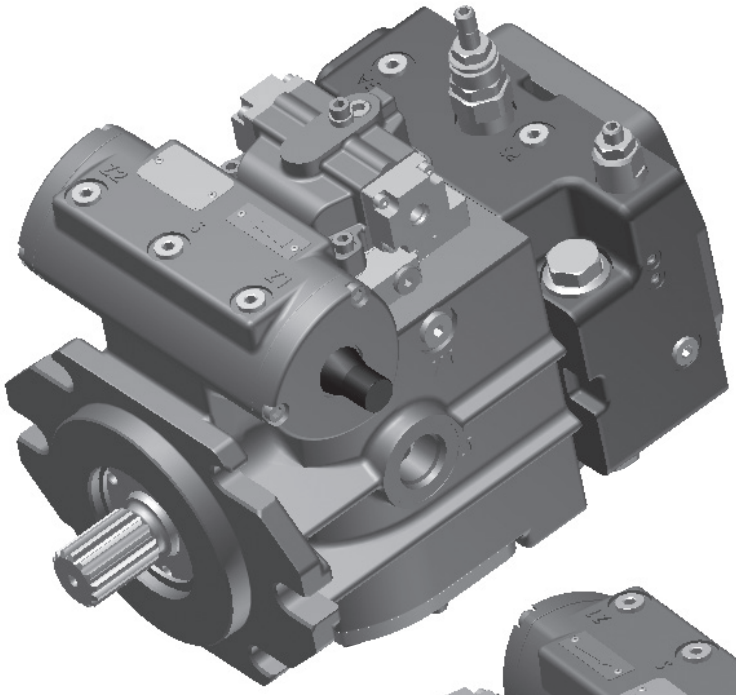
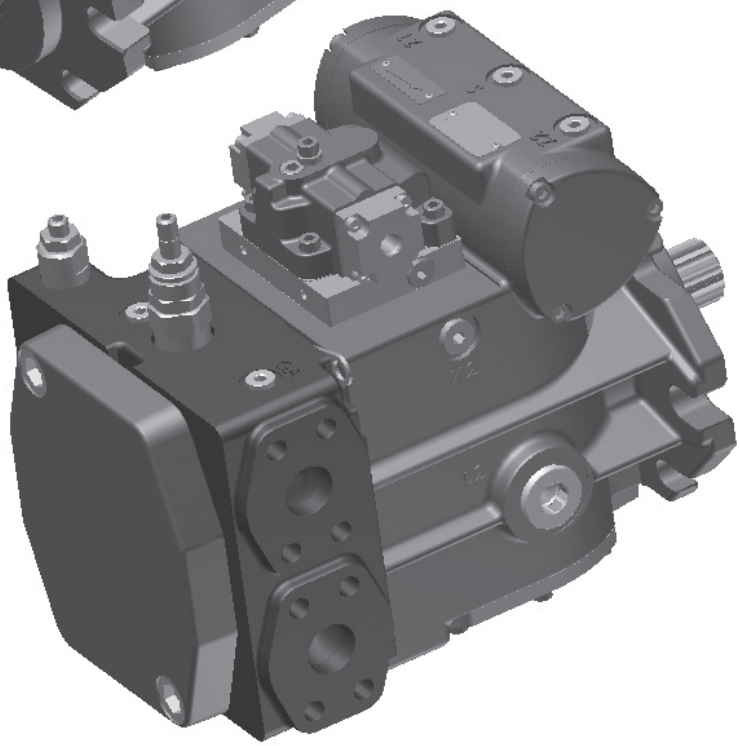




C055 Variable Displacement Axial Piston Pump Service Information

HY28-2705-02/C/US January 2017

ENGINEERING YOUR SUCCESS.

Contents

Parker Hannifin Corporation
Hydraulic Pump and Power Systems Division
United States

Installation Information

Guidelines

Pump case should be filled prior to start up and plumbed to ensure it remains filled with fluid under all conditions. Pump case pressure should not exceed 4 bar (58 PSI) continuous pressure, 6 bar (87 PSI) on cold start up.

Care should be taken to ensure line velocities are not above standard design specifications as noted in *Table 1*. Raised line velocities will cause an increase in pressure loss in the hoses and cause premature failure under certain conditions. Pressure in the suction line of the pump should never be below .8 bar (11.6 PSI) absolute. Maximum suction pressure is 4 bar (58 PSI) continuous and 6 bar (87 PSI) on cold startup.

Long line lengths and sharp turns in the fluid conveyance will add additional pressure loss or restriction to the system. It is recommended to keep the line lengths as short as possible and to avoid as many fluid direction changes in the system as possible.

Table 1

Function	Fluid Velocity m/sec (Ft/sec)
Suction	0.6-1.2 (2-4)
Case Drain	1.5-3 (5-10)
Pressure	3-6 (10-20)

Orientation

The C series pump can be installed in many different orientations, see *Figure A* for examples. If you want to mount the unit in an orientation not shown, please contact technical support.

It is suggested that the pump be mounted so that it is level or below minimum fluid level in the hydraulic reservoir. The pump can be mounted above fluid level but extra attention must be paid to ensure that the case remains filled at all times and proper suction pressure is maintained.

Regardless of installation orientation, the highest case drain port (L1, L2) should always be used and should return below fluid level.

Air bleed port should only be used while filling the case of the unit to ensure the unit is completely filled with fluid. Once the unit is filled, the air bleed port should be closed via a port plug or shut-off valve.

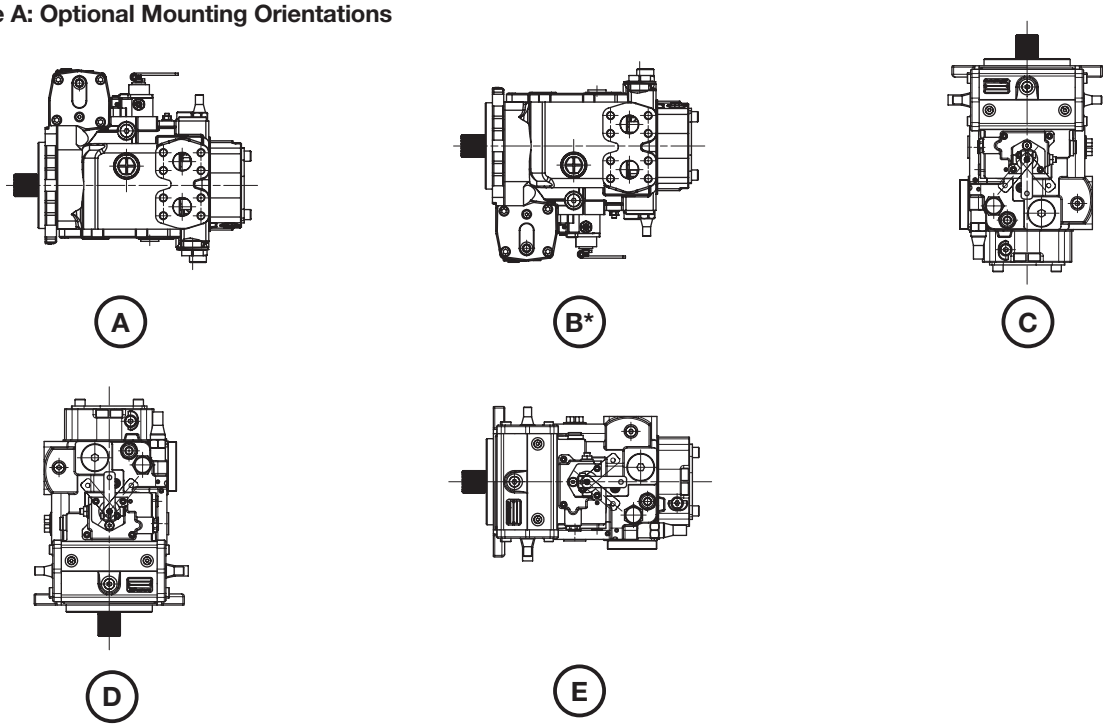
Fluid

Parker recommends using a fluid with a petroleum base that contains agents which provide oxidation inhibition and antirust, antifoam and de-aerating properties as described in Parker standard HF-1. Where antiwear additive fluids are specified, see Parker standard HF-0.

Use fluids with a minimum viscosity index of 90. Higher viscosity index extends the range of operating temperatures but may reduce the service life of the fluid.

It is recommended that the reservoir, hydraulic fluid and fluid conveyance items be cleaned prior to use. Filtration of the fluid is recommended before and during use. Maximum fluid contamination level is 20/18/15 per ISO 4406:1999. Better cleanliness levels will increase the life of the system.

Figure A: Optional Mounting Orientations



**Contamination can cause issues when mounting in this orientation. Ensure system is clean when this orientation is used.*

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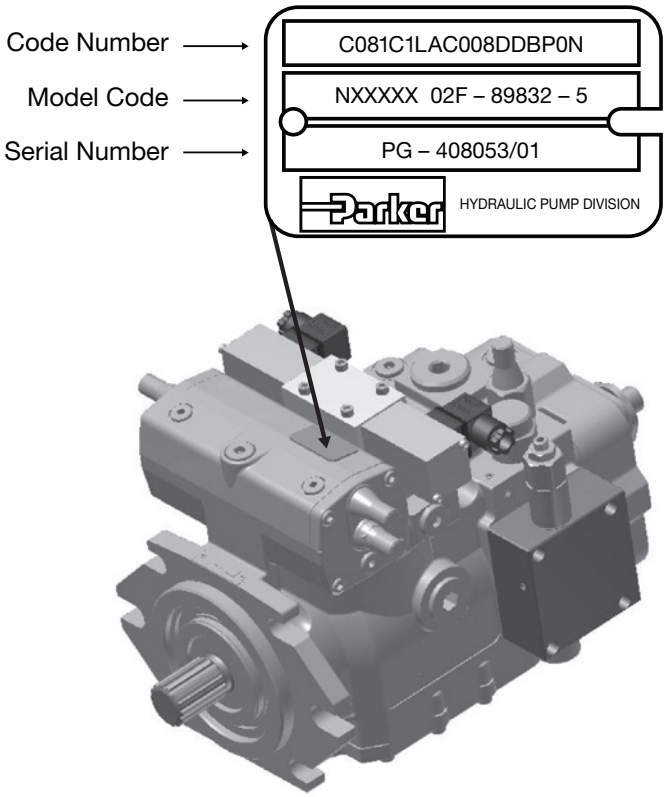
Unit Identification

All Parker Hydraulic Pump and Power Systems Division products are supplied with an identification plate. Units can be properly identified only if all information is supplied.



DO NOT REMOVE, ALTER OR DAMAGE THE DATA PLATE.

C Series Identification Tag
The Identification tag on the C series pumps will have the following layout:

The top line of the model code will contain the model code for the unit.

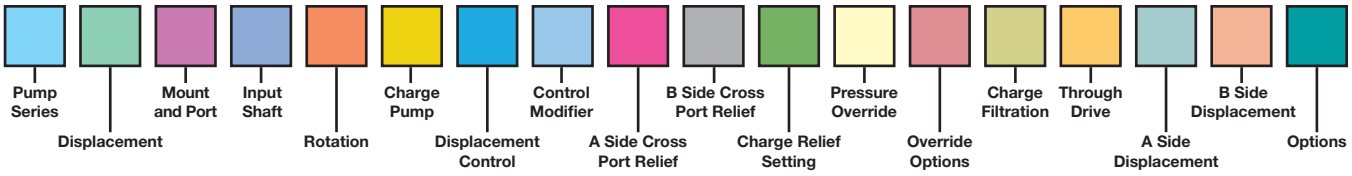
The second line of the tag will also have model code information. It is also important to note the final digit of the model code is truncated as it would not leave enough space for the code number, which will also be on the second line of the identification tag. The code number is generated by Parker Hydraulic Pump and Power Systems Division and will be specific to a single model code combination.

The third line of the model code will contain the unit serial number. Serial number provides month and year of production as well as the batch number.

Serial Number Detail
The first two digits of the serial number provide the year and month of production. The letter in position 1 indicates the year of production while the letter in position 2 indicates the month of production. See the tables for details on positions 1 and 2. The remaining digits identify the batch number the unit was produced in.

Position 1 Letter	Year
A	2001
B	2002
C	2003
D	2004
E	2005
F	2006
G	2007
H	2008
J	2009
K	2010
L	2011
M	2012
N	2013
P	2014
Q	2015
R	2016
S	2017
T	2018
U	2019
V	2020
W	2021
X	2022
Y	2023
Z	2024

Position 2 Letter	Month
A	January
B	February
C	March
D	April
E	May
F	June
G	July
H	August
J	September
K	October
L	November
M	December



Pump Series	
C	C Series closed circuit pump

Displacement	
055	055 cc/rev (3.35 CIR)
081	081 cc/rev (4.94 CIR)
136	136 cc/rev (8.3 CIR)

Mount and Port Options	
C	SAE C 2/4 bolt mount with SAE ports (55 and 81 only)
D	SAE D 2/4 bolt mount with SAE ports (55 and 81 only)
G	SAE C 2/4 bolt mount with ISO ports (136 only)
H	SAE D 2/4 bolt mount with ISO ports (136 only)

Rotation	
R	CW (clockwise)
L	CCW (counter clockwise)
As viewed looking at the shaft	

Charge Pump		055	081	136
A	18 cc/rev (1.1 CIR)	#	#	—
B	23.1 cc/rev (1.41 CIR)	—	X	X
C	27.3 cc/rev (1.65 CIR)	—	X	#
D	11 cc/rev (0.67 CIR)	X	—	—
E	14 cc/rev (0.85 CIR)	X	—	—
X	No charge pump	X	X	X

 # = Standard option
X = Available
— = Not available

Pump Control	
A	Manual lever
C	Hydraulic proportional control with internal feedback
D	Hydraulic proportional control without internal feedback
E	Electric non proportional
F	Electric proportional with internal feedback
G	Electric proportional without internal feedback
H	Electric proportional with internal feedback and hydraulic override
J	Automotive control electrical
K	Automotive control hydraulic

Input Shaft		055	081	136
1	SAE C 14T 12/24 DP 1 1/4" OD ANSI B92.1a-1976	#	#	—
2	21T 16/32 DP 1 3/8" OD ANSI B92.1a-1976	X	X	—
3	SAE D-E 13T 8/16 DP 1 3/4" OD ANSI B92.1a-1976	—	—	#
4	SAE F 15T 8/16 DP 2" OD ANSI B92.1a-1976	—	—	X
5	23T 16/32 DP 1 1/2" OD ANSI B92.1a-1976	—	—	X
6	27T 16/32 DP 1 3/4" OD ANSI B92.1a-1976	—	—	X
7	W40x2x30x18 DIN 5480	—	—	X
8	W45x2x30x21 DIN 5480	—	—	X

 # = Standard option
X = Available
— = Not available

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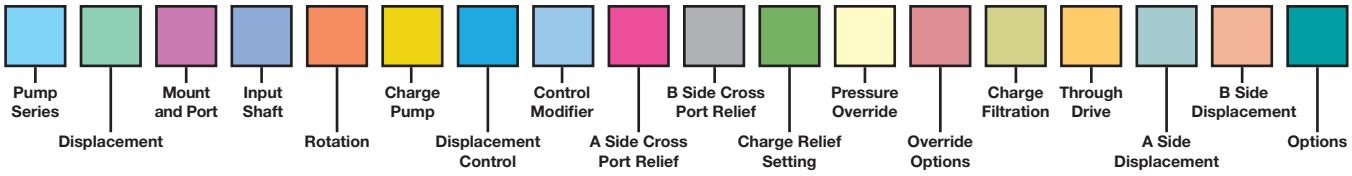
United States



Pump Control										Control Modifier			
A	C	D	E	F	G	H	J	K		Pump control selection determines what modifier is used			
#	—	A	—	—	—	—	—	—	<->	0	0	0	No control orifices
—	—	X	—	—	—	—	—	—	<->	0	0	5	0.5 mm (.019 in) Control orifice
—	X	X	—	—	—	—	—	—	<->	0	0	6	0.6 mm (.024 in) Control orifice
—	X	X	—	—	—	—	—	—	<->	0	0	7	0.7 mm (.027 in) Control orifice
—	#	X	—	—	—	—	—	—	<->	0	0	8	0.8 mm (.031 in) Control orifice
—	X	#	—	—	—	—	—	—	<->	0	0	9	0.9 mm (.035 in) Control orifice
—	X	X	—	—	—	—	—	—	<->	0	1	2	1.2 mm (.047 in) Control orifice
—	—	—	—	X	—	—	—	—	<->	2	0	0	12 VDC, No control orifice
—	—	—	—	X	—	—	—	—	<->	2	0	6	12 VDC, 0.6 mm (.024 in) Control orifice
—	—	—	—	X	—	—	—	—	<->	2	0	7	12 VDC, 0.7 mm (.027 in) Control orifice
—	—	—	—	#	X	X	—	—	<->	2	0	8	12 VDC, 0.8 mm (.031 in) Control orifice
—	—	—	X	X	—	—	—	—	<->	2	1	2	12 VDC, 1.2 mm (.047 in) Control orifice
—	—	—	—	X	—	—	—	—	<->	2	2	0	12 VDC, 2.0 mm (.079 in) Control orifice
—	—	—	—	X	—	—	—	—	<->	4	0	0	24 VDC, No control orifice
—	—	—	—	X	—	—	—	—	<->	4	0	6	24 VDC, 0.6 mm (.024 in) Control orifice
—	—	—	—	X	—	—	—	—	<->	4	0	7	24 VDC, 0.7 mm (.027 in) Control orifice
—	—	—	—	#	#	#	—	—	<->	4	0	8	24 VDC, 0.8 mm (.031 in) Control orifice
—	—	—	X	X	—	—	—	—	<->	4	1	2	24 VDC, 1.2 mm (.047 in) Control orifice
—	—	—	—	X	—	—	—	—	<->	4	2	0	24 VDC, 2.0 mm (.079 in) Control orifice
—	—	—	—	—	—	—	X	—	<->	D			No inching valve, 12 VDC coils, J control only
—	—	—	—	—	—	—	X	—	<->	E			Hydraulic inching valve,12 VDC coils, J control only
—	—	—	—	—	—	—	X	—	<->	F			No inching valve, 24 VDC coils, J control only
—	—	—	—	—	—	—	X	—	<->	G			Hydraulic inching valve, 24 VDC coils, J control only
—	—	—	—	—	—	—	—	X	<->	H			Hydraulic inching valve, K control only
—	—	—	—	—	—	—	—	X	<->	X			No inching valve, K control only
—	—	—	—	—	—	—	X	X	<->		2		1.2 mm (.047 in) Control orifice
—	—	—	—	—	—	—	X	X	<->		5		1.5 mm (.059 in) Control orifice
—	—	—	—	—	—	—	X	X	<->			P	Prepared for flushing valve
—	—	—	—	—	—	—	X	X	<->			1	Flushing valve installed with 1.5 mm orifice
—	—	—	—	—	—	—	X	X	<->			2	Flushing valve installed with 2.0 mm orifice
—	—	—	—	—	—	—	X	X	<->			3	Flushing valve installed with 2.5 mm orifice

 # = Standard option
X = Available
— = Not available
A = Without pressure override only

Example modifier with J/K control

G	5	P	*Hydraulic inching valve, 24VDC coils with a 1.5 mm control orifice and prepared for flushing*

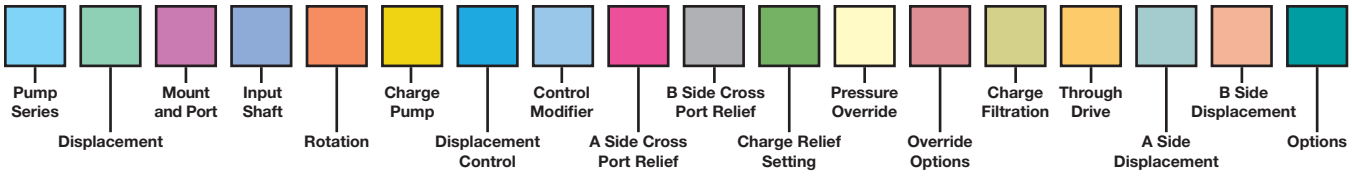
When ordering J/K control specify starting input RPM, input RPM at rated torque and rated input torque (NM)

A Side Cross Port Relief	
A	250 Bar (3625 PSI)
B	350 Bar (5075 PSI)
C	420 Bar (6090 PSI)
D	450 Bar (6525 PSI)

B Side Cross Port Relief	
A	250 Bar (3625 PSI)
B	350 Bar (5075 PSI)
C	420 Bar (6090 PSI)
D	450 Bar (6525 PSI)

Charge Relief Setting		055	081	136
A	20 Bar (290 PSI)	X	X	—
B	22 Bar (319 PSI)	#	#	#
C	25 Bar (362 PSI)	X	X	X

 # = Standard option
X = Available
— = Not available



Pressure Override	
X	No pressure override
P	Hydraulic internal pressure override
E	Electrical override
C	Electrical override and hydraulic internal pressure override

Override not available on J/K control.
Pressure override should be set 20-30 bar below cross port relief settings.

Pressure Override					Override Options		
					Pressure override selection determines override option		
X	**P**	**E**	**C**				
X	—	—	—	<->	**X**	**X**	No pressure override
—	X	—	—	<->	**0**	**A**	Locked
—	X	—	—	<->	**0**	**B**	100 Bar (1450 PSI)
—	X	—	—	<->	**0**	**C**	150 Bar (2175 PSI)
—	X	—	—	<->	**0**	**D**	200 Bar (2900 PSI)
—	X	—	—	<->	**0**	**E**	250 Bar (3625 PSI)
—	X	—	—	<->	**0**	**F**	280 Bar (4060 PSI)
—	X	—	—	<->	**0**	**G**	300 Bar (4350 PSI)
—	X	—	—	<->	**0**	**H**	320 Bar (4712 PSI)
—	X	—	—	<->	**0**	**J**	330 Bar (4785 PSI)
—	X	—	—	<->	**0**	**K**	350 Bar (5075 PSI)
—	X	—	—	<->	**0**	**M**	380 Bar (5510 PSI)
—	X	—	—	<->	**0**	**N**	400 Bar (5800 PSI)
—	—	X	—	<->	**1**	**2**	12 VDC coil
—	—	X	—	<->	**2**	**4**	24 VDC coil
—	—	—	X	<->	**2**	**A**	12VDC coil locked override
—	—	—	X	<->	**2**	**B**	12VDC coil, 100 Bar (1450 PSI) override
—	—	—	X	<->	**2**	**C**	12VDC coil, 150 Bar (2175 PSI) override
—	—	—	X	<->	**2**	**D**	12VDC coil, 200 Bar (2900 PSI) override
—	—	—	X	<->	**2**	**E**	12VDC coil, 250 Bar (3625 PSI) override
—	—	—	X	<->	**2**	**G**	12VDC coil, 300 Bar (4350 PSI) override
—	—	—	X	<->	**2**	**K**	12VDC coil, 350 Bar (5075 PSI) override
—	—	—	X	<->	**2**	**M**	12VDC coil, 380 Bar (5510 PSI) override
—	—	—	X	<->	**2**	**N**	12VDC coil, 400 Bar (5800 PSI) override
—	—	—	X	<->	**4**	**A**	24 VDC coil locked override
—	—	—	X	<->	**4**	**B**	24 VDC coil, 100 Bar (1450 PSI) override
—	—	—	X	<->	**4**	**C**	24 VDC coil, 150 Bar (2175 PSI) override
—	—	—	X	<->	**4**	**D**	24 VDC coil, 200 Bar (2900 PSI) override
—	—	—	X	<->	**4**	**E**	24 VDC coil, 250 Bar (3625 PSI) override
—	—	—	X	<->	**4**	**G**	24 VDC coil, 300 Bar (4350 PSI) override
—	—	—	X	<->	**4**	**K**	24 VDC coil, 350 Bar (5075 PSI) override
—	—	—	X	<->	**4**	**M**	24 VDC coil, 380 Bar (5510 PSI) override
—	—	—	X	<->	**4**	**N**	24 VDC coil, 400 Bar (5800 PSI) override

X = *Available*
— = *Not available*

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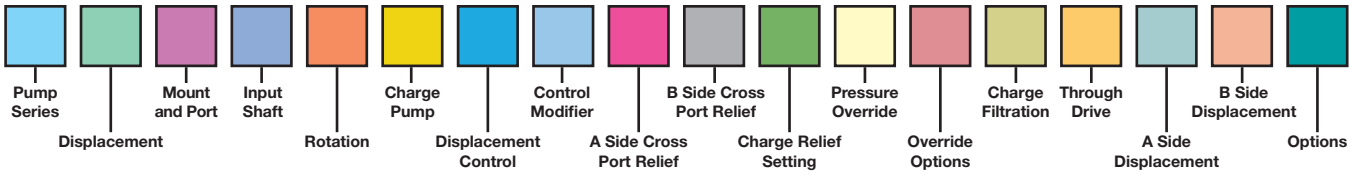
United States



Charge Filtration		055	081	136
X	No charge filter	#	#	#
N	Charge filter with 8 Bar (116 PSI) mechanical bypass indicator	X	X	X
G	Charge filter with 8 Bar (116 PSI) electrical bypass indicator	X	X	X
R	Prepared for remote charge pressure filtration	X	X	X

 # = Standard option
X = Available
— = Not available

A Side Displacement	
00-99	Set displacement of A side between 0-99%
XX	XX = 100% displacement

B Side Displacement	
00-99	Set displacement of B side between 0-99%
XX	XX = 100% displacement

Options		055	081	136
X	No paint, no bypass valve	#	#	#
Y	No paint with bypass valve	X	X	—
P	Paint black, no bypass valve	X	X	X
D	Paint black with bypass valve	X	X	—
M	Special modification contact technical support			

 # = Standard option
X = Available all displacements
— = Not available

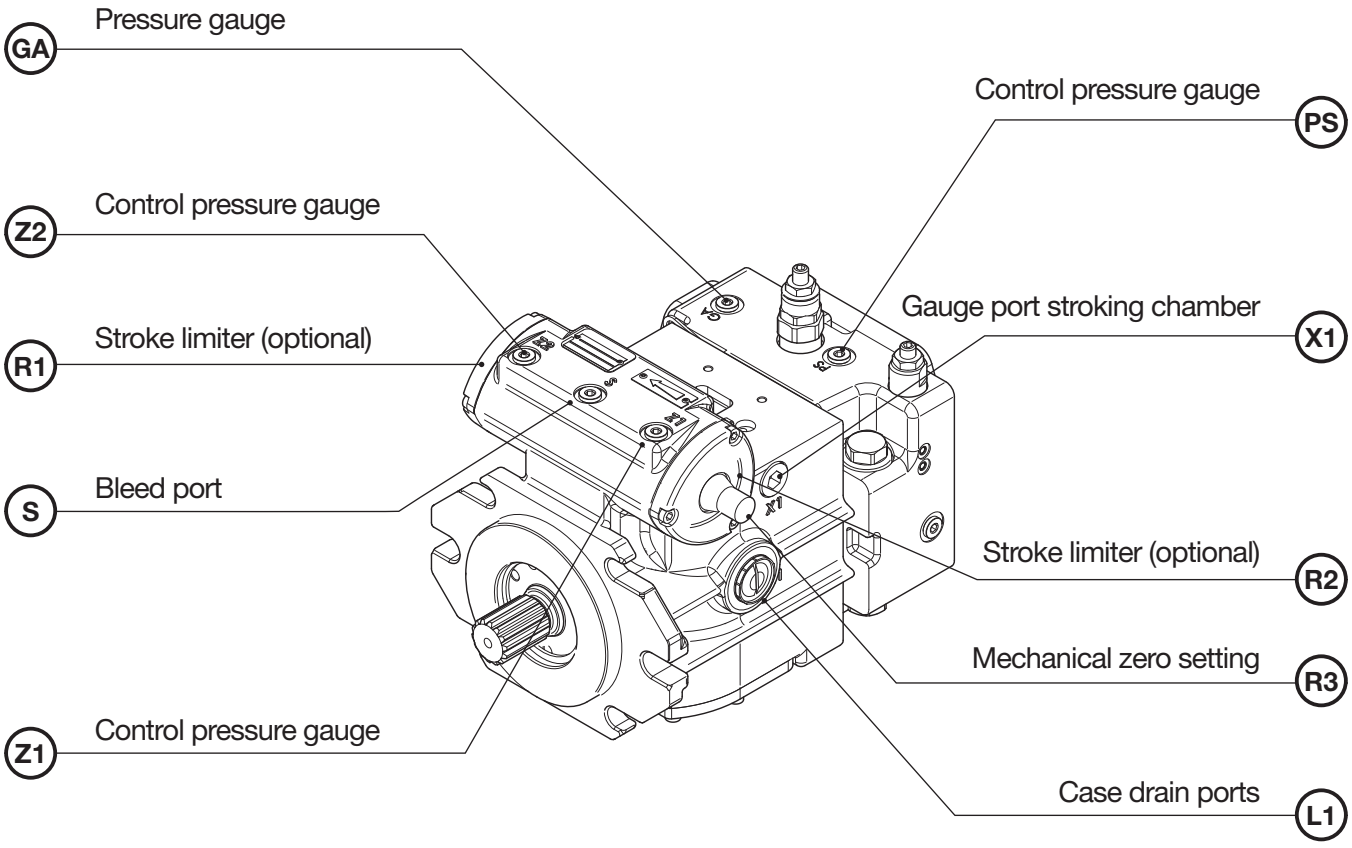
Through Drive		055	081	136
X	No through drive	#	#	#
A	SAE A mount, 9T spline shaft	X	X	X
B	SAE B mount, 13T spline shaft	X	X	X
G	SAE B mount, 15T spline shaft	X	X	X
C	SAE C mount, 14T spline shaft	X	X	X
H	SAE C mount, 17T spline shaft	X	X	X
D	SAE D mount, 13T spline shaft	X	X	X

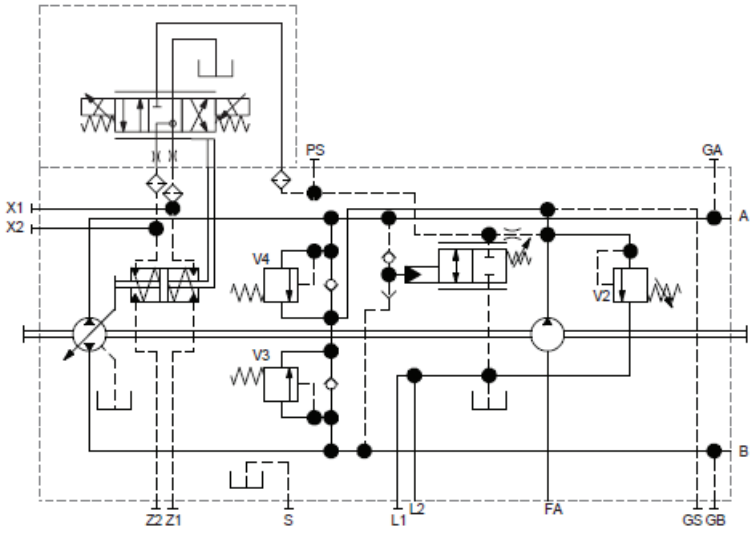
 # = Standard option
X = Available
— = Not available

Example Model Code

C081C1RAF208BBBP0HRAXXXXP

C081 = 81cc frame
C = SAE C 2/4 bolt mount with SAE ports
1 = SAE C 14T 12/24 DP 1-1/4" OD ANSI B92.1A-1976
R = CW rotation (looking at the shaft)
A = 81cc frame 18cc/rev (1.1 CIR) charge pump
F = Electric proportional with internal feedback displacement control
208 = 12 VDC, 0.8mm (.031 in) control orifice
B = A side cross port relief set to 350 bar (5075 PSI)
B = B side cross port relief set to 350 bar (5075 PSI)
B = Charge relief set to 22 bar (319 PSI)
P = Hydraulic internal pressure override
0H = Pressure override set to 320 bar (4712 PSI)
R = Prepared for remote charge pressure filtration
A = SAE A mount through drive with 9T spline shaft coupling
XX = A side displacement set to 100%
XX = B side displacement set to 100%
P = Paint black, no bypass valve





C055 Port Sizes		
Port	**Mount C**	**Mount G**
A	1" SAE Code 62	1" SAE Code 62
B	1" SAE Code 62	1" SAE Code 62
L1	-12 SAE ORB	3/4" G
L2	-12 SAE ORB	3/4" G
FA	-16 SAE ORB	1" G
GA	-4 SAE ORB	1/4" G
GB	-4 SAE ORB	1/4" G
GS	-4 SAE ORB	1/4" G
PS	-4 SAE ORB	1/4" G
S	-4 SAE ORB	1/4" G
X1	-6 SAE ORB	3/8" G
X2	-6 SAE ORB	3/8" G
Z1	-4 SAE ORB	1/4" G
Z2	-4 SAE ORB	1/4" G

Schematic shown is a C055 with "F" control and pressure override.

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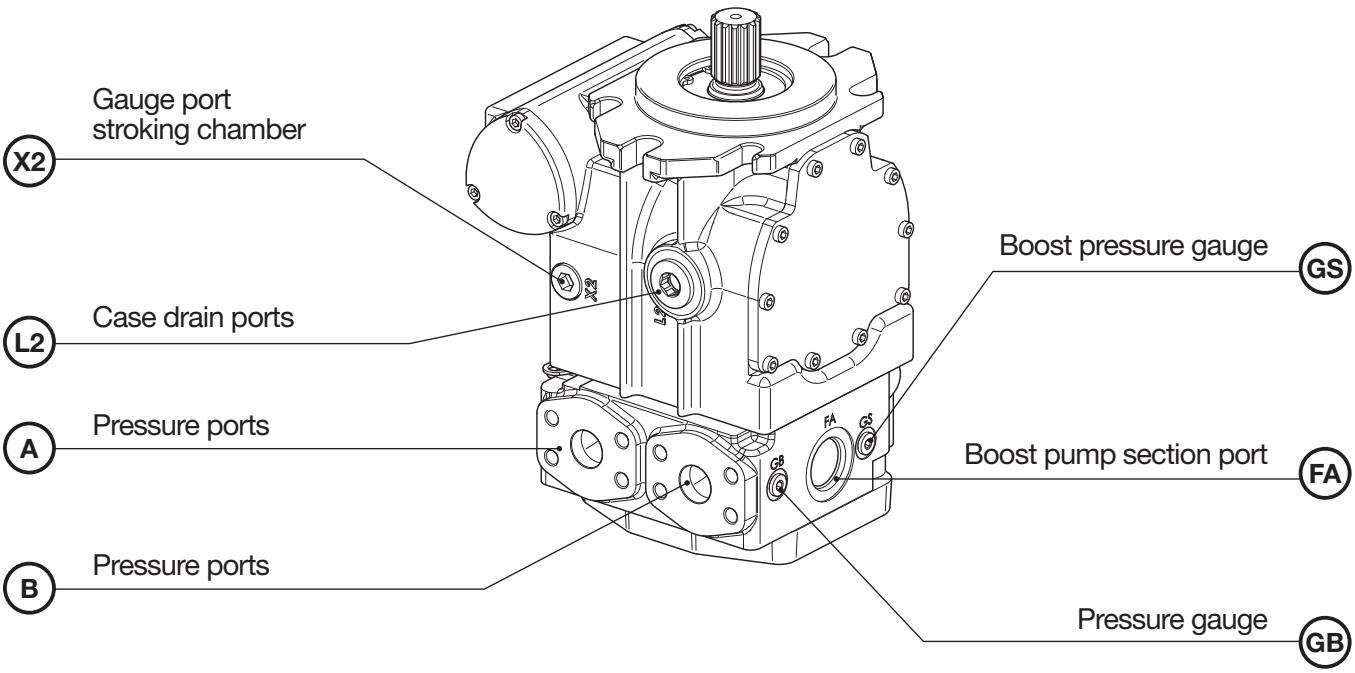
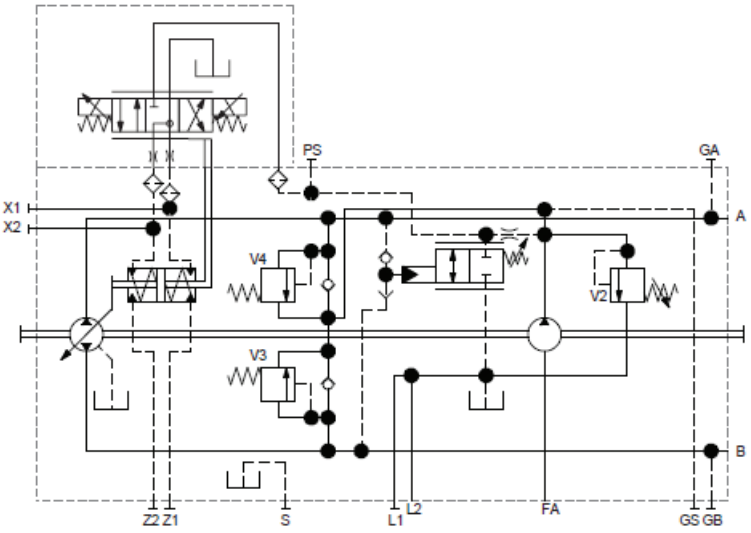




C055 Port Sizes		
Port	**Mount C**	**Mount G**
A	1" SAE Code 62	1" SAE Code 62
B	1" SAE Code 62	1" SAE Code 62
L1	-12 SAE ORB	3/4" G
L2	-12 SAE ORB	3/4" G
FA	-16 SAE ORB	1" G
GA	-4 SAE ORB	1/4" G
GB	-4 SAE ORB	1/4" G
GS	-4 SAE ORB	1/4" G
PS	-4 SAE ORB	1/4" G
S	-4 SAE ORB	1/4" G
X1	-6 SAE ORB	3/8" G
X2	-6 SAE ORB	3/8" G
Z1	-4 SAE ORB	1/4" G
Z2	-4 SAE ORB	1/4" G

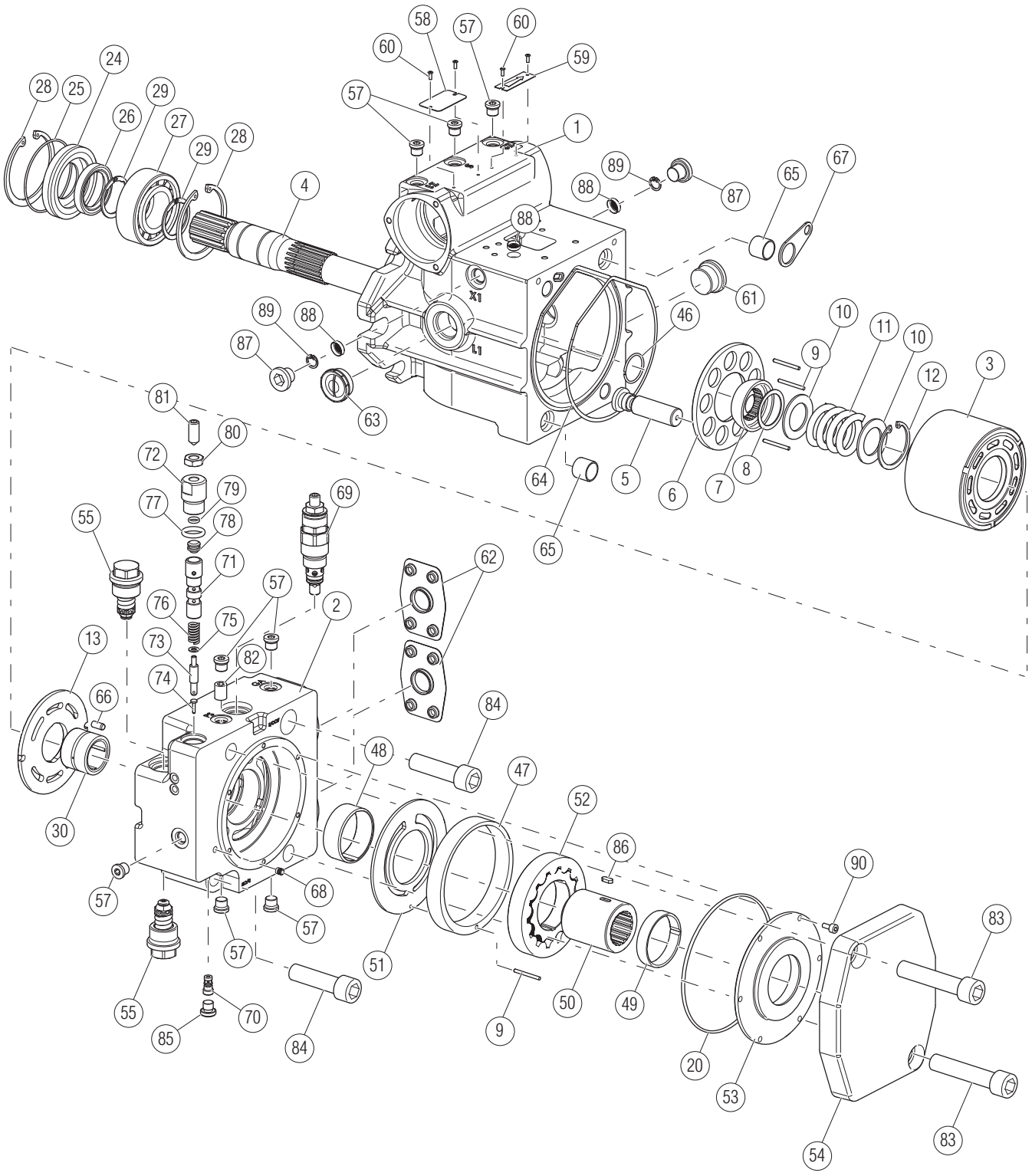
Schematic shown is a C055 with "F" control and pressure override.

C Series Displacement Controls				
Mount	**Control Code**	**Control Modifier**	**Description**	**Part Number**
All	A	000	A000 controller, manual lever	S2F-19950-5
C/D	C	SELECT KIT	C CONT NO ORF HPDCF SAE S2	S2F-20229-5
G/H	C	SELECT KIT	C CONT, NO ORF HPDCF ISO S2	S2F-20228-5
C/D	D	000	D000 controller, HPDCN, no orifice, SAE	S2F-19962-5
G/H	D	000	D000 controller, HPDCN, no orifice, ISO	S2F-19963-5
C/D	D	005	D005 controller, HPDCN, .5 mm orifice, SAE	S2F-19964-5
G/H	D	005	D005 controller, HPDCN, .5 mm orifice, ISO	S2F-19965-5
C/D	D	009	D009 controller, HPDCN, .9 mm orifice, SAE	S2F-19966-5
G/H	D	009	D009 controller, HPDCN, .9 mm orifice, ISO	S2F-19967-5
All	E/J	212/D2*/E2*	E212 controller, ENPDC, 1.2 mm orifice, 12V S2	S2F-19968-5
All	E/J	212/F2*/G2*	E412 controller, ENPDC, 1.2 mm orifice, 24V S2	S2F-19973-5
All	F	SELECT KIT	F CONT, NO ORF EPDCF 12V S2	S2F-20230-5
All	F	SELECT KIT	F CONT, NO ORF EPDCF 24V S2	S2F-20231-5
All	G	208	G208 controller, EPDCN, 0.8 mm orifice, 12VDC	S2F-19984-5
All	G	408	G408 controller, EPDCN, 0.8 mm orifice, 24VDC	S2F-19985-5
C/D	H	SELECT KIT	H CONT, NO ORF EPDCFH 12V SAE	S2F-20232-5
C/D	H	SELECT KIT	H CONT, NO ORF EPDCFH 24V SAE	S2F-20233-5
C/D	H	SELECT KIT	H CONT, NO ORF EPDCFH 12V ISO	S2F-20234-5
C/D	H	SELECT KIT	H CONT, NO ORF EPDCFH 24V ISO	S2F-20235-5
All	J	D5*/E5*	E215 controller, ENPDC, 1.5 mm orifice, 12VDC, J control only	S2F-19990-5
All	J	F5*/G5*	E415 controller, ENPDC, 1.5 mm orifice, 24VDC, J control only	S2F-19991-5
C/D	K	Any	K control only, SAE ports	S2F-19992-5
G/H	K	Any	K control only, ISO ports	S2F-19993-5

Use control modifier in unit model code to select correct control orifice kit for “C”, “F”, and “H” controls.

Please note that “C”, “F”, and “H” controls above do not have orifices installed. Orifices must be installed prior to installation onto unit. For more information reference product update bulletin PC-0061.

Control Orifice Kits	
Description	**Part Number**
Orifice Kit, 0.6 mm	S2F-20236-5
Orifice Kit, 0.7 mm	S2F-20237-5
Orifice Kit, 0.8 mm	S2F-20238-5
Orifice Kit, 0.9 mm	S2F-20239-5
Orifice Kit, 1.0 mm	S2F-20240-5
Orifice Kit, 1.2 mm	S2F-20241-5
Orifice Kit, 1.5 mm	S2F-20242-5
Orifice Kit, 2.0 mm	S2F-20244-5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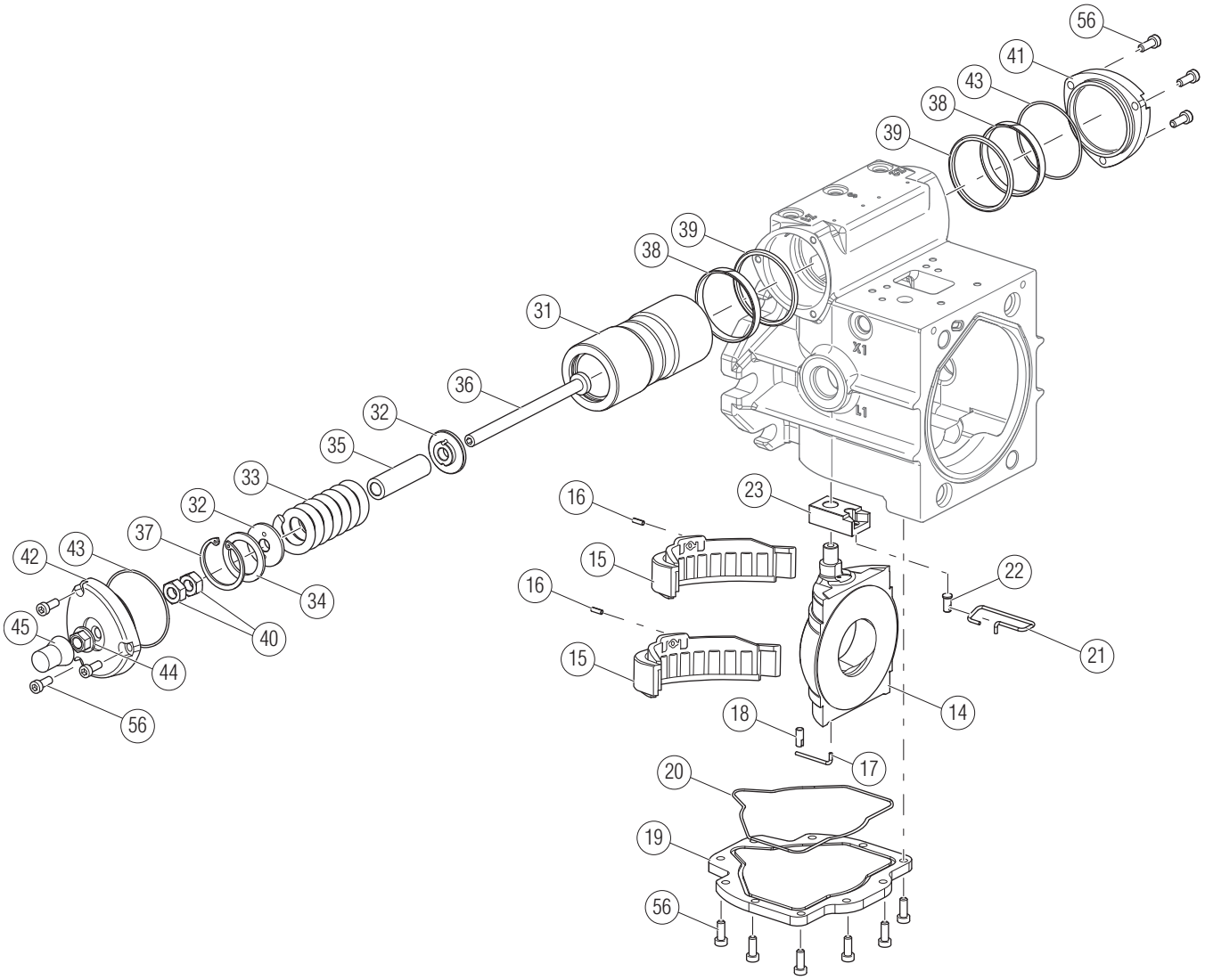

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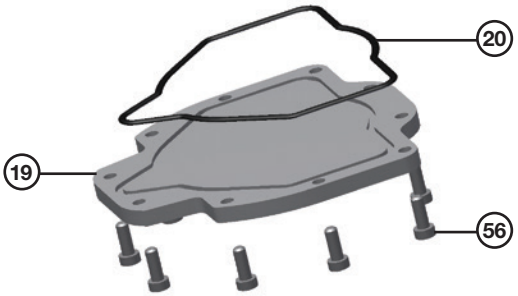
C055 Bill of Material			
Balloon #	**Description**	**Qty**	**Kit**
1	Housing	1	Housing kit
2	Port block	1	Port block kit
3	Barrel	1	Rotating group kit
4	Pump shaft	1	Shaft assembly kit
5	Piston	9	Rotating group kit
6	Retainer	1	Rotating group kit
7	Ball seat	1	Rotating group kit
8	Spacer	1	Rotating group kit
9	Pin	4	Rotating group kit/ charge pump kit
10	Spacer	2	Rotating group kit
11	Spring	1	Rotating group kit
12	Snap ring	1	Rotating group kit
13	Valve plate	1	Valve plate kit
14	Swash plate	1	Swash plate kit
15	Swash plate bearing	2	Swash plate kit
16	Pin	2	Swash plate kit
17	Bottom timing spring	1	Swash plate kit
18	Timing pin	1	Swash plate kit
19	Lower cover	1	Housing cover kit
20	O-ring	2	Housing cover kit/seal kit
21	Top timing spring	1	Swash plate kit
22	Top timing pin	1	Swash plate kit
23	Feedback link	1	Swash plate kit
24	Seal retainer	1	Shaft retainer kit
25	O-ring	1	Shaft retainer kit
26	Shaft seal	1	Shaft retainer kit/seal kit
27	Bearing	1	Shaft assembly kit
28	Snap ring	2	Shaft assembly kit
29	Snap ring	2	Shaft assembly kit
30	Bearing	1	Bushing kit
31	Servo piston	1	Servo piston kit
32	Spring guide	2	Servo piston kit
33	Spring	1	Servo piston kit
34	Spacer	1	Servo piston kit
35	Spacer	1	Servo piston kit
36	Threaded rod	1	Servo piston kit
37	Snap ring	1	Servo piston kit
38	Seal guide	2	Seal kit
39	Ring seal	2	Seal kit
40	Nut	2	Servo piston kit
41	Servo cover with centering	1	Servo piston kit
42	Servo cover	1	Servo piston kit
43	O-ring	2	Seal kit
44	Seal nut	1	Servo piston kit
45	Protective cap	1	NO KIT

C055 Bill of Material			
Balloon #	**Description**	**Qty**	**Kit**
46	O-ring	1	Seal kit
47	Gerotor eccentric	1	Charge pump kit
48	Bushing	1	Bushing kit
49	Bushing	1	Charge pump kit
50	Coupling	1	Charge pump kit
51	Charge spacer	1	Charge pump kit
52	Gerotor	1	Charge pump kit
53	Gerotor cap	1	Charge pump kit
54	Through drive cover	1	Through drive kit
55	Cross port relief	2	Relief assembly kit
56	Socket head screw	16	Servo piston/housing cover kit
57	Socket head screw	8	Housing kit
58	Name plate	1	NO KIT
59	Rotation plate	1	NO KIT
60	Rivets	4	NO KIT
61	Socket head plug	1	Housing kit
62	Plastic cover	2	NO KIT
63	Plastic plug	1	NO KIT
64	O-ring	1	Seal kit
65	Guide ring	2	Housing kit
66	Pin	1	Valve plate kit
67	Lifting eye	1	Housing kit
68	Expansion plug	1	Port block kit
69	Charge relief	1	Charge relief kit
70	Shuttle valve	1	Port block kit
71	Valve body	1	Pressure override kit
72	Valve plug	1	Pressure override kit
73	Valve spool	1	Pressure override kit
74	Valve pin	1	Pressure override kit
75	Spacer	1	Pressure override kit
76	Spring	1	Pressure override kit
77	O-ring	1	Pressure override kit
78	Cap	1	Pressure override kit
79	O-ring	1	Pressure override kit
80	Hex nut	1	Pressure override kit
81	Setting screw	1	Pressure override kit
82	Orifice	1	Port block kit
83	Socket head screw	1	Through drive kit
84	Socket head screw	2	Port block kit
85	Socket head plug	2	Port block kit
86	Charge pump key	1	Charge pump kit
87	Socket head plug	2	Housing kit
88	Filter screen	3	Housing kit
89	Snap ring	2	Housing kit
90	Socket head screw	6	Charge pump kit

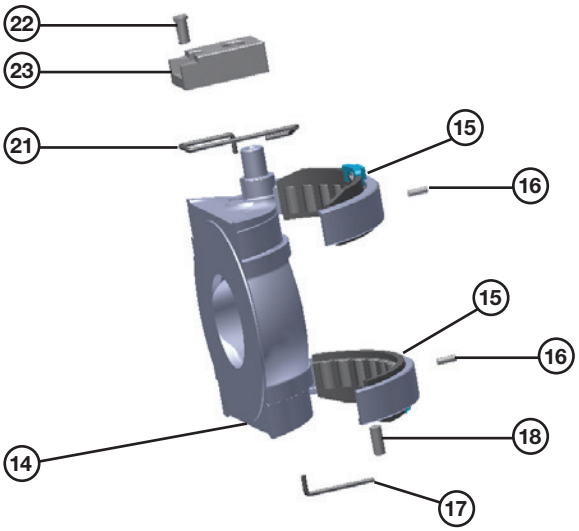
Seal Kit	
Contains all seals for the pump	S2F-20414-5

Housing Cover Kit	
Part number	S2F-20413-5

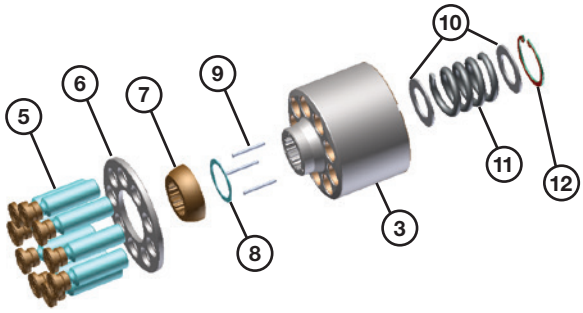


Seal Retainer Kit	
Part number	S2F-20386-5

Swashplate Kit	
Part number	S2F-20412-5



Rotating Group Kit	
Part number	S2F-20389-5



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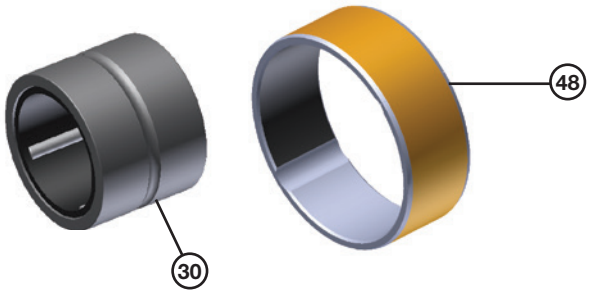
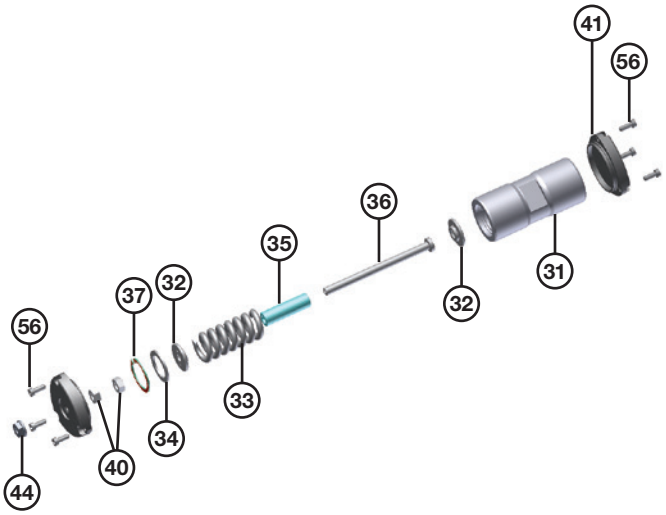
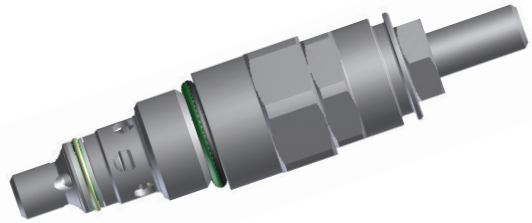
Bushing Kit	
Part number	S2F-20400-5



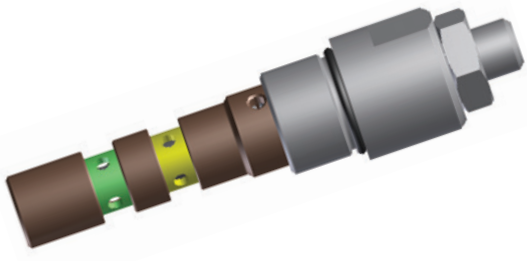
Servo Piston Kit	
Part number	S2F-20411-5



Charge Pressure Relief Kit	
Part number	S2F-20397-5

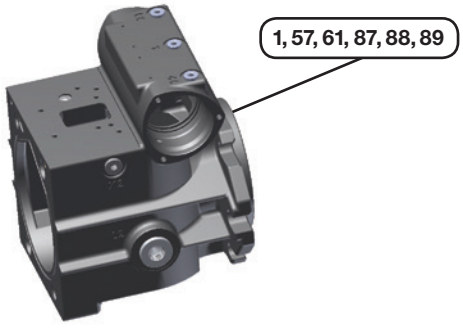


Pressure Override Kit	
Part number	S2F-20392-5

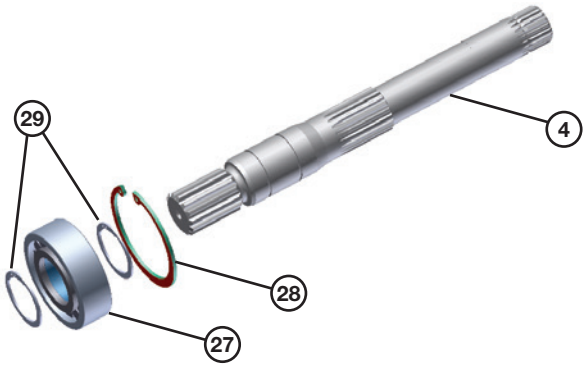


Cross Port Relief Kits	
Relief Option	**Part Number**
A	S2F-20393-5
B	S2F-20394-5
C	S2F-20395-5
D	S2F-20396-5

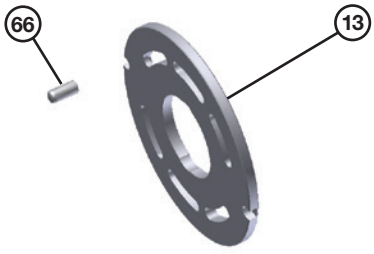
Housing Kit		
Mount	**Description**	**Part Number**
C	C055 SAE C 2/4 boltMT SAE port	S2F-20387-5
G	C055 SAE C 2/4 bolt MT ISO port	S2F-20388-5



Shaft Assembly Kit		
Shaft Option	**Description**	**Part Number**
1	Kit shaft SAE C 14T SPL C055	S2F-20384-5
2	Kit shaft SAE 21T 16/32 C055	S2F-20385-5



Valve Plate Kit		
Rotation	**Description**	**Part Number**
R	Kit, CW valve plate C055	S2F-20390-5
L	Kit, CCW valve plate C055	S2F-20391-5



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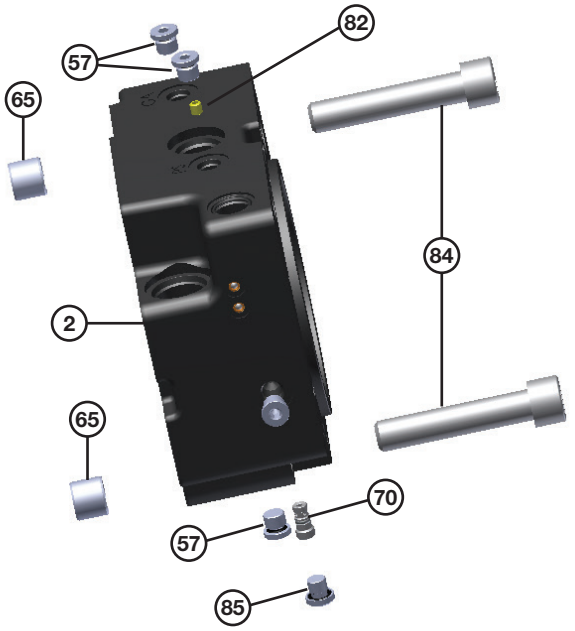
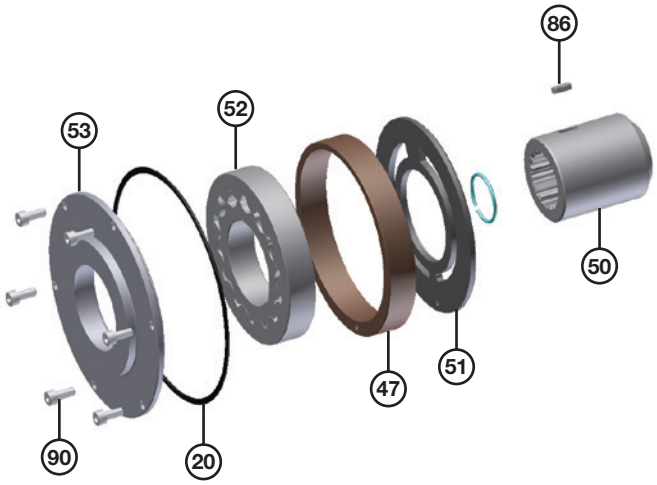
Port Block Kit		
Mount	**Description**	**Part Number**
C	Kit, port block, SAE C055	S2F-20398-5
G	Kit, port block, ISO C055	S2F-20399-5

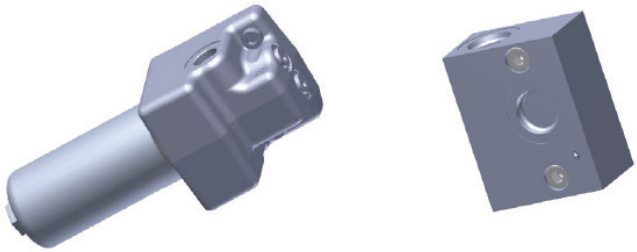


Through Drive Kit		
Through Drive Option	**Description**	**Part Number**
X	Kit, through drive, blanking C055	S2F-20405-5
A	Kit, SAE A through drive C055	S2F-20406-5
B	Kit, SAE B through drive C055	S2F-20407-5
G	Kit, SAE B-B through drive C055	S2F-20408-5
C	Kit, SAE C through drive C055	S2F-20409-5
H	Kit, SAE C-C through drive C055	S2F-20410-5



Charge Pump Kit		
Charge Pump Option	**Description**	**Part Number**
A	Kit, 18CC charge pump C055	S2F-20403-5
D	Kit, 11CC charge pump C055	S2F-20401-5
E	Kit, 14CC charge pump C055	S2F-20402-5
X	Kit, charge pump blanking C055	S2F-20404-5

Charge Filter Kit		
Charge Pump Option	**Description**	**Part Number**
X	No charge filter	
N	Charge filter with mechanical 8 bar indicator C055	S2F-20444-5
G	Charge filter with electrical 8 bar indicator C055	S2F-20445-5
R	Remote charge filter block C055	S2F-20446-5
	Charge filter element	S2F-20440-5



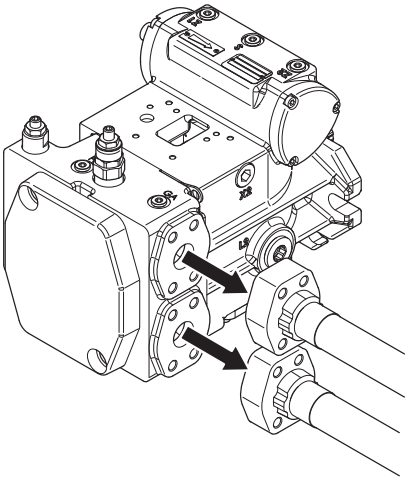
Introduction

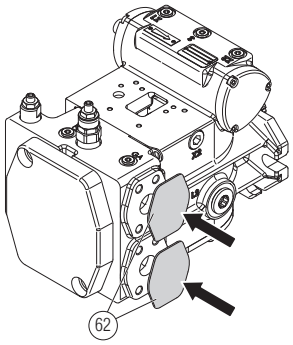
Before removing the pump you need to take all the precautions necessary to ensure safety. Stop the machine. Check that the system is not under pressure. Discharge or disconnect accumulators. Verify that there are no suspended loads connected to the machine.

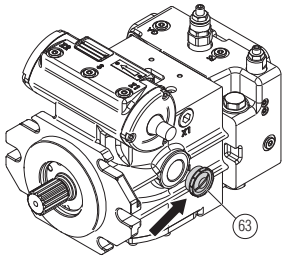
Before disconnecting the various pipes or hoses, clean the pump to avoid the accidental ingress of dirt. If there are electrical connections, check that they are not under tension.

Remove the pressure, case drain and pilot lines and any electrical connections.

CAUTION:
The hydraulic circuit and the pump may be hot! Start the disassembly operations only after cooling.



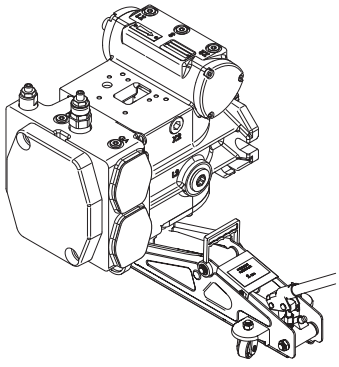


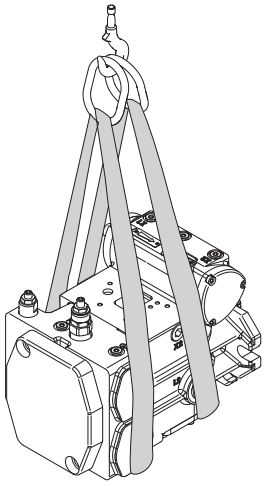


After removing the hoses, apply protections at all open ports to prevent the ingress of foreign bodies.

Move the pump by the means of lifting straps, eye bolts or, if not possible, lift it with a hydraulic trolley jack.

Make sure you apply the straps firmly to the pump before you move it to prevent an accidental fall and damage of objects and/or injury to persons. If you use a jack, make sure the pump is securely resting on the plate.





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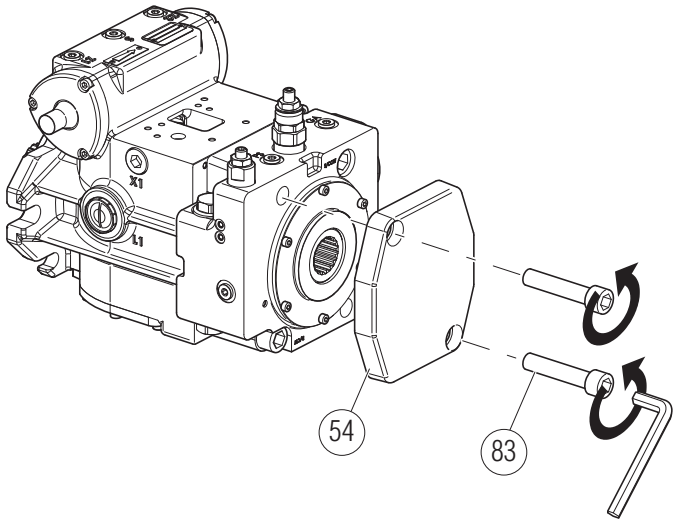


Figure 1

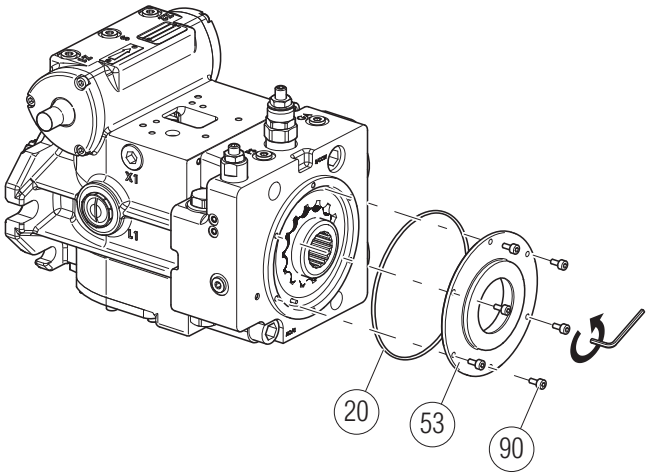


Figure 2

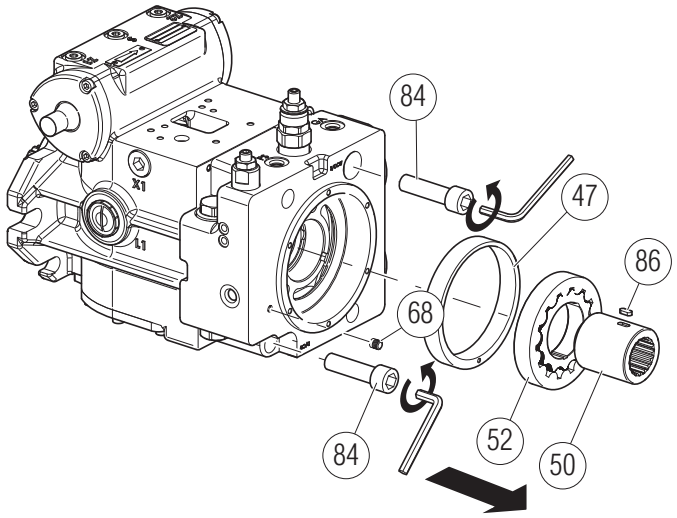


Figure 3

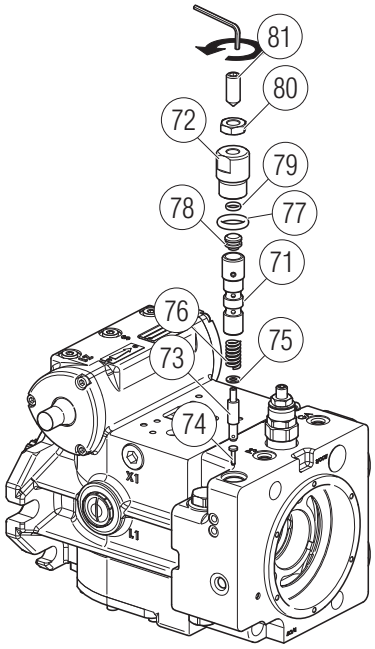


Figure 4

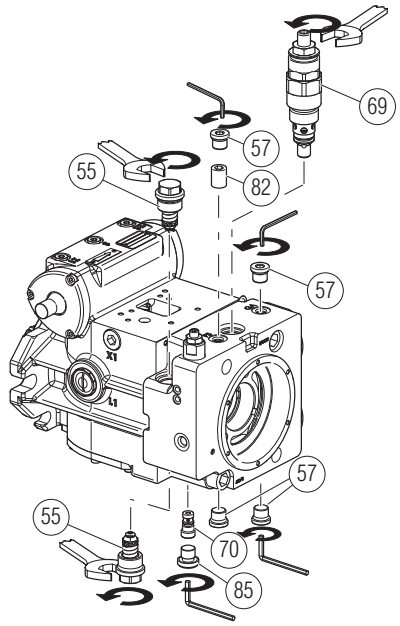


Figure 5

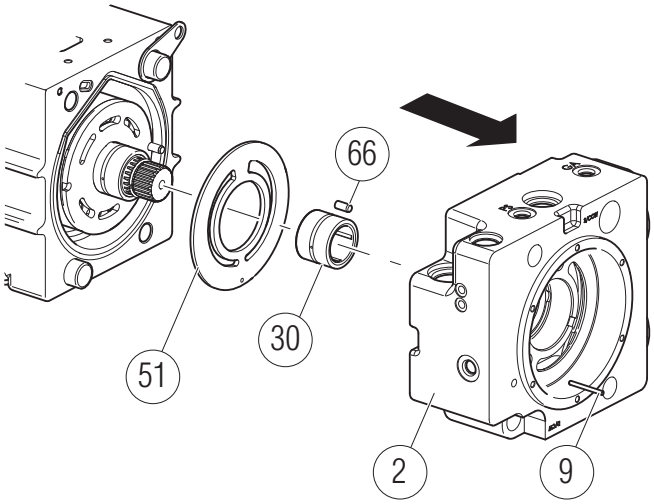


Figure 6

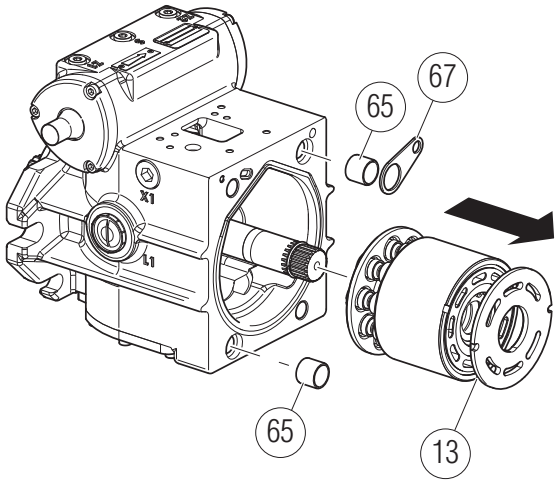


Figure 7

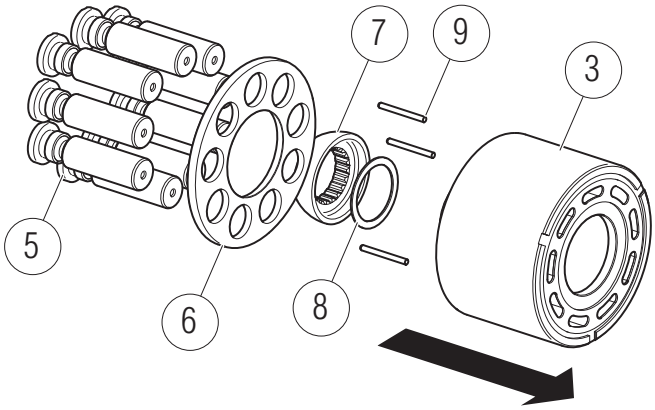
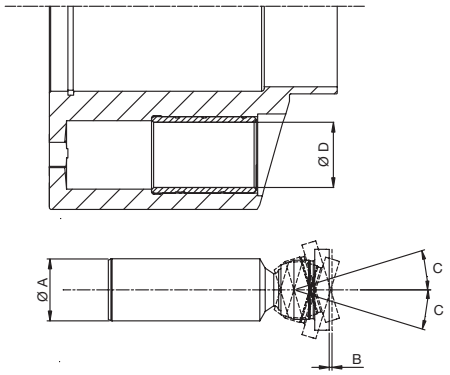


Figure 8

Handle with care to avoid damage.
Check clearances and diameters of the components as shown in the table in *Figure 9*.



Piston Diameter A (Mm)	Piston-Slider Axial End Float B (Mm)	Slider Rotation (Max.) C (°)	Piston Bore Diameter D (Mm)
Ø18 0.015/-0.010	0.05-0.10	17	Ø18 +0.02/+0.035

Figure 9

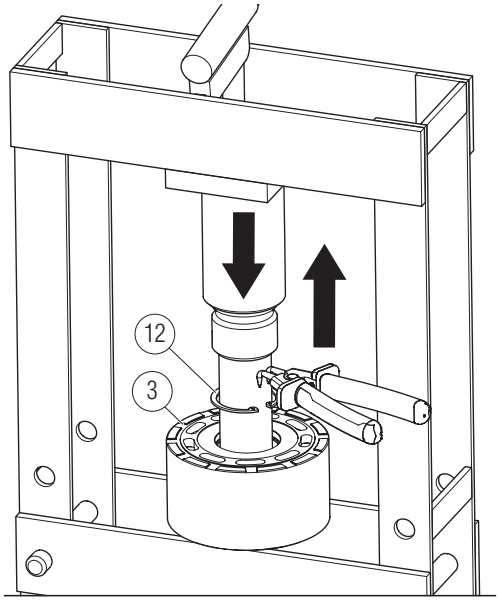
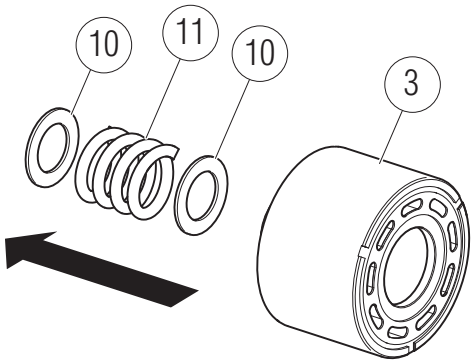


Figure 10



Compress the internal spring of the rotating unit (3) with a press so that the snap ring (12) can be removed.

WARNING:
The kit is subject to elastic load. Do not remove the snap ring before compressing the spring.

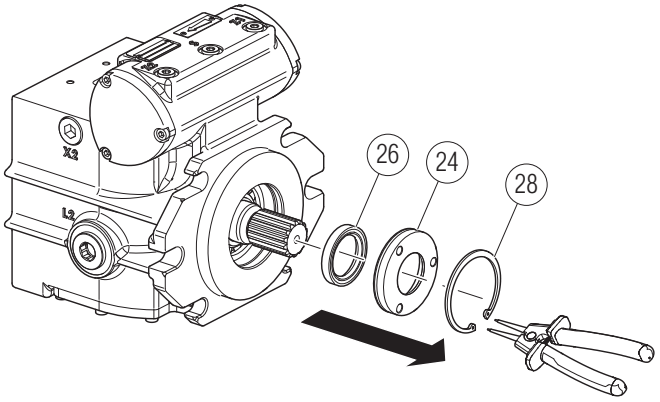
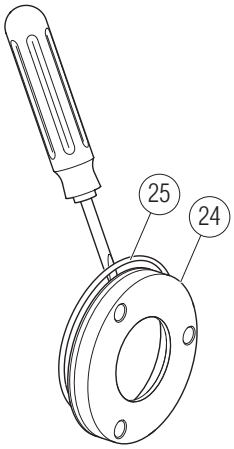


Figure 11



Remove the O-ring (25), taking care not to damage it with sharp or pointed tools.

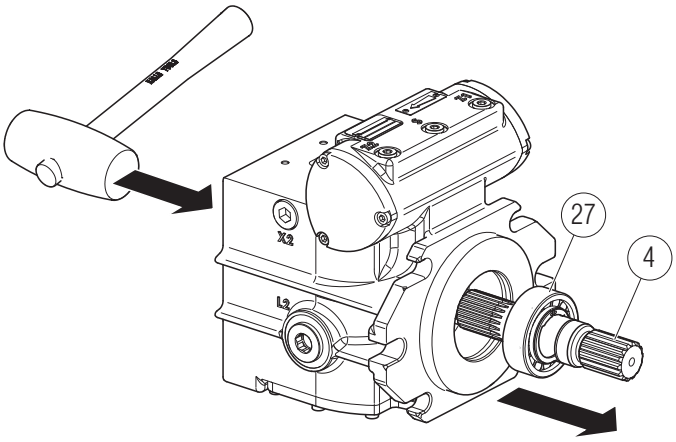


Figure 12

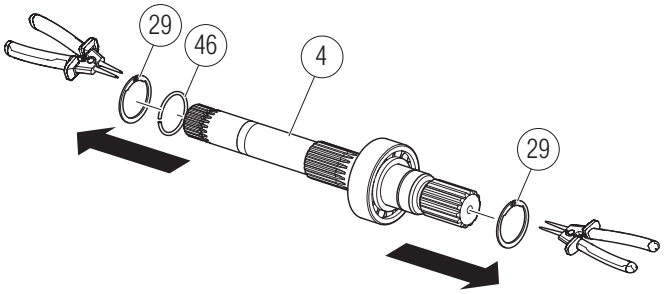
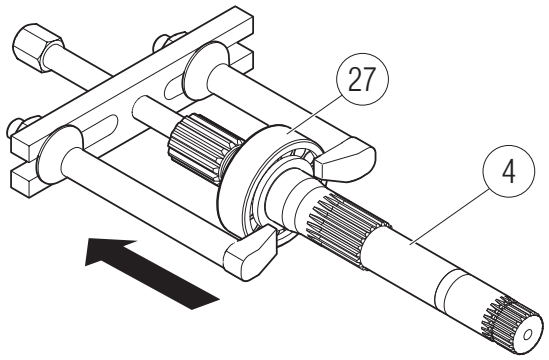


Figure 13

Remove the shaft, using a rubber mallet, gently tapping on the back end.



Remove the bearing with a puller.

Figure 14

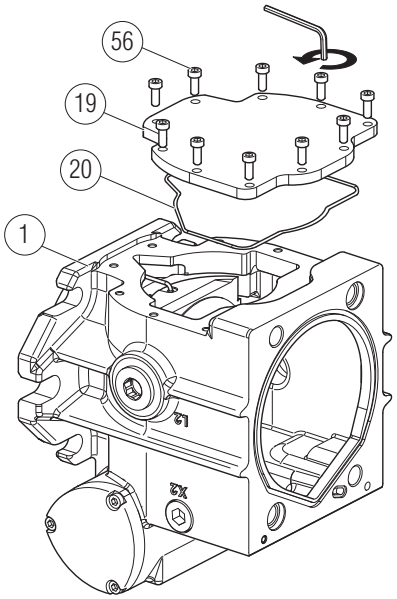


Figure 15

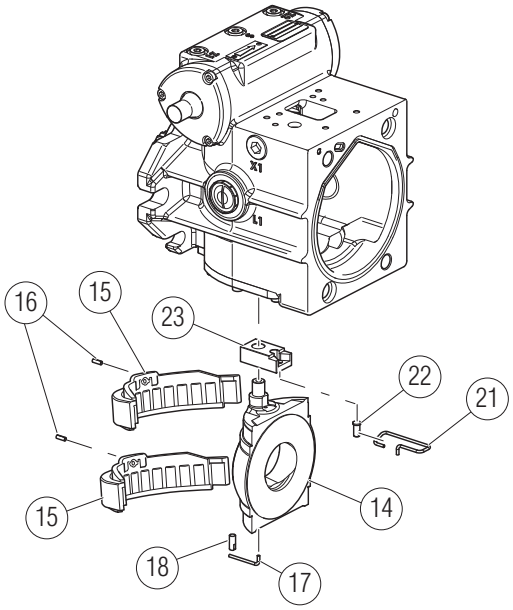


Figure 16

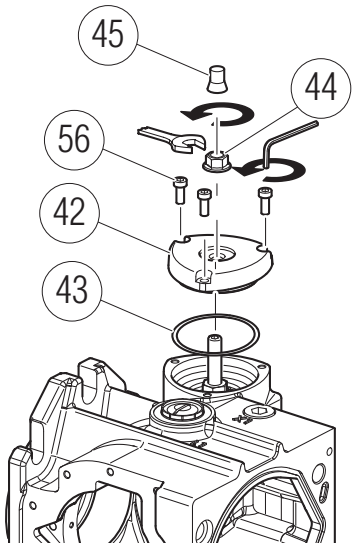


Figure 17

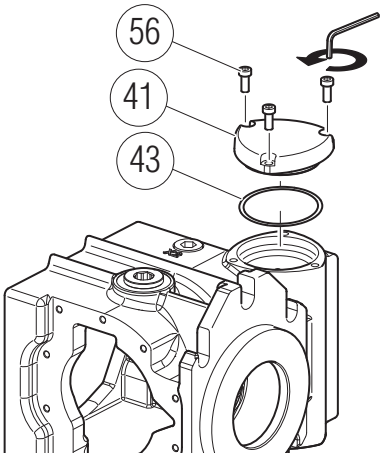


Figure 18

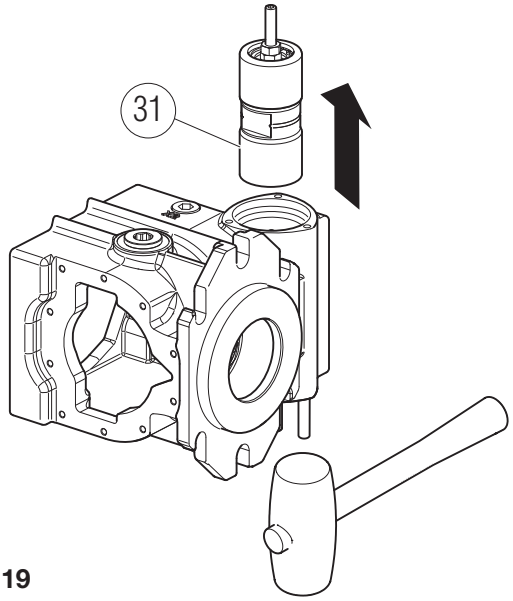


Figure 19

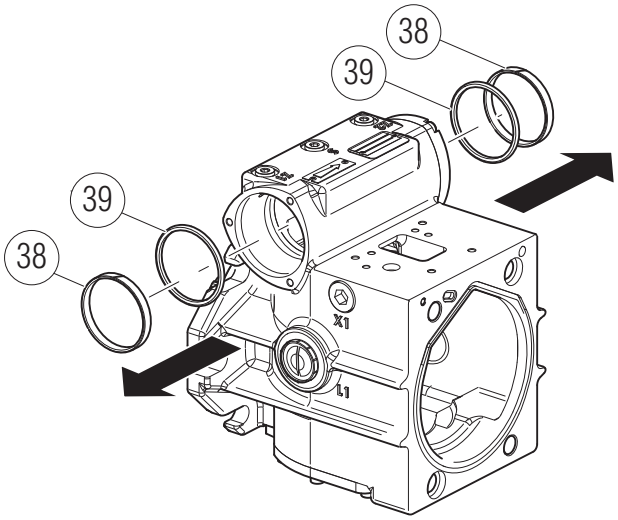


Figure 20

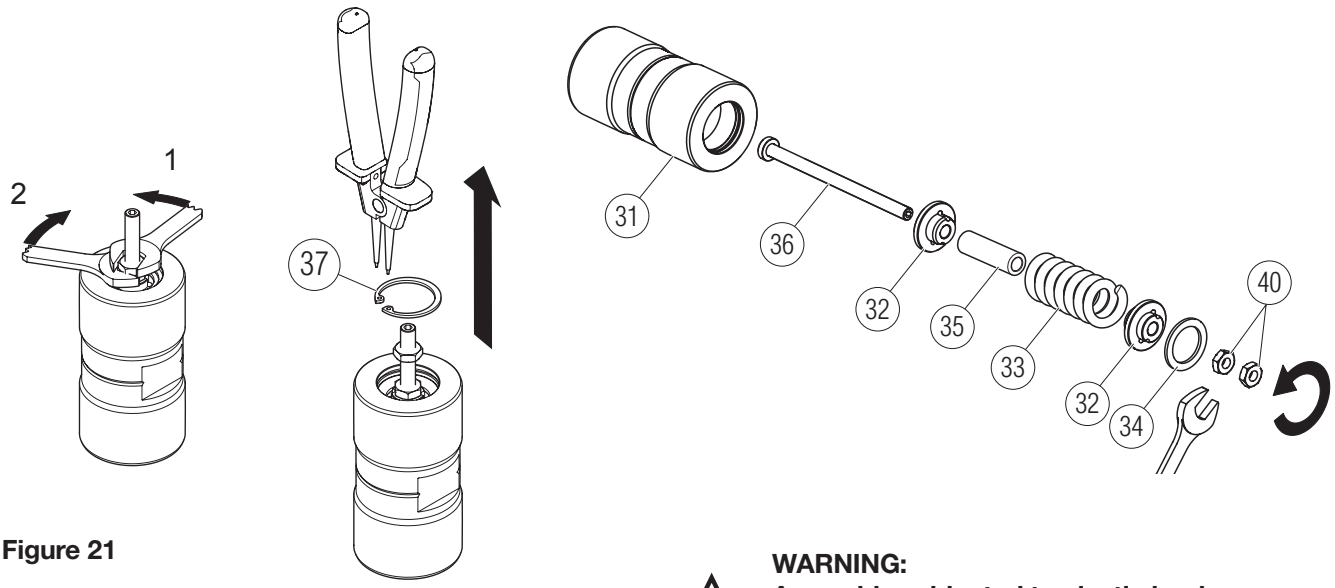


Figure 21

WARNING:
Assembly subjected to elastic load.
Never remove the snap ring (37) before you compress the spring (33) by tightening the nut (40).

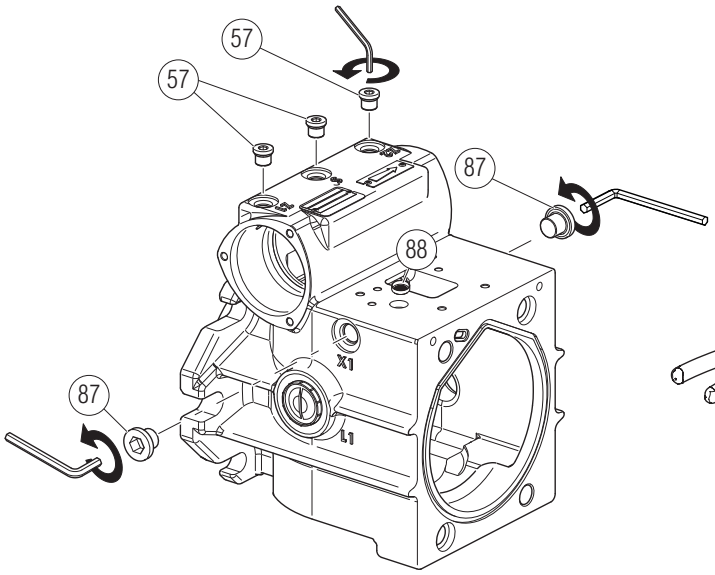


Figure 22

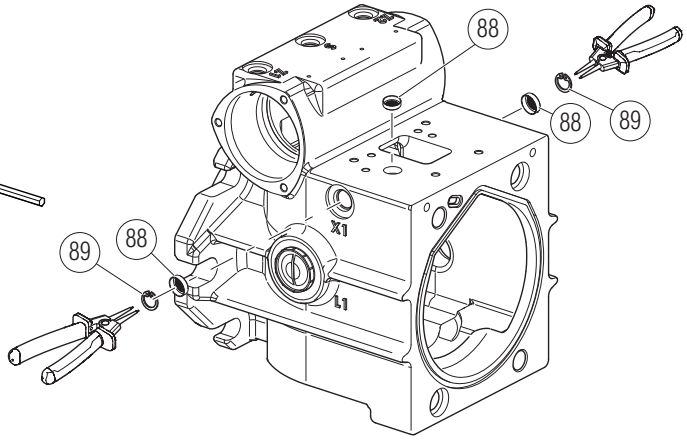


Figure 23

Check the condition and cleanliness of the filter (88).

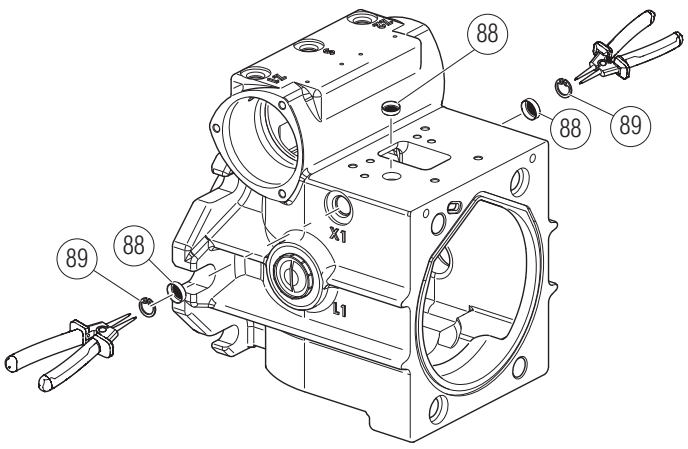


Figure 30

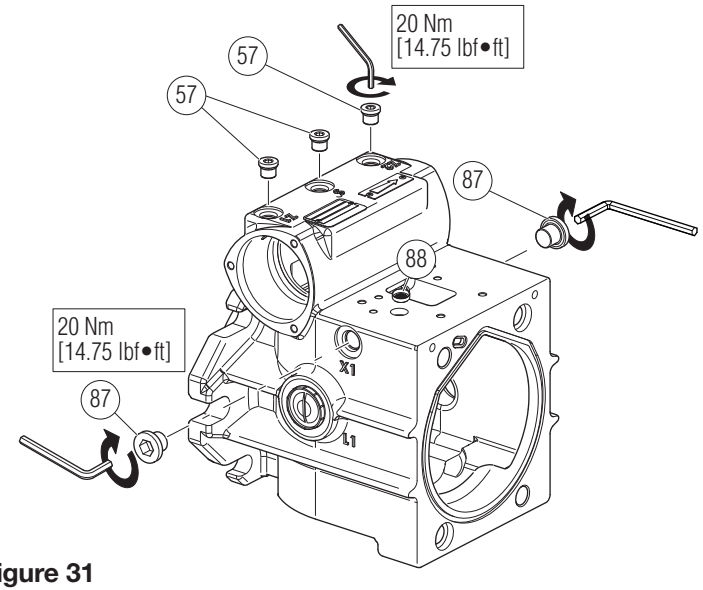


Figure 31

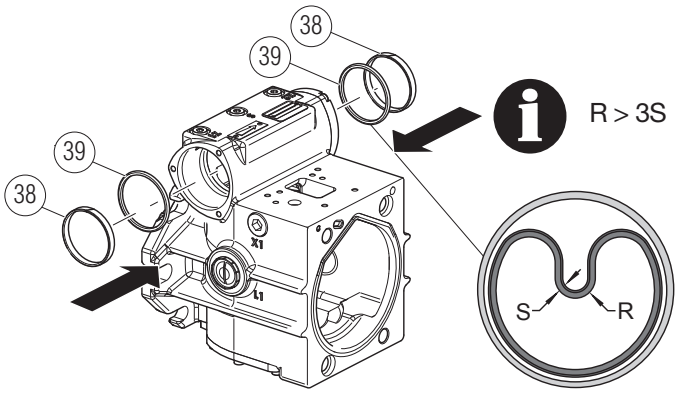


Figure 32

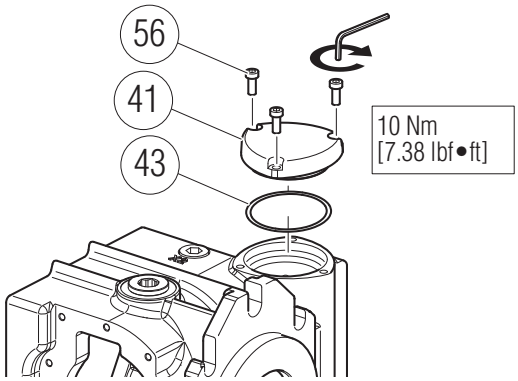


Figure 33

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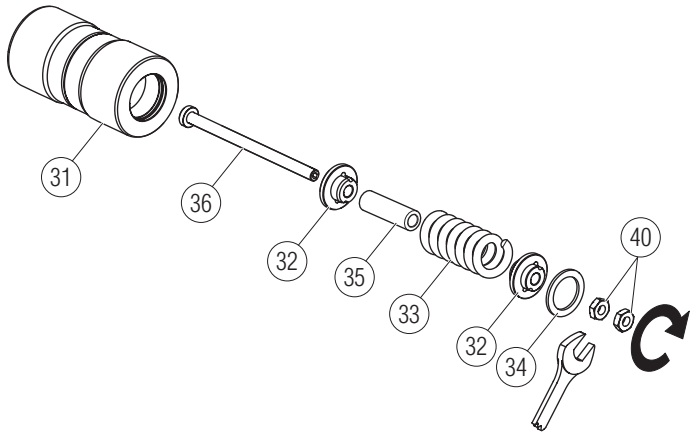

Figure 34

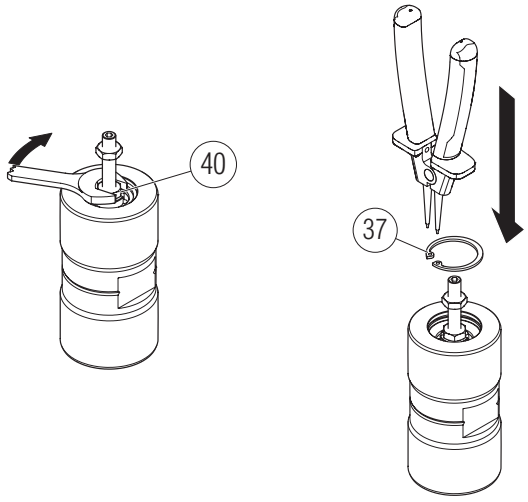

Figure 35

Screw the nut (40) until the seat of the snap ring is completely visible.

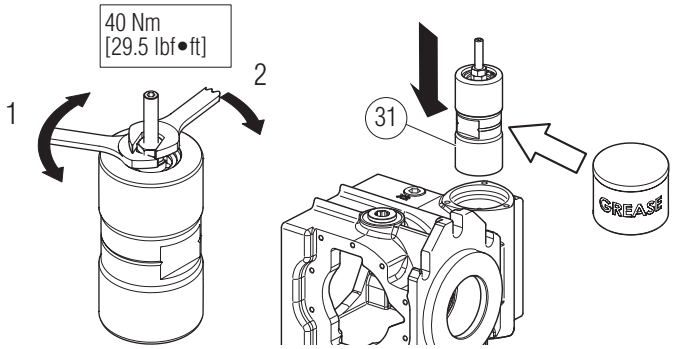

Figure 36

Adjustment of the lock nuts: act on the first of the two nuts (40) so as to eliminate all axial float between the various components, then tighten the second lock nut. Insert the piston into the pump housing. Place the milling plane of the piston facing the lower side of the body and as much as possible aligned with respect to the axis. Check the piston is free to move with only the friction due to the seals.

WARNING:
When inserting the piston, one can gently tap on the end by the means of a plastic hammer. Do not use steel hammers.

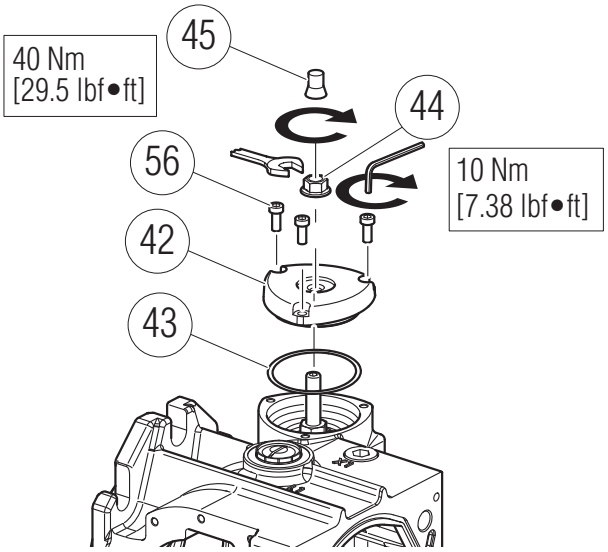

Figure 37

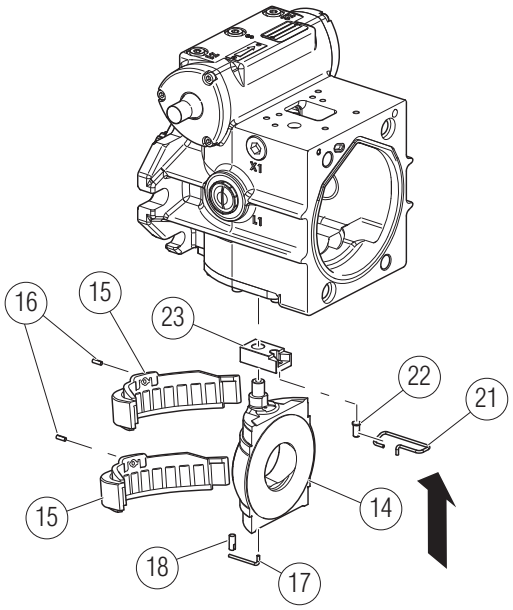

Figure 38

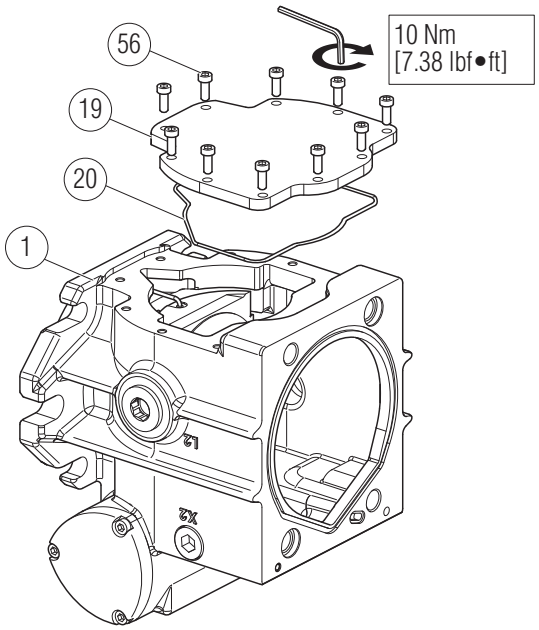

Figure 39

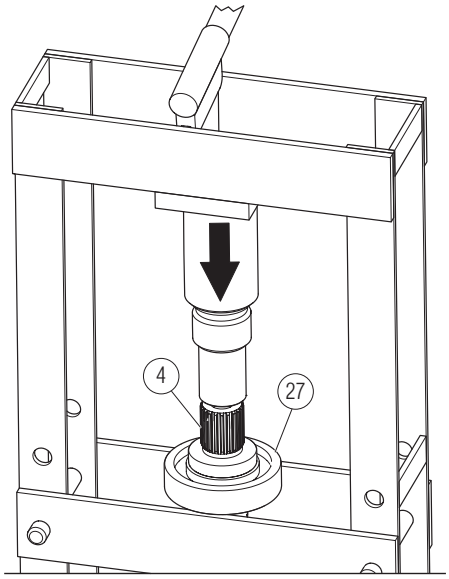

Figure 40

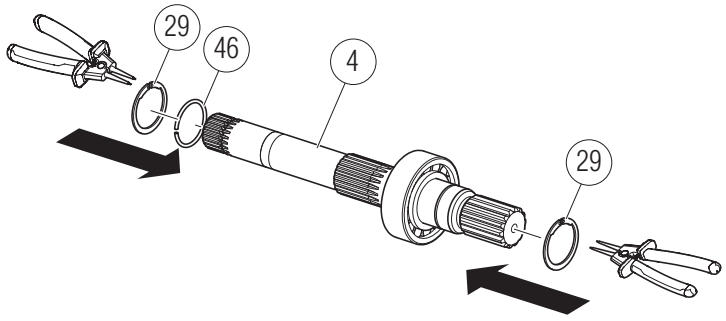

Figure 41

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United States

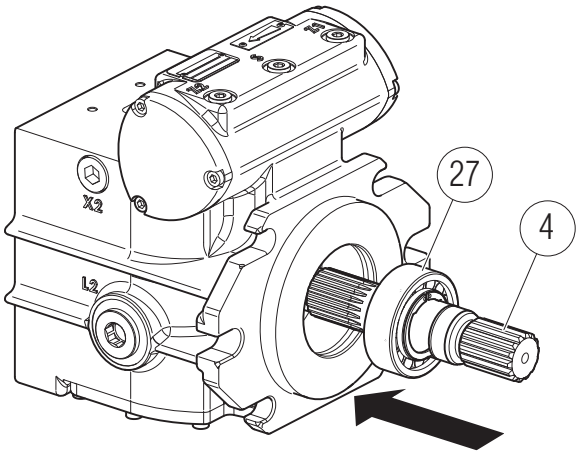

Figure 42

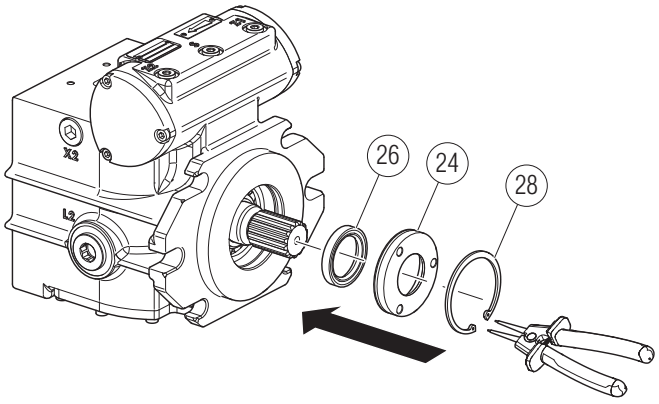

Figure 43

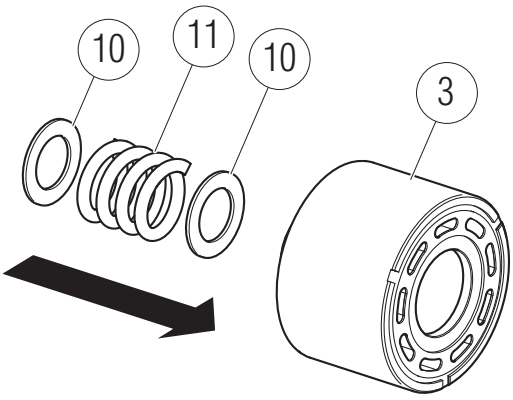

Figure 44

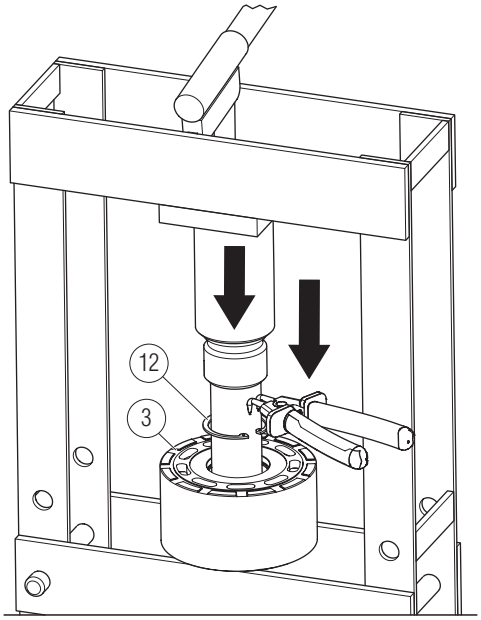

Figure 45

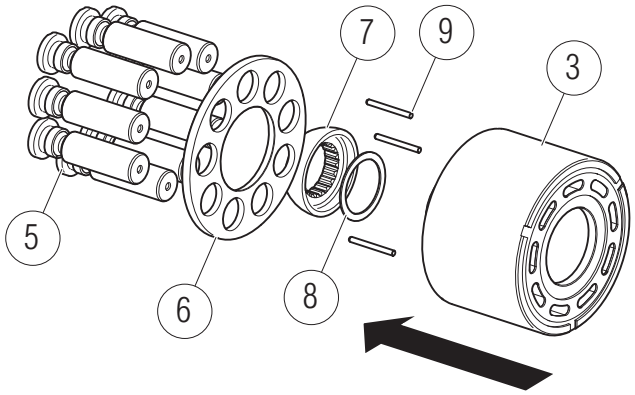

Figure 46

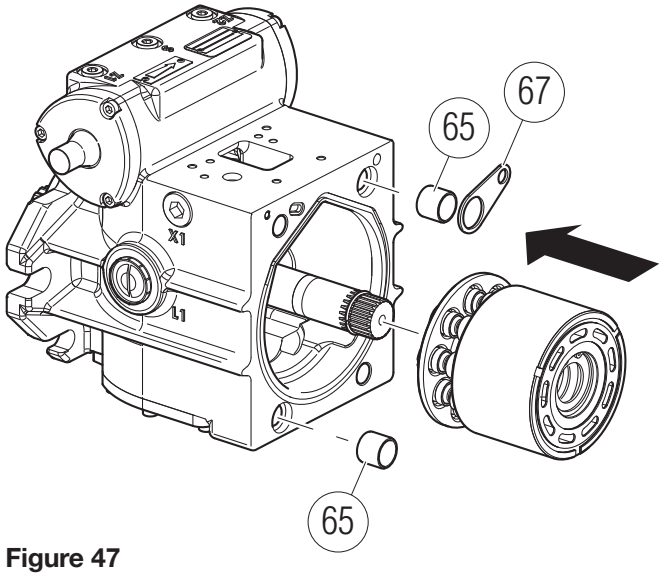

Figure 47

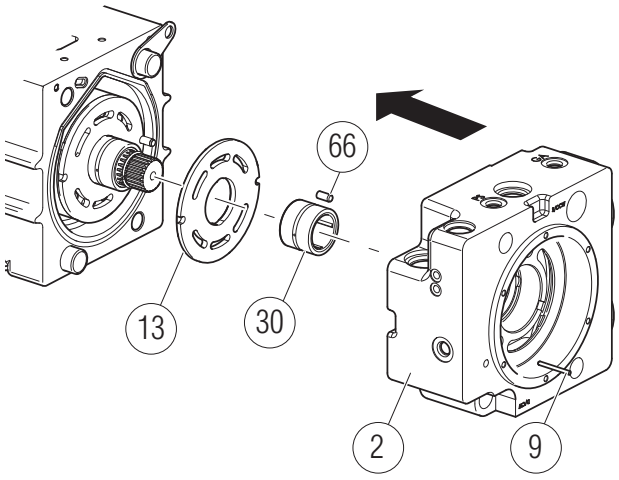

Figure 48

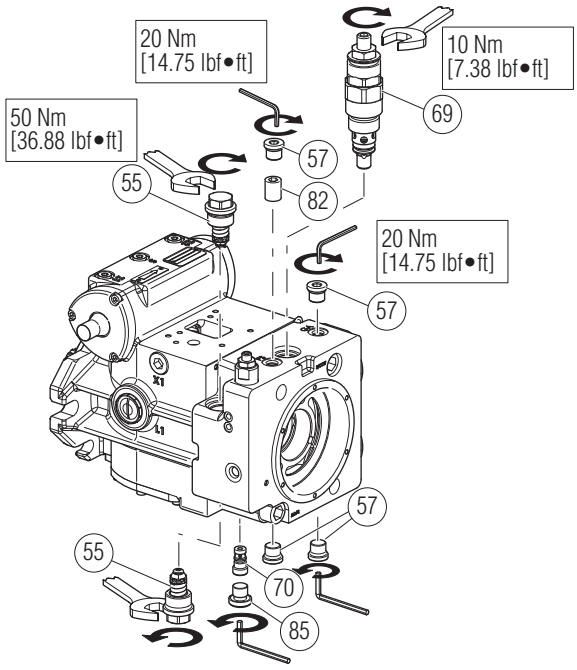

Figure 49

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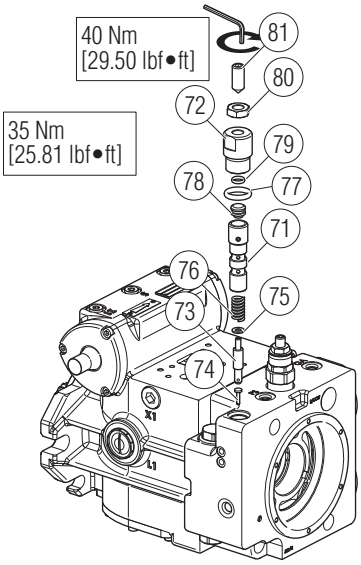


Figure 50

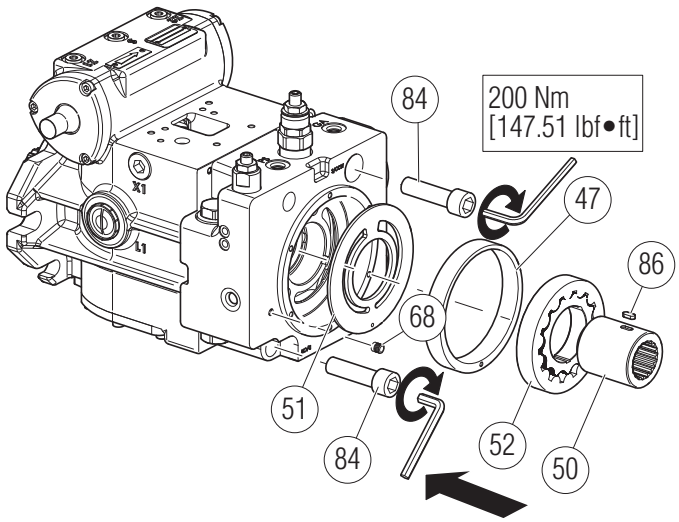


Figure 51

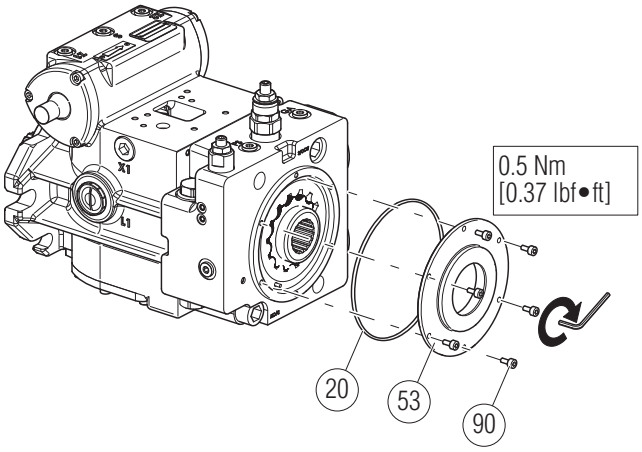


Figure 52

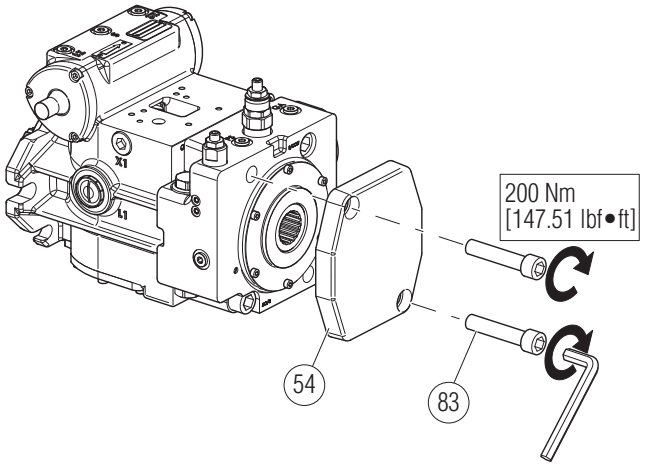
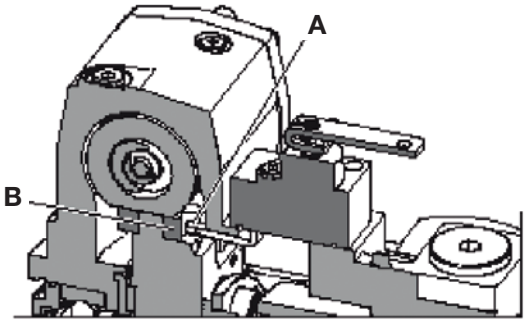


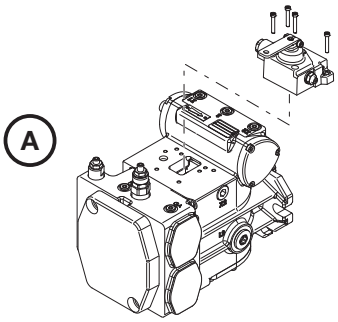
Figure 53

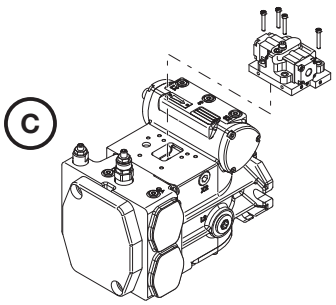
Controls Assembly

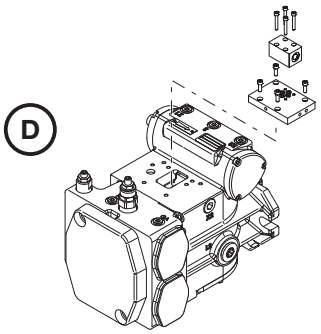
For mounting of controls with feedback (A-C-F-H)

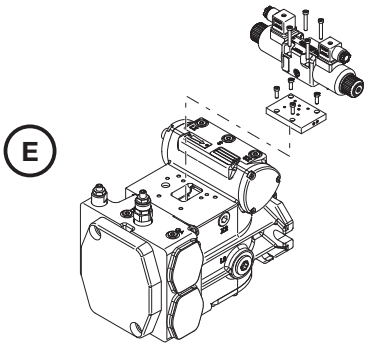
During assembly, pay attention that the lever (A) of the kit is correctly inserted into the slot of the shoe (B) of the control piston. In the body there is a groove that serves as a guide for easier insertion.

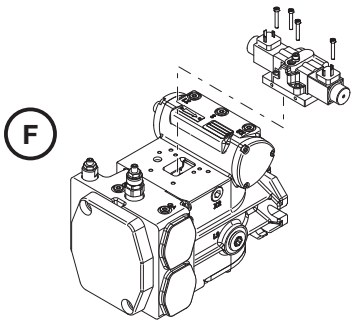


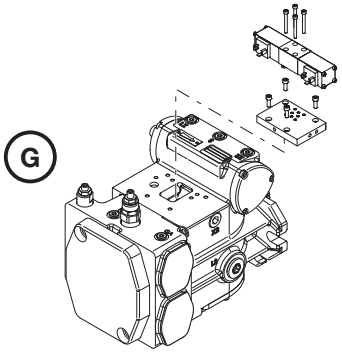


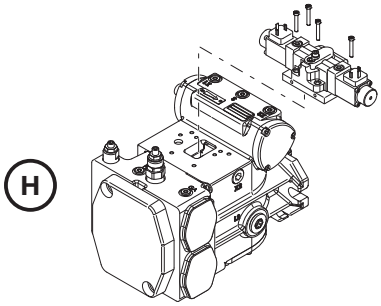


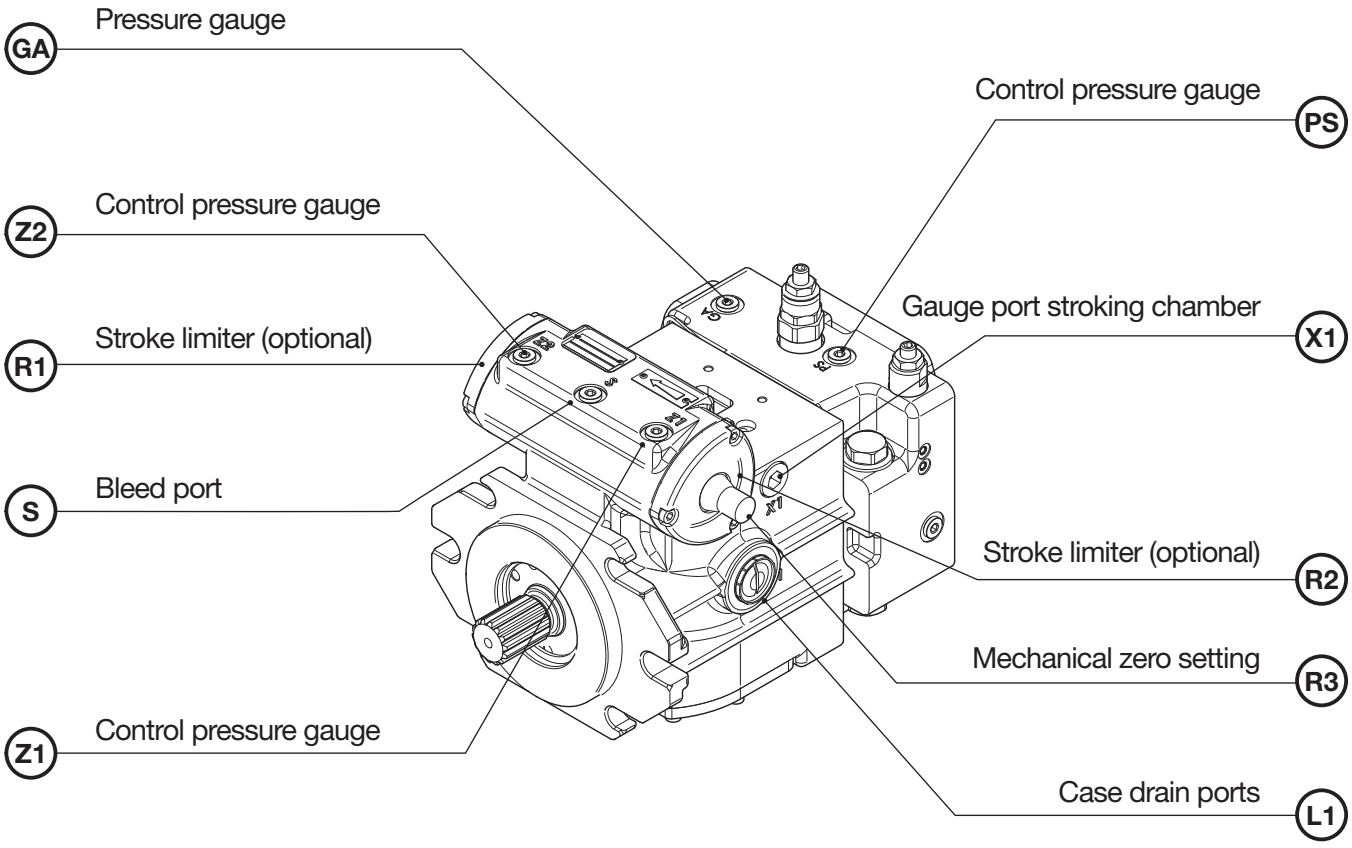


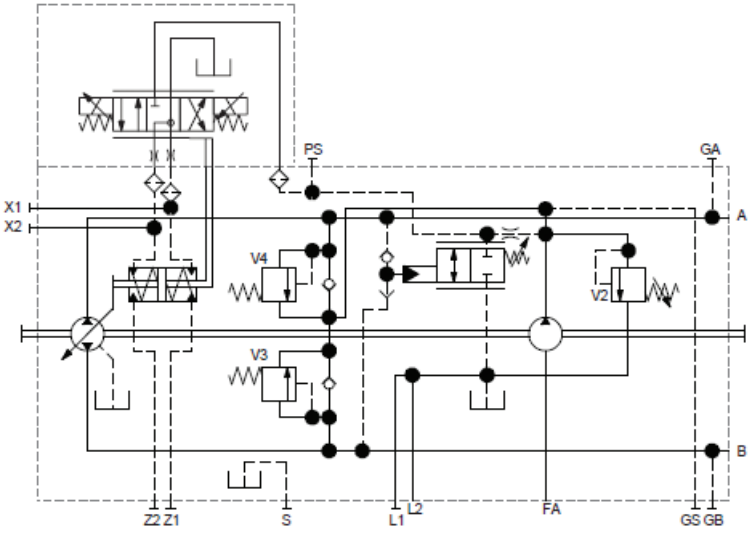






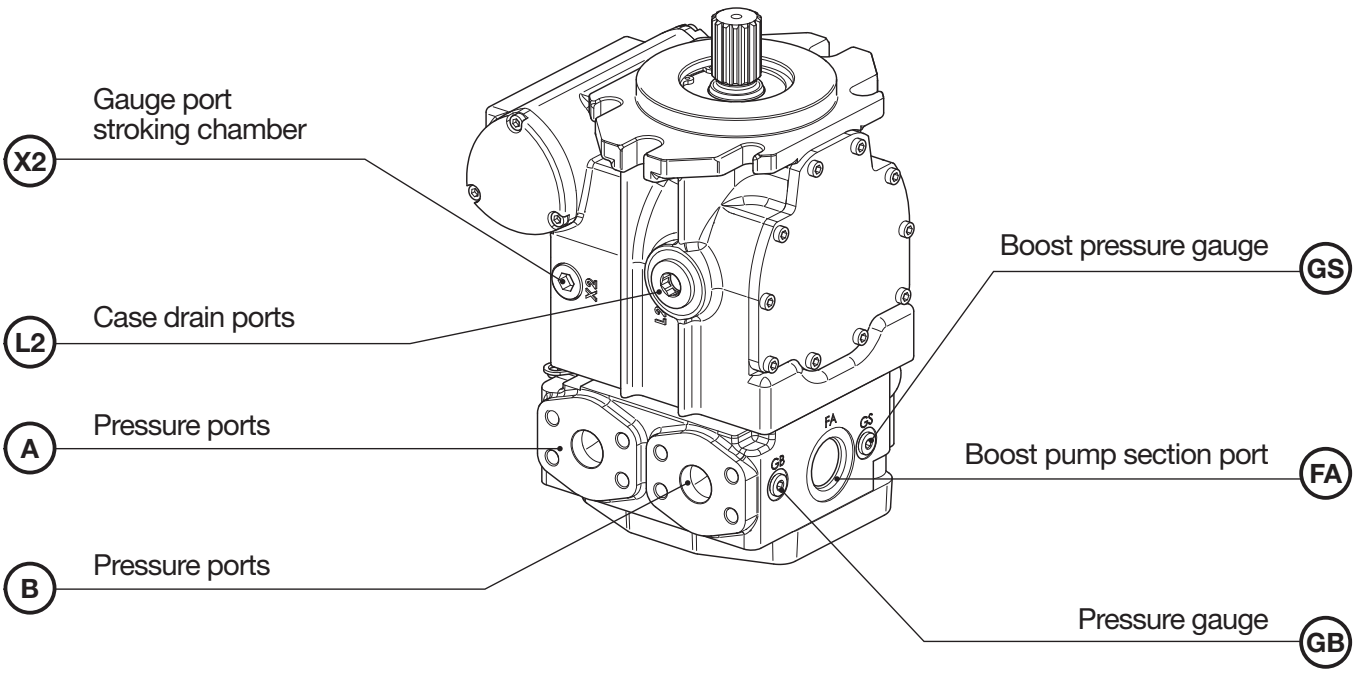


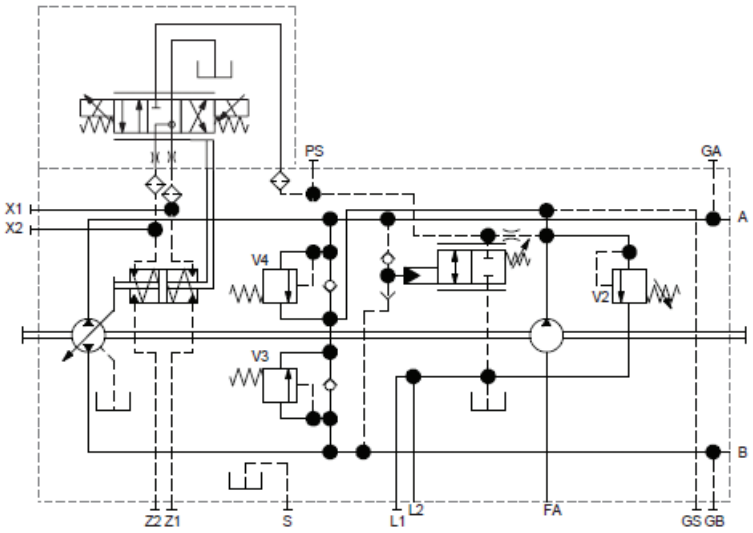




C055 Port Sizes		
Port	**Mount C**	**Mount G**
A	1" SAE Code 62	1" SAE Code 62
B	1" SAE Code 62	1" SAE Code 62
L1	-12 SAE ORB	3/4" G
L2	-12 SAE ORB	3/4" G
FA	-16 SAE ORB	1" G
GA	-4 SAE ORB	1/4" G
GB	-4 SAE ORB	1/4" G
GS	-4 SAE ORB	1/4" G
PS	-4 SAE ORB	1/4" G
S	-4 SAE ORB	1/4" G
X1	-6 SAE ORB	3/8" G
X2	-6 SAE ORB	3/8" G
Z1	-4 SAE ORB	1/4" G
Z2	-4 SAE ORB	1/4" G

Schematic shown is a C055 with "F" control and pressure override.





Schematic shown is a C055 with "F" control and pressure override.

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A	1" SAE Code 62	1" SAE Code 62
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FA	-16 SAE ORB	1" G
GA	-4 SAE ORB	1/4" G
GB	-4 SAE ORB	1/4" G
GS	-4 SAE ORB	1/4" G
PS	-4 SAE ORB	1/4" G
S	-4 SAE ORB	1/4" G
X1	-6 SAE ORB	3/8" G
X2	-6 SAE ORB	3/8" G
Z1	-4 SAE ORB	1/4" G
Z2	-4 SAE ORB	1/4" G

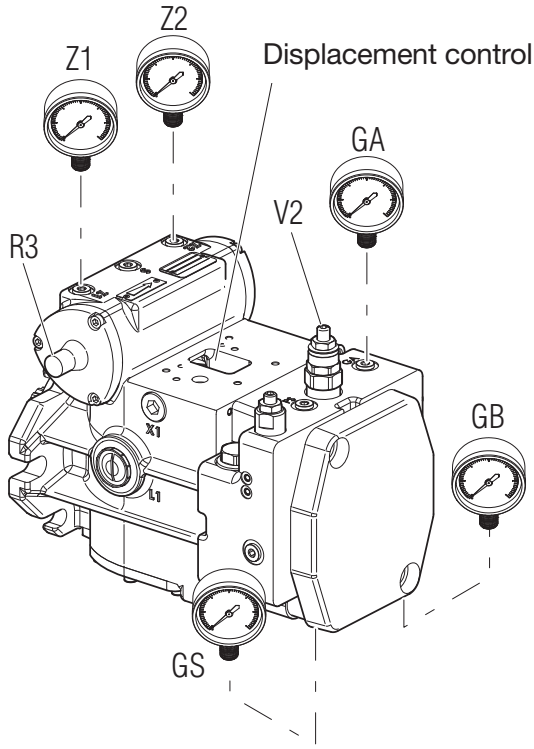
Suggested Gauges
Z1 & Z2 = 0-25 bar (0-365 PSI)
GS = 0-60 bar (0-870 PSI)
GA & GB = 0-600 bar (0-8700 PSI)

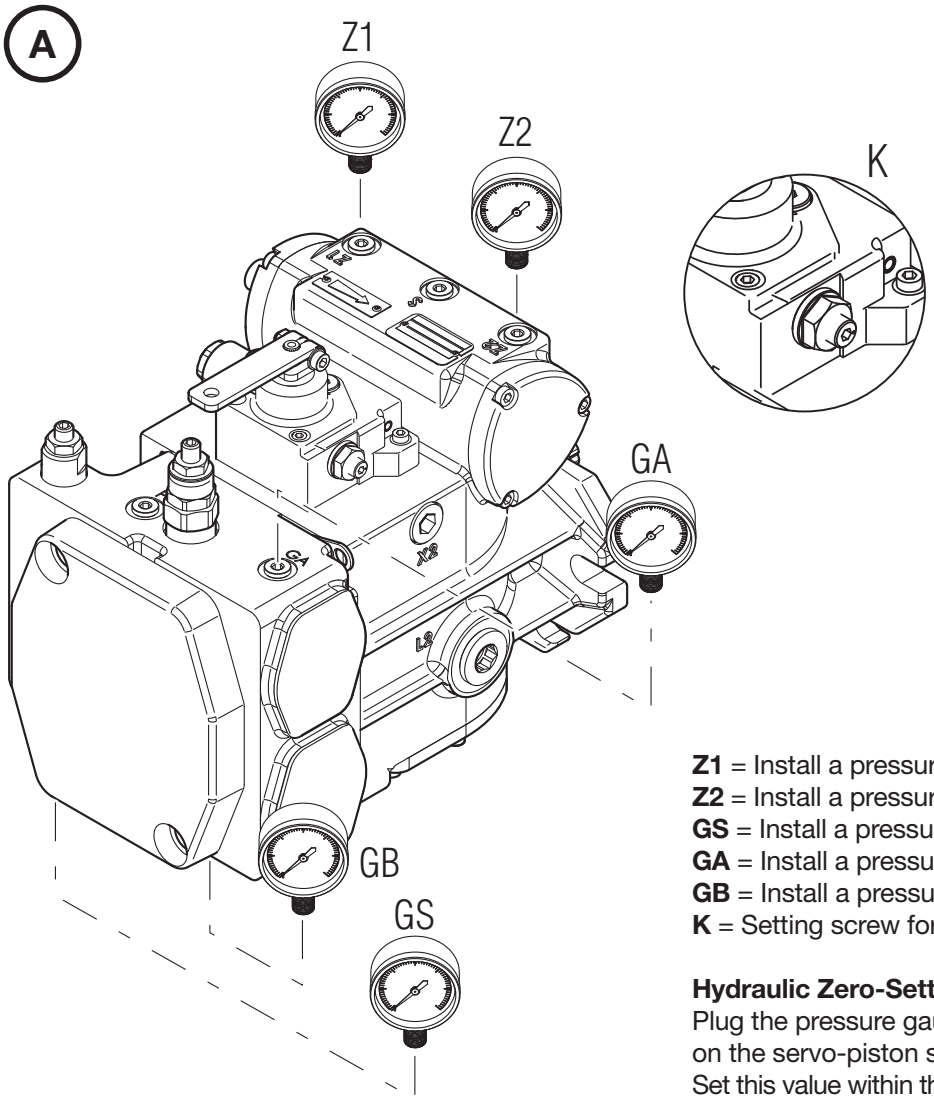
Setting Charge Pressure Relief Valve (V2)
Insert 60 bar (870 PSI) pressure gauge into port GS. Check to ensure test stand and pump input rotations are correct and bring prime mover up to 1000 RPM, run until oil temperatures are greater than 68°F (20°C) Loosen charge relief lock nut and adjust CW to increase pressure setting or counter clockwise to reduce pressure setting. Once completed tighten lock nut to 11 ft-lb (15 N-m).

Centering of the Pump Servo Piston
Insert gauges into ports GA and GA, ensure test stand rotation and pump rotation are the same and bring prime mover up to operating speed. Observing GA and GB you will notice one pressure being higher than the other. Rotate R3 until pressures on both gauges equalize and note the position of the wrench at this point. Continue rotating until pressure rises on the opposite gauge, reverse rotation on the adjustment until the pressure is equal on both ports and note the wrench position. Adjust the R3 adjustment to the midpoint between the two noted positions and tighten lock nut to 29 ft-lb (40 N-m).

Setting Mechanical Pressure Override (Override Option P)
Insert gauges into ports GA and GA. Ensure test stand and pump rotations are correct and bring unit up to operating speed.

Loosen POR valve lock nut and operate control to 30-40% of maximum flow. Slowly increase load until POR value activates. Adjust POR valve adjustment CW to increase setting and CCW to reduce setting. Tighten lock nut to 29 ft-lb (40 N-m). Reduce load to ensure pump flow is returned to the circuit and then increase load until POR activates and ensure setting has not changed. Run for 10-15 seconds to ensure no pressure oscillations are occurring when POR is active. Repeat test in opposite flow directions to ensure setting is unchanged.

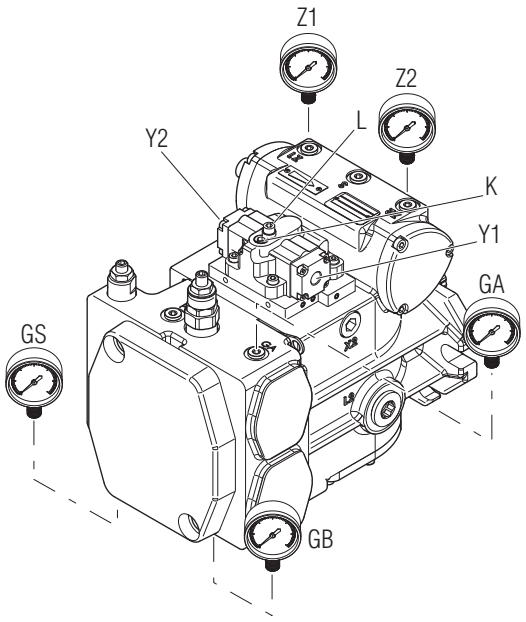


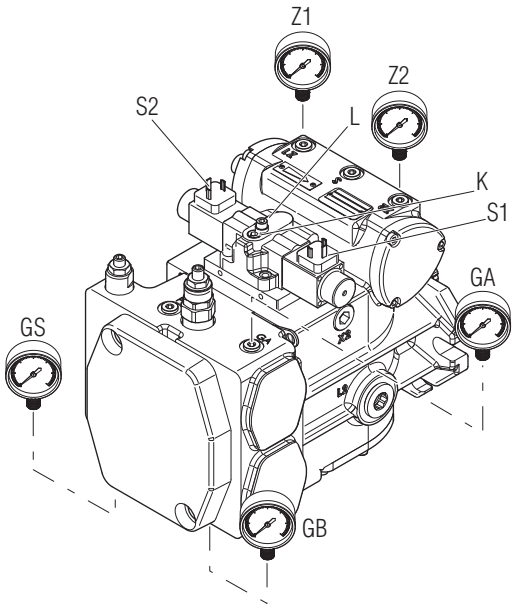


Z1 = Install a pressure gauge 0 ÷ 25 bar
Z2 = Install a pressure gauge 0 ÷ 25 bar
GS = Install a pressure gauge 0 ÷ 60 bar
GA = Install a pressure gauge 0 ÷ 600 bar
GB = Install a pressure gauge 0 ÷ 600 bar
K = Setting screw for zero setting

Hydraulic Zero-Setting of the A Control
Plug the pressure gauges Z1-Z2 and check the pressure on the servo-piston sides: max △p accepted = 1 bar. Set this value within this range adjusting the screw (K). At the rotation speed of normal use, swivel the pump to maximum displacement, via the control lever, then suddenly release the said lever. The pump must swivel back to zero flow within two seconds. Repeat the procedure for both flow directions. There must be no significant difference between the two flow directions (equal pressure on GA and BG, max 2-3 bar differential). If this should occur, act on the control hydraulic zero-setting, until the proper control operation is achieved.

Check the control operation repeating procedure as described above in both the flow directions. The pump must always restore the zero flow position.





P1 = Install a pressure gauge 0 ÷ 25 bar
P2 = Install a pressure gauge 0 ÷ 25 bar
GS = Install a pressure gauge 0 ÷ 60 bar
GA = Install a pressure gauge 0 ÷ 600 bar
GB = Install a pressure gauge 0 ÷ 600 bar

S1/S2 = Input electrical signal
Y1/Y2 = Hydraulic input signal
K = Setting screw for zero setting
L = Locking screw of screw “K”

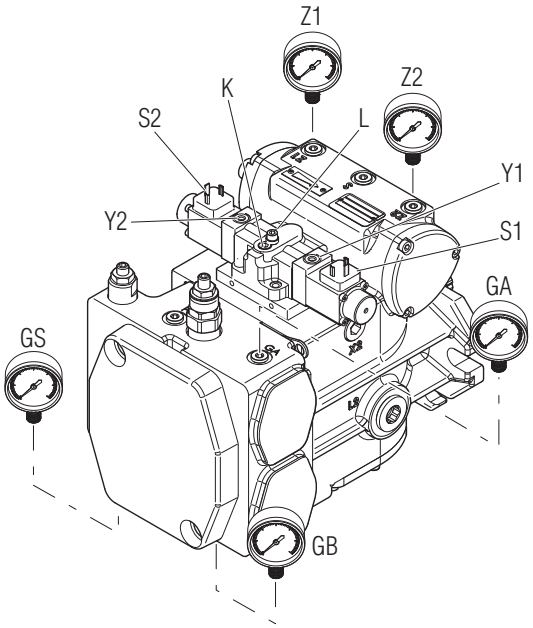
Hydraulic Zero-Setting of the Controls C-F-H
Plug the pressure gauges Z1-Z2 and check the pressure on the servo piston sides: max △p accepted = 1 bar.

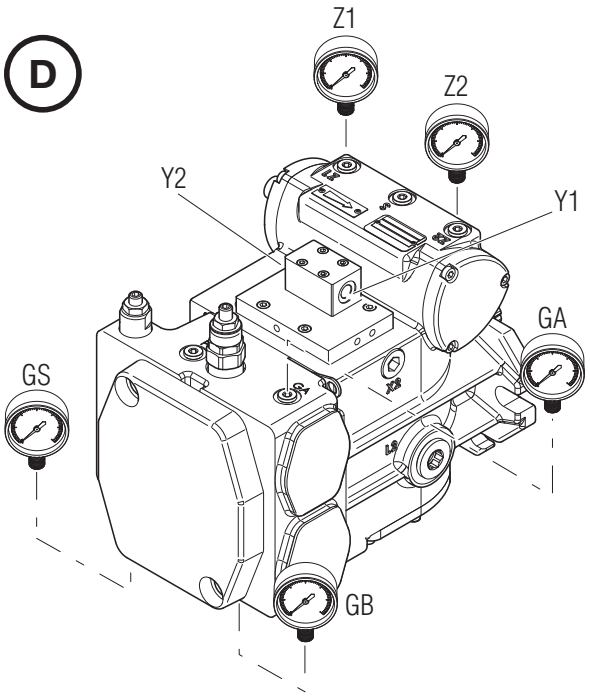
Set this value within this range adjusting the screw (K). At the rotation speed of normal use, swivel the pump to maximum displacement, via the hydraulic control (C) or electric control (F-H), then suddenly release the said lever. The pump must swivel back to zero flow within two seconds. Repeat the procedure for both flow directions. There must be no significant difference between the two flow directions (equal pressure on GA and BG, max 2-3 bar differential).

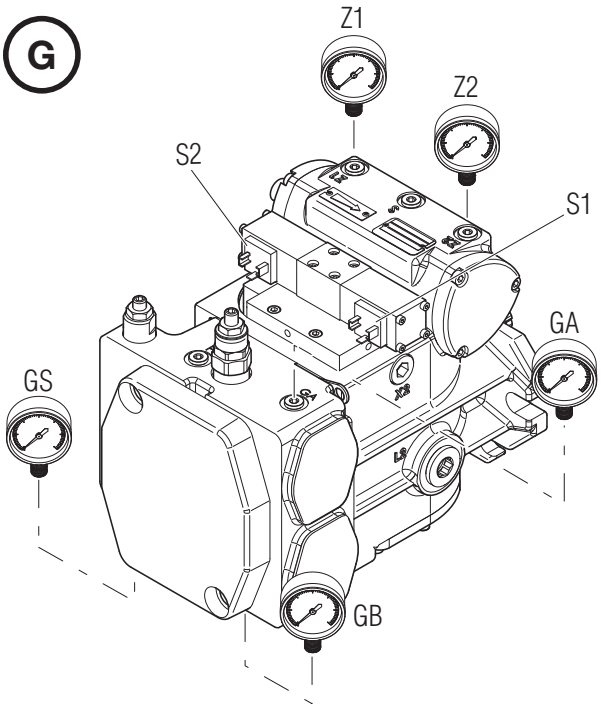
If this should occur, act on the control hydraulic zero-setting screw (K) unblocking the screw (L) for eccentic fixing, turning them in order to restore the control zero-setting, until the proper control operation is achieved.

Check the control operation repeating procedure as described above in both the flow directions. The pump must always restore the zero flow position.

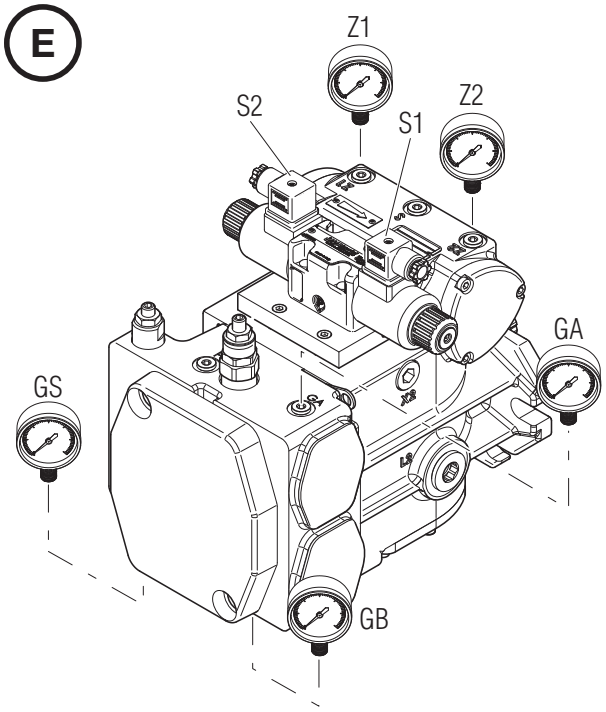
Alternative supply current to the magnets S1-S2 (or pressure to the attacks Y1-Y2). Check the current (or pressure) of the control start and the max flow value with and without load. If the parameters do not fall within the expected values check the hydraulic zero.







Check for Correct Operation Controls D-E-G
Feed voltage current to solenoids S1-S2 (or feed pressure to Y1-Y2) to check current (or pressure) of the control start and the max flow (see table on page 40) with and without load. If the parameters do not fall within the expected values the control or the pump must be checked for damage or wear.



P1 = Install a pressure gauge 0 ÷ 25 bar (0-365 PSI)
P2 = Install a pressure gauge 0 ÷ 25 bar (0-365 PSI)
GS = Install a pressure gauge 0 ÷ 60 bar (0-870 PSI)
GA = Install a pressure gauge 0 ÷ 600 bar (0-8700 PSI)
GB = Install a pressure gauge 0 ÷ 600 bar (0-8700 PSI)
S1/S2 = Input electrical signal
Y1/Y2 = Hydraulic input signal
K = Setting screw for zero setting
L = Locking screw of screw “K”

Alternately activate solenoids S1-S2 to check proper functioning of the “ON-OFF” control

Control Setting Values						
			Minimum Value of Piloting Pressure on Starting	**Maximum Value of Piloting Pressure on Starting**	**Minimum Value of Piloting Pressure on Finish**	**Maximum Value of Piloting Pressure on Finish**
A	Manual lever control with feedback	–	–	–	–	–
C	Hydraulic proportional with feedback	(*)	5 bar	7 bar	16 bar	19.5 bar
D	Hydraulic proportional without feedback	(*)	5 bar	7 bar	12 bar	15 bar
F	Electric proportional with feedback	24V (*)	180 mA	240 mA	540 mA	660 mA
		12V (*)	360 mA	460 mA	1080 mA	1320 mA
G	Electric proportional without feedback	24V (*)	235 mA	365 mA	585 mA	715 mA
		12V (*)	470 mA	730 mA	1170 mA	1430 mA
E	Electric on/off		–	–	–	–
H	Electric proportional with feedback, with hydraulic emergency override	24V (**)	180 mA	240 mA	540 mA	660 mA
		12V (**)	360 mA	460 mA	1080 mA	1320 mA

**Max case pressure: 1 bar*
***Testing functionality hydraulic emergency*

Troubleshooting Matrix	
Symptom	**Possible Causes**
Pump not operating in either direction	Low fluid level in reservoir
	Charge pump suction line plugged or disconnected
	Cross port relief damaged
	Wrong input rotation
	Command to pump control may be faulty
	Damaged actuator
Symptom	**Possible Causes**
Pump operates sluggishly or generates erratic movement	Low fluid level in reservoir
	Charge pump suction line restricted
	Improper charge pressure, check charge relief
	Command to pump control may be faulty
	Damaged actuator
Symptom	**Possible Causes**
Transmission operating hot	Heat exchanger improperly sized
	Heat exchanger damaged/plugged
	Excessive operation over cross port reliefs
	Cross port relief damaged
	Actuator damaged/bypassing fluid
	Low fluid level in reservoir
Symptom	**Possible Causes**
Excessive noise from system	Improper shaft alignment
	Charge pump suction line restricted/cavitation of charge pump
	Low fluid level in reservoir
	Aeration of hydraulic fluid in tank
Symptom	**Possible Causes**
Leakage from shaft seal	Case drain pressure too high
	Seal damaged
Symptom	**Possible Causes**
High case drain pressure	Drain hose improperly sized
	Drain hose restricted or blocked
Symptom	**Possible Causes**
Slow actuator speed	Prime mover RPM is slow
	Improper charge pressure, check charge relief
	Charge pump suction line restricted
	Oil temperature too high
Symptom	**Possible Causes**
Low actuator output force	Cross port relief damaged
	Cross port relief improperly set
	Actuator damaged
	Oil temperature too high

When diagnosing, it is suggested that you have two 600 bar (8700 PSI) pressure gauges (system pressure), a 60 bar (870) PSI pressure gauge (charge pressure), a vacuum gauge (charge inlet), tachometer (engine RPM), amp meter (electric motor current draw), and temperature gun (to measure system temperatures).

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