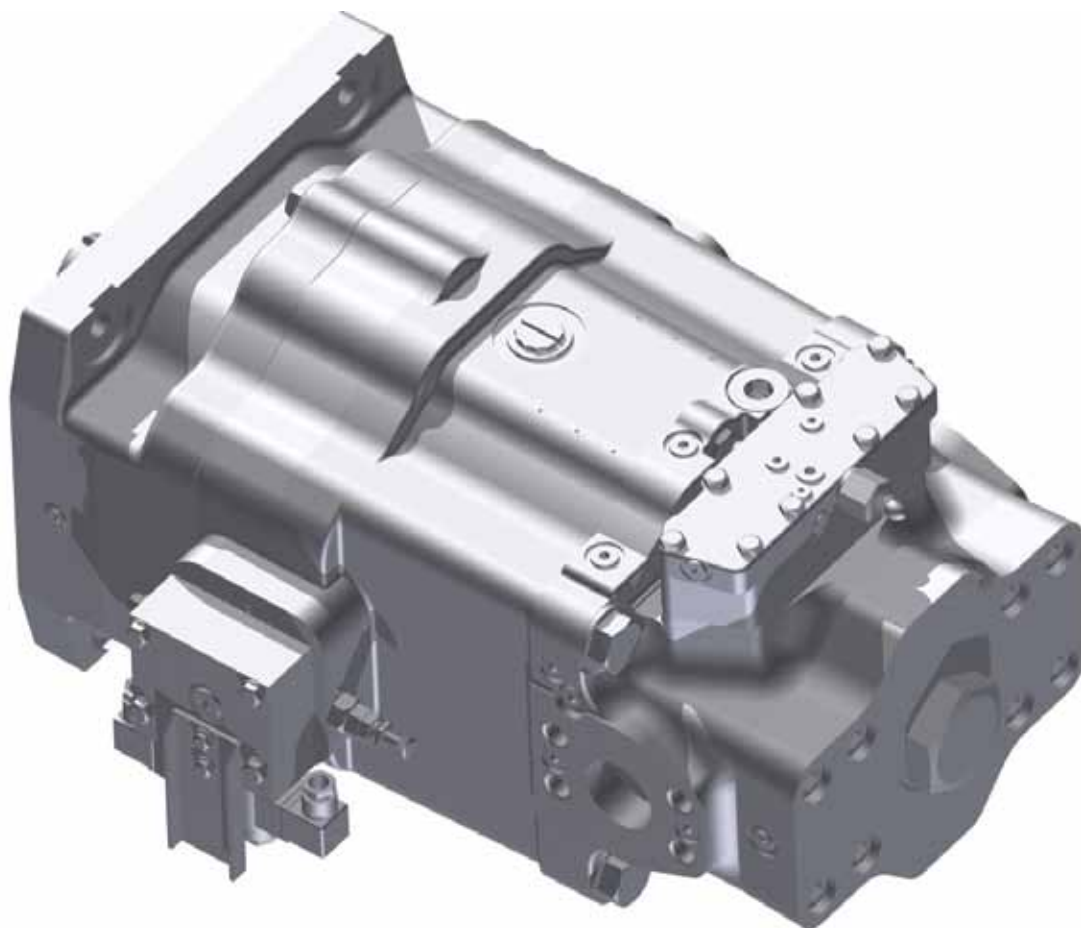




GOLD CUP® **Spare Parts and Exploded Views**

P24-30 Options

HY28-2678-03/GC/US

Effective: March 15, 2013

aerospace
climate control
electromechanical
filtration
fluid & gas handling
hydraulics
pneumatics
process control
sealing & shielding



ENGINEERING YOUR SUCCESS.

Hydraulic Pump Division and Denison Hydraulics

The Hydraulic Pump Division of Parker Hannifin was formed in 2004 when our significant piston pump business was expanded through the acquisition of **Denison Hydraulics**. The addition of **Denison** allowed us to marry the wealth of knowledge that both companies have in the design, manufacture, and application of piston products in both open circuit and closed circuit system applications. Since before WWII, **Denison** products have been chosen for Military test stand applications and for shipboard hydraulic applications being recognized as technology leaders.

The heavy duty **GOLD CUP®** series of pumps in this catalog represent a broadening of our product offering with hydrostatic transmission applications in marine, drilling, and shredding applications, among others. The tried and true design of the **GOLD CUP®** product line incorporates features such as integral servo and replenishing pump, hot oil shuttle, and a unique servo control system; all of which combine to provide a rugged self contained package which can withstand the harshest of conditions and continue to perform with trouble free long life.

The division is a leading worldwide manufacturer of hydraulic components and systems for earthmoving and construction vehicles; for mining equipment; for pulp and paper, chemical and other processing equipment; for ships and ordnance equipment; and for such in-plant machines as machine tools, plastic molding, die casters, and stamping presses.



DENISON	Hydraulics
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The user, through its own analysis and testing, is solely responsible for making the final selection of the system and components and assuring that all performance, endurance, maintenance, safety and warning requirements of the application are met. The user must analyze all aspects of the application, follow applicable industry standards, and follow the information concerning the product in the current product catalog and in any other materials provided from Parker or its subsidiaries or authorized distributors.

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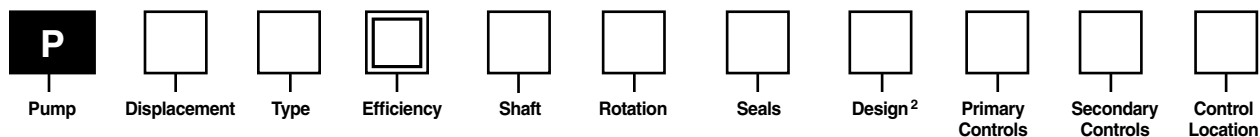
OFFER OF SALE

The items described in this document are hereby offered for sale by Parker-Hannifin Corporation, its subsidiaries or its authorized distributor. This offer and its acceptance are governed by the provisions stated in the detailed "Offer of Sale" elsewhere in this document.

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Notes:

1. Parts list and associated drawings shown in this bulletin are for standard model pumps only. All documentation for special "M2" modification pump model numbers must be verified with a HPD Factory Representative prior to ordering parts for such products.
2. * Indicates Special Instructions or Considerations.
3. ** Indicates Common Parts.
4. N/A Indicates Not Available or Not Applicable.
5. All documentation represented in this bulletin is for standard production models only, (as follows):
 - 5.1. P24 = Design Level "E" Model Pump
 - 5.2. P30 = Design Level "B" Model Pump
6. See ordering code for configuration options.
7. All orientation references are described when viewing pump from main drive shaft with valve block up.
8. Assembly part numbers with - 0 suffixes, indicate Buna N (Nitrile) seal compound. For Ethylene Propylene, (EPR), compound, use - 4 suffix. For Fluorocarbon compound use - 5 suffixes.
9. Detail part numbers for O-rings with 671 / 691 prefix, indicate Buna N (Nitrile) seal compound. For Ethylene Propylene, (EPR), compound, use 674 / 694 prefix. For Fluorocarbon compound use 675 / 695 prefix.
10. Drawings with items marked with double balloons "◎", indicate assemblies.



Code	Displacement
6	6.00 in ³ /rev (98 cc/rev)
7	7.25 in ³ /rev (119 cc/rev)
8	8.00 in ³ /rev (131 cc/rev)
11	11.0 in ³ /rev (180 cc/rev)
14	14.0 in ³ /rev (229 cc/rev)
24	24.6 in ³ /rev (403 cc/rev)
30	30.6 in ³ /rev (501 cc/rev)

Code	Type
F	Fixed Displacement, Open/Closed Circuit
M	Fixed Displacement with High Torque Thru-Drive, Open/Closed Circuit
P	Variable Displacement, Closed Circuit
X	Variable Displacement with Medium Torque Thru-Drive, Closed Circuit
S	Variable Displacement with Medium Torque Thru-Drive & Shuttle Package, Closed Circuit
R	Variable Displacement with High Torque Thru-Drive, Closed Circuit
L	Variable Displacement with High Torque Thru-Drive & Shuttle Package, Closed Circuit
V	Variable Displacement, Open Circuit (P6, 7, 8, 11 & 14 only)
D	Variable Displacement, Open & Closed Circuit (P6, 7 & 8 only)

Code	Efficiency
H	High Efficiency (P24 only)
Omit	Standard Efficiency

Code	Shaft
2	Keyed SAE – Mechanical Shaft Seal (Single Lip Seal on P6, 7, 8F/M)
3	Splined SAE – Mechanical Shaft Seal (Single Lip Seal on P6, 7, 8F/M)
4	Keyed SAE-D (Mounting & Shaft) – Mechanical Shaft Seal (P6, 7 & 8 only, Single Lip Seal on Fixed Displacement Pumps)
-5	Splined SAE-D (Mounting & Shaft) – Mechanical Shaft Seal (P6, 7 & 8 only, Single Lip Seal on Fixed Displacement Pumps)
7	Keyed SAE – Double Lip Shaft Seal
8	Splined SAE – Double Lip Shaft Seal
9	Keyed (long) SAE – Double Lip Shaft Seal
10	Keyed (long) SAE – Mechanical Shaft Seal

Code	Rotation
R	Clockwise
L	Counterclockwise

Code	Seals
1	Nitrile (Buna-N)
4	EPR ^{1,3}
5	Fluorocarbon

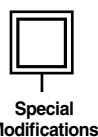
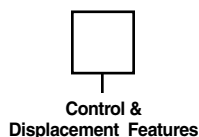
Code	Primary Controls
Omit	None (Fixed Displacement only)
10	Screw Adjustment (Spring Offset to Maximum Displacement)
2A	Cylinder Control w/Adjustable Maximum Volume Stops
2H	Cylinder Control – 3-Position (Spring Control with Zero Adjustment)
2M	Cylinder Control – 2-Position Electrohydraulic w/Adjustable Maximum Volume Stop (Spring Offset to Maximum Displacement) ¹
2N	Cylinder Control – 3-Position (Spring Centered) Electrohydraulic ¹
40	Rotary Servo – Spring Centered
4A	Rotary Servo – Spring Centered w/ Adjustable Maximum Volume Stops
4B	Rotary Servo – Spring Centered w/ Automatic Brake Control
4C	Rotary Servo – Spring centered w/ Adjustable Maximum Volume Stops & Automatic Brake Control
5A	Electrohydraulic Stroker w/Adjustable Maximum Volume Stops ¹
5C	Electrohydraulic Stroker w/Adjustable Maximum Volume Stops & Automatic Brake Control ¹
7D	High IQ with 10 GPM Servo Valve & Volume Indicator ¹
7F	High IQ with 10 GPM Servo Valve & 4A (Rotary Servo) Control ¹
7J	High IQ with DF+ Valve & Volume Indicator ¹
7K	High IQ with DF+ Valve & 4A (Rotary Servo) Control ¹
8A	Hydraulic Stroker w/Adjustable Maximum Volume Stops
8C	Hydraulic Stroker w/Adjustable Maximum Volume Stops & Automatic Brake Control
9A	Electrohydraulic Stroker w/Adjustable Maximum Volume Stops ¹
9C	Electrohydraulic Stroker w/Adjustable Maximum Volume Stops & Automatic Brake Control ¹
9D	Electro-hydraulic stroker w/ adjustable maximum volume stops

Code	Secondary Controls
Omit	None (Fixed Displacement only)
2	Volume Indicator
4	Torque Limiter & Volume Indicator
6	Cam Position Feedback Potentiometer ¹
7	Cam Position Feedback RVD (AC) ¹
8	Cam Position Feedback RVD (DC) ¹

Code	Control Location
Omit	None (Fixed Displacement only)
A	Primary Control on Port A Side
B	Primary Control on Port B Side

- ¹ Not ATEX approved.
² Assigned by manufacturer
³ Not available when using "5A" or "5C" primary controls. Pump will be unpainted unless otherwise specified.

 = Omit if not required



Control	Code	Control & Displacement Features
2M* & 2N*	00	CETOP3, NG6 Valve, 110AC/60Hz with Hirschmann Connector ¹
	01	CETOP3, NG6 Valve, 12VDC with Hirschmann Connector ¹
	02	CETOP3, NG6 Valve, 240VAC/50Hz with Hirschmann Connector ¹
	03	CETOP3, NG6 Valve, 110VAC/60Hz, Wiring Box ¹
	04	CETOP3, NG6 Valve, 12VDC, Wiring Box ¹
	05	CETOP3 (D03, NG6) Interface, No Valve ¹
	06	CETOP3, NG6 Valve, 24VDC with Hirschmann Connector ¹
	07	CETOP3, NG6 Valve, 110VAC/50Hz with Hirschmann Connector ¹
5**	00	With Deadband ¹
	01	Without Deadband ¹
7**	00	Without Manual Override Shutoff ¹
	01	With Manual Override Shutoff ¹ (required for F & K primary options)
8**	00	75-350 PSI (5-24 Bar)
	01	75-435 PSI (5-30 Bar)
	02	100-375 PSI (7-26 Bar)
	03	150-400 PSI (10-28 Bar)
	04	75-250 PSI (5-17 Bar)
g**	00	24VDC
	01	12VDC
All Other	00	None ¹
Pump	Code	Reduced Displacement
P**F & P**M	00	Standard Cam (19°)
	10	P6 with 17° Cam – 5.3 in ³ /rev (87cc/rev)
		P7 with 17° Cam – 6.4 in ³ /rev (105 cc/rev)
		P8 with 17° Cam – 7.1 in ³ /rev (116 cc/rev)
		P11 with 17° Cam – 9.7 in ³ /rev (160 cc/rev)
		P14 with 17° Cam – 12.5 in ³ /rev (205 cc/rev)
	20	P24 with 17° Cam – 22.0 in ³ /rev (360 cc/rev)
		P30 with 17° Cam – 27.2 in ³ /rev (446 cc/rev)
		P6 with 15° Cam – 4.6 in ³ /rev (76 cc/rev)
		P7 with 15° Cam – 5.6 in ³ /rev (92 cc/rev)
	30	P8 with 15° Cam – 6.2 in ³ /rev (102 cc/rev)
		P11 with 15° Cam – 8.5 in ³ /rev (140 cc/rev)
		P14 with 15° Cam – 10.9 in ³ /rev (179 cc/rev)
		P6 with 13° Cam – 4.0 in ³ /rev (66 cc/rev)
		P7 with 13° Cam – 4.8 in ³ /rev (79 cc/rev)
		P8 with 13° Cam – 5.3 in ³ /rev (88 cc/rev)

Code	Internal Pump
0	1.07 in ³ /rev (17.5 cc/rev) – P6, 7, 8P/S/X/V/D & P11, 14V only** 2.14 in ³ /rev (35 cc/rev) – P11, 14P/S/X only** 2.81 in ³ /rev (46 cc/rev) – P24, 30P/S/X only (standard)**
1	1.61 in ³ /rev (26.4 cc/rev) – P24, 30P/S/X only (auxiliary external replenishing flow required)
2	1.05 in ³ /rev (17.2 cc/rev) – P24, 30P/S/X only (auxiliary external replenishing flow required)
3	3.56 in ³ /rev (58.3 cc/rev) – P24, 30P/S/X only
4	4.84 in ³ /rev (79.3 cc/rev) – P24, 30P/S/X only
5	5.42 in ³ /rev (88.8 cc/rev) – P24, 30P/S/X only
6	6.10 in ³ /rev (100.0 cc/rev) – P24, 30P/S/X only
X	No Internal Pump (standard on P*R/L/F/M)

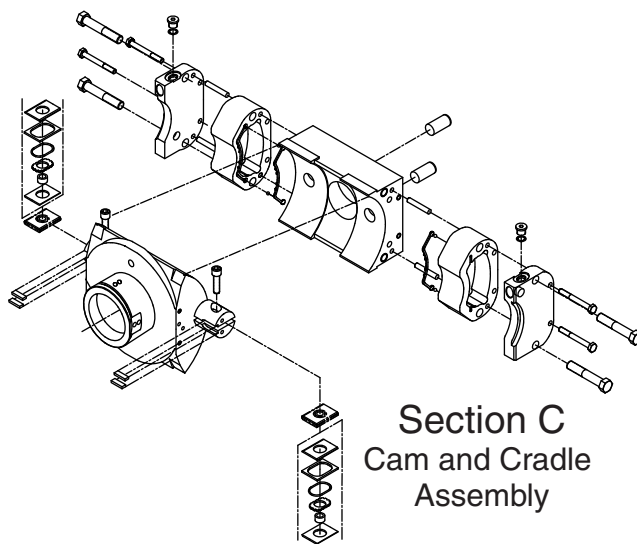
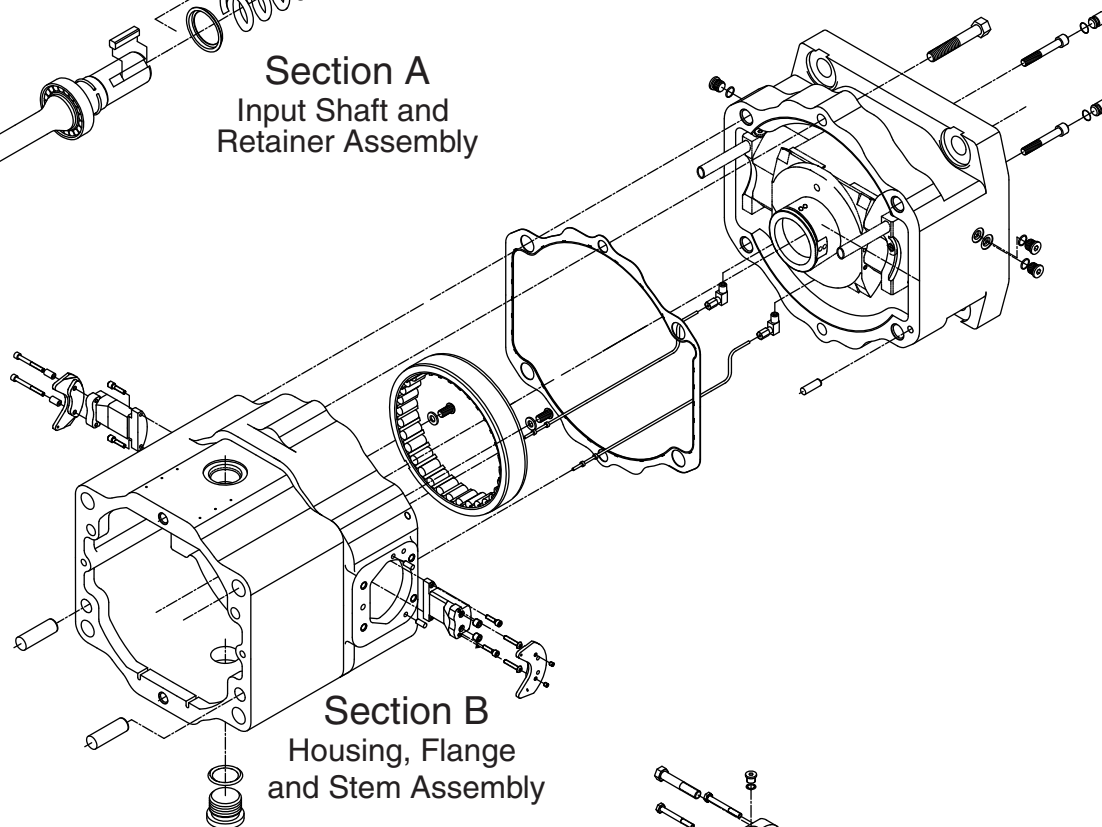
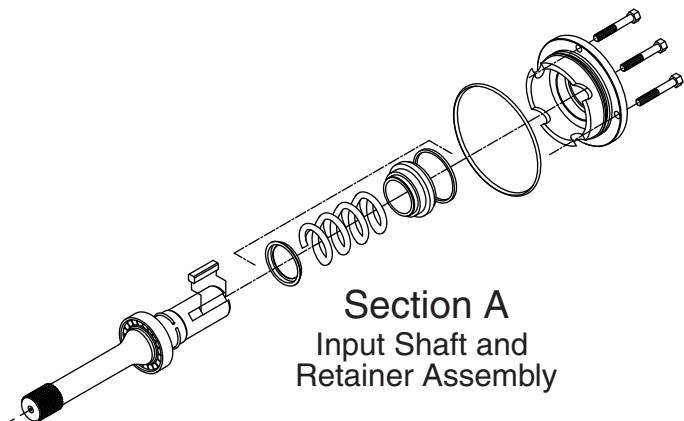
** Omit code if no external drive is required.

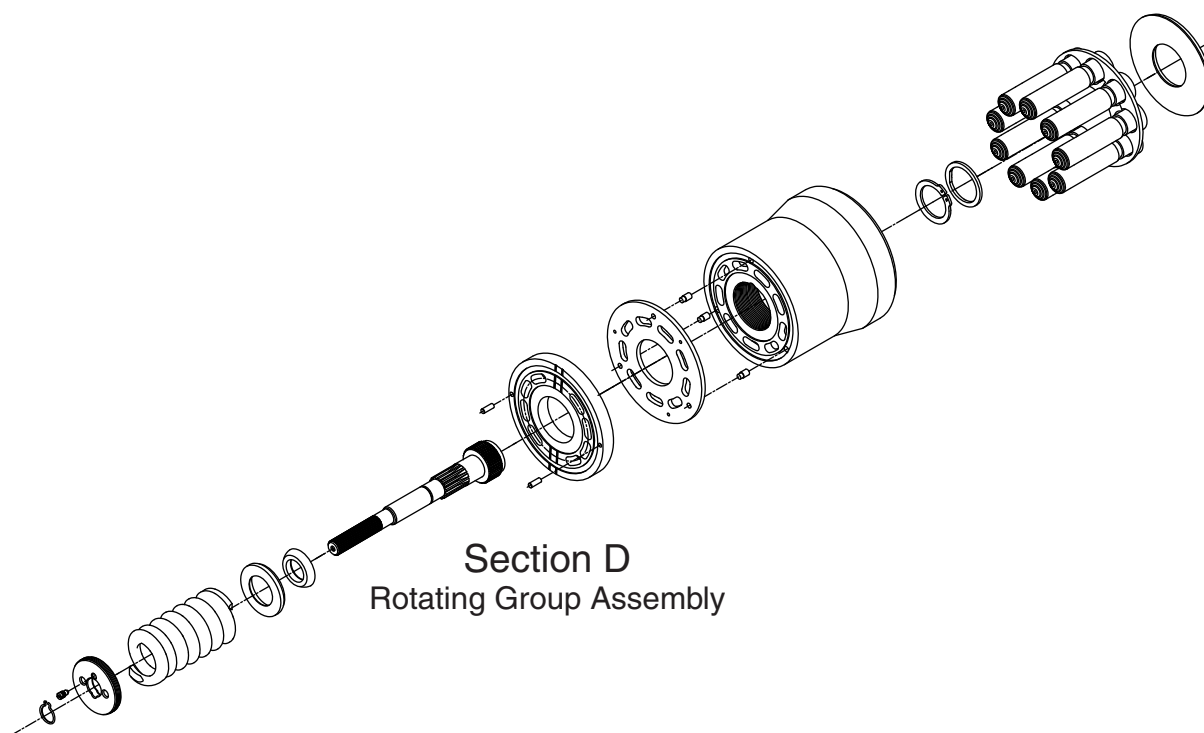
Code	External Drive
Omit	None ¹
M	Blanking plate – for P6, 7, 8, 11, 14S/X only
A	SAE-A (SAE 82-2) – P6, 7, 8, 11, 14S/X/R/L/M only
B	SAE-B (SAE 101-2) – P6, 7, 8, 11, 14, 24, 30S/X/R/L/M SAE-B (SAE 101-4) – P11, 14, 24, 30R/L/M
C	SAE-C (SAE 127-2) – P6, 7, 8, 11, 14, 24, 30R/L/M & P24, 30S/X SAE-C (SAE 127-4) – P11, 14, 24, 30R/L/M
D	SAE-D (SAE 152-4) – P11, 14, 24, 30R/L/M only
E	SAE-E (SAE 165-4) – P11, 14, 24, 30R/L/M only
F	SAE-F (SAE 177-4) – P24, 30R/L/M only

Code	External Mounting
Omit	No External Drive Required
0	No External Pump Mounted
1	External Pump Mounted (must be separately specified) – Requires Special Modification “-M2” ¹
2	ATEX Externally Mounted Pump

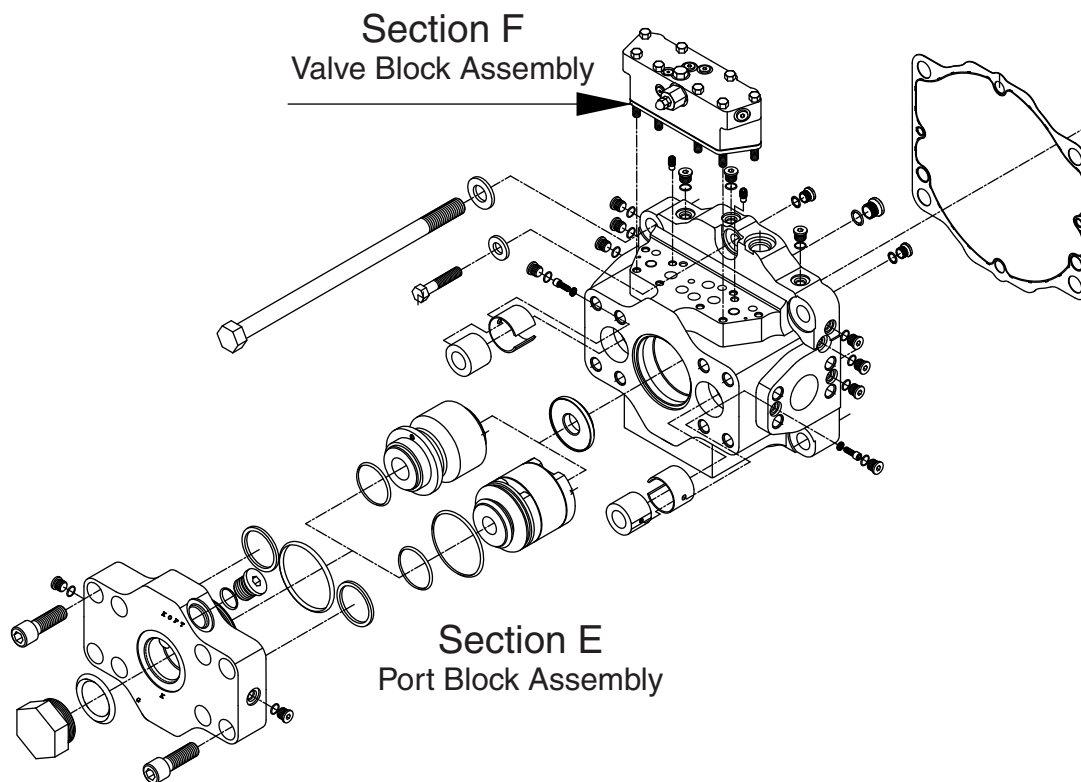
Code	Special Modifications
Omit	None
NP	No Paint ¹
EX	ATEX APPROVED PUMP (May contain additional modifications. Contact tech support.)
M2	Other Special Modification (example: bronze caged barrel bearing for low viscosity fluids, tandem pumps, etc.) ¹

= Omit if not required



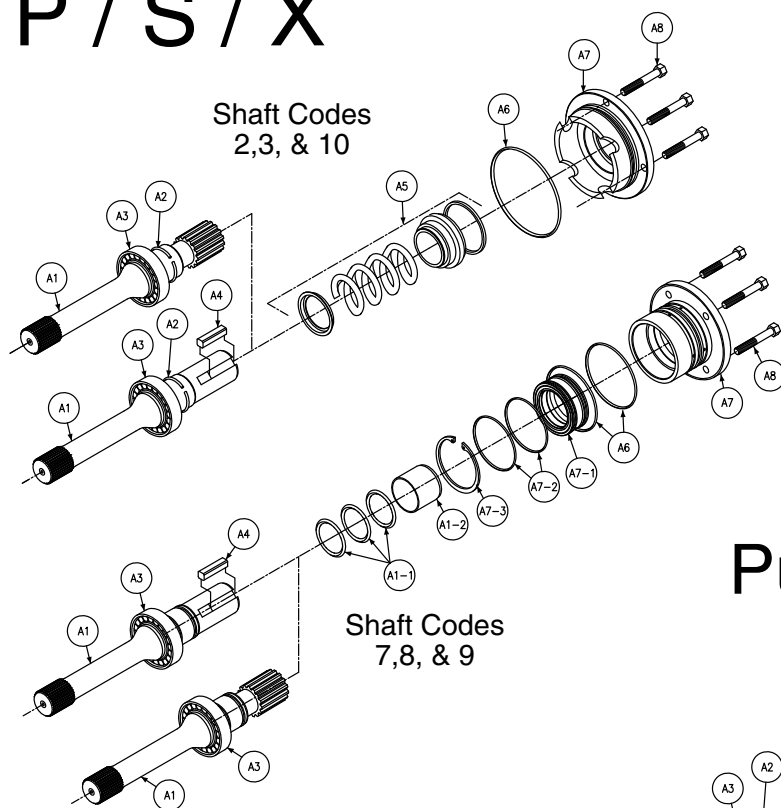


Section D
Rotating Group Assembly

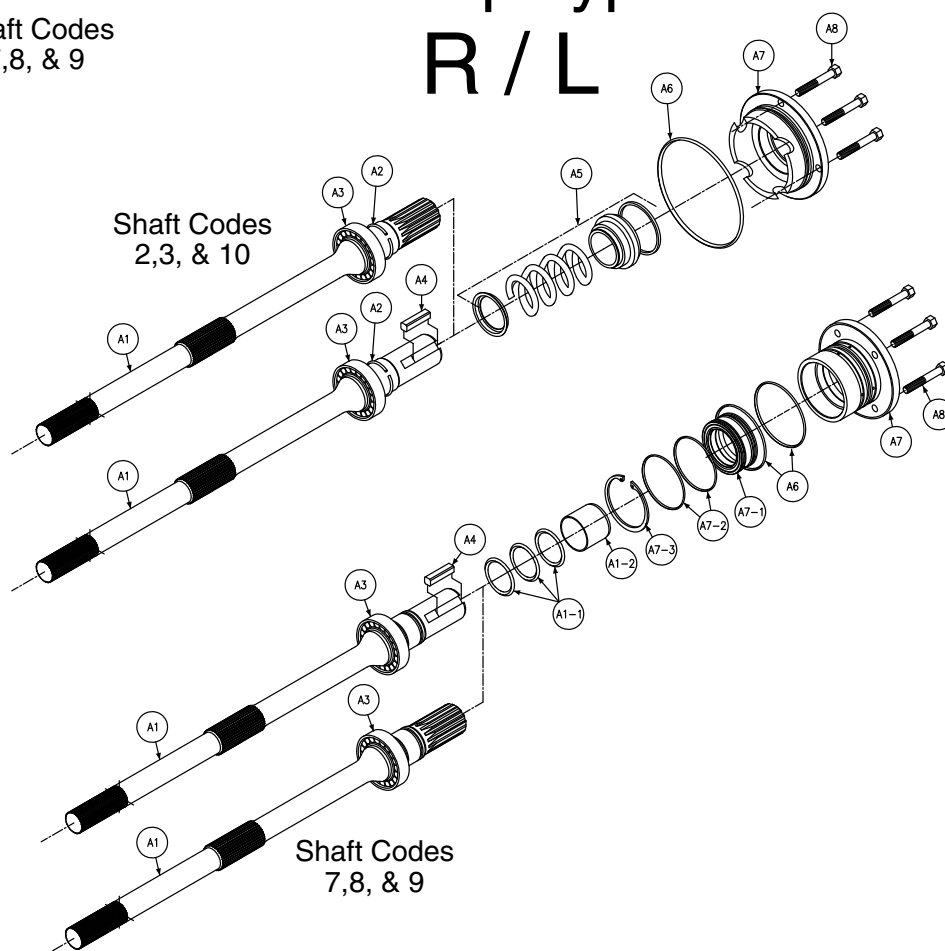


Section E
Port Block Assembly

Pump Type P / S / X



Pump Type R / L



Section A						
P24/30 Input Shaft and Retainer Assembly						
Balloon #	Pump Type	Shaft Code	Seal Code	Item #	Description	Qty
A1	P/S/X	2	**	033-91140-0	Shaft, Keyed Mech Seal	1
	P/S/X	3	**	033-91139-0	Shaft, Splined Mech Seal	
	P/S/X	7	**	*033-94118-0	Shaft, Keyed Lip Seal	
	P/S/X	8	**	*033-94177-0	Shaft, Splined Lip Seal	
	P/S/X	9	**	*033-94192-0	Shaft, Keyed Long w lip seals	
	P/S/X	10	**	033-93610-0	Shaft, Keyed, long w mech seal	
	R/L	2	**	033-92843-0	Shaft, Keyed Mech Seal	
	R/L	3	**	033-92729-0	Shaft, Splined Mech Seal	
	R/L	7	**	*033-94178-0	Shaft, Keyed Lip Seal	
	R/L	8	**	*033-94179-0	Shaft, Splined Lip Seal	
	R/L	9	**	033-93615-0	Shaft, Keyed Long w lip seals	
	R/L	10	**	033-93616-0	Shaft, Keyed, long w mech seal	
A1-1	P/S/X	7/8/9	1	671-00133-0	Gasket O-ring	3
			4	674-00133-0		
			5	675-00133-0		
	R/L	7/8	1	671-00133-0	Gasket O-ring	3
			4	674-00133-0		
			5	675-00133-0		
A1-2	P/S/X	7/8/9	**	033-94117-0	Sleeve, Shaft	1
	R/L	7/8	**	033-94117-0	Sleeve, Shaft	1
A2	P/S/X	2/3/10	**	033-71712-0	Ring, Retaining	1
		7/8/9	**	not used		not used
	R/L	2/3/9/10	**	033-71712-0	Ring, Retaining	1
		7/8	**	not used		not used
A3	P/S/X/R/L	2/3/7/8/9/10	**	230-82213-0	Bearing, Shaft	1
A4	P/S/X/R/L	2/7	**	033-71910-0	Key, Square	1
		9/10	**	033-93619-0		
A5	P/S/X/R/L	2/3/10	4	623-00015-4	Seal, Shaft - Mechanical	1
		2/3/10	5	623-00015-5		
A6	P/S/X/R/L	2/3/10	1	671-00246-0	Gasket O-ring	1
		2/3/10	4	674-00246-0		
		2/3/10	5	675-00246-0		
	P/S/X/R/L	7/8/9	1	671-00246-0		2
		7/8/9	4	674-00246-0		
		7/8/9	5	675-00246-0		
A7	P/S/X/R/L	2/3/10	**	033-57472-0	Retainer, Seal	1
		7/8/9	**	033-95484-0		1
A7-1	P/S/X/R/L	7/8/9	**	620-82126-0	Seal, Shaft Lip Bi-Directional	1
A7-2	P/S/X/R/L	7/8/9	1	671-00149-0	Gasket O-ring	2
		7/8/9	4	674-00149-0		
		7/8/9	5	675-00149-0		
A7-3	P/S/X/R/L	7/8/9	**	356-65160-0	Ring, Retaining	1
A8	P/S/X/R/L	2/3/7/8/9/10	**	306-40123-0	Screw, HHC 3/8-16 UNC X 1 1/4 Lg	4

Note: Shaft part numbers marked with * are not usable without items A1-1 & A1-2, (o'rings and sleeve).

Section View - A - Kits

GOLD CUP® P24-30

Spare Parts and Exploded Views

P24/30 Seal Kits				
Note: Seal kits for "M" mod pumps and for aux pumps require part verification with HPD factory representatives. Standard Seal Kits below contain seals for the following				
1. Main pump				
2. Valve block				
3. Input/output controls				
4. shaft seal				
Pump Type	Shaft Code	Rotation	Seal Code	Part Number
P24/30 P	2/3	**	1	S23-18006-0
P24/30 R	2/3	**	1	S23-18016-0
P24/30 X	2/3	**	1	S23-15514-0
P24/30 P	7/8/9	CW	1	S23-17038-0
P24/30 P	7/8/9	CCW	1	S23-17039-0
P24/30 R	7/8/9	CW	1	S23-17017-0
P24/30 R	7/8/9	CCW	1	S23-17018-0
P24/30 X	7/8/9	CW	1	S23-18022-0
P24/30 X	7/8/9	CCW	1	S23-18023-0
P24/30 S	2/3	**	1	S23-17040-0
P24/30 L	2/3	**	1	S23-18019-0
P24/30 S	7/8/9	CW	1	S23-17041-0
P24/30 S	7/8/9	CCW	1	S23-17042-0
P24/30 L	7/8/9	CW	1	S23-18020-0
P24/30 L	7/8/9	CCW	1	S23-18021-0
P24/30 S	2/3	**	1	S23-11600-0
P24/30 S	7/8/9	CW	1	S23-15696-0
P24/30 S	7/8/9	CCW	1	S23-15696-0

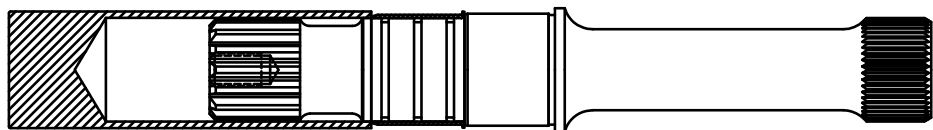
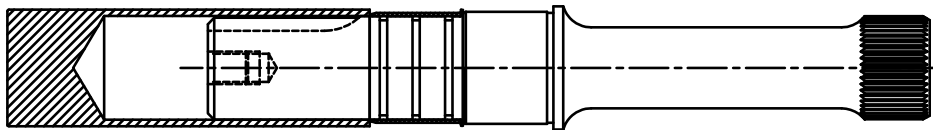
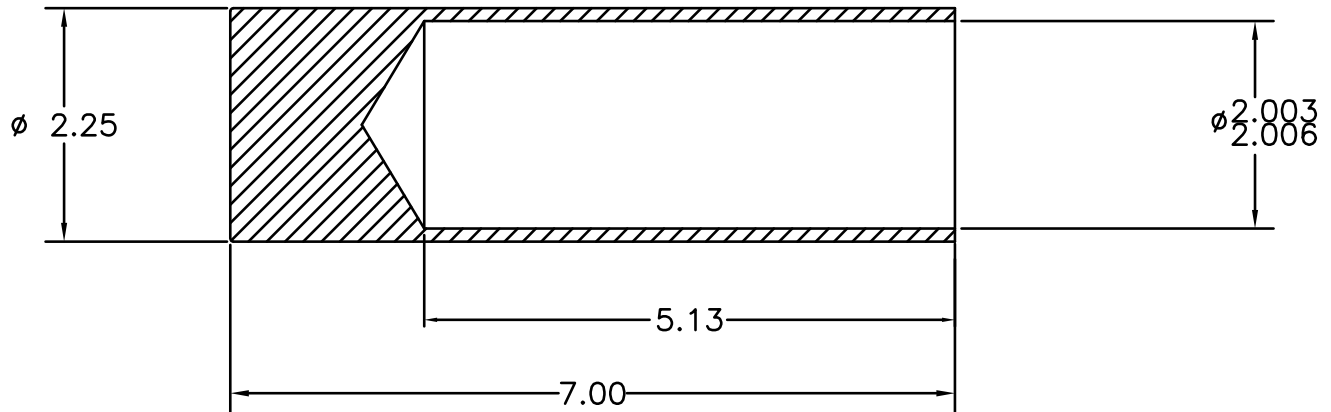
P24/30 Shaft and Bearing Assembly Kits		
Composed of items A1, A1-1, A1-2, A2, A3, A4 as applicable		
Pump Type	Shaft Code	Part Number
P/S/X	2	S23-12475-0
P/S/X	3	S23-12474-0
P/S/X	7	S23-18233-0
P/S/X	8	S23-18234-0
P/S/X	9	S23-18235-0
P/S/X	10	S23-17491-0
R/L	2	S23-16362-0
R/L	3	S23-16364-0
R/L	7	S23-16473-0
R/L	8	S23-16475-0
R/L	9	S23-17496-0
R/L	10	S23-17497-0

Replacement shaft sleeve & o-rings are available for Pump Type P/S/X/R/L with 7/8/9 shafts. However, special tool P/N 213-0-004202 is required to remove and install the sleeve.

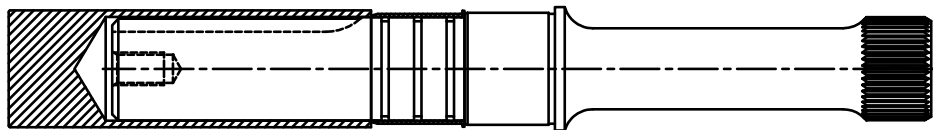
Note: See Page 9 for tool details.

P24/30 Seal retainer assembly kits				
Composed of items: A7 A7-1, A7-2, and A7-3				
Shaft Code	Pump Type	Rotation	Seal Code	Part Number
7/8/9	P/V/X/S/R/L	BI-Directional	1	S23-15391-0

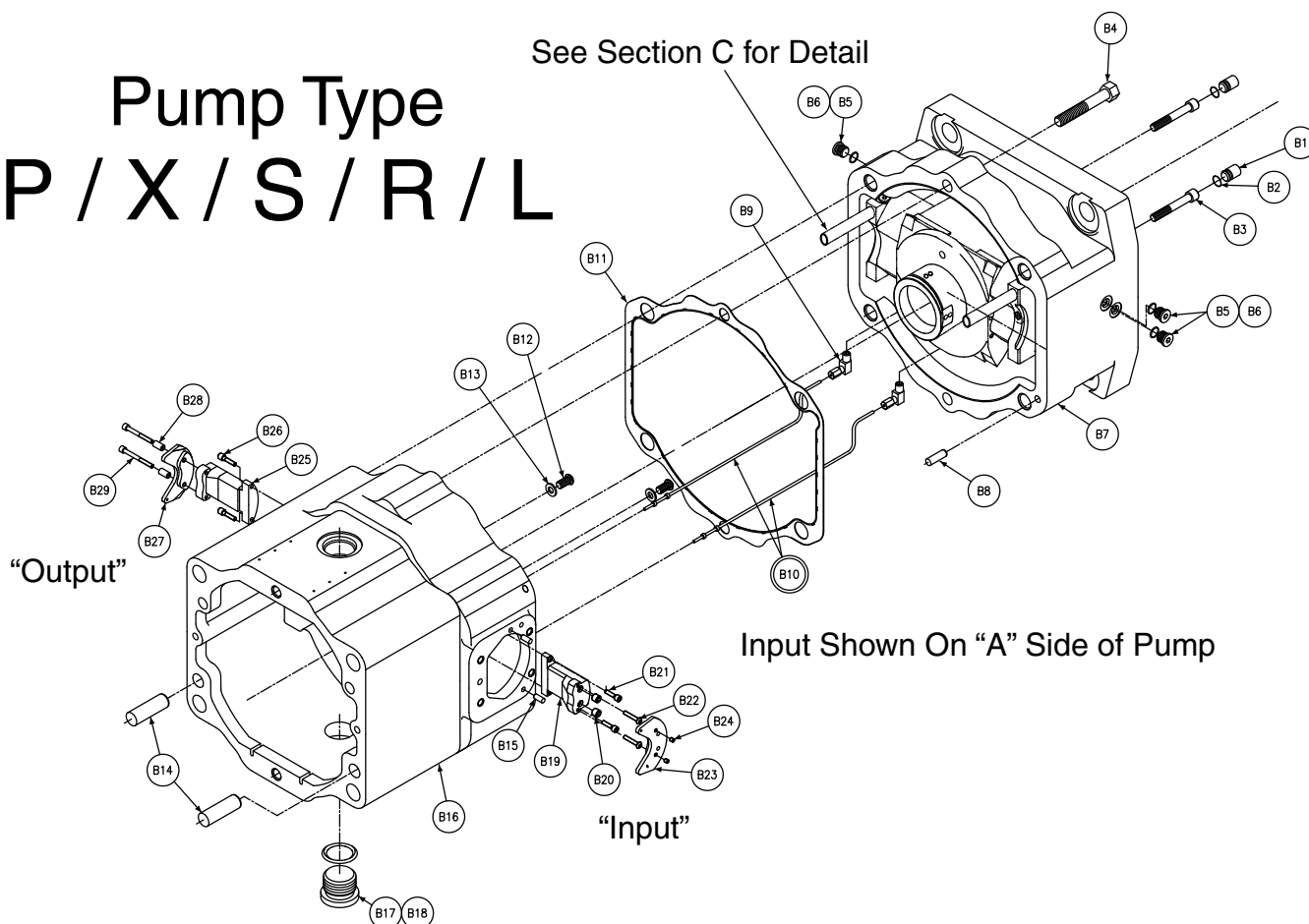
Material: Medium carbon steel heat treated to 27–34 RC



DO NOT HAMMER OR OTHERWISE IMPACT!
APPLY A CONSTANT PRESSING FORCE ONLY!



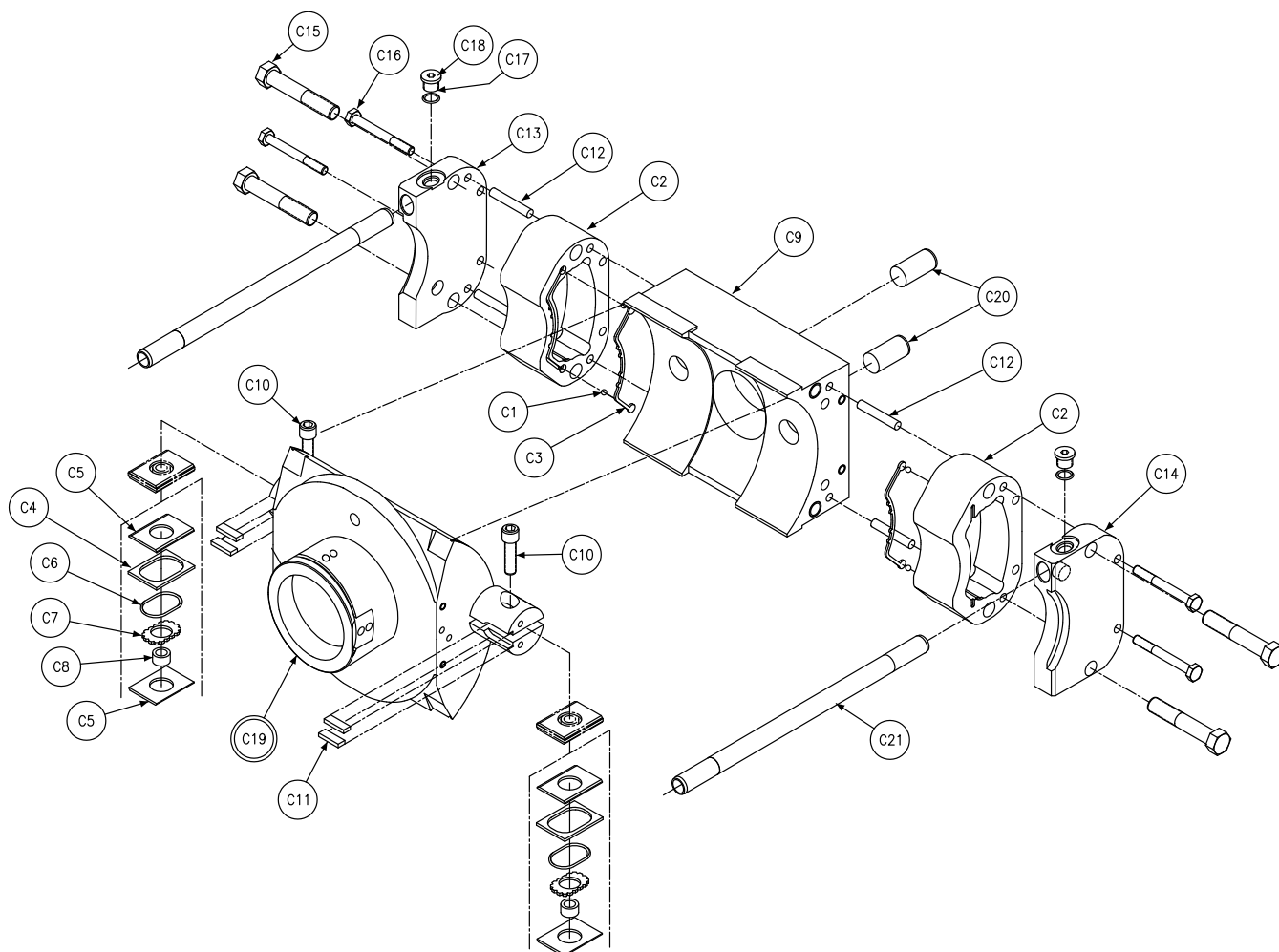
Pump Type P / X / S / R / L



Section B							
P24/30 Housing, Mounting Flange, Input, and Output Stems							
Balloon #	Displacement	Pump Type	Shaft Code	Seal Code	Item #	Description	Qty
B1	P24/P30	P/S/X/R/L	2/3/7/8/9/10	**	033-57475-0	Plug	2
B2	P24/P30	P/S/X/R/L	2/3/7/8/9/10	1	671-00111-0	Gasket, O-ring	2
	P24/P30	P/S/X/R/L	2/3/7/8/9/10	4	674-00111-0		
	P24/P30	P/S/X/R/L	2/3/7/8/9/10	5	675-00111-0		
B3	P24/P30	P/S/X/R/L	2/3/7/8/9/10	**	358-16260-0	Screw, SHC 3/8-16 UNC X 2-1/4 LG	2
B4	P24/P30	P/S/X/R/L	2/3/7/8/9/10	**	306-40009-0	Screw, SHC 5/8-11 UNC X 3 LG	2
B5	P24/P30	P/S/X/R/L	2/3/7/8/9/10	1	691-00904-0	Gasket, O-ring	3
	P24/P30	P/S/X/R/L	2/3/7/8/9/10	4	694-00904-0		
	P24/P30	P/S/X/R/L	2/3/7/8/9/10	5	695-00904-0		
B6	P24/P30	P/S/X/R/L	2/3/7/8/9/10	**	488-35061-0	SHC Plug	3
B7	P24/P30	P/S/X/R/L	2/3/7/8/9/10	**	033-91137-0	Flange, Mounting	1
B8	P24/P30	P/S/X/R/L	2/3/7/8/9/10	**	324-22416-0	Pin, Dowel 3/8 X 1	1
B9	P24/P30	P/S/X/R/L	2/3/7/8/9/10	**	473-15041-0	Fitting, Elbow	2
B10	P24	P/S/X/R/L	2/3/7/8/9/10	**	S13-44469-0	P24 Pressure Feed Tube	2
	P30	P/S/X/R/L	2/3/7/8/9/10	**	S23-12172-0	P30 Pressure Feed Tube	
B11	P24/P30	P/S/X/R/L	2/3/7/8/9/10	**	033-91082-0	Gasket, Mtg. Flg.	1
B12	P24/P30	P/S/X/R/L	2/3/7/8/9/10	**	358-14106-0	Screw-SHC 1/4 X 1/2	2
B13	P24/P30	P/S/X/R/L	2/3/7/8/9/10	**	345-10020-0	Washer- 11/32	2
B14	P24/P30	P/S/X/R/L	2/3/7/8/9/10	**	324-24832-0	Pin, Dowel 3/4 X 2.00	2
B15	P24/P30	P/S/X/R/L	2/3/7/8/9/10	**	324-21608-0	Pin, Dowel 1/4 X 1/2	4
B16	P24	P/S/X/R/L	2/3/7/8/9/10	**	033-57150-0	P24 Housing	1
	P30	P/S/X/R/L	2/3/7/8/9/10	**	033-57925-0	P30 Housing	
B17	P24/P30	P/S/X/R/L	2/3/7/8/9/10	1	691-00920-0	Gasket, O-ring	1
	P24/P30	P/S/X/R/L	2/3/7/8/9/10	4	694-00920-0		
	P24/P30	P/S/X/R/L	2/3/7/8/9/10	5	695-00920-0		
B18	P24/P30	P/S/X/R/L	2/3/7/8/9/10	**	488-35019-0	Plug, STR. THD.	1
B19	P24/P30	P/S/X/R/L	2/3/7/8/9/10	**	033-91256-0	Stem, Servo	1
B20	P24/P30	P/S/X/R/L	2/3/7/8/9/10	**	033-70819-0	Plug- Orifice 1/16 Dia.	2
B21	P24/P30	P/S/X/R/L	2/3/7/8/9/10	**	358-10120-0	Screw, SHC #10-24 X 3/4 LG	2
B22	P24/P30	P/S/X/R/L	2/3/7/8/9/10	**	353-25023-0	Screw, BHC #10-24 X 1/2 LG	2
B23	P24/P30	P/S/X/R/L	2/3/7/8/9/10	**	033-53874-0	Plate, Servo	1
B24	P24/P30	P/S/X/R/L	2/3/7/8/9/10	**	312-09032-0	Screw, Set, #10-32 x3/16 LG	2
B25	P24/P30	P/S/X/R/L	2/3/7/8/9/10	**	033-71774-0	Stem, Balance	1
B26	P24/P30	P/S/X/R/L	2/3/7/8/9/10	**	358-10120-0	Screw, SHC #10-24 X 3/4 LG	2
B27	P24/P30	P/S/X/R/L	2/3/7/8/9/10	**	033-70546-0	Plate, Balance	1
B28	P24/P30	P/S/X/R/L	2/3/7/8/9/10	**	033-71247-0	Spacer	2
B29	P24/P30	P/S/X/R/L	2/3/7/8/9/10	**	359-09180-0	Screw, SHC #10-32 X 1 1/4 LG	2

Stem Kits "Standard"	
Input stem kits include the following:	
B19, B20, B21, B22, B23 and B24	
Output stem kits include the following:	
B25, B26, B27, B28 and B29	
Description	Part Number
P24/30 Input stem kit	S23-15110-0
P24/30 Output stem kit	S23-03950-0

Pump Type P / X / S / L / R



Section C								
P24/30 Cam and Cradle Assembly								
Balloon #	Displacement	Pump Type	Shaft Code	Rotation	Seal Code	Item #	Description	Qty
C1	P24/P30	P/S/X/R/L	2/3/7/8/9/10	**	**	201-06001-0	Check Ball	4
C2	P24/P30	P/S/X/R/L	2/3/7/8/9/10	**	**	033-71757-0	Vane Chamber	2
C3	P24/P30	P/S/X/R/L	2/3/7/8/9/10	**	1	606-25045-0	Seal - Molded	2
	P24/P30	P/S/X/R/L	2/3/7/8/9/10	**	4	606-25040-4		
	P24/P30	P/S/X/R/L	2/3/7/8/9/10	**	5	606-25040-5		
C4	P24/P30	P/S/X/R/L	2/3/7/8/9/10	**	**	033-71714-0	Seal - Vane	2
C5	P24/P30	P/S/X/R/L	2/3/7/8/9/10	**	**	033-71726-0	Backup Plate - Vane Seal	4
C6	P24/P30	P/S/X/R/L	2/3/7/8/9/10	**	1	691-00128-0	Gasket - O-ring	2
	P24/P30	P/S/X/R/L	2/3/7/8/9/10	**	4	674-00128-0		
	P24/P30	P/S/X/R/L	2/3/7/8/9/10	**	5	695-00128-0		
C7	P24/P30	P/S/X/R/L	2/3/7/8/9/10	**	**	033-71727-0	Spacer - Vane	2
C8	P24/P30	P/S/X/R/L	2/3/7/8/9/10	**	**	033-59806-0	Spacer (.2500/.2495-Blue)	Select fit 2
	P24/P30	P/S/X/R/L	2/3/7/8/9/10	**	**	033-59983-0	Spacer (.2515/.2510-Yellow)	
	P24/P30	P/S/X/R/L	2/3/7/8/9/10	**	**	033-59984-0	Spacer (.2530/.2525-Green)	
C9	P24/P30	P/S/X/R/L	2/3/7/8/9/10	**	**	033-91141-0	Cradle - Rocker	1
C10	P24/P30	P/S/X/R/L	2/3/7/8/9/10	**	**	359-13160-0	Screw, SHC. 5/16 -24 UNF X 1	2
C11	P24/P30	P/S/X/R/L	2/3/7/8/9/10	**	**	033-70816-0	Vane - holddown	4
C12	P24/P30	P/S/X/R/L	2/3/7/8/9/10	**	**	324-22428-0	Pin - Dowel 3/8 X 1 3/4	4
C13	P24/P30	P/S/X/R/L	2/3/7/8/9/10	CCW	**	033-71595-0	Right Control Cover	1
	P24/P30	P/S/X/R/L	2/3/7/8/9/10	CW	**	033-71598-0		
C14	P24/P30	P/S/X/R/L	2/3/7/8/9/10	CCW	**	033-71593-0	Left control cover	1
	P24/P30	P/S/X/R/L	2/3/7/8/9/10	CW	**	033-71597-0		
C15	P24/P30	P/S/X/R/L	2/3/7/8/9/10	**	**	306-40174-0	Screw, HHC 1/2-13 UNC X 3 1/4 LG	4
C16	P24/P30	P/S/X/R/L	2/3/7/8/9/10	**	**	306-40035-0	Screw, HHC 3/8-16 UNC X 3 LG	4
C17	P24/P30	P/S/X/R/L	2/3/7/8/9/10	**	1	691-00905-0	Gasket O-ring	2
	P24/P30	P/S/X/R/L	2/3/7/8/9/10	**	4	674-00905-0		
	P24/P30	P/S/X/R/L	2/3/7/8/9/10	**	5	695-00905-0		
C18	P24/P30	P/S/X/R/L	2/3/7/8/9/10	**	**	488-35020-0	Hex socket plug	2
C19	P24/P30	P/S/X/R/L	2/3/7/8/9/10	**	**	S23-12482-0	Rocker cam and Plug assembly	1
C20	P24/P30	P/S/X/R/L	**	**	**	324-24028-0	Pin, Dowel	2
C21	P24	P/S/X/R/L	2/3/7/8/9/10	**	**	033-71731-0	Tube, Override	2
	P30	P/S/X/R/L	2/3/7/8/9/10	**	**	033-57933-0		

Cam and Cradle assembly			
Composed of Items:			
C1 thru C19			
P24/30 Pump Type P,S,X,R,L			
Part Number	Pump Type	Shaft Type	Rotation
S23-12481-0	P/S/X/R/L	2/3/7/8/9/10	CW
S23-12480-0	P/S/X/R/L	2/3/7/8/9/10	CCW

Pump Type P / X / S

Pump Type R / L

Pump Type
R / L

Section D						
P24/30 Rotating Group						
Balloon #	Displacement	Pump Type	Rotation	Item #	Description	Qty
D1	P24/P30	P/S/X/R/L	**	033-91653-0	Creep plate	1
D2	P24	P/S/X/R/L	**	S13-44470-0	Assembly, Retainer, Piston, & Shoes	1
	P30	P/S/X/R/L	**	S23-12684-0		
D3	P24/P30	P/S/X/R/L	**	033-59805-0	Bearing, thrust	1
D4	P24/P30	P/S/X/R/L	**	033-92754-0	Retaining ring, Black, .078/.077 thk	Select fit 1
	P24/P30	P/S/X/R/L	**	033-59746-0	Retaining ring, Blue, .079/.081 thk	
	P24/P30	P/S/X/R/L	**	033-71718-0	Retaining ring, Red, .081/.083 thk	
	P24/P30	P/S/X/R/L	**	033-91130-0	Retaining ring, White, .083/.085 thk	
	P24/P30	P/S/X/R/L	**	033-71717-0	Retaining ring, Green, .085/.087 thk	
	P24/P30	P/S/X/R/L	**	033-71716-0	Retaining ring, Yellow, .087/.089 thk	
D5	P24/P30	P/S/X/R/L	**	033-93046-0	Bearing, Barrel	1
D6	P24	P/S/X/R/L	**	S23-12091-0	Barrel assembly	1
	P30	P/S/X/R/L	**	S23-12170-0		
D7	P24/P30	P/S/X/R/L	**	033-59747-0	Pin, face plate	3
D8	P24	P/S/X/R/L	**	033-71748-0	Face plate	1
	P30	P/S/X/R/L	**	033-57571-0		
D9	P24	P/S/X/R/L	CW	033-71752-0	Plate - Port	1
	P24	P/S/X/R/L	CCW	033-71753-0		
	P30	P/S/X/R/L	CW	033-91238-0		
	P30	P/S/X/R/L	CCW	033-91237-0		
D10	P24/P30	P/S/X/R/L	**	324-21610-0	Pin, Dowel 1/4 x 5/8 Lg	2
D11	P24	P	**	033-57257-0	* Shaft, Internal Auxiliary Pump	1
	P30	P	**	033-91188-0		
	P24	S/X	**	033-93535-0	** Shaft, External Auxiliary Pump	
	P30	S/X	**	033-93536-0		
D12	P24	P/S/X	**	033-57147-0	Seat, Spherical	1
D13	P24	P/S/X	**	033-57148-0	Retainer, Spring	1
D14	P24/P30	R/L	**	033-92790-0	Washer, Spring backup	1
D15	P24	P/S/X	**	033-57136-0	Spring, Holddown, (Helical)	1
	P30	P/S/X	**	035-71713-0	Spring, Holddown Belleville Washer	8
	P24	R/L	**	033-92725-0	Spring, Holddown Belleville Washer	8
	P30	R/L	**	033-92725-0	Spring, Holddown Belleville Washer	10
D16	P24	R/L	**	033-92916-0	Retainer, BBL HD spring Disc	1
	P30	R/L	**	033-92788-0	Retainer, BBL HD spring Disc	
	P30	P/S/X	**	033-57138-0	Retainer, BBL HD spring Disc	
D17	P24/P30	R/L	**	033-94648-0	Nut, BBL Holdown	1
	P24	P/S/X	**	033-57139-0	Nut, BBL Holdown ADJ Screw	
	P30	P/S/X	**	033-94648-0	Nut, BBL Holdown	
D18	P24	P/S/X	**	033-57241-0	Screw, BBL Holddown retaining	1
	P30	P/S/X	**	033-94649-0	Insert, BBL Holddown Locking Nut	1
P24/P30	R/L	**				
D19	P24/P30	R/L	**	358-12100-0	Screw, SHC 1/4-20 UNC X 5/8	6
	P30	P/S/X	**			
	P24	P/S/X	**	033-57239-0	Lock ring	1
D20	P30	P/S/X	**	346-60036-0	Lockwsher, HI collar, 1/4	6
	P24/P30	R/L	**			

IMPORTANT NOTES: 1,2,3,4

- 1.* AUXILIARY DRIVE SHAFT 033-57257-0 MUST BE USED WITH REAR COVER ASSEMBLY S23-15182 FOR P24 "P" TYPE PUMPS ONLY
 2.* AUXILIARY DRIVE SHAFT 033-91188-0 MUST BE USED WITH REAR COVER ASSEMBLY S23-15122 FOR P30 "P" TYPE PUMPS ONLY
 3.**AUXILIARY DRIVE SHAFT 033-93535-0 MUST BE USED WITH REAR COVER ASSEMBLY S23-15183, (SAE-B EXT MOUNT), OR S23-15172, (SAE-C EXT MOUNT), FOR P24 "S&X" TYPE PUMPS ONLY
 4 ** AUXILIARY DRIVE SHAFT 033-93536-0 MUST BE USED WITH REAR COVER ASSEMBLY S23-15125 (SAE-B EXT MOUNT), OR S23-17546, (SAE-C EXT MOUNT), OR S23-17546 (SAE-C EXT MOUNT), FOR P30 "S&X" TYPE PUMPS

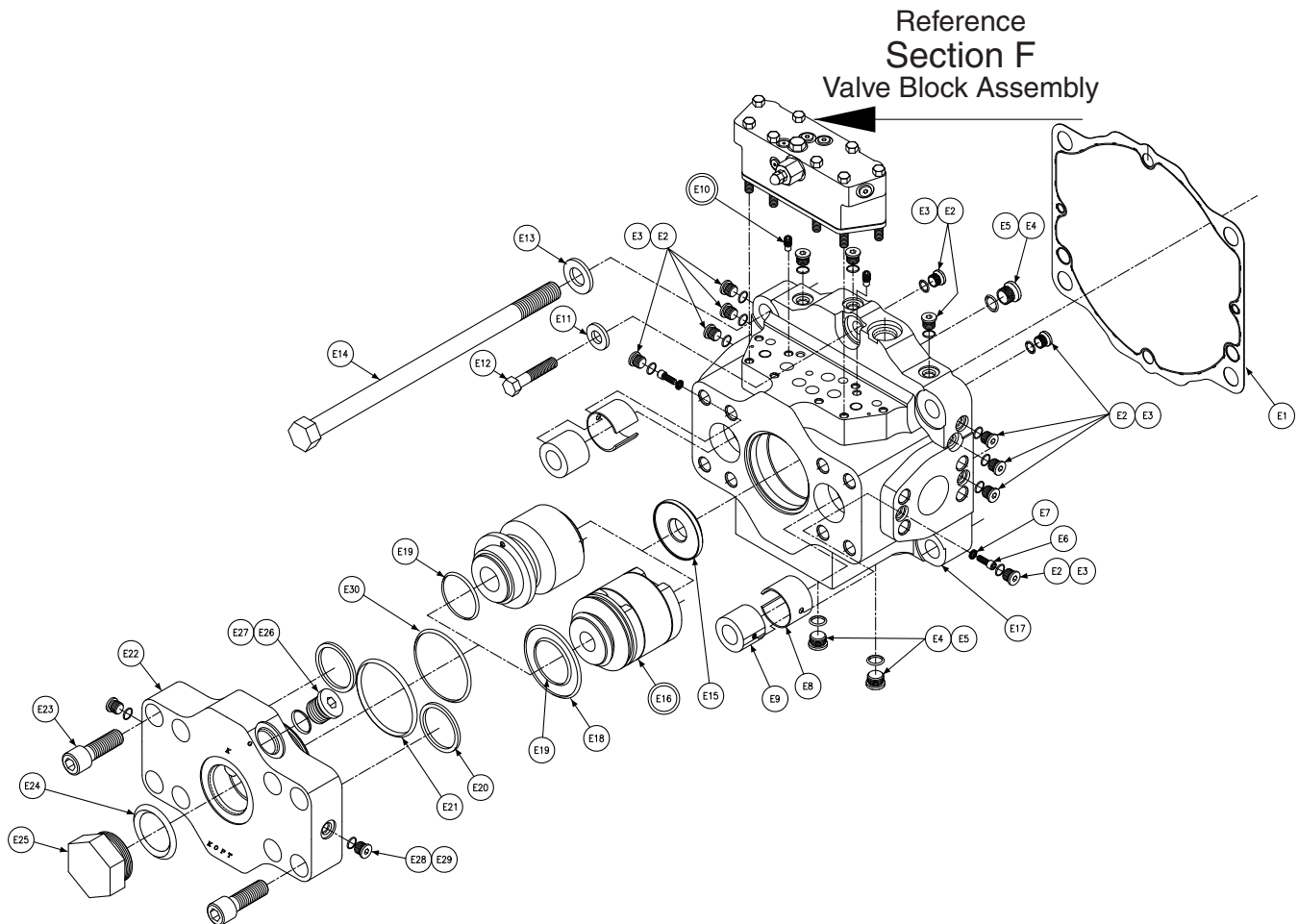
Major Rotating Group Kit**Composed of Items:****D1,D2,D5,D6,D7, D8, D9, and D10**

Displacement	Model Type	Rotation	Part Number
P24	P/X/S/R/L	CW	S23-17111-0
P24	P/X/S/R/L	CCW	S23-17112-0
P30	P/X/S/R/L	CW	S23-17113-0
P30	P/X/S/R/L	CCW	S23-17114-0

Barrel Hold Down Kit**Composed of Items:****D11, & D15****No Kit available for R/L versions**

Displacement	Model Type	Rotation	Part Number
P24	P	**	S23-17253-0
P24	P	**	S23-17254-0
P30	S/X	**	S23-17255-0
P30	S/X	**	S23-17256-0





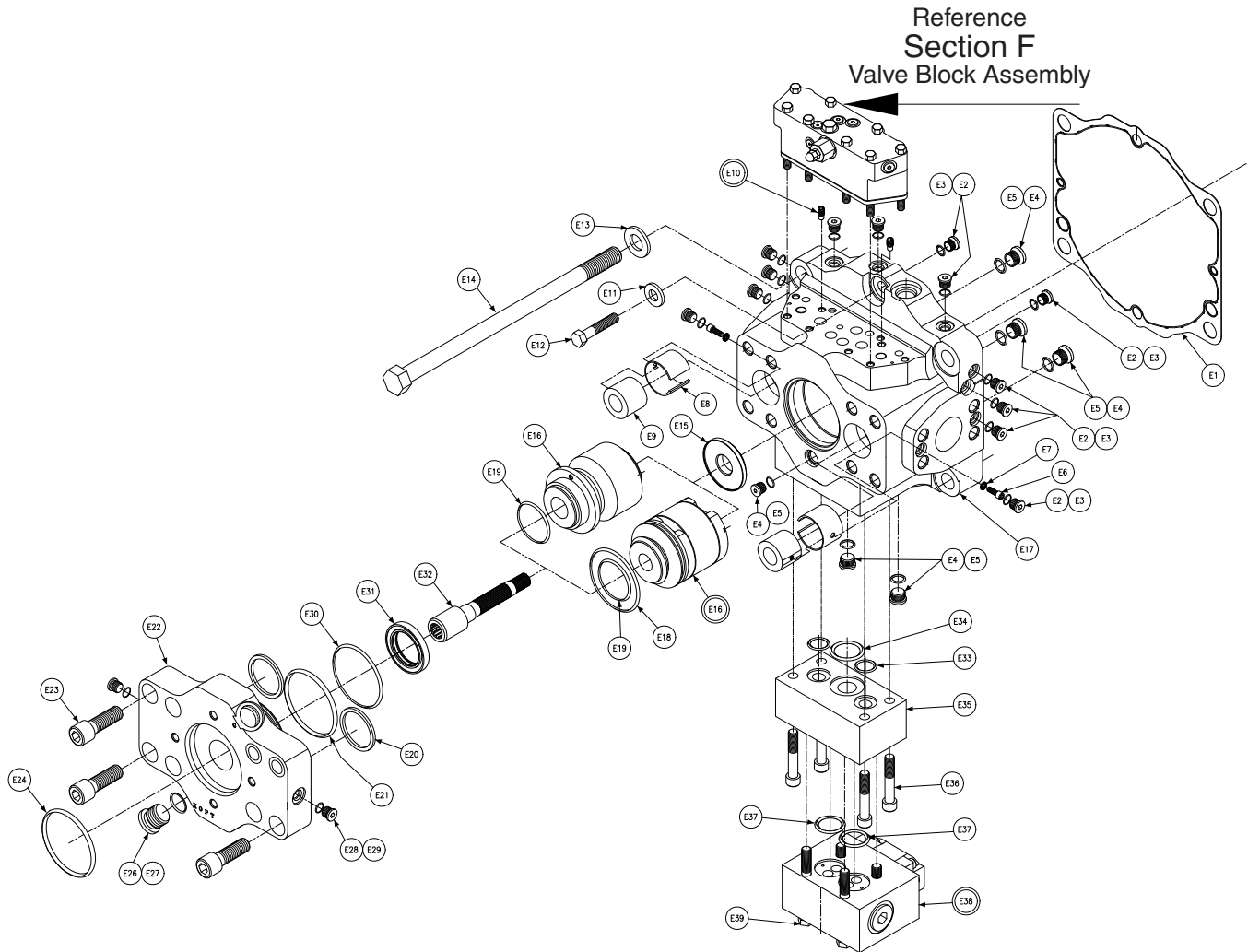
Section E							
P24/30 PUMP TYPE P PORT BLOCK ASSEMBLY							
Balloon #	Displacement	Pump Type	Rotation	Seal Code	Item #	Description	Qty
E1	P24/30	P24/30 P	**	**	033-91085-0	Gasket, Port Block/Housing	1
E2	P24/30	P24/30 P	**	**	488-35041-0	Plug, 6HP5N	13
E3	P24/30	P24/30 P	**	1	691-00906-0	Gasket O-ring	13
	P24/30	P24/30 P	**	4	674-00906-0		
	P24/30	P24/30 P	**	5	695-00906-0		
E4	P24/30	P24/30 P	**	**	488-35018-0	Plug, 8HP5N	3
	P24/30	P24/30 P	**	1	691-00908-0		
	P24/30	P24/30 P	**	4	694-00908-0		
E5	P24/30	P24/30 P	**	5	695-00908-0	Gasket O-ring	3
	P24/30	P24/30 P	**	**	359-11140-0		
E6	P24/30	P24/30 P	**	**	350-10168-0	Screw, SHC	2
E7	P24/30	P24/30 P	**	**	035-72355-0	Washer, LOC	2
E8	P24/30	P24/30 P	**	**	035-72355-0	Ring check, P24/30	2
E9	P24/30	P24/30 P	**	**	033-94747-0	Stop, Ring Check	2
E10	P24/30	P24/30 P	**	**	S13-40266-0	Check valve assembly	2
E11	P24/30	P24/30 P	**	**	350-10136-0	Washer, 5/8	2
E12	P24/30	P24/30 P	**	**	306-40008-0	Screw, HHC 5/8-11UNC	2
E13	P24/30	P24/30 P	**	**	350-10135-0	Washer, 7/8	4
E14	P24	P24/30 P	**	**	306-40221-0	Screw, HHC 7/8-9UNC X 13	4
	P30	P24/30 P	**	**	306-40230-0	Screw, HHC 7/8-9UNC X 14	
E15	P24/30	P24/30 P	**	**	033-91073-0	Washer, Sealing	1

Continued on next page.

P24/30 PUMP TYPE P PORT BLOCK ASSEMBLY (CONTINUED)							
Balloon #	Displacement	Pump Type	Rotation	Seal Code	Item #	Description	Qty
E16	P24/30	P24/30 P	CW	**	S24-11918-0	Vane Pump, Cart. Assy' 2.81 CIPR	1
		P24/30 P	CCW	**	S24-05562-0		
		P24/30 P	CW	**	S24-11789-0	Vane Pump, Cart. Assy' 1.64 CIPR	
		P24/30 P	CCW	**	S24-51206-0		
		P24/30 P	CW	**	S24-11697-0	Vane Pump, Cart. Assy' 1.05 CIPR	
		P24/30 P	CCW	**	S24-11778-0		
		P24/30 P	CW	**	S24-05342-0	Vane Pump, Cart. Assy' 3.56 CIPR	
		P24/30 P	CCW	**	S24-05563-0		
		P24/30 P	CW	**	S24-05509-0	Vane Pump, Cart. Assy' 4.84 CIPR	
		P24/30 P	CCW	**	S24-05510-0		
		P24/30 P	CW	**	S24-63562-0	Vane Pump, Cart. Assy' 5.42 CIPR	
		P24/30 P	CCW	**	S24-44844-0		
		P24/30 P	CW	**	S24-63563-0	Vane Pump, Cart. Assy' 6.10 CIPR	
P24/30 P	CCW	**	S24-63564-0				
P24/30 P	**	**	S23-15102-0	Blank, Cart assy,			
E17	P24/30	P24/30 P	**	**	033-91564-0	Port block	1
E18	P24/30	P24/30 P	**	1	691-00238-0	Gasket O-ring	1
	P24/30	P24/30 P	**	4	694-00238-0		
	P24/30	P24/30 P	**	5	695-00238-0		
E19	P24/30	P24/30 P	**	1	691-10229-0	Gasket, Tetraseal	1
	P24/30	P24/30 P	**	4	694-10229-0		
	P24/30	P24/30 P	**	5	695-10229-0		
E20	P24/30	P24/30 P	**	1	691-10228-0	Gasket, Tetraseal	2
	P24/30	P24/30 P	**	4	694-10228-0		
	P24/30	P24/30 P	**	5	695-10228-0		
E21	P24/30	P24/30 P	**	1	671-00242-0	Gasket O-ring	1
	P24/30	P24/30 P	**	4	674-00242-0		
	P24/30	P24/30 P	**	5	675-00242-0		
E22	P24/30	P24/30 P	**	**	033-91566-0	Cover, Rear	1
E23	P24/30	P24/30 P	**	**	358-26240-0	Screw, SHC 3/4-10 X 2	8
E24	P24/30	P24/30 P	**	1	691-00932-0	Gasket O-ring	1
	P24/30	P24/30 P	**	4	694-00932-0		
	P24/30	P24/30 P	**	5	695-00932-0		
E25	P24/30	P24/30 P	**	**	488-35059-0	Plug	1
E26	P24/30	P24/30 P	**	1	691-00916-0	Gasket O-ring	1
	P24/30	P24/30 P	**	4	694-00916-0		
	P24/30	P24/30 P	**	5	695-00916-0		
E27	P24/30	P24/30 P	**	**	488-35024-0	Plug	1
E28	P24/30	P24/30 P	**	1	691-00906-0	Gasket O-ring	1
	P24/30	P24/30 P	**	4	674-00906-0		
	P24/30	P24/30 P	**	5	695-00906-0		
E29	P24/30	P24/30 P	**	**	488-35041-0	Plug, 6HP5N	2
E30	P24/30	P24/30 P	**	1	691-00238-0	Gasket O-ring	1
	P24/30	P24/30 P	**	4	694-00238-0		
	P24/30	P24/30 P	**	5	695-00238-0		

Rear Cover Kit**Composed of Items:****E20 thru E30, & Part number Auxiliary shaft 033-57257-0 FOR P24 TYPE "P" PUMPS-****E20 thru E30, & Part number Auxiliary shaft 033-91188-0 FOR P30 TYPE "P" PUMPS-**

Displacement	Model Type	Rotation	Part Number
P24	P	**	S23-15182-0
P30	P	**	S23-15122-0



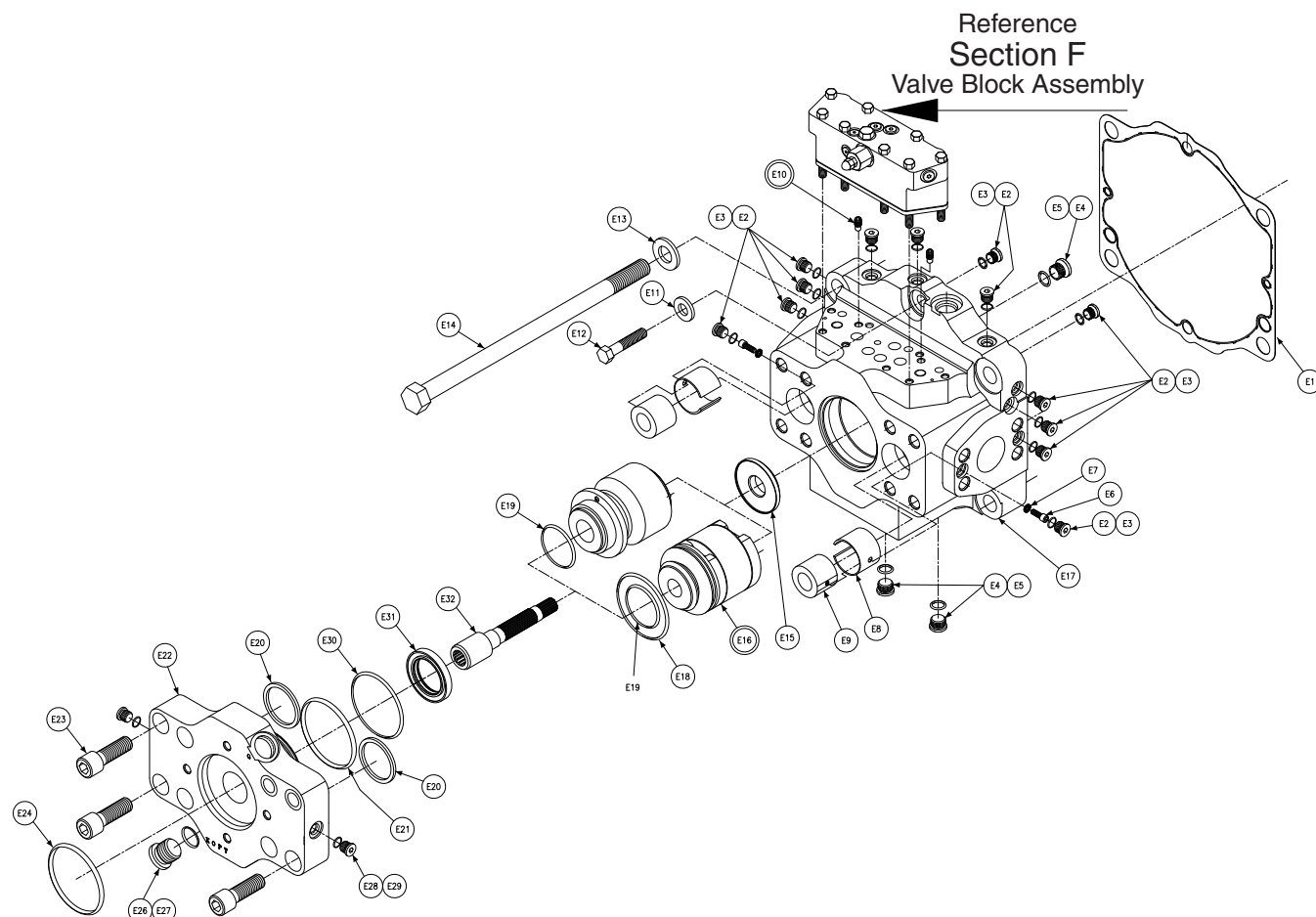
Section E							
P24/30 PUMP TYPE S PORT BLOCK ASSEMBLY							
Balloon #	Displacement	Pump Type	Rotation	Seal Code	Item #	Description	Qty
E1	P24/30	P24/30 S	**	**	033-91085-0	Gasket, Port Block/Housing	1
E2	P24/30	P24/30 S	**	**	488-35041-0	Plug, 6HP5N	13
E3	P24/30	P24/30 S	**	1	691-00906-0	Gasket O-ring	13
	P24/30	P24/30 S	**	4	674-00906-0		
	P24/30	P24/30 S	**	5	695-00906-0		
E4	P24/30	P24/30 S	**	**	488-35018-0	Plug, 8HP5N	3
E5	P24/30	P24/30 S	**	1	691-00908-0	Gasket O-ring	3
	P24/30	P24/30 S	**	4	694-00908-0		
	P24/30	P24/30 S	**	5	695-00908-0		
E6	P24/30	P24/30 S	**	**	359-11140-0	Screw, SHC	2
E7	P24/30	P24/30 S	**	**	350-10168-0	Washer,LOC	2
E8	P24/30	P24/30 S	**	**	035-72355-0	Ring check, P24/30	2
E9	P24/30	P24/30 S	**	**	033-94747-0	Stop, Ring Check	2
E10	P24/30	P24/30 S	**	**	S13-40266-0	Check valve assembly	2
E11	P24/30	P24/30 S	**	**	350-10136-0	Washer, 5/8	2
E12	P24/30	P24/30 S	**	**	306-40008-0	Screw, HHC 5/8-11UNC	2
E13	P24/30	P24/30 S	**	**	350-10135-0	Washer, 7/8	4
E14	P24	P24/30 S	**	**	306-40221-0	Screw, HHC 7/8-9UNC X 13	4
	P30	P24/30 S	**	**	306-40230-0	Screw, HHC 7/8-9UNC X 14	
E15	P24/30	P24/30 S	**	**	033-91073-0	Washer, Sealing	1
E16	P24/30	P24/30 S	CW	**	S24-11918-0	Vane Pump, Cart. Assy' 2.81CIPR	1
		P24/30 S	CCW	**	S24-05562-0		
		P24/30 S	CW	**	S24-11789-0	Vane Pump, Cart. Assy' 1.64 CIPR	
		P24/30 S	CCW	**	S24-51206-0		
		P24/30 S	CW	**	S24-11697-0	Vane Pump, Cart. Assy' 1.05 CIPR	
		P24/30 S	CCW	**	S24-11778-0		
		P24/30 S	CW	**	S24-05342-0	Vane Pump, Cart. Assy' 3.56 CIPR	
		P24/30 S	CCW	**	S24-05563-0		
		P24/30 S	CW	**	S24-05509-0	Vane Pump, Cart. Assy' 4.84 CIPR	
		P24/30 S	CCW	**	S24-05510-0		
		P24/30 S	CW	**	S24-63562-0	Vane Pump, Cart. Assy' 5.42 CIPR	
		P24/30 S	CCW	**	S24-44844-0		
		P24/30 S	CW	**	S24-63563-0	Vane Pump, Cart. Assy' 6.10 CIPR	
		P24/30 S	CCW	**	S24-63564-0		
		P24/30 S	**	**	S23-15102-0	Blank, Cart assy,	
E17	P24/30	P24/30 S	**	**	033-91604-0	Port block	1
E18	P24/30	P24/30 S	**	1	691-00238-0	Gasket O-ring	1
	P24/30	P24/30 S	**	4	694-00238-0		
	P24/30	P24/30 S	**	5	695-00238-0		
E19	P24/30	P24/30 S	**	1	691-10229-0	Gasket,Tetraseal	1
	P24/30	P24/30 S	**	4	694-10229-0		
	P24/30	P24/30 S	**	5	695-10229-0		
E20	P24/30	P24/30 S	**	1	691-10228-0	Gasket,Tetraseal	2
	P24/30	P24/30 S	**	4	694-10228-0		
	P24/30	P24/30 S	**	5	695-10228-0		
E21	P24/30	P24/30 S	**	1	671-00242-0	Gasket O-ring	1
	P24/30	P24/30 S	**	4	674-00242-0		
	P24/30	P24/30 S	**	5	675-00242-0		
E22	P24/30	P24/30 S	**	**	033-91605-0	Cover, Rear SAE "B" EXT Mount	1
	P24/30	P24/30 S	**	**	033-91624-0	Cover, Rear SAE "C" EXT Mount	
E23	P24/30	P24/30 S	**	**	358-26240-0	Screw, SHC 3/4-10 X 2	8
E24	P24/30	P24/30 S	**	1	671-00159-0	Gasket O-ring	1
	P24/30	P24/30 S	**	4	674-00159-0		
	P24/30	P24/30 S	**	5	675-00159-0		
E26	P24/30	P24/30 S	**	1	691-00916-0	Gasket O-ring	1
	P24/30	P24/30 S	**	4	694-00916-0		
	P24/30	P24/30 S	**	5	695-00916-0		
E27	P24/30	P24/30 S	**	**	488-35024-0	Plug	1

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P24/30 PUMP TYPE S PORT BLOCK ASSEMBLY (CONTINUED)							
Balloon #	Displacement	Pump Type	Rotation	Seal Code	Item #	Description	Qty
E28	P24/30	P24/30 S	**	1	691-00906-0	Gasket O-ring	1
	P24/30	P24/30 S	**	4	674-00906-0		
	P24/30	P24/30 S	**	5	695-00906-0		
E29	P24/30	P24/30 S	**	**	488-35041-0	Plug, 6HP5N	2
E30	P24/30	P24/30 S	**	1	691-00238-0	Gasket O-ring	1
	P24/30	P24/30 S	**	4	694-00238-0		
	P24/30	P24/30 S	**	5	695-00238-0		
E31	P24/30	P24/30 S	**	**	620-82066-0	Seal, Rear SAE "B" EXT Mount	1
	P24/30	P24/30 S	**	**	620-82069-0	Seal, Rear SAE "C" EXT Mount	
E32	P24/30	P24/30 S	**	**	033-93537-0	Coupling, Shaft Rear SAE "B" EXT Mount	1
	P24/30	P24/30 S	**	**	033-93538-0	Coupling, Shaft Rear SAE "C" EXT Mount	
E33	P24/30	P24/30 S	**	1	691-10214-0	Gasket, Tetraseal	2
	P24/30	P24/30 S	**	4	694-10214-0		
	P24/30	P24/30 S	**	5	695-10214-0		
E34	P24/30	P24/30 S	**	1	671-00223-0	Gasket O-ring	1
	P24/30	P24/30 S	**	4	674-00223-0		
	P24/30	P24/30 S	**	5	675-00223-0		
E35	P24/30	P24/30 S	**	**	033-57188-0	Adaptor, Shuttle	1
E36	P24/30	P24/30 S	**	**	358-20280-0	Screw, SHC 1/2-13 UNC X	4
E37	P24/30	P24/30 S	**	1	691-10221-0	Gasket, Tetraseal	2
	P24/30	P24/30 S	**	4	694-10221-0		
	P24/30	P24/30 S	**	5	695-10221-0		
E38	P24/30	P24/30 S	**	1	080030100001	Shuttle, EXT. Pilot Drain	1
	P24/30	P24/30 S	**	5	080030100002	Shuttle, EXT. Pilot Drain	
E39	P24/30	P24/P30 L	**	**	306-40224-0	Screw, HHC 1/2-13 UNC X 3 1/2	4

Rear Cover Kit				
Composed of Items:				
E20 thru E32, & Part number Auxiliary shaft 033-91535-0 FOR P24 TYPE "S" PUMPS				
E20 thru E32, & Part number Auxiliary shaft 033-91536-0 FOR P30 TYPE "S" PUMPS				
Displacement	Model Type	Rotation	Part Number	
P24	P24S	**	S23-15183-0	SAE "B" EXT MOUNT
P24	P24S	**	S23-17172-0	SAE "C" EXT MOUNT
P30	P30S	**	S23-15125-0	SAE "B" EXT MOUNT
P30	P30S	**	S23-17546-0	SAE "C" EXT MOUNT

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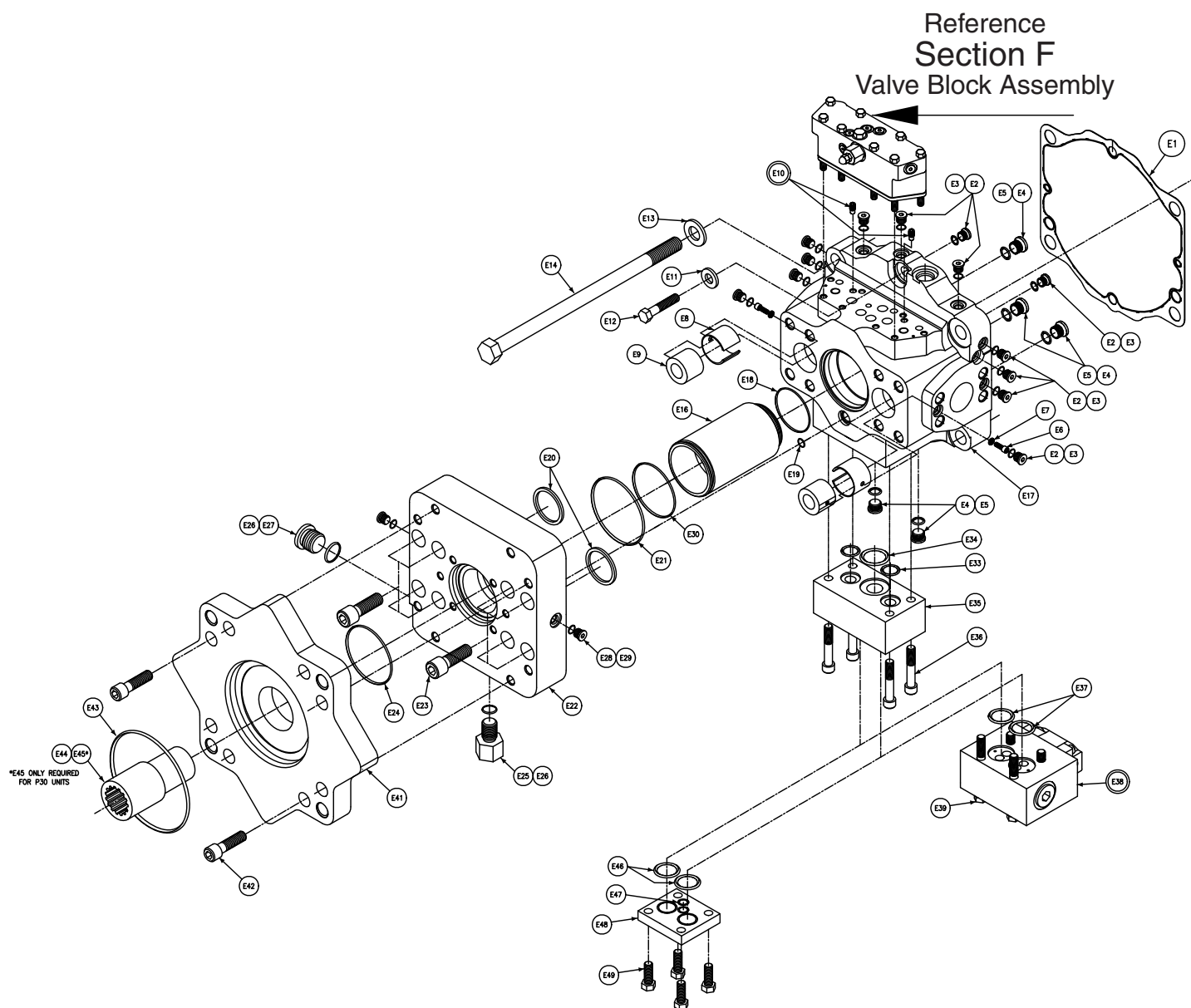


Section E							
P24/30 PUMP TYPE X PORT BLOCK ASSEMBLY							
Balloon #	Displacement	Pump Type	Rotation	Seal Code	Item #	Description	Qty
E1	P24/30	P24/30 X	**	**	033-91085-0	Gasket, Port Block/Housing	1
E2	P24/30	P24/30 X	**	**	488-35041-0	Plug, 6HP5N	13
E3	P24/30	P24/30 X	**	1	691-00906-0	Gasket O-ring	13
	P24/30	P24/30 X	**	4	674-00906-0		
	P24/30	P24/30 X	**	5	695-00906-0		
E4	P24/30	P24/30 X	**	**	488-35018-0	Plug, 8HP5N	3
	P24/30	P24/30 X	**	1	691-00908-0		
	P24/30	P24/30 X	**	4	694-00908-0		
E5	P24/30	P24/30 X	**	5	695-00908-0	Gasket O-ring	3
	P24/30	P24/30 X	**	**	359-11140-0		
	P24/30	P24/30 X	**	**	350-10168-0		
E6	P24/30	P24/30 X	**	**	035-72355-0	Screw, SHC	2
E7	P24/30	P24/30 X	**	**	033-94747-0	Washer, LOC	2
E8	P24/30	P24/30 X	**	**	S13-40266-0	Ring check, P24/30	2
E9	P24/30	P24/30 X	**	**	350-10136-0	Stop, Ring Check	2
E10	P24/30	P24/30 X	**	**	306-40008-0	Check valve assembly	2
E11	P24/30	P24/30 X	**	**	350-10135-0	Washer, 5/8	2
E12	P24/30	P24/30 X	**	**	306-40221-0	Screw, HHC 5/8-11UNC	2
E13	P24/30	P24/30 X	**	**	306-40230-0	Washer, 7/8	4
	P24	P24/30 X	**	**	033-91073-0	Screw, HHC 7/8-9UNC X 13	
	P30	P24/30 X	**	**		Screw, HHC 7/8-9UNC X 14	
E14	P24/30	P24/30 X	**	**		Washer, Sealing	1

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P24/30 PUMP TYPE X PORT BLOCK ASSEMBLY (CONTINUED)							
Balloon #	Displacement	Pump Type	Rotation	Seal Code	Item #	Description	Qty
E16	P24/30	P24/30 X	CW	**	S24-11918-0	Vane Pump, Cart. Assy' 2.81CIPR	1
		P24/30 X	CCW	**	S24-05562-0		
		P24/30 X	CW	**	S24-11789-0		
		P24/30 X	CCW	**	S24-51206-0	Vane Pump, Cart. Assy' 1.64 CIPR	
		P24/30 X	CW	**	S24-11697-0		
		P24/30 X	CCW	**	S24-11778-0	Vane Pump, Cart. Assy' 1.05 CIPR	
		P24/30 X	CW	**	S24-05342-0		
		P24/30 X	CCW	**	S24-05563-0	Vane Pump, Cart. Assy' 3.56 CIPR	
		P24/30 X	CW	**	S24-05509-0		
		P24/30 X	CCW	**	S24-05510-0	Vane Pump, Cart. Assy' 4.84 CIPR	
		P24/30 X	CW	**	S24-63562-0		
		P24/30 X	CCW	**	S24-44844-0	Vane Pump, Cart. Assy' 5.42 CIPR	
		P24/30 X	CW	**	S24-63563-0		
P24/30 X	CCW	**	S24-63564-0	Vane Pump, Cart. Assy' 6.10 CIPR			
P24/30 X	**	**	S23-15102-0				
E17	P24/30	P24/30 X	**	**	033-91564-0	Blank, Cart assy, Port block	1
E18	P24/30	P24/30 X	**	1	691-00238-0	Gasket O-ring	1
	P24/30	P24/30 X	**	4	694-00238-0		
	P24/30	P24/30 X	**	5	695-00238-0		
E19	P24/30	P24/30 X	**	1	691-10229-0	Gasket, Tetraseal	1
	P24/30	P24/30 X	**	4	694-10229-0		
	P24/30	P24/30 X	**	5	695-10229-0		
E20	P24/30	P24/30 X	**	1	691-10228-0	Gasket, Tetraseal	2
	P24/30	P24/30 X	**	4	694-10228-0		
	P24/30	P24/30 X	**	5	695-10228-0		
E21	P24/30	P24/30 X	**	1	671-00242-0	Gasket O-ring	1
	P24/30	P24/30 X	**	4	674-00242-0		
	P24/30	P24/30 X	**	5	675-00242-0		
E22	P24/30	P24/30 X	**	**	033-91605-0	Cover, Rear SAE "B" EXT Mount	1
	P24/30	P24/30 X	**	**	033-91624-0	Cover, Rear SAE "C" EXT Mount	
E23	P24/30	P24/30 X	**	**	358-26240-0	Screw, SHC 3/4-10 X 2	8
E24	P24/30	P24/30 S	**	1	671-00159-0	Gasket O-ring	1
	P24/30	P24/30 S	**	4	674-00159-0		
	P24/30	P24/30 S	**	5	675-00159-0		
E26	P24/30	P24/30 X	**	1	691-00916-0	Gasket O-ring	1
	P24/30	P24/30 X	**	4	694-00916-0		
	P24/30	P24/30 X	**	5	695-00916-0		
E27	P24/30	P24/30 X	**	**	488-35024-0	Plug	1
E28	P24/30	P24/30 X	**	1	691-00906-0	Gasket O-ring	1
	P24/30	P24/30 X	**	4	674-00906-0		
	P24/30	P24/30 X	**	5	695-00906-0		
E29	P24/30	P24/30 X	**	**	488-35041-0	Plug, 6HP5N	2
E30	P24/30	P24/30 X	**	1	691-00238-0	Gasket O-ring	1
	P24/30	P24/30 X	**	4	694-00238-0		
	P24/30	P24/30 X	**	5	695-00238-0		
E31	P24/30	P24/30 X	**	**	620-82066-0	Seal, Rear SAE "B" EXT Mount	1
	P24/30	P24/30 X	**	**	620-82069-0	Seal, Rear SAE "C" EXT Mount	
E32	P24/30	P24/30 X	**	**	033-93537-0	Coupling, Shaft Rear SAE "B" EXT Mount	1
	P24/30	P24/30 X	**	**	033-93538-0	Coupling, Shaft Rear SAE "C" EXT Mount	

Rear Cover Kit				
Composed of Items:				
E20 thru E32, & Part number Auxiliary shaft 033-91535-0 FOR P24 TYPE "X" PUMPS				
E20 thru E32, & Part number Auxiliary shaft 033-91536-0 FOR P30 TYPE "X" PUMPS				
Displacement	Model Type	Rotation	Part Number	
P24	P24X	**	S23-15183-0	SAE "B" EXT MOUNT
P24	P24X	**	S23-17172-0	SAE "C" EXT MOUNT
P30	P30X	**	S23-15125-0	SAE "B" EXT MOUNT
P30	P30X	**	S23-17546-0	SAE "C" EXT MOUNT



Section E							
P24/30 PUMP TYPE R & L PORT BLOCK ASSEMBLY							
Balloon #	Displacement	Pump Type	Rotation	Seal Code	Item #	Description	Qty
E1	P24/30	P24/P30 R/L	**	**	033-91085-0	Gasket, Port Block/Housing	1
E2	P24/30	P24/P30 R/L	**	**	488-35041-0	Plug, 6HP5N	13
E3	P24/30	P24/P30 R/L	**	1	691-00906-0	Gasket O-ring	13
	P24/30	P24/P30 R/L	**	4	674-00906-0		
	P24/30	P24/P30 R/L	**	5	695-00906-0		
E4	P24/30	P24/P30 R/L	**	**	488-35018-0	Plug, 8HP5N	5
E5	P24/30	P24/P30 R/L	**	1	691-00908-0	Gasket O-ring	5
	P24/30	P24/P30 R/L	**	4	694-00908-0		
	P24/30	P24/P30 R/L	**	5	695-00908-0		
E6	P24/30	P24/P30 R/L	**	**	359-11140-0	Screw, SHC	2

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Section View - E - Pump Type - R & L - Port Block Assembly Spare Parts and Exploded Views

P24/30 PUMP TYPE R & L PORT BLOCK ASSEMBLY (CONTINUED)							
Balloon #	Displacement	Pump Type	Rotation	Seal Code	Item #	Description	Qty
E7	P24/30	P24/P30 R/L	**	**	350-10168-0	Washer, LOC	2
E8	P24/30	P24/P30 R/L	**	**	035-72355-0	Ring check, P24/30	2
E9	P24/30	P24/P30 R/L	**	**	033-94747-0	Stop, Ring Check	2
E10	P24/30	P24/P30 R/L	**	**	S13-40266-0	Check valve assembly	2
E11	P24/30	P24/P30 R/L	**	**	350-10136-0	Washer, 5/8	2
E12	P24/30	P24/P30 R/L	**	**	306-40008-0	Screw, HHC 5/8-11UNC	2
E13	P24/30	P24/P30 R/L	**	**	350-10135-0	Washer, 7/8	4
E14	P24	P24 R/L	**	**	306-40221-0	Screw, HHC 7/8-9UNC X 13	4
	P30	P30 R/L	**	**	306-40230-0	Screw, HHC 7/8-9UNC X 14	
E15	P24/30	P24/P30 R/L				Not Used	Not Used
E16	P24/30	P24/P30 R/L	**	**	033-92816-0	Sleeve, Replen Isolation	1
E17	P24/30	P24/P30 R/L	**	**	033-91604-0	Block, Port	1
E18	P24/30	P24/P30 R/L	**	1	671-00233-0	Gasket O-ring	1
	P24/30	P24/P30 R/L	**	4	674-00233-0		
	P24/30	P24/P30 R/L	**	5	675-00233-0		
E19	P24/30	P24/P30 R/L	**	1	671-00122-0	Gasket O-ring	1
	P24/30	P24/P30 R/L	**	4	674-00122-0		
	P24/30	P24/P30 R/L	**	5	675-00122-0		
E20	P24/30	P24/P30 R/L	**	1	671-10228-0	Gasket, Tetraseal	2
	P24/30	P24/P30 R/L	**	4	674-10228-0		
	P24/30	P24/P30 R/L	**	5	675-10228-0		
E21	P24/30	P24/P30 R/L	**	1	671-00242-0	Gasket O-ring	1
	P24/30	P24/P30 R/L	**	4	674-00242-0		
	P24/30	P24/P30 R/L	**	5	675-00242-0		
E22	P24/30	P24/P30 R/L	**	**	033-92814-0	Adaptor, Rear Drive	1
E23	P24/30	P24/P30 R/L	**	**	358-26280-0	Screw, SHC 3/4-10 X 2 1/2	8
E24	P24/30	P24/P30 R/L	**	1	671-00155-0	Gasket O-ring	1
	P24/30	P24/P30 R/L	**	4	674-00155-0		
	P24/30	P24/P30 R/L	**	5	675-00155-0		
E25	P24/30	P24/P30 R/L	**	**	033-93464-0	Plug, Special	1
E26	P24/30	P24/P30 R/L	**	1	691-00916-0	Gasket O-ring	2
	P24/30	P24/P30 R/L	**	4	694-00916-0		
	P24/30	P24/P30 R/L	**	5	695-00916-0		
E27	P24/30	P24/P30 R/L	**	**	488-35024-0	Plug	1
E28	P24/30	P24/P30 R/L	**	1	691-00906-0	Gasket O-ring	2
	P24/30	P24/P30 R/L	**	4	674-00906-0		
	P24/30	P24/P30 R/L	**	5	695-00906-0		
E29	P24/30	P24/P30 R/L	**	**	488-35041-0	Plug, 6HP5N	2
E30	P24/30	P24/P30 R/L	**	1	671-00238-0	Gasket O-ring	1
	P24/30	P24/P30 R/L	**	4	674-00238-0		
	P24/30	P24/P30 R/L	**	5	675-00238-0		
E33	P24/30	P24/P30 R/L	**	1	691-10214-0	Gasket, Tetraseal	2
	P24/30	P24/P30 R/L	**	4	694-10214-0		
	P24/30	P24/P30 R/L	**	5	695-10214-0		
E34	P24/30	P24/P30 R/L	**	1	671-00223-0	Gasket O-ring	1
	P24/30	P24/P30 R/L	**	4	674-00223-0		
	P24/30	P24/P30 R/L	**	5	675-00223-0		
E35	P24/30	P24/P30 R/L	**	**	033-57188-0	Adaptor, Shuttle	1
E36	P24/30	P24/P30 R/L	**	**	358-20280-0	Screw, SHC 1/2-13 UNC X 2 1/2	4
E37	P24/30	P24/P30 L	**	1	691-10221-0	Gasket, Tetraseal	2
	P24/30	P24/P30 L	**	4	694-10221-0		
	P24/30	P24/P30 L	**	5	695-10221-0		
E38	P24/30	P24/P30 L	**	1	080030100001	Shuttle, EXT. Pilot Drain	1
	P24/30	P24/P30 L	**	5	080030100002	Shuttle, EXT. Pilot Drain	
E39	P24/30	P24/P30 L	**	**	306-40224-0	Screw, HHC 1/2-13 UNC X 3 1/2	4
E41	P24/30	P24/P30 R/L	**	**	033-92827-0	Adaptor, Rear SAE "C" EXT Mount	1
	P24/30	P24/P30 R/L	**	**	033-92828-0	Adaptor, Rear SAE "D" EXT Mount	
	P24/30	P24/P30 R/L	**	**	033-92823-0	Adaptor, Rear SAE "E" EXT Mount	
	P24/30	P24/P30 R/L	**	**	033-92824-0	Adaptor, Rear SAE "F" EXT Mount	
E42	P24/30	P24/P30 R/L	**	**	358-24240-0	Screw, SHC 5/8-11 UNC X 2	4

Continued on next page.



Section View - E - Pump Type - R & L - Port Block Assembly Spare Parts and Exploded Views

P24/30 PUMP TYPE R & L PORT BLOCK ASSEMBLY (CONTINUED)							
Balloon #	Displacement	Pump Type	Rotation	Seal Code	Item #	Description	Qty
E43	P24/30	P24/P30 R/L	**	1	671-00159-0	Gasket, O'ring SAE "C" EXT Mount	1
	P24/30	P24/P30 R/L	**	4	674-00159-0		
	P24/30	P24/P30 R/L	**	5	675-00159-0		
	P24/30	P24/P30 R/L	**	1	671-00163-0	Gasket, O'ring SAE "D" EXT Mount	
	P24/30	P24/P30 R/L	**	4	674-00163-0		
	P24/30	P24/P30 R/L	**	5	675-00163-0		
	P24/30	P24/P30 R/L	**	1	671-00165-0	Gasket, O'ring SAE "E" EXT Mount	
	P24/30	P24/P30 R/L	**	4	674-00165-0		
	P24/30	P24/P30 R/L	**	5	675-00165-0		
	P24/30	P24/P30 R/L	**	1	671-00262-0	Gasket, O'ring SAE "E" EXT Mount	
P24/30	P24/P30 R/L	**	4	674-00262-0			
P24/30	P24/P30 R/L	**	5	675-00262-0			
E44	P24/30	P24/P30 R/L	**	**	033-92835-0	Coupling, Rear SAE "C" EXT Mount	1
			**	**	033-92836-0	Coupling, Rear SAE "D" EXT Mount	
			**	**	033-92836-0	Coupling, Rear SAE "E" EXT Mount	
			**	**	033-92778-0	Coupling, Rear SAE "F" EXT Mount	
E45	P30	P30 R/L	Req'd for P30 only	**	356-30156-0	Retaining Ring, Coupling SAE "D" EXT Mount	1
	P30	P30 R/L		**		Retaining Ring, Coupling SAE "D" EXT Mount	
	P30	P30 R/L		**		Retaining Ring, Coupling SAE "E" EXT Mount	
	P30	P30 R/L		**		Retaining Ring, Coupling SAE "F" EXT Mount	
E46	P24/30	P24/P30 R	**	1	691-00024-0	Gasket O-ring	2
	P24/30	P24/P30 R	**	4	694-00024-0		
	P24/30	P24/P30 R	**	5	695-00024-0		
E47	P24/30	P24/P30 R	**	1	691-00015-0	Gasket O-ring	1
	P24/30	P24/P30 R	**	4	694-00015-0		
	P24/30	P24/P30 R	**	5	695-00015-0		
E48	P24/30	P24/P30 R	**	**	033-57642-0	Cover, Blank - Shuttle Pad	1
E49	P24/30	P24/P30 R	**	**	306-40080-0	Screw, HHC 1/2-13 UNC X 1 1/4	4

Kit, Rear Adaptor Mounting

Composed of Items:

41, 42, 43, 44, & 45 as applicable

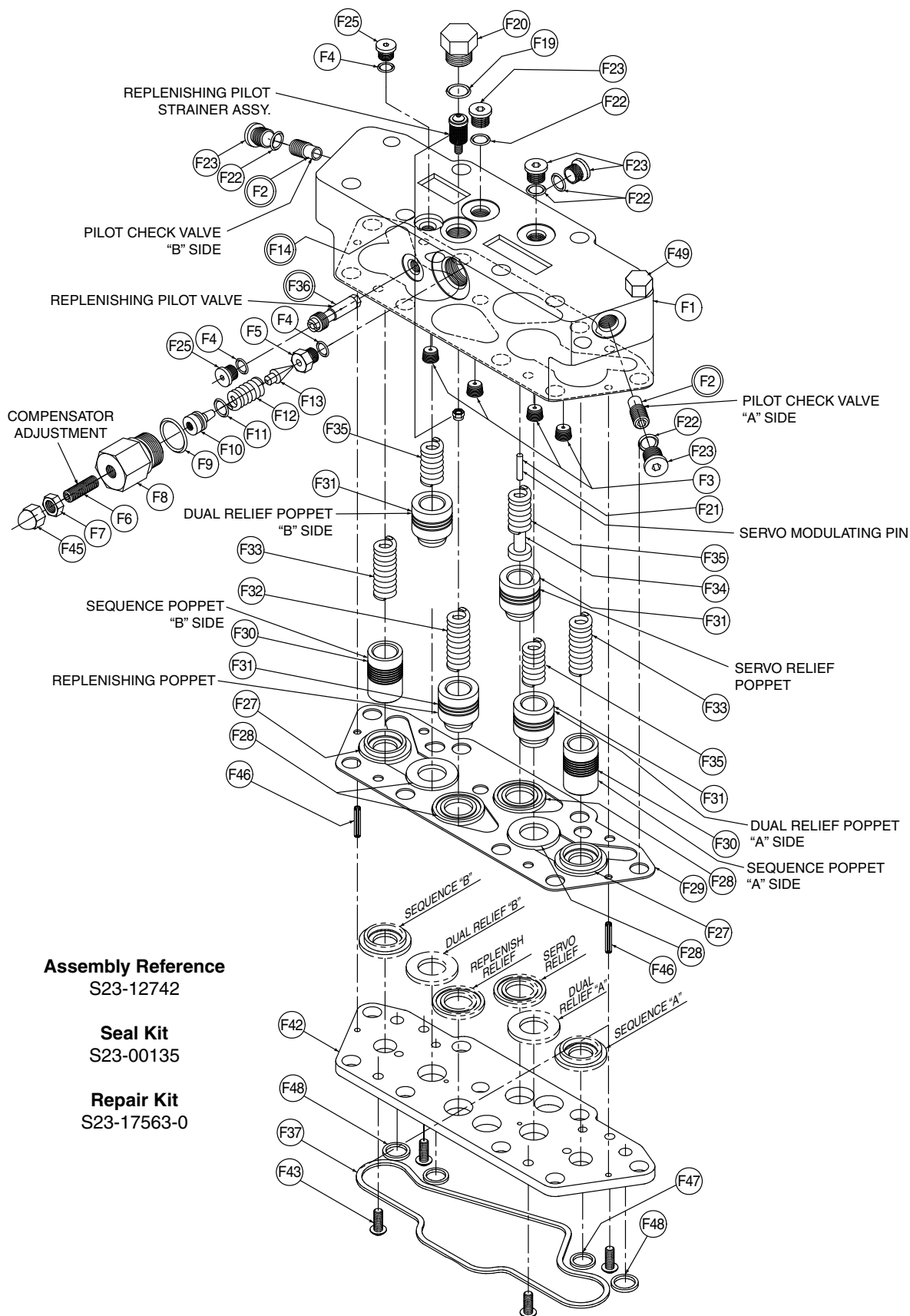
Displacement	Model Type	Rotation	Part Number	
P24	P24R/L	**	S23-16340-0	SAE "C" EXT MOUNT
	P24R/L	**	S23-16341-0	SAE "D" EXT MOUNT
	P24R/L	**	S23-16342-0	SAE "E" EXT MOUNT
	P24R/L	**	S23-16343-0	SAE "F" EXT MOUNT
P30	P30R/L	**	S23-16351-0	SAE "C" EXT MOUNT
	P30R/L	**	S23-16352-0	SAE "D" EXT MOUNT
	P30R/L	**	S23-16353-0	SAE "E" EXT MOUNT
	P30R/L	**	S23-16354-0	SAE "F" EXT MOUNT

Kit, Shuttle Assembly

Composed of Items: E37, E38, & E39 as applicable

Displacement	Model Type	Seal Code	Part Number	
P24/30	P24/P30 L	1	080030100001	Shuttle, EXT. Pilot Drain
P24/30	P24/P30 L	5	080030100002	Shuttle, EXT. Pilot Drain

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Section F						
Valve Block Assembly (Reference P/N S23 -12742, P24 Pumps), & (S23 -12795 P30 Pumps)						
Balloon #	Displacement	Pump Type	Seal Code	Item #	Description	Qty
F1	P24	P24P/S/X/R/L	**	033-91221-0	Valve Body	1
	P30	P30P/S/X/R/L	**	033-91334-0		
F2	P24/P30	P24/P30 P/S/X/R/L	**	S13-40266-0	Valve check	2
F3	P24/P30	P24/P30 P/S/X/R/L	**	033-91249-0	Orifice, Plug 1/8 NPTF Flush .046 dia.	4
F4	P24/P30	P24/P30 P/S/X/R/L	1	691-00903-0	Gasket, O-ring	3
	P24/P30	P24/P30 P/S/X/R/L	4	694-00903-0		
	P24/P30	P24/P30 P/S/X/R/L	5	695-00903-0		
F5	P24/P30	P24/P30 P/S/X/R/L	**	033-70508-0	Seat, Pilot stage	1
F6	P24/P30	P24/P30 P/S/X/R/L	**	312-13160-0	Screw, SOCHD 5/16-24 UNF X 1	1
F7	P24/P30	P24/P30 P/S/X/R/L	**	335-13100-0	Nut, Hex Jam 5/16-24 UNF	1
F8	P24/P30	P24/P30 P/S/X/R/L	**	033-70545-0	Housing, Guide	1
F9	P24/P30	P24/P30 P/S/X/R/L	1	691-00910-0	Gasket, O-ring	1
	P24/P30	P24/P30 P/S/X/R/L	4	694-00910-0		
	P24/P30	P24/P30 P/S/X/R/L	5	695-00910-0		
F10	P24/P30	P24/P30 P/S/X/R/L	**	036-21767-0	Piston, Seal	1
F11	P24/P30	P24/P30 P/S/X/R/L	1	691-00012-0	Gasket, O-ring	1
	P24/P30	P24/P30 P/S/X/R/L	4	694-00012-0		
	P24/P30	P24/P30 P/S/X/R/L	5	695-00012-0		
F12	P24/P30	P24/P30 P/S/X/R/L	**	032-91798-0	Spring	1
F13	P24/P30	P24/P30 P/S/X/R/L	**	036-12288-0	Cone	1
F14	P24/P30	P24/P30 P/S/X/R/L	**	S23-43240-0	Assy, Repl Strainer	1
F19	P24/P30	P24/P30 P/S/X/R/L	1	691-00906-0	Gasket, O-ring	1
	P24/P30	P24/P30 P/S/X/R/L	4	694-00906-0		
	P24/P30	P24/P30 P/S/X/R/L	5	695-00906-0		
F20	P24/P30	P24/P30 P/S/X/R/L	**	488-35003-0	Plug, HHC	1
F21	P24	P24P/S/X/R/L	**	230-82226-0	Pin, Modulating 1/8 dia.X 5/8 Lg	1
	P30	P30P/S/X/R/L	**	033-92868-0	Pin, Modulating 5/32 dia.X 5/8 Lg	
F22	P24/P30	P24/P30 P/S/X/R/L	1	691-00906-0	Gasket, O-ring	5
	P24/P30	P24/P30 P/S/X/R/L	4	694-00906-0		
	P24/P30	P24/P30 P/S/X/R/L	5	695-00906-0		
F23	P24/P30	P24/P30 P/S/X/R/L	**	488-35001-0	Plug, SHC	5
F25	P24/P30	P24/P30 P/S/X/R/L	**	488-35049-0	Plug, SHC	2
F27	P24/P30	P24/P30 P/S/X/R/L	**	033-70507-0	Seat, Sequence	2
F28	P24/P30	P24/P30 P/S/X/R/L	**	033-70500-0	Seat, Repl & servo	4
F29	P24/P30	P24/P30 P/S/X/R/L	**	033-91193-0	Gasket, Valve Block	1
F30	P24/P30	P24/P30 P/S/X/R/L	**	033-72378-0	Poppet, Sequence	2
F31	P24/P30	P24/P30 P/S/X/R/L	**	033-72379-0	Poppet, Dual & Repl.	4
F32	P24/P30	P24/P30 P/S/X/R/L	**	033-22141-0	Spring, Repl.	1
F33	P24/P30	P24/P30 P/S/X/R/L	**	033-70512-0	Spring, Sequence	2
F34	P24/P30	P24/P30 P/S/X/R/L	**	033-70482-0	Spring, Retainer	1
F35	P24/P30	P24/P30 P/S/X/R/L	**	033-71086-0	Spring, Dual Relief	3
F36	P24/P30	P24/P30 P/S/X/R/L	**	S23-12814-0	Valve, Cartridge Repl Pilot	1
F37	P24/P30	P24/P30 P/S/X/R/L	1	671-00050-0	Gasket, O-ring	1
	P24/P30	P24/P30 P/S/X/R/L	4	674-00050-0		
	P24/P30	P24/P30 P/S/X/R/L	5	675-00050-0		
F42	P24/P30	P24/P30 P/S/X/R/L	**	033-91422-0	Plate, Retainer	1
F43	P24/P30	P24/P30 P/S/X/R/L	**	353-25078-0	Screw, Button Head	4
F45	P24/P30	P24/P30 P/S/X/R/L	**	327-25006-0	Nut, Acron	1
F46	P24/P30	P24/P30 P/S/X/R/L	**	325-08120-0	Pin, Spring	2
F47	P24/P30	P24/P30 P/S/X/R/L	1	671-00013-0	Gasket, O-ring	2
	P24/P30	P24/P30 P/S/X/R/L	4	674-00013-0		
	P24/P30	P24/P30 P/S/X/R/L	5	675-00013-0		
F48	P24/P30	P24/P30 P/S/X/R/L	1	671-00014-0	Gasket, O-ring	2
	P24/P30	P24/P30 P/S/X/R/L	4	674-00014-0		
	P24/P30	P24/P30 P/S/X/R/L	5	675-00014-0		
F49	P24/P30	P24/P30 P/S/X/R/L	**	306-40169-0	Screw, HHC 3/8-16 UNC X 3 1/4 Lg. Grade 8	8

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Offer of Sale**GOLD CUP® P24-30
Spare Parts and Exploded Views**

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8. User Responsibility. The user, through its own analysis and testing, is solely responsible for making the final selection of the system and Product and assuring that all performance, endurance, maintenance, safety and warning requirements of the application are met. The user must analyze all aspects of the application and follow applicable industry standards and Product information. If Seller provides Product or system options, the user is responsible for determining that such data and specifications are suitable and sufficient for all applications and reasonably foreseeable uses of the Products or systems.

9. Loss to Buyer's Property. Any designs, tools, patterns, materials, drawings, confidential information or equipment furnished by Buyer or any other items which become Buyer's property, may be considered obsolete and may be destroyed by Seller after two consecutive years have elapsed without Buyer placing an order for the items which are manufactured using such property. Seller shall not be responsible for any loss or damage to such property while it is in Seller's possession or control.

10. Special Tooling. A tooling charge may be imposed for any special tooling, including without limitation, dies, fixtures, molds and patterns, acquired to manufacture Products. Such special tooling shall be and remain Seller's property notwithstanding payment of any charges by Buyer. In no event will Buyer acquire any interest in apparatus belonging to Seller which is utilized in the manufacture of the Products, even if such apparatus has been specially converted or adapted for such manufacture and notwithstanding any charges paid by Buyer. Unless otherwise agreed, Seller shall have the right to alter, discard or otherwise dispose of any special tooling or other property in its sole discretion at any time.

11. Buyer's Obligation; Rights of Seller. To secure payment of all sums due or otherwise, Seller shall retain a security interest in the goods delivered and this agreement shall be deemed a Security Agreement under the Uniform Commercial Code. Buyer authorizes Seller as its attorney to execute and file on Buyer's behalf all documents Seller deems necessary to perfect its security interest. Seller shall have a security interest in, and lien upon, any property of Buyer in Seller's possession as security for the payment of any amounts owed to Seller by Buyer.

12. Improper Use and Indemnity. Buyer shall indemnify, defend, and hold Seller harmless from any claim, liability, damages, lawsuits, and costs (including attorney fees), whether for personal injury, property damage, patent, trademark or copyright infringement or any other claim, brought by or incurred by Buyer, Buyer's employees, or any other person, arising out of: (a) improper selection, improper application or other misuse of Products purchased by Buyer from Seller; (b) any act or omission, negligent or otherwise, of Buyer; (c) Seller's use of patterns, plans, drawings, or specifications furnished by Buyer to manufacture Product; or (d) Buyer's failure to comply with these terms and conditions. Seller shall not indemnify Buyer under any circumstance except as otherwise provided.

13. Cancellations and Changes. Orders shall not be subject to cancellation or change by Buyer for any reason, except with Seller's written consent and upon terms that will indemnify, defend and hold Seller harmless against all direct, incidental and consequential loss or damage. Seller may change product features, specifications, designs and availability with notice to Buyer.

14. Limitation on Assignment. Buyer may not assign its rights or obligations under this agreement without the prior written consent of Seller.

15. Entire Agreement. This agreement contains the entire agreement between the Buyer and Seller and constitutes the final, complete and exclusive expression of the terms of the agreement. All prior or contemporaneous written or oral agreements or negotiations with respect to the subject matter are herein merged.

16. Waiver and Severability. Failure to enforce any provision of this agreement will not waive that provision nor will any such failure prejudice Seller's right to enforce that provision in the future. Invalidation of any provision of this agreement by legislation or other rule of law shall not invalidate any other provision herein. The remaining provisions of this agreement will remain in full force and effect.

17. Termination. This agreement may be terminated by Seller for any reason and at any time by giving Buyer thirty (30) days written notice of termination. In addition, Seller may by written notice immediately terminate this agreement for the following: (a) Buyer commits a breach of any provision of this agreement (b) the appointment of a trustee, receiver or custodian for all or any part of Buyer's property (c) the filing of a petition for relief in bankruptcy of the other Party on its own behalf, or by a third party (d) an assignment for the benefit of creditors, or (e) the dissolution or liquidation of the Buyer.

18. Governing Law. This agreement and the sale and delivery of all Products hereunder shall be deemed to have taken place in and shall be governed and construed in accordance with the laws of the State of Ohio, as applicable to contracts executed and wholly performed therein and without regard to conflicts of laws principles. Buyer irrevocably agrees and consents to the exclusive jurisdiction and venue of the courts of Cuyahoga County, Ohio with respect to any dispute, controversy or claim arising out of or relating to this agreement. Disputes between the parties shall not be settled by arbitration unless, after a dispute has arisen, both parties expressly agree in writing to arbitrate the dispute.

19. Indemnity for Infringement of Intellectual Property Rights. Seller shall have no liability for infringement of any patents, trademarks, copyrights, trade dress, trade secrets or similar rights except as provided in this Section. Seller will defend and indemnify Buyer against allegations of infringement of U.S. patents, U.S. trademarks, copyrights, trade dress and trade secrets ("Intellectual Property Rights"). Seller will defend at its expense and will pay the cost of any settlement or damages awarded in an action brought against Buyer based on an allegation that a Product sold pursuant to this Agreement infringes the Intellectual Property Rights of a third party. Seller's obligation to defend and indemnify Buyer is contingent on Buyer notifying Seller within ten (10) days after Buyer becomes aware of such allegations of infringement, and Seller having sole control over the defense of any allegations or actions including all negotiations for settlement or compromise. If a Product is subject to a claim that it infringes the Intellectual Property Rights of a third party, Seller may, at its sole expense and option, procure for Buyer the right to continue using the Product, replace or modify the Product so as to make it noninfringing, or offer to accept return of the Product and return the purchase price less a reasonable allowance for depreciation. Notwithstanding the foregoing, Seller shall have no liability for claims of infringement based on information provided by Buyer, or directed to Products delivered hereunder for which the designs are specified in whole or part by Buyer, or infringements resulting from the modification, combination or use in a system of any Product sold hereunder. The foregoing provisions of this Section shall constitute Seller's sole and exclusive liability and Buyer's sole and exclusive remedy for infringement of Intellectual Property Rights.

20. Taxes. Unless otherwise indicated, all prices and charges are exclusive of excise, sales, use, property, occupational or like taxes which may be imposed by any taxing authority upon the manufacture, sale or delivery of Products.

21. Equal Opportunity Clause. For the performance of government contracts and where dollar value of the Products exceed \$10,000, the equal employment opportunity clauses in Executive Order 11246, VEVRRA, and 41 C.F.R. §§ 60-1.4(a), 60-741.5(a), and 60-250.4, are hereby incorporated.



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