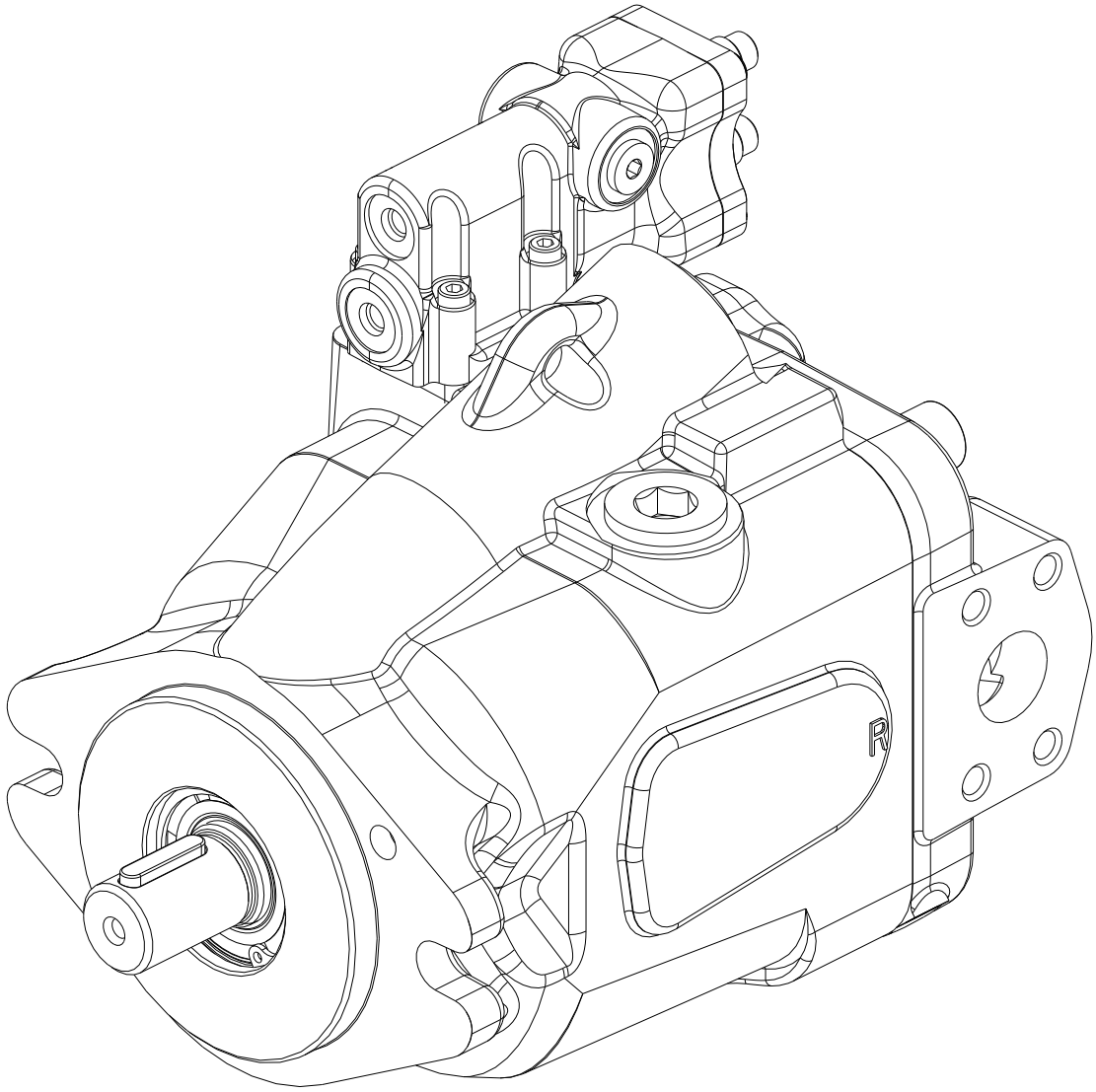
420 Mobile piston pump
Service manual

ADU041
ADU049

ADU062
ADU080

Design code C



Powering Business Worldwide

Table of contents

Service Parts

Repair

Part identification

Item	Part number	Quantity	Description	Page number
1	See table 1	1	Shaft, drive & key ●	10
2	Not saleable	1	Ring, crush/bearing shim kit 9900194-008 ●	32
3	See table 1	1	Key, drive shaft	10
4	See table 2	1	Endcover ●	11
6	16026-610	1	Roll pin (Valve plate)	6
8	See table 3	1	Plate, valve	12
10	16015-58-90	1	O-Ring (End pilot cover)	6
12	16003-405-90	2	O-Ring (End cover/Housing)	6
14	See table 4	1	Housing ●	13
16	4994698-001	1	Bearing assy, shaft (Front) ●	32
18	4994699-001	1	Bearing assy, shaft (Rear) ●	32
22	4993209-002	2	Bearing, swashplate	6
23	4993411-050	2	Screw, cap, socket, flat (Swash bearing)	6
24	4993194-001	1	Spring, bias	6
26	See table 5	1	Swash plate	14
28	See table 6	1	Rotating group S/A ■	14
30	16147-816	4	Screw, cap (Housing/Endcover)	6
31	882993	1	Vfo drain hole filter (Double shaft seal)	6
32	See table 7	1	Seal, shaft	15
33	16077-32	1	Ring, retaining, internal (Shaft seal)	6
34	16077-32	1	Ring, retaining, internal (Double shaft seal)	8
35	See table 7	1	Seal, shaft (double shaft seal)	15
36	See table 8	1	Compensator kit	16
37	See table 9	1	Cold start manifold (Destroke)	17
38	107275-011	2	O-Ring (Compensator/housing) ■	16
39	107275-017	1	O-Ring (Secondary compensator/housing) ■	16
40	See table 10	4	Screw, cap (Compensator mounting)	17

■ Standard seal kit: 9900633-000 (polyacrylate shaft seal)/ optional seal kit: 9900634-000 (flurocarbon shaft seal), 9900620-001 single flurocarbon shafts

△ Adjustable maximum displacement volume stop kit: 9900194-004

● Bearing shim kit required: 9900194 - 008

Part identification

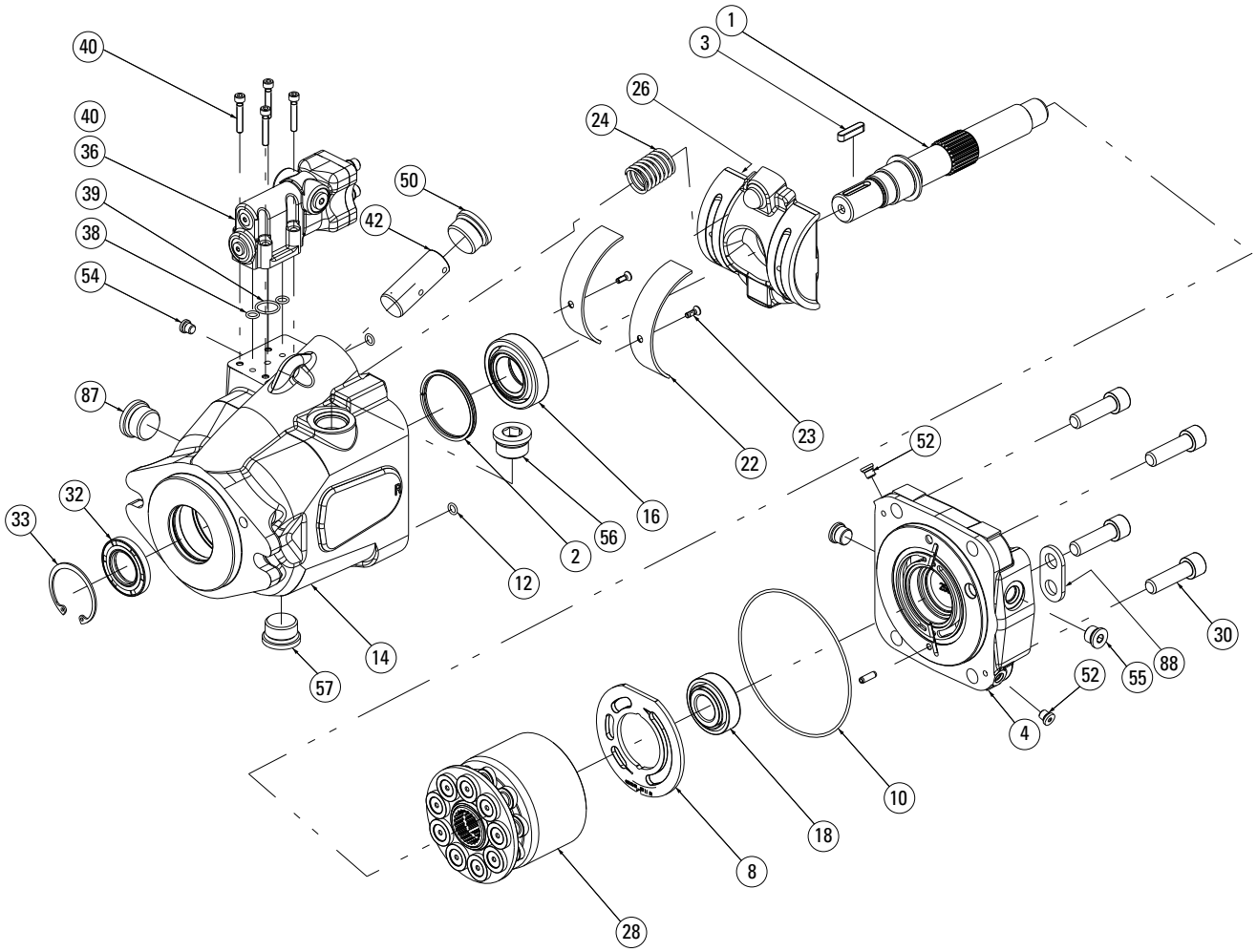
Item	Part number	Quantity	Description	Page number
42	See Table 11	1	Piston, control	18
44	See Page 8	1	Plug, adjustable volume stop Δ	8
45	See Page 8	1	O-Ring (adjustable volume stop) Δ	8
46	See Page 8	1	Screw, set (Adjustable volume stop) Δ	8
48	See Page 8	1	Nut, sealing (Adjustable volume stop) Δ	8
50	16103-314	1	Plug assy (Fixed volume stop)	6
52	16103-302	2	Plug (Endcover)	6
54	16103-302	1	Plug (Housing)	6
55	See Table 12	2	Plug (Diagnostic ports)	18
56	See Table 12	1	Plug (Top case drain port)	18
57	See Table 12	1	Plug (Bottom case drain port)	18
58	937166	1	Cover, tamper proof (Compensator adj. screws)	18
80	See Table 13	1	Thru drive coupler	19
81	16008-000	1	Coupler lock ring	-
84	See Table 14	1	Cover plate	19
86	See Table 15	2	Hex head cap screw (Cover plate)	20
88	101822-000	1	Lifting strap	6
91	See Table 16	1	Electronic displacement control S/A	20
92	473712	4	Screw, hex socket	7
93	6035825-012	1	Coil, 12V	7
94	6041646-001	1	Check valve	7
95	6039386-001	1	Spring, feedback	7

■ Standard seal kit: 9900633-000 (polyacrylate shaft seal)/ optional seal kit: 9900634-000 (flurocarbon shaft seal), 9900620-001 single flurocarbon shafts

Δ Adjustable maximum displacement volume stop kit: 9900194-004

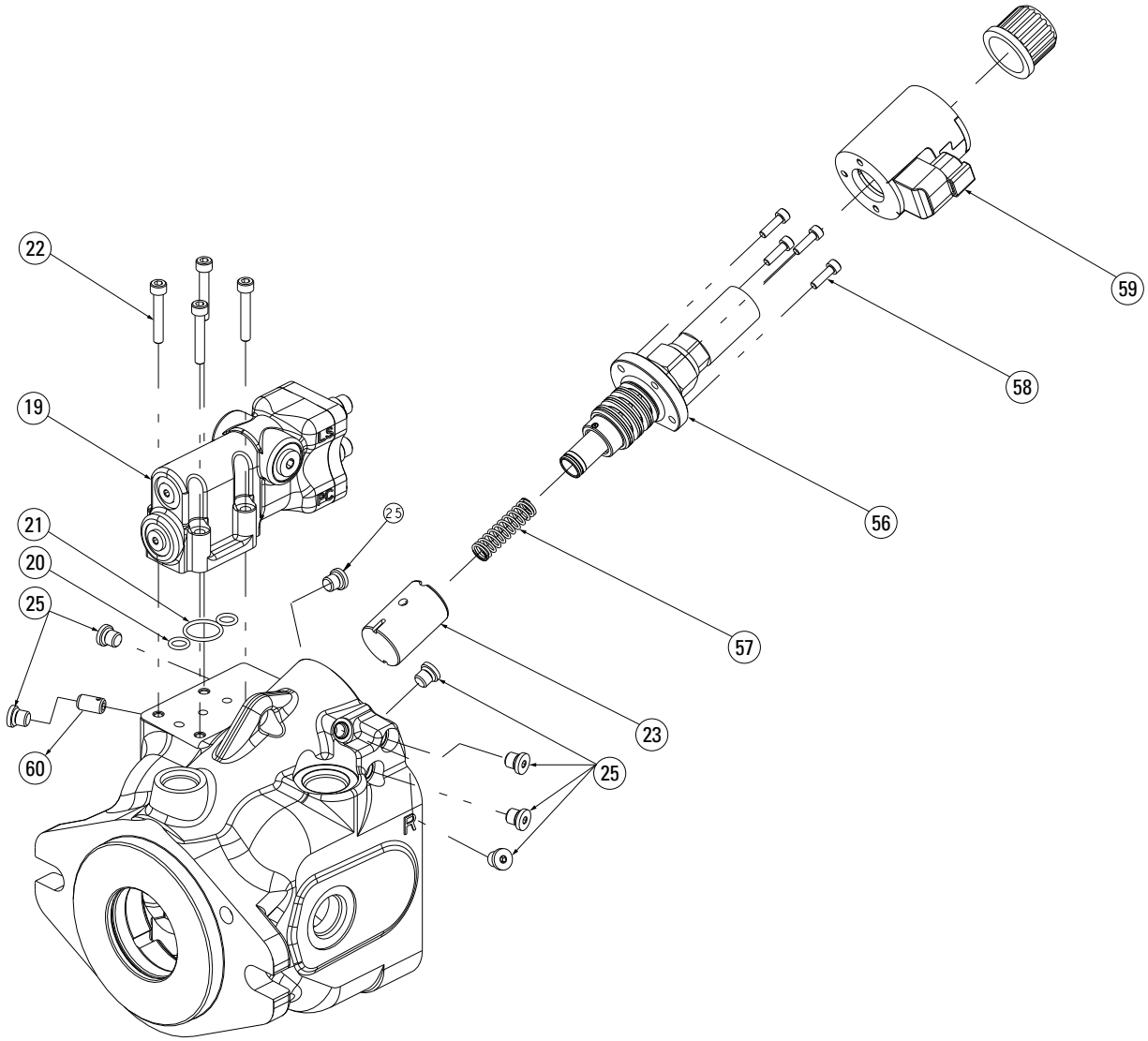
● Bearing shim kit required: 9900194-008

Exploded assembly



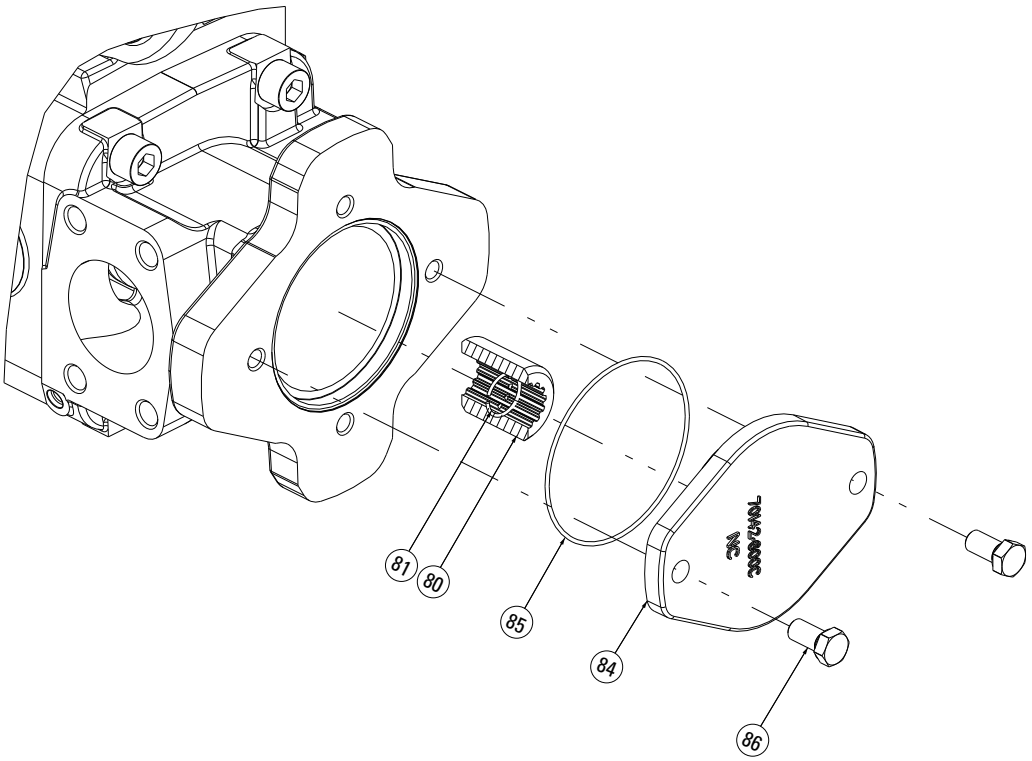
Optional assembly

Electronic displacement control option

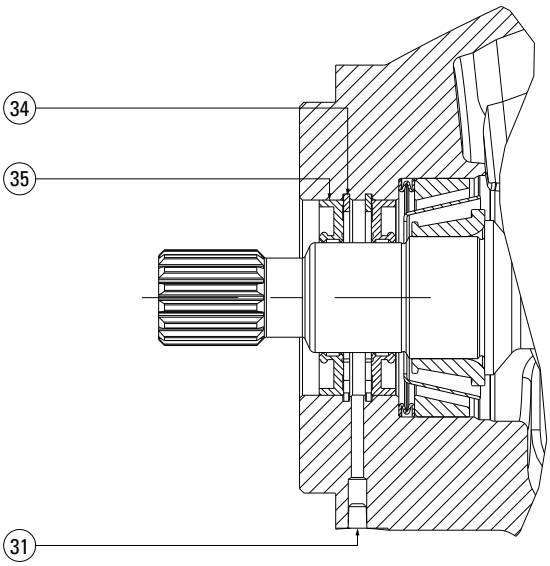


Optional assembly

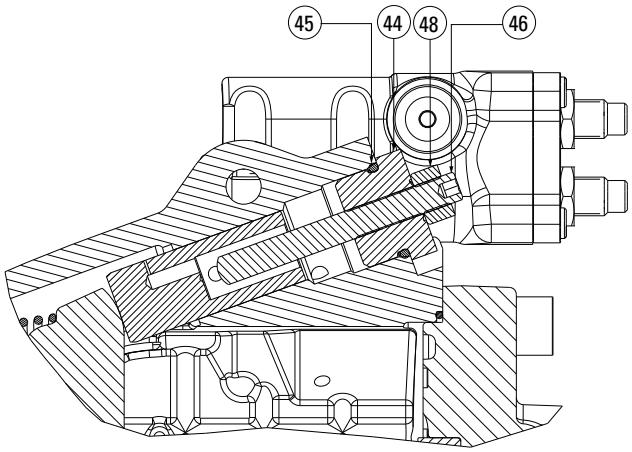
Through drive part option



Dual seal option



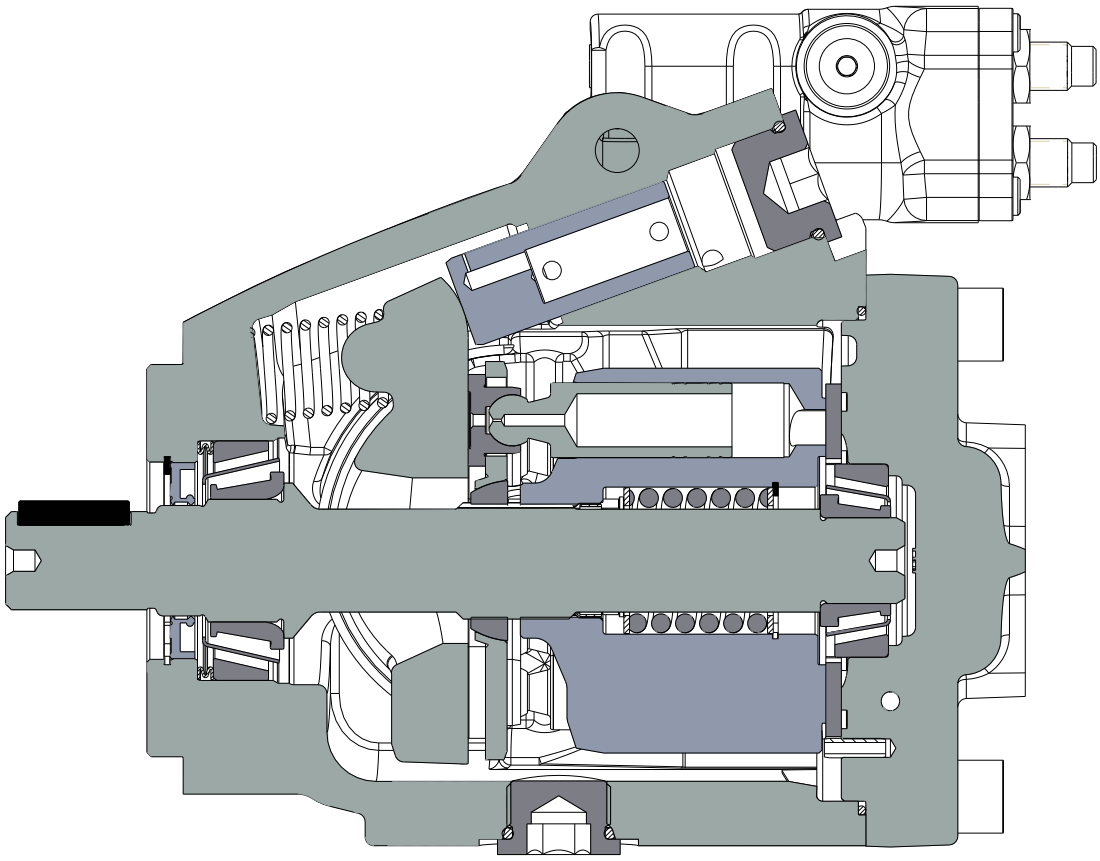
Maximum adjustable stop options



Replaces plug sub-assembly item 50-reference kit 9900194-004

Typical cross section

Side view

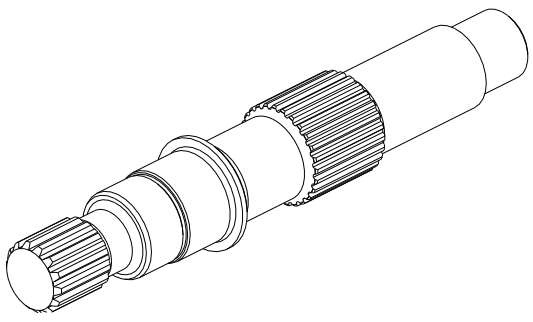


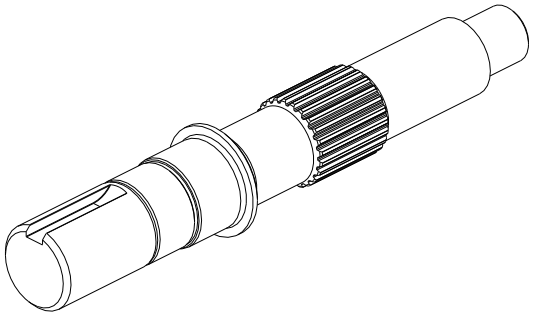
Drive shaft & key - Items 1 & 3

Table 1

Table 1. Drive shaft & key (Items 1 & 3)

Code position 8, 9	26, 27	28	Key (Item 3)	Part number	Description
01	00	0,1,2,4,6	24500-619	4997174-005	0. 875 Dia. W/Key, 1.62 Ext
01	AA	0,1,2,4,6	24500-619	4997177-013	0. 875 Dia. W/Key, 1.62 Ext
01	AB	0,1,2,4,6	24500-619	4997177-014	0. 875 Dia. W/Key, 1.62 Ext
01	AC	0,1,2,4,6	24500-619	4997177-015	0. 875 Dia. W/Key, 1.62 Ext
02	00	0,1,2,4,6	16246-516	4997174-004	1.00 Dia. W/Key, 1.81 Ext.
02	00	3	16246-516	4997174-013	1.00 Dia. W/Key, 1.81 Ext. (Dual seal)
02	AA	0,1,2,4,6	16246-516	4997177-007	1.00 Dia. W/Key, 1.81 Ext.
02	AB	0,1,2,4,6	16246-516	4997177-008	1.00 Dia. W/Key, 1.81 Ext.
04	00	0,1,2,4,6	20100-25	4997174-002	SAE J744-25-3 Taper
04	AA	0,1,2,4,6	20100-25	4997177-002	SAE J744-25-3 Taper
04	AC	0,1,2,4,6	20100-25	4997177-003	SAE J744-25-3 Taper
04	AB	0,1,2,4,6	20100-25	4997177-004	SAE J744-25-3 Taper
05	00	3,5,6	-	4995082-003	13 Tooth, 1.62 Ext (Dual seal)
05	00	0,1,2,4,6	-	4997174-003	13 Tooth 16/32, 1.62 Ext
05	AA	0,1,2,4,6	-	4997177-010	13 Tooth 16/32, 1.62 Ext
05	AB	0,1,2,4,6	-	4997177-011	13 Tooth 16/32, 1.62 Ext
05	AC	0,1,2,4,6	-	4997177-012	13 Tooth 16/32, 1.62 Ext
08	00	0,1,2,4,6	-	4997174-001	15 Tooth 16/32, 1.81 Ext
08	AC	0,1,2,4,6	-	4997177-001	15 Tooth 16/32, 1.81 Ext
08	AA	0,1,2,4,6	-	4997177-005	15 Tooth 16/32, 1.81 Ext
08	AB	0,1,2,4,6	-	4997177-006	15 Tooth 16/32, 1.81 Ext
08	AC	3,5	-	4997596-001	15 Tooth, 1.81 Ext (Dual seal)
08	00	3,5	-	4995082-001	15 Tooth, 1.81 Ext (Dual seal)
30	00	0,1,2,4,6	-	4997174-006	1.00 Taper W/.375-24 Thd.
30	AA	0,1,2,4,6	-	4997177-016	1.00 Taper W/.375-24 Thd.
30	AB	0,1,2,4,6	-	4997177-017	1.00 Taper W/.375-24 Thd.
30	AC	0,1,2,4,6	-	4997177-018	1.00 Taper W/.375-24 Thd.
31	00	0,1,2,4,6	16246-516	4997174-007	1.00 DIA. W/Key & .375 Thd.
32	AA	3,5,6	-	6029472-001	14 Tooth 12/24, 2.19 Ext.
32	00	3,5	-	4998581-001	14 Tooth 12/24, 2.19 Ext.
33	00	3,5,6	-	4998581-002	1.25 Dia. W/Key, (Dual seal)
34	00	0,1,2,4,6	-	4997174-009	15 Tooth W/ 1/4-20 Thd.
35	00	0,1,2,4,6	-	4997174-011	14 Tooth 12/24,2.19 Ext
36	00	3,5	-	4998581-003	14 Tooth 12/24, 3.06 Ext.
37	00	3,5	-	4995082-002	11 Tooth, 1.50 Ext (Dual seal)
38	00	3,5	16029-1018	6025191-001	1.25 Dia. tapered, (Dual seal)



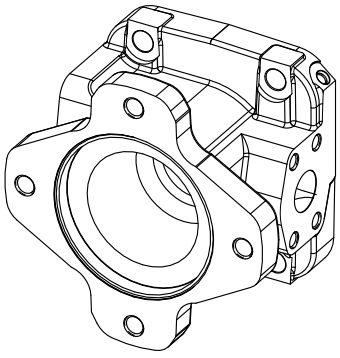


End cover - Item 4

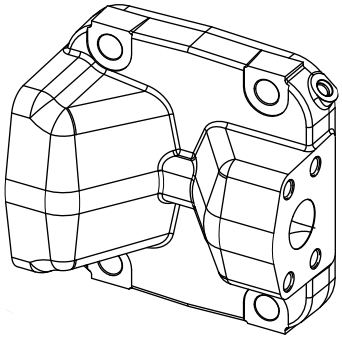
Table 2

Table 2. End cover (Item 4)

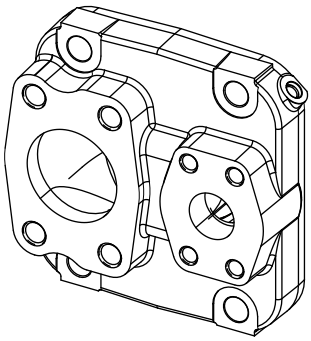
Code position 4, 5, 6	10, 11	13	26, 27	Kit number	Part number	Description
041	AB	0	AC,AD	9900267-022	5992827-001	Endcover, thru-drive dual B, Code 61, 2.50
041	AB	0	00	9900267-026	5992833-001	Endcover, side port, Code 61, 2.50
041	AD	0	00	9900267-027	5992833-002	Endcover, side port, Code 61, 2.50, Metric
041	AA	0	00	9900267-029	5992835-001	Endcover, rear port, Code 61, 2.50
041	AC	0	00	9900267-030	5992835-002	Endcover, rear port, Code 61, 2.50, Metric
041	AE	0	00	9900267-013	5992843-001	Endcover, rear port, SAE threaded, 2.50
041	AF	0	00	9900267-014	5992847-001	Endcover, side port, SAE threaded
041	AF	0	AA,AB,AE	9900267-015	5992851-001	Endcover, thru-drive dual A, SAE threaded, 2.50
041	AF	0	AC,AD	9900267-016	5992851-002	Endcover, thru-drive dual B, SAE threaded, 2.50
049	AB	0	AC,AD	9900267-003	5992825-001	Endcover, thru-drive dual B, Code 61, 3.00
049	AD	0	AC,AD	9900267-004	5992825-002	Endcover, thru-drive dual B, Code 61, 3.00 Metric
049	AB	0	00	9900267-007	5992831-001	Endcover, side port, Code 61, 3.00
049	AD	0	00	9900267-008	5992831-002	Endcover, side port, Code 61, 3.00, Metric
049	AD	4	00	9900267-025	5992831-003	Endcover, side port, Code 61 3.00, Metric
049	AA	0	00	9900267-009	5992837-001	Endcover, rear port, Code 61, 3.00
049	AC	0	00	9900267-010	5992837-002	Endcover, rear port, Code 61, 3.00, Metric
049	AE	0	00	9900267-041	5992841-001	Endcover, rear port, SAE threaded, 3.00
049	AF	0	00	9900267-042	5992845-001	Endcover, side port, SAE threaded
049	AF	0	AA,AB	9900267-043	5992849-001	Endcover, thru-drive dual A, SAE threaded, 3.00
062,080	AB	0	AC,AD,AF	9900267-001	5992823-001	Endcover, thru-drive dual B, Code 61
062,080	AD	0	AC,AD	9900267-002	5992823-002	Endcover, thru-drive dual B, Code61 Metric
062,080	AB	0	00	9900267-005	5992829-001	Endcover, side port, Code 61
062,080	AD	0	00	9900267-006	5992829-002	Endcover, side port, Code61, Metric
062,080	AB	3	00	9900267-017	5992829-003	Endcover, side port, Code 61
062,080	AA	0	00	9900267-011	5992839-001	Endcover, rear port, Code 61
062,080	AC	0	00	9900267-012	5992839-002	Endcover, rear port, Code 61 Metric



Thru-drive



Side ported



Rear ported

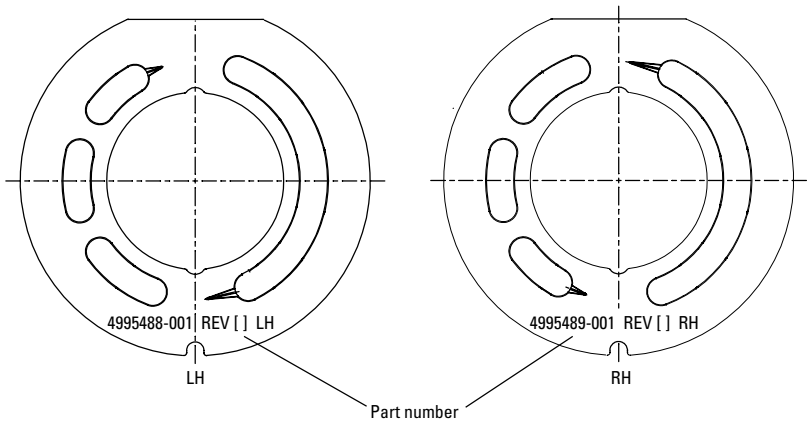
Valve plate - Item 8

Table 3

Table 3. Valve plate (Item 8)

Code position 4, 5, 6	7	Part number	Description
041	L	4997402-013	Plate, valve 41cc (LH, 2.50)
041	R	4997403-013	Plate, valve 41cc (RH, 2.50)
049	L	4995488-014	Plate, valve 49cc (LH, 3.00)
049	R	4995489-014	Plate, valve 49cc (RH, 3.00)
062	L	4995491-001	Plate, valve 62cc (LH, 3.80)
062	R	4995492-001	Plate, valve 62cc (RH, 3.80)
080	L	5986963-001	Plate, valve 80cc (LH, 4.88)
080	R	4998319-001	Plate, valve 80cc (RH, 4.88)
080	L	6024952-002	Plate, valve (LH) - IMM
080	R	6024952-001	Plate, valve (RH) - IMM

Valve plate identification

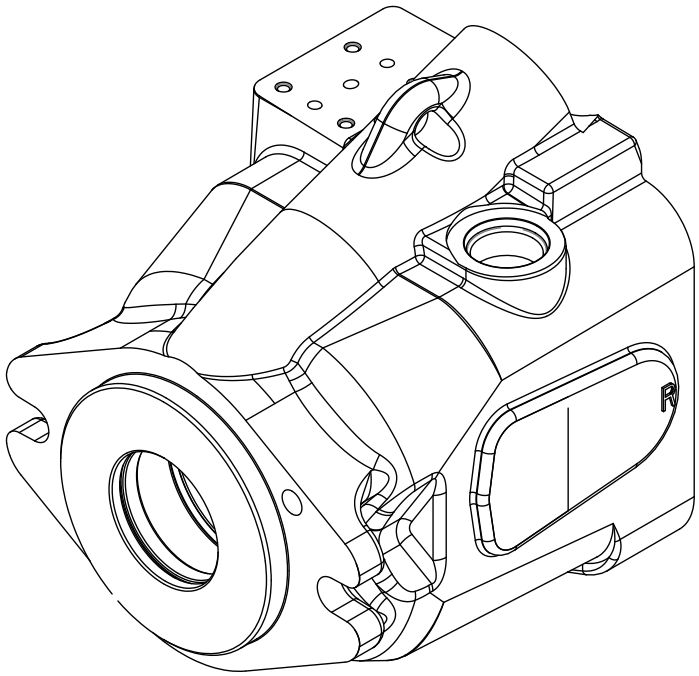


Housing - Item 14

Table 4

Table 4. Housing (Item 14)

Code position 8,9	12	28	29, 30	Part number	Description
Not 32	1,2,7,9,A	0,1,2,4	Not AB, AC	5999590-001	Housing
Not 32	3,4	0,1,2,4	Not AB, AC	5999590-002	Housing (Metric)
Not 32	1,2,7	0,1,2,4	AB	5999590-003	Housing (Swash sensor)
Not 32	1,2,7	0,1,2,4	AC	5999590-004	Housing (Speed sensor)
Not 32	1,2,7,9	0,1,2,4	Not AB, AC	5999591-001	Housing (W/Torque control)
Not 32	3,4	0,1,2,4	Not AB, AC	5999591-002	Housing (Metric, W/Torque control)
Not 32	1,2,7	0,1,2,4	AB	5999591-003	Housing (Swash sensor, W/Torque control)
32	1,2,7	3	Not AB, AC	5999592-001	Housing (C mount, Dual seal)
32	1,2,7	5	Not AB, AC	5999592-002	Housing (C mount)
32	1,2,7	3	00,AA,AE	5999593-001	Housing (C mount, Dual seal, W/Torque control)
32	1,2,7	5	Not AB, AC	5999593-002	Housing (C mount, W/Torque control)
32	3,4	5	00,AA,AE	5999593-003	Housing (C mount, Metric W/Torque control)
Not 32	1,2,7,A	3,6	Not AB, AC	5999819-001	Housing (Double seal)
Not 32	3,4	3	Not AB, AC	5999819-002	Housing (Double seal, Metric)
Not 32	1,2,7	3	AB	5999819-003	Housing (Double seal, Swash sensor)
Not 32	G	0,1,2,4	Not AB, AC	6040034-001	Housing (Metric)
Not 32	Not 5	-	-	6038971-002	Housing, EDC



Swash plate - Item 26
Rotating groups - Item 28

Table 5 & 6

Table 5. Swash plate (Item 26)

Code position 29, 30	Part number	Description
Not AB,AG	4997172-001	Swashplate
AB,AG	4997172-002	Swashplate (Feedback sensor)

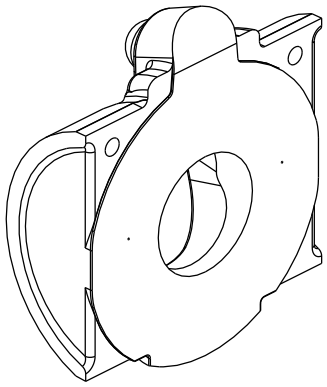
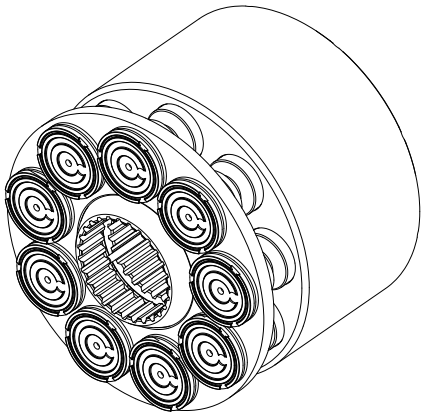


Table 6. Rotating groups (Item 28)

Code position 4, 5, 6	29, 30	Part number	Description
041	Not AC	4993556-001	Rotating group S/A 41cc (2.50 in3)
041	AC	4993556-002	Rotating group S/A 41cc (2.50 in3) (Speed sensor)
049	Not AC	4993463-001	Rotating group S/A 49cc (3.00 in3)
049	AC	4993463-002	Rotating group S/A 49cc (3.00 in3) (Speed sensor)
062	Not AC	4993735-001	Rotating group S/A 62cc (3.80 in3)
062	AC	4993735-002	Rotating group S/A 62cc (3.80 in3) (Speed sensor)
062	Not AC	4993735-004	Rotating group S/A 62cc (3.80 in3)
080	Not AC	4998046-001	Rotating group S/A 80cc (4.88 in3)
080	AC	4998046-002	Rotating group S/A 80cc (4.88 in3) (Speed sensor)

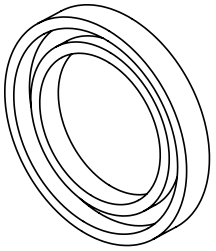


Shaft seals - Items 32 & 35

Table 7

Table 7. Shaft seals (Item 32 & 35)

Code position 8, 9	28	Part number	Description
Not 32,33	2,3,6	16253-218	Seal, shaft, fluorocarbon, SAE B
Not 32,33	1	4993012-001	Seal, shaft, polyacrylate, SAE B
Not 32,33	4	16253-18	Seal, shaft, nitrile, SAE B
32,33	2,3,5,6	4998834-001	Seal, shaft, fluorocarbon, SAE C

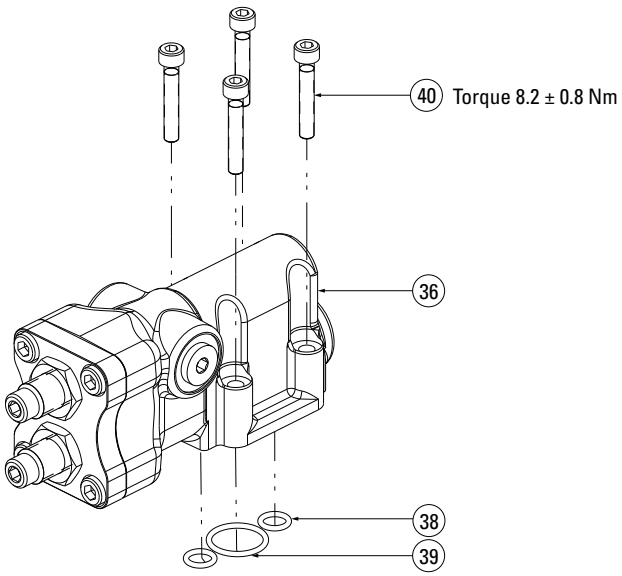


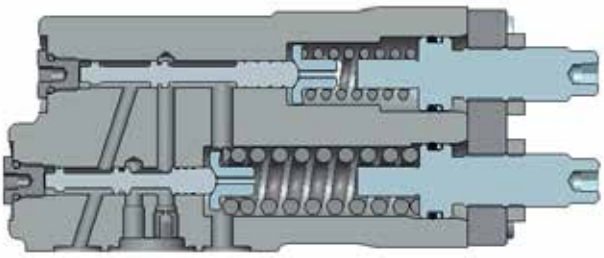
Compensator kits - Items 36, 38, 39 & 40

Table 8 - Factory set

Table 8. Compensator kits (Items 36, 38, 39 & 40)

Code position 14, 15	16,17	Pressure limit setting	18,19	Flow setting	22, 23	Part number
AA	28	206.8-213.7 Bar [3000-3100 lbf/in^2]	23	23.10-25.17 Bar [335-365 lbf/in^2]	00	9901219-001
AA	32	226.5-233.4 Bar [3285-3385 lbf/in^2]	16	13.79-16.55 Bar [200-240 lbf/in^2]	00	9901219-002
AA	27	199.9-206.8 Bar [2900-3000 lbf/in^2]	25	23.44-26.89 Bar [340-390 lbf/in^2]	00	9901219-003
AA	43	275.8-282.7 Bar [4000-4100 lbf/in^2]	16	13.79-16.55 Bar [200-240 lbf/in^2]	00	9901219-008
AA	39	258.6-265.4 Bar [3750-3850 lbf/in^2]	28	26.20-28.96 Bar [380-420 lbf/in^2]	00	9901219-049
AA	15	151.7-158.6 Bar [2200-2300 lbf/in^2]	34	4.50-6.90 Bar [66-100 lbf/in^2]	00	9901219-063
AA	19	168.9-175.8 Bar [2450-2550 lbf/in^2]	20	17.24-19.99 Bar [250-290 lbf/in^2]	00	9901219-080
AA	12	137.9-144.8 Bar [2000-2100 lbf/in^2]	10	9.65-12.41 Bar [140-180 lbf/in^2]	00	9901219-081
AA	35	241.3-248.2 Bar [3500-3600 lbf/in^2]	14	12.41-15.17 Bar [180-220 lbf/in^2]	00	9901219-028
AB	28	206.8-213.7 Bar [3000-3100 lbf/in^2]	24	22.75-25.51 Bar [330-370 lbf/in^2]	00	9901219-012
AB	43	275.8-282.7 Bar [4000-4100 lbf/in^2]	24	22.75-25.51 Bar [330-370 lbf/in^2]	00	9901219-011
AB	27	199.9-206.8 Bar [2900-3000 lbf/in^2]	17	15.86-18.62 Bar [230-270 lbf/in^2]	00	9901219-040
AC	12	137.9-144.8 Bar [2000-2100 lbf/in^2]	00	No flow comp. setting	00	9900512-021
AC	19	168.9-175.8 Bar [2450-2550 lbf/in^2]	00	No flow comp. setting	00	9900512-023
AC	21	179.3-186.2 Bar [2600-2700 lbf/in^2]	00	No flow comp. setting	00	9900512-029
AC	28	206.8-213.7 Bar [3000-3100 lbf/in^2]	00	No flow comp. setting	00	9900512-016
AC	43	275.8-282.7 Bar [4000-4100 lbf/in^2]	00	No flow comp. setting	00	9900512-009
AC	45	306.8-313.7 Bar [4450-4550 lbf/in^2]	00	No flow comp. setting	00	9900512-004





Cold start manifold (Destroke) - Item 37
Compensator mounting screws - Item 40

Table 9 & 10

Table 9. Cold start manifold (Destroke) (Item 37)

Code position 22, 23	Part number	Description
0L	631AA00288A-009	Destroke manifold with metri-pack connector
0C	631AA00288A-003	12V DC destroke manifold with integrated deutsch connector
0B	631AA00288A-015	24V DC destroke manifold with deutsch connector

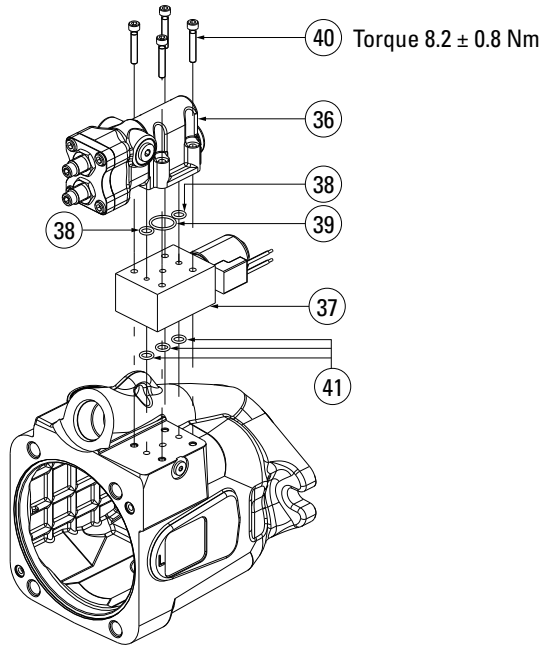


Table 10. Compensator mounting screws (Item 40)

Code position 14, 15	22, 23	Part number	Description
AA,AB,AC	00,0A,0L	114953-030	Screw, cap (Compensator mounting)
AH,AJ, AV	0V,0S,0T,0U	114953-070	Screw, cap (Compensator mounting)
-	0C,0D,0G,0H	114953-060	Screw, cap (Compensator/manifold mounting)
-	0Y,0Z,AA	114953-065	Screw, cap (Compensator/manifold mounting)

Control piston - Item 42
Plug sub-assemblies - Items 55, 56 & 57

Table 11 & 12

Table 11. Control piston (Item 42)

Code position 14, 15	29, 30	Part number	Description
Not AT,AY	Not AF,AK	6023986-001	Piston, control
Not AT,AY	AF,AK	6023987-001	Piston, control special
AT,AY	AB	6039060-002	Piston, control EDC

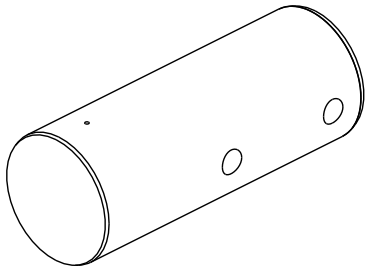


Table 12. Plug sub-assemblies (Item 55, 56 & 57)

Code position 12	13	Part number	Description
1,2	3	16103-304	Plug (Diagnostic ports) 0.4375-20 Thd.
1,2	1	16103-306	Plug (Diagnostic ports) 0.5625-18 Thd.
3,4	4	9237-002	Plug (Diagnostic ports) M12 x 1.5 Thd.
3,4	2	115050-014	Plug (Diagnostic ports) M14 x 1.5 Thd.
1,5	1,3	16103-312	Plug (Top case drain port) 1.0625-12 Thd.
3	2,4	9237-009	Plug (Top case drain port) M27 x 2 Thd.
2,5	1,3	16103-312	Plug (Bottom case drain port) 1.0625-12 Thd.
4	2,4	9237-009	Plug (Bottom case drain port) M27 x 2 Thd.
6	0	9170-005	Plug (Bottom case drain port) G 3/4 BSPP

Thru drive coupler - Item 80
Cover plate - Item 84

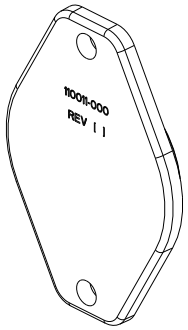
Table 13 & 14

Table 13. Thru drive coupler (Item 80)

Code position 26, 27	Part number	Description
AB	70111-687	Coupler, 11 Tooth (SAE A)
AC	70411-638	Coupler S/A, 13 Tooth (SAE B)
AE	5987377-001	Coupler, 9 Tooth (SAE A)
AD	475134	Coupler, 15 Tooth (SAE B)
AC	864307	Coupler, 13 Tooth (SAE B)

Table 14. Cover plate (Item 84)

Code position 26, 27	29, 30	Part number	Description
AC,AD,AF	AA	110011-000	Cover, B-Pad
AA,AB,AE	AA	70142-600	Cover, A-Pad



Hex head cap screw (Cover plate) - Item 86
Electronic displacement control S/A - Item 91

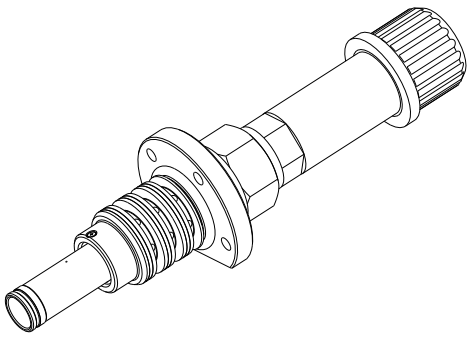
Table 15 & 16

Table 15. Hex head cap screw (Cover plate) (Item 86)

Code position 26, 27	29, 30	Part number	Description
AA,AB,AE	AA	16032-606	Screw, cap (A cover plate)
AC,AD,AF	AA	16136-812	Screw, cap (B cover plate)

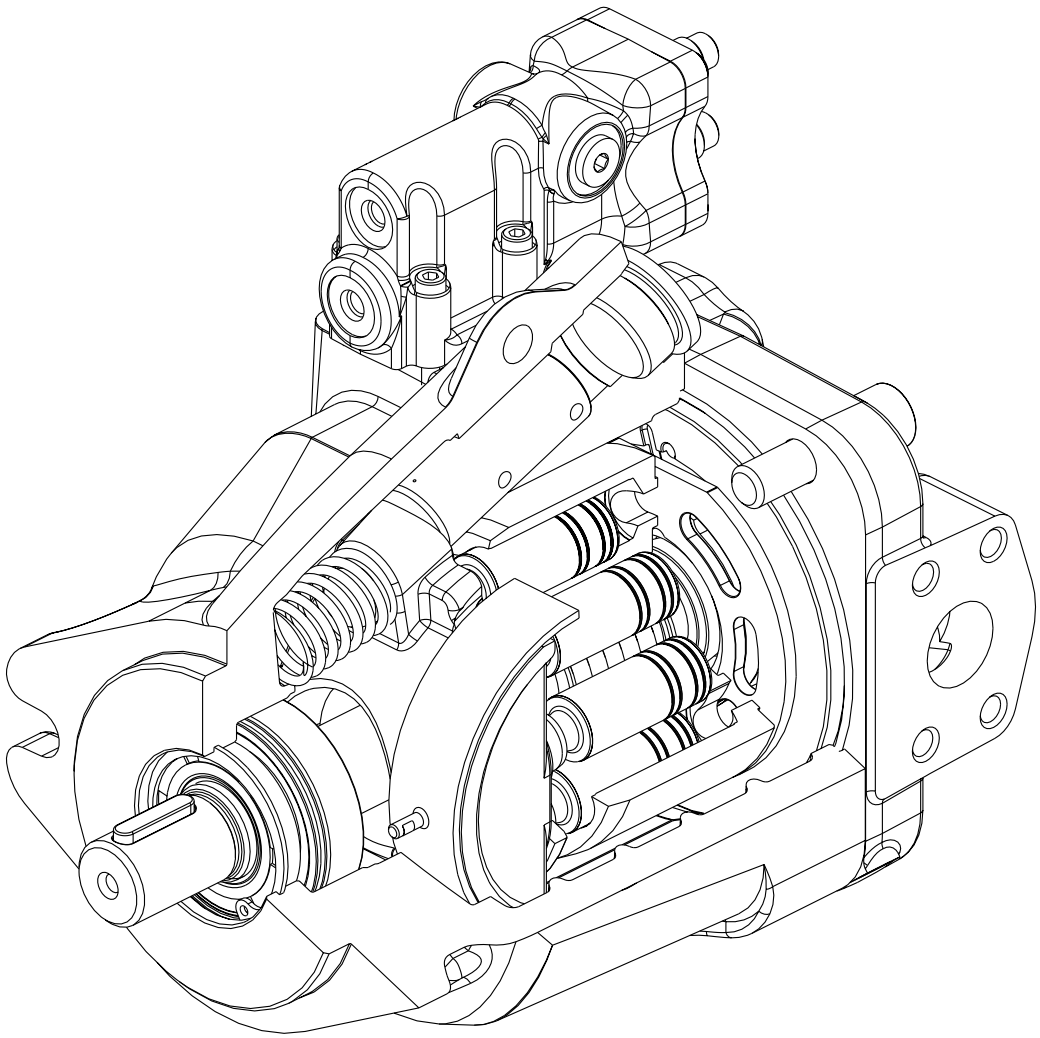
Table 16. Electronic displacement control S/A (Item 91)

Code position 14, 15	Part number	Description
AT	6041219-003	EDC, EP type
AY	6041167-003	EDC, EPD type



420 Mobile piston pump repair

Cutaway



General information

Ordering replacement parts

Read this assembly manual thoroughly before starting work on the pumps.

This manual assumes appropriately trained technicians with specialized knowledge of mechanical and hydraulic component assembly and disassembly.

Replacement parts

When ordering replacement parts, give the product number, date code, part name, part number and quantity of parts required. This product information is found stamped on the tag which is located on the side of the housing.

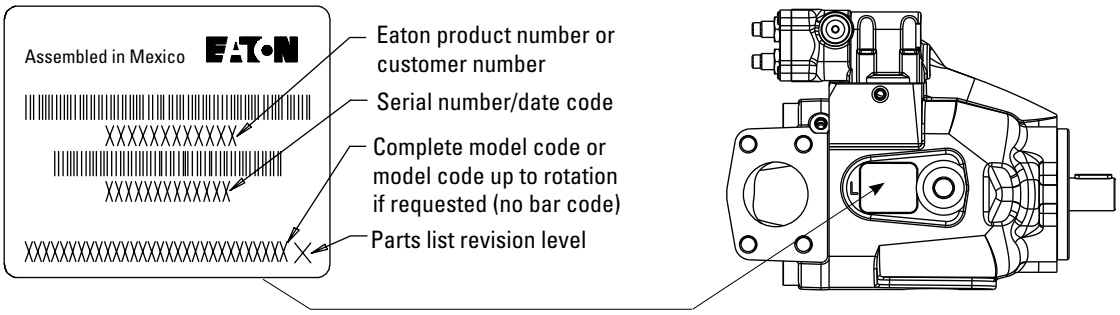
When the Eaton model 420 pressure, pressure-flow compensated piston pump is repaired, thoroughly clean the pump before any repairs are attempted.

The part number and serial number are on the tag.

Serial Number/Date Code Interpretation

08 02 17 RC 1010

- 08 — Year Built
- 02 — Month
- 17 — Day of Month
- RC — Manufacturing Plant - Reynosa, MX
- 1010 — Serial Number



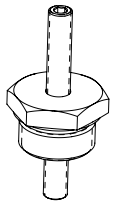
Required tools

Standard tools for disassembly

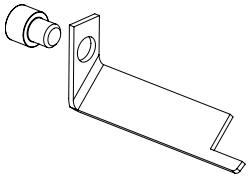
- Ball peen hammer
- Plastic tip hammer
- Flat tip screw driver
- Snap ring pliers
- Torque wrench
- Magnet stick
- 1-1/4" wrench
- 1-3/8" wrench
- 4mm Allen wrench
- 3/32" Allen wrench
- Impact screwdriver
- Sliding bearing remover hammer
- Dial indicator and accessories
- Marker or paint pen
- Petroleum jelly
- Cleaning solvent

Special tools

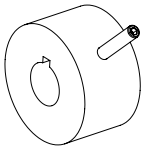
- Assembly Tool Kit 9900275-000 (includes)
  - – Swashplate Locator Tool



  - – Swashplate Retainer Tool



  - – Shaft Retainer Tool



Disassembly

Before attempting to disassemble, clean the pump exterior. Dispose of leakage oil and oily cloths in an environmentally responsible manner. All parts within the unit must be kept clean during the overhaul process.

Handle each part with great care, marking as necessary to ensure proper reassembly. The close tolerance of the parts makes this requirement very important. Clean all parts that are removed from the unit with a commercial solvent that is compatible with the system fluid. Compressed air may be used in the cleaning process. However, it must be filtered to remove water and other contamination.

1. Remove control piston plug assembly

2. Install Swash Plate Locator Tool

Adjustment will take place in Step 11.

3. Remove compensator

4. Remove end cover

Mark the housing and end cover to ensure orientation. Remove the four cap screws that hold the end cover in place.

Note: The valve plate may stick to end cover. Use caution so valve plate does not fall off.

5. Remove valve plate

6. Remove O-Ring seal

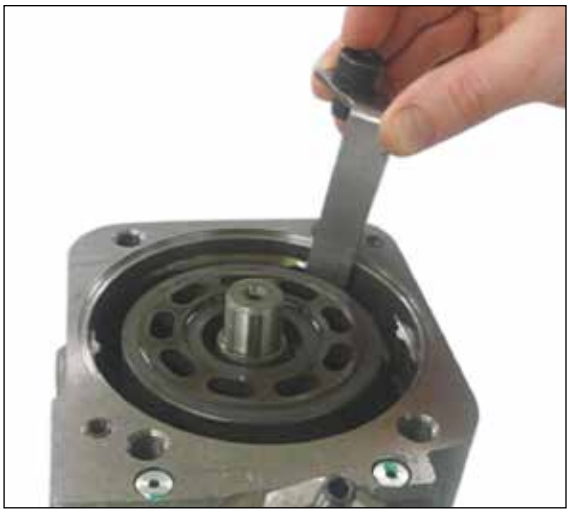
7. Remove bearing race

The bearing race is pressed in and will require the use of a sliding bearing removal hammer or similar tool to remove it.

8. Remove housing O-Rings

9. Remove bearing

10. Install swashplate retainer



Install the swash plate hold down tool and tighten the cap screw 16147-804. This will prevent the swash plate from moving.

11. Swashplate locator adjustment

With the hold down tool in place, tighten the adjustment screw so the control piston spring is compressed.

Note: This step is designed to force the swashplate to a neutral position to enable easy removal of the rotating group, and to retain the swashplate.

12. Install shaft retainer tool

Tighten the set screw while being careful not to damage shaft.

13. Remove rotating group

Position shaft upwards and carefully remove rotating group.

14. Remove shaft

Remove shaft retainer tool and lift out shaft. Use caution when moving shaft through shaft seal.

15. Remove swashplate locator

16. Remove swashplate retainer

17. Remove control piston

Note Orientation.

18. Remove swashplate

19. Remove bias spring

20. Remove bearing

21. Remove cradle bearing screws

Caution: Socket head cap screws are easily damaged during repair with improper tool.

22. Remove cradle bearings

Note: The cradle bearings are asymmetrical. Note proper orientation shown in picture.

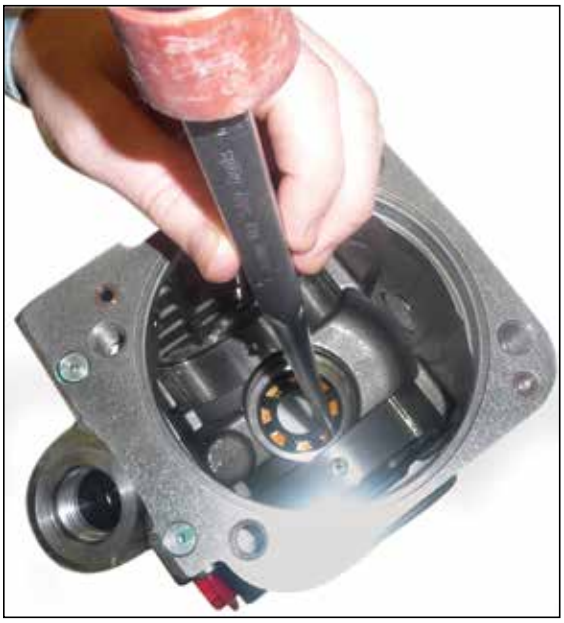
23. Remove front bearing race

24. Remove crush ring

Note: The crush ring located under the bearing cup in the housing does not need to be removed. The only time the crush ring needs to be removed is when the front or rear shaft tapered roller bearings, bearing cups, drive shaft, end cover or housing assembly is replaced. A shim kit is required if the crush ring is replaced.

25. Remove shaft seal

With the seal retaining ring removed use a punch or similar tool to knock out the shaft seal.



Inspection

Before inspection of parts, clean with a solvent that is compatible with system fluid.

Rotating group parts

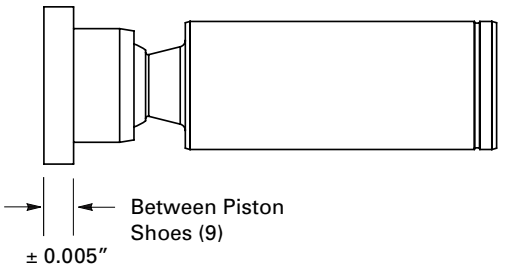
1. Inspect cylinder block face for wear, scratches, and/or erosion. If cylinder block condition is questionable, replace the entire rotating group.
2. Remove the pistons, spider, and spider pivot from piston block. The piston block assembly doesn't need to be disassembled unless the internal pins or spring are damaged.
3. Check each cylinder block bore for excessive wear. Use the piston and shoe S/A (37) for this purpose. The pistons should be a very close fit and slide in and out of the cylinder block bores. NO BINDING CAN BE TOLERATED. If binding occurs, clean the cylinder block and pistons. Lubricate the cylinder block bores with clean fluid and try again. Even minor contamination of the fluid may cause a piston to freeze up in a cylinder bore.
4. Inspect each of the nine piston and shoe subassemblies (31) for a maximum end play of 0.005 inch between the piston and shoe. Also check the face dimension of each shoe. The face dimension must be within 0.001 inch.
5. Inspect spider and spider pivot for wear and/or scratches. If condition is questionable, replace entire rotating group.

Do not lap the face of piston block assembly.

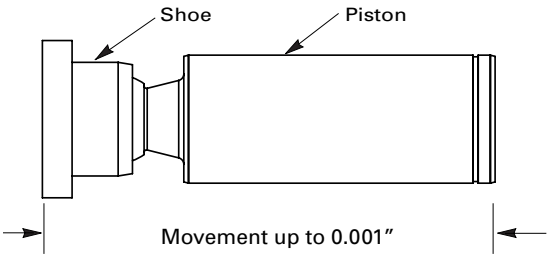
Piston S/A tolerances

Shoe face rides on swash plate. Shoe must swivel smoothly on ball.

End play must not exceed 0.005 inch.



This dimension must be maintained on all nine shoes within 0.001 inch.



Inspection, repair & part replacement

End cover & associated parts

1. Inspect end cover for erosion, cracks, and burrs. Clean up minor burrs with an India stone. If erosion or cracks are found, replace the valve block.
2. Inspect roller bearing and bearing race for nicks and pitting. Make sure the roller bearing turns freely within the bearing race. If the roller bearing needs replacement, both the roller bearing and the bearing race must be replaced.
3. Inspect valve plate for erosion, excessive wear, heavy scratches, and cracks. If any of the above conditions are found, replace the valve plate.
4. Inspect control piston and maximum displacement screw for burrs, scratches and cracks. Clean up minor scratches with 500 grit paper. Remove burrs with an India stone. The control piston should move freely in the bore.

Swashplate parts

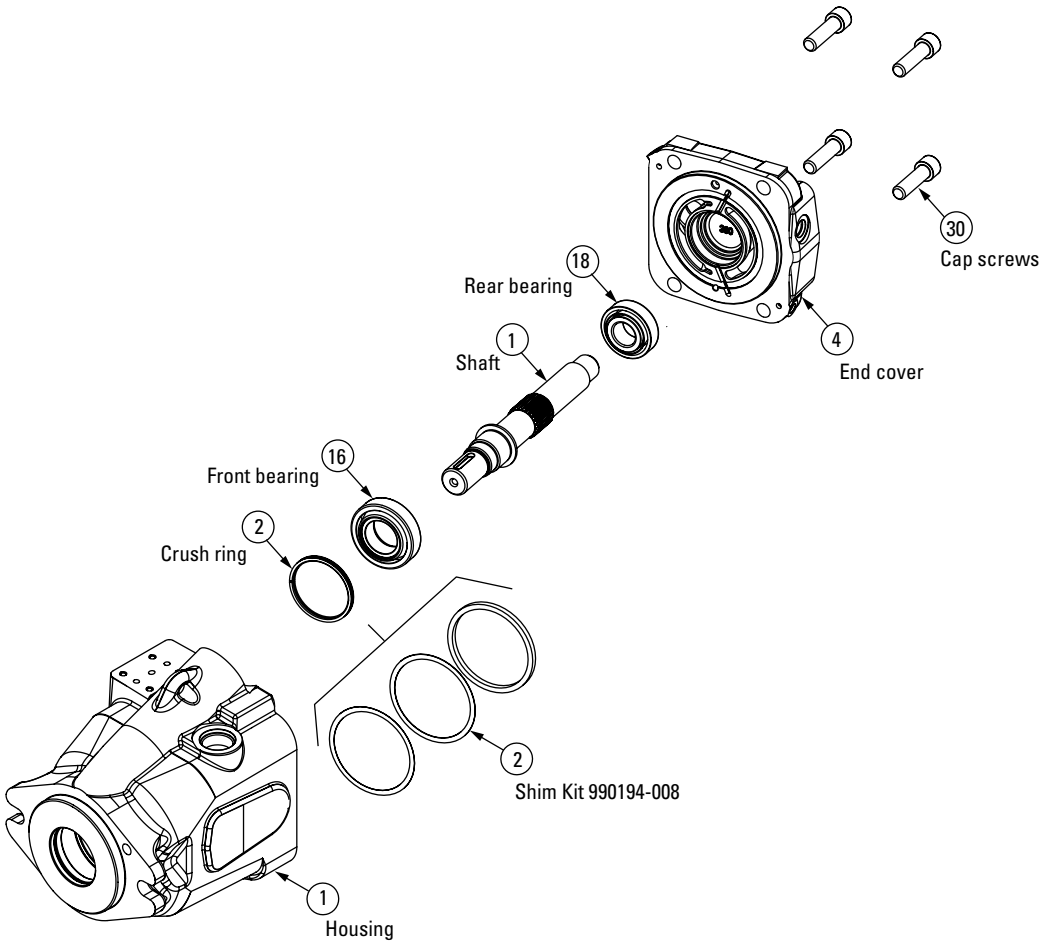
1. Inspect swashplate face for wear, roughness or scoring. Check the swashplate hubs and bearing surfaces for wear and cracks. Replace if defective.
2. Inspect saddle bearing surfaces for wear, pitting, and smooth operation. Replace if necessary.

Shaft/housing parts

1. Inspect drive shaft for wear, stripped splines, and burrs. Remove burrs with an India stone. Inspect the contact area of bearing and shaft seal). Replace the drive shaft if wear or scoring is greater than 0.005 T.I.R. (total indicator reading).
2. Inspect drive shaft bearing for roughness, pitting of rollers, and excessive end play. Replace, if defective. If the bearing needs to be replaced, the bearing race also requires replacement.
3. Inspect housing mounting flange for nicks and burrs. Remove minor nicks and burrs with an India stone. Also check the housing for damaged or stripped threads. If any thread is damaged, replace the housing.
4. Check remaining pump parts for excessive wear, damaged threads, burrs, cracks and erosion. Replace any part that is in questionable condition.

Inspection, repair and part replacement

Shimming Process



Kit 9900194-008

Shimming Process
Installation Information

This skim kit is to replace the crush ring within the pump housing. If the housing, drive shaft, shaft bearings or end cover is replaced during servicing, the original crush ring can no longer be used to assure proper bearing set.

Shimming procedures

1. Measure the thickness of the existing crush ring.
2. To obtain a starting point, stack shims to a few thousandth of an inch less than the measurement of existing crush ring. Then insert shims into the housing in the same location as the removed crush ring.
3. Assemble the housing (without interface 0-ring seals), shaft bearings, shaft and end cover. Install the end cover cap screws and torque to 97+/- 9 lb-ft.
4. Using a dial indicator, measure drive shaft end play. Target bearing set range is .001" clearance to .002" interface (preload). Add shims to achieve proper bearing set. If no movement of the shaft is observed, shims will need to be removed and steps 3 and 4 repeated.
5. Finish the assembly of the pump.

Assembly

Assembly must be conducted in a clean environment. Dispose of leakage oil and oily cloths in an environmentally responsible manner. Before assembly carefully clean all parts and blow out holes with compressed air. Tighten all screws plugs to the specified torque (see Appendix A). Exceptions are specified in the text. Lubricate O-Rings and shaft sealing rings lightly with acid free lubricant for easier installation and to hold the O-Ring in place in its groove or cavity.

1. Install snap ring and shaft seal

2. Install crush ring

3. Insert the shaft bearing race

4. Install cradle bearings

Note: The cradle bearings are asymmetrical. Install as shown in picture.

5. Install cradle bearing screws

Note: The old cap screws cannot be reused and must be replaced with new ones because the screws will be damaged during disassembly. The new cap screw threads will be coated with loctite.

Kit #9900194-002 (2) bearings and (2) screws per kit.

6. Install bearing

7. Install bias spring

8. Install swashplate

With the bias spring in place, tilt the swash plate toward the spring and install the swash plate.

9. Install control piston

11. Install swashplate locator

Adjust the screw until the swashplate is near neutral (will look flat in housing).

10. Install swashplate retainer

12. Install shaft

Caution: Use care while inserting shaft end through shaft seal.

13. Install shaft retainer tool

14. Install the rotating group

Position shaft upwards and carefully install rotating group.

15. Remove swashplate locator

16. Remove swashplate retainer

17. Install O-Ring seal

18. Install housing O-Rings

19. Install bearing race

Using a press, install the bearing race.

20. Install valve plate

Lightly coat the back plate side of the valve plate with petroleum jelly for retention during assembly.

Install the valve plate over the bearing race aligning the small slot on the outside of the valve plate with the dowel pin in the back plate.

21. Install bearing

22. Install end cover

Ensure correct orientation. Use caution so valve plate does not fall off.

23. Install control piston plug assembly

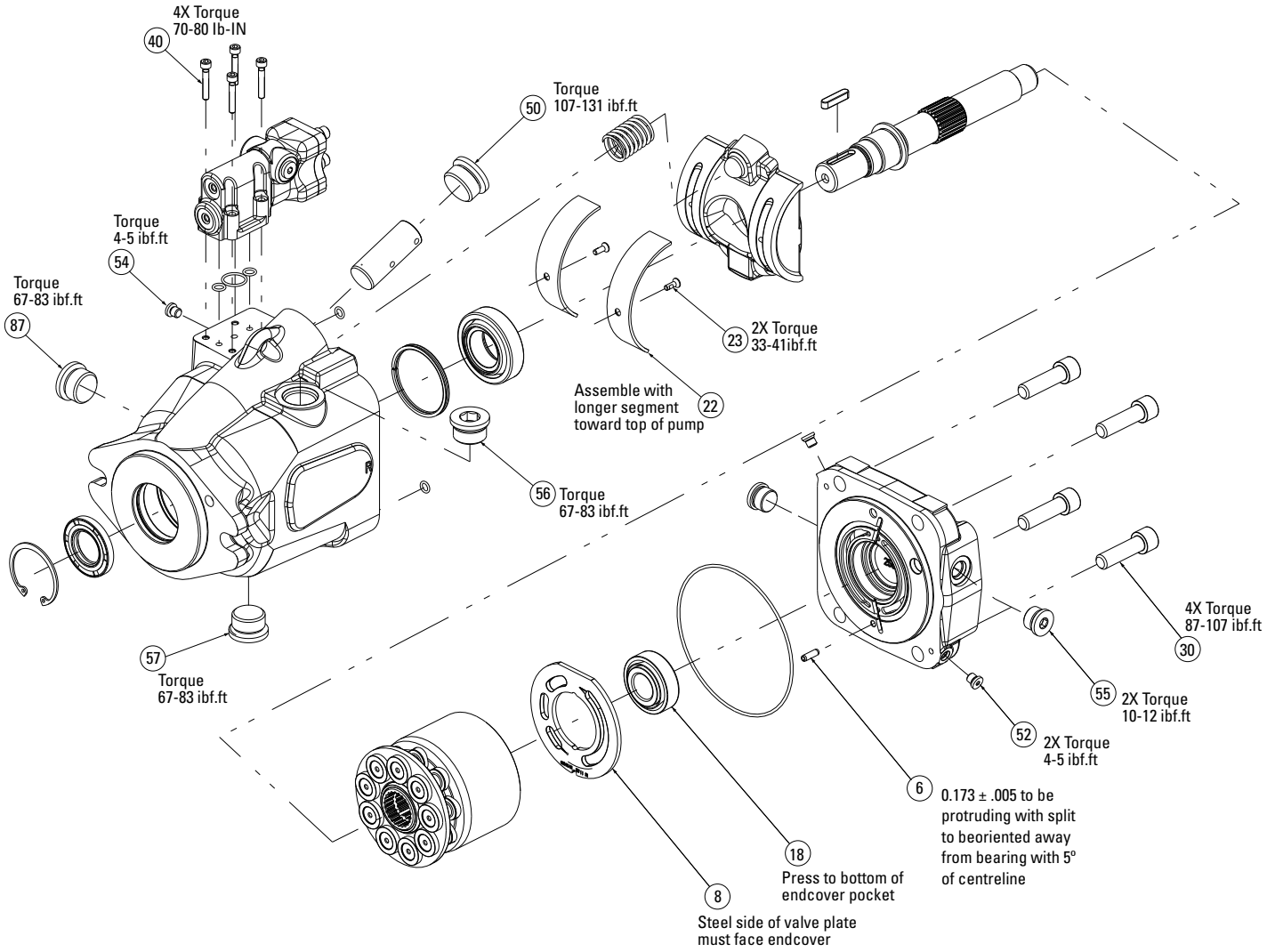
24. Install compensator

25. Testing

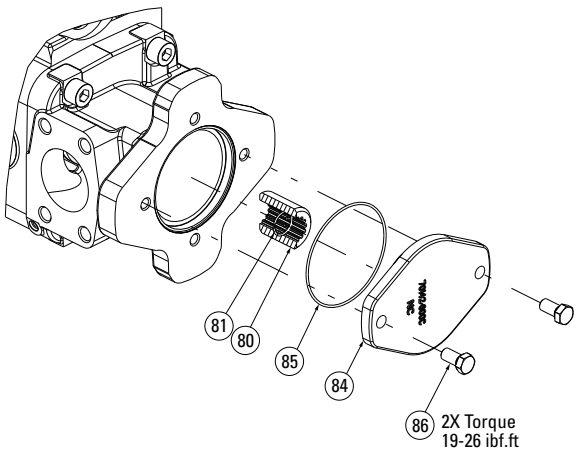
Perform functional test on pump according to Eaton test procedure.

Assembly torque values

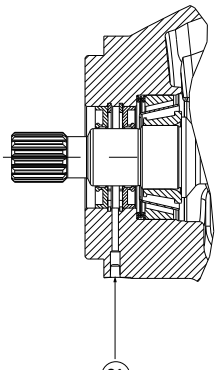
Instructions



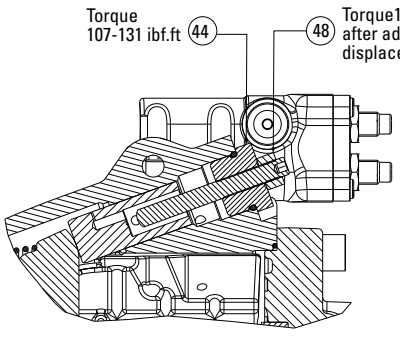
Thru-drive part option



Dual shaft seal option



Adjustable maximum stop option



(Replaces plug sub-assembly item 50-reference kit 9900194-004)

Notes

Notes

Notes

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Powering Business Worldwide

Printed in USA
Document No. E-PUPI-TP002-E5
Supersedes E-PUPI-TP002-E3
August 2017