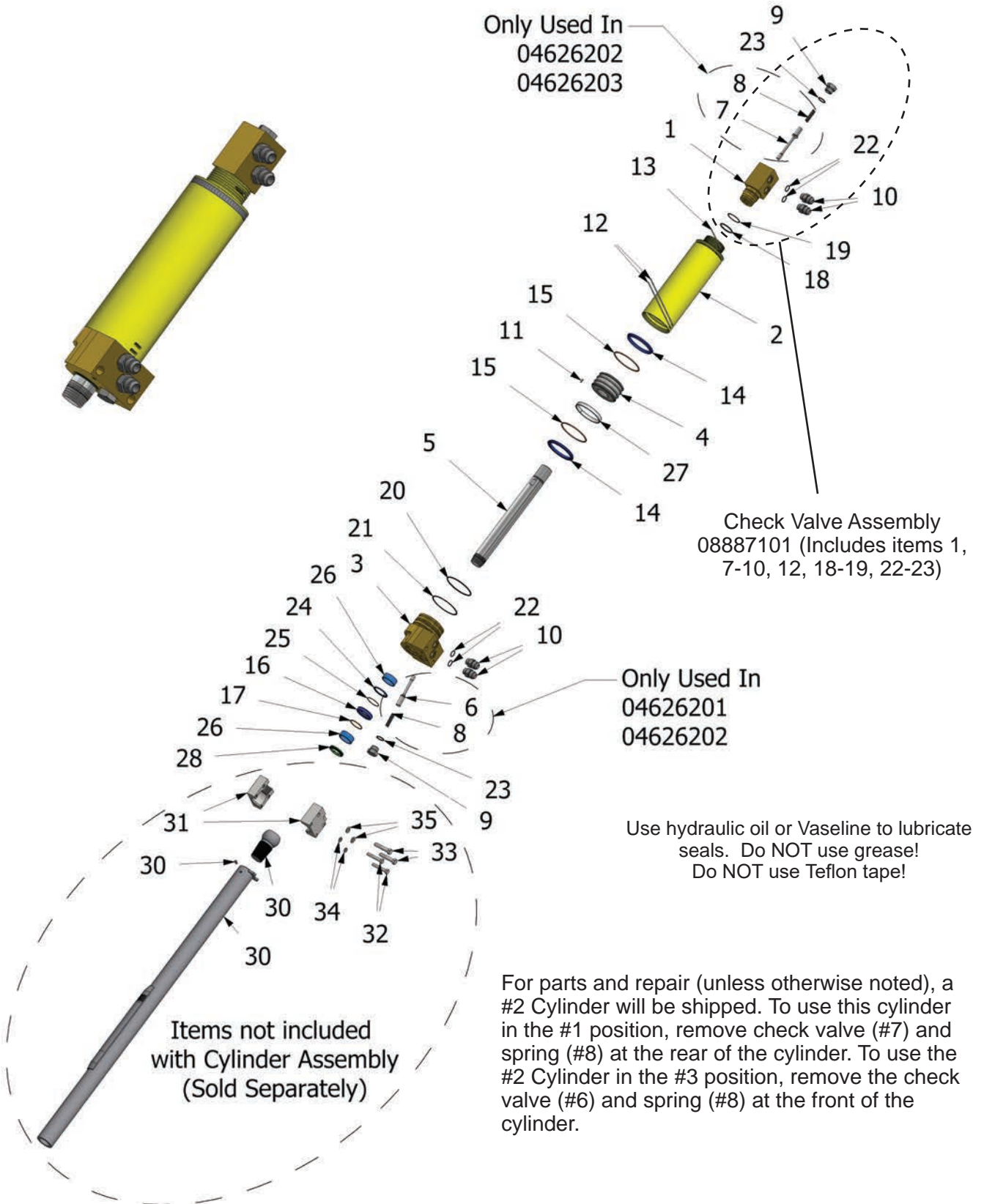
### Notes:

1. This view is from the top of the Cross-Drive Assemblies.
2. Both #2 assemblies are identical, however one unit is rotated 180° as shown above.

### Cross-Drive Assembly with Kwik Klamp® System

ID#	Qty	Part #	Description
1	-	04842801	<b>Cross-Drive Assembly with Kwik Klamp System (Includes Items 2-3)</b>
2	(2)	04842802	<b>Cross-Drive #1 &amp; #3, 24 Slat (Includes Items 4, 6-10)</b>
4	1	04684702	Cross-Drive Weld Assembly #2
3	(1)	04842803	<b>Cross-Drive #2, 24 Slat (Includes Items 5-10)</b>
5	1	04684703	Cross-Drive Weld Assembly #3
6	8	04317801	Kwik Klamp Upper Shoe
7	8	04412401	Kwik Klamp Lower Bolt Plate
8	32	87016250	16mm x 45mm Hex Cap Screw
9	32	86558500	5/8" Large OD Washer
10	32	87103000	16mm Hex Nut

### Cylinder Assembly #2 - with Vertical Mounting Bolts

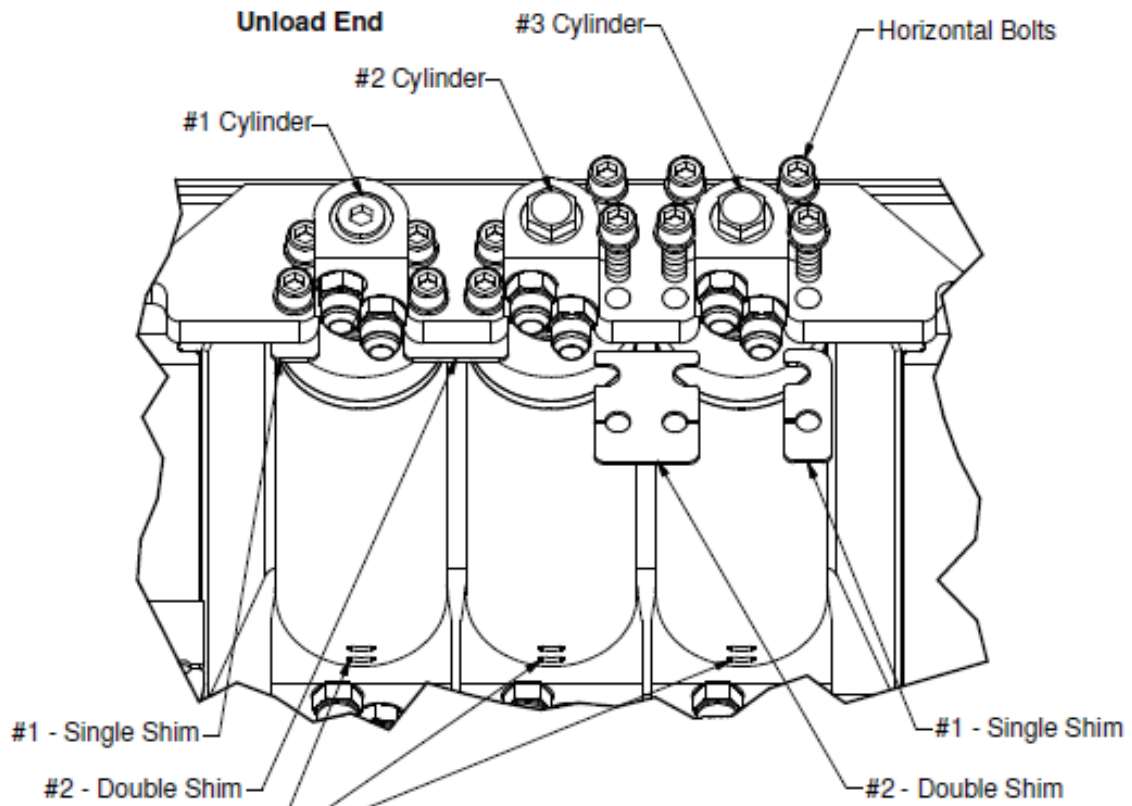


## PARTS CATALOG

## WORKHORSE

-	1	-	-	04626201	Cylinder #1 w/Vertical Bolts (Requires Modifications to a 04626202)
-	-	1	-	04626202	Cylinder #2 w/Vertical Bolts (Includes Items 1-28)
-	-	-	1	04626203	Cylinder #3 w/Vertical Bolts (Requires Modifications to a 04626202)
ID#	Qty	Qty	Qty	Part #	Description
-	-	-	-	08887101	Check Valve Assembly 08887101 (Includes items 1, 7-10, 13, 18-19, 22-23)
1	1	1	1	04581101	STEEL HEAD MOUNTED CHECK VALVE BODY
2	1	1	1	04621001	4" BARREL WELD ASSEMBLY
3	1	1	1	06711101	4" DIA. ALUMINUM HEAD WITH ROUND WIRE LOCK
4	1	1	1	04581901	PISTON ST 4" WORKHORSE
5	1	1	1	04936901	45MM ROD W/TAPERED GROOVES
6	1	1	-	04537301	CHECK VALVE ROD END (WORKHORSE)
7	-	1	1	04601901	CHECK VALVE POPPET BLIND END (WORKHORSE)
8	1	2	1	84454730	71570 Spring
9	2	2	2	84686900	12 P5ON-S HEX HEAD PLUG M O-RING HEX CAP
10	4	4	4	84684900	12-10 F5OX-S Straight Thread Connector MJIC X M O-RING
-	-	-	-	06592301	Workhorse Seal Kit (Includes Items 11-28)
11	1	1	1	86650400	PIN DRIVE LOCK 3/16" X 1/2"
12	2	2	2	04834401	12.875", WIRE LOCKS FOR WORKHORSE CYLINDERS
13	1	1	1	04834402	7.125", WIRE LOCKS FOR WORKHORSE CYLINDERS
14	2	2	2	84352500	SEAL PISTON 4X3/8
15	2	2	2	w/seal	BACKUP SEAL PISTON 4X3-1/2X3/8
16	1	1	1	84354200	ROD SEAL, R2 45MM WITH ENERGIZER
17	1	1	1	w/seal	BACKUP ROD SEAL, R2 45MM
18	1	1	1	84383700	224 O-Ring Buna 90
19	1	1	1	84392160	224 Back-up Buna 90
20	1	1	1	84385000	240 O-RING BUNA 90
21	1	1	1	84393200	240 BACK-UP BUNA 90
22	4	4	4	84387200	910 O-RING BUNA 90
23	2	2	2	84387400	912 O-RING BUNA 90
24	1	1	1	84400201	BUFFER SEAL, CYL ROD, 45MM
25	1	1	1	w/seal	BACKUP BUFFER SEAL, 45MM
26	2	2	2	84401205	WEAR RING, CYL ROD, 45MM, PTFE (BLUE)
27	1	1	1	84403800	PISTON WEAR RING p/n: WR-4250-0750-125 CIP131A
28	1	1	1	84426605	WIPER, ROD, 45MM
-	-	-	-	-	Items 30-35 NOT Included with Cylinder Assembly (Sold Separately)
30	1	1	1	04828501	CROSS-DRIVE #1 TUBE ASSEMBLY
30	1	1	1	04828502	CROSS-DRIVE #2 TUBE ASSEMBLY
30	1	1	1	04828503	CROSS-DRIVE #3 TUBE ASSEMBLY
31	1	1	1	06256801	Ball Socket Split Clamp with Round Tapered Grooves Assembly
32	2	2	2	87008550	BOLT HEX GR10.9 10MMX60MM ZINC
33	2	2	2	87013100	BOLT HEX GR10.9 12MMX60MM ZINC
34	2	2	2	87076500	WASHER LOCK 10MM
35	2	2	2	87077000	WASHER LOCK 12MM

### Shims for Cylinders with Horizontal Mounting Bolts



Note wire lock slot width for cylinder model identification.  
8.0mm (5/16") wide groove - no shims - assembly numbers are

#1 Cyl. 06336102, #2 Cyl. 06336202, #3 Cyl. 06336302.  
See pages 27-28



## Cylinder Shims

ID#	Qty	Part #	Description	Size
1	2	06260801	Double Shim	10 Gauge 3.4mm (.135")
1	2	06260802	Double Shim	12 Gauge 2.7mm (.105")
1	2	06260803	Double Shim	14 Gauge 1.9mm (.075")
1	2	06260804	Double Shim	18 Gauge 1.2mm (.048")
2	2	06260901	Single Shim	10 Gauge 3.4mm (.135")
2	2	06260902	Single Shim	12 Gauge 2.7mm (.105")
2	2	06260903	Single Shim	14 Gauge 1.9mm (.075")
2	2	06260904	Single Shim	18 Gauge 1.2mm (.045")

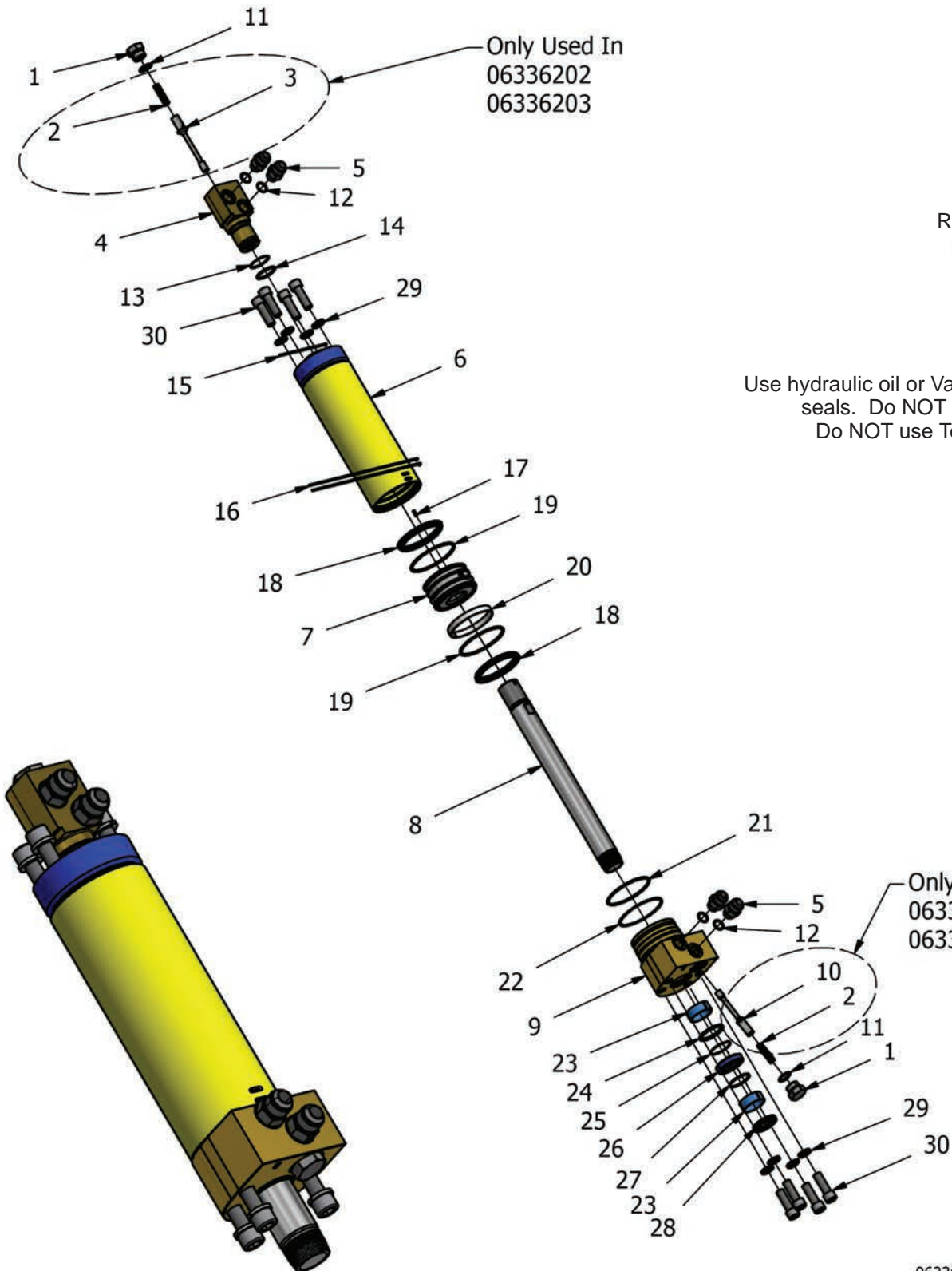
\* All 4 shims must be the same size.

### Cylinder Assembly #2 - with Horizontal Mounting Bolts

**TOOL**



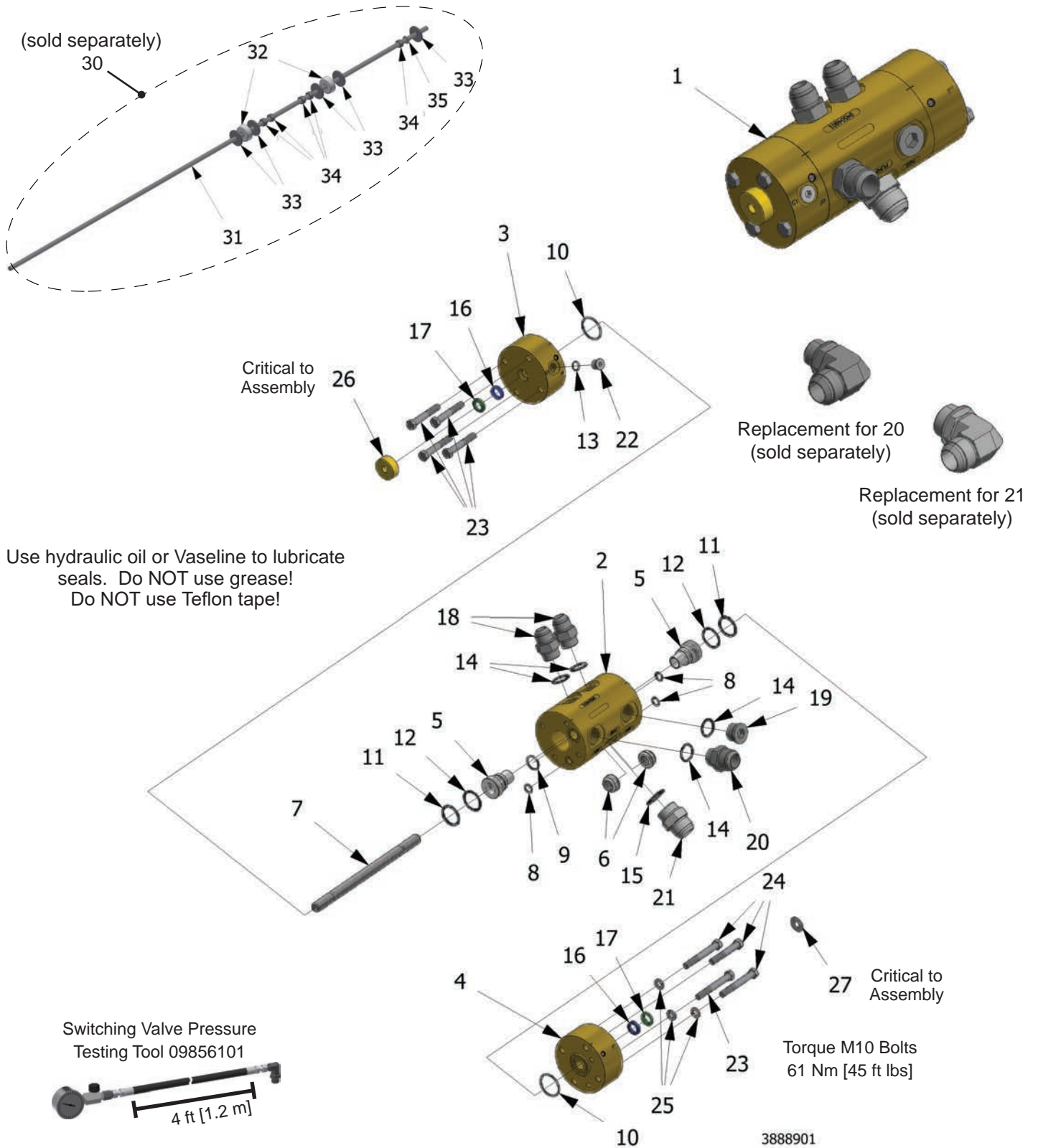
06381801  
Rod Nose Cone for  
head installation



06336202

-	1	-	-	06336201	Cylinder #1 w/Hz Bolts (Requires Modifications to 06336202)
-	-	1	-	06336202	Cylinder #2 w/Hz Bolts (Includes Items 1-28)
-	-	-	1	06336203	Cylinder #3 w/Hz Bolts (Requires Modifications to 06336202)
ID#	Qty	Qty	Qty	Part #	Description
1	2	2	2	84686900	12 P50N-S HEX HEAD PLUG M O-RING HEX CAP
2	1	2	1	84453400	Spring Check Valve External Large
3	-	1	1	04601901	Check Valve Poppet Blind End (Workhorse)
4	1	1	1	05791802	WELDED HEAD CHECK VALVE BODY (MAIL BOX)
5	4	4	4	84684900	12-10 F50X-S Straight Thread Connector MJIC X M O-RING
6	1	1	1	06325901	4-1/2 X 4 WELDED BARREL ASSY
7	1	1	1	04581901	PISTON ST 4" WORKHORSE
8	1	1	1	05791501	45mm Rod w/Tapered Grooves
9	1	1	1	06373102	4" HORIZONTAL BOLTED ALUMINUM WORKHORSE HEAD
10	1	1	-	04537301	CHECK VALVE ROD END (WORKHORSE)
-	-	-	-	06592301	<b>Workhorse Seal Kit (Includes Items 11-28)</b>
11	2	2	2	84387400	912 O-RING BUNA 90
12	4	4	4	84387200	910 O-Ring Buna 90
13	1	1	1	w/Seal	222 Back-up Buna 90
14	1	1	1	84383500	222 O-Ring Buna 90
15	1	1	1	06326401	WIRE LOCK SMALL END WORKHORSE CYLINDER
16	2	2	2	03812107	WIRE LOCK, 100MM CYLINDER HEAD, RD
17	1	1	1	86650400	PIN DRIVE LOCK 3/16" X 1/2"
18	2	2	2	84352500	SEAL PISTON CYLINDER 4" W/Back-up
19	2	2	2	w/Seal	Piston Seal Backup Ring, NYLON SPLIT 4" R2 (w/84352500)
20	1	1	1	84403800	PISTON WEAR RING p/n: WR-4250-0750-125 CIP131A
21	1	1	1	84385000	240 O-RING BUNA 90
22	1	1	1	84393200	240 BACK-UP BUNA 90
23	2	2	2	84401205	WEAR RING, CYL ROD, 45MM, PTFE (BLUE)
24	1	1	1	84400201	SEAL, BUFFER 45MM
25	1	1	1	W/Seal	BACKUP RING, 45MM (COMES WITH 84400201)
26	1	1	1	84354200	ROD SEAL, R2 CYLINDER 45MM
27	1	1	1	w/Seal	BACK UP RING, ROD SEAL 45MM (Comes with 84354200)
28	1	1	1	84426605	WIPER, ROD, 45MM
-	-	-	-	-	<b>Items 29-30 NOT Included With Cylinder Assembly (Sold Separately)</b>
29	8	8	8	87078000	Lock Washer - M16 Steel, Mild
30	8	8	8	87012905	Hex Socket Head Cap Screw - M16x2 x 50

Switching Valve Assembly & Threaded Rod Assembly (November 2014 - Present)



(2) The Switching Valve Seal Kit contains all necessary components to rebuild all Switching Valve models.

## Switching Valve Assembly (November 2014 - Present)

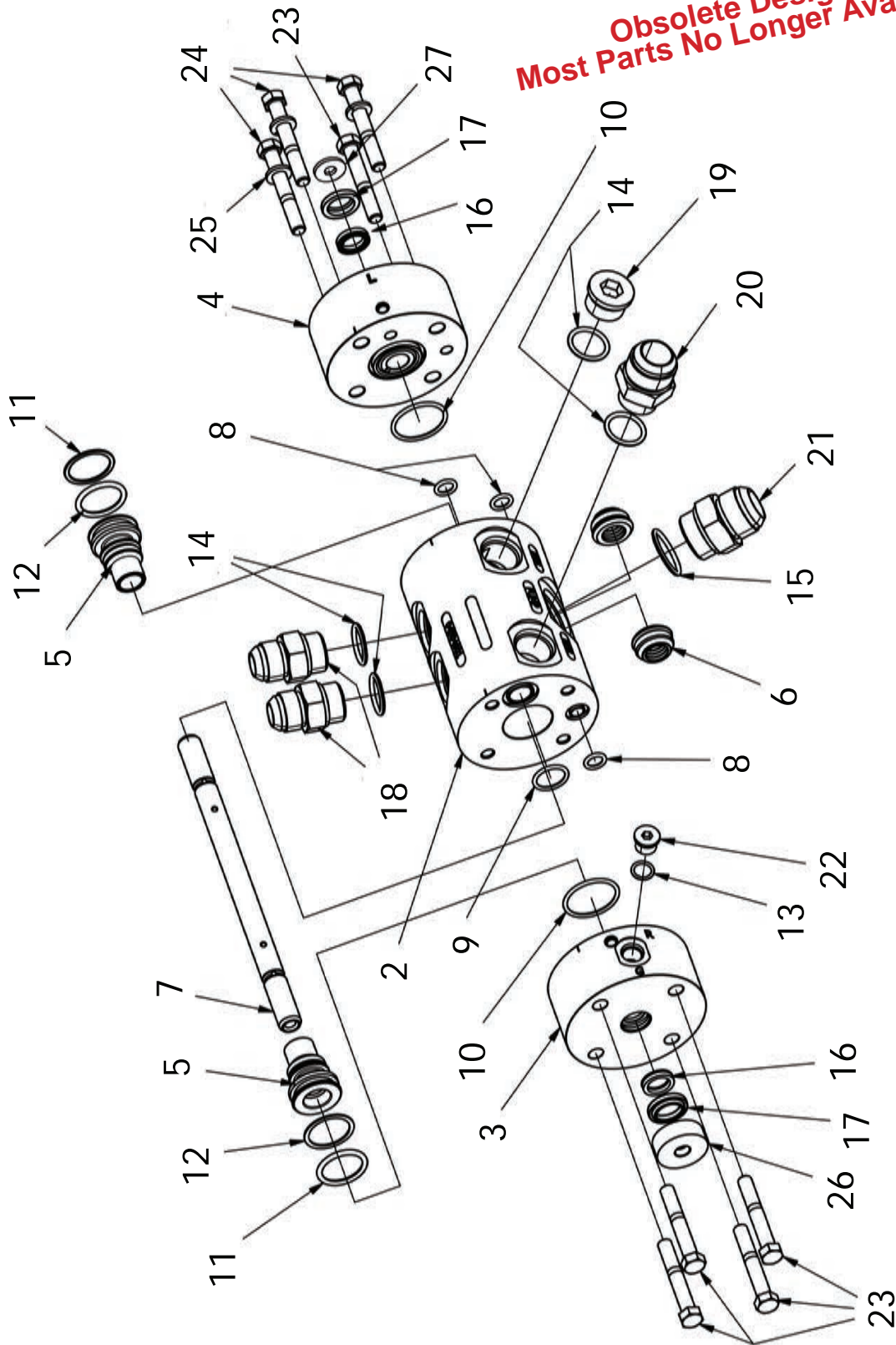
ID#	Qty	Part #	Description
1	-	03888902	Switching Valve Assembly Metric (Includes Items 2-27)
2	1	04504602	Body Switching Valve (not sold separately)
3	1	04504701	End Cap Right Switching Valve (not sold separately)
4	1	04504801	End Cap Left Switching Valve (not sold separately)
5	2	03718901	Poppet Switching Valve
6	2	03718801	Ring Poppet Switching Valve
7	1	01335502	Control Rod Switching Valve
-(1)	-	03878001	Seal Kit Switching Valve (Includes items 8-17)
8	3	84376200	O-Ring 111 Buna 90
9	1	84377000	O-Ring 117 Buna 90
10	2	84378200	O-Ring 126 Buna 90
11	2	84382200	O-Ring 216 Buna 90
12	2	84391600	O-Ring Backup 216 Buna 90
13	1	84386800	O-Ring 906 Buna 90
14	4	84387400	O-Ring 912 Buna 90
15	1	84387800	O-Ring 916 Buna 90
16	2	84352200	Seal Rod 5/8"
17	2	84426800	Wiper Snap In 5/8" Rod
18	2	84685000	6400-12-12 Straight
19	1	84687700	6408-12 M O-Ring Socket Plug
20	1	84685300	6400-16-12 Straight Threaded
21	1	84685400	6400-16-16 Straight Threaded
22	1	84687400	6408-6 M O-Ring Socket Plug
23	5	87009000	Bolt Hex M10 x 65mm
24	3	87009750	Bolt Hex M10 x 75mm
25	3	87076500	Washer Lock M10
26	1	02552101	Cap Limit Switching Valve (Critical for Assembly)
27	1	86553500	Washer Large OD 3/8" (Critical for Assembly)
-	-	84691700	6801-16-12 Straight Threaded Elbow (sold separately)
-	-	84691800	6801-16-16 Straight Threaded Elbow (sold separately)

## Threaded Rod Assembly

ID#	Qty	Metric	DESCRIPTION
30	-	04842502	Rod Threaded Assembly (Includes Items 31-35)
31	1	87151000	Actuator Rod Threaded M10-1.5 x 1320 mm Zinc
32	2	83217500	Switching Valve Grommet
33	5	86553500	Washer Large OD 3/8"
34	5	87101500	Nut Hex M10 x 1.5
35	1	87076500	Washer Lock 10mm

Switching Valve Assembly (April 2013 - November 2014)

**Obsolete Design -  
Most Parts No Longer Available**

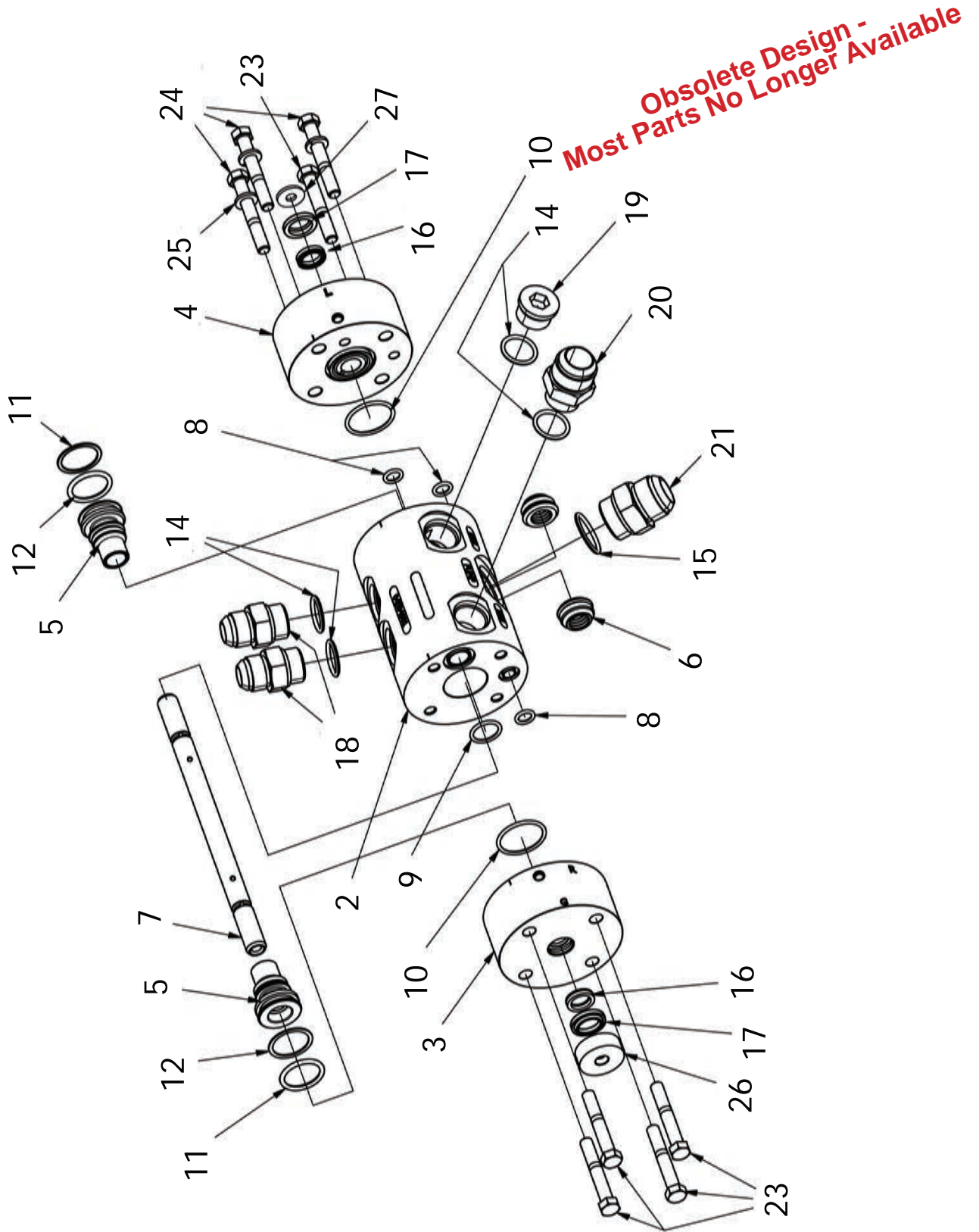


## Switching Valve Assembly (April 2013 - November 2014)

ID#	Qty	Part #	Description
-	-	<b>03888902</b>	<b>Switching Valve Assembly Metric (Includes Items 2-27)</b>
2	1	04504702	Body Switching Valve (not sold separately)
3	1	04504701	End Cap Right Switching Valve (not sold separately)
4	1	04504801	End Cap Left Switching Valve (not sold separately)
5	2	03718901	Poppet Switching Valve
6	2	03718801	Ring Poppet Switching Valve
7	1	01335502	Control Rod Switching Valve
-(2)	<b>1</b>	<b>03878001</b>	<b>Seal Kit Switching Valve (Includes items 8-17)</b>
8	3	84376200	O-Ring 111 Buna 90
9	1	84377000	O-Ring 117 Buna 90
10	2	84378200	O-Ring 126 Buna 90
11	2	84382200	O-Ring 216 Buna 90
12	2	84391600	O-Ring Backup 216 Buna 90
13	1	84386800	O-Ring 906 Buna 90
14	4	84387400	O-Ring 912 Buna 90
15	1	84387800	O-Ring 916 Buna 90
16	2	84352200	Seal Rod 5/8"
17	2	84427200	Wiper Canned 5/8" Rod
18	2	84685000	6400-12-12 Straight
19	1	84687700	6408-12 M O-Ring Socket Plug
20	1	84685300	6400-16-12 Straight Threaded
21	1	84685400	6400-16-16 Straight Threaded
22	1	84687400	6408-6 M O-Ring Socket Plug
23	5	87009000	Bolt Hex M10 x 65mm
24	3	87009750	Bolt Hex M10 x 75mm
25	3	86555000	Washer Lock M10
26	1	02552101	Cap Limit Switching Valve (Critical for Assembly)
27	1	86553500	Washer Large OD 3/8" (Critical for Assembly)

(2) The Switching Valve Seal Kit contains all necessary components to rebuild all Switching Valve models.

Switching Valve Assembly (August 2008 - April 2013)



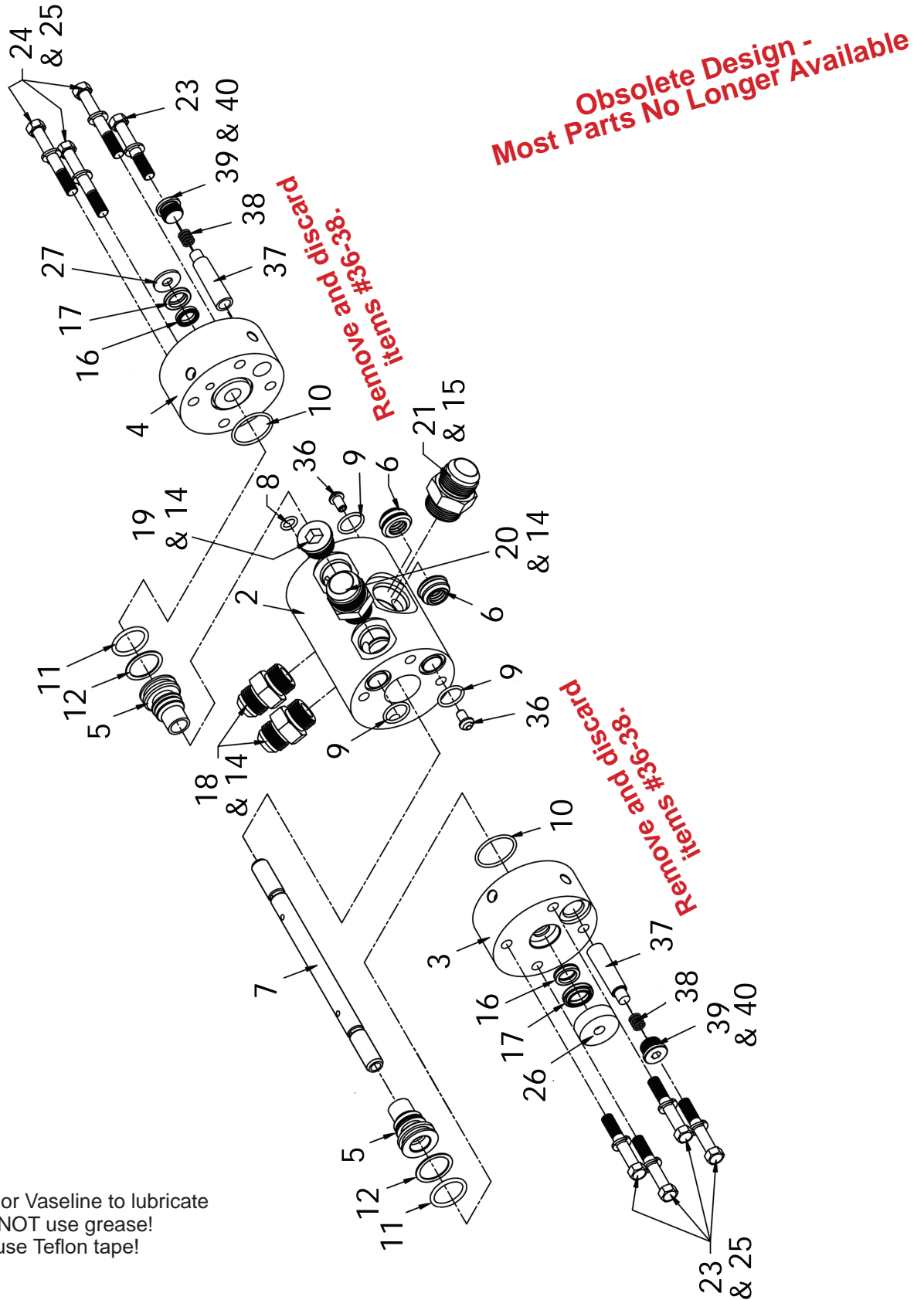


## Switching Valve Assembly (August 2008 - April 2013)

ID#	Qty	Part #	Description
-	-	<b>03888902</b>	<b>Switching Valve Assembly Metric (Includes Items 2-27)</b>
2	1	04504702	Body Switching Valve (not sold separately)
3	1	04504701	End Cap Right Switching Valve (not sold separately)
4	1	04504801	End Cap Left Switching Valve (not sold separately)
5	2	03718901	Poppet Switching Valve
6	2	03718801	Ring Poppet Switching Valve
7	1	01335502	Control Rod Switching Valve
-(2)	<b>1</b>	<b>03878001</b>	<b>Seal Kit Switching Valve (Includes items 8-17)</b>
8	3	84376200	O-Ring 111 Buna 90
9	1	84377000	O-Ring 117 Buna 90
10	2	84378200	O-Ring 126 Buna 90
11	2	84382200	O-Ring 216 Buna 90
12	2	84391600	O-Ring Backup 216 Buna 90
14	4	84387400	O-Ring 912 Buna 90
15	1	84387800	O-Ring 916 Buna 90
16	2	84352200	Seal Rod 5/8"
17	2	84427200	Wiper Canned 5/8" Rod
18	2	84685000	6400-12-12 Straight
19	1	84687700	6408-12 M O-Ring Socket Plug
20	1	84685300	6400-16-12 Straight Threaded
21	1	84685400	6400-16-16 Straight Threaded
23	5	87009000	Bolt Hex M10 x 65mm
24	3	87009750	Bolt Hex M10 x 75mm
25	3	86555000	Washer Lock M10
26	1	02552101	Cap Limit Switching Valve (Critical for Assembly)
27	1	86553500	Washer Large OD 3/8" (Critical for Assembly)

<sup>(2)</sup> The Switching Valve Seal Kit contains all necessary components to rebuild all Switching Valve models.

### Switching Valve Assembly (June 2002 - August 2008)



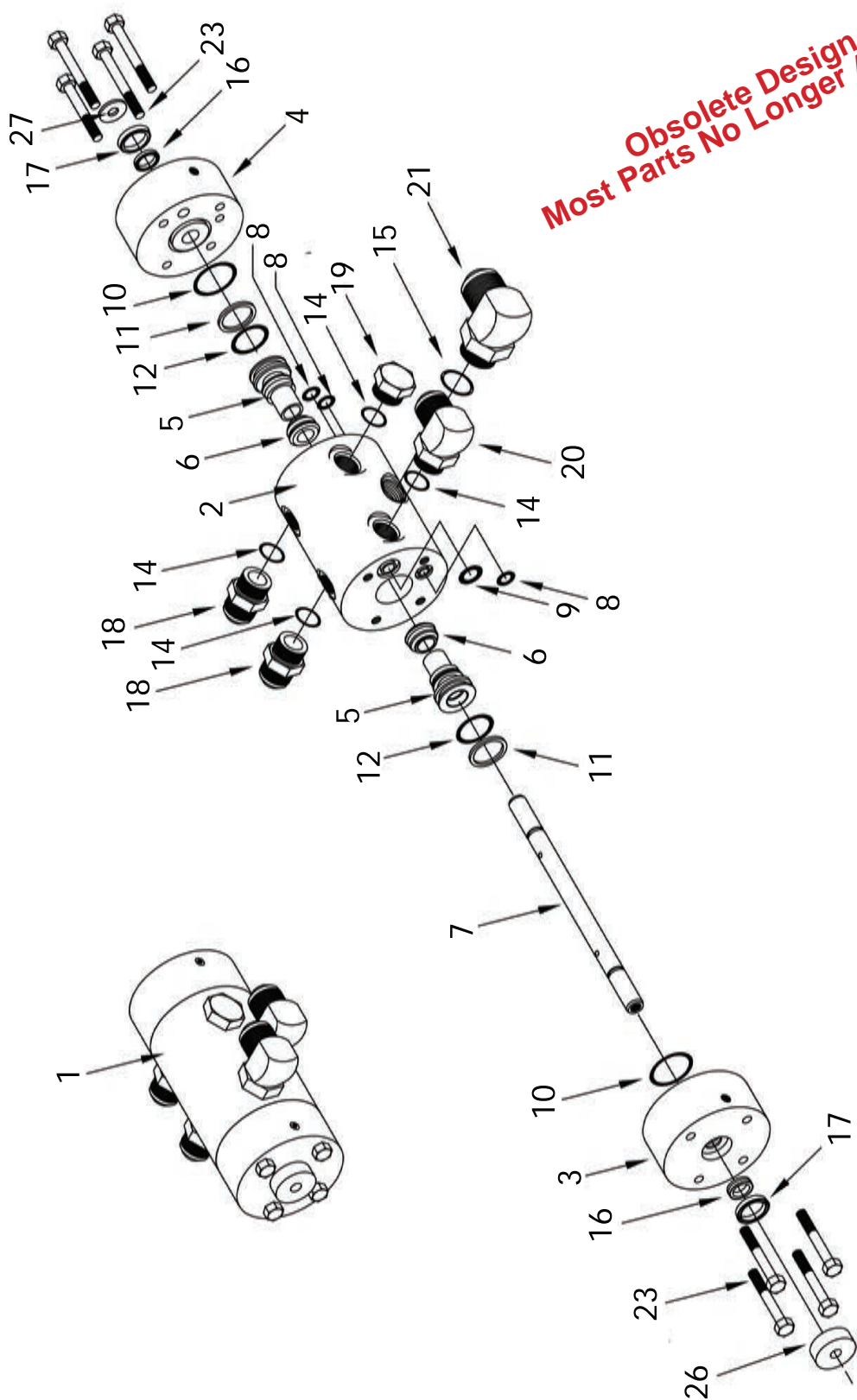
Use hydraulic oil or Vaseline to lubricate seals. Do NOT use grease!  
Do NOT use Teflon tape!

## Switching Valve Assembly (June 2002 - August 2008)

ID#	Qty	Part #	Description
-	-	<b>03888902</b>	<b>Switching Valve Assembly Metric (Includes Items 2-27, 36-40)</b>
2	1	04504702	Body Switching Valve (not sold separately)
3	1	04504701	End Cap Right Switching Valve (not sold separately)
4	1	04504801	End Cap Left Switching Valve (not sold separately)
5	2	03718901	Poppet Switching Valve
6	2	03718801	Ring Poppet Switching Valve
7	1	01335502	Control Rod Switching Valve
-(2)	1	<b>03878001</b>	<b>Seal Kit Switching Valve (Includes items 8-17)</b>
8	1	84376200	O-Ring 111 Buna 90
9	3	84377000	O-Ring 117 Buna 90
10	2	84378200	O-Ring 126 Buna 90
11	2	84382200	O-Ring 216 Buna 90
12	2	84391600	O-Ring Backup 216 Buna 90
14	4	84387400	O-Ring 912 Buna 90
15	1	84387800	O-Ring 916 Buna 90
16	2	84352200	Seal Rod 5/8"
17	2	84427200	Wiper Canned 5/8" Rod
18	2	84685000	6400-12-12 Straight
19	1	84687700	6408-12 M O-Ring Socket Plug
20	1	84685300	6400-16-12 Straight Threaded
21	1	84685400	6400-16-16 Straight Threaded
23	8	87009000	Bolt Hex M10 x 65mm
26	1	02552101	Cap Limit Switching Valve (Critical for Assembly)
27	1	86553500	Washer Large OD 3/8" (Critical for Assembly)
36	2	04502701	FILTER SEAT SWV PILOT100 (REMOVE & DISCARD)
37	2	84012700	FILTER ELEMENT CF0563-46 SWV (REMOVE & DISCARD)
38	2	84451750	SPRING S-157 (REMOVE & DISCARD)
39	2	84687500	08 HP50N-S Hollow Hex Plug M O-Ring Hex Socket (6408-H08-O)
40	2	84387000	O-Ring 908 Buna 90

(2) The Switching Valve Seal Kit contains all necessary components to rebuild all Switching Valve models.

### Switching Valve Assembly (December 1998 - June 2002)



**Obsolete Design -  
Most Parts No Longer Available**

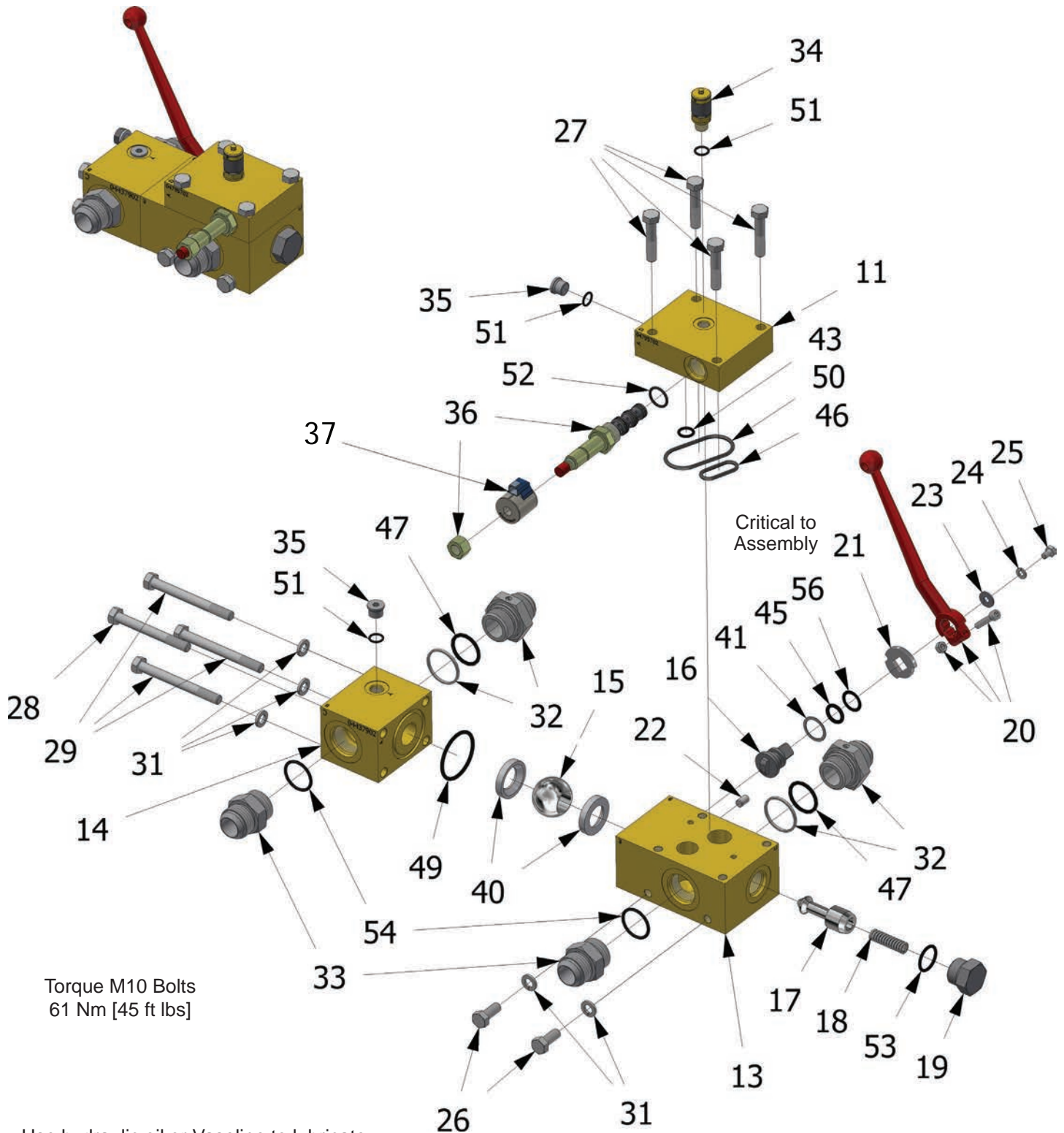
## Switching Valve Assembly (December 1998 - June 2002)

ID#	Qty	Part #	Description
-	-	<b>03888902</b>	<b>Switching Valve Assembly Metric (Includes Items 2-27)</b>
2	1	03851502	Body Switching Valve (not sold separately)
3	1	03851701	End Cap Right Switching Valve (not sold separately)
4	1	03851601	End Cap Left Switching Valve (not sold separately)
5	2	03718901	Poppet Switching Valve
6	2	03718801	Ring Poppet Switching Valve
7	1	01335502	Control Rod Switching Valve
-( <sup>2</sup> )	<b>1</b>	<b>03878001</b>	<b>Seal Kit Switching Valve (Includes items 8-17)</b>
8	3	84376200	O-Ring 111 Buna 90
9	1	84377000	O-Ring 117 Buna 90
10	2	84378200	O-Ring 126 Buna 90
11	2	84382200	O-Ring 216 Buna 90
12	2	84391600	O-Ring Backup 216 Buna 90
14	4	84387400	O-Ring 912 Buna 90
15	1	84387800	O-Ring 916 Buna 90
16	2	84352200	Seal Rod 5/8"
17	2	84427200	Wiper Canned 5/8" Rod
18	2	84685000	6400-12-12 Straight
19	1	84686900	12 P5ON-S HEX HEAD PLUG M O-RING HEX CAP (6408-O-12)
20	1	84691700	16-12 C5OX-S Straight Thread Elbow MJIC (6801-16-12)
21	1	84691800	16 C5OX-S Straight Thread Elbow MJIC (6801-16-16)
23	8	87009000	Bolt Hex M10 x 65mm
26	1	02552101	Cap Limit Switching Valve (Critical for Assembly)
27	1	86553500	Washer Large OD 3/8" (Critical for Assembly)

<sup>(2)</sup> The Switching Valve Seal Kit contains all necessary components to rebuild all Switching Valve models.

<sup>(3)</sup> Part numbers vary for Switching Valves made before 1998.

### Ball Valve On/Off Pilot Operated Electric / Manual Assembly



Torque M10 Bolts  
61 Nm [45 ft lbs]

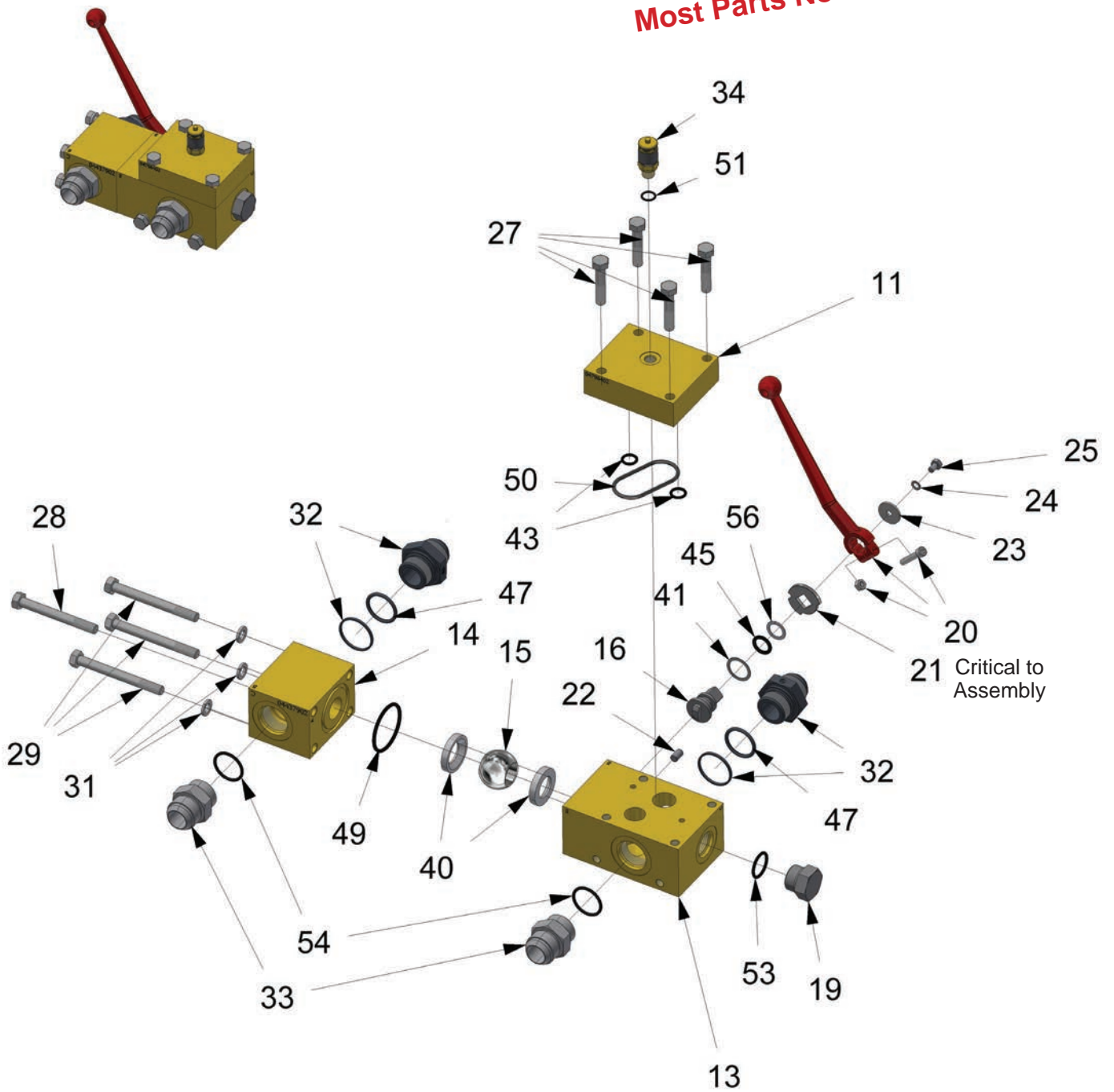
Use hydraulic oil or Vaseline to lubricate  
seals. Do NOT use grease!  
Do NOT use Teflon tape!

## Ball Valve On/Off Pilot Operated Electric / Manual Assembly

ID#	Qty	Part #	Description
-	-	<b>04718802</b>	<b>Pilot Operated Electric Manual On / Off Valve Assembly (Includes all items below)</b>
11	1	04795702	COVER PLATE PO EBV ECKV PLATE PO BV
13	1	04436602	BODY PO ON/OFF BV KRFII WH KFD MET
14	1	04437902	BODY NON-VALVE PO ON/OFF KRFII WH MET MAN/ELE BV
15	1	04337101	BALL VALVE BALL KFD KRFII MAN/ELECT EUROPE & STAS
16	1	04438101	SHAFT SPUD KRFII KFD WH PO ELEC ON/OFF BALL VALVE
17	1	04438401	POPPET BALL VALVE PO ON/OFF
18	1	84453400	SPRING B-18273 EXT CKV LARGE
19	1	84686900	12 P5ON-S HEX HEAD PLUG M O-RING HEX CAP (6408-O-12)
20	1	04657801	HANDLE BALL VALVE BENT USED WITH MODULAR BALL VALVE
20	1	87004120	BOLT SOCKET HEAD 6MMX30MM ZN
20	1	87100510	NUT HEX 6MM-1.0 ZINC
21	1	84802910	SPUD STOP LW56 / BALL VALVE (Critical to Assembly)
22	1	86651500	PIN DOWEL 5/16X1/2
23	1	87075410	WASHER FENDER FLAT 6MM ZN DIN 9021
24	1	87075501	WASHER LOCK M6 EXTERNAL TOOTH
25	1	87002450	BOLT HEX GR8.8 6MMX10MM
26	2	87008480	BOLT HEX 10.9 10MMX25MM HCS
27	4	87008530	BOLT HEX GR10.9 10MM-1.5 X 50MM ZINC
28	1	87010500	BOLT HEX 10.9 10MMX90MM
29	3	87011000	BOLT HEX 10.9 10MM X 100MM 17MM HEAD
31	5	87076500	WASHER LOCK 10MM ZN
32	2	84671400	16 F40MX-S STRAIGHT BSPP MJIC X BSPP (7002-16-16)
33	2	84685400	16 F5OX-S STRAIGHT THREAD CONNECTOR MJIC X M O-RING (6400-16-16)
34	1	84904000	PRESSURE TEST COUPLER SMK20-G1/4-VC
35	2	84687400	06 HP5ON-S HOLLOW HEX PLUG M O-RING HEX SOCKET (6408-H06-O)
36	1	85108800	VALVE CART. SV10-40M-0-N-00 HF
36	1	85108802	NUT COIL HF SV10-40M HF # 7004590
37	1	85600250	COIL 24VDC 4303724 HF SV1 DEUT DEUTSCH CONNECTOR
38	1	11467301	PLATE ID KRFII-KFD 1" BV PRESS RED
39	1	11467302	PLATE ID KRFII-KFD 1" BV TANK BLUE
-	-	<b>06932301</b>	<b>Seal Kit On/Off Ball Valve (Includes items 40 - 56)</b>
-	-	<b>85108798</b>	<b>Seal Kit for Cartridge Valves</b>
40	2	04337301	BUSHING SEAL BALL VALVE ELEC ON/OFF
41	1	04337601	SPUD WEAR WASHER MAN/ELE BV
43	2	84376300	112 O-RING BUNA 90
45	1	84379600	208 O-RING BUNA 90
46	2	84382200	216 O-RING BUNA 90
47	2	84382600	217 O-RING BUNA 90
49	1	84383800	225 O-RING BUNA 90
50	2	84384000	228 O-RING BUNA 90
51	3	84386800	906 O-RING BUNA 90
52	1	84387200	910 O-RING BUNA 90
53	1	84387400	912 O-RING BUNA 90
54	2	84387800	916 O-RING BUNA 90 N1490-90
56	1	84390100	208 O-RING BACKUP BUNA 90

### Ball Valve On/Off Manual Assembly

**Obsolete Design -  
Most Parts No Longer Available**



Use hydraulic oil or Vaseline to lubricate seals. Do NOT use grease!  
Do NOT use Teflon tape!

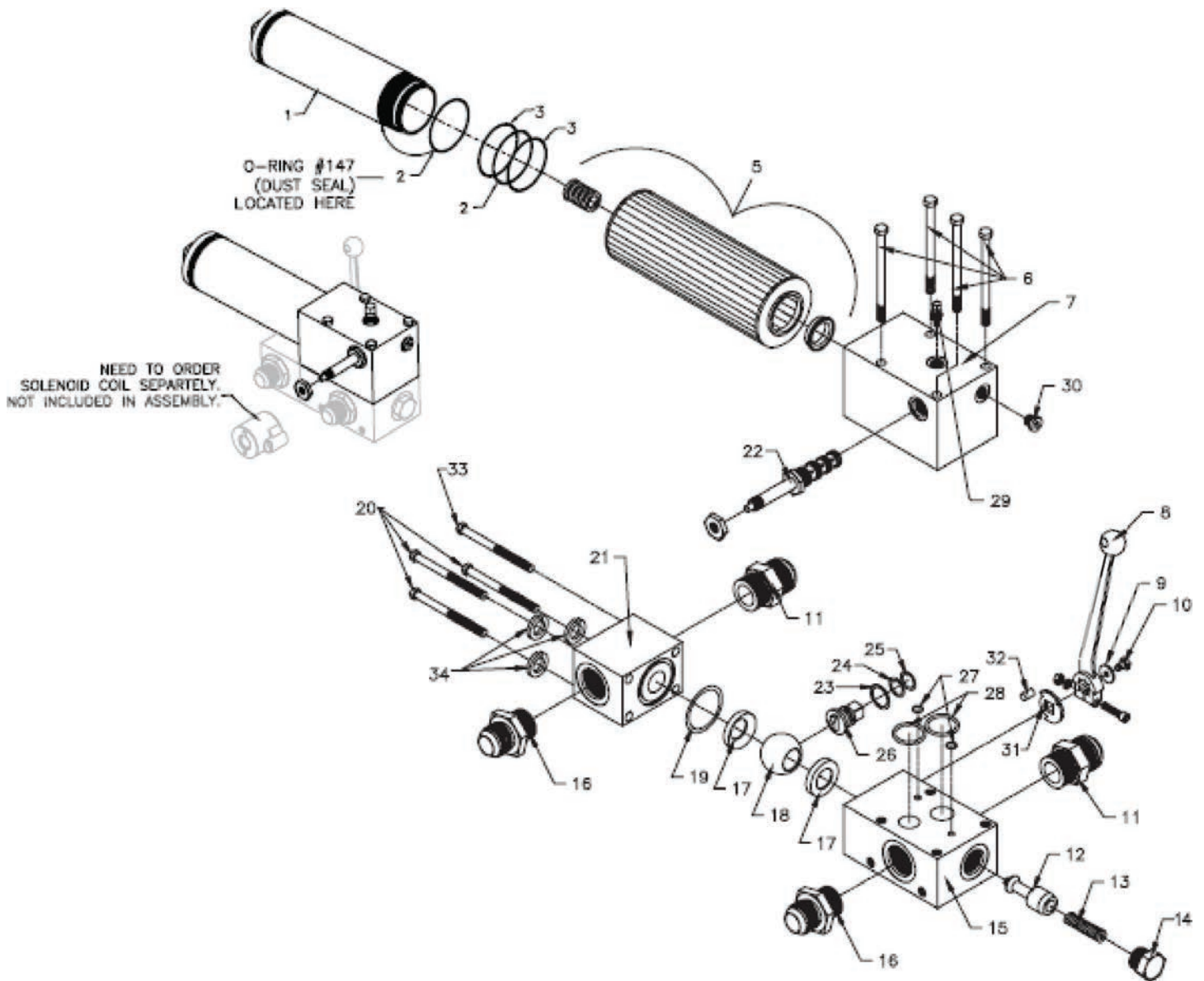


### Ball Valve On/Off Manual Assembly

ID#	Qty	Part #	Description
-	-	<b>04840002</b>	<b>Manual On/Off Ball Valve Assembly (Includes all items below)</b>
11	1	04796402	COVER PLATE ON/OFF BALL VALVE
13	1	04436602	BODY PO ON/OFF BV KRFII WH KFD MET
14	1	04437902	BODY NON-VALVE PO ON/OFF KRFII WH MET MAN/ELE BV
15	1	04337101	BALL VALVE BALL KFD KRFII MAN/ELECT EUROPE & STAS
16	1	04438101	SHAFT SPUD KRFII KFD WH PO ELEC ON/OFF BALL VALVE
19	1	84686900	12 P5ON-S HEX HEAD PLUG M O-RING HEX CAP (6408-O-12)
20	1	84802900	HANDLE BALL VALVE INCL SOC HEAD BOLT & NUT NO HOLE
20	1	87004120	BOLT SOCKET HEAD 6MMX30MM ZN
20	1	87100510	NUT HEX 6MM-1.0 ZINC
21	1	84802910	SPUD STOP LW56 / BALL VALVE
22	1	86651500	PIN DOWEL 5/16X1/2
23	1	87075400	WASHER FLAT 6MM
25	1	87002450	BOLT HEX GR8.8 6MMX10MM
27	4	87008530	BOLT HEX GR10.9 10MM-1.5 X 50MM ZINC
28	1	87010500	BOLT HEX 10.9 10MMX90MM
29	4	87011000	BOLT HEX 10.9 10MM X 100MM 17MM HEAD
31	3	87076500	WASHER LOCK 10MM ZN
32	2	84671400	16 F40MX-S STRAIGHT BSPP MJIC X BSPP (7002-16-16)
33	2	84685400	16 F5OX-S STRAIGHT THREAD CONNECTOR MJIC X M O-RING (6400-16-16)
34	1	84904000	PRESSURE TEST COUPLER SMK20-G1/4-VC
-	-	<b>06932301</b>	<b>Seal Kit On/Off Ball Valve (Includes items 40 - 56)</b>
40	2	04337301	BUSHING SEAL BALL VALVE ELEC ON/OFF
41	1	04337601	SPUD WEAR WASHER MAN/ELE BV
43	2	84376300	O-RING 112 BUNA 90
45	1	84379600	O-RING 208 BUNA 90
47	2	84382600	O-RING 217 BUNA 90
49	1	84383800	O-RING 225 BUNA 90
50	2	84384000	O-RING 228 BUNA 90
51	1	84386800	O-RING 906 BUNA 90
53	1	84387400	O-RING 912 BUNA 90
54	2	84387800	O-RING 916 BUNA 90 N1490-90
56	1	84390100	O-RING BACKUP 208 BUNA 90

Obsolete Design -  
 Most Parts No Longer Available

Ball Valve On/Off Pilot Operated with Filter Electric / Manual Assembly



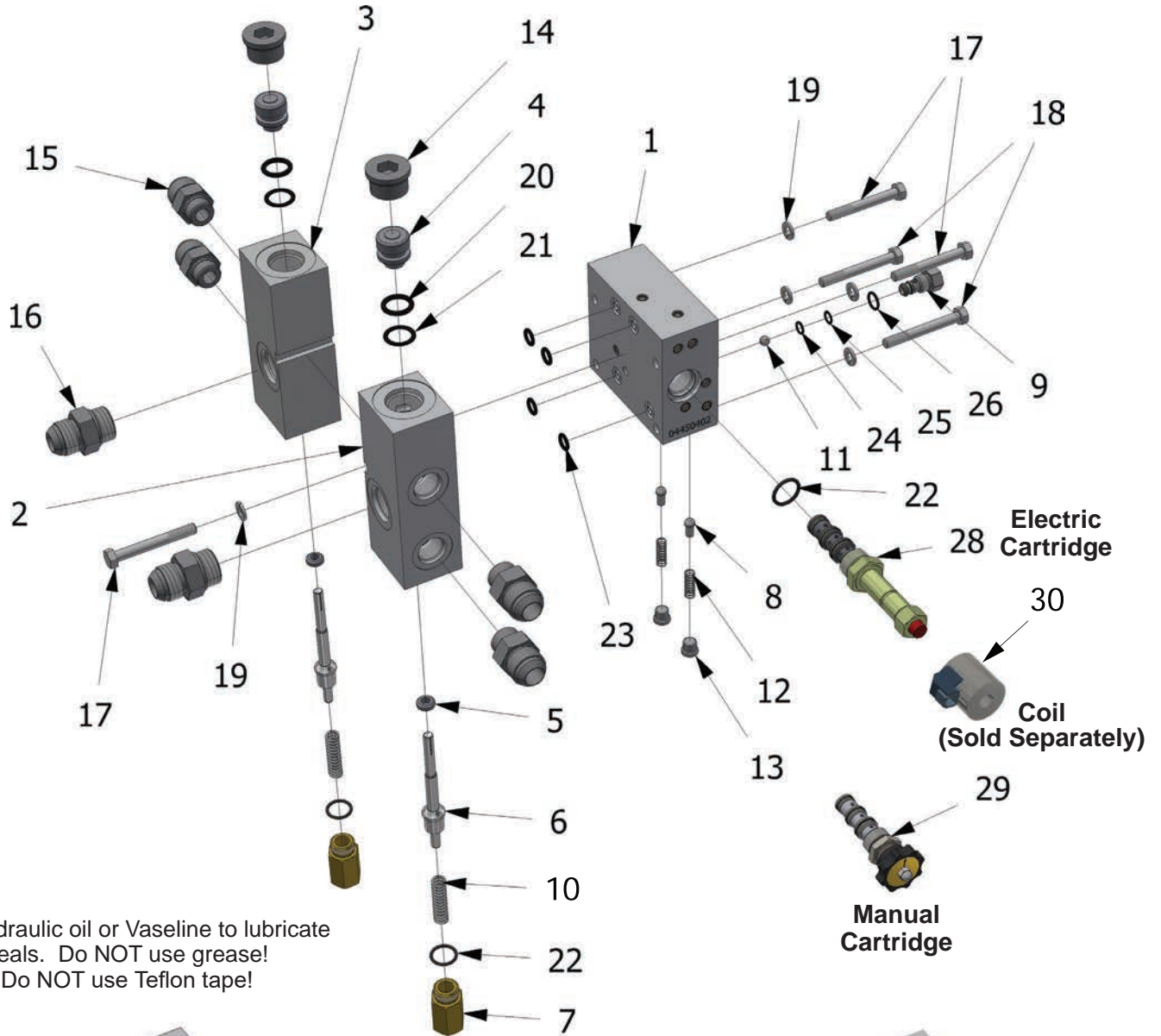
Use hydraulic oil or Vaseline to lubricate seals. Do NOT use grease!  
Do NOT use Teflon tape!

### Ball Valve On/Off Pilot Operated with Filter Electric / Manual Assembly

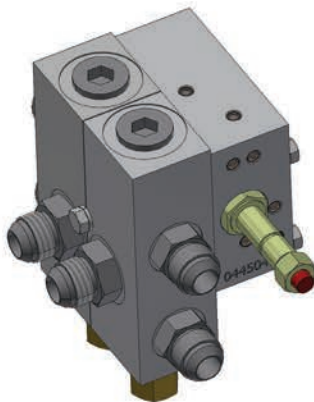
ID#	Qty	Part #	Description
-	1	<b>04465802</b>	<b>Pilot Operated/Manual On/Off Ball Valve Assembly w/Filter (Includes items 1-34)</b>
1 <sup>(1)</sup>	1	04426601	Threaded end Cap
1	1	06151501	Welded Filter Canister Assy.
2	2	84378447	147 O-Ring
3	2	84389047	147 O-Ring Backup
4 <sup>(1)</sup>	1	04426501	Threaded Barrel
5	1	84006520	Fairley Arlon Filter Element #MXW2-GDL20 w/Spring 7 Rubber Seal
6	4	87011500	10mm x 110mm Hex Bolt
7	1	04436501	Fairley Arlon Filter Block
8	1	04657801	Ball Valve Bent Handle w/bolt, washer & nut
9	1	87075400	6mm Flat Washer
10	1	87002450	6mm x 10mm Hex Bolt
11	2	84671400	2404-16-16 BSPP Straight Fitting
12	1	04438401	On/Off Poppet
13	1	84453400	Spring #B-18273
14	1	84686900	6408-12 O-Ring Plug
15	1	04436602	Valve Housing
16	2	84685400	6400-16-16 Straight Fitting
17	2	04337301	Ball Valve Seal Bushing
18	1	04337101	Ball Valve Ball
19	1	84383800	225 O-Ring
20	3	87011000	10mm x 100mm Hex Bolt
21	1	04437902	Non-Valve Housing
22	1	85108800	Solenoid Control Valve SV10-40
23	1	04337601	SPUD WEAR WASHER MAN/ELE BV
-	-	<b>85108798</b>	<b>Seal Kit for Cartridge Valves</b>
24	1	84379600	208 O-Ring
25	1	84390200	208 O-Ring Backup Teflon
26	1	04438101	Spud Shaft
27	2	84376300	112 O-Ring
28	2	84382800	218 O-Ring
29	1	84904000	Test Coupling SMK20-G1/4VC
30	1	84686500	6408-04 O-Ring Hex Plug
31	1	84802910	Spud Stop
32	1	86651500	5/16" x 1/2" Dowel Pin
33	1	87010500	10mm x 90mm Hex Bolt
34	3	87076500	10mm Lock Washer

<sup>(1)</sup> Not Shown. For use with previous models.

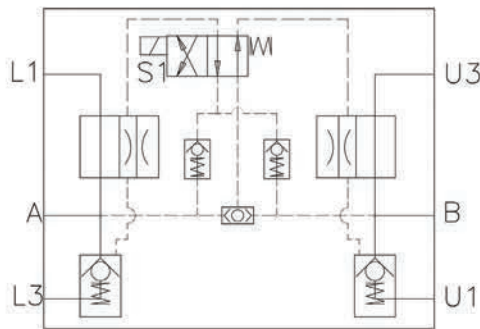
Control Valve Assembly (Pre - Aug 2023)



Use hydraulic oil or Vaseline to lubricate seals. Do NOT use grease!  
Do NOT use Teflon tape!



**Electric CV  
04459401**



**Hydraulic Schematic**  
S1 De-Energized for Unload  
S1 Energized for Load

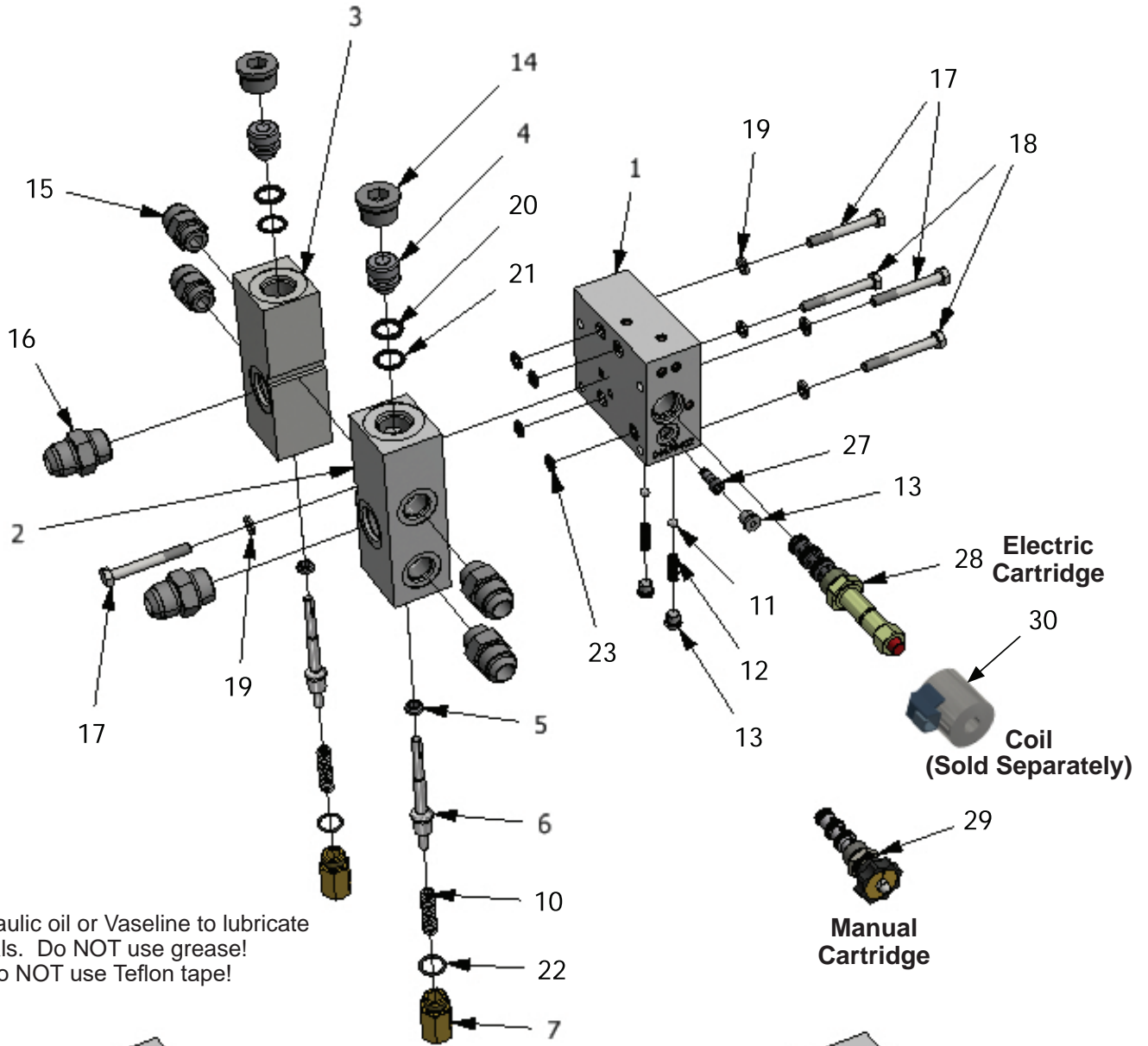


**Manual CV  
04459402**

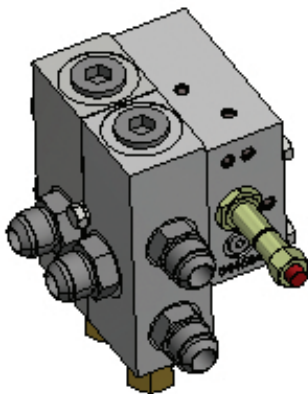
## Control Valve Assembly (Aug '23 - Present)

ID#	Qty	Electric Part #	Manual Part #	Description
-	-	04459401	04459402	6 Port Modular Control Valve Assembly (Includes Items 1-29)
1	1	04450402		PILOT VALVE SECTION, 6 PORT MODULAR CONTROL VALVE
2	1	04456302		UNLOAD SECTION, 6 PORT MODULAR CONTROL VALVE
3	1	04456402		LOAD SECTION, 6 PORT MODULAR CONTROL VALVE
4	2	04452801		PILOT PISTON, 6 PORT MODULAR CONTROL VALVE
5	2	04453001		Restrictor Washer, 6 Port Modular CTV
6	2	04453101		POPPET, 6 PORT MODULAR ELECTRIC CONTROL VALVE
7	1	04453201		SPRING CAP, 6 PORT MODULAR CONTROL VALVE
8	2	11287801		POPPET 6-PORT CTV 032446 TO TANK
9	1	11308201		SHUTTLE VALVE SEAT 6 PORT #32446
10	2	84453400		SPRING CHECK VALVE EXTERNAL LARGE
11	1	84800500		5/16 STEEL BALL
12	2	84450800		SPRING, .328" OD X 1.0" LG, .027 WIRE, 10.5 COILS
13	2	84687300		04 HP5ON-S HOLLOW HEX PLUG M O-RING HEX SOCKET
14	2	84687700		12 HP5ON-S HOLLOW HEX PLUG M O-RING
15	4	84684900		12-10 F5OX-S Straight Thread Connector MJIC X M O-RING
16	2	84685000		12 F5OX-S Straight Thread Connector MJIC X M O-RING
17	3	87006300		BOLT HEX GR8.8 8MMX65MM ZINC
18	2	87006400		BOLT HEX GR8.8 8MMX70MM ZINC
19	5	87075750		WASHER LOCK 8MM
20	2	84380000		209 O-Ring Buna 90
21	2	84390400		209 Back-up Buna 90
22	3	84387200		910 O-RING BUNA 90
23	4	84376000		110 O-RING BUNA 90
24	1	84375200		011 O-RING BUNA 90
25	1	84388406		011 BACK-UP BUNA 90
26	1	84386800		906 O-RING BUNA 90
28	1	85108800	-	VALVE CARTRIDGE, HYDRAFORCE, 4-WAY, 2 POSITION, SOLENOID, SV10-40M-0-N-0
29	1	-	85105200	VALVE, ROTARY CARTRIDGE, 4-WAY, 2 POSITION, MRV4-10
-	-	85108798		Seal Kit for Cartridge Valves
30	1	varies	-	Coil (Sold Separately) Contact KEITH for Information

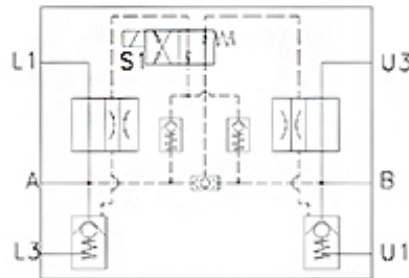
### Control Valve Assembly (Pre - Aug 2023)



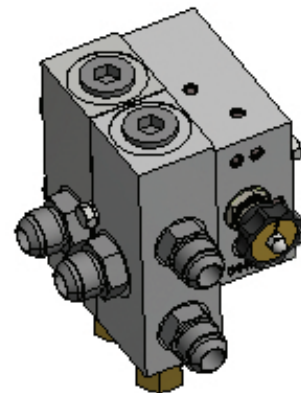
Use hydraulic oil or Vaseline to lubricate seals. Do NOT use grease!  
Do NOT use Teflon tape!



**Electric CV**  
**04459401**



Hydraulic Schematic  
S1 De-Energized for Unload  
S1 Energized for Load

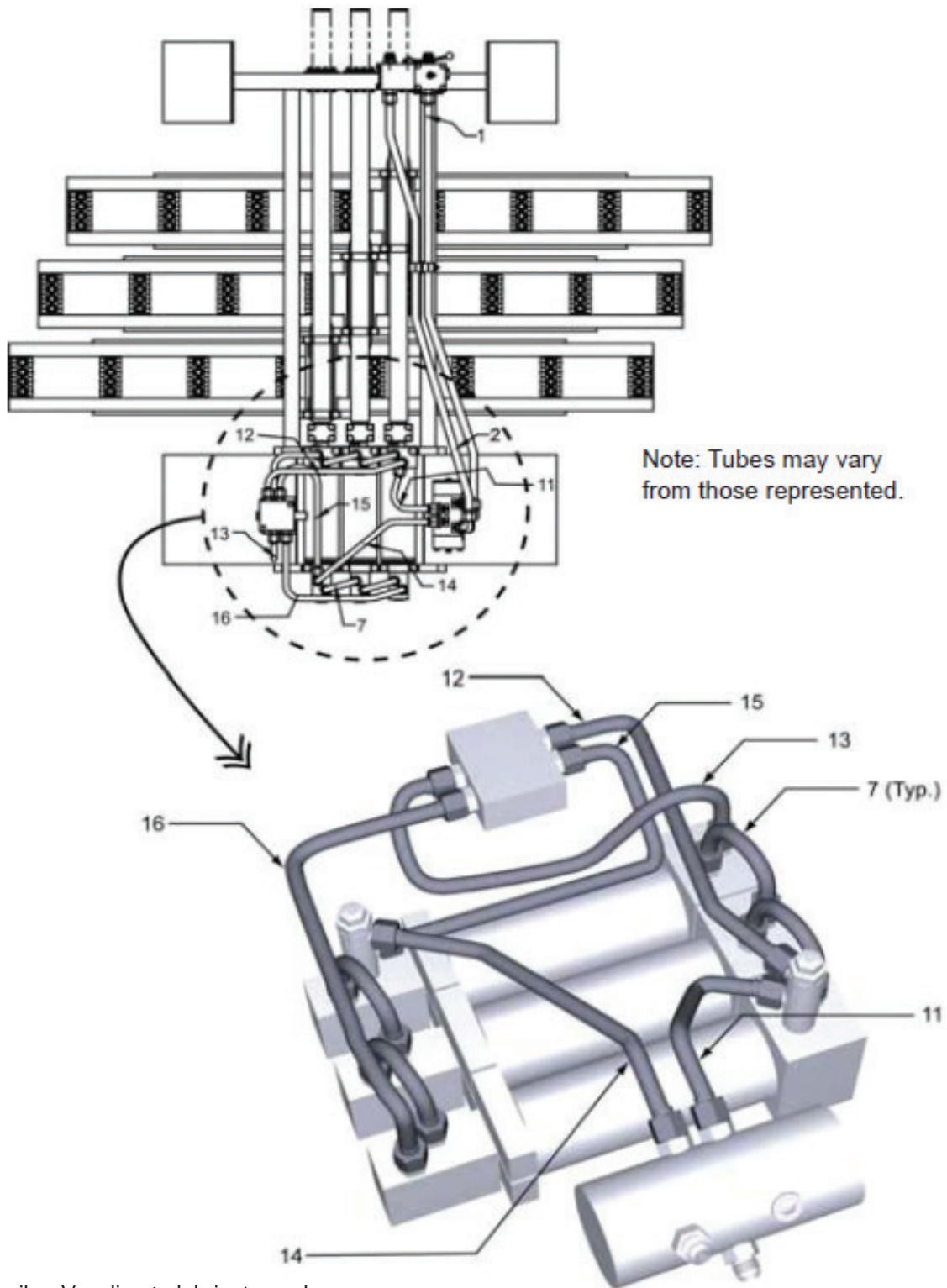


**Manual CV**  
**04459402**

## Control Valve Assembly (Pre - Aug 2023)

ID#	Qty	Electric Part #	Manual Part #	Description
-	-	04459401	04459402	6 Port Modular Control Valve Assembly (Includes Items 1-29)
1	1	04450402		PILOT VALVE SECTION, 6 PORT MODULAR CONTROL VALVE
2	1	04456302		UNLOAD SECTION, 6 PORT MODULAR CONTROL VALVE
3	1	04456402		LOAD SECTION, 6 PORT MODULAR CONTROL VALVE
4	2	04452801		PILOT PISTON, 6 PORT MODULAR CONTROL VALVE
5	2	04453001		Restrictor Washer, 6 Port Modular CTV
6	2	04453101		POPPET, 6 PORT MODULAR ELECTRIC CONTROL VALVE
7	1	04453201		SPRING CAP, 6 PORT MODULAR CONTROL VALVE
10	2	84453400		SPRING CHECK VALVE EXTERNAL LARGE
11	2	84800500		5/16 STEEL BALL
12	2	84450800		SPRING, .328" OD X 1.0" LG, .027 WIRE, 10.5 COILS
13	3	84687300		04 HP50N-S HOLLOW HEX PLUG M O-RING HEX SOCKET
14	2	84687700		12 HP50N-S HOLLOW HEX PLUG M O-RING
15	4	84684900		12-10 F50X-S Straight Thread Connector MJIC X M O-RING
16	2	84685000		12 F50X-S Straight Thread Connector MJIC X M O-RING
17	3	87006300		BOLT HEX GR8.8 8MMX65MM ZINC
18	2	87006400		BOLT HEX GR8.8 8MMX70MM ZINC
19	5	87075750		WASHER LOCK 8MM
20	2	84380000		209 O-Ring Buna 90
21	2	84390400		209 Back-up Buna 90
22	1	84387200		910 O-RING BUNA 90
23	4	84376000		110 O-RING BUNA 90
27	1	85104800		CARTRIDGE VALVE, SHUTTLE, -4, DOWN HOLE
28	1	85108800	-	VALVE CARTRIDGE, HYDRAFORCE, 4-WAY, 2 POSITION, SOLENOID, SV10-40M-0-N-0
29	1	-	85105200	VALVE, ROTARY CARTRIDGE, 4-WAY, 2 POSITION, MRV4-10
-	-	85108798		Seal Kit for Cartridge Valves
30	1	varies	-	Coil (Sold Separately) Contact KEITH for Information

### Hydraulic Tubes for Manual Controls



Use hydraulic oil or Vaseline to lubricate seals.  
Do NOT use grease!  
Do NOT use Teflon tape!



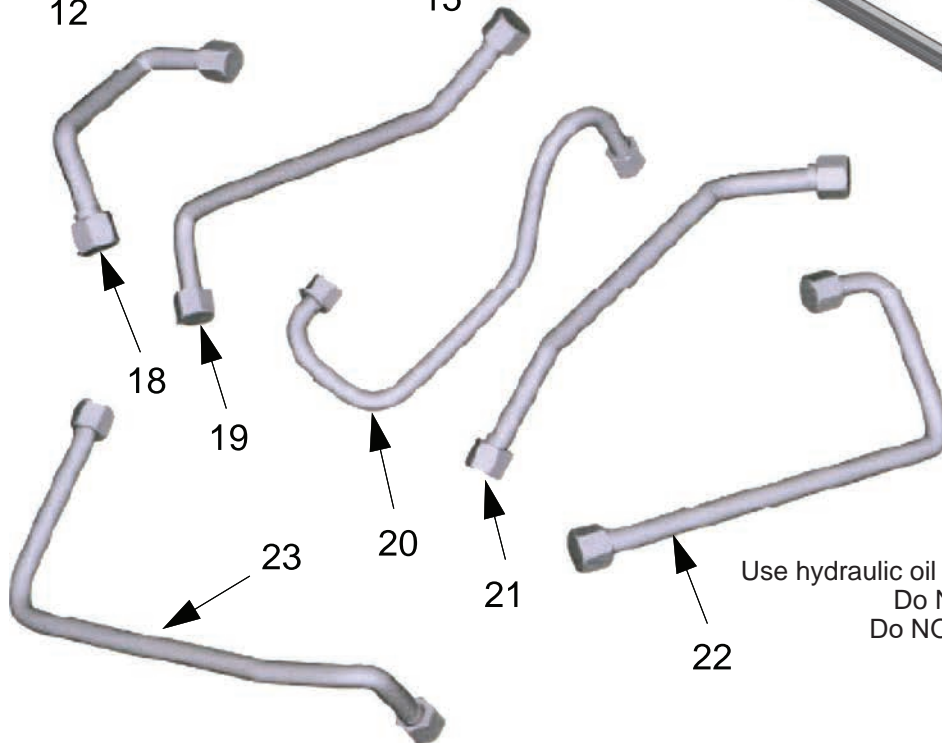
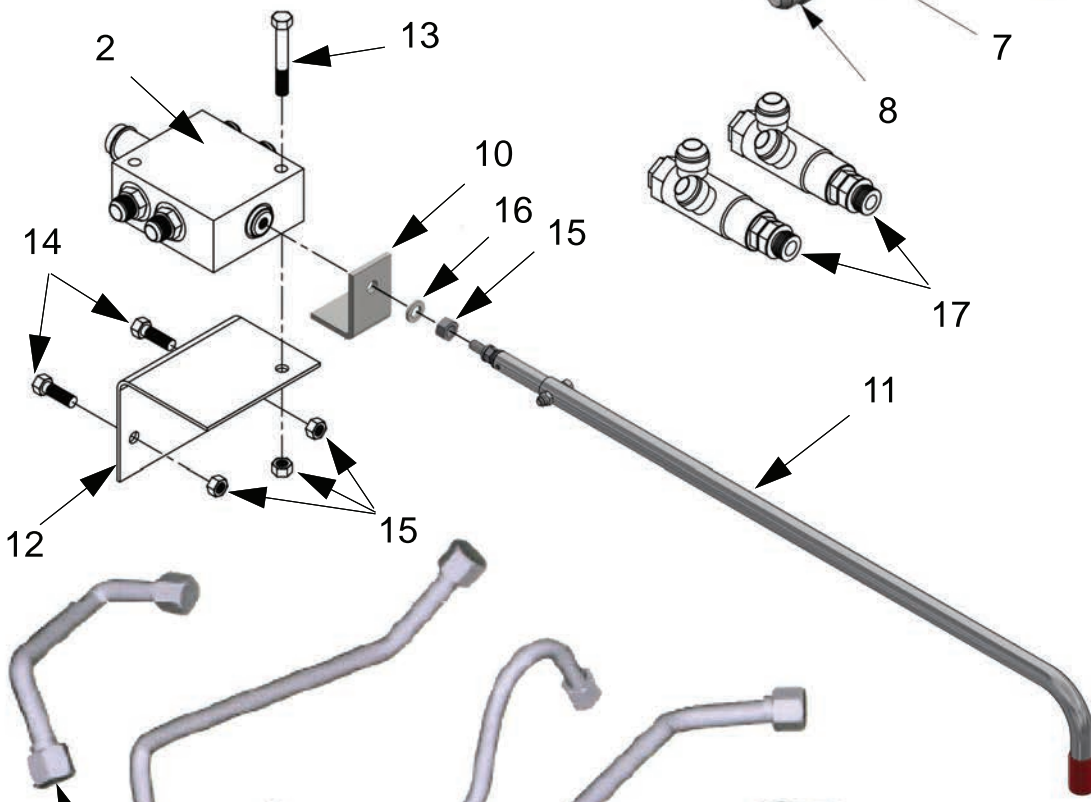
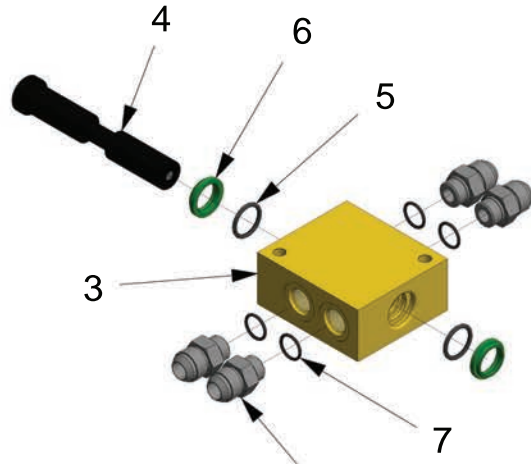
## Hydraulic Tubes for Manual Controls

ID#	Qty	Part #	Description
1	1	04841201	1" Tube: Ball Valve to Switching Valve Pressure Tube
2	1	04841301	1" Tube: Ball Valve to Switching Valve Return Tube
7	4	04840501	3/4" Tube: Cylinder Cross-Over Tubes
11	1	04840601	3/4" Tube: #1 Cylinder Unload End to Switching Valve
12	1	04840801	3/4" Tube: #1 Cylinder Load End to Control Valve
13	1	04840901	3/4" Tube: #3 Cylinder Load End to Control Valve
14	1	04841001	3/4" Tube: #3 Cylinder Unload End to Switching Valve
15	1	04840701	3/4" Tube: #3 Cylinder Unload End to Control Valve
16	1	04840701	3/4" Tube: #1 Cylinder Unload End to Control Valve

### Conversion Kit - Electric to Manual Load / Unload Valve



**Obsolete**  
Dec 1993 -  
Dec 2011



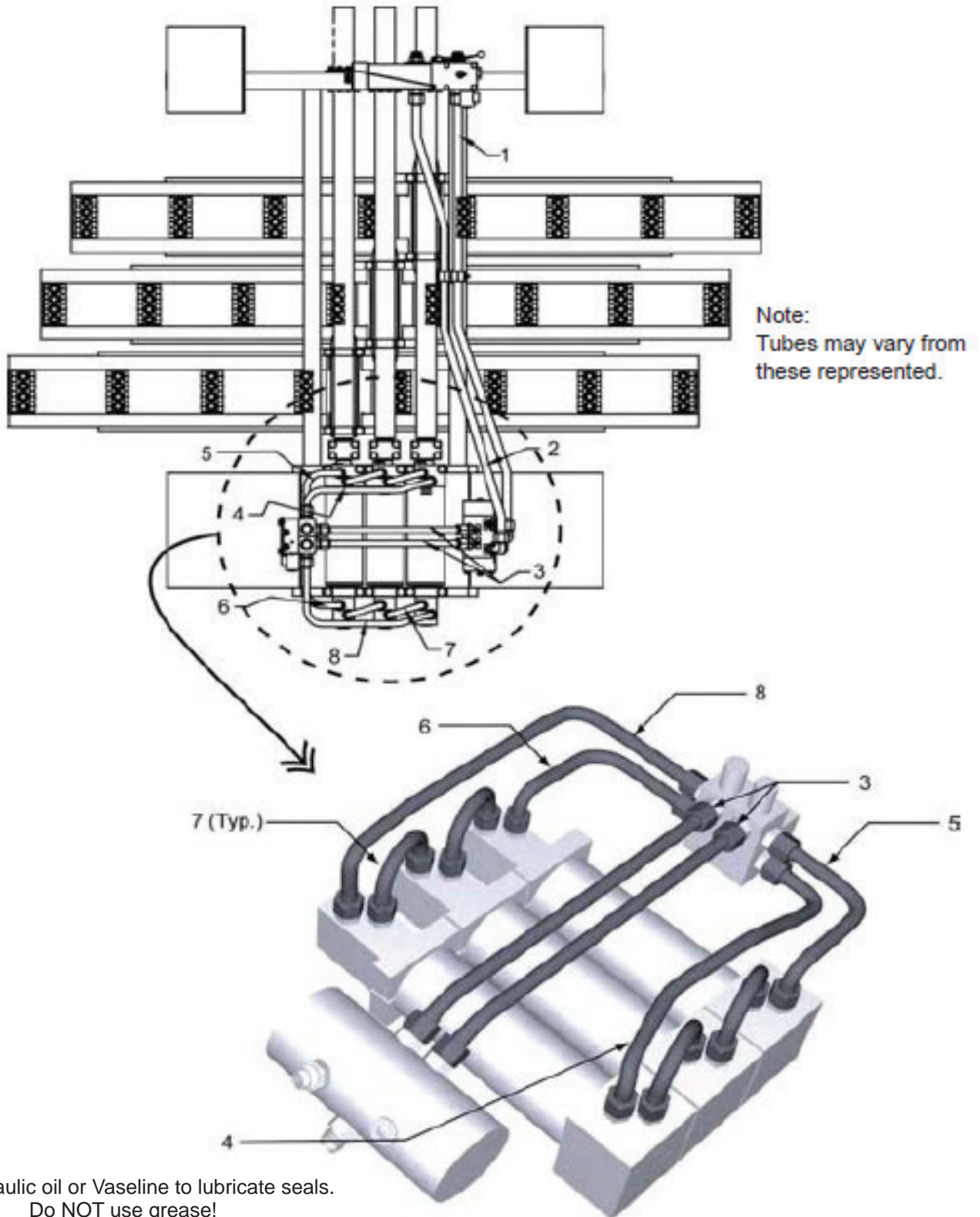
\*Tubes are drawn only for representation

Use hydraulic oil or Vaseline to lubricate seals.  
Do NOT use grease!  
Do NOT use Teflon tape!

### Conversion Kit - Electric to Manual Load / Unload

ID#	Qty	Part #	Description
1	1	04839202	Conversion Kit to Manual Load/Unload Valve (Includes items 2-23)
2	1	02552702	Control Valve Manual Metric (Includes items 3-8)
3	1	01049501	Body Control Valve (not sold separately)
4	1	03423202	Spool Control Valve (Metric, SAE) (not sold separately)
-	-	03877901	Seal Kit Control Valve Load/Unload (Includes items 5-7)
5	2	84381800	O-Ring 214 (Buna 70, Viton)
6	2	84427000	Wiper 1" Rod
7	4	84387200	O-Ring 910 (Buna 90, Viton)
8	4	84684900	6400-12-10 Straight
9	1	84801000	Snap Ring (2 Pcs) <b>OBSOLETE</b>
10	1	06998701	Spool End Stop (Critical for Assembly)
11	1	11262901	HANDLE CTV ASSY DX MET TELESCOPING
12	1	04838501	Control Valve Mount Plate Manual
13	1	87009500	10mm x 70mm Hex Cap Screw
14	2	87008470	10mm x 20mm Hex Cap Screw
15	4	87101500	10mm Hex Nut
16	1	87076500	10mm Lock Washer
17	2	04935701	Restrictor Valve
18	1	04840601	3/4" Tube: #1 Cylinder Load End to Switching Valve
19	1	04840801	3/4" Tube: #1 Cylinder Load End to Control Valve
20	1	04840901	3/4" Tube: #3 Cylinder Load End to Control Valve
21	1	04841001	3/4" Tube: #3 Cylinder Unload End to Switching Valve
22	1	04841101	3/4" Tube: #3 Cylinder Unload End to Control Valve
23	1	04840701	3/4" Tube: #1 Cylinder Unload End to Control Valve

### Hydraulic Tubes for Electric Controls



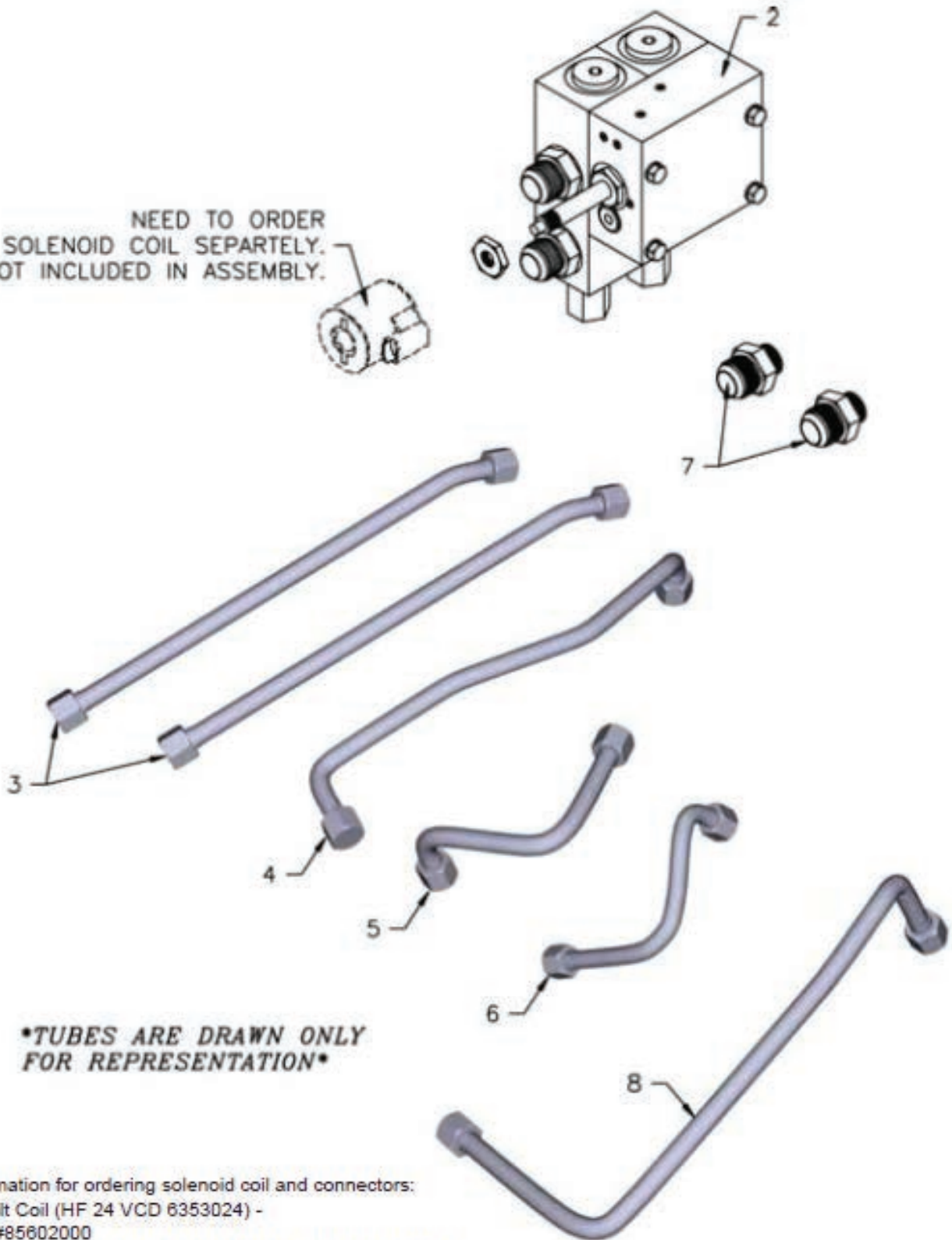
Use hydraulic oil or Vaseline to lubricate seals.  
Do NOT use grease!  
Do NOT use Teflon tape!

## Hydraulic Tubes for Electric Controls

ID#	Qty	Part #	Description
1	1	04841201	1" Tube: Ball Valve to Switching Valve Pressure Tube
2	1	04841301	1" Tube: Ball Valve to Switching Valve Return Tube
3	2	04841401	3/4" Tube: Control Valve to Switching Valve
4	1	04841501	3/4" Tube: #1 Cylinder Load End to Control Valve
5	1	04841601	3/4" Tube: #3 Cylinder Load End to Control Valve
6	1	04841701	3/4" Tube: #3 Cylinder Unload End to Control Valve
7	4	04840501	3/4" Tube: Cylinder Cross-Over Tubes
8	1	04840701	3/4" Tube: #1 Cylinder Unload End to Control Valve

### Conversion Kit - Manual to Electric Load / Unload Control Valve

NEED TO ORDER  
SOLENOID COIL SEPARATELY.  
NOT INCLUDED IN ASSEMBLY.



**\*TUBES ARE DRAWN ONLY  
FOR REPRESENTATION\***

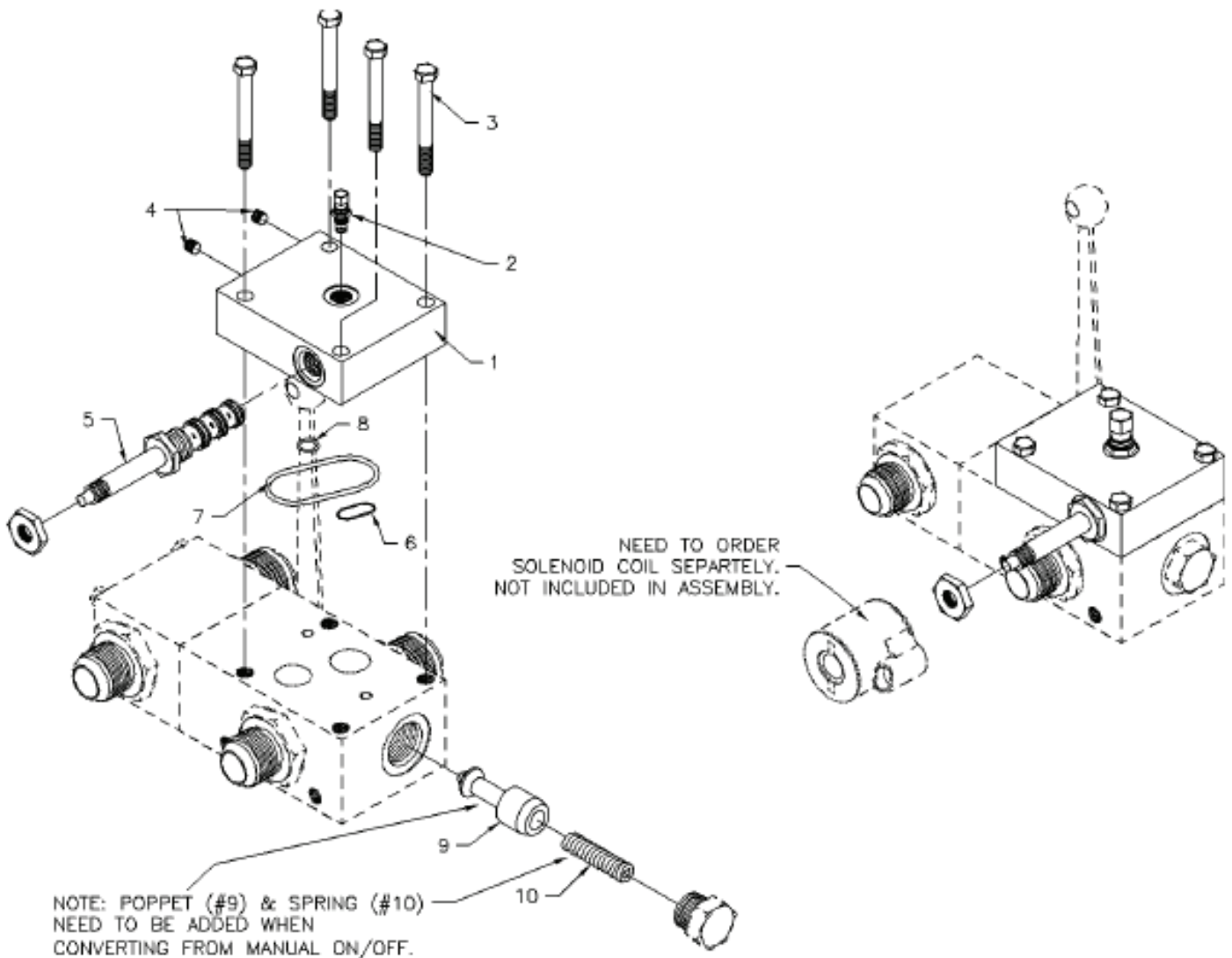
Information for ordering solenoid coil and connectors:  
24 volt Coil (HF 24 VCD 6353024) -  
Part #85602000  
Din Connect (RR Din Plug RR00011039) - Part #85102790

### Conversion Kit - Manual to Electric Load / Unload Control Valve

ID#	Qty	Part #	Description
1	1	04839302	Conversion Kit to Electric Load/Unload Control Valve (Includes items 2-6)
2	1	04459402	Control Valve Modular 6-Port Metric
3	2	04841401	3/4" Tube: Control Valve to Switching Valve
4	1	04841501	3/4" Tube: #1 Cylinder load end to Control Valve
5	1	04841601	3/4" Tube: #3 Cylinder load end to Control Valve
6	1	04841701	3/4" Tube: #3 Cylinder unload end to Control Valve
7	2	84684900	Hydraulic Straight Fitting Male 37° JIC to Male O-Ring
8	1	04841701	3/4" Tube: #1 Cylinder unload end to Control Valve

Use hydraulic oil or Vaseline to lubricate seals.  
 Do NOT use grease!  
 Do NOT use Teflon tape!

## Conversion Kit - Manual to Electric On / Off Ball Valve



Information For Ordering Solenoid Coil & Connectors: 24 Volt Coil (HF 24 VCD 6353024) – Part #85602000  
 Din Connect (RR Din Plug RR00011039) – Part #85102790

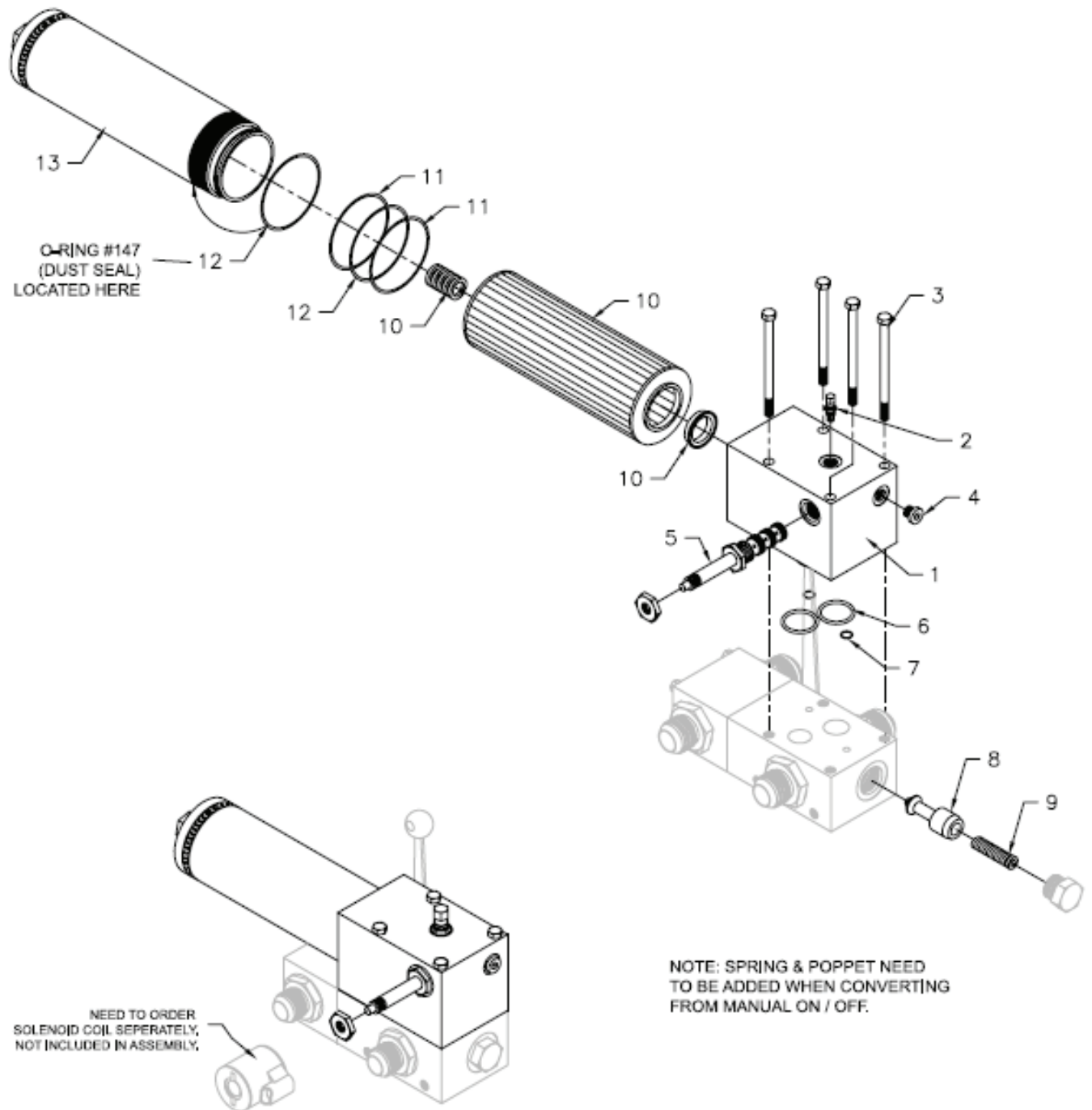
Use hydraulic oil or Vaseline to lubricate seals.  
 Do NOT use grease!  
 Do NOT use Teflon tape!



### Conversion Kit - Manual to Electric On / Off Ball Valve

ID#	Qty	Part #	Description
-	-	<b>04839502</b>	<b>Conversion Kit to Electric On/Off Ball Valve (Includes items 1-4, 6-10)</b>
1	1	04795702	Electric Cover Plate On/Off Ball Valve
2	1	84904000	Test Coupling SMK20-G1/4VC
3	4	87008530	10mm x 50mm Hex Bolt
4	2	84680770	1/16" NPT Pipe Plug
5	1	85108800	Solenoid Control Valve SV10-40 (Sold Separately)
-	-	<b>85108798</b>	<b>Seal Kit for Cartridge Valves</b>
6	1	84382200	216 O-Ring
7	1	84384000	228 O-Ring
8	1	84376300	112 O-Ring
9	1	04438401	On/Off Poppet
10	1	84453400	Spring #B-18273

### Conversion Kit - Electric On / Off Valve with Integrated Filter



Use hydraulic oil or Vaseline to lubricate seals.  
Do NOT use grease!  
Do NOT use Teflon tape!

Information For Ordering Solenoid Coil & Connectors:  
24 Volt Coil (HF 24 VCD 6353024) - Part #85602000  
Din Connect (RR Din Plug RR00011039) - Part #85102790

### Conversion Kit - Electric On / Off Valve with Integrated Filter

ID#	Qty	Part #	Description
-	-	<b>04839602</b>	<b>Conversion Kit to Electric On/Off Valve w/ Integrated Filter (Includes items 1-13)</b>
1	1	04436502	Fairley Arlon Filter Block
2	1	84904000	Test Coupling SMK20-G1/4VC
3	4	87011500	10mm x 110mm Hex Bolt
4	1	84686500	6408-04 O-Ring Hex Plug
5	1	85108800	Solenoid Control Valve SV10-40
-	-	<b>85108798</b>	<b>Seal Kit for Cartridge Valves</b>
6	2	84382800	218 O-Ring
7	2	84376300	112 O-Ring
8	1	04438401	On/Off Poppet
9	1	84453400	Spring #B-18273
10	1	84006520	Fairley Arlon Filter Element #MXW2-GDL20 w/Spring Rubber Seal
11	2	84389047	147 O-Ring Backup
12	2	84378447	147 O-Ring
13	1	06151501	Welded Filter Canister Assy.