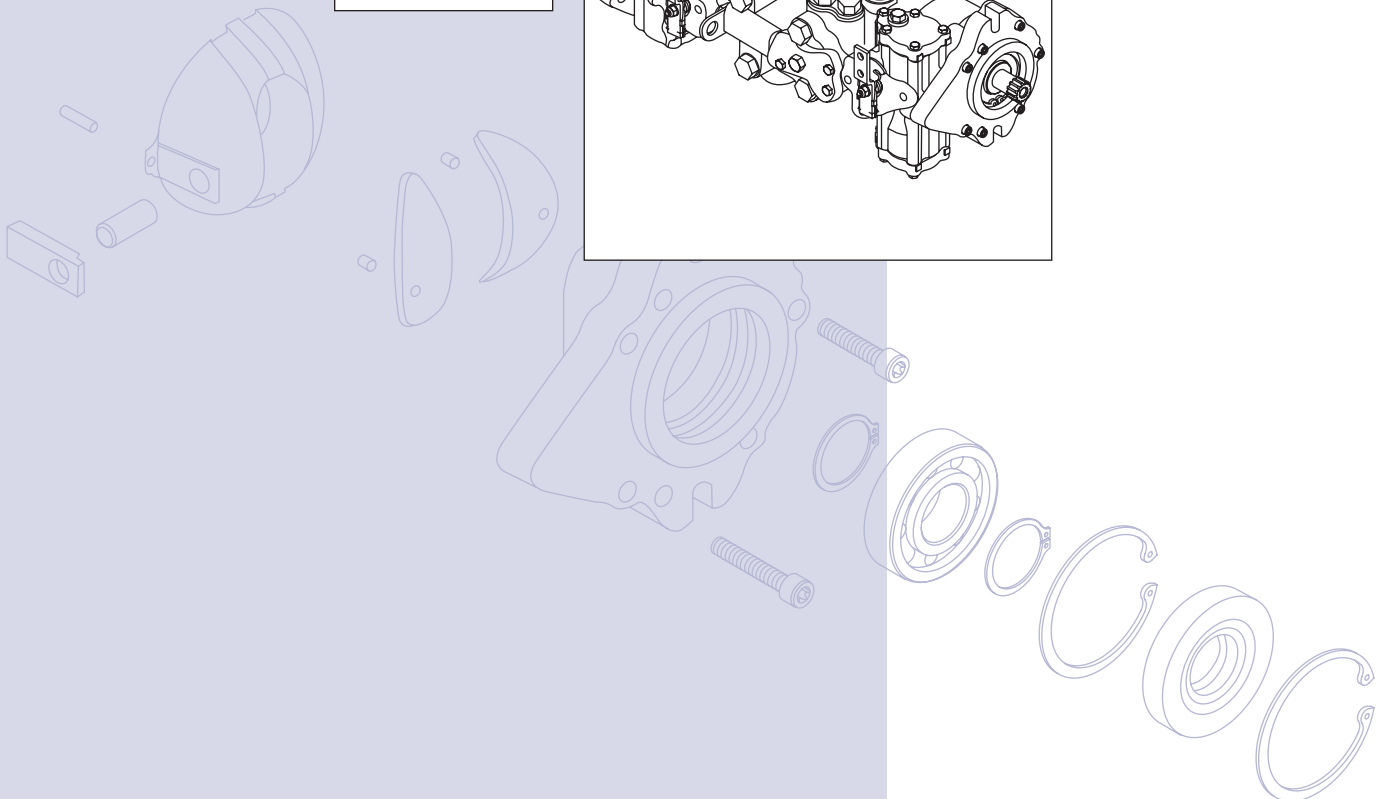
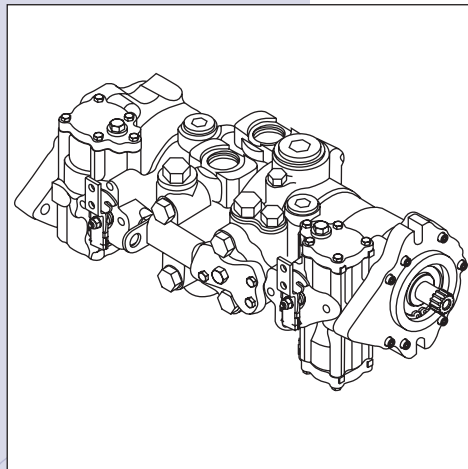
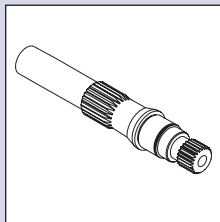
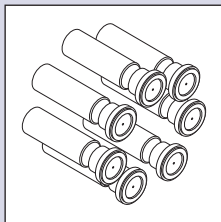


Series 40
M46 Axial Piston
Tandem Pump

Parts Manual



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Front cover illustrations: P107 970, P107 971, P107 972, P100 535

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SERVICE PARTS IDENTIFICATION

The following information and procedure is used to identify the module group, item number, manufacture date, part number, and part name of the parts included in the series 40 M46 variable displacement tandem pump.

The parts listed include all parts which may be used when performing either "Minor Repairs," "Major Repairs" or "Conversions" on the M46 tandem pumps.

NAMEPLATE

Each unit will have a nameplate affixed to the housing. The nameplate will include the following information.

Model Code

The Sauer-Danfoss model code completely defines the specific unit and must be used when ordering parts to service this product.

Model Number

The Sauer-Danfoss model number is used by the factory in manufacturing. On repeat orders, a complete unit can be ordered by the model number.

Serial Number

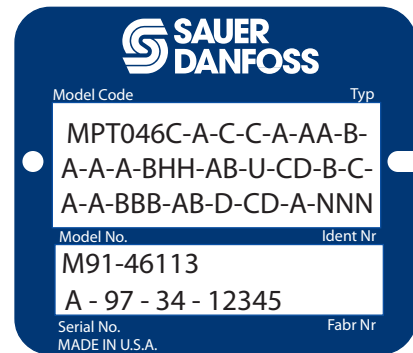
The Sauer-Danfoss serial number is used to identify the manufacture date and the unit sequence in the build. The serial number is also used to identify the units warranty time period.

The letter code indicates the location of original manufacture (assembly). "A" indicates the unit was originally assembled in Ames, Iowa, USA.

The first number (2 digits) indicates the year of manufacture. ("97" would indicate the unit was manufactured in 1997)

The second number (2 digits) indicates the calendar week of manufacture.

The third number (5 digits) is a sequential number used to identify a specific unit.



DATE CODE

The date code is defined as the year and week of manufacture. The same item number may list more than one part number. This indicates that there is more than one configuration for that item number. You will see that there are different date codes for the different part numbers. Find the date code of your unit from the nameplate to determine which service part number you need to order.

EXAMPLE: The service part desired is Item 159.

Order Code	Item	Date Begin	Date End	Part Number	Part Name	Qty. per Model/Kit
	159	89-23		4460563	Front cover (SB-1989-013)	1
	159	86-23	89-22	4460392	Front cover	1

All units using this order code with a date code of 86-23 and up to and including 89-22, must use part number "4460392". All units with a date code of 89-23 and newer must use part number "4460563".

SERVICE BULLETINS

A Service Bulletin Number (SB-____ - ____) may follow the "Part Name" of the part you desire. You must read that Service Bulletin prior to ordering that part. The information contained in these Service Bulletins, as of the print date of this bulletin, are included at the end of this manual. Service Bulletins contain more detailed information such as interchangeability, what additional parts are involved, etc. It is suggested that you add additional Service Bulletins to this manual as you receive them.

PROCEDURE TO IDENTIFY A PART

General

The modular design of series 40 units results in a simplified service parts list and part number identification procedure. The same item numbers are used for same part names on all units within a product type. (Example: The lip seal - Item 301 has the same item number on all pumps.)

A part number that has another number following it in parentheses is done to make this a world wide manual. The first number is sold in Germany. The number in parentheses is sold in the United States. (Example: 5000731, customers would order 9001315-0011 if ordering the part in the United States.)

Example of a Part Identification

The nameplate on an M46 variable displacement tandem pump has an Order Code of MPT046C-A-C-C-A-AA-B-A-A-A-BHH-AB-U-CD-B-C-A-A-BBB-AB-D-CD-A-NNN. Use the following procedures to determine the part number of the drive shaft used on this pump.

1) Referring to the input shaft module in the Order Code (see page 7), the input shaft option for this pump is identified by the code "A". (MPT046C-A-C-C-A-AA-B-A-A-A-BHH-AB-U-CD-B-C-A-A-BBB-AB-D-CD-A-NNN)

2) Referring to the Service Parts List, find the shaft group. Next find the order code that relates to this unit, which is "A". The shaft is found to be item 2201 and part number 4460151.



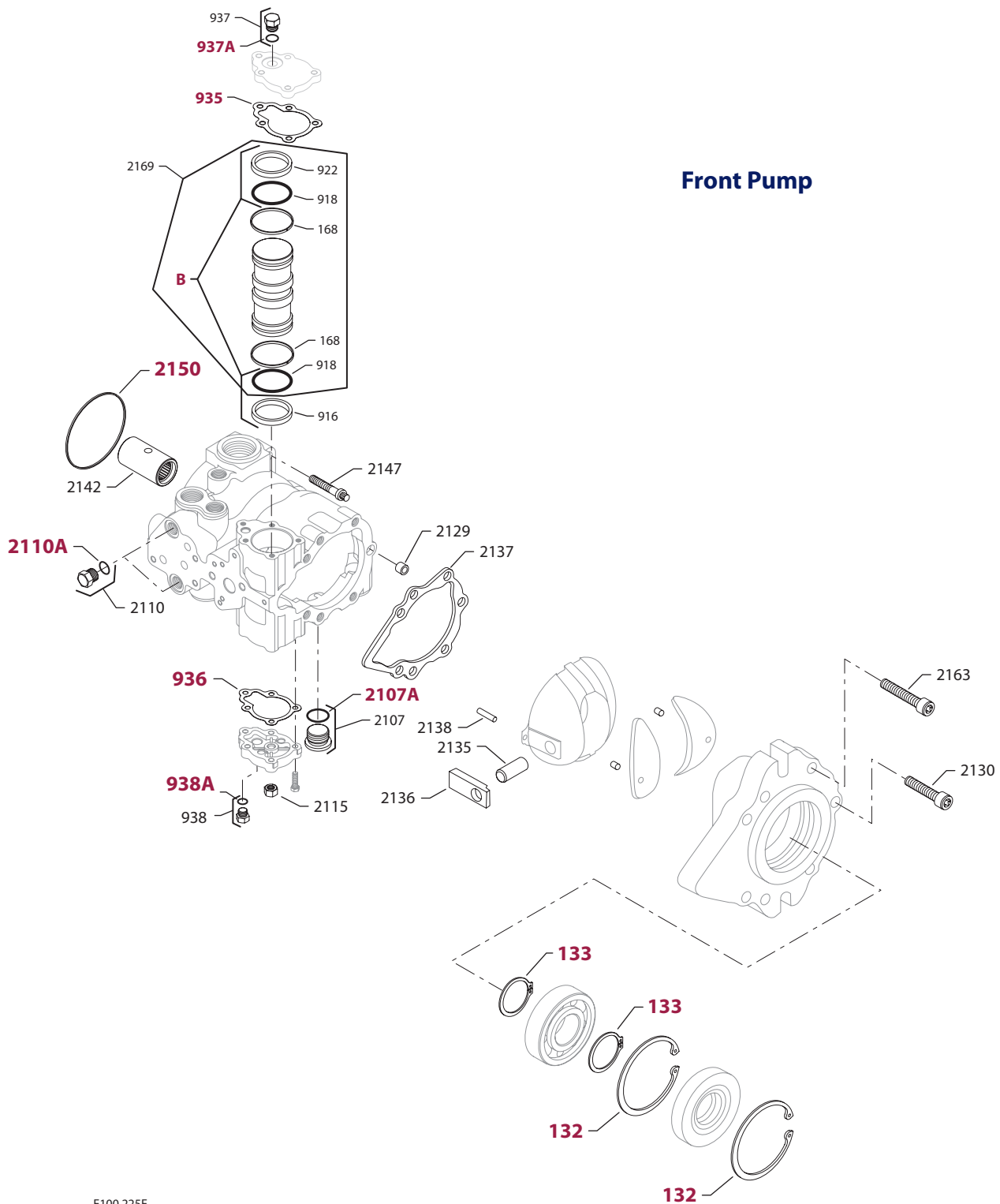
Series 40 M46 Axial Piston Tandem Pump
Parts Manual
Notes



	M	P	T	0	4	6	C	A	C	C	A	A	A	B	A	A	A	B	H	H	A	B	U	C	D	B	C	A	A	B	B	B	A	B	D	C	D	A	N	N	N
Product																																									
Frame Size																																									
Type																																									
Front Pump																																									
Input Shaft																																									
Rotation																																									
Charge Pump Displ.																																									
Charge Pressure Setting																																									
Filtration																																									
Swashplate																																									
Seal																																									
Displacement																																									
Bypass Valve																																									
System Pressure Protection																																									
Control																																									
Control Handle Position																																									
Control Orifice																																									
Rear Pump																																									
Swashplate																																									
Seal																																									
Displacement																																									
Bypass Valve																																									
System Pressure Protection																																									
Control																																									
Control Handle Position																																									
Control Orifice																																									
Auxiliary Mounting Pad																																									
Special Hardware																																									

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Front Pump

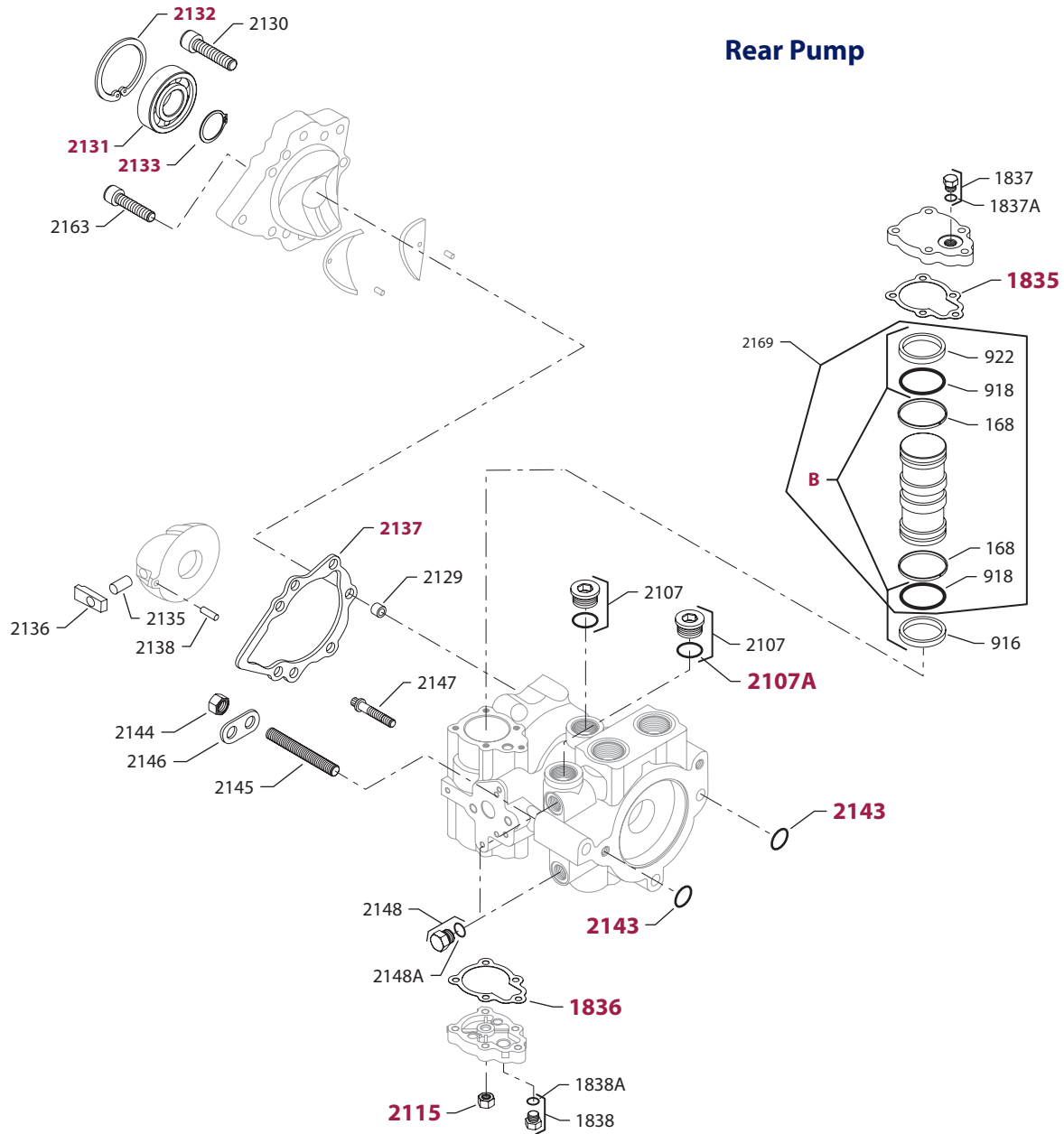


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Enlarged **bold** type item numbers are recommended parts to be stocked for servicing

COMMON PARTS, FRONT PUMP

Order Code	Item	Date Begin	Date End	Part Number	Part Name	Qty. per Model/Kit
	B	88-01		4510002	Servo piston ring kit	1
	168	88-05		4460648	Bearing ring (SB-1988-002 & SB-1991-009)	2
	916	88-01		8700067	Piston ring	1
	918	88-01		9004100-1310	O-ring	2
	922	88-01		8700067	Piston ring	1
	935	84-31		4461311	Servo cover gasket (SB-2002-037)	1
	936	84-31		4461311	Servo cover gasket (SB-2002-037)	1
	937	87-41		9005100-5600	Plug assembly	1
	937	84-31	87-40	9005100-4400	Plug assembly (SB-1987-029)	1
	937A	87-41		9004201-3700	O-ring	1
	937A	84-31	87-40	9004201-2500	O-ring (SB-1987-029)	1
	938	87-41		9005100-5600	Plug assembly	1
	938	84-31	87-40	9005100-4400	Plug assembly (SB-1987-029)	1
	938A	87-41		9004201-3700	O-ring	1
	938A	84-31	87-40	9004201-2500	O-ring (SB-1987-029)	1
	2107	84-31		9005110-9000	Plug assembly	1
	2107A	84-31		9004201-7500	O-ring	1
	2110	84-31		9005100-5600	Plug assembly	2
	2110A	84-31		9004201-3700	O-ring	2
	2115	84-31		9003575-0083	Seal nut	1
	2129	85-37		9004875-0100	Pin	1
	2129	84-31	85-36	9004875-0067	Pin	1
	2130	84-31		5000208	Screw (SB-1994-037)	1
	2132	84-31		9006200-0281	Retaining ring	3
	2133	84-31		9006300-0137	Retaining ring	3
	2135	84-31		9004820-4416	Pin	2
	2136	84-31		4460162	Bearing sleeve	2
	2137	84-31		4460564	Front cover gasket	2
	2138	86-14		5000507	Pin (SB-1995-022 & SB-1998-012)	2
	2142	84-31		4460258	Coupling	1
	2147	84-31		9007500-5028	Screw	1
	2150	84-31		9004375-0022	O-ring	1
	2169	84-31		4461335	Piston assembly	1
	2163	89-23		5000207	Screw (SB-1994-037)	6
	2163	84-31	89-22	9007510-3716	Screw (SB-1989-013)	6

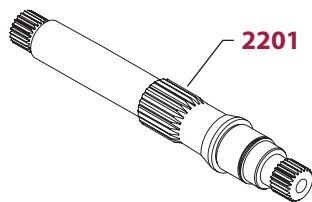
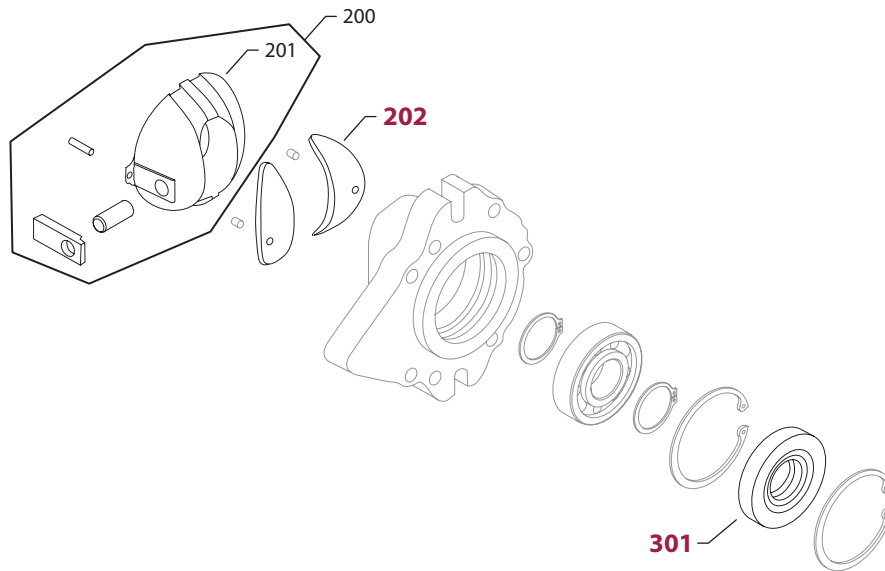


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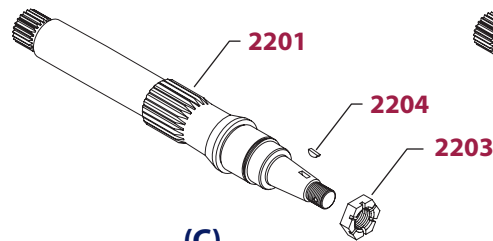
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numbers are recommended
parts to be stocked for servicing

COMMON PARTS, REAR PUMP

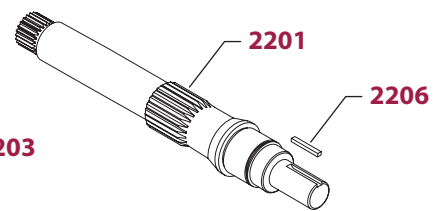
Order Code	Item	Date Begin	Date End	Part Number	Part Name	Qty. per Model/Kit
	B	88-01		4510002	Servo piston ring kit	1
	168	88-05		4460648	Bearing ring (SB-1988-002 & SB-1991-009)	2
	916	88-01		8700067	Piston ring	1
	918	88-01		9004100-1310	O-ring	2
	922	88-01		8700067	Piston ring	1
	1835	84-31		4461311	Servo cover gasket (SB-2002-037)	1
	1836	84-31		4461311	Servo cover gasket (SB-2002-037)	1
	1837	87-41		9005100-5600	Plug assembly	1
	1837	84-31	87-40	9005100-4400	Plug assembly (SB-1987-029)	1
	1837A	87-41		9004201-3700	O-ring	1
	1837A	84-31	87-40	9004201-2500	O-ring (SB-1987-029)	1
	1838	87-41		9005100-5600	Plug assembly	1
	1838	84-31	87-40	9005100-4400	Plug assembly (SB-1987-029)	1
	1838A	87-41		9004201-3700	O-ring	1
	1838A	84-31	87-40	9004201-2500	O-ring (SB-1987-029)	1
	2107	84-31		9005110-9000	Plug assembly	2
	2107A	84-31		9004201-7500	O-ring	2
	2115	84-31		9003575-0083	Seal nut	1
	2129	85-37		9004875-0100	Pin	1
	2129	84-31	85-36	9004875-0067	Pin	1
	2130	84-31		5000208	Screw (SB-1994-037)	1
	2131	84-31		5000731	Ball bearing	1
	2132	84-31		9006200-0281	Retaining ring	1
	2133	84-31		9006300-0137	Retaining ring	1
	2135	84-31		9004820-4416	Pin	1
	2136	84-31		4460162	Bearing sleeve	1
	2137	84-31		4460564	Front cover gasket	1
	2138	86-14		5000507	Pin (SB-1995-022 & SB-1998-012)	1
	2143	84-31		9004101-1160	O-ring	2
	2144	84-31		9003530-5000	Nut	1
	2145	84-31		9008800-5048	Stud	1
	2146	84-31		8800565	Lifting bracket	1
	2147	84-31		9007500-5028	Screw	1
	2148	84-31		9005100-5600	Plug assembly	2
	2148A	84-31		9004201-3700	O-ring	2
	2169	84-31		4461335	Piston assembly	1
	2163	89-23		5000207	Screw (SB-1994-037)	6
	2163	84-31	89-22	9007510-3716	Screw (SB-1989-013)	6



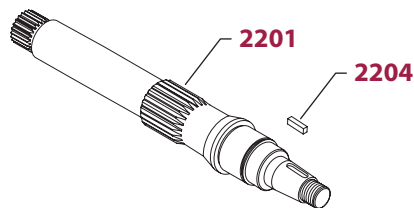
(A, B, and E)



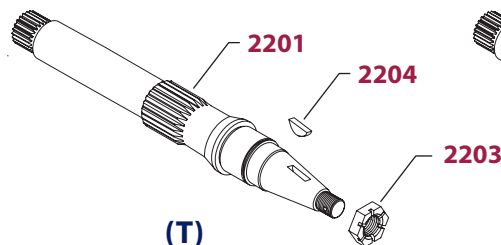
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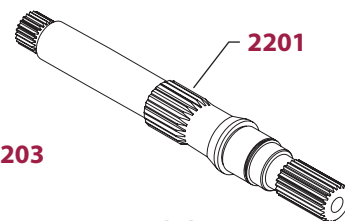
(D)



(H)



(T)



(Z)

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parts to be stocked for servicing

SWASHPLATE GROUP, FRONT PUMP

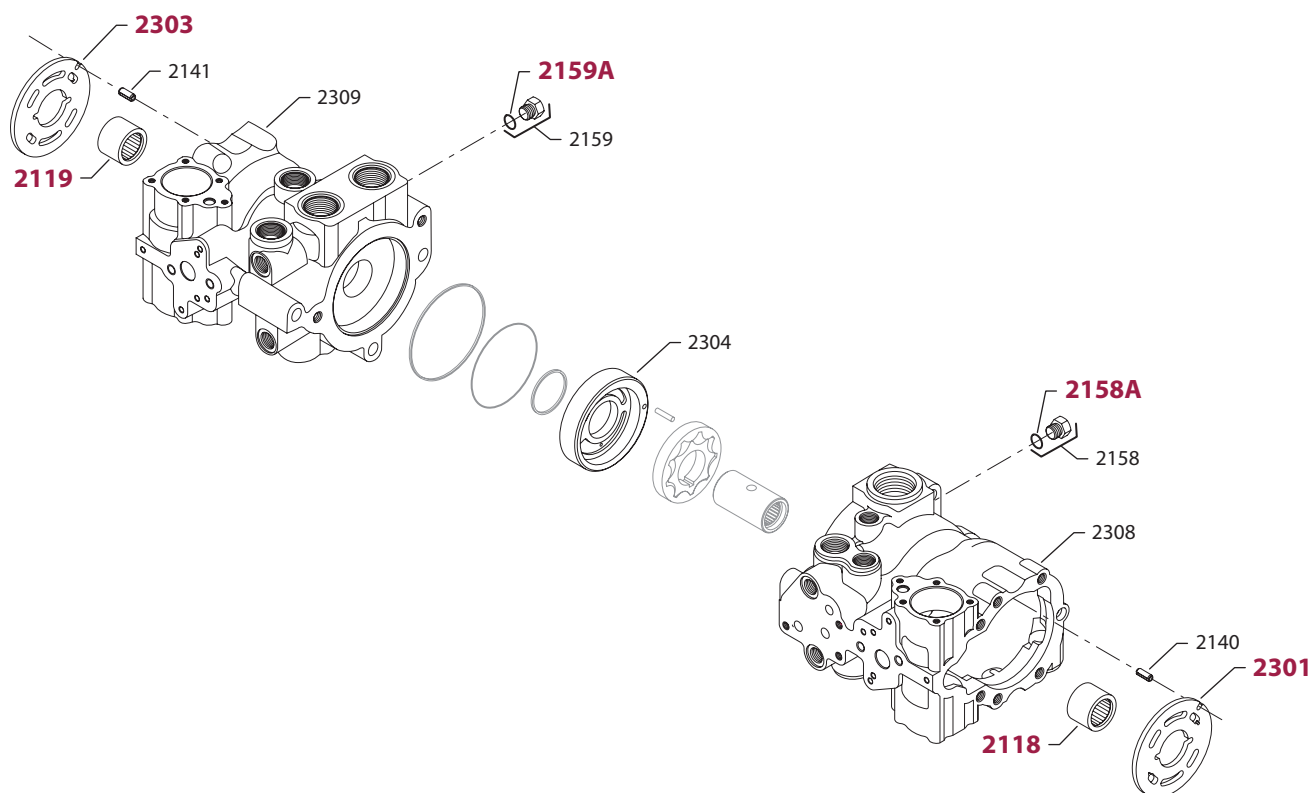
Order Code	Item	Date Begin	Date End	Part Number	Part Name	Qty. per Model/Kit
A	200	86-23	94-23	4510072	Non-balanced swashplate kit (SB-1994-002)	1
	201	86-23	94-23	4460393	Non-balanced swashplate	
	202	86-23	94-23	4460325-0001	Journal bearing (SB-1994-011)	2
	202	84-31	86-22	4460277	Journal bearing	2
B	200	86-23		4510073	Balanced swashplate kit	1
	201	86-23		4460394	Balanced swashplate	1
	202	86-23		4460696	Journal bearing (SB-1994-011)	2
C	201	04-26		4461417	Balance high response swashplate	1
	202	04-26		4461402	Journal bearing	2

SEAL GROUP

A	301	84-31		9008000-0121	Lip seal	1
B	301	84-31		9008000-0121	Lip seal	1

INPUT SHAFT

A	2201	84-31		4460151	Shaft, 15 tooth	1
B	2201	84-31		4460153	Shaft, 19 tooth	1
C	2202	84-31	94-43	4460154	Shaft, tapered	1
	2203	84-31	94-43	9003575-0071	Slotted nut	1
	2204	84-31	94-43	9003310-2514	Key	1
D	2205	84-31		4460399	Shaft, straight key	1
	2206	84-31		9003261-2526	Key	1
E	2201	97-38		4460354	Shaft, 19 tooth	1
H	2202	84-31		4461307	Shaft, tapered (SB-2002-021)	1
	2204	02-34		5000664	Key, square	1
	2204	84-31	02-33	9003310-2514	Key, woodruff (SB-2002-021)	1
T	2202	89-50		4460612	Shaft, tapered	1
	2203	89-50		5000606	Slotted nut	1
	2204	89-50		9003310-3724	Key, woodruff	1
Z	2201	85-37		4460994	Shaft, 15 tooth, special spline length	1



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Enlarged **bold** type item
numbers are recommended
parts to be stocked for servicing

COMMON ROTATION/HOUSING PARTS

Order Code	Item	Date Begin	Date End	Part Number	Part Name	Qty. per Model/Kit
	2118	84-31		9001465-0010	Bearing, needle	1
	2119	84-31		9001465-0010	Bearing, needle	1
	2140	84-31		9004700-1907	Pin, slotted	1
	2141	84-31		9004700-1907	Pin, slotted	1
	2155	84-31		9005100-4400	Plug assembly	1
	2155A	84-31		9004201-2500	O-ring	1
	2156	84-31		9005100-4400	Plug assembly	1
	2156A	84-31		9004201-2500	O-ring	1

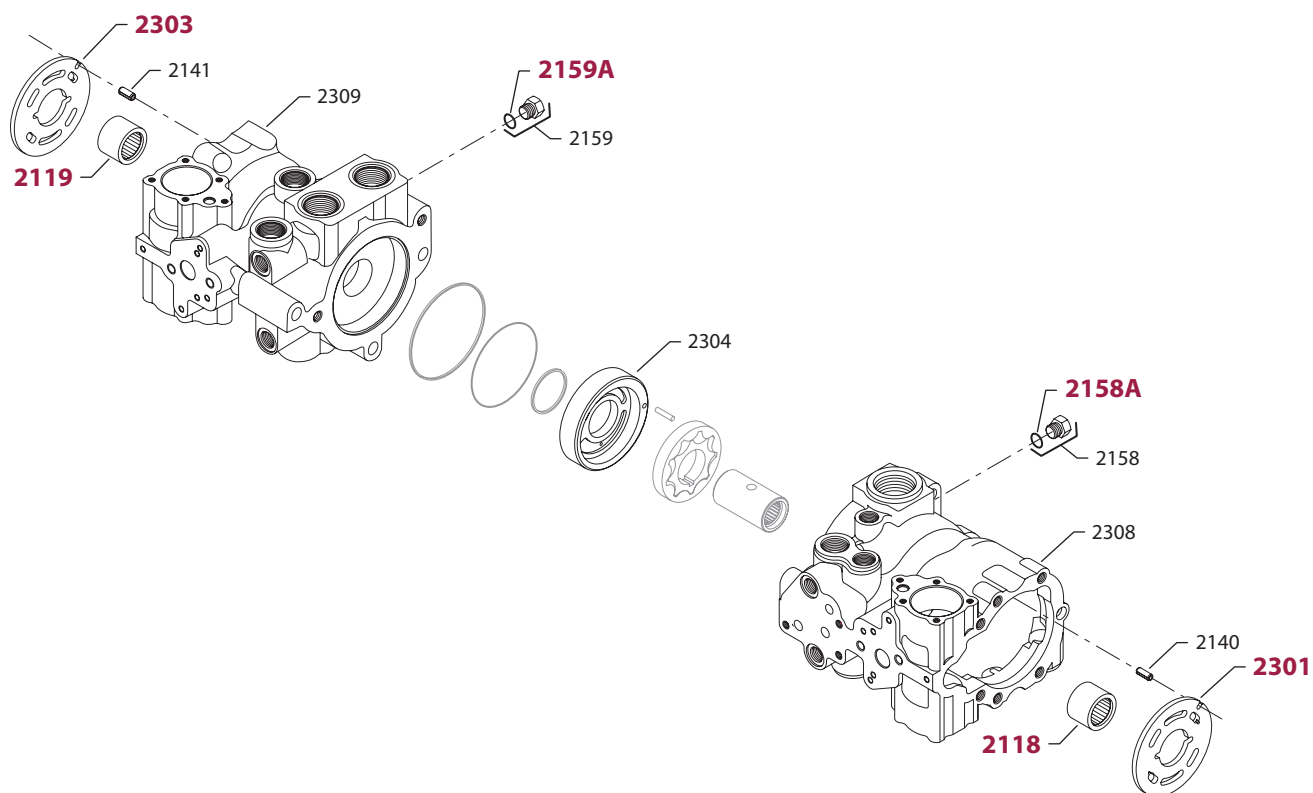
ROTATION/HOUSING

A	2301	86-27	02-25	4460417	Valve plate, CW (SB-1987-011)	1
	2301	86-18	86-26	4460318	Valve plate, CW, non-balanced	1
	2301	84-31	86-17	4460108	Valve plate, CW	1
	2303	86-27	02-25	4460418	Valve plate, CCW (SB-1987-011)	1
	2303	86-18	86-26	4460319	Valve plate, CCW, non-balanced	1
	2303	84-31	86-17	4460109	Valve plate, CCW	1
	2304	87-28	02-25	4800159-0001	Gerotor cover, CW	1
	2308	89-23	02-25	4461169	Housing assembly, front (SB-1989-013)	1
	2309	89-23	02-25	4461170	Housing assembly, rear (SB-1989-013)	1

C	2301	86-27		4460417	Valve plate, CW (SB-1987-011)	1
	2301	86-18	86-26	4460318	Valve plate, CW, non-balanced	1
	2301	84-31	86-17	4460108	Valve plate, CW	1
	2303	86-27		4460418	Valve plate, CCW (SB-1987-011)	1
	2303	86-18	86-26	4460319	Valve plate, CCW, non-balanced	1
	2303	84-31	86-17	4460109	Valve plate, CCW	1
	2304	87-28		4800159-0002	Gerotor cover, CW	1
	2308	89-23		4461169	Housing assembly, front (SB-1989-013)	1
	2309	89-23		4461170	Housing assembly, rear (SB-1989-013)	1

D	2301	86-27		4460418	Valve plate, CCW (SB-1987-011)	1
	2301	86-18	86-26	4460319	Valve plate, CCW, non-balanced	1
	2301	84-31	86-17	4460109	Valve plate, CCW	1
	2303	86-27		4460417	Valve plate, CW (SB-1987-011)	1
	2303	86-18	86-26	4460318	Valve plate, CW, non-balanced	1
	2303	84-31	86-17	4460108	Valve plate, CW	1
	2304	87-28		4800160-0002	Gerotor cover, CCW	1
	2308	89-23		4461169	Housing assembly, front (SB-1989-013)	1
	2309	89-23		4461170	Housing assembly, rear (SB-1989-013)	1

E	2301	86-18		4460318	Valve plate, CW, non-balanced	1
	2301	84-31	86-17	4460108	Valve plate, CW	1
	2303	86-18		4460319	Valve plate, CCW, non-balanced	1
	2303	84-31	86-17	4460109	Valve plate, CCW	1
	2304	87-28		4800159-0002	Gerotor cover, CW	1
	2308	89-23		4461169	Housing assembly, front (SB-1989-013)	1
	2309	89-23		4461170	Housing assembly, rear (SB-1989-013)	1



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Enlarged **bold** type item
numbers are recommended
parts to be stocked for servicing

COMMON ROTATION/HOUSING PARTS

Order Code	Item	Date Begin	Date End	Part Number	Part Name	Qty. per Model/Kit
	2118	84-31		9001465-0010	Bearing, needle	1
	2119	84-31		9001465-0010	Bearing, needle	1
	2140	84-31		9004700-1907	Pin, slotted	1
	2141	84-31		9004700-1907	Pin, slotted	1
	2155	84-31		9005100-4400	Plug assembly	1
	2155A	84-31		9004201-2500	O-ring	1
	2156	84-31		9005100-4400	Plug assembly	1
	2156A	84-31		9004201-2500	O-ring	1

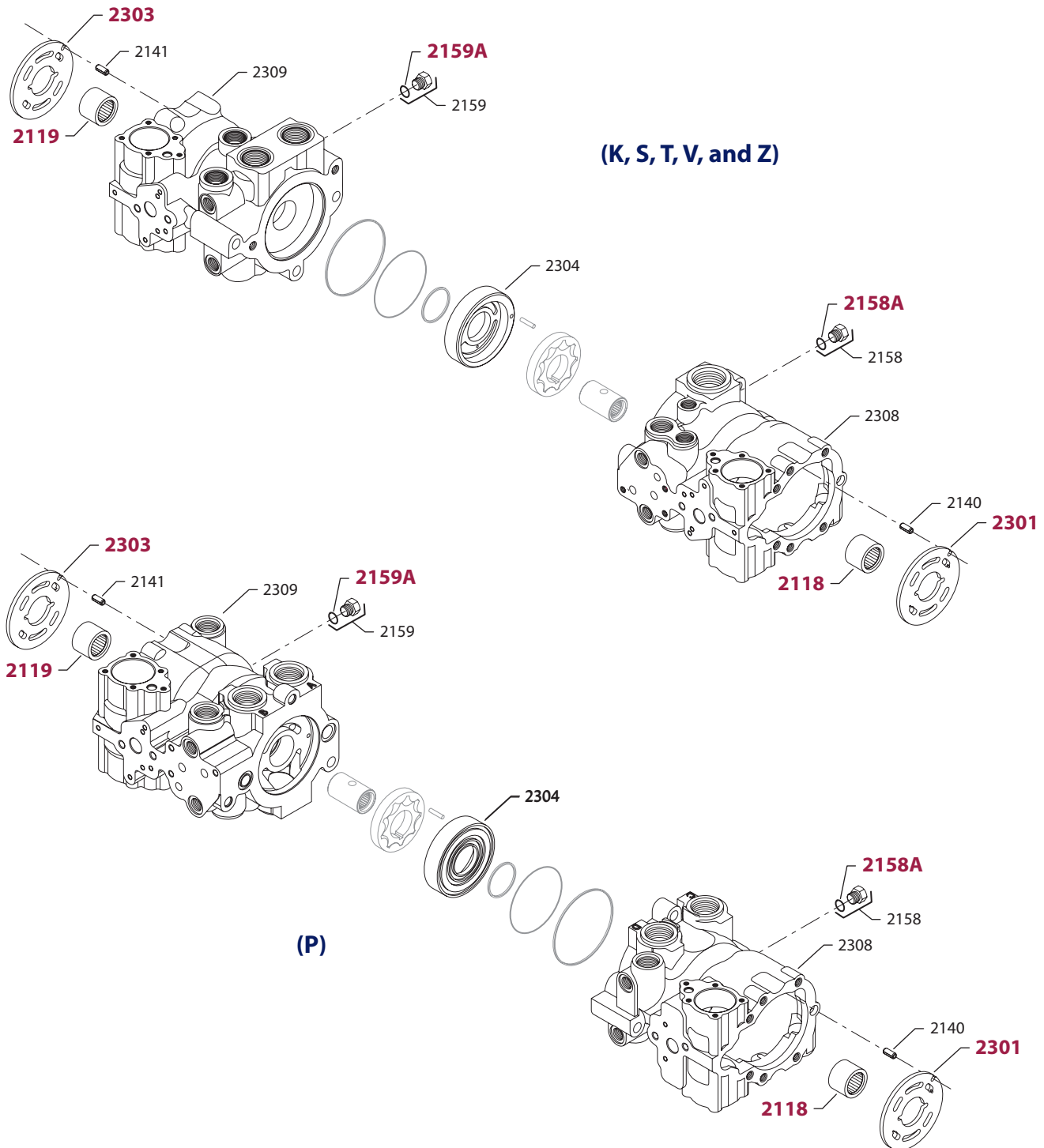
ROTATION/HOUSING

F	2301	86-18		4460319	Valve plate, CCW, non-balanced	1
	2301	84-31	86-17	4460109	Valve plate, CCW	1
	2303	86-18		4460318	Valve plate, CW, non-balanced	1
	2303	84-31	86-17	4460108	Valve plate, CW	1
	2304	87-28		4800160-0002	Gerotor cover, CCW	1
	2308	89-23		4461169	Housing assembly, front (SB-1989-013)	1
	2309	89-23		4461170	Housing assembly, rear (SB-1989-013)	1

G	2301	86-27		4460417	Valve plate, CW (SB-1987-011)	1
	2301	86-18	86-26	4460318	Valve plate, CW, non-balanced	1
	2301	84-31	86-17	4460108	Valve plate, CW	1
	2303	86-27		4460418	Valve plate, CCW (SB-1987-011)	1
	2303	86-18	86-26	4460319	Valve plate, CCW, non-balanced	1
	2303	84-31	86-17	4460109	Valve plate, CCW	1
	2304	84-31		4800159-0002	Gerotor cover, CW (SB-2002-007)	1
	2308	89-23		4461169	Housing assembly, front (SB-1989-013)	1
	2309	89-23		4461170	Housing assembly, rear (SB-1989-013)	1

H	2301	86-27		4460418	Valve plate, CCW (SB-1987-011)	1
	2301	86-18	86-26	4460319	Valve plate, CCW, non-balanced	1
	2301	84-31	86-17	4460109	Valve plate, CCW	1
	2303	86-27		4460417	Valve plate, CW (SB-1987-011)	1
	2303	86-18	86-26	4460318	Valve plate, CW, non-balanced	1
	2303	84-31	86-17	4460108	Valve plate, CW	1
	2304	84-31		4800159-0002	Gerotor cover, CW (SB-2002-007)	1
	2308	89-23		4461169	Housing assembly, front (SB-1989-013)	1
	2309	89-23		4461170	Housing assembly, rear (SB-1989-013)	1

J	2301	86-18		4460318	Valve plate, CW, non-balanced	1
	2301	84-31	86-17	4460108	Valve plate, CW	1
	2303	86-18		4460319	Valve plate, CCW, non-balanced	1
	2303	84-31	86-17	4460109	Valve plate, CCW	1
	2304	84-31		4800159-0002	Gerotor cover, CW (SB-2002-007)	1
	2308	89-23		4461169	Housing assembly, front (SB-1989-013)	1
	2309	89-23		4461170	Housing assembly, rear (SB-1989-013)	1
	2308	89-23		4461169	Housing assembly, front (SB-1989-013)	1
	2309	89-23		4461170	Housing assembly, rear (SB-1989-013)	1



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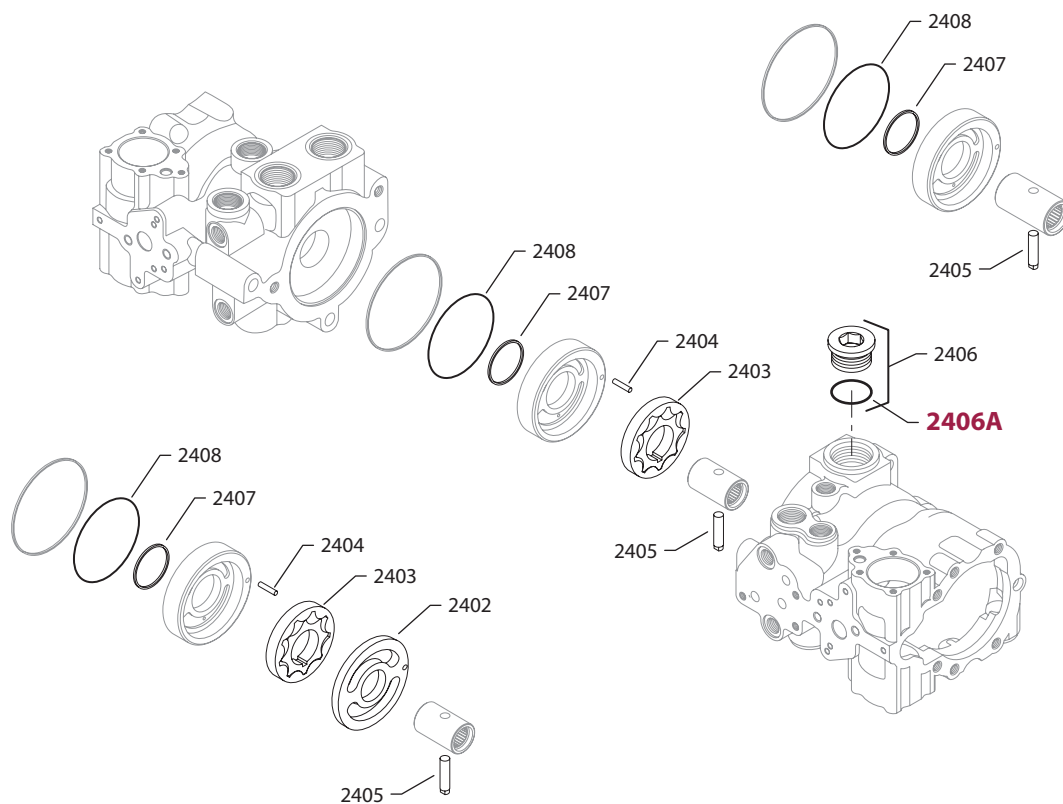
Enlarged **bold** type item
numbers are recommended
parts to be stocked for servicing

COMMON ROTATION/HOUSING PARTS

Order Code	Item	Date Begin	Date End	Part Number	Part Name	Qty. per Model/Kit
	2118	84-31		9001465-0010	Bearing, needle	1
	2119	84-31		9001465-0010	Bearing, needle	1
	2140	84-31		9004700-1907	Pin, slotted	1
	2141	84-31		9004700-1907	Pin, slotted	1
	2155	84-31		9005100-4400	Plug assembly	1
	2155A	84-31		9004201-2500	O-ring	1
	2156	84-31		9005100-4400	Plug assembly	1
	2156A	84-31		9004201-2500	O-ring	1

ROTATION/HOUSING

K	2301	89-23	02-25	4460418	Valve plate, CCW, balanced	1
	2303	89-23	02-25	4460417	Valve plate, CW, balanced	1
	2304	89-23	02-25	4800160-0001	Gerotor cover, CCW	1
	2308	89-23	02-25	4461169	Housing assembly, front	1
	2309	89-23	02-25	4461170	Housing assembly, rear	1
P	2301	94-01	03-31	4460418	Valve plate, CCW, balanced	1
	2303	94-01	03-31	4460417	Valve plate, CW, balanced	1
	2304	94-01	03-31	4800159-0002	Gerotor cover, CW (SB-2007-007)	1
	2308	89-23	03-31	4461171	Housing assembly, front (SB-1989-013)	1
	2309	89-23	03-31	4461169	Housing assembly, rear (SB-1989-013)	1
S	2301	94-38		4460683	Valve plate, CW, quiet	1
	2303	94-38		4460684	Valve plate, CCW, quiet	1
	2304	94-38		4800159-0002	Gerotor cover, CW (SB-2002-007)	1
	2308	94-38		4461169	Housing assembly, front	1
	2309	94-38		4461170	Housing assembly, rear	1
T	2301	94-38		4460684	Valve plate, CCW, quiet	1
	2303	94-38		4460683	Valve plate, CW, quiet	1
	2304	94-38		4800159-0002	Gerotor cover, CW (SB-2002-007)	1
	2308	94-38		4461169	Housing assembly, front	1
	2309	94-38		4461170	Housing assembly, rear	1
V	2301	93-11		4460683	Valve plate, CW, quiet	1
	2303	93-11		4460684	Valve plate, CCW, quiet	1
	2304	93-11		4800159-0002	Gerotor cover, CW	1
	2308	93-11		4461169	Housing assembly, front	1
	2309	93-11		4461170	Housing assembly, rear	1
Z	2301	94-38		4460684	Valve plate, CCW, quiet	1
	2303	94-38		4460683	Valve plate, CW, quiet	1
	2304	94-38		4800160-0002	Gerotor cover, CCW	1
	2308	94-38		4461169	Housing assembly, front	1
	2309	94-38		4461170	Housing assembly, rear	1

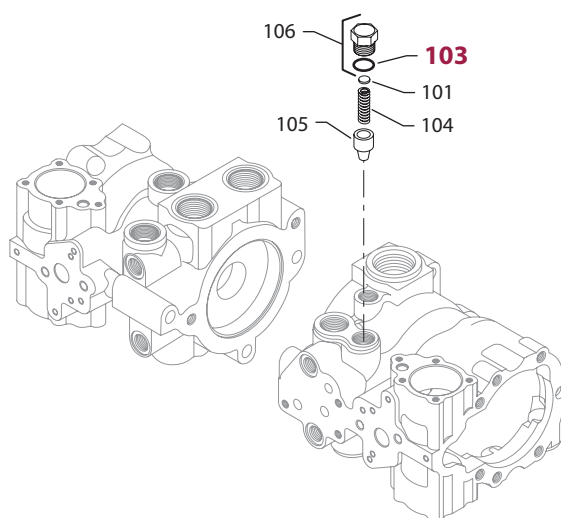


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Enlarged **bold** type item
numbers are recommended
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CHARGE PUMP DISPLACEMENT

Order Code	Item	Date Begin	Date End	Part Number	Part Name	Qty. per Model/Kit
A	2405	84-31		9004700-3724	Pin, slotted	1
	2406	84-31		9005110-9500	Plug assembly	1
	2406A	84-31		9004201-9000	O-ring	1
	2407	84-31		9004101-2240	O-ring	1
	2408	87-34		9004101-2380	O-ring	1
	2408	84-31	87-33	9004104-2400	O-ring	1
B	2402	84-31	02-25	4460260	Spacer plate	1
	2403	84-31	02-25	4800077-0001	Gerotor assembly	1
	2404	84-31	02-25	9004800-1913	Pin	1
	2405	84-31	02-25	9004875-0081	Pin	1
	2407	84-31	02-25	9004101-2240	O-ring	1
	2408	87-34	02-25	9004101-2380	O-ring	1
	2408	84-31	87-33	9004104-2400	O-ring	1
C	2403	84-31		4800077-0002	Gerotor assembly	1
	2404	84-31		9004800-1913	Pin	1
	2405	84-31		9004875-0081	Pin	1
	2407	84-31		9004101-2240	O-ring	1
	2408	87-34		9004101-2380	O-ring	1
	2408	84-31	87-33	9004104-2400	O-ring	1



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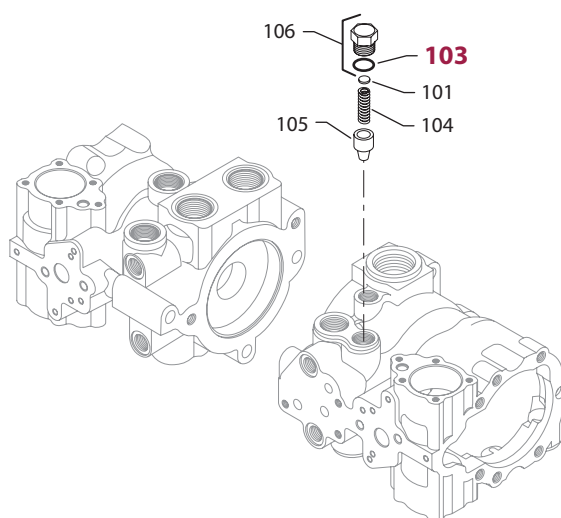
Enlarged **bold** type item
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COMMON CHARGE PRESSURE RELIEF PARTS

Order Code	Item	Date Begin	Date End	Part Number	Part Name	Qty. per Model/Kit
	101	86-14		9510445	Shim kit	1
	101	84-31	86-13	9510362	Shim kit	1
	103	86-14		9004201-6200	O-ring	1
	103	84-31	86-13	9004201-5000	O-ring	1
	106	86-14		4461325	Plug assembly	1
	106	84-31	86-13	4250174	Plug assembly	1

CHARGE PRESSURE RELIEF SETTING

A	104	86-14		4800431	Charge relief spring, 16.0 bar [230 psi]	1
	104	84-31	86-13	3102280	Charge relief spring	1
	105	86-14		9800965	Relief valve	1
	105	84-31	86-13	3102274	Relief valve	1
B	104	86-14		4800431	Charge relief spring, 19.0 bar [285 psi]	1
	104	84-31	86-13	3102280	Charge relief spring	1
	105	86-14		9800965	Relief valve	1
	105	84-31	86-13	3102274	Relief valve	1
C	104	86-14		4800431	Charge relief spring, 18.0 bar [260 psi]	1
	104	84-31	86-13	3102280	Charge relief spring	1
	105	86-14		9800965	Relief valve	1
	105	84-31	86-13	3102274	Relief valve	1
D	104	86-14		4800431	Charge relief spring, 17.0 bar [250 psi]	1
	104	84-31	86-13	3102280	Charge relief spring	1
	105	86-14		9800965	Relief valve	1
	105	84-31	86-13	3102274	Relief valve	1
J	104	86-14		4800431	Charge relief spring, 21.5 bar [315 psi]	1
	104	84-31	86-13	3102280	Charge relief spring	1
	105	86-14		9800965	Relief valve	1
	105	84-31	86-13	3102274	Relief valve	1
K	104	86-14		4800431	Charge relief spring, 23.0 bar [330 psi]	1
	105	86-14		9800965	Relief valve, 23.0 bar [330 psi]	1
M	104	86-14		4800431	Charge relief spring, 28.3 bar [410 psi]	1
	104	84-31	86-13	3102280	Charge relief spring	1
	105	86-14		9800965	Relief valve	1
	105	84-31	86-13	3102274	Relief valve	1
R	104	02-12		4800826	Charge relief spring, 25.0 bar [360 psi]	1
	105	02-12		4461310	Relief valve, .028 orifice	1
S	104	86-14		4800431	Charge relief spring, 25.0 bar [360 psi]	1
	104	84-31	86-13	3102280	Charge relief spring	1
	105	86-14		9800965	Relief valve	1
	105	84-31	86-13	3102274	Relief valve	1



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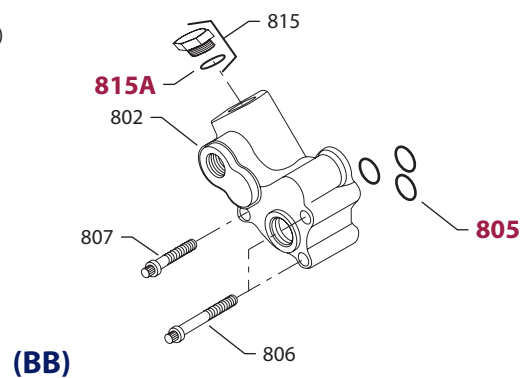
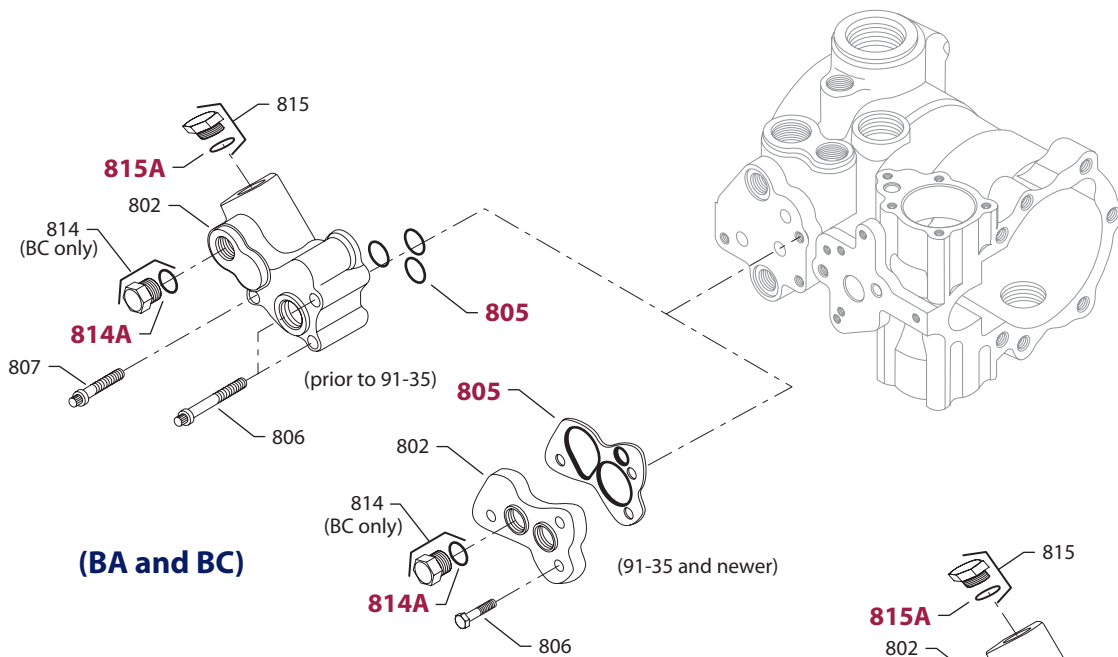
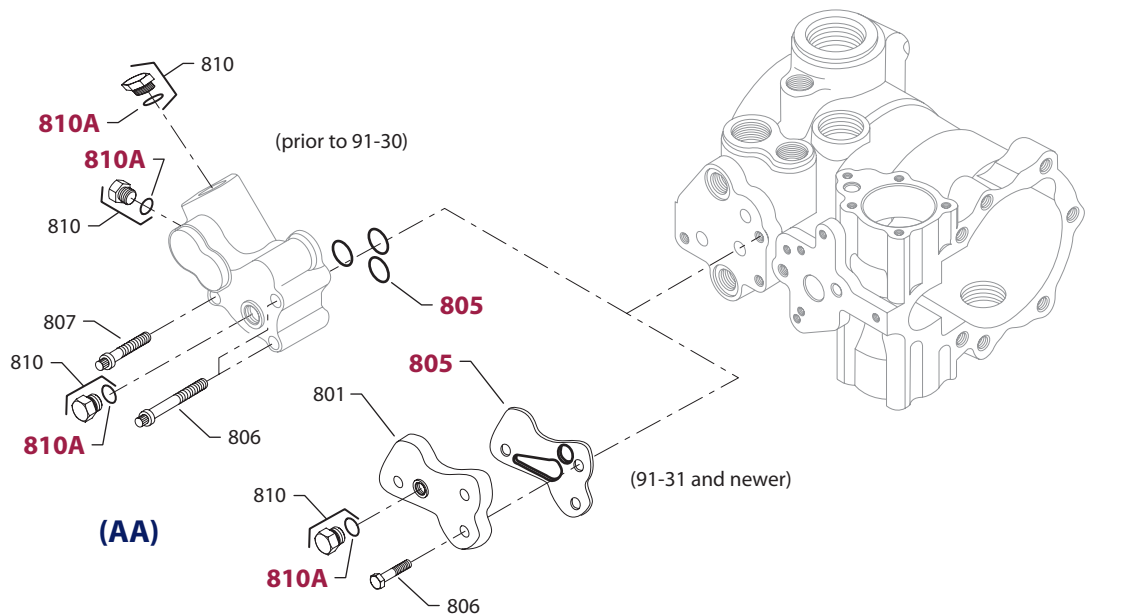
Enlarged **bold** type item
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COMMON CHARGE PRESSURE RELIEF PARTS

Order Code	Item	Date Begin	Date End	Part Number	Part Name	Qty. per Model/Kit
	101	86-14		9510445	Shim kit	1
	101	84-31	86-13	9510362	Shim kit	1
	103	86-14		9004201-6200	O-ring	1
	103	84-31	86-13	9004201-5000	O-ring	1
	106	86-14		4461325	Plug assembly	1
	106	84-31	86-13	4250174	Plug assembly	1

CHARGE PRESSURE RELIEF SETTING

T	104	94-08		4800431	Charge relief spring, 28.5 bar [415 psi]	1
	105	94-08		4800356	Relief valve, .050 orifice	1
U	104	86-14		4800431	Charge relief spring, 27.0 bar [390 psi]	1
	104	84-31	86-13	3102280	Charge relief spring	1
	105	86-14		9800965	Relief valve	1
	105	84-31	86-13	3102274	Relief valve	1

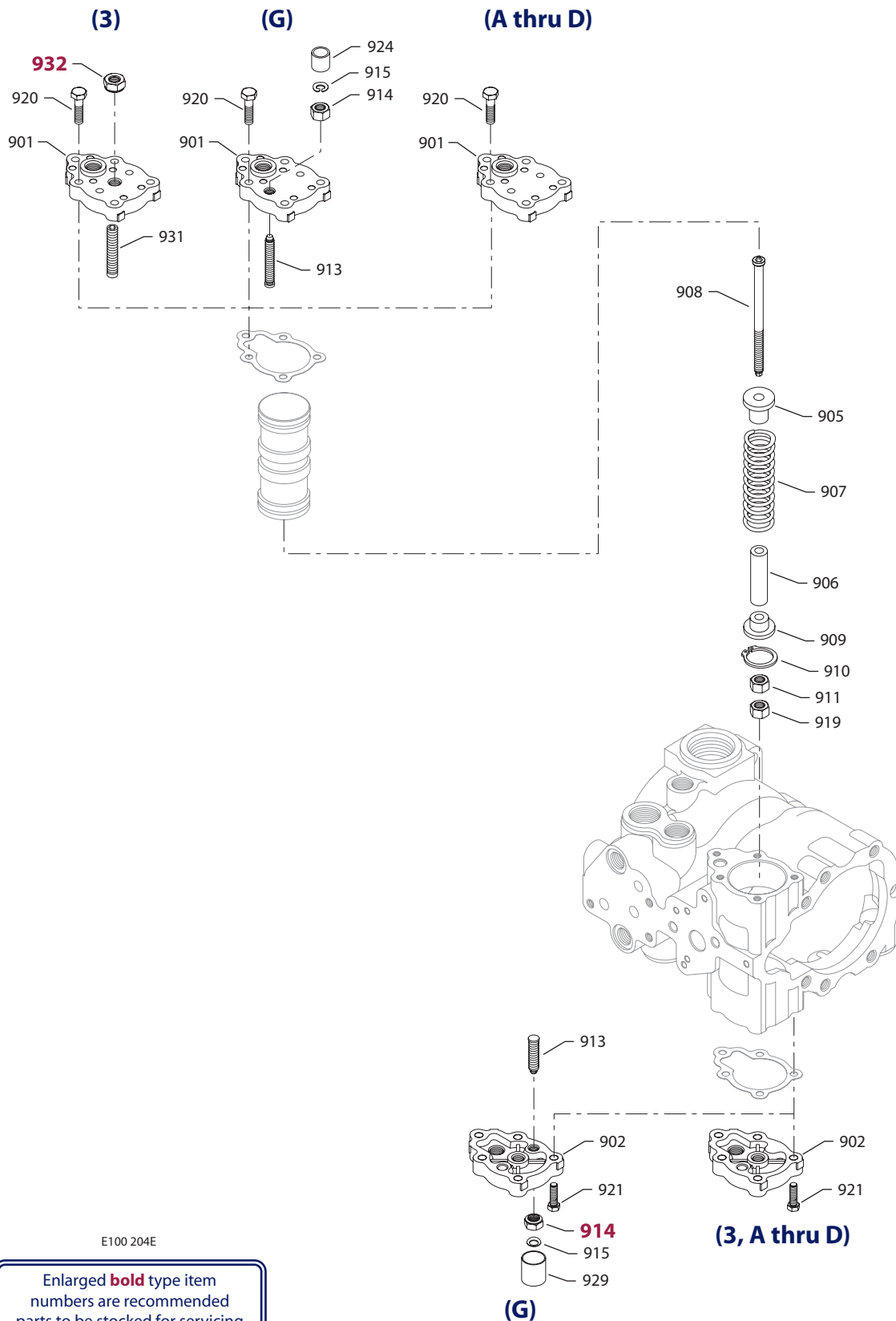


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numbers are recommended
parts to be stocked for servicing

FILTRATION

Order Code	Item	Date Begin	Date End	Part Number	Part Name	Qty. per Model/Kit
AA	801	91-31		4460643	Filtration adaptor, suction (SB-1990-017)	1
	805	91-31		4460655	Filtration adaptor seal, suction (SB-1990-017)	1
	805	86-14	91-30	9004101-0170	O-ring	3
	805	84-31	86-13	9004104-0180	O-ring	2
	806	91-31		9007206-3116	Screw (SB-1990-017)	3
	806	86-14	91-30	9007500-3130	Screw	2
	806	84-31	86-13	9007200-3124	Screw	2
	807	86-14	91-30	9007500-3124	Screw (SB-1990-017)	1
	807	84-31	86-13	9007200-3124	Screw	1
	810	91-31		9005100-5600	Plug assembly	1
	810	84-31	91-30	9005100-5600	Plug assembly	3
	810A	91-31		9004201-3700	O-ring	1
	810A	84-31	91-30	9004201-3700	O-ring	3
BA	801	91-36		4460644	Filtration adaptor, remote (SB-1990-017)	1
	805	91-36		4460656	Filtration adaptor seal, remote (SB-1990-017)	1
	805	86-40	91-35	9004101-0170	O-ring	3
	805	84-31	86-39	9004104-0180	O-ring	2
	806	91-36		9007206-3116	Screw (SB-1990-017)	3
	806	86-40	91-35	9007500-3130	Screw	2
	806	84-31	86-39	9007200-3124	Screw	2
	807	86-40	91-35	9007500-3124	Screw (SB-1990-017)	1
	807	84-31	86-39	9007200-3124	Screw	1
	815	86-40	91-35	9005100-5600	Plug assembly	1
	815	86-14	86-39	9005219-0120	Expansion plug	1
	815A	86-40	91-35	9004201-3700	O-ring	1
BB	802	92-10	01-07	4460434	Filtration adaptor, remote	1
	805	92-10	01-07	9004101-0170	O-ring	3
	806	92-10	01-07	9007500-3130	Screw	2
	807	92-10	01-07	9007500-3124	Screw (SB-1990-017)	1
	815	92-10	01-07	9005100-5600	Plug assembly	1
	815A	92-10	01-07	9004201-3700	O-ring	1
BC	801	91-36		4460644	Filtration adaptor, remote (SB-1990-017)	1
	805	91-36		4460656	Filtration adaptor seal, remote (SB-1990-017)	1
	805	86-40	91-35	9004101-0170	O-ring	3
	805	84-31	86-39	9004104-0180	O-ring	2
	806	91-36		9007206-3116	Screw (SB-1990-017)	3
	806	86-40	91-35	9007500-3130	Screw	2
	806	84-31	86-39	9007200-3124	Screw	2
	807	86-40	91-35	9007500-3124	Screw (SB-1990-017)	1
	807	84-31	86-39	9007200-3124	Screw	1
	814	84-31		9005100-8700	Plug assembly	1
	814A	84-31		9004201-6200	O-ring	1
	815	86-40	91-35	9005100-5600	Plug assembly	1
	815	86-14	86-39	9005219-0120	Expansion plug	1
	815A	86-40	91-35	9004201-3700	O-ring	1

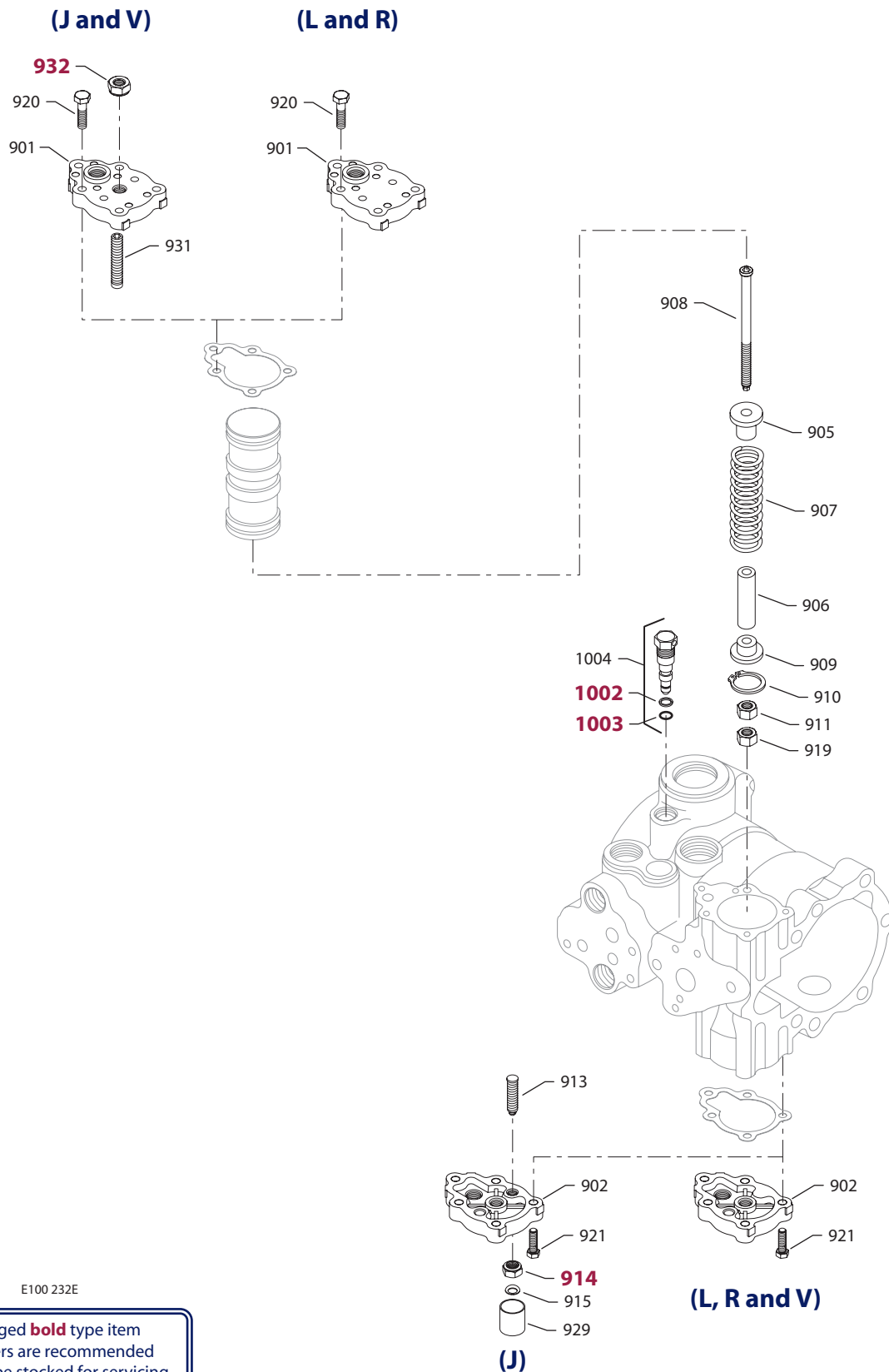


COMMON MAXIMUM DISPLACEMENT PARTS

Order Code	Item	Date Begin	Date End	Part Number	Part Name	Qty. per Model/Kit
	905	84-31		4461034	Spring guide (SB-1998-051)	1
	907	84-31		4460164	Servo spring	1
	908	84-31		4461033	Servo screw (SB-1998-051)	1
	909	84-31		4460302	Spring guide	1
	910	84-31		9006220-0131	Retaining ring	1
	911	84-31		9003535-3700	Nut	1
	919	87-40		5000480	Nut	1
	920	84-31		9007276-0134	Screw (SB-1990-012)	5
	921	84-31		9007276-0134	Screw (SB-1990-012)	5

MAXIMUM DISPLACEMENT

3	901	03-32		4460455-0002	Servo cover	1
	902	03-32		4460455-0002	Servo cover	1
	906	03-32		4460303-0006	Servo stop	1
	931	03-32		4460946	Servo stop	1
	932	03-32		9003575-0083	Seal nut	1
A	901	87-41		4460455-0004	Servo cover (SB-1987-029)	1
	902	87-41		4460455-0002	Servo cover (SB-1987-029)	1
	906	84-31		4460303-0001	Servo stop	1
B	901	87-41		4460455-0004	Servo cover (SB-1987-029)	1
	902	87-41		4460455-0002	Servo cover (SB-1987-029)	1
	906	84-31		4460303-0002	Servo stop	1
C	901	87-41		4460455-0004	Servo cover (SB-1987-029)	1
	902	87-41		4460455-0002	Servo cover (SB-1987-029)	1
	906	84-31		4460303-0003	Servo stop	1
D	901	87-41		4460455-0004	Servo cover (SB-1987-029)	1
	902	87-41		4460455-0002	Servo cover (SB-1987-029)	1
	906	84-31		4460303-0004	Servo stop	1
G	901	87-41		4460455-0003	Servo cover (SB-1987-029)	1
	902	87-41		4460455-0001	Servo cover (SB-1987-029)	1
	906	84-31		4460303-0002	Servo stop	1
	913	84-31		4460603	Servo stop	2
	914	84-31		9003575-0094	Seal nut	2
	915	84-31		9006326-0025	Retaining ring	2
	924	84-31		4800174	Servo adjust cover	1
	929	84-31		4800174	Servo adjust cover	1



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COMMON MAXIMUM DISPLACEMENT PARTS

Order Code	Item	Date Begin	Date End	Part Number	Part Name	Qty. per Model/Kit
	905	84-31		4461034	Spring guide (SB-1998-051)	1
	907	84-31		4460164	Servo spring	1
	908	84-31		4461033	Servo screw (SB-1998-051)	1
	909	84-31		4460302	Spring guide	1
	910	84-31		9006220-0131	Retaining ring	1
	911	84-31		9003535-3700	Nut	1
	919	87-40		5000480	Nut	1
	920	84-31		9007276-0134	Screw	5
	921	84-31		9007276-0134	Screw	5

MAXIMUM DISPLACEMENT

J	901	03-10		4460455-0002	Servo cover	1
	902	03-10		4460455-0001	Servo cover	1
	906	03-10		4460303-0001	Servo stop	1
	913	03-10		4460603	Servo stop	1
	914	03-10		9003575-0094	Seal nut	1
	915	03-10		9006326-0025	Retaining ring	1
	929	03-10		4800174	Servo adjust cover	1
	931	03-10		4460946	Servo stop	1
	932	03-10		9003575-0083	Seal nut	1

L	901	87-41		4460455-0004	Servo cover (SB-1987-029)	1
	902	87-41		4460455-0002	Servo cover (SB-1987-029)	1
	906	84-31		4460303-0005	Servo stop	1

R	901	92-30		4460455-0004	Servo cover	1
	902	92-30		4460455-0002	Servo cover	1
	906	92-30		4460303-0006	Servo stop	1

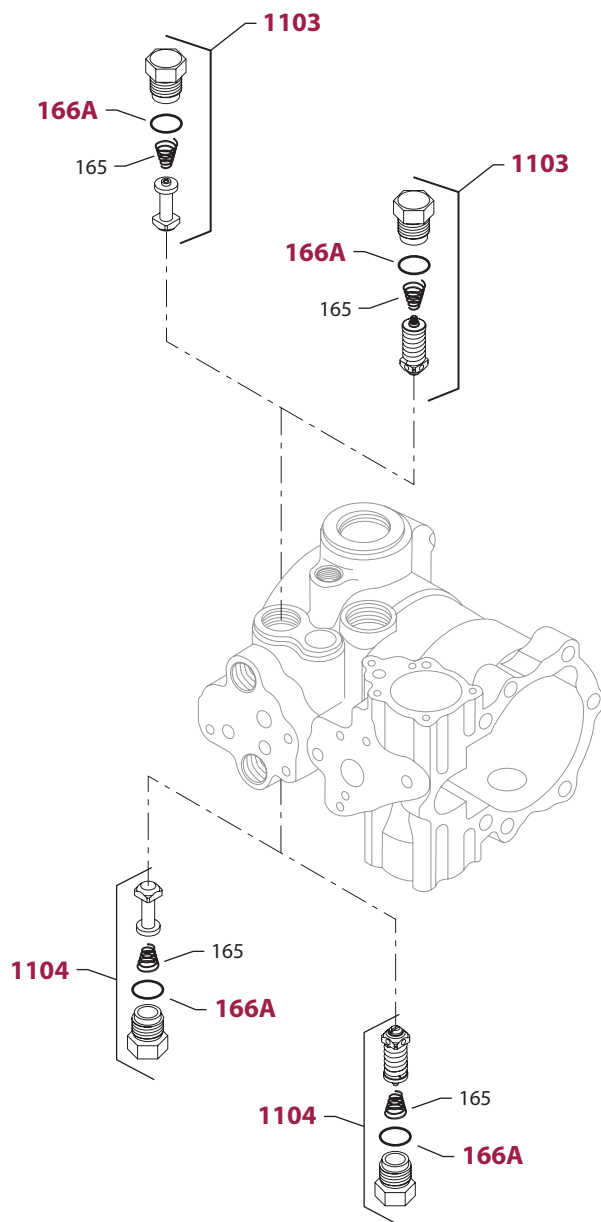
V	901	97-26		4460455-0002	Servo cover	1
	902	97-26		4460455-0002	Servo cover	1
	906	97-26		4460303-0001	Servo stop	1
	931	97-26		4460946	Servo stop	1
	932	97-26		9003575-0083	Seal nut	1

BYPASS VALVE

A	1004	84-31		4461332	Bypass valve assembly	1
	1002	84-31		9006110-0120	Back up ring	1
	1003	84-31		5000654	O-ring	1

B	1004	84-31		4461333	Bypass valve assembly, .031" orifice	1
	1002	84-31		9006110-0120	Back up ring	1
	1003	84-31		5000654	O-ring	1

C	1004	84-31		4461334	Bypass valve assembly, .040" orifice	1
	1002	84-31		9006110-0120	Back up ring	1
	1003	84-31		5000654	O-ring	1



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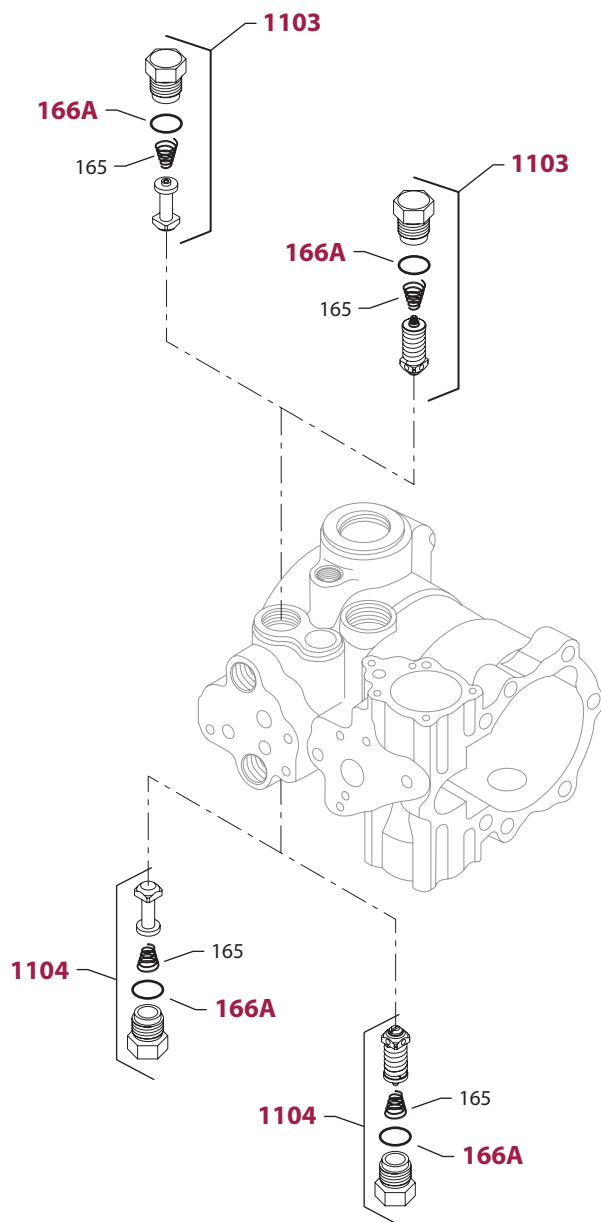
Enlarged **bold** type item
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COMMON SYSTEM PRESSURE PROTECTION PARTS

Order Code	Item	Date Begin	Date End	Part Number	Part Name	Qty. per Model/Kit
	165	84-31		4461386	Conical spring	2
	166A	84-31		9004201-7500	O-ring	2

SYSTEM PRESSURE PROTECTION

AAA	1103	87-38		4510004-0000	Check valve kit (SB-1987-024)	1
	1104	87-38		4510004-0000	Check valve kit (SB-1987-024)	1
BBB	1103	87-38		4510004-0175	SCR valve kit, 175 bar [2538 psi] (SB-1987-024)	1
	1104	87-38		4510004-0175	SCR valve kit, 175 bar [2538 psi] (SB-1987-024)	1
BBF	1103	87-38		4510004-0175	SCR valve kit, 175 bar [2538 psi] (SB-1987-024)	1
	1104	87-38		4510004-0250	SCR valve kit, 250 bar [3625 psi] (SB-1987-024)	1
BBG	1103	87-38		4510004-0175	SCR valve kit, 175 bar [2538 psi] (SB-1987-024)	1
	1104	87-38		4510004-0280	SCR valve kit, 280 bar [4060 psi] (SB-1987-024)	1
BBJ	1103	87-38		4510004-0175	SCR valve kit, 175 bar [2538 psi] (SB-1987-024)	1
	1104	87-38		4510004-0345	SCR valve kit, 345 bar [5000 psi] (SB-1987-024)	1
BCC	1103	87-38		4510004-0190	SCR valve kit, 190 bar [2755 psi] (SB-1987-024)	1
	1104	87-38		4510004-0190	SCR valve kit, 190 bar [2755 psi] (SB-1987-024)	1
BCE	1103	87-38		4510004-0190	SCR valve kit, 190 bar [2755 psi] (SB-1987-024)	1
	1104	87-38		4510004-0230	SCR valve kit, 230 bar [3335 psi] (SB-1987-024)	1
BDD	1103	87-38		4510004-0210	SCR valve kit, 210 bar [3045 psi] (SB-1987-024)	1
	1104	87-38		4510004-0210	SCR valve kit, 210 bar [3045 psi] (SB-1987-024)	1
BED	1103	87-38		4510004-0230	SCR valve kit, 230 bar [3335 psi] (SB-1987-024)	1
	1104	87-38		4510004-0210	SCR valve kit, 210 bar [3045 psi] (SB-1987-024)	1
BEE	1103	87-38		4510004-0230	SCR valve kit, 230 bar [3335 psi] (SB-1987-024)	1
	1104	87-38		4510004-0230	SCR valve kit, 230 bar [3335 psi] (SB-1987-024)	1
BEF	1103	87-38		4510004-0230	SCR valve kit, 230 bar [3335 psi] (SB-1987-024)	1
	1104	87-38		4510004-0250	SCR valve kit, 250 bar [3625 psi] (SB-1987-024)	1
BFF	1103	87-38		4510004-0250	SCR valve kit, 250 bar [3625 psi] (SB-1987-024)	1
	1104	87-38		4510004-0250	SCR valve kit, 250 bar [3625 psi] (SB-1987-024)	1
BGB	1103	87-38		4510004-0280	SCR valve kit, 280 bar [4060 psi] (SB-1987-024)	1
	1104	87-38		4510004-0175	SCR valve kit, 175 bar [2538 psi] (SB-1987-024)	1
BGE	1103	87-38		4510004-0280	SCR valve kit, 280 bar [4060 psi] (SB-1987-024)	1
	1104	87-38		4510004-0230	SCR valve kit, 230 bar [3335 psi] (SB-1987-024)	1
BGG	1103	87-38		4510004-0280	SCR valve kit, 280 bar [4060 psi] (SB-1987-024)	1
	1104	87-38		4510004-0280	SCR valve kit, 280 bar [4060 psi] (SB-1987-024)	1



E100 208E

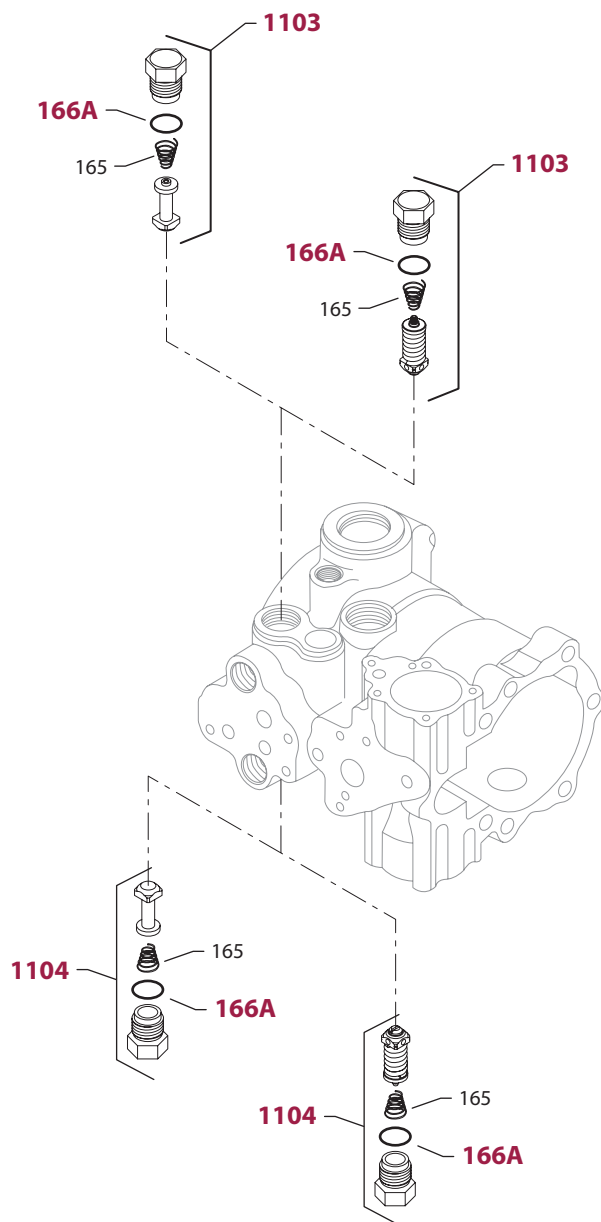
Enlarged **bold** type item
numbers are recommended
parts to be stocked for servicing

COMMON SYSTEM PRESSURE PROTECTION PARTS

Order Code	Item	Date Begin	Date End	Part Number	Part Name	Qty. per Model/Kit
	165	84-31		4461386	Conical spring	2
	166A	84-31		9004201-7500	O-ring	2

SYSTEM PRESSURE PROTECTION

BHH	1103	87-38		4510004-0300	SCR valve kit, 300 bar [4350 psi] (SB-1987-024)	1
	1104	87-38		4510004-0300	SCR valve kit, 300 bar [4350 psi] (SB-1987-024)	1
BHM	1103	87-38		4510004-0300	SCR valve kit, 300 bar [4350 psi] (SB-1987-024)	1
	1104	87-38		4510004-0140	SCR valve kit, 140 bar [2030 psi] (SB-1987-024)	1
BJB	1103	87-38		4510004-0345	SCR valve kit, 345 bar [5000 psi] (SB-1987-024)	1
	1104	87-38		4510004-0175	SCR valve kit, 175 bar [2538 psi] (SB-1987-024)	1
BJD	1103	87-38		4510004-0345	SCR valve kit, 345 bar [5000 psi] (SB-1987-024)	1
	1104	87-38		4510004-0210	SCR valve kit, 210 bar [3045 psi] (SB-1987-024)	1
BJF	1103	87-38		4510004-0345	SCR valve kit, 345 bar [5000 psi] (SB-1987-024)	1
	1104	87-38		4510004-0250	SCR valve kit, 250 bar [3625 psi] (SB-1987-024)	1
BJJ	1103	87-38		4510004-0345	SCR valve kit, 345 bar [5000 psi] (SB-1987-024)	1
	1104	87-38		4510004-0345	SCR valve kit, 345 bar [5000 psi] (SB-1987-024)	1
BKK	1103	87-38		4510004-0360	SCR valve kit, 360 bar [5220 psi] (SB-1987-024)	1
	1104	87-38		4510004-0360	SCR valve kit, 360 bar [5220 psi] (SB-1987-024)	1
BLL	1103	87-38		4510004-0415	SCR valve kit, 415 bar [6020 psi] (SB-1987-024)	1
	1104	87-38		4510004-0415	SCR valve kit, 415 bar [6020 psi] (SB-1987-024)	1
BMG	1103	87-38		4510004-0140	SCR valve kit, 140 bar [2030 psi] (SB-1987-024)	1
	1104	87-38		4510004-0280	SCR valve kit, 280 bar [4060 psi] (SB-1987-024)	1
BMJ	1103	87-38		4510004-0140	SCR valve kit, 140 bar [2030 psi] (SB-1987-024)	1
	1104	87-38		4510004-0345	SCR valve kit, 345 bar [5000 psi] (SB-1987-024)	1
BMM	1103	87-38		4510004-0140	SCR valve kit, 140 bar [2030 psi] (SB-1987-024)	1
	1104	87-38		4510004-0140	SCR valve kit, 140 bar [2030 psi] (SB-1987-024)	1
BRJ	1103	02-19		4510004-0325	SCR valve kit, 325 bar [4712 psi]	1
	1104	02-19		4510004-0345	SCR valve kit, 345 bar [5000 psi]	1
BRK	1103	02-19		4510004-0325	SCR valve kit, 325 bar [4712 psi]	1
	1104	02-19		4510004-0360	SCR valve kit, 360 bar [5220 psi]	1
BRR	1103	96-51		4510004-0325	SCR valve kit, 325 bar [4712 psi]	1
	1104	96-51		4510004-0325	SCR valve kit, 325 bar [4712 psi]	1
BSS	1103	96-51		4510004-0385	SCR valve kit, 385 bar [5580 psi]	1
	1104	96-51		4510004-0385	SCR valve kit, 385 bar [5580 psi]	1



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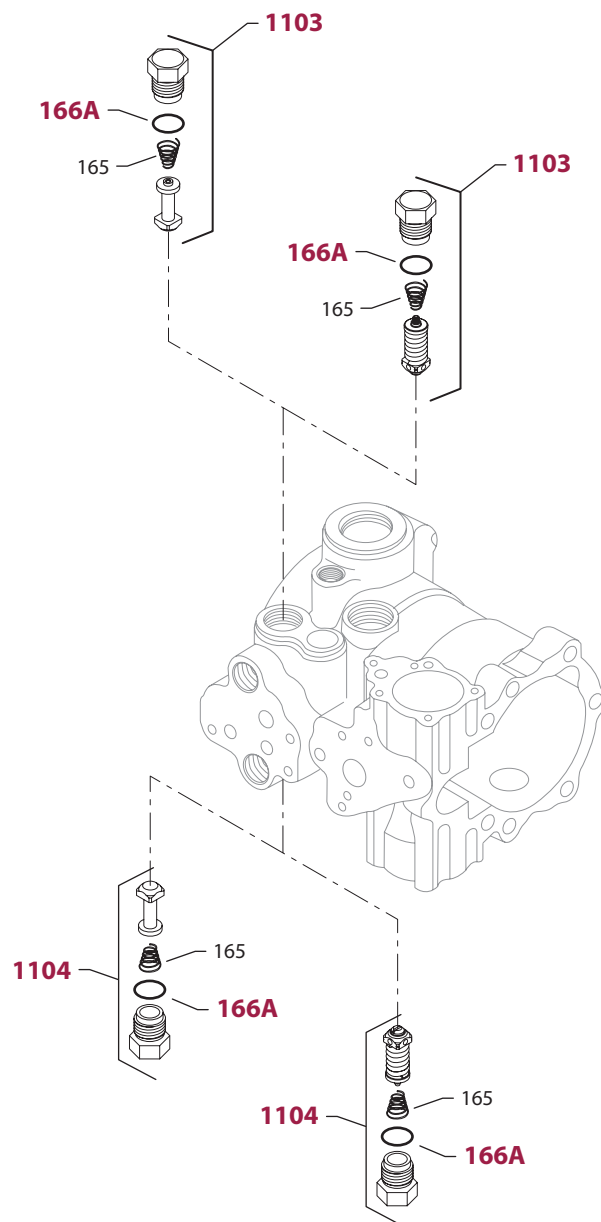
Enlarged **bold** type item
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COMMON SYSTEM PRESSURE PROTECTION PARTS

Order Code	Item	Date Begin	Date End	Part Number	Part Name	Qty. per Model/Kit
	165	84-31		4461386	Conical spring	2
	166A	84-31		9004201-7500	O-ring	2

SYSTEM PRESSURE PROTECTION

CBA	1103	87-38		4510004-0175	SCR valve kit, 175 bar [2538 psi] (SB-1987-024)	1
	1104	87-38		4510004-0000	Check valve kit (SB-1987-024)	1
CCA	1103	87-38		4510004-0190	SCR valve kit, 190 bar [2755 psi] (SB-1987-024)	1
	1104	87-38		4510004-0000	Check valve kit (SB-1987-024)	1
CDA	1103	87-38		4510004-0210	SCR valve kit, 210 bar [3045 psi] (SB-1987-024)	1
	1104	87-38		4510004-0000	Check valve kit (SB-1987-024)	1
CEA	1103	87-38		4510004-0230	SCR valve kit, 230 bar [3335 psi] (SB-1987-024)	1
	1104	87-38		4510004-0000	Check valve kit (SB-1987-024)	1
CFA	1103	87-38		4510004-0250	SCR valve kit, 250 bar [3625 psi] (SB-1987-024)	1
	1104	87-38		4510004-0000	Check valve kit (SB-1987-024)	1
CGA	1103	87-38		4510004-0280	SCR valve kit, 280 bar [4060 psi] (SB-1987-024)	1
	1104	87-38		4510004-0000	Check valve kit (SB-1987-024)	1
CHA	1103	87-38		4510004-0300	SCR valve kit, 300 bar [4350 psi] (SB-1987-024)	1
	1104	87-38		4510004-0000	Check valve kit (SB-1987-024)	1
CJA	1103	87-38		4510004-0345	SCR valve kit, 345 bar [5000 psi] (SB-1987-024)	1
	1104	87-38		4510004-0000	Check valve kit (SB-1987-024)	1
CKA	1103	87-38		4510004-0360	SCR valve kit, 360 bar [5220 psi] (SB-1987-024)	1
	1104	87-38		4510004-0000	Check valve kit (SB-1987-024)	1
CMA	1103	87-38		4510004-0140	SCR valve kit, 210 bar [2030 psi] (SB-1987-024)	1
	1104	87-38		4510004-0000	Check valve kit (SB-1987-024)	1
DAB	1103	87-38		4510004-0000	Check valve kit (SB-1987-024)	1
	1104	87-38		4510004-0175	SCR valve kit, 175 bar [2538 psi] (SB-1987-024)	1
DAC	1103	87-38		4510004-0000	Check valve kit (SB-1987-024)	1
	1104	87-38		4510004-0190	SCR valve kit, 190 bar [2755 psi] (SB-1987-024)	1
DAD	1103	87-38		4510004-0000	Check valve kit (SB-1987-024)	1
	1104	87-38		4510004-0210	SCR valve kit, 210 bar [3045 psi] (SB-1987-024)	1
DAE	1103	87-38		4510004-0000	Check valve kit (SB-1987-024)	1
	1104	87-38		4510004-0230	SCR valve kit, 230 bar [3335 psi] (SB-1987-024)	1
DAF	1103	87-38		4510004-0000	Check valve kit (1987-024)	1
	1104	87-38		4510004-0250	SCR valve kit, 250 bar [3625 psi] (SB-1987-024)	1



E100 208E

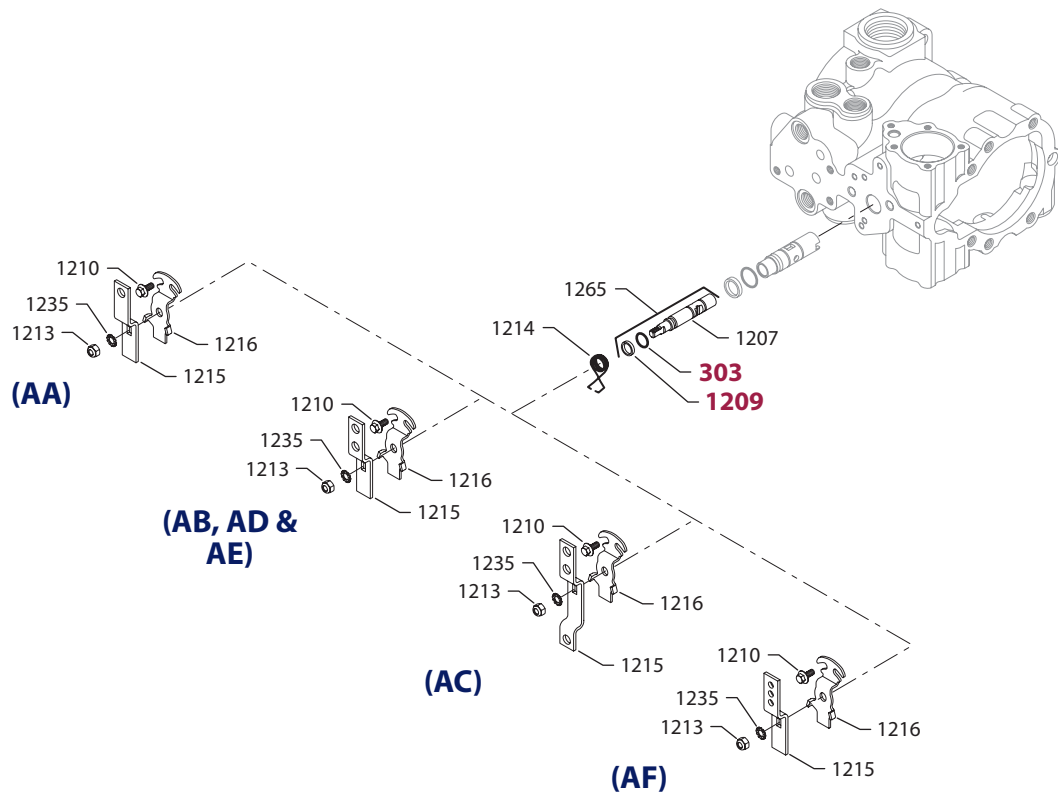
Enlarged **bold** type item numbers are recommended parts to be stocked for servicing

COMMON SYSTEM PRESSURE PROTECTION PARTS

Order Code	Item	Date Begin	Date End	Part Number	Part Name	Qty. per Model/Kit
	165	84-31		4461386	Conical spring	2
	166A	84-31		9004201-7500	O-ring	2

SYSTEM PRESSURE PROTECTION

DAG	1103	87-38		4510004-0000	Check valve kit (SB-1987-024)	1
	1104	87-38		4510004-0280	SCR valve kit, 280 bar [4060 psi] (SB-1987-024)	1
DAH	1103	87-38		4510004-0000	Check valve kit (SB-1987-024)	1
	1104	87-38		4510004-0300	SCR valve kit, 300 bar [4350 psi] (SB-1987-024)	1
DAJ	1103	87-38		4510004-0000	Check valve kit (SB-1987-024)	1
	1104	87-38		4510004-0345	SCR valve kit, 345 bar [5000 psi] (SB-1987-024)	1
DAK	1103	87-38		4510004-0000	Check valve kit (SB-1987-024)	1
	1104	87-38		4510004-0360	SCR valve kit, 360 bar [5220 psi] (SB-1987-024)	1



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Enlarged **bold** type item
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parts to be stocked for servicing

COMMON CONTROL PARTS

Order Code	Item	Date Begin	Date End	Part Number	Part Name	Qty. per Model/Kit
	303	84-31		5000654	O-ring	1
	1209	84-31		9006150-0120	Back up ring	1
	1213	84-31		9003575-0102	Lock nut	1
	1235	84-31		9009660-3100	Toothlock washer	1

CONTROL

AA	1210	97-29		9007276-0123	Screw	1
	1214	97-29		4800315	Neutral return spring	1
	1215	97-29		4460952	Handle	1
	1216	97-29		4800084	Neutral return bracket	1
	1265	97-29		4461327	Spool assembly	1

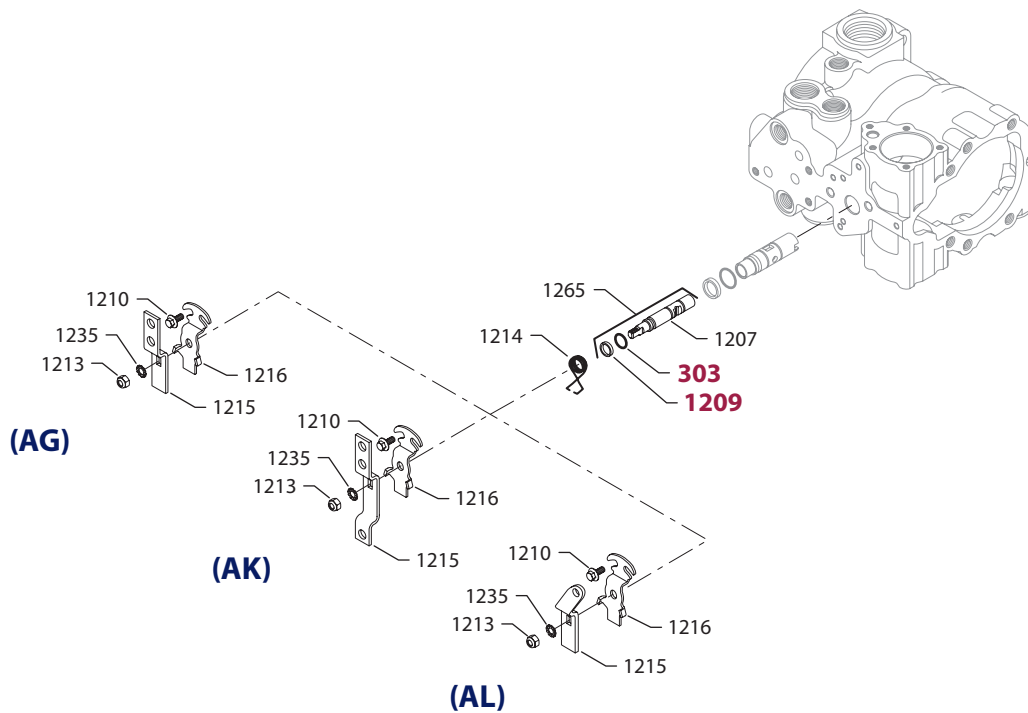
AB	1207	84-31	86-13	4460316	Spool	1
	1210	84-31		9007276-0123	Screw (SB-1987-020)	1
	1214	84-31		4800315	Neutral return spring	1
	1215	84-31		4800086-0002	Handle	1
	1216	84-31		4800084	Neutral return bracket	1
	1265	86-14		4461327	Spool assembly	1

AC	1207	84-31	86-13	4460316	Spool	1
	1210	84-31		9007276-0123	Screw (SB-1987-020)	1
	1214	84-31		4800315	Neutral return spring	1
	1215	84-31		4800153	Handle	1
	1216	84-31		4800084	Neutral return bracket	1
	1265	86-14		4461327	Spool assembly	1

AD	1207	84-31	86-13	4460316	Spool	1
	1210	84-31		9007276-0123	Screw (SB-1987-020)	1
	1214	84-31		4800315	Neutral return spring	1
	1215	84-31		4800086-0002	Handle	1
	1216	84-31		4800084	Neutral return bracket	1
	1265	86-14		4461327	Spool assembly	1

AE	1207	84-31	86-13	4460316	Spool	1
	1210	84-31		9007276-0123	Screw (SB-1987-020)	1
	1214	84-31		4800315	Neutral return spring	1
	1215	84-31		4800086-0002	Handle	1
	1216	84-31		4800084	Neutral return bracket	1
	1265	86-14		4461327	Spool assembly	1

AF	1207	84-31	86-13	4460316	Spool	1
	1210	84-31	03-07	9007276-0123	Screw (SB-1987-020)	1
	1214	84-31	03-07	4800315	Neutral return spring	1
	1215	84-31	03-07	4800137	Handle	1
	1216	84-31	03-07	4800084	Neutral return bracket	1
	1265	86-14	03-07	4461331	Spool assembly	1



E100 239E

Enlarged **bold** type item
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COMMON CONTROL PARTS

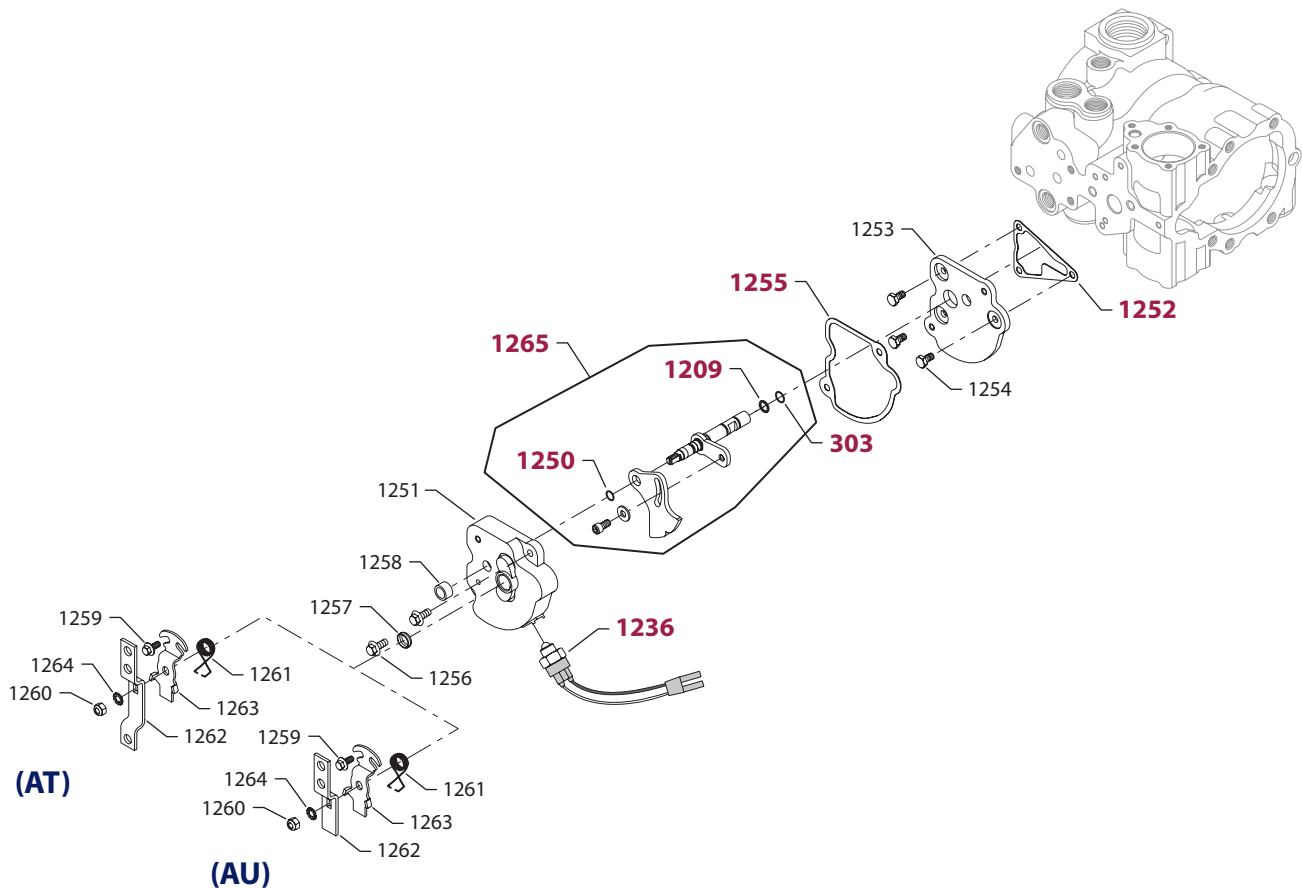
Order Code	Item	Date Begin	Date End	Part Number	Part Name	Qty. per Model/Kit
	303	84-31		5000654	O-ring	1
	1209	84-31		9006150-0120	Back up ring	1
	1213	84-31		9003575-0102	Lock nut	1
	1235	84-31		9009660-3100	Toothlock washer	1

CONTROL

AG	1207	84-31	86-13	4460316	Spool	1
	1210	84-31	03-07	9007276-0123	Screw (SB-1987-020)	1
	1214	84-31	03-07	4800315	Neutral return spring	1
	1215	84-31	03-07	4800086-0002	Handle	1
	1216	84-31	03-07	4800089	Neutral return bracket	1
	1265	84-31	03-07	4461327	Spool assembly	1

AK	1210	89-02		9007276-0123	Screw	1
	1214	89-02		4800315	Neutral return spring	1
	1215	89-02		4800153	Handle	1
	1216	89-02		4800084	Neutral return bracket	1
	1265	89-02		4461331	Spool assembly	1

AL	1210	89-39	03-08	9007276-0123	Screw	1
	1214	89-39	03-08	4800315	Neutral return spring	1
	1215	89-39	03-08	4800184	Handle	1
	1216	89-39	03-08	4800084	Neutral return bracket	1
	1265	89-39	03-08	4461331	Spool assembly	1

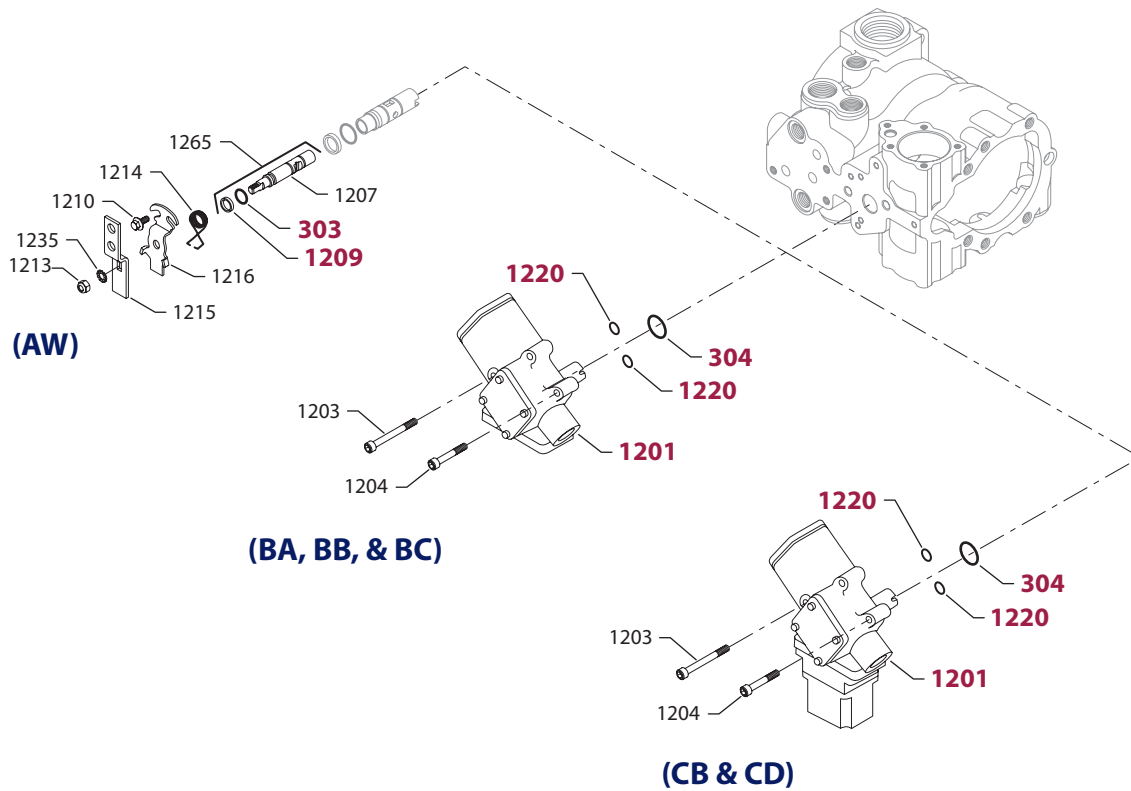


E100 240E

Enlarged **bold** type item
numbers are recommended
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CONTROL

Order Code	Item	Date Begin	Date End	Part Number	Part Name	Qty. per Model/Kit
AT	303	95-38		5000654	O-ring	1
	1209	95-38		9006150-0120	Back up ring	1
	1236	95-38		4700033	Neutral start switch	1
	1250	95-38		9004100-0110	O-ring	1
	1251	95-38		4461049	Neutral start switch cover	1
	1252	95-38		4460789	Neutral start switch mounting plate gasket	1
	1253	95-38		4461051	Neutral start switch plate assembly	1
	1254	95-38		5000385	Screw	3
	1255	95-38		4461053	Neutral start switch cover gasket	1
	1256	95-38		9007276-0123	Screw	2
	1257	95-38		9005215-6200	Expansion plug	1
	1258	95-38		4460817	Control spring spacer	1
	1259	95-38		9007276-0123	Screw	1
	1260	95-38		9003575-0102	Nut	1
	1261	95-38		4800315	Neutral return spring	1
	1262	95-38		4800153	Control handle	1
	1263	95-38		4800084	Neutral return bracket	1
	1264	95-38		9009660-3100	Toothlock washer	1
	1265	95-38		4461305	Spool assembly	1
AU	303	97-24		5000654	O-ring	1
	1209	97-24		9006150-0120	Back up ring	1
	1236	97-24		503545	Neutral start switch	1
	1250	97-24		9004100-0110	O-ring	1
	1251	97-24		4461049	Neutral start switch cover	1
	1252	97-24		4460789	Neutral start switch mounting plate gasket	1
	1253	97-24		4461051	Neutral start switch plate assembly	1
	1254	97-24		5000385	Screw	3
	1255	97-24		4461053	Neutral start switch cover gasket	1
	1256	97-24		9007276-0123	Screw	2
	1257	97-24		9005215-6200	Expansion plug	1
	1258	97-24		4460817	Control spring spacer	1
	1259	97-24		9007276-0123	Screw	1
	1260	97-24		9003575-0102	Nut	1
	1261	97-24		4800315	Neutral return spring	1
	1262	97-24		4800086-0002	Control handle	1
	1263	97-24		4800084	Neutral return bracket	1
	1264	97-24		9009660-3100	Toothlock washer	1
	1265	97-24		4461305	Spool assembly	1

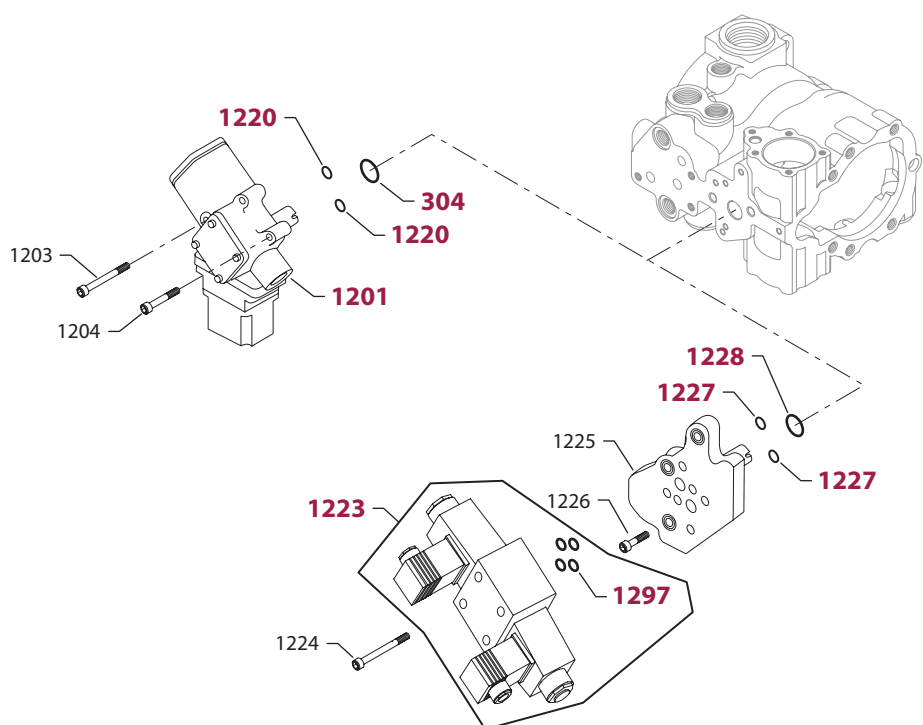


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Enlarged **bold** type item
numbers are recommended
parts to be stocked for servicing

CONTROL

Order Code	Item	Date Begin	Date End	Part Number	Part Name	Qty. per Model/Kit
AW	303	06-02		5000654	O-ring	1
	1209	06-02		9006150-0120	Back up ring	1
	1210	06-02		9007276-0123	Screw	1
	1213	06-02		9003575-0102	Lock nut	1
	1214	06-02		4800315	Neutral return spring	1
	1215	06-02		4800086-0002	Handle	1
	1216	06-02		4800084	Neutral return bracket	1
	1235	06-02		9009660-3100	Toothlock washer	1
	1265	06-02		4461331	Spool assembly	1
BA	304	98-33		9004101-1190	O-ring (SB-1998-052)	1
	304	85-37	98-32	9004100-0210	O-ring	1
	1201	85-37		MCV108C3011	HDC (SB-1998-052 & SB-1997-001)	1
	1203	85-37		9007300-2532	Screw	2
	1204	85-37		9007300-2512	Screw	2
	1220	85-37		9004101-0140	O-ring	2
BB	304	98-33		9004101-1190	O-ring (SB-1998-052)	1
	304	90-17	98-32	9004100-0210	O-ring	1
	1201	90-17		MCV108C3014	HDC (SB-1998-052 & SB-1997-001)	1
	1203	90-17		9007300-2532	Screw	2
	1204	90-17		9007300-2512	Screw	2
	1220	90-17		9004101-0140	O-ring	2
BC	304	98-33		9004101-1190	O-ring (SB-1998-052)	1
	304	90-17	98-32	9004100-0210	O-ring	1
	1201	90-17		MCV108C3015	HDC (SB-1998-052 & SB-1997-001)	1
	1203	90-17		9007300-2532	Screw	2
	1204	90-17		9007300-2512	Screw	2
	1220	90-17		9004101-0140	O-ring	2
CA	Replaced by 'CB' (SB-1989-01)					
CB	304	98-31		9004101-1190	O-ring (SB-1998-052)	1
	304	85-37	98-30	9004100-0210	O-ring	1
	1201	85-37		MCV105C3022	EDC (SB-1998-052, SB-1997-001, & SB-1989-001)	1
	1203	85-37		9007300-2532	Screw	2
	1204	85-37		9007300-2512	Screw	2
	1220	85-37		9004101-0140	O-ring	2
CC	Replaced by 'CD' (SB-1989-01)					
CD	304	98-31		9004101-1190	O-ring (SB-1998-052)	1
	304	85-37	98-30	9004100-0210	O-ring	1
	1201	85-37		MCV105C3026	EDC (SB-1998-052, SB-1997-001, & SB-1989-001)	1
	1203	85-37		9007300-2532	Screw	2
	1204	85-37		9007300-2512	Screw	2
	1220	85-37		9004101-0140	O-ring	2

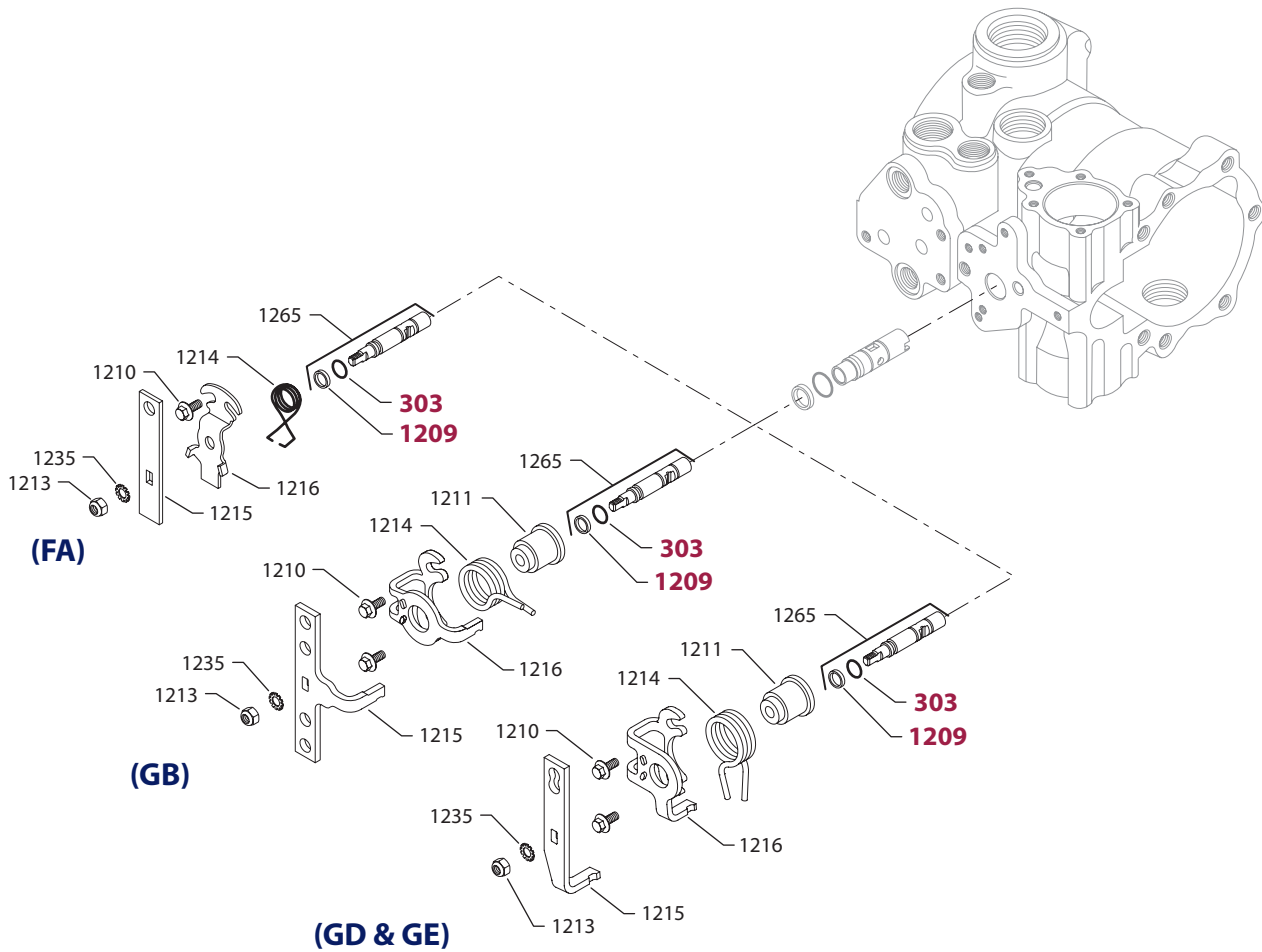


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Enlarged **bold** type item
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CONTROL

Order Code	Item	Date Begin	Date End	Part Number	Part Name	Qty. per Model/Kit
CE	304	98-31		9004101-1190	O-ring (SB-1998-052)	1
	304	85-37	98-30	9004100-0210	O-ring	1
	1201	85-37		MCV105C3023	EDC (SB-1998-052, SB-1997-001, & SB-1989-001)	1
	1203	85-37		9007300-2532	Screw	2
	1204	85-37		9007300-2512	Screw	2
	1220	85-37		9004101-0140	O-ring	2
CG	304	98-31		9004101-1190	O-ring (SB-1998-052)	1
	304	85-37	98-30	9004100-0210	O-ring	1
	1201	85-37		MCV105C3027	EDC (SB-1998-052, SB-1997-001, & SB-1989-001)	1
	1203	85-37		9007300-2532	Screw	2
	1204	85-37		9007300-2512	Screw	2
	1220	85-37		9004101-0140	O-ring	2
CH	304	98-31		9004101-1190	O-ring (SB-1998-052)	1
	304	94-23	98-30	9004100-0210	O-ring	1
	1201	94-23		MCV105C3046	EDC (SB-1998-052, SB-1997-001, & SB-1989-001)	1
	1203	94-23		9007300-2532	Screw	2
	1204	94-23		9007300-2512	Screw	2
	1220	94-23		9004101-0140	O-ring	2
DA	1223	91-07		9700873	Solenoid valve, 12 volt	1
	1224	91-07		9007315-0507	Screw	4
	1225	91-07		4460590	Manifold assembly	1
	1226	91-07		9007300-2512	Screw	3
	1227	91-07		9004101-0140	O-ring	2
	1228	91-07		9004100-0200	O-ring	1
	1297	91-07		9004104-0120	O-ring	4
DB	1223	91-07		9700918	Solenoid valve, 24 volt	1
	1224	91-07		9007315-0507	Screw	4
	1225	91-07		4460590	Manifold assembly	1
	1226	91-07		9007300-2512	Screw	3
	1227	91-07		9004101-0140	O-ring	2
	1228	91-07		9004100-0200	O-ring	1
	1297	91-07		9004104-0120	O-ring	4

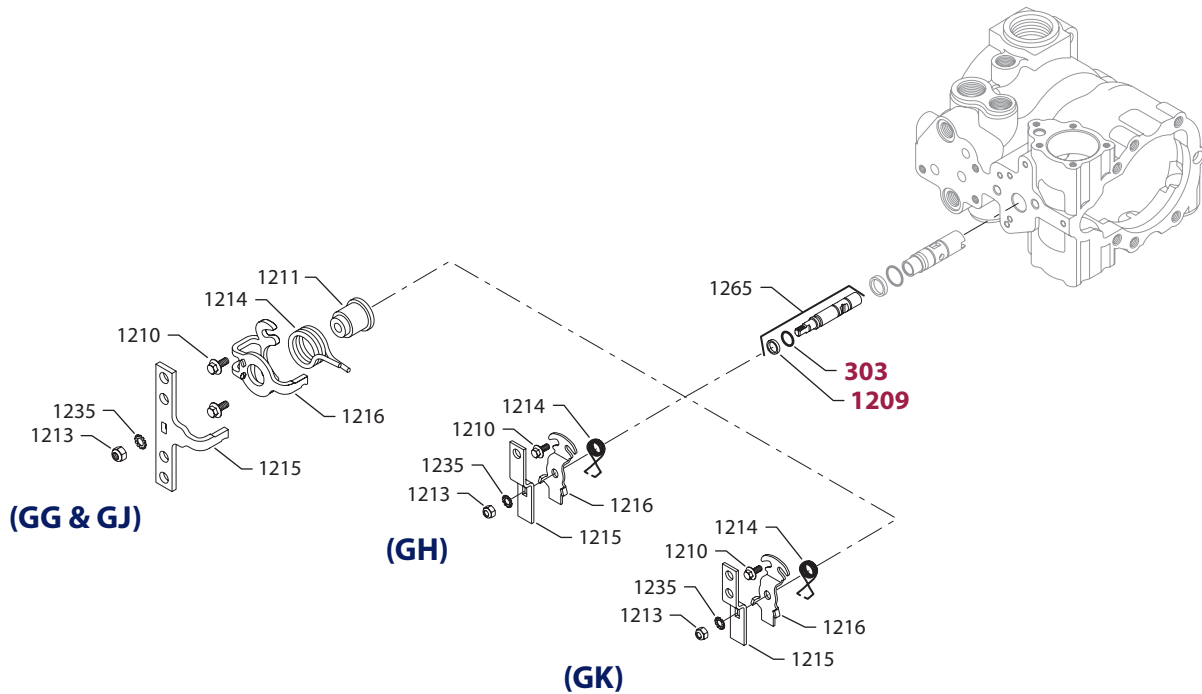


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Enlarged **bold** type item
numbers are recommended
parts to be stocked for servicing

CONTROL

Order Code	Item	Date Begin	Date End	Part Number	Part Name	Qty. per Model/Kit
FA	303	02-46		5000654	O-ring	1
	1209	02-46		9006150-0120	Back up ring	1
	1210	02-46		9007276-0123	Screw (SB-1987-020)	2
	1213	02-46		9003575-0102	Nut	1
	1214	02-46		4800315	Neutral return spring	1
	1215	02-46		4461272	Handle	1
	1216	02-46		4800084	Neutral return bracket	1
	1235	02-46		9009660-3100	Toothlock washer	1
	1265	02-46		4461331	Spool assembly	1
GB	303	02-46		5000654	O-ring	1
	1209	02-46		9006150-0120	Back up ring	1
	1210	97-43		9007276-0123	Screw (SB-1987-020)	2
	1211	97-43		4461234	Spring guide	1
	1213	97-43		9003575-0102	Nut	1
	1214	97-43		4461061	Neutral return spring	1
	1215	97-43		4461065	Handle	1
	1216	97-43		4461187	Neutral return bracket	1
	1235	97-43		9009660-3100	Toothlock washer	1
	1265	97-43		4461329	Spool assembly	1
GD	303	02-46		5000654	O-ring	1
	1209	02-46		9006150-0120	Back up ring	2
	1210	98-24		9007276-0123	Screw (SB-1987-020)	1
	1211	98-24		4461234	Spring guide	1
	1213	98-24		9003575-0102	Nut	1
	1214	98-24		4461213	Neutral return spring	1
	1215	98-24		4461286	Handle	1
	1216	98-24		4461150	Neutral return bracket	1
	1235	98-24		9009660-3100	Toothlock washer	1
	1265	98-24		4461329	Spool assembly	1
GE	303	02-46		5000654	O-ring	1
	1209	02-46		9006150-0120	Back up ring	1
	1210	97-43		9007276-0123	Screw (SB-1987-020)	2
	1211	97-43		4461234	Spring guide	1
	1213	97-43		9003575-0102	Nut	1
	1214	97-43		4461213	Neutral return spring	1
	1215	97-43		4461286	Handle	1
	1216	97-43		4461150	Neutral return bracket	1
	1235	97-43		9009660-3100	Toothlock washer	1
	1265	97-43		4461328	Spool assembly	1



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Enlarged **bold** type item
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CONTROL

Order Code	Item	Date Begin	Date End	Part Number	Part Name	Qty. per Model/Kit
GG	303	02-49		5000654	O-ring	1
	1209	02-49		9006150-0120	Back up ring	1
	1210	02-49		9007276-0123	Screw	2
	1211	02-49		4461234	Spring guide	1
	1213	02-49		9003575-0102	Nut	1
	1214	02-49		4461060	Neutral return spring	1
	1215	02-49		4461065	Handle	1
	1216	02-49		4461187	Neutral return bracket	1
	1235	02-49		9009660-3100	Toothlock washer	1
	1265	02-49		4461329	Spool assembly	1

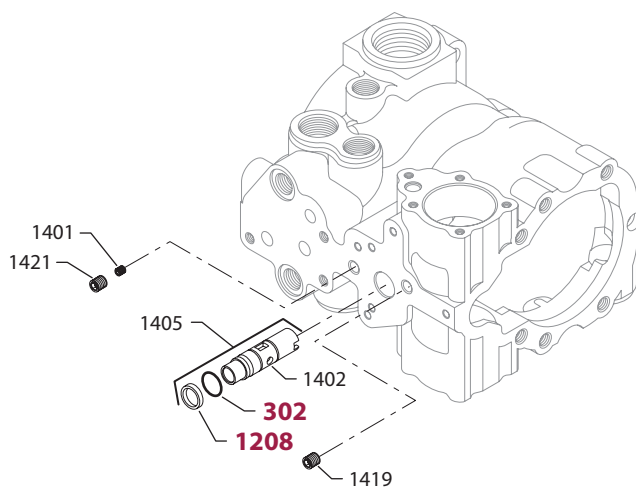
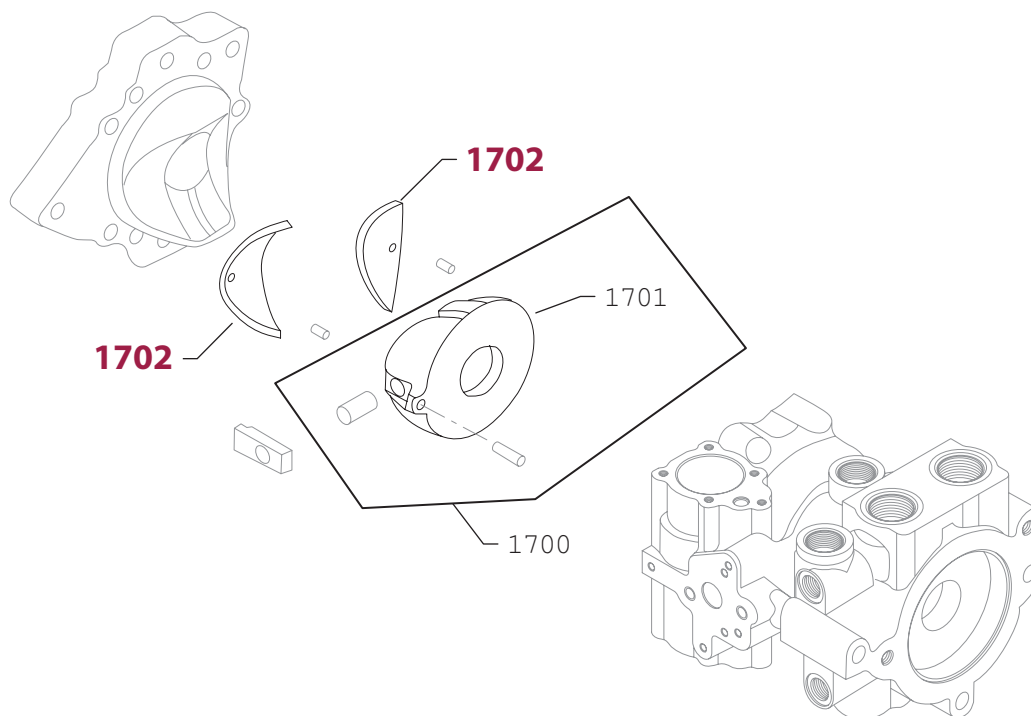
GH	303	00-28		5000654	O-ring	1
	1209	00-28		9006150-0120	Back up ring	1
	1210	00-28		9007276-0123	Screw	1
	1213	00-28		9003575-0102	Nut	1
	1214	00-28		4800315	Neutral return spring	1
	1215	00-28		4460952	Handle	1
	1216	00-28		4800084	Neutral return bracket	1
	1235	00-28		9009660-3100	Toothlock washer	1
	1265	00-28		4461331	Spool assembly	1

GJ	303	00-28		5000654	O-ring	1
	1209	00-28		9006150-0120	Back up ring	1
	1210	00-28		9007276-0123	Screw	2
	1211	00-28		4461234	Spring guide	1
	1213	00-28		9003575-0102	Nut	1
	1214	00-28		4461060	Neutral return spring	1
	1215	00-28		4461065	Handle	1
	1216	00-28		4461187	Neutral return bracket	1
	1235	00-28		9009660-3100	Toothlock washer	1
	1265	00-28		4461328	Spool assembly	1

GK	303	00-46		5000654	O-ring	1
	1209	00-46		9006150-0120	Back up ring	1
	1210	00-46		9007276-0123	Screw	2
	1213	00-46		9003575-0102	Nut	1
	1214	00-46		4800315	Neutral return spring	1
	1215	00-46		4800086-0002	Handle	1
	1216	00-46		4800084	Neutral return bracket	1
	1235	00-46		9009660-3100	Toothlock washer	1
	1265	00-46		4461357	Spool assembly	1

CONTROL HANDLE POSITION

A	Not applicable (no control handle)
B	Both up and down
D	Down
U	Up



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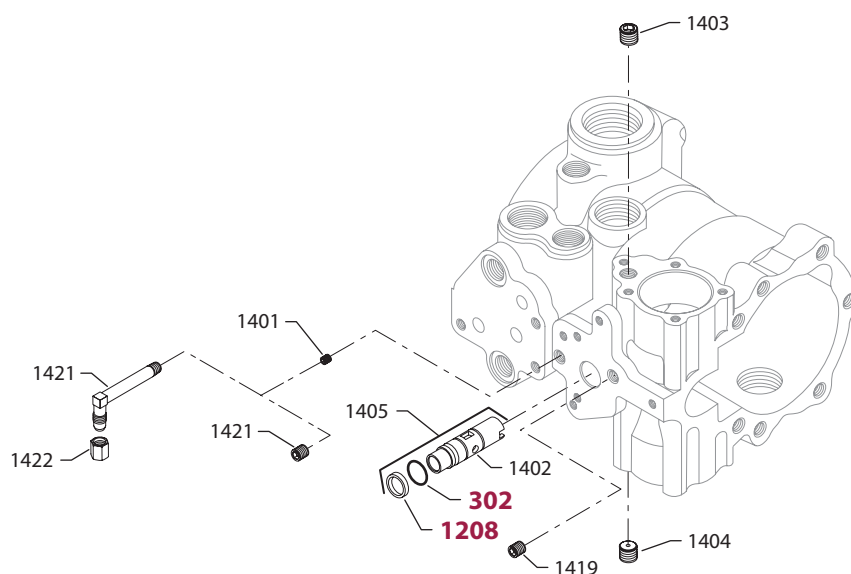
Enlarged **bold** type item
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SWASHPLATE GROUP, REAR PUMP

Order Code	Item	Date Begin	Date End	Part Number	Part Name	Qty. per Model/Kit
A	1700	86-23	94-23	4510072	Non-balanced swashplate kit (SB-1994-002)	1
	1701	86-23	94-23	4460393	Non-balanced swashplate	
	1702	86-23	94-23	4460325-0001	Journal bearing	2
	1702	84-31	86-22	4460277	Journal bearing	2
B	1700	86-23		4510073	Balanced swashplate kit	1
	1701	86-23		4460394	Balanced swashplate	1
	1702	86-23		4460696	Journal bearing (SB-1994-011)	2
C	1701	04-26		4461417	Balance high response swashplate	1
	1702	04-26		4461402	Journal bearing	2

CONTROL ORIFICE

AA	302	86-14		5000653	O-ring	1
	1208	86-14		9006150-0160	Back up ring	1
	1401	86-14		4800155-0006	Orifice plug, .031"	1
	1402	84-31	86-13	4800092-0003	Sleeve, .031"	1
	1405	86-14		4461342	Sleeve assembly, .031" (SB-1997-001)	1
Also replace control spool with p/n 4460468 if manufacture date is 86-14 thru 87-31.						
	1419	86-14		9005001-1200	Pipe plug	1
	1421	86-14		9005001-1200	Pipe plug	1
AB	302	86-14		5000653	O-ring	1
	1208	86-14		9006150-0160	Back up ring	1
	1401	86-14		4800155-0006	Orifice plug, .031"	1
	1402	84-31	86-13	4800092-0005	Sleeve, .036"	1
	1405	86-14		4461343	Sleeve assembly, .036" (SB-1997-001)	1
Also replace control spool with p/n 4460468 if manufacture date is 86-14 thru 87-31.						
	1419	86-14		9005001-1200	Pipe plug	1
	1421	86-14		9005001-1200	Pipe plug	1
AD	302	86-14		5000653	O-ring	1
	1208	86-14		9006150-0160	Back up ring	1
	1401	86-14		4800155-0006	Orifice plug, .031"	1
	1402	84-31	86-13	4800092-0002	Sleeve, .046"	1
	1405	86-14		4461341	Sleeve assembly, .046" (SB-1997-001)	1
Also replace control spool with p/n 4460468 if manufacture date is 86-14 thru 87-31.						
	1419	86-14		9005001-1200	Pipe plug	1
	1421	86-14		9005001-1200	Pipe plug	1
AF	302	88-33		5000653	O-ring	1
	1208	88-33		9006150-0160	Back up ring	1
	1401	88-33		4800155-0006	Orifice plug, .031"	1
	1405	88-33		4461340	Sleeve assembly, .250" (SB-1997-001)	1
	1419	88-33		9005001-1200	Pipe plug	1
	1421	88-33		9005001-1200	Pipe plug	1

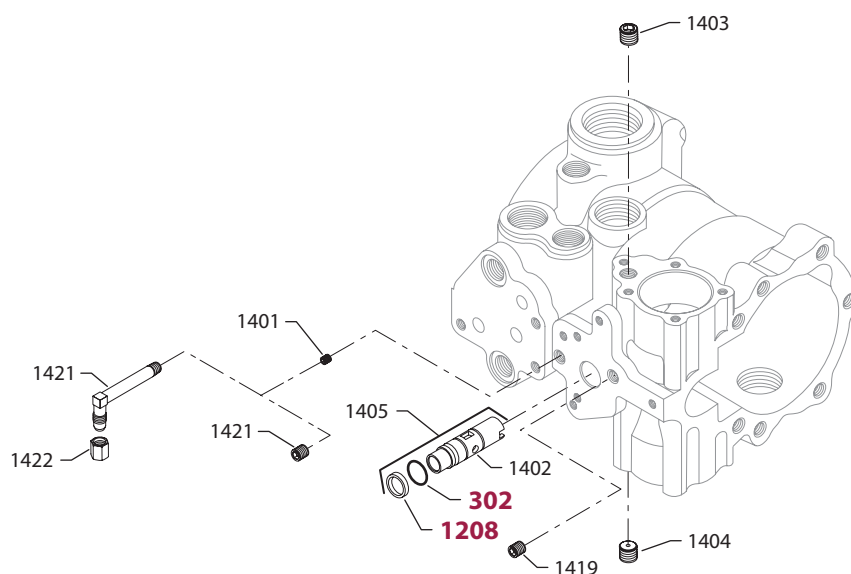


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CONTROL ORIFICE

Order Code	Item	Date Begin	Date End	Part Number	Part Name	Qty. per Model/Kit
BA	302	86-14		5000653	O-ring	1
	1208	86-14		9006150-0160	Back up ring	1
	1401	86-14		4800155-0001	Orifice plug, .036"	1
	1402	84-31	86-13	4800092-0003	Sleeve, .031"	1
	1405	86-14		4461342	Sleeve assembly, .031" (SB-1997-001)	1
Also replace control spool with p/n 4460468 if manufacture date is 86-14 thru 87-31.						
	1419	86-14		9005001-1200	Pipe plug	1
	1421	86-14		9005001-1200	Pipe plug	1
BB	302	86-14		5000653	O-ring	1
	1208	86-14		9006150-0160	Back up ring	1
	1401	86-14		4800155-0001	Orifice plug, .036"	1
	1402	84-31	86-13	4800092-0005	Sleeve, .036"	1
	1405	86-14		4461343	Sleeve assembly, .036" (SB-1997-001)	1
Also replace control spool with p/n 4460468 if manufacture date is 86-14 thru 87-31.						
	1419	86-14		9005001-1200	Pipe plug	1
	1421	86-14		9005001-1200	Pipe plug	1
BD	302	86-14		5000653	O-ring	1
	1208	86-14		9006150-0160	Back up ring	1
	1401	86-14		4800155-0001	Orifice plug, .036"	1
	1402	84-31	86-13	4800092-0002	Sleeve, .046"	1
	1405	86-14		4461341	Sleeve assembly, .046" (SB-1997-001)	1
Also replace control spool with p/n 4460468 if manufacture date is 86-14 thru 87-31.						
	1419	86-14		9005001-1200	Pipe plug	1
	1421	86-14		9005001-1200	Pipe plug	1
BF	302	86-14		5000653	O-ring	1
	1208	86-14		9006150-0160	Back up ring	1
	1401	86-14		4800155-0001	Orifice plug, .036"	1
	1402	84-31	86-13	4800092-0004	Sleeve, .250"	1
	1405	86-14		4461340	Sleeve assembly, .250" (SB-1997-001)	1
Also replace control spool with p/n 4460468 if manufacture date is 86-14 thru 87-31.						
	1419	86-14		9005001-1200	Pipe plug	1
	1421	86-14		9005001-1200	Pipe plug	1
BP	302	98-16		5000653	O-ring	1
	1208	98-16		9006150-0160	Back up ring	1
	1401	98-16		4800155-0001	Orifice plug, .036"	1
	1405	98-16		4461358	Sleeve assembly, .062"	1
	1419	98-16		9005001-1200	Pipe plug	1
	1421	98-16		9005001-1200	Pipe plug	1

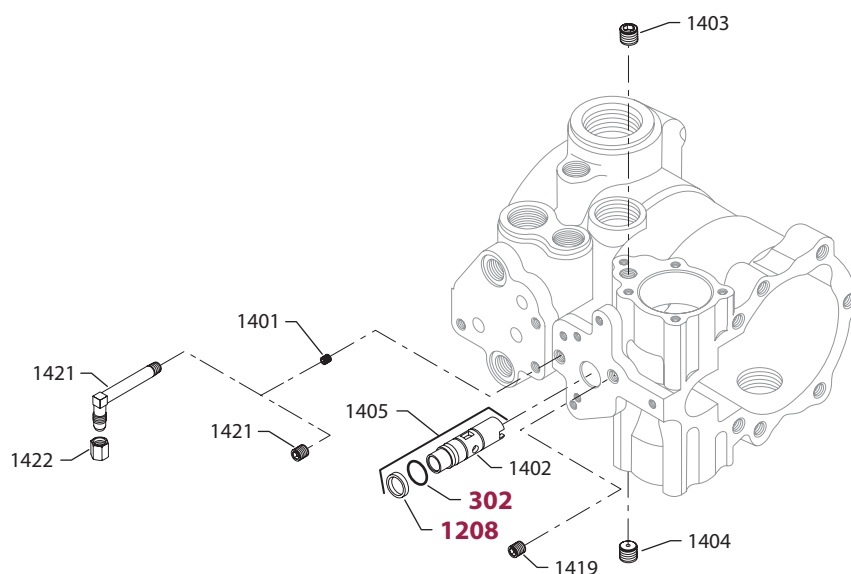


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CONTROL ORIFICE

Order Code	Item	Date Begin	Date End	Part Number	Part Name	Qty. per Model/Kit
CA	302	86-14		5000653	O-ring	1
	1208	86-14		9006150-0160	Back up ring	1
	1401	86-14		4800155-0001	Orifice plug, .036"	1
	1402	84-31	86-13	4800092-0003	Sleeve, .031"	1
	1405	86-14		4461342	Sleeve assembly, .031" (SB-1997-001)	1
Also replace control spool with p/n 4460468 if manufacture date is 86-14 thru 87-31.						
	1419	86-14		9005001-1200	Pipe plug	1
	1421	86-14		9005001-1200	Pipe plug	1
CB	302	86-14		5000653	O-ring	1
	1208	86-14		9006150-0160	Back up ring	1
	1401	86-14		4800155-0004	Orifice plug, .041"	1
	1402	84-31	86-13	4800092-0005	Sleeve, .036"	1
	1405	86-14		4461343	Sleeve assembly, .036" (SB-1997-001)	1
Also replace control spool with p/n 4460468 if manufacture date is 86-14 thru 87-31.						
	1419	86-14		9005001-1200	Pipe plug	1
	1421	86-14		9005001-1200	Pipe plug	1
CD	302	86-14		5000653	O-ring	1
	1208	86-14		9006150-0160	Back up ring	1
	1401	86-14		4800155-0004	Orifice plug, .041"	1
	1402	84-31	86-13	4800092-0002	Sleeve, .046"	1
	1405	86-14		4461341	Sleeve assembly, .046" (SB-1997-001)	1
Also replace control spool with p/n 4460468 if manufacture date is 86-14 thru 87-31.						
	1419	86-14		9005001-1200	Pipe plug	1
	1421	86-14		9005001-1200	Pipe plug	1
CF	302	86-14		5000653	O-ring	1
	1208	86-14		9006150-0160	Back up ring	1
	1401	86-14		4800155-0004	Orifice plug, .041"	1
	1402	84-31	86-13	4800092-0004	Sleeve, .250"	1
	1405	86-14		4461340	Sleeve assembly, .250" (SB-1997-001)	1
Also replace control spool with p/n 4460468 if manufacture date is 86-14 thru 87-31.						
	1419	86-14		9005001-1200	Pipe plug	1
	1421	86-14		9005001-1200	Pipe plug	1
DA	302	86-14		5000653	O-ring	1
	1208	86-14		9006150-0160	Back up ring	1
	1401	86-14		4800155-0002	Orifice plug, .046"	1
	1402	84-31	86-13	4800092-0003	Sleeve, .031"	1
	1405	86-14		4461342	Sleeve assembly, .031" (SB-1997-001)	1
Also replace control spool with p/n 4460468 if manufacture date is 86-14 thru 87-31.						
	1419	86-14		9005001-1200	Pipe plug	1
	1421	86-14		9005001-1200	Pipe plug	1

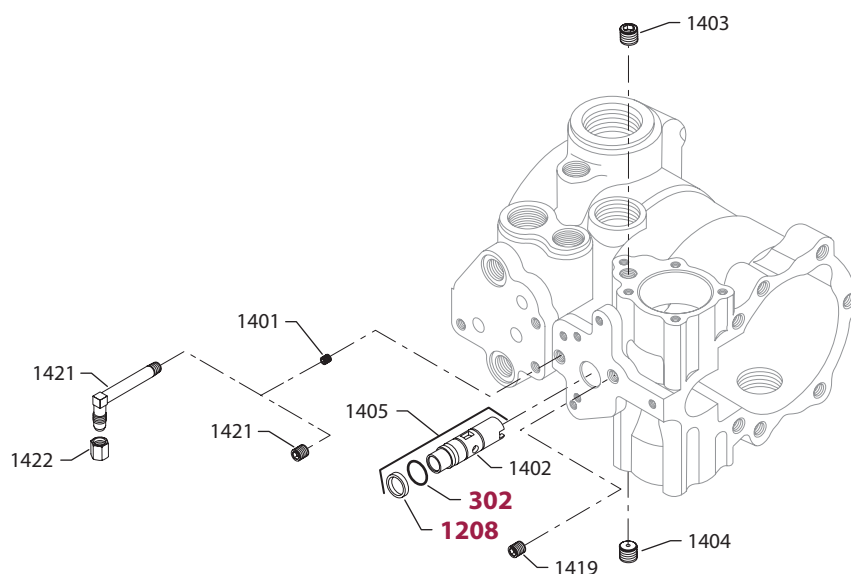


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CONTROL ORIFICE

Order Code	Item	Date Begin	Date End	Part Number	Part Name	Qty. per Model/Kit
DB	302	86-14		5000653	O-ring	1
	1208	86-14		9006150-0160	Back up ring	1
	1401	86-14		4800155-0002	Orifice plug, .046"	1
	1402	84-31	86-13	4800092-0005	Sleeve, .036"	1
	1405	86-14		4461343	Sleeve assembly, .036" (SB-1997-001)	1
Also replace control spool with p/n 4460468 if manufacture date is 86-14 thru 87-31.						
	1419	86-14		9005001-1200	Pipe plug	1
	1421	86-14		9005001-1200	Pipe plug	1
DD	302	86-14		5000653	O-ring	1
	1208	86-14		9006150-0160	Back up ring	1
	1401	86-14		4800155-0002	Orifice plug, .046"	1
	1402	84-31	86-13	4800092-0002	Sleeve, .046"	1
	1405	86-14		4461341	Sleeve assembly, .046" (SB-1997-001)	1
Also replace control spool with p/n 4460468 if manufacture date is 86-14 thru 87-31.						
	1419	86-14		9005001-1200	Pipe plug	1
	1421	86-14		9005001-1200	Pipe plug	1
DF	302	86-14		5000653	O-ring	1
	1208	86-14		9006150-0160	Back up ring	1
	1401	86-14		4800155-0002	Orifice plug, .046"	1
	1402	84-31	86-13	4800092-0004	Sleeve, .250"	1
	1405	86-14		4461340	Sleeve assembly, .250" (SB-1997-001)	1
Also replace control spool with p/n 4460468 if manufacture date is 86-14 thru 87-31.						
	1419	86-14		9005001-1200	Pipe plug	1
	1421	86-14		9005001-1200	Pipe plug	1
DT	1401	04-36		4800155-0005	Orifice plug, .062"	1
	1403	04-36		4460333-0002	Orifice plug, .046"	1
	1404	04-36		4460333-0002	Orifice plug, .046"	1
EA	302	86-14		5000653	O-ring	1
	1208	86-14		9006150-0160	Back up ring	1
	1401	86-14		4800155-0003	Orifice plug, .054"	1
	1402	84-31	86-13	4800092-0003	Sleeve, .031"	1
	1405	86-14		4461342	Sleeve assembly, .031" (SB-1997-001)	1
Also replace control spool with p/n 4460468 if manufacture date is 86-14 thru 87-31.						
	1419	86-14		9005001-1200	Pipe plug	1
	1421	86-14		9005001-1200	Pipe plug	1
EB	302	86-14		5000653	O-ring	1
	1208	86-14		9006150-0160	Back up ring	1
	1401	86-14		4800155-0003	Orifice plug, .054"	1
	1402	84-31	86-13	4800092-0005	Sleeve, .036"	1
	1405	86-14		4461343	Sleeve assembly, .036" (SB-1997-001)	1
Also replace control spool with p/n 4460468 if manufacture date is 86-14 thru 87-31.						
	1419	86-14		9005001-1200	Pipe plug	1
	1421	86-14		9005001-1200	Pipe plug	1

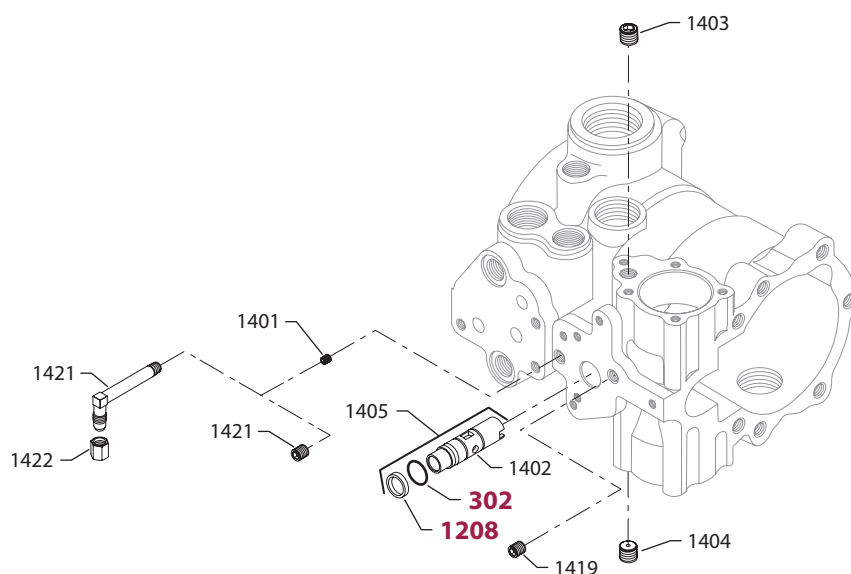


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CONTROL ORIFICE

Order Code	Item	Date Begin	Date End	Part Number	Part Name	Qty. per Model/Kit
ED	302	86-14		5000653	O-ring	1
	1208	86-14		9006150-0160	Back up ring	1
	1401	86-14		4800155-0003	Orifice plug, .054"	1
	1402	84-31	86-13	4800092-0002	Sleeve, .046"	1
	1405	86-14		4461341	Sleeve assembly, .046" (SB-1997-001)	1
Also replace control spool with p/n 4460468 if manufacture date is 86-14 thru 87-31.						
	1419	86-14		9005001-1200	Pipe plug	1
	1421	86-14		9005001-1200	Pipe plug	1
EF	302	86-14		5000653	O-ring	1
	1208	86-14		9006150-0160	Back up ring	1
	1401	86-14		4800155-0003	Orifice plug, .054"	1
	1402	84-31	86-13	4800092-0004	Sleeve, .250"	1
	1405	86-14		4461340	Sleeve assembly, .250" (SB-1997-001)	1
Also replace control spool with p/n 4460468 if manufacture date is 86-14 thru 87-31.						
	1419	86-14		9005001-1200	Pipe plug	1
	1421	86-14		9005001-1200	Pipe plug	1
FA	302	86-14		5000653	O-ring	1
	1208	86-14		9006150-0160	Back up ring	1
	1401	86-14		4800155-0007	Orifice plug, .146"	1
	1402	84-31	86-13	4800092-0003	Sleeve, .031"	1
	1405	86-14		4461342	Sleeve assembly, .031" (SB-1997-001)	1
Also replace control spool with p/n 4460468 if manufacture date is 86-14 thru 87-31.						
	1419	86-14		9005001-1200	Pipe plug	1
	1421	86-14		9005001-1200	Pipe plug	1
FB	302	86-14		5000653	O-ring	1
	1208	86-14		9006150-0160	Back up ring	1
	1401	86-14		4800155-0007	Orifice plug, .146"	1
	1402	84-31	86-13	4800092-0005	Sleeve, .036"	1
	1405	86-14		4461343	Sleeve assembly, .036" (SB-1997-001)	1
Also replace control spool with p/n 4460468 if manufacture date is 86-14 thru 87-31.						
	1419	86-14		9005001-1200	Pipe plug	1
	1421	86-14		9005001-1200	Pipe plug	1
FD	302	86-14		5000653	O-ring	1
	1208	86-14		9006150-0160	Back up ring	1
	1401	86-14		4800155-0007	Orifice plug, .146"	1
	1402	84-31	86-13	4800092-0003	Sleeve, .031"	1
	1405	86-14		4461341	Sleeve assembly, .046" (SB-1997-001)	1
Also replace control spool with p/n 4460468 if manufacture date is 86-14 thru 87-31.						
	1419	86-14		9005001-1200	Pipe plug	1
	1421	86-14		9005001-1200	Pipe plug	1

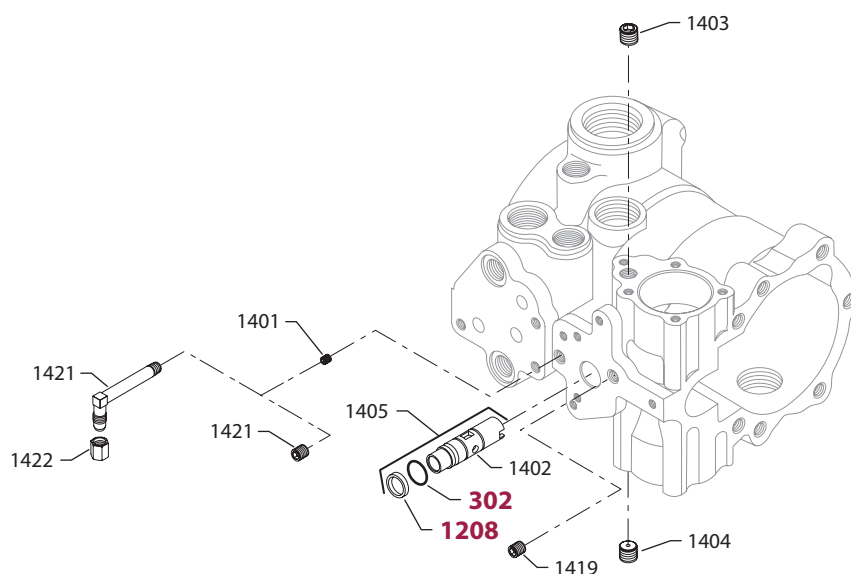


E100 218E

Enlarged **bold** type item
numbers are recommended
parts to be stocked for servicing

CONTROL ORIFICE

Order Code	Item	Date Begin	Date End	Part Number	Part Name	Qty. per Model/Kit
FF	302	86-14		5000653	O-ring	1
	1208	86-14		9006150-0160	Back up ring	1
	1401	86-14		4800155-0007	Orifice plug, .146"	1
	1402	84-31	86-13	4800092-0004	Sleeve, .250"	1
	1405	86-14		4461340	Sleeve assembly, .250" (SB-1997-001)	1
Also replace control spool with p/n 4460468 if manufacture date is 86-14 thru 87-31.						
	1419	86-14		9005001-1200	Pipe plug	1
	1421	86-14		9005001-1200	Pipe plug	1
GG	1401	84-31		4800155-0007	Orifice plug, .146"	1
	1403	84-31		4460333-0003	Orifice plug, .054"	1
	1404	84-31		4460333-0003	Orifice plug, .054"	1
GJ	1401	84-31		4800155-0007	Orifice plug, .146"	1
	1403	84-31		4460333-0003	Orifice plug, .054"	1
HH	1401	84-31		4800155-0007	Orifice plug, .146"	1
	1403	84-31		4460333-0001	Orifice plug, .036"	1
	1404	84-31		4460333-0001	Orifice plug, .036"	1
JJ	1401	84-31		4800155-0007	Orifice plug, .146"	1
KF	302	00-18		5000653	O-ring	1
	1208	00-18		9006150-0160	Back up ring	1
	1401	00-18		9005001-0600	Pipe plug	1
	1405	00-18		4461340	Sleeve assembly, .250"	1
	1419	00-18		9005001-1200	Pipe plug	1
	1421	00-18		4461159	Elbow	1
	1422	00-18		9001800-4400	Cap	1
LA	302	89-01		5000653	O-ring	1
	1208	89-01		9006150-0160	Back up ring	1
	1401	89-01		4800155-0011	Orifice plug, .028"	1
	1405	89-01		4461342	Sleeve assembly, .031" (SB-1997-001)	1
	1419	89-01		9005001-1200	Pipe plug	1
	1421	89-01		9005001-1200	Pipe plug	1
MF	302	03-18		5000653	O-ring	1
	1208	03-18		9006150-0160	Back up ring	1
	1401	03-18		9005001-0600	Pipe plug	1
	1405	03-18		4461340	Sleeve assembly, .250"	1
	1419	03-18		9005001-1200	Pipe plug	1
	1421	03-18		4461320	Elbow	1
	1422	03-18		9001800-4400	Cap	1

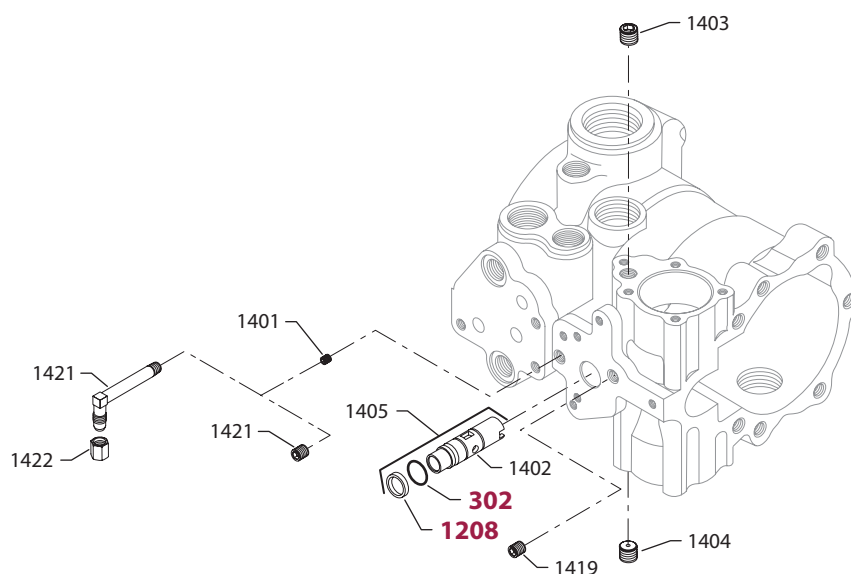


E100 218E

Enlarged **bold** type item
numbers are recommended
parts to be stocked for servicing

CONTROL ORIFICE

Order Code	Item	Date Begin	Date End	Part Number	Part Name	Qty. per Model/Kit
PF	302	87-32		5000653	O-ring	1
	1208	87-32		9006150-0160	Back up ring	1
	1401	87-32		4800155-0005	Orifice plug, .062"	1
	1405	87-32		4461340	Sleeve assembly, .250" (SB-1997-001)	1
	1419	87-32		9005001-1200	Pipe plug	1
	1421	87-32		9005001-1200	Pipe plug	1
RR	1401	84-31		4800155-0007	Orifice plug, .146"	1
	1403	84-31		4460333-0005	Orifice plug, .031"	1
	1404	84-31		4460333-0005	Orifice plug, .031"	1
SA	302	88-07		5000653	O-ring	1
	1208	88-07		9006150-0160	Back up ring	1
	1401	88-01		9005001-0600	Pipe plug	1
	1405	88-07		4461342	Sleeve assembly, .031" (SB-1997-001)	1
	1419	88-07		9005001-1200	Pipe plug	1
	1421	88-07		9005001-1200	Pipe plug	1
SS	1401	84-31		4800155-0007	Orifice plug, .146"	1
	1403	84-31		4460333-0002	Orifice plug, .046"	1
	1404	84-31		4460333-0002	Orifice plug, .046"	1
TT	1401	84-31		4800155-0007	Orifice plug, .146"	1
	1403	84-31		4460333-0007	Orifice plug, .028"	1
	1404	84-31		4460333-0007	Orifice plug, .028"	1
WA	1401	03-29		4800155-0007	Orifice plug, .146"	1
	1403	03-29		4460333-0005	Orifice plug, .031"	1
	1404	03-29		4460333-0005	Orifice plug, .031"	1
	1419	03-29		8800242-0012	Orifice plug, .025"	1
	1421	03-29		8800242-0012	Orifice plug, .025"	1
WB	1401	03-29		4800155-0007	Orifice plug, .146"	1
	1403	03-29		4460333-0001	Orifice plug, .036"	1
	1404	03-29		4460333-0001	Orifice plug, .036"	1
	1421	03-29		8800242-0012	Orifice plug, .025"	1
YA	1401	01-12		4800155-0002	Orifice plug, .046"	1
YB	302	02-42		5000653	O-ring	1
	1208	02-42		9006150-0160	Back up ring	1
	1401	02-42		4800155-0006	Orifice plug, .031"	1
	1403	02-42		4460333-0002	Orifice plug, .046"	1
	1405	02-42		4461358	Sleeve assembly, .062"	1
	1419	02-42		9005001-1200	Pipe plug	1
	1421	02-42		9005001-1200	Pipe plug	1

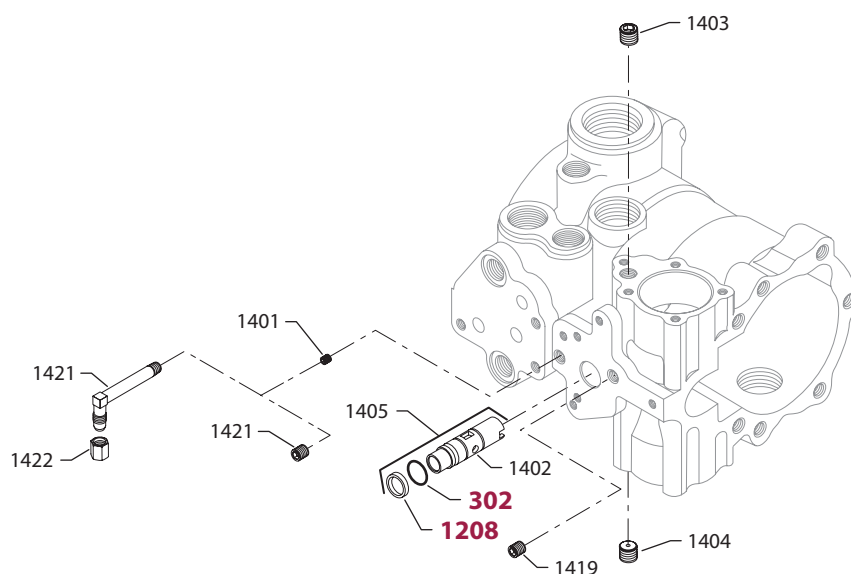


E100 218E

Enlarged **bold** type item
numbers are recommended
parts to be stocked for servicing

CONTROL ORIFICE

Order Code	Item	Date Begin	Date End	Part Number	Part Name	Qty. per Model/Kit
YC	1401	03-26		4800155-0002	Orifice plug, .046"	1
	1403	03-26		4460333-0003	Orifice plug, .054"	1
	1404	03-26		4460333-0003	Orifice plug, .054"	1
YE	302	03-49		5000653	O-ring	1
	1208	03-49		9006150-0160	Back up ring	1
	1401	03-49		4800155-0002	Orifice plug, .046"	1
	1403	03-49		4460333-0007	Orifice plug, .028"	1
	1404	03-49		4460333-0007	Orifice plug, .028"	1
	1405	03-49		4461341	Sleeve assembly, .046"	1
	1419	03-49		9005001-1200	Pipe plug	1
	1421	03-49		9005001-1200	Pipe plug	1
YF	302	04-36		5000653	O-ring	1
	1208	04-36		9006150-0160	Back up ring	1
	1401	04-36		4800155-0005	Orifice plug, .062"	1
	1403	04-36		4460333-0007	Orifice plug, .028"	1
	1404	04-36		4460333-0007	Orifice plug, .028"	1
	1405	04-36		4461341	Sleeve assembly, .046"	1
	1419	04-36		9005001-1200	Pipe plug	1
	1421	04-36		9005001-1200	Pipe plug	1
ZC	302	98-04		5000653	O-ring	1
	1208	98-04		9006150-0160	Back up ring	1
	1401	98-04		4800155-0006	Orifice plug, .031"	1
	1403	98-04		4460333-0004	Orifice plug, .062"	1
	1404	98-04		4460333-0004	Orifice plug, .062"	1
	1405	98-04		4461342	Sleeve assembly, .031"	1
	1419	98-04		9005001-1200	Pipe plug	1
	1421	98-04		9005001-1200	Pipe plug	1
ZM	302	90-26		5000653	O-ring	1
	1208	90-26		9006150-0160	Back up ring	1
	1401	90-26		4800155-0001	Orifice plug, .031"	1
	1403	90-26		4460333-0005	Orifice plug, .031"	1
	1404	90-26		4460333-0005	Orifice plug, .031"	1
	1405	90-26		4461342	Sleeve assembly, .031"	1
	1419	90-26		9005001-1200	Pipe plug	1
	1421	90-26		9005001-1200	Pipe plug	1
ZP	302	89-13		5000653	O-ring	1
	1208	89-13		9006150-0160	Back up ring	1
	1401	89-13		4800155-0001	Orifice plug, .036"	1
	1403	89-13		4460333-0006	Orifice plug, none	1
	1404	89-13		4460333-0006	Orifice plug, none	1
	1405	89-13		4461340	Sleeve assembly, .250" (SB-1997-001)	1
	1419	89-13		9005001-1200	Pipe plug	1
	1421	89-13		9005001-1200	Pipe plug	1

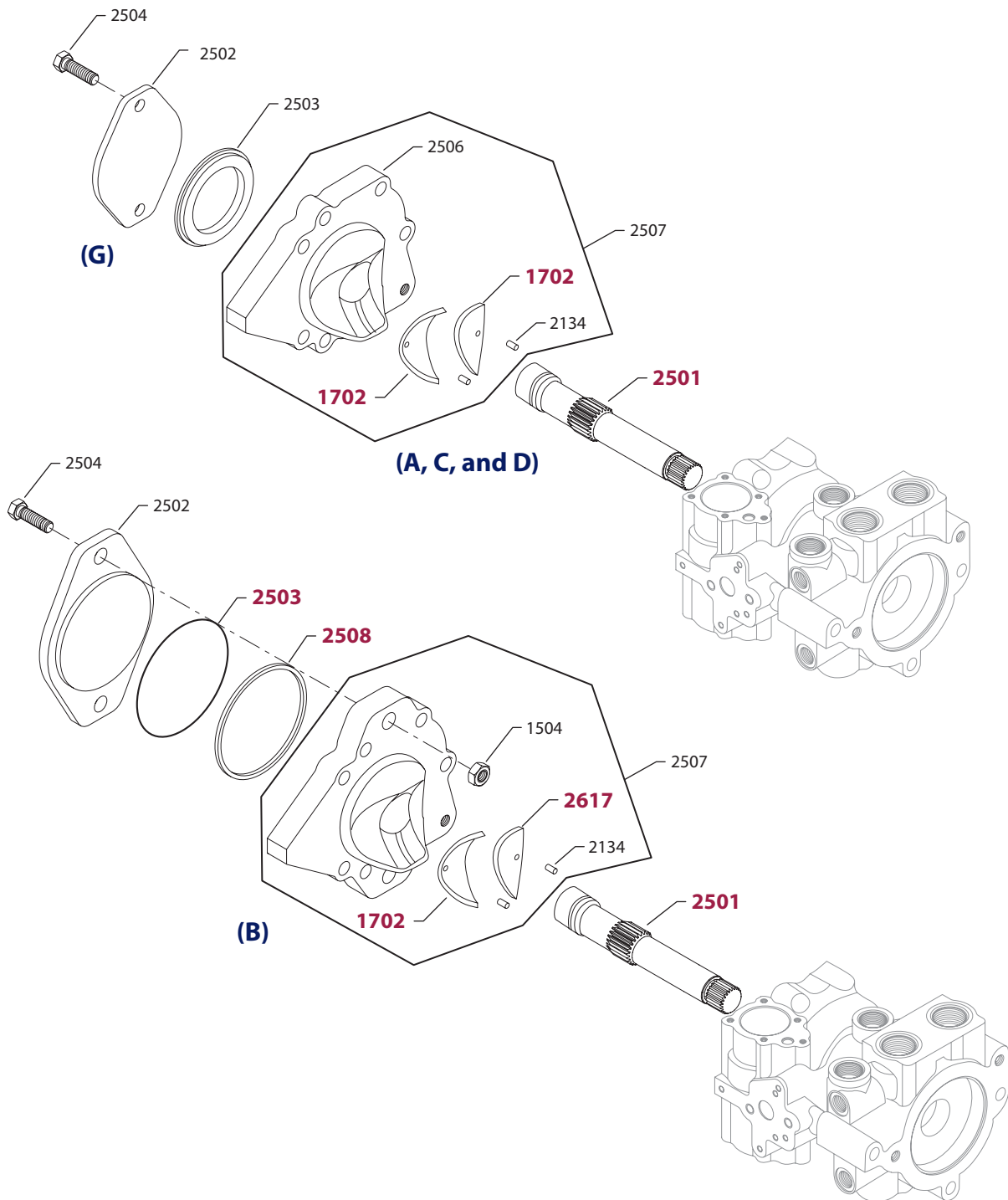


E100 218E

Enlarged **bold** type item
numbers are recommended
parts to be stocked for servicing

CONTROL ORIFICE

Order Code	Item	Date Begin	Date End	Part Number	Part Name	Qty. per Model/Kit
ZR	302	89-02		5000653	O-ring	1
	1208	89-02		9006150-0160	Back up ring	1
	1401	89-02		4800155-0006	Orifice plug, .031"	1
	1403	89-02		4460333-0005	Orifice plug, .031"	1
	1404	89-02		4460333-0005	Orifice plug, .031"	1
	1405	89-02		4461341	Sleeve assembly, .046" (SB-1997-001)	1
	1419	89-02		9005001-1200	Pipe plug	1
	1421	89-02		9005001-1200	Pipe plug	1
ZS	302	88-09		5000653	O-ring	1
	1208	88-09		9006150-0160	Back up ring	1
	1401	88-09		4800155-0007	Orifice plug, .146"	1
	1403	88-09		4460333-0002	Orifice plug, .046"	1
	1404	88-09		4460333-0002	Orifice plug, .046"	1
	1405	88-09		4461340	Sleeve assembly, .250" (SB-1997-001)	1
	1419	88-09		9005001-1200	Pipe plug	1
	1421	88-09		9005001-1200	Pipe plug	1
ZW	302	87-50		5000653	O-ring	1
	1208	87-50		9006150-0160	Back up ring	1
	1401	87-50		9005001-0600	Pipe plug	1
	1403	87-50		4460333-0006	Orifice plug, none	1
	1404	87-50		4460333-0006	Orifice plug, none	1
	1405	87-50		4461341	Sleeve assembly, .046" (SB-1997-001)	1
	1419	87-50		9005001-1200	Pipe plug	1
	1421	87-50		9005001-1200	Pipe plug	

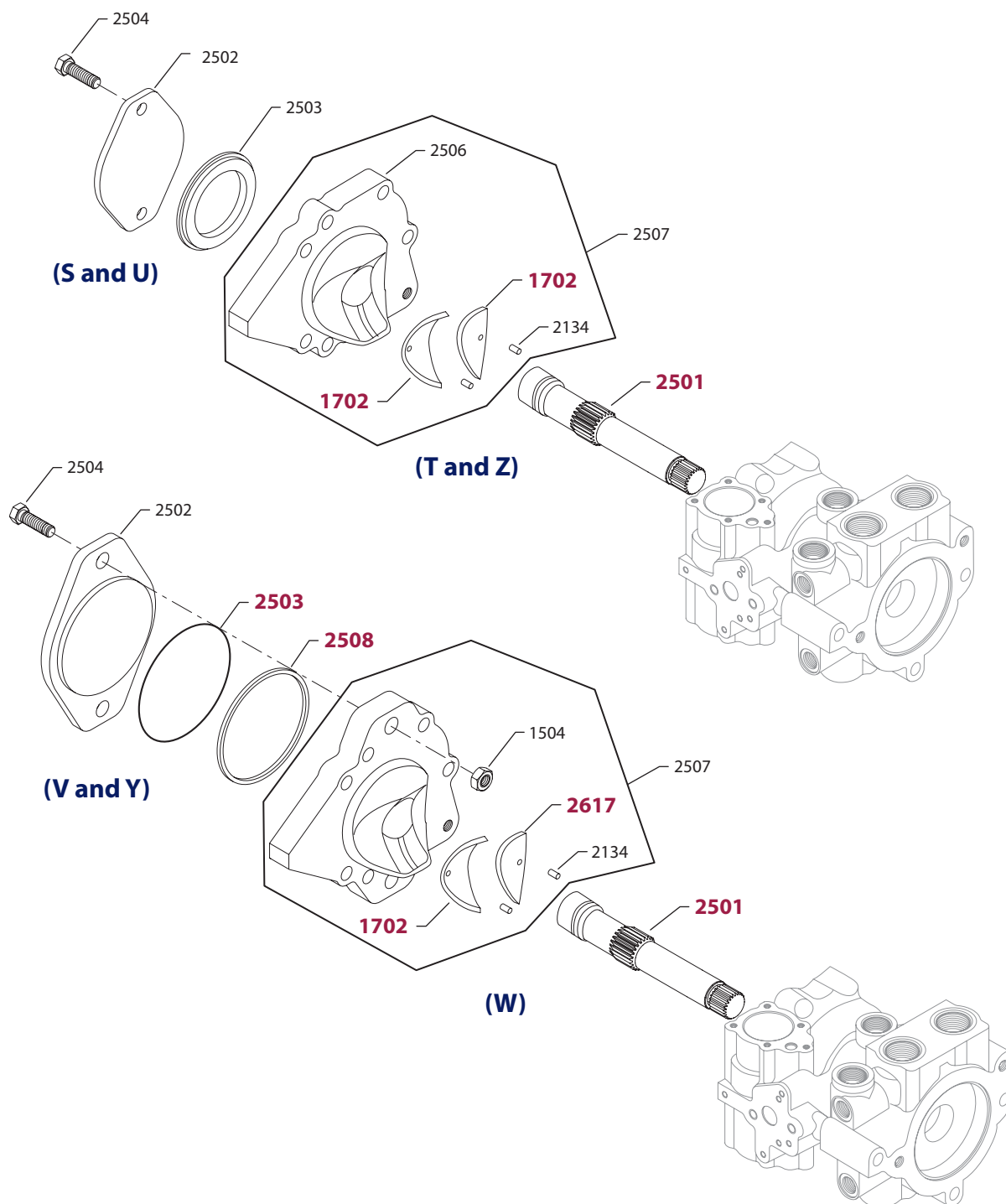


E100 244E

Enlarged **bold** type item
numbers are recommended
parts to be stocked for servicing

AUXILIARY MOUNTING

Order Code	Item	Date Begin	Date End	Part Number	Part Name	Qty. per Model/Kit
A	1702	86-23		4460696	Journal bearing	2
	2134	94-48		5000116	Pin, flared (SB-1994-011)	2
	2134	84-31	94-47	9004700-1206	Pin	2
	2501	84-31		4460152	Shaft, 9 tooth	1
	2502	89-43		4460586	Cover plate (SB-1989-021)	1
	2503	89-43		4800482	A pad seal (SB-1989-021 & SB-1995-019)	1
	2504	84-31		9007200-3716	Screw	2
	2507	86-23		4461350	Cover assembly	1
	2506	87-02	89-22	4460449	Rear cover (SB-1989-013)	1
B	1702	86-23		4460696	Journal bearing	2
	2134	94-48		5000116	Pin, flared (SB-1994-011)	2
	2134	84-31	94-47	9004700-1206	Pin	2
	2501	84-31		4460150	Shaft, 13 tooth	1
	2502	84-31		4460370	Cover plate (SB-1989-021)	1
	2503	87-07		9004100-0440	O-ring (SB-1989-021)	1
	2503	84-31	87-06	9004100-0450	O-ring	
	2504	84-31		9007200-5030	Screw	2
	2507	86-23		4461351	Cover assembly	1
	2506	87-02	89-22	4460437	Rear cover (SB-1989-013)	1
	2508	87-48		9004375-0020	O-ring	1
	2617	84-31		9003530-5000	Nut	2
C	1702	86-23		4460696	Journal bearing	2
	2134	94-48		5000116	Pin, flared (SB-1994-011)	2
	2134	84-31	94-47	9004700-1206	Pin	2
	2501	84-31		4460155	Shaft, no auxiliary drive	1
	2502	89-43		4460586	Cover plate (SB-1989-021)	1
	2503	89-43		4800482	A pad seal (SB-1989-021 & SB-1995-019)	1
	2504	84-31		9007200-3716	Screw	2
	2507	86-23		4461350	Cover assembly	1
	2506	87-02	89-22	4460449	Rear cover (SB-1989-013)	1
D	1702	86-23		4460696	Journal bearing	2
	2134	94-48		5000116	Pin, flared (SB-1994-011)	2
	2134	84-31	94-47	9004700-1206	Pin	2
	2501	84-31		4460441	Shaft, 11 tooth	1
	2502	89-43		4460586	Cover plate (SB-1989-021)	1
	2503	89-43		4800482	A pad seal (SB-1989-021 & SB-1995-019)	1
	2504	84-31		9007200-3716	Screw	2
	2507	86-23		4461350	Cover assembly	1
	2506	87-02	89-22	4460449	Rear cover (SB-1989-013)	1
G	1702	94-42		4460696	Journal bearing	2
	2134	94-42		5000116	Pin, flared (SB-1994-011)	2
	2501	94-42		4460441	Shaft, 11 tooth	1
	2507	94-42		4461350	Cover assembly	1

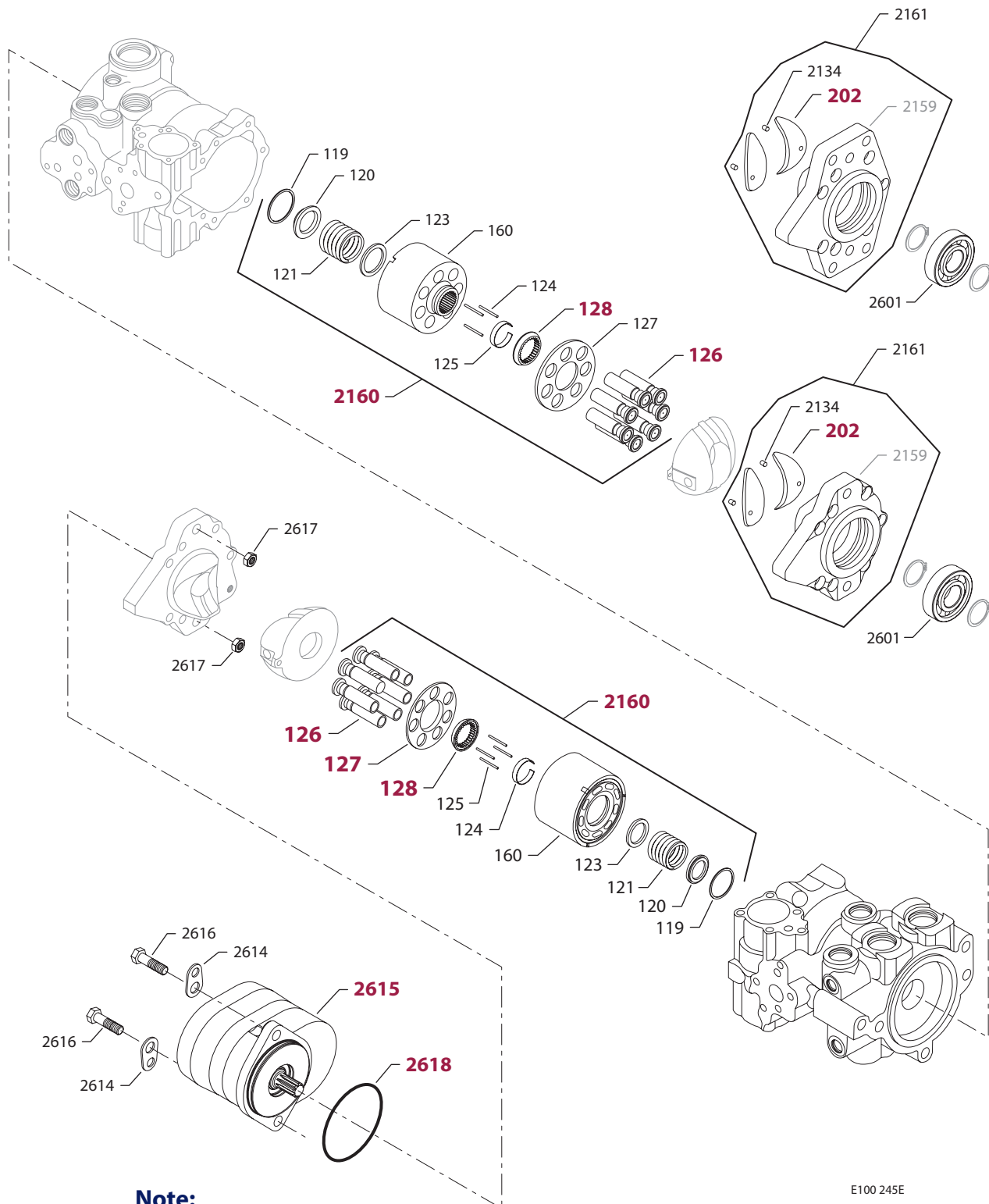


E100 244E

Enlarged **bold** type item
numbers are recommended
parts to be stocked for servicing

AUXILIARY MOUNTING

Order Code	Item	Date Begin	Date End	Part Number	Part Name	Qty. per Model/Kit
S	1702	95-05		4460696	Journal bearing	2
	2134	95-05		5000116	Pin, flared	2
	2501	95-05		4460152	Shaft, 9 tooth	1
	2502	95-05		4460586	Cover plate	1
	2503	95-05		4800482	A pad seal (SB-1995-019)	1
	2504	95-05		9007200-3716	Screw	2
	2507	95-05		4461353	Cover assembly	1
T	1702	04-26		4461402	Journal bearing	2
	2134	04-26		5000116	Pin, flared	2
	2501	04-26		4460152	Shaft, 9 tooth	1
	2507	04-26		4461414	Cover assembly	1
U	1702	04-26		4461402	Journal bearing	2
	2134	04-26		5000116	Pin, flared	2
	2501	04-26		4460441	Shaft, 11 tooth	1
	2502	04-26		4460586	Cover plate	1
	2503	04-26		4800482	A pad seal	1
	2504	04-26		9007200-3716	Screw	2
	2507	04-26		4461414	Cover assembly	1
V	1702	04-26		4461402	Journal bearing	2
	2134	04-26		5000116	Pin, flared	2
	2501	04-26		4460150	Shaft, 13 tooth	1
	2507	04-26		4461415	Cover assembly	1
W	1702	04-26		4461402	Journal bearing	2
	2134	04-26		5000116	Pin, flared	2
	2501	04-26		4460150	Shaft, 13 tooth	1
	2502	04-26		4460370	Cover plate	1
	2503	04-26		9004100-0440	O-ring	1
	2504	04-26		9007200-5030	Screw	2
	2507	04-26		4461415	Cover assembly	1
	2508	04-26		9004375-0020	O-ring	1
	2617	04-26		9003530-5000	Nut	2
Y	1702	99-30		4460696	Journal bearing	2
	2134	99-30		5000116	Pin, flared	2
	2501	99-30		4460150	Shaft, 13 tooth	1
	2507	99-30		4461351	Cover assembly	1
Z	1702	99-04		4460696	Journal bearing	2
	2134	99-04		5000116	Pin, flared	2
	2501	99-04		4460152	Shaft, 9 tooth	1
	2507	99-04		4461350	Cover assembly	1



Note:
Generic gear pump
shown mounted at 180°
orientation.

E100 245E

Enlarged **bold** type item
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parts to be stocked for servicing

COMMON SPECIAL HARDWARE PARTS

Order Code	Item	Date Begin	Date End	Part Number	Part Name	Qty. per Model/Kit
	119	84-31		9006250-0162	Retaining ring	2
	120	84-31		9009625-0105	Washer, special	2
	121	84-31		4460111	Cylinder block spring	2
	123	84-31		9009625-0108	Washer	2
	124	84-31		9004875-0113	Holddown pin	6
	125	84-31		4460028	Holddown pin retainer	2
	126	84-31		4461032	Piston assembly (SB-1998-077)	14
	127	84-31		4460009	Slipper guide	2
	128	84-31		4460180	Retainer guide	2
	2134	84-31		5000116	Coiled pin	2

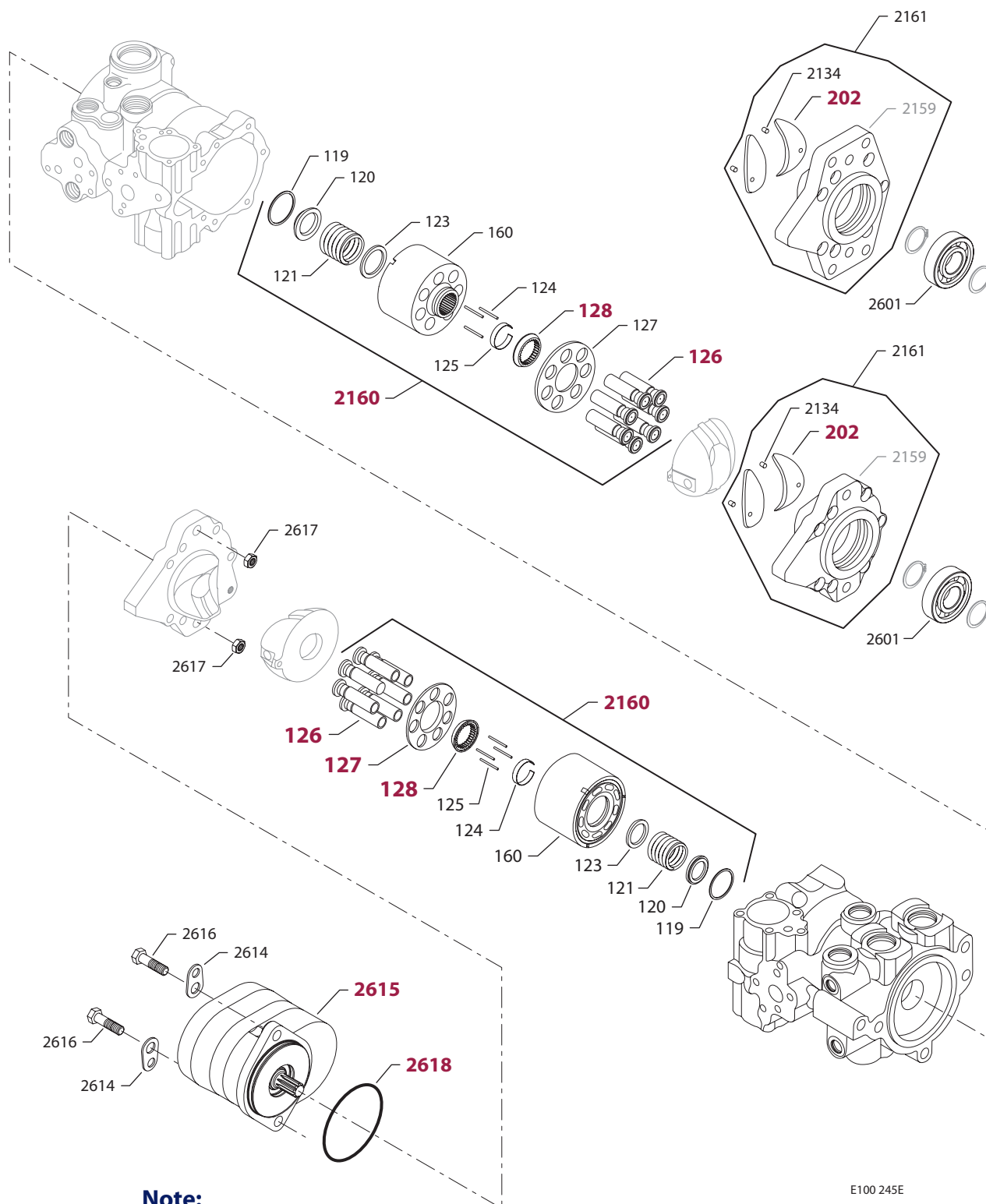
SPECIAL HARDWARE

ANN	160	84-31		4460832	Cylinder block	2
	202	84-31		4460696	Journal bearing	2
	2159	86-23	89-22	4460478	Front cover (SB-1989-013)	1
	2160	86-23		4460890	Cylinder block kit	2
	2161	89-23		4461352	Front cover assembly	1
	2601	84-31		5000731	Ball bearing	1

GDA	160	96-28	08-04	4460832	Cylinder block	2
	202	96-28	08-04	4460696	Journal bearing	2
	2160	96-28	08-04	4460890	Cylinder block kit	2
	2161	96-28	08-04	4461352	Front cover assembly	1
	2601	96-28	08-04	5000731	Ball bearing	1
	2615	96-28	08-04	550129165	Gear pump, 0 ° mounting orientation	1
	2616	96-28	08-04	9007200-3716	Screw	2
	2617	96-28	08-04	9009610-4069	Washer	2
	2618	96-28	08-04	5000373	O-ring	1

GDB	160	03-09		4460832	Cylinder block	2
	202	03-09		4460696	Journal bearing	2
	2160	03-09		4460890	Cylinder block kit	2
	2161	03-09		4461349	Front cover assembly	1
	2601	03-09		5000731	Ball bearing	1
	2615	03-09		163D70581	Gear pump, 180 ° mounting orientation	1
	2616	03-09		9007200-5030	Screw	2
	2617	03-09		9003530-5000	Nut	2
	2618	03-09		9004100-0440	O-ring	1

GDC	160	03-17		4461088	Cylinder block	2
	202	03-17		4461402	Journal bearing	2
	2160	03-17		4461090	Cylinder block kit	2
	2161	03-17		4461412	Front cover assembly	1
	2601	03-17		5000731	Ball bearing	1
	2614	03-17		8800565	Lifting bracket	2
	2615	03-17		163D1310	Gear pump, 180 ° mounting orientation	1
	2616	03-17		9007200-5030	Screw	2
	2617	03-17		9003530-5000	Nut	2
	2618	03-17		9004100-0440	O-ring	1



Note:
Generic gear pump
shown mounted at 180 °
orientation.

E100 245E

Enlarged **bold** type item
numbers are recommended
parts to be stocked for servicing

COMMON SPECIAL HARDWARE PARTS

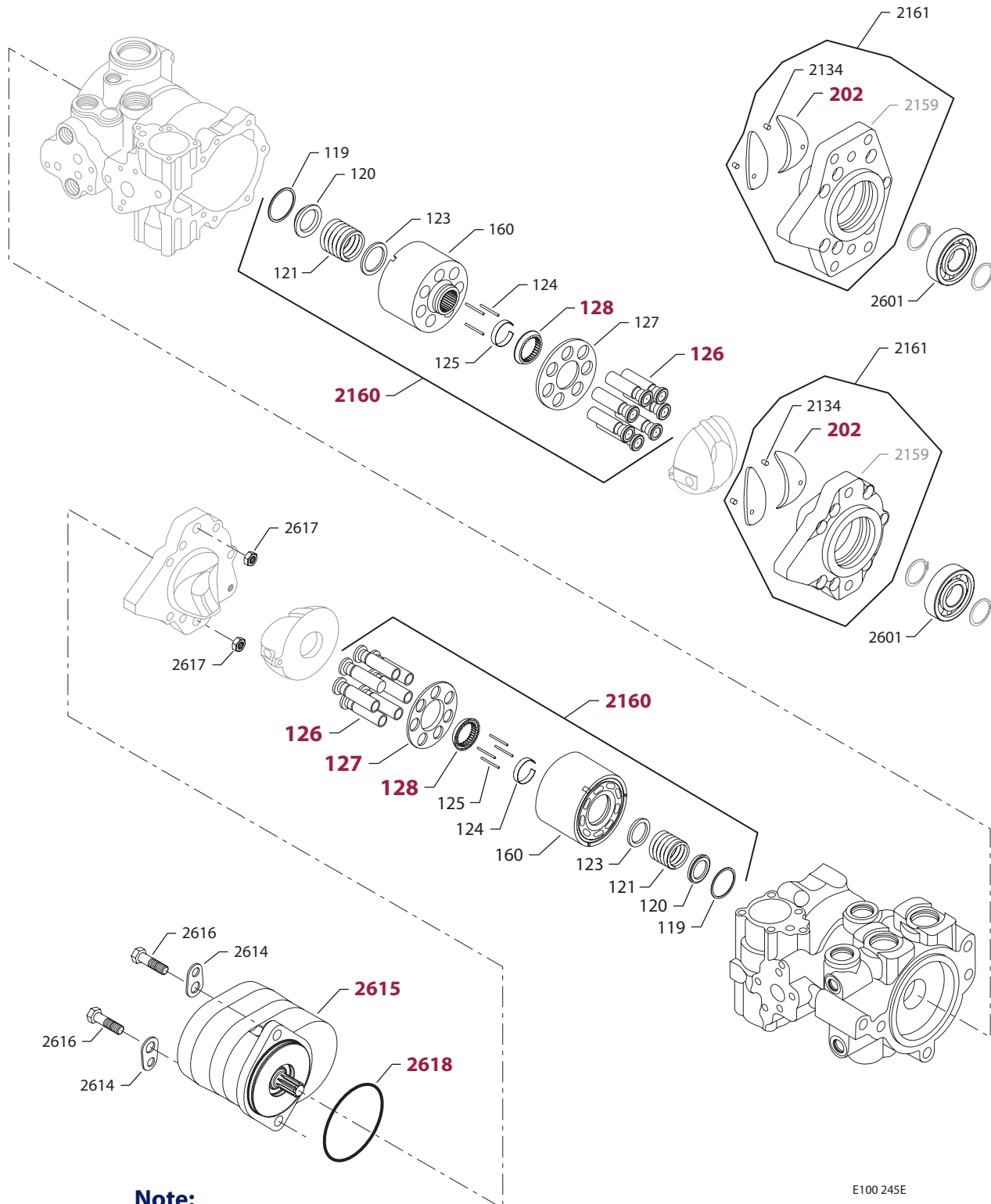
Order Code	Item	Date Begin	Date End	Part Number	Part Name	Qty. per Model/Kit
	119	84-31		9006250-0162	Retaining ring	2
	120	84-31		9009625-0105	Washer, special	2
	121	84-31		4460111	Cylinder block spring	2
	123	84-31		9009625-0108	Washer	2
	124	84-31		9004875-0113	Holddown pin	6
	125	84-31		4460028	Holddown pin retainer	2
	126	84-31		4461032	Piston assembly (SB-1998-077)	14
	127	84-31		4460009	Slipper guide	2
	128	84-31		4460180	Retainer guide	2
	2134	84-31		5000116	Coiled pin	2

SPECIAL HARDWARE

GDD	160	03-17		4461088	Cylinder block	2
	202	03-17		4461402	Journal bearing	2
	2160	03-17		4461090	Cylinder block kit	2
	2161	03-17		4461412	Front cover assembly	1
	2601	03-17		5000731	Ball bearing	1
	2614	03-17		8800565	Lifting bracket	2
	2615	03-17		163D1349	Gear pump, 180 ° mounting orientation	1
	2616	03-17		9007200-5030	Screw	2
	2617	03-17		9003530-5000	Nut	2
	2618	03-17		9004100-0440	O-ring	1

GDF	160	03-26		4461088	Cylinder block	2
	202	03-26		4461402	Journal bearing	2
	2160	03-26		4461090	Cylinder block kit	2
	2161	03-26		4461412	Front cover assembly	1
	2601	03-26		5000731	Ball bearing	1
	2614	03-26		8800565	Lifting bracket	2
	2615	03-26		163D1366	Gear pump, 180 ° mounting orientation	1
	2616	03-26		9007200-5030	Screw	2
	2617	03-26		9003530-5000	Nut	2
	2618	03-26		9004100-0440	O-ring	1

GDG	160	04-26		4460832	Cylinder block	2
	202	04-26		4461402	Journal bearing	2
	2160	04-26		4460890	Cylinder block kit	2
	2161	04-26		4461413	Front cover assembly	1
	2601	04-26		5000731	Ball bearing	1
	2614	04-26		8800565	Lifting bracket	2
	2615	04-26		163D1463	Gear pump, 180 ° mounting orientation	1
	2616	04-26		9007200-5030	Screw	2
	2617	04-26		9003530-5000	Nut	2
	2618	04-26		9004100-0440	O-ring	1



Note:
Generic gear pump
shown mounted at 180°
orientation.

E100 245E

Enlarged **bold** type item
numbers are recommended
parts to be stocked for servicing

COMMON SPECIAL HARDWARE PARTS

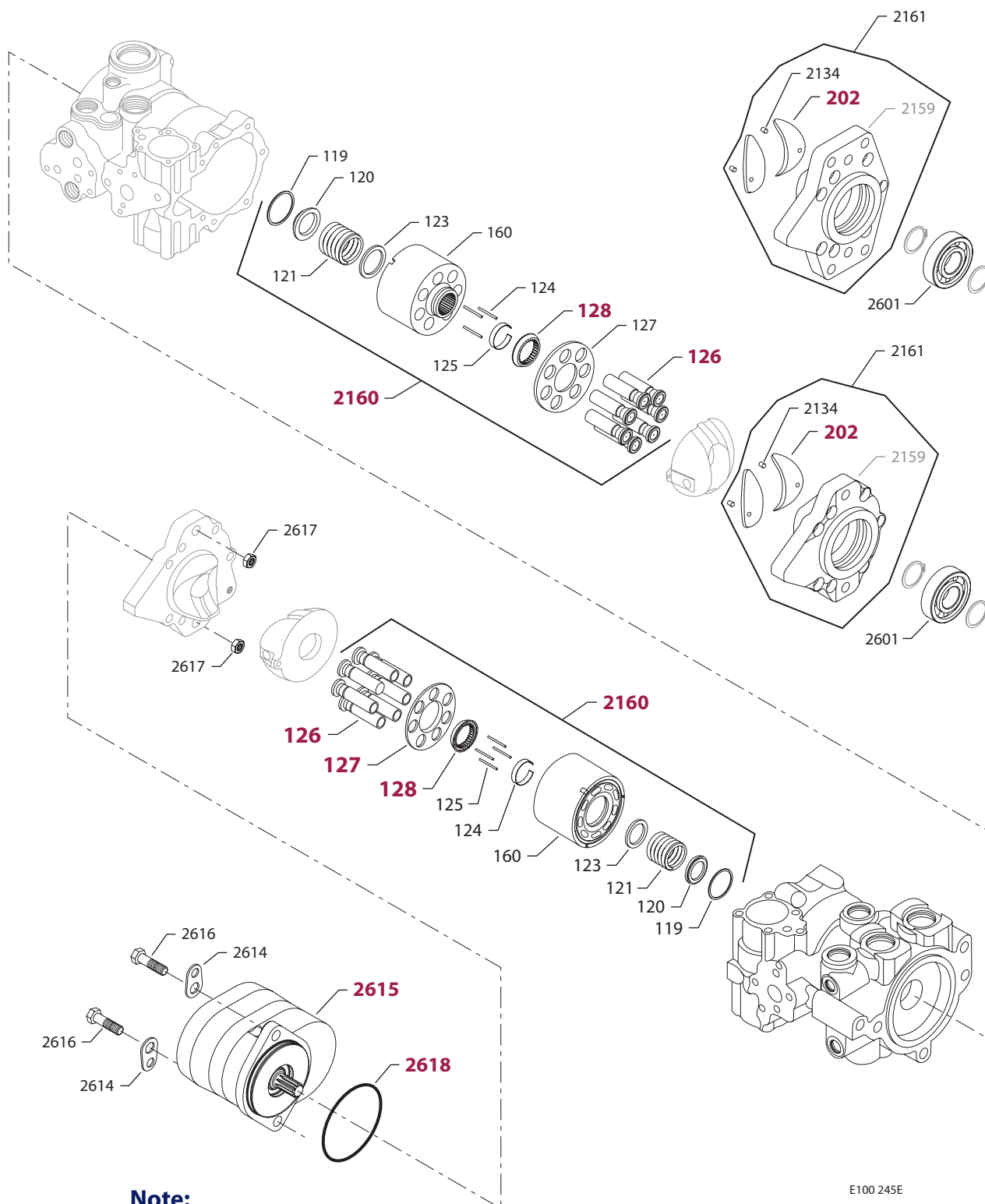
Order Code	Item	Date Begin	Date End	Part Number	Part Name	Qty. per Model/Kit
	119	84-31		9006250-0162	Retaining ring	2
	120	84-31		9009625-0105	Washer, special	2
	121	84-31		4460111	Cylinder block spring	2
	123	84-31		9009625-0108	Washer	2
	124	84-31		9004875-0113	Holddown pin	6
	125	84-31		4460028	Holddown pin retainer	2
	126	84-31		4461032	Piston assembly (SB-1998-077)	14
	127	84-31		4460009	Slipper guide	2
	128	84-31		4460180	Retainer guide	2
	2134	84-31		5000116	Coiled pin	2

SPECIAL HARDWARE

GDH	160	04-26		4460832	Cylinder block	2
	202	04-26		4461402	Journal bearing	2
	2160	04-26		4460890	Cylinder block kit	2
	2161	04-26		4461413	Front cover assembly	1
	2601	04-26		5000731	Ball bearing	1
	2614	04-26		8800565	Lifting bracket	2
	2615	04-26		163D1415	Gear pump, 180 ° mounting orientation	1
	2616	04-26		9007200-5030	Screw	2
	2617	04-26		9003530-5000	Nut	2
	2618	04-26		9004100-0440	O-ring	1

GDJ	160	03-47		4461088	Cylinder block	2
	202	03-47		4461402	Journal bearing	2
	2160	03-47		4461090	Cylinder block kit	2
	2161	03-47		4461412	Front cover assembly	1
	2601	03-47		5000731	Ball bearing	1
	2614	03-47		8800565	Lifting bracket	2
	2615	03-47		163D1404	Gear pump, 180 ° mounting orientation	1
	2616	03-47		9007200-5030	Screw	2
	2617	03-47		9003530-5000	Nut	2
	2618	03-47		9004100-0440	O-ring	1

GDK	160	03-47		4461088	Cylinder block	2
	202	03-47		4461402	Journal bearing	2
	2160	03-47		4461090	Cylinder block kit	2
	2161	03-47		4461412	Front cover assembly	1
	2601	03-47		5000731	Ball bearing	1
	2614	03-47		8800565	Lifting bracket	2
	2615	03-47		163D1403	Gear pump, 180 ° mounting orientation	1
	2616	03-47		9007200-5030	Screw	2
	2617	03-47		9003530-5000	Nut	2
	2618	03-47		9004100-0440	O-ring	1



Note:
Generic gear pump
shown mounted at 180°
orientation.

E100 245E

Enlarged **bold** type item
numbers are recommended
parts to be stocked for servicing

COMMON SPECIAL HARDWARE PARTS

Order Code	Item	Date Begin	Date End	Part Number	Part Name	Qty. per Model/Kit
	119	84-31		9006250-0162	Retaining ring	2
	120	84-31		9009625-0105	Washer, special	2
	121	84-31		4460111	Cylinder block spring	2
	123	84-31		9009625-0108	Washer	2
	124	84-31		9004875-0113	Holddown pin	6
	125	84-31		4460028	Holddown pin retainer	2
	126	84-31		4461032	Piston assembly (SB-1998-077)	14
	127	84-31		4460009	Slipper guide	2
	128	84-31		4460180	Retainer guide	2
	2134	84-31		5000116	Coiled pin	2

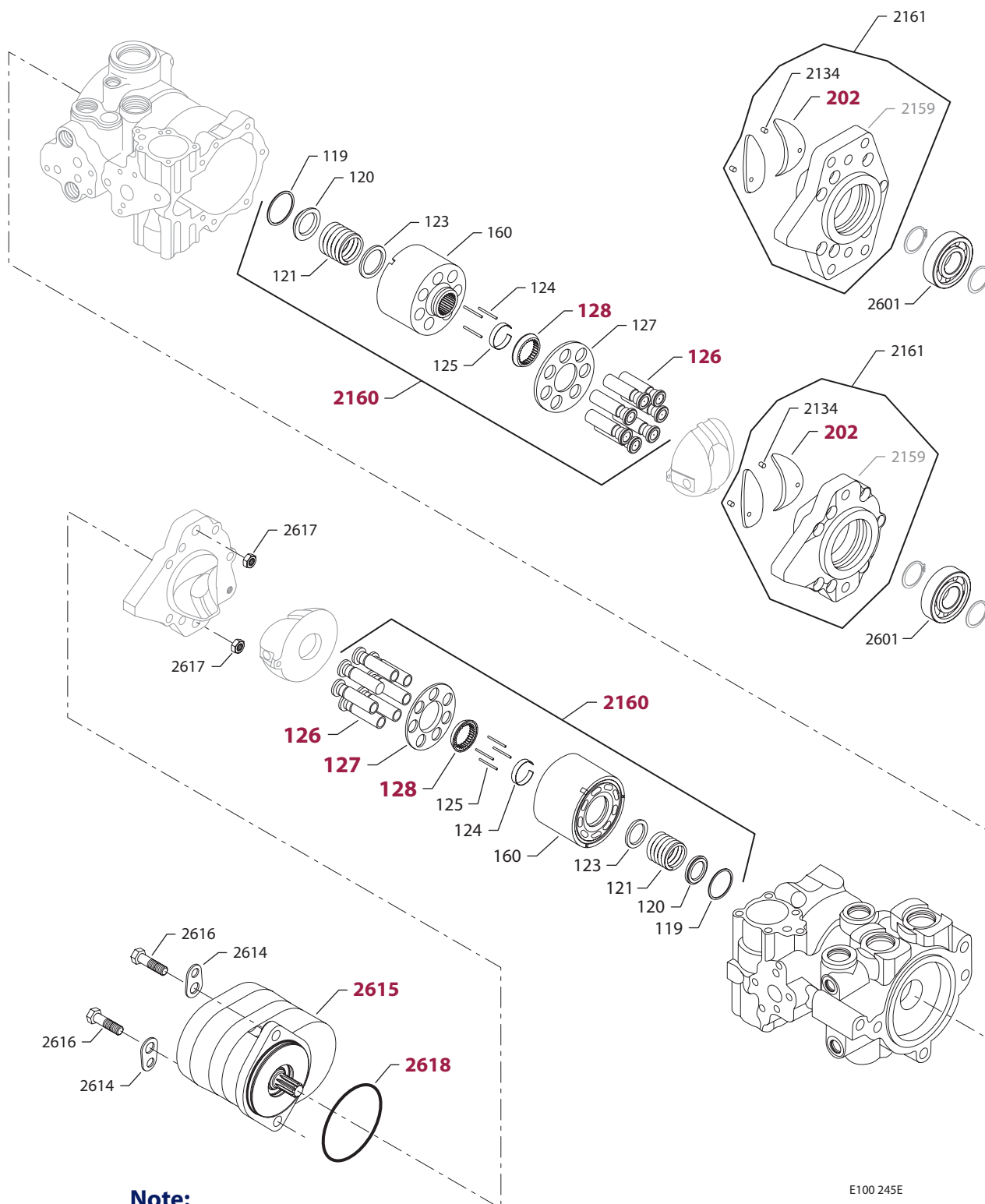
SPECIAL HARDWARE

NAA	160	06-18		4460832	Cylinder block	2
	202	06-18		4460696	Journal bearing	2
	2160	06-18		4460890	Cylinder block kit	2
	2161	06-18		4461352	Front cover assembly	1
	2601	06-18		5000731	Ball bearing	1

NAB	160	06-18		4461088	Cylinder block	2
	202	06-18		4461402	Journal bearing	2
	2160	06-18		4461090	Cylinder block kit	2
	2161	06-18		4461412	Front cover assembly	1
	2601	06-18		5000731	Ball bearing	1
	2614	06-18		8800565	Lifting bracket	2
	2615	06-18		163D1310	Gear pump, 180 ° mounting orientation	1
	2616	06-18		9007200-5030	Screw	2
	2617	06-18		9003530-5000	Nut	2
	2618	06-18		9004100-0440	O-ring	1

NAC	160	06-18		4461088	Cylinder block	2
	202	06-18		4461402	Journal bearing	2
	2160	06-18		4461090	Cylinder block kit	2
	2161	06-18		4461412	Front cover assembly	1
	2601	06-18		5000731	Ball bearing	1

NAD	160	06-46		4461088	Cylinder block	2
	202	06-46		4461402	Journal bearing	2
	2160	06-46		4461090	Cylinder block kit	2
	2161	06-46		4461412	Front cover assembly	1
	2601	06-46		5000731	Ball bearing	1
	2614	06-46		8800565	Lifting bracket	2
	2615	06-46		80002205	Gear pump, 180 ° mounting orientation	1
	2616	06-46		9007200-5030	Screw	2
	2617	06-46		9003530-5000	Nut	2
	2618	06-46		9004100-0440	O-ring	1



Note:
Generic gear pump
shown mounted at 180°
orientation.

E100 245E

Enlarged **bold** type item
numbers are recommended
parts to be stocked for servicing

COMMON SPECIAL HARDWARE PARTS

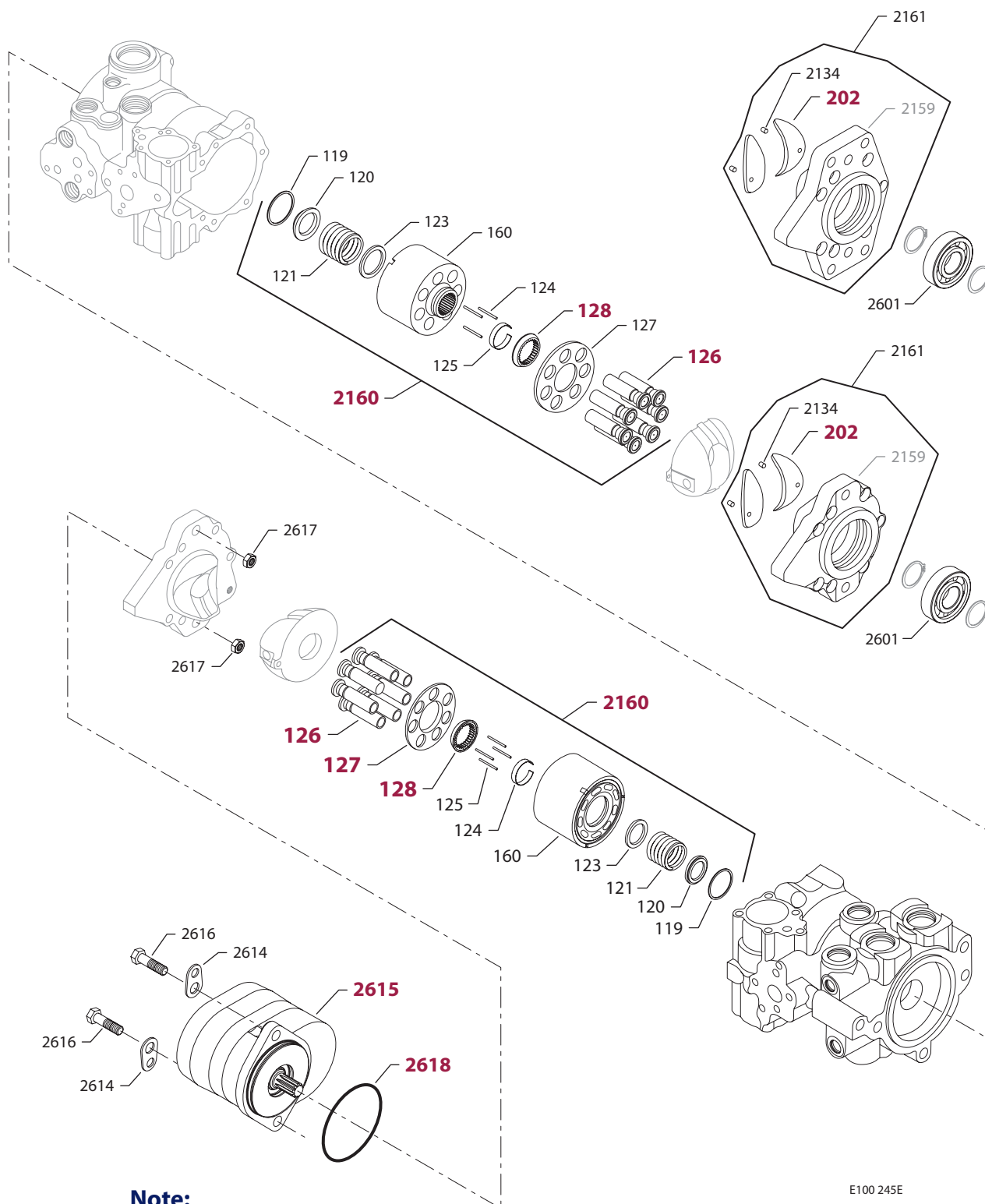
Order Code	Item	Date Begin	Date End	Part Number	Part Name	Qty. per Model/Kit
	119	84-31		9006250-0162	Retaining ring	2
	120	84-31		9009625-0105	Washer, special	2
	121	84-31		4460111	Cylinder block spring	2
	123	84-31		9009625-0108	Washer	2
	124	84-31		9004875-0113	Holddown pin	6
	125	84-31		4460028	Holddown pin retainer	2
	126	84-31		4461032	Piston assembly (SB-1998-077)	14
	127	84-31		4460009	Slipper guide	2
	128	84-31		4460180	Retainer guide	2
	2134	84-31		5000116	Coiled pin	2

SPECIAL HARDWARE

NAE	160	06-46		4461088	Cylinder block	2
	202	06-46		4461402	Journal bearing	2
	2160	06-46		4461090	Cylinder block kit	2
	2161	06-46		4461412	Front cover assembly	1
	2601	06-46		5000731	Ball bearing	1
	2614	06-46		8800565	Lifting bracket	2
	2615	06-46		80002206	Gear pump, 180 ° mounting orientation	1
	2616	06-46		9007200-5030	Screw	2
	2617	06-46		9003530-5000	Nut	2
	2618	06-46		9004100-0440	O-ring	1

NAF	160	06-46		4461088	Cylinder block	2
	202	06-46		4461402	Journal bearing	2
	2160	06-46		4461090	Cylinder block kit	2
	2161	06-46		4461412	Front cover assembly	1
	2601	06-46		5000731	Ball bearing	1
	2614	06-46		8800565	Lifting bracket	2
	2615	06-46		80002207	Gear pump, 180 ° mounting orientation	1
	2616	06-46		9007200-5030	Screw	2
	2617	06-46		9003530-5000	Nut	2
	2618	06-46		9004100-0440	O-ring	1

NAG	160	07-11		4460832	Cylinder block	2
	202	07-11		4461402	Journal bearing	2
	2160	07-11		4460890	Cylinder block kit	2
	2161	07-11		4461413	Front cover assembly	1
	2601	07-11		5000731	Ball bearing	1
	2614	07-11		8800565	Lifting bracket	2
	2615	07-11		80003557	Gear pump, 180 ° mounting orientation	1
	2616	07-11		9007200-5030	Screw	2
	2617	07-11		9003530-5000	Nut	2
	2618	07-11		9004100-0440	O-ring	1



Note:
Generic gear pump
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orientation.

E100 245E

Enlarged **bold** type item
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COMMON SPECIAL HARDWARE PARTS

Order Code	Item	Date Begin	Date End	Part Number	Part Name	Qty. per Model/Kit
	119	84-31		9006250-0162	Retaining ring	2
	120	84-31		9009625-0105	Washer, special	2
	121	84-31		4460111	Cylinder block spring	2
	123	84-31		9009625-0108	Washer	2
	124	84-31		9004875-0113	Holddown pin	6
	125	84-31		4460028	Holddown pin retainer	2
	126	84-31		4461032	Piston assembly (SB-1998-077)	14
	127	84-31		4460009	Slipper guide	2
	128	84-31		4460180	Retainer guide	2
	2134	84-31		5000116	Coiled pin	2

SPECIAL HARDWARE

NAM	160	09-19		4460832	Cylinder block	2
	202	09-19		4460696	Journal bearing	2
	2160	09-19		4460890	Cylinder block kit	2
	2161	09-19		4461349	Front cover assembly	1
	2601	09-19		5000731	Ball bearing	1

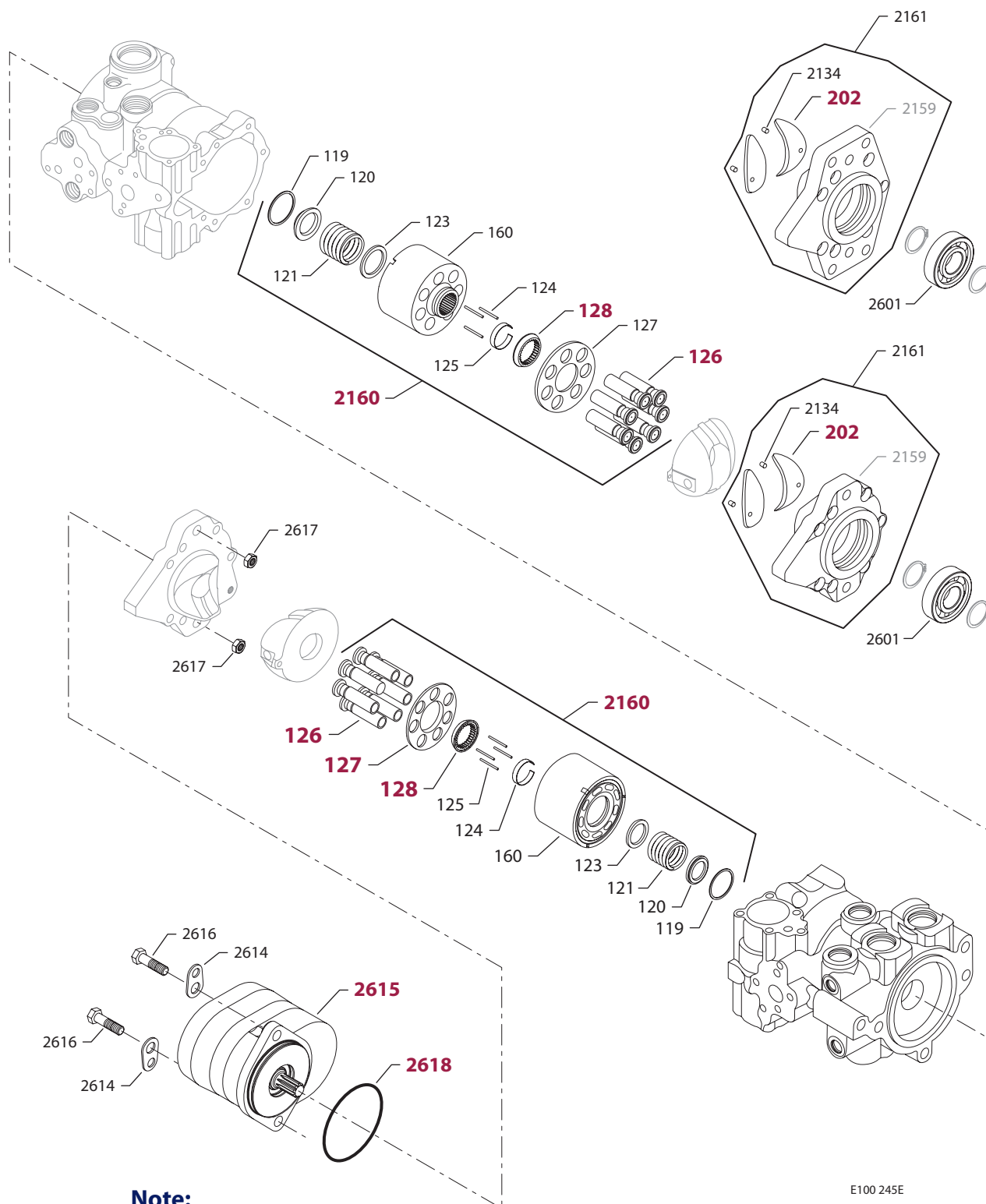
NBA	160	00-07		4461088	Cylinder block	2
	202	00-07		4460696	Journal bearing	2
	2160	00-07		4461090	Cylinder block kit	2
	2161	00-07		4461352	Front cover assembly	1
	2601	00-07		5000731	Ball bearing	1

NBB	160	04-26		4461088	Cylinder block	2
	202	04-26		4460696	Journal bearing	2
	2160	04-26		4461090	Cylinder block kit	2
	2161	04-26		4461412	Front cover assembly	1
	2601	04-26		5000731	Ball bearing	1

NBC	160	04-26		4460832	Cylinder block	2
	202	04-26		4461402	Journal bearing	2
	2160	04-26		4460890	Cylinder block kit	2
	2161	04-26		4461413	Front cover assembly	1
	2601	04-26		5000731	Ball bearing	1

NBN	160	00-07		4461088	Cylinder block	2
	202	00-07		4460696	Journal bearing	2
	2160	00-07		4461090	Cylinder block kit	2
	2161	00-07		4461349	Front cover assembly	1
	2601	00-07		5000731	Ball bearing	1

NNA	160	06-10		4460832	Cylinder block	2
	202	06-10		4460696	Journal bearing	2
	2160	06-10		4460890	Cylinder block kit	2
	2161	06-10		4461349	Front cover assembly	1
	2601	06-10		5000731	Ball bearing	1



Note:
Generic gear pump
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orientation.

E100 245E

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parts to be stocked for servicing

COMMON SPECIAL HARDWARE PARTS

Order Code	Item	Date Begin	Date End	Part Number	Part Name	Qty. per Model/Kit
	119	84-31		9006250-0162	Retaining ring	2
	120	84-31		9009625-0105	Washer, special	2
	121	84-31		4460111	Cylinder block spring	2
	123	84-31		9009625-0108	Washer	2
	124	84-31		9004875-0113	Holddown pin	6
	125	84-31		4460028	Holddown pin retainer	2
	126	84-31		4461032	Piston assembly (SB-1998-077)	14
	127	84-31		4460009	Slipper guide	2
	128	84-31		4460180	Retainer guide	2
	2134	84-31		5000116	Coiled pin	2

SPECIAL HARDWARE

NNB	160	06-10		4460832	Cylinder block	2
	202	06-10		4460696	Journal bearing	2
	2160	06-10		4460890	Cylinder block kit	2
	2161	06-10		4461349	Front cover assembly	1
	2601	06-10		5000731	Ball bearing	1

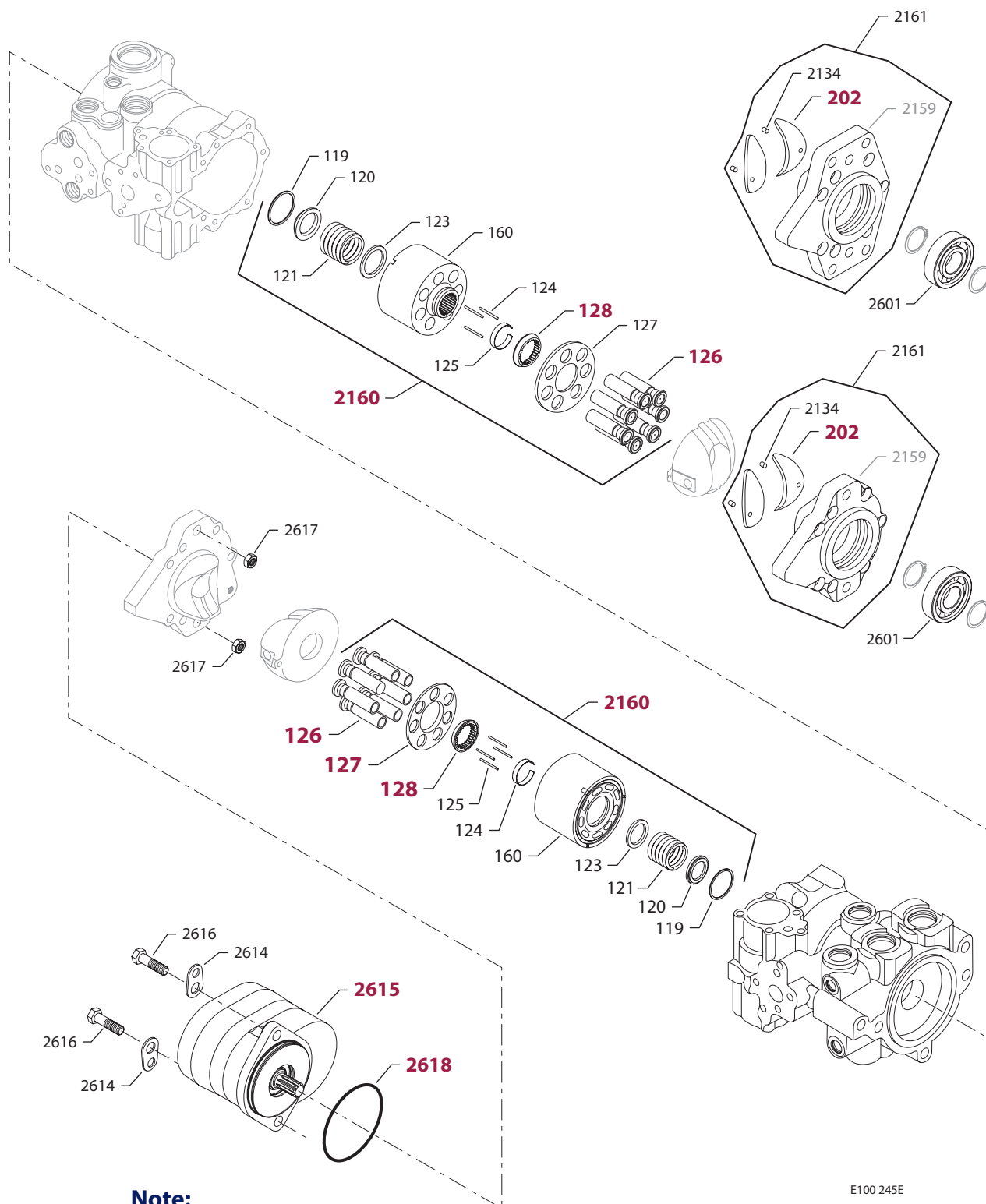
NNC	160	06-10		4460832	Cylinder block	2
	202	06-10		4460696	Journal bearing	2
	2160	06-10		4460890	Cylinder block kit	2
	2161	06-10		4461349	Front cover assembly	1
	2601	06-10		5000731	Ball bearing	1

NND	160	06-10		4460832	Cylinder block	2
	202	06-10		4460696	Journal bearing	2
	2160	06-10		4460890	Cylinder block kit	2
	2161	06-10		4461349	Front cover assembly	1
	2601	06-10		5000731	Ball bearing	1

NNE	160	06-10		4460832	Cylinder block	2
	202	06-10		4460696	Journal bearing	2
	2160	06-10		4460890	Cylinder block kit	2
	2161	06-10		4461349	Front cover assembly	1
	2601	06-10		5000731	Ball bearing	1

NNF	160	06-10		4461088	Cylinder block	2
	202	06-10		4460696	Journal bearing	2
	2160	06-10		4461090	Cylinder block kit	2
	2161	06-10		4461352	Front cover assembly	1
	2601	06-10		5000731	Ball bearing	1

NNG	160	06-10		4460832	Cylinder block	2
	202	06-10		4460696	Journal bearing	2
	2160	06-10		4460890	Cylinder block kit	2
	2161	06-10		4461349	Front cover assembly	1
	2601	06-10		5000731	Ball bearing	1



Note:
Generic gear pump
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orientation.

E100 245E

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COMMON SPECIAL HARDWARE PARTS

Order Code	Item	Date Begin	Date End	Part Number	Part Name	Qty. per Model/Kit
	119	84-31		9006250-0162	Retaining ring	2
	120	84-31		9009625-0105	Washer, special	2
	121	84-31		4460111	Cylinder block spring	2
	123	84-31		9009625-0108	Washer	2
	124	84-31		9004875-0113	Holddown pin	6
	125	84-31		4460028	Holddown pin retainer	2
	126	84-31		4461032	Piston assembly (SB-1998-077)	14
	127	84-31		4460009	Slipper guide	2
	128	84-31		4460180	Retainer guide	2
	2134	84-31		5000116	Coiled pin	2

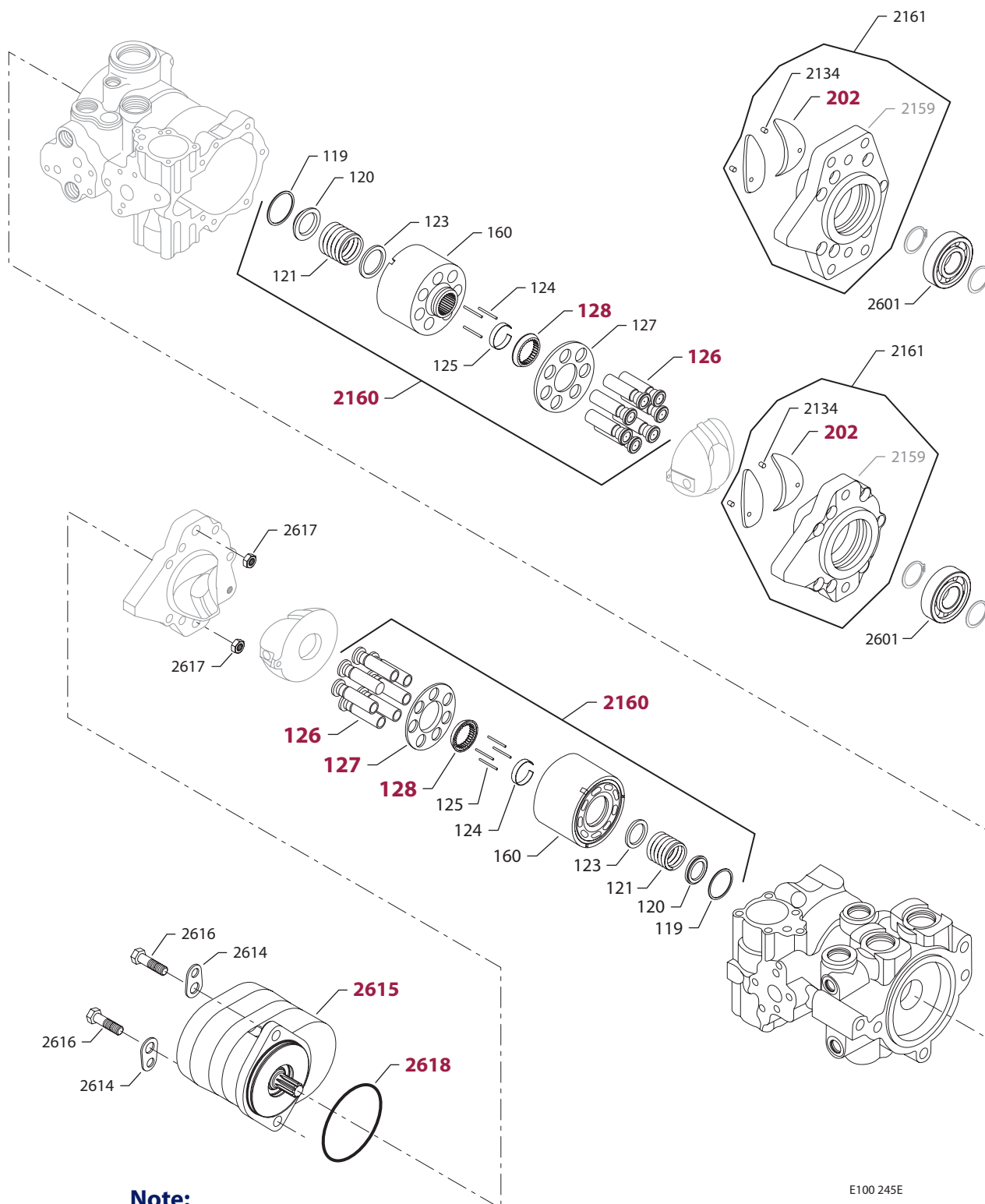
SPECIAL HARDWARE

NNL	160	06-10		4461088	Cylinder block	2
	202	06-10		4461402	Journal bearing	2
	2160	06-10		4461090	Cylinder block kit	2
	2161	06-10		4461412	Front cover assembly	1
	2601	06-10		5000731	Ball bearing	1
	2614	06-10		8800565	Lifting bracket	2
	2615	06-10		163D1349	Gear pump, 180 ° mounting orientation	1
	2616	06-10		9007200-5030	Screw	2
	2617	06-10		9003530-5000	Nut	2
	2618	06-10		9004100-0440	O-ring	1

NNM	160	06-10		4461088	Cylinder block	2
	202	06-10		4461402	Journal bearing	2
	2160	06-10		4461090	Cylinder block kit	2
	2161	06-10		4461412	Front cover assembly	1
	2601	06-10		5000731	Ball bearing	1
	2614	06-10		8800565	Lifting bracket	2
	2615	06-10		163D1366	Gear pump, 180 ° mounting orientation	1
	2616	06-10		9007200-5030	Screw	2
	2617	06-10		9003530-5000	Nut	2
	2618	06-10		9004100-0440	O-ring	1

NNN	160	86-23		4460832	Cylinder block	2
	202	86-23		4460696	Journal bearing	2
	2159	86-23	89-22	4460478	Front cover (SB-1989-013)	1
	2160	86-23		4460890	Cylinder block kit	2
	2161	89-23		4461349	Front cover assembly	1
	2601	86-23		5000731	Ball bearing	1

NNR	160	86-23		4460832	Cylinder block	2
	202	86-23		4460696	Journal bearing	2
	2160	86-23		4460890	Cylinder block kit	2
	2161	89-23		4461349	Front cover assembly	1
	2601	86-23		357616	Ball bearing	1



Note:
Generic gear pump
shown mounted at 180°
orientation.

E100 245E

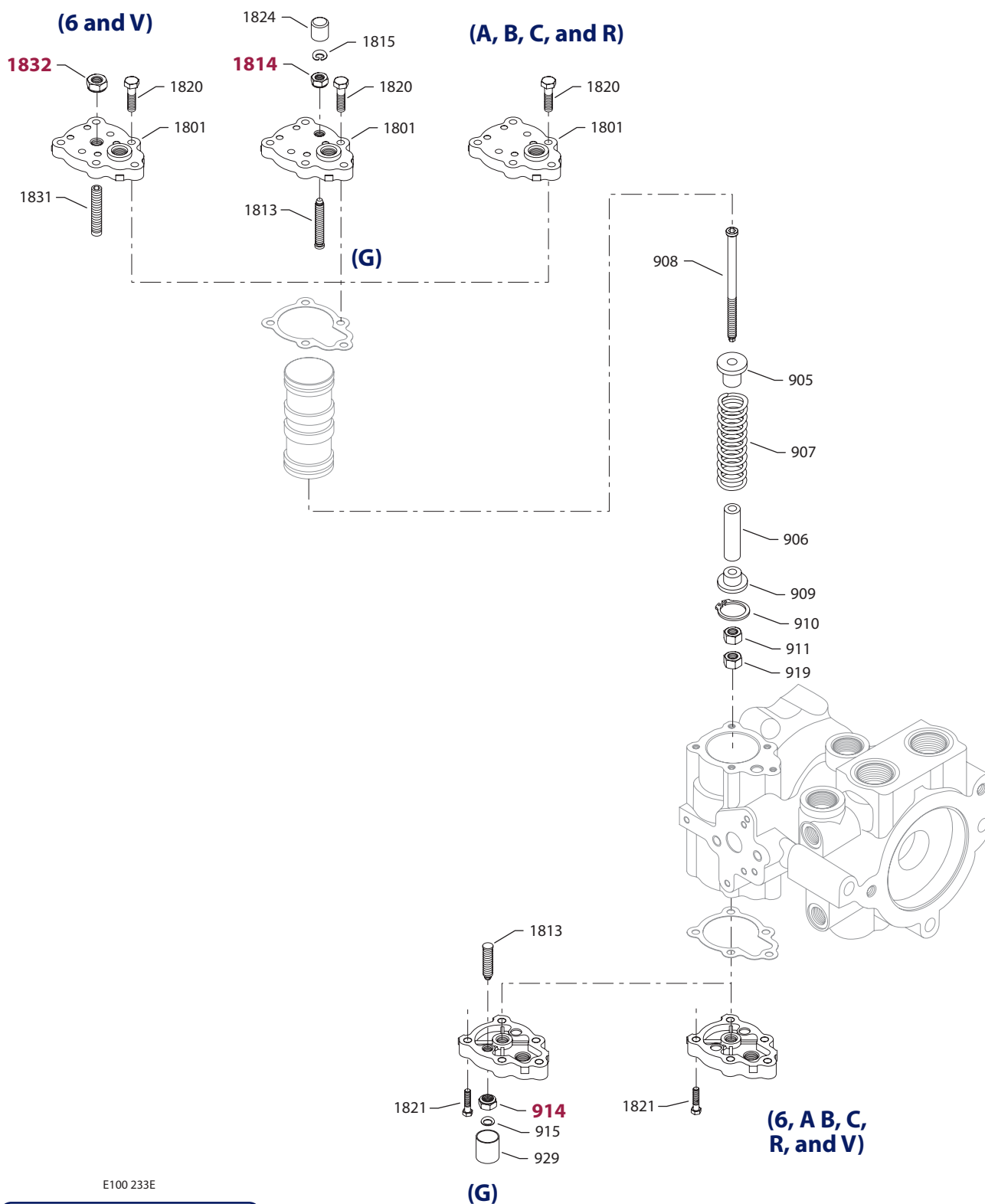
Enlarged **bold** type item
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COMMON SPECIAL HARDWARE PARTS

Order Code	Item	Date Begin	Date End	Part Number	Part Name	Qty. per Model/Kit
	119	84-31		9006250-0162	Retaining ring	2
	120	84-31		9009625-0105	Washer, special	2
	121	84-31		4460111	Cylinder block spring	2
	123	84-31		9009625-0108	Washer	2
	124	84-31		9004875-0113	Holddown pin	6
	125	84-31		4460028	Holddown pin retainer	2
	126	84-31		4461032	Piston assembly (SB-1998-077)	14
	127	84-31		4460009	Slipper guide	2
	128	84-31		4460180	Retainer guide	2
	2134	84-31		5000116	Coiled pin	2

SPECIAL HARDWARE

NNS	160	06-10		4461088	Cylinder block	2
	202	06-10		4461402	Journal bearing	2
	2160	06-10		4461090	Cylinder block kit	2
	2161	06-10		4461412	Front cover assembly	1
	2601	06-10		5000731	Ball bearing	1
	2614	06-10		8800565	Lifting bracket	2
	2615	06-10		163D1403	Gear pump, 180 ° mounting orientation	1
	2616	06-10		9007200-5030	Screw	2
	2617	06-10		9003530-5000	Nut	2
	2618	06-10		9004100-0440	O-ring	1



E100 233E

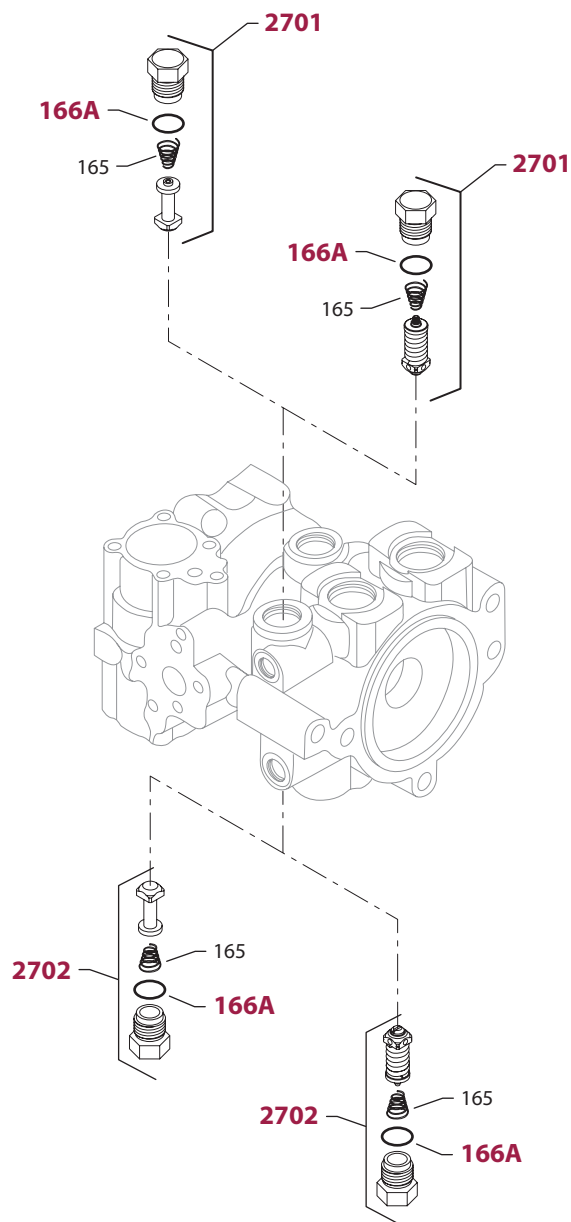
Enlarged **bold** type item numbers are recommended parts to be stocked for servicing

COMMON MAXIMUM DISPLACEMENT PARTS

Order Code	Item	Date Begin	Date End	Part Number	Part Name	Qty. per Model/Kit
	1805	84-31		4461034	Spring guide (SB-1998-051)	1
	1807	84-31		4460164	Servo spring	1
	1808	84-31		4461033	Servo screw (SB-1998-051)	1
	1809	84-31		4460302	Spring guide	1
	1810	84-31		9006220-0131	Retaining ring	1
	1811	84-31		9003535-3700	Nut	1
	1819	87-40		5000480	Nut	1
	1820	84-31		9007276-0134	Screw (SB-1990-012)	5
	1821	84-31		9007276-0134	Screw (SB-1990-012)	5

MAXIMUM DISPLACEMENT

6	1801	07-42		4460455-0002	Servo cover	1
	1802	07-42		4460455-0002	Servo cover	1
	1806	07-42		4460303-0002	Servo stop	1
	1831	07-42		4460946	Servo stop	1
	1832	07-42		9003575-0083	Seal nut	1
A	1801	87-41		4460455-0004	Servo cover (SB-1987-029)	1
	1802	87-41		4460455-0002	Servo cover (SB-1987-029)	1
	1806	84-31		4460303-0001	Servo stop	1
B	1801	87-41		4460455-0004	Servo cover (SB-1987-029)	1
	1802	87-41		4460455-0002	Servo cover (SB-1987-029)	1
	1806	84-31		4460303-0002	Servo stop	1
C	1801	87-41		4460455-0004	Servo cover (SB-1987-029)	1
	1802	87-41		4460455-0002	Servo cover (SB-1987-029)	1
	1806	84-31		4460303-0003	Servo stop	1
G	1801	87-41		4460455-0003	Servo cover (SB-1987-029)	1
	1802	87-41		4460455-0001	Servo cover (SB-1987-029)	1
	1806	84-31		4460303-0001	Servo stop	1
	1813	84-31		4460603	Servo stop	2
	1814	84-31		9003575-0094	Seal nut	2
	1815	84-31		9006326-0025	Retaining ring	2
	1824	84-31		4800174	Servo adjust cover	1
	1829	84-31		4800174	Servo adjust cover	1
R	1801	92-30		4460455-0004	Servo cover	1
	1802	92-30		4460455-0002	Servo cover	1
	1806	92-30		4460303-0006	Servo stop	1
V	1801	97-26		4460455-0002	Servo cover	1
	1802	97-26		4460455-0002	Servo cover	1
	1806	97-26		4460303-0001	Servo stop	1
	1831	97-26		4460946	Servo stop	1
	1832	97-26		9003575-0083	Seal nut	1



E100 235E

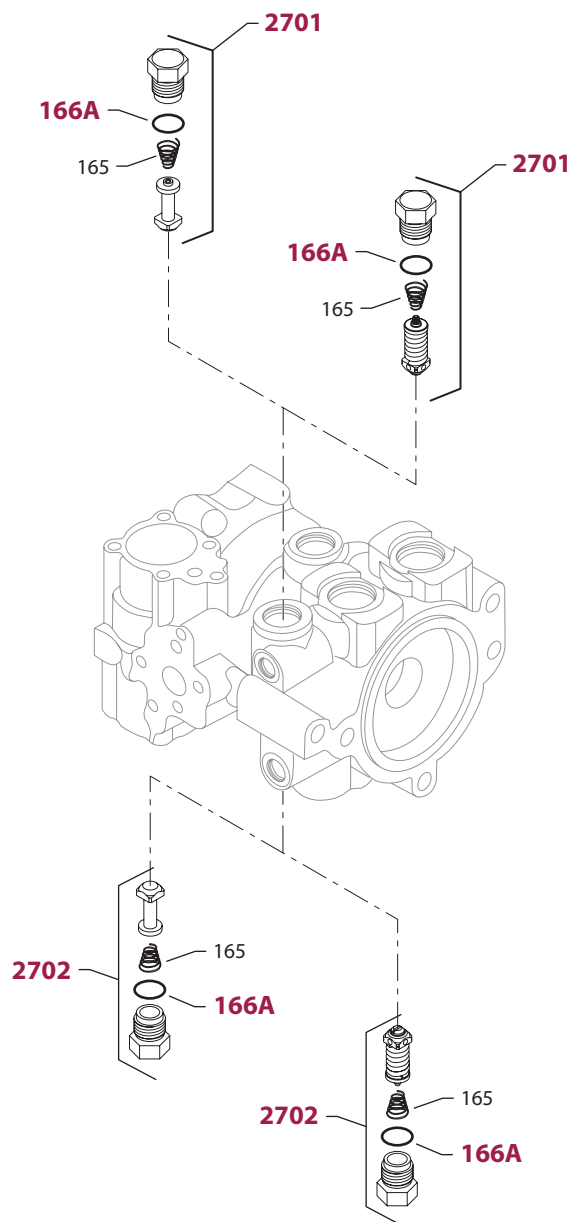
Enlarged **bold** type item numbers are recommended parts to be stocked for servicing

COMMON SYSTEM PRESSURE PROTECTION PARTS

Order Code	Item	Date Begin	Date End	Part Number	Part Name	Qty. per Model/Kit
	165	84-31		4461386	Conical spring	2
	166A	84-31		9004201-7500	O-ring	2

SYSTEM PRESSURE PROTECTION

AAA	2701	87-38		4510004-0000	Check valve kit (SB-1987-024)	1
	2702	87-38		4510004-0000	Check valve kit (SB-1987-024)	1
BBB	2701	87-38		4510004-0175	SCR valve kit, 175 bar [2538 psi] (SB-1987-024)	1
	2702	87-38		4510004-0175	SCR valve kit, 175 bar [2538 psi] (SB-1987-024)	1
BBF	2701	87-38		4510004-0175	SCR valve kit, 175 bar [2538 psi] (SB-1987-024)	1
	2702	87-38		4510004-0250	SCR valve kit, 250 bar [3625 psi] (SB-1987-024)	1
BBG	2701	87-38		4510004-0175	SCR valve kit, 175 bar [2538 psi] (SB-1987-024)	1
	2702	87-38		4510004-0280	SCR valve kit, 280 bar [4060 psi] (SB-1987-024)	1
BBJ	2701	87-38		4510004-0175	SCR valve kit, 175 bar [2538 psi] (SB-1987-024)	1
	2702	87-38		4510004-0345	SCR valve kit, 345 bar [5000 psi] (SB-1987-024)	1
BBM	2701	87-38		4510004-0175	SCR valve kit, 175 bar [2538 psi] (SB-1987-024)	1
	2702	87-38		4510004-0140	SCR valve kit, 140 bar [2030 psi] (SB-1987-024)	1
BCC	2701	87-38		4510004-0190	SCR valve kit, 190 bar [2755 psi] (SB-1987-024)	1
	2702	87-38		4510004-0190	SCR valve kit, 190 bar [2755 psi] (SB-1987-024)	1
BDD	2701	87-38		4510004-0210	SCR valve kit, 210 bar [3045 psi] (SB-1987-024)	1
	2702	87-38		4510004-0210	SCR valve kit, 210 bar [3045 psi] (SB-1987-024)	1
BED	2701	87-38		4510004-0230	SCR valve kit, 230 bar [3335 psi] (SB-1987-024)	1
	2702	87-38		4510004-0210	SCR valve kit, 210 bar [3045 psi] (SB-1987-024)	1
BEE	2701	87-38		4510004-0230	SCR valve kit, 230 bar [3335 psi] (SB-1987-024)	1
	2702	87-38		4510004-0230	SCR valve kit, 230 bar [3335 psi] (SB-1987-024)	1
BFD	2701	87-38		4510004-0250	SCR valve kit, 250 bar [3625 psi] (SB-1987-024)	1
	2702	87-38		4510004-0210	SCR valve kit, 210 bar [3045 psi] (SB-1987-024)	1
BFF	2701	87-38		4510004-0250	SCR valve kit, 250 bar [3625 psi] (SB-1987-024)	1
	2702	87-38		4510004-0250	SCR valve kit, 250 bar [3625 psi] (SB-1987-024)	1
BGB	2701	87-38		4510004-0280	SCR valve kit, 280 bar [4060 psi] (SB-1987-024)	1
	2702	87-38		4510004-0175	SCR valve kit, 175 bar [2538 psi] (SB-1987-024)	1
BGE	2701	87-38		4510004-0280	SCR valve kit, 280 bar [4060 psi] (SB-1987-024)	1
	2702	87-38		4510004-0230	SCR valve kit, 230 bar [3335 psi] (SB-1987-024)	1
BGG	2701	87-38		4510004-0280	SCR valve kit, 280 bar [4060 psi] (SB-1987-024)	1
	2702	87-38		4510004-0280	SCR valve kit, 280 bar [4060 psi] (SB-1987-024)	1



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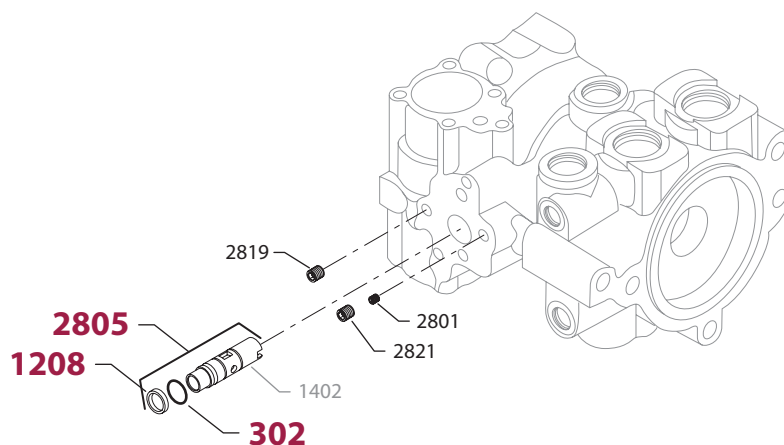
Enlarged **bold** type item numbers are recommended parts to be stocked for servicing

COMMON SYSTEM PRESSURE PROTECTION PARTS

Order Code	Item	Date Begin	Date End	Part Number	Part Name	Qty. per Model/Kit
	165	84-31		4461386	Conical spring	2
	166A	84-31		9004201-7500	O-ring	2

SYSTEM PRESSURE PROTECTION

BHH	2701	87-38		4510004-0300	SCR valve kit, 300 bar [4350 psi] (SB-1987-024)	1
	2702	87-38		4510004-0300	SCR valve kit, 300 bar [4350 psi] (SB-1987-024)	1
BJB	2701	87-38		4510004-0345	SCR valve kit, 345 bar [5000 psi] (SB-1987-024)	1
	2702	87-38		4510004-0175	SCR valve kit, 175 bar [2538 psi] (SB-1987-024)	1
BJD	2701	87-38		4510004-0345	SCR valve kit, 345 bar [5000 psi] (SB-1987-024)	1
	2702	87-38		4510004-0210	SCR valve kit, 210 bar [3045 psi] (SB-1987-024)	1
BJF	2701	87-38		4510004-0345	SCR valve kit, 345 bar [5000 psi] (SB-1987-024)	1
	2702	87-38		4510004-0250	SCR valve kit, 250 bar [3625 psi] (SB-1987-024)	1
BJJ	2701	87-38		4510004-0345	SCR valve kit, 345 bar [5000 psi] (SB-1987-024)	1
	2702	87-38		4510004-0345	SCR valve kit, 345 bar [5000 psi] (SB-1987-024)	1
BKJ	2701	87-38		4510004-0360	SCR valve kit, 360 bar [5220 psi] (SB-1987-024)	1
	2702	87-38		4510004-0345	SCR valve kit, 345 bar [5000 psi] (SB-1987-024)	1
BKK	2701	87-38		4510004-0360	SCR valve kit, 360 bar [5220 psi] (SB-1987-024)	1
	2702	87-38		4510004-0360	SCR valve kit, 360 bar [5220 psi] (SB-1987-024)	1
BKR	2701	87-38		4510004-0360	SCR valve kit, 360 bar [5220 psi] (SB-1987-024)	1
	2702	87-38		4510004-0325	SCR valve kit, 325 bar [4712 psi] (SB-1987-024)	1
BLL	2701	87-38		4510004-0415	SCR valve kit, 415 bar [6020 psi] (SB-1987-024)	1
	2702	87-38		4510004-0415	SCR valve kit, 415 bar [6020 psi] (SB-1987-024)	1
BMJ	2701	87-38		4510004-0140	SCR valve kit, 140 bar [2030 psi] (SB-1987-024)	1
	2702	87-38		4510004-0345	SCR valve kit, 345 bar [5000 psi] (SB-1987-024)	1
BMM	2701	87-38		4510004-0140	SCR valve kit, 140 bar [2030 psi] (SB-1987-024)	1
	2702	87-38		4510004-0140	SCR valve kit, 140 bar [2030 psi] (SB-1987-024)	1

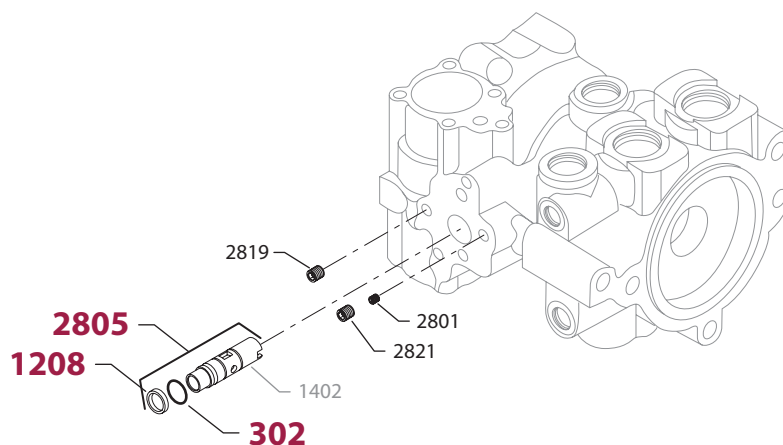


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numbers are recommended
parts to be stocked for servicing

CONTROL ORIFICE

Order Code	Item	Date Begin	Date End	Part Number	Part Name	Qty. per Model/Kit
AA	302	86-14		5000653	O-ring	1
	1208	86-14		9006150-0160	Back up ring	1
	1402	84-31	86-13	4800092-0003	Sleeve, .031"	1
	2801	86-14		4800155-0006	Orifice plug, .031"	1
	2805	86-14		4461342	Sleeve assembly, .031" (SB-1997-001)	1
Also replace control spool with p/n 4460468 if manufacture date is 86-14 thru 87-31.						
	2819	86-14		9005001-1200	Pipe plug	1
	2821	86-14		9005001-1200	Pipe plug	1
AB	302	86-14		5000653	O-ring	1
	1208	86-14		9006150-0160	Back up ring	1
	1402	84-31	86-13	4800092-0005	Sleeve, .036"	1
	2801	86-14		4800155-0006	Orifice plug, .031"	1
	2805	86-14		4461343	Sleeve assembly, .036" (SB-1997-001)	1
Also replace control spool with p/n 4460468 if manufacture date is 86-14 thru 87-31.						
	2819	86-14		9005001-1200	Pipe plug	1
	2821	86-14		9005001-1200	Pipe plug	1
AD	302	86-14		5000653	O-ring	1
	1208	86-14		9006150-0160	Back up ring	1
	1402	84-31	86-13	4800092-0002	Sleeve, .046"	1
	2801	86-14		4800155-0006	Orifice plug, .031"	1
	2805	86-14		4461341	Sleeve assembly, .046" (SB-1997-001)	1
Also replace control spool with p/n 4460468 if manufacture date is 86-14 thru 87-31.						
	2819	86-14		9005001-1200	Pipe plug	1
	2821	86-14		9005001-1200	Pipe plug	1
AF	302	88-33		5000653	O-ring	1
	1208	88-33		9006150-0160	Back up ring	1
	2801	88-33		4800155-0006	Orifice plug, .031"	1
	2805	88-33		4461340	Sleeve assembly, .250" (SB-1997-001)	1
	2819	88-33		9005001-1200	Pipe plug	1
	2821	88-33		9005001-1200	Pipe plug	1
BA	302	86-14		5000653	O-ring	1
	1208	86-14		9006150-0160	Back up ring	1
	1402	84-31	86-13	4800092-0003	Sleeve, .031"	1
	2801	86-14		4800155-0001	Orifice plug, .036"	1
	2805	86-14		4461342	Sleeve assembly, .031" (SB-1997-001)	1
Also replace control spool with p/n 4460468 if manufacture date is 86-14 thru 87-31.						
	2819	86-14		9005001-1200	Pipe plug	1
	2821	86-14		9005001-1200	Pipe plug	1

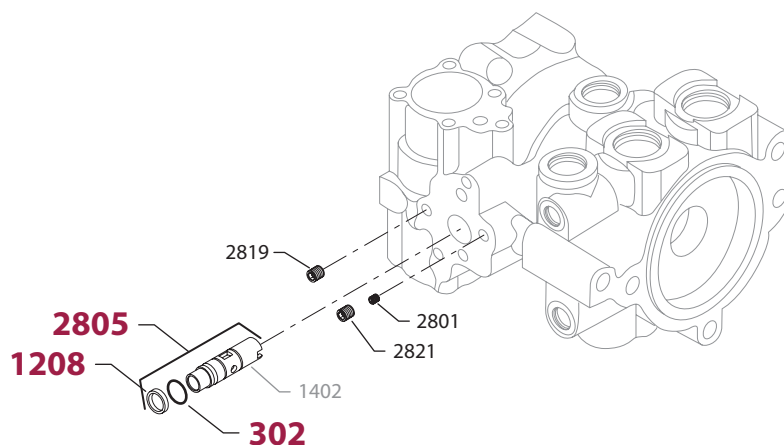


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Enlarged **bold** type item
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CONTROL ORIFICE

Order Code	Item	Date Begin	Date End	Part Number	Part Name	Qty. per Model/Kit
BB	302	86-14		5000653	O-ring	1
	1208	86-14		9006150-0160	Back up ring	1
	1402	84-31	86-13	4800092-0005	Sleeve, .036"	1
	2801	86-14		4800155-0001	Orifice plug, .036"	1
	2805	86-14		4461343	Sleeve assembly, .036" (SB-1997-001)	1
Also replace control spool with p/n 4460468 if manufacture date is 86-14 thru 87-31.						
	2819	86-14		9005001-1200	Pipe plug	1
	2821	86-14		9005001-1200	Pipe plug	1
BD	302	86-14		5000653	O-ring	1
	1208	86-14		9006150-0160	Back up ring	1
	1402	84-31	86-13	4800092-0002	Sleeve, .046"	1
	2801	86-14		4800155-0001	Orifice plug, .036"	1
	2805	86-14		4461341	Sleeve assembly, .046" (SB-1997-001)	1
Also replace control spool with p/n 4460468 if manufacture date is 86-14 thru 87-31.						
	2819	86-14		9005001-1200	Pipe plug	1
	2821	86-14		9005001-1200	Pipe plug	1
BF	302	86-14		5000653	O-ring	1
	1208	86-14		9006150-0160	Back up ring	1
	1402	84-31	86-13	4800092-0004	Sleeve, .250"	1
	2801	86-14		4800155-0001	Orifice plug, .036"	1
	2805	86-14		4461340	Sleeve assembly, .250" (SB-1997-001)	1
Also replace control spool with p/n 4460468 if manufacture date is 86-14 thru 87-31.						
	2819	86-14		9005001-1200	Pipe plug	1
	2821	86-14		9005001-1200	Pipe plug	1
BP	302	98-16		5000653	O-ring	1
	1208	98-16		9006150-0160	Back up ring	1
	2801	98-16		4800155-0001	Orifice plug, .036"	1
	2805	98-16		4461358	Sleeve assembly, .062"	1
	2819	98-16		9005001-1200	Pipe plug	1
	2821	98-16		9005001-1200	Pipe plug	1
CD	302	86-14		5000653	O-ring	1
	1208	86-14		9006150-0160	Back up ring	1
	1402	84-31	86-13	4800092-0002	Sleeve, .046"	1
	2801	86-14		4800155-0004	Orifice plug, .041"	1
	2805	86-14		4461341	Sleeve assembly, .046" (SB-1997-001)	1
Also replace control spool with p/n 4460468 if manufacture date is 86-14 thru 87-31.						
	2819	86-14		9005001-1200	Pipe plug	1
	2821	86-14		9005001-1200	Pipe plug	1

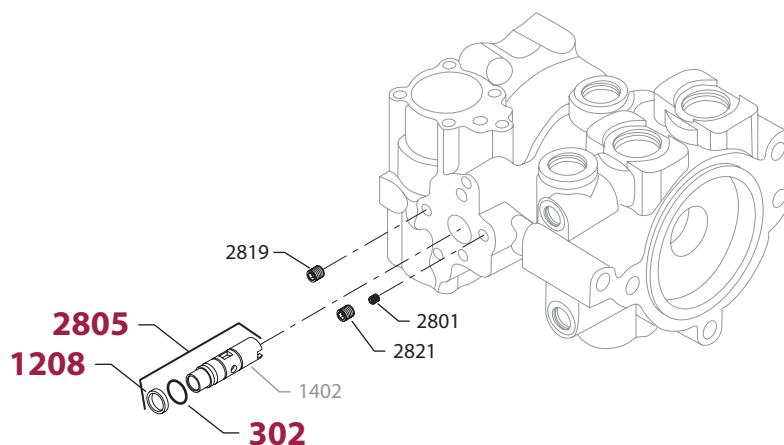


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Enlarged **bold** type item
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CONTROL ORIFICE

Order Code	Item	Date Begin	Date End	Part Number	Part Name	Qty. per Model/Kit
CF	302	86-14		5000653	O-ring	1
	1208	86-14		9006150-0160	Back up ring	1
	1402	84-31	86-13	4800092-0004	Sleeve, .250"	1
	2801	86-14		4800155-0004	Orifice plug, .041"	1
	2805	86-14		4461340	Sleeve assembly, .250" (SB-1997-001)	1
Also replace control spool with p/n 4460468 if manufacture date is 86-14 thru 87-31.						
	2819	86-14		9005001-1200	Pipe plug	1
	2821	86-14		9005001-1200	Pipe plug	1
DB	302	86-14		5000653	O-ring	1
	1208	86-14		9006150-0160	Back up ring	1
	1402	84-31	86-13	4800092-0005	Sleeve, .036"	1
	2801	86-14		4800155-0002	Orifice plug, .046"	1
	2805	86-14		4461343	Sleeve assembly, .036" (SB-1997-001)	1
Also replace control spool with p/n 4460468 if manufacture date is 86-14 thru 87-31.						
	2819	86-14		9005001-1200	Pipe plug	1
	2821	86-14		9005001-1200	Pipe plug	1
DD	302	86-14		5000653	O-ring	1
	1208	86-14		9006150-0160	Back up ring	1
	1402	84-31	86-13	4800092-0002	Sleeve, .046"	1
	2801	86-14		4800155-0002	Orifice plug, .046"	1
	2805	86-14		4461341	Sleeve assembly, .046" (SB-1997-001)	1
Also replace control spool with p/n 4460468 if manufacture date is 86-14 thru 87-31.						
	2819	86-14		9005001-1200	Pipe plug	1
	2821	86-14		9005001-1200	Pipe plug	1
DF	302	86-14		5000653	O-ring	1
	1208	86-14		9006150-0160	Back up ring	1
	1402	84-31	86-13	4800092-0004	Sleeve, .250"	1
	2801	86-14		4800155-0002	Orifice plug, .046"	1
	2805	86-14		4461340	Sleeve assembly, .250" (SB-1997-001)	1
Also replace control spool with p/n 4460468 if manufacture date is 86-14 thru 87-31.						
	2819	86-14		9005001-1200	Pipe plug	1
	2821	86-14		9005001-1200	Pipe plug	1
EA	302	86-14		5000653	O-ring	1
	1208	86-14		9006150-0160	Back up ring	1
	1402	84-31	86-13	4800092-0003	Sleeve, .031"	1
	2801	86-14		4800155-0003	Orifice plug, .054"	1
	2805	86-14		4461342	Sleeve assembly, .031" (SB-1997-001)	1
Also replace control spool with p/n 4460468 if manufacture date is 86-14 thru 87-31.						
	2819	86-14		9005001-1200	Pipe plug	1
	2821	86-14		9005001-1200	Pipe plug	1

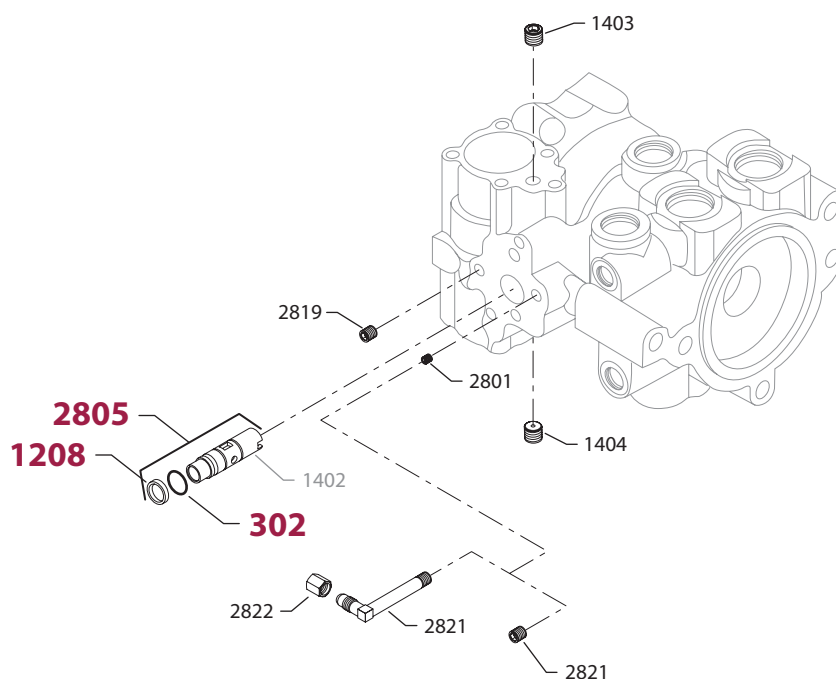


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CONTROL ORIFICE

Order Code	Item	Date Begin	Date End	Part Number	Part Name	Qty. per Model/Kit
EB	302	86-14		5000653	O-ring	1
	1208	86-14		9006150-0160	Back up ring	1
	1402	84-31	86-13	4800092-0005	Sleeve, .036"	1
	2801	86-14		4800155-0003	Orifice plug, .054"	1
	2805	86-14		4461343	Sleeve assembly, .036" (SB-1997-001)	1
Also replace control spool with p/n 4460468 if manufacture date is 86-14 thru 87-31.						
	2819	86-14		9005001-1200	Pipe plug	1
	2821	86-14		9005001-1200	Pipe plug	1
ED	302	86-14		5000653	O-ring	1
	1208	86-14		9006150-0160	Back up ring	1
	1402	84-31	86-13	4800092-0002	Sleeve, .046"	1
	2801	86-14		4800155-0003	Orifice plug, .054"	1
	2805	86-14		4461341	Sleeve assembly, .046" (SB-1997-001)	1
Also replace control spool with p/n 4460468 if manufacture date is 86-14 thru 87-31.						
	2819	86-14		9005001-1200	Pipe plug	1
	2821	86-14		9005001-1200	Pipe plug	1
EF	302	86-14		5000653	O-ring	1
	1208	86-14		9006150-0160	Back up ring	1
	1402	84-31	86-13	4800092-0004	Sleeve, .250"	1
	2801	86-14		4800155-0003	Orifice plug, .054"	1
	2805	86-14		4461340	Sleeve assembly, .250" (SB-1997-001)	1
Also replace control spool with p/n 4460468 if manufacture date is 86-14 thru 87-31.						
	2819	86-14		9005001-1200	Pipe plug	1
	2821	86-14		9005001-1200	Pipe plug	1
FB	302	86-14		5000653	O-ring	1
	1208	86-14		9006150-0160	Back up ring	1
	1402	84-31	86-13	4800092-0005	Sleeve, .036"	1
	2801	86-14		4800155-0007	Orifice plug, .146"	1
	2805	86-14		4461343	Sleeve assembly, .036" (SB-1997-001)	1
Also replace control spool with p/n 4460468 if manufacture date is 86-14 thru 87-31.						
	2819	86-14		9005001-1200	Pipe plug	1
	2821	86-14		9005001-1200	Pipe plug	1
FD	302	86-14		5000653	O-ring	1
	1208	86-14		9006150-0160	Back up ring	1
	1402	84-31	86-13	4800092-0003	Sleeve, .031"	1
	2801	86-14		4800155-0007	Orifice plug, .146"	1
	2805	86-14		4461341	Sleeve assembly, .046" (SB-1997-001)	1
Also replace control spool with p/n 4460468 if manufacture date is 86-14 thru 87-31.						
	2819	86-14		9005001-1200	Pipe plug	1
	2821	86-14		9005001-1200	Pipe plug	1

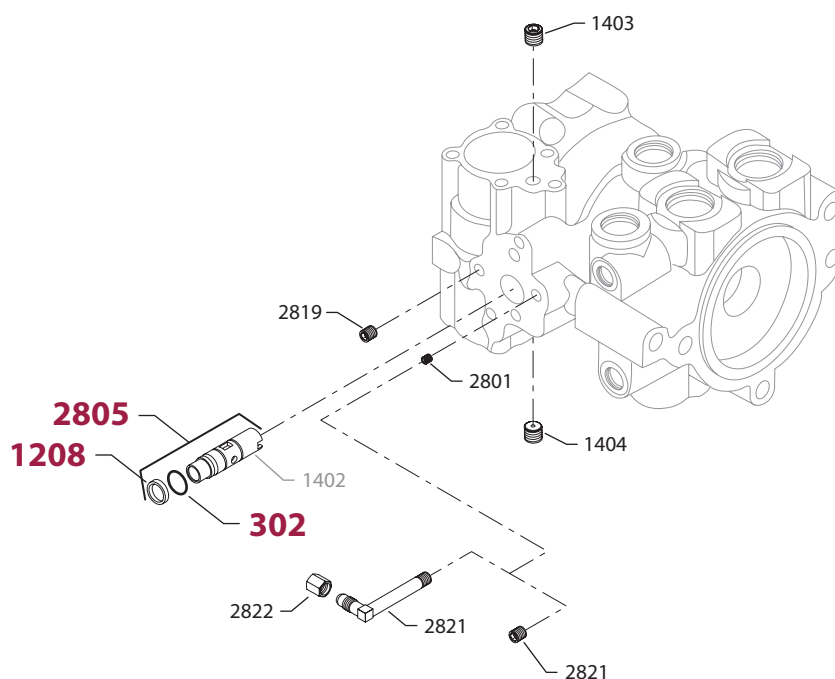


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Enlarged **bold** type item
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CONTROL ORIFICE

Order Code	Item	Date Begin	Date End	Part Number	Part Name	Qty. per Model/Kit
FF	302	86-14		5000653	O-ring	1
	1208	86-14		9006150-0160	Back up ring	1
	1402	84-31	86-13	4800092-0004	Sleeve, .250"	1
	2801	86-14		4800155-0007	Orifice plug, .146"	1
	2805	86-14		4461340	Sleeve assembly, .250" (SB-1997-001)	1
Also replace control spool with p/n 4460468 if manufacture date is 86-14 thru 87-31.						
	2819	86-14		9005001-1200	Pipe plug	1
	2821	86-14		9005001-1200	Pipe plug	1
GG	2801	84-31		4800155-0007	Orifice plug, .146"	1
	2803	84-31		4460333-0003	Orifice plug, .054"	1
	2804	84-31		4460333-0003	Orifice plug, .054"	1
HH	2801	84-31		4800155-0007	Orifice plug, .146"	1
	2803	84-31		4460333-0001	Orifice plug, .036"	1
	2804	84-31		4460333-0001	Orifice plug, .036"	1
JJ	2801	84-31		4800155-0007	Orifice plug, .146"	1
KF	302	00-18		5000653	O-ring	1
	1208	00-18		9006150-0160	Back up ring	1
	2801	00-18		9005001-0600	Pipe plug	1
	2805	00-18		4461340	Sleeve assembly, .250"	1
	2819	00-18		9005001-1200	Pipe plug	1
	2821	00-18		4461159	Elbow	1
	2822	00-18		9001800-4400	Cap	1
MF	302	03-18		5000653	O-ring	1
	1208	03-18		9006150-0160	Back up ring	1
	2801	03-18		9005001-0600	Pipe plug	1
	2805	03-18		4461340	Sleeve assembly, .250"	1
	2819	03-18		9005001-1200	Pipe plug	1
	2821	03-18		4461320	Elbow	1
	2822	03-18		9001800-4400	Cap	1
PF	302	87-32		5000653	O-ring	1
	1208	87-32		9006150-0160	Back up ring	1
	2801	87-32		4800155-0005	Orifice plug, .062"	1
	2805	87-32		4461340	Sleeve assembly, .250" (SB-1997-001)	1
	2819	87-32		9005001-1200	Pipe plug	1
	2821	87-32		9005001-1200	Pipe plug	1
RR	2801	84-31		4800155-0007	Orifice plug, .146"	1
	2803	84-31		4460333-0005	Orifice plug, .031"	1
	2804	84-31		4460333-0005	Orifice plug, .031"	1

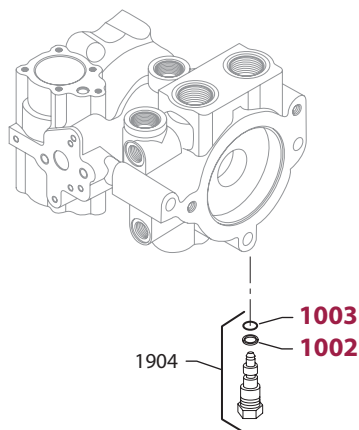


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parts to be stocked for servicing

CONTROL ORIFICE

Order Code	Item	Date Begin	Date End	Part Number	Part Name	Qty. per Model/Kit
SS	2801	84-31		4800155-0007	Orifice plug, .146"	1
	2803	84-31		4460333-0002	Orifice plug, .046"	1
	2804	84-31		4460333-0002	Orifice plug, .046"	1
WA	2801	03-29		4800155-0007	Orifice plug, .146"	1
	2803	03-29		4460333-0005	Orifice plug, .031"	1
	2804	03-29		4460333-0005	Orifice plug, .031"	1
	2819	03-29		8800242-0012	Orifice plug, .025"	1
	2821	03-29		8800242-0012	Orifice plug, .025"	1
WB	2801	03-29		4800155-0007	Orifice plug, .146"	1
	2803	03-29		4460333-0001	Orifice plug, .036"	1
	2804	03-29		4460333-0001	Orifice plug, .036"	1
	2821	03-29		8800242-0012	Orifice plug, .025"	1
ZC	302	94-28		5000653	O-ring	1
	1208	94-28		9006150-0160	Back up ring	1
	2801	94-28		4800155-0006	Orifice plug, .031"	1
	2803	94-28		4460333-0004	Orifice plug, .062	1
	2804	94-28		4460333-0004	Orifice plug, .062	1
	2805	94-28		4461342	Sleeve assembly, .031"	1
	2819	94-28		9005001-1200	Pipe plug	1
	2821	94-28		9005001-1200	Pipe plug	1
ZP	302	89-13		5000653	O-ring	1
	1208	89-13		9006150-0160	Back up ring	1
	2801	89-13		4800155-0001	Orifice plug, .036"	1
	2803	89-13		4460333-0006	Orifice plug, none	1
	2804	89-13		4460333-0006	Orifice plug, none	1
	2805	89-13		4461340	Sleeve assembly, .250"	1
	2819	89-13		9005001-1200	Pipe plug	1
	2821	89-13		9005001-1200	Pipe plug	1
ZR	302	06-45		5000653	O-ring	1
	1208	06-45		9006150-0160	Back up ring	1
	2801	06-45		4800155-0006	Orifice plug, .031"	1
	2803	06-45		4460333-0005	Orifice plug, .031"	1
	2804	06-45		4460333-0005	Orifice plug, .031"	1
	2805	06-45		4461341	Sleeve assembly, .046"	1
	2819	06-45		9005001-1200	Pipe plug	1
	2821	06-45		9005001-1200	Pipe plug	1

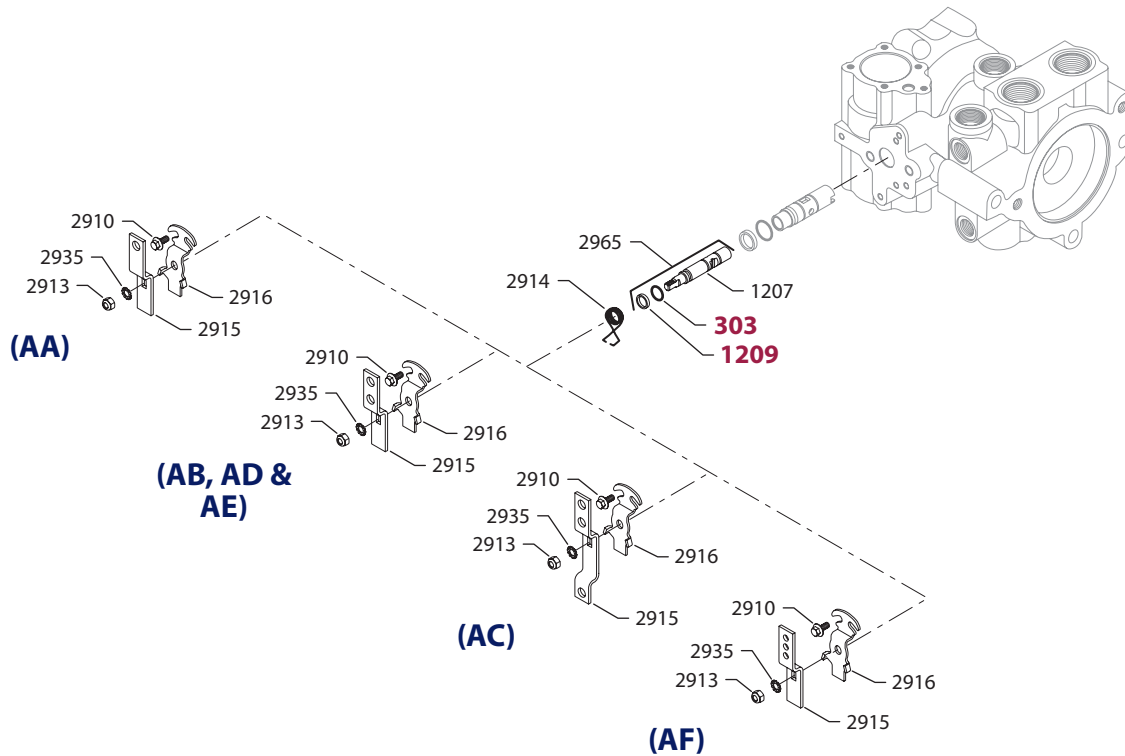


E100 236E

Enlarged **bold** type item
numbers are recommended
parts to be stocked for servicing

BYPASS VALVE

Order Code	Item	Date Begin	Date End	Part Number	Part Name	Qty. per Model/Kit
A	1904	84-31		4461332	Bypass valve assembly	1
	1002	84-31		9006110-0120	Back up ring	1
	1003	84-31		5000654	O-ring	1
B	1004	84-31		4461333	Bypass valve assembly, .031" orifice	1
	1002	84-31		9006110-0120	Back up ring	1
	1003	84-31		5000654	O-ring	1
C	1004	84-31		4461334	Bypass valve assembly, .040" orifice	1
	1002	84-31		9006110-0120	Back up ring	1
	1003	84-31		5000654	O-ring	1
X				none		



E100 237E

Enlarged **bold** type item
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parts to be stocked for servicing

COMMON CONTROL PARTS

Order Code	Item	Date Begin	Date End	Part Number	Part Name	Qty. per Model/Kit
	303	84-31		5000654	O-ring	1
	1209	84-31		9006150-0120	Back up ring	1
	2913	84-31		9003575-0102	Lock nut	1
	2935	84-31		9009660-3100	Toothlock washer	1

CONTROL

AA	2910	97-29		9007276-0123	Screw	1
	2914	97-29		4800315	Neutral return spring	1
	2915	97-29		4460952	Handle	1
	2916	97-29		4800084	Neutral return bracket	1
	2965	97-29		4461327	Spool assembly	1

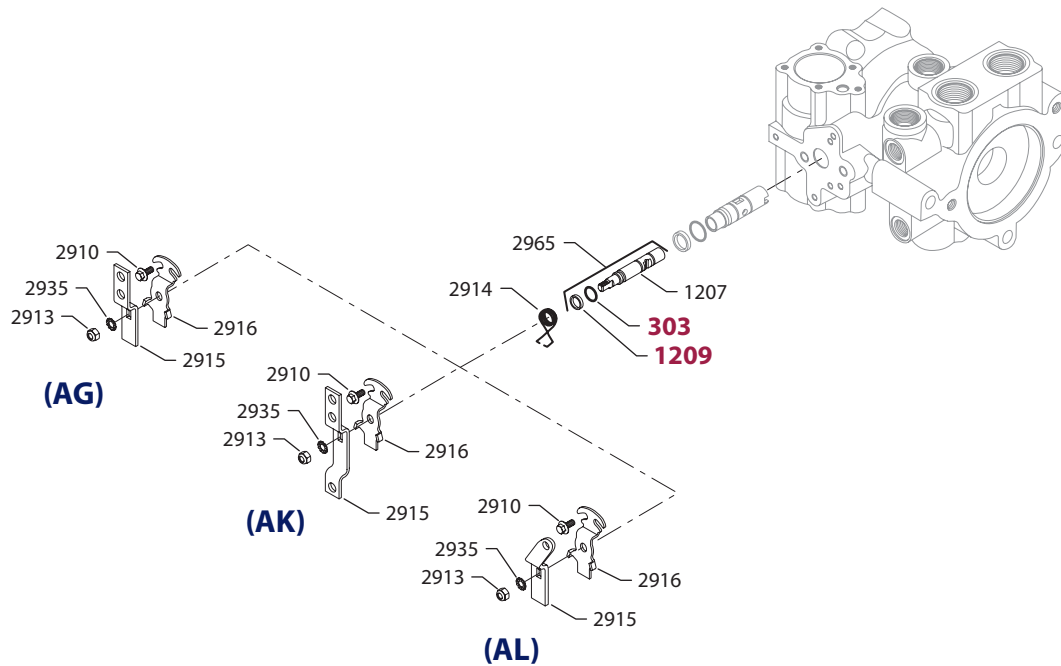
AB	1207	84-31	86-13	4460316	Spool	1
	2910	84-31		9007276-0123	Screw (SB-1987-020)	1
	2914	84-31		4800315	Neutral return spring	1
	2915	84-31		4800086-0002	Handle	1
	2916	84-31		4800084	Neutral return bracket	1
	2965	86-14		4461327	Spool assembly	1

AC	1207	84-31	86-13	4460316	Spool	1
	2910	84-31		9007276-0123	Screw (SB-1987-020)	1
	2914	84-31		4800315	Neutral return spring	1
	2915	84-31		4800153	Handle	1
	2916	84-31		4800084	Neutral return bracket	1
	2965	86-14		4461327	Spool assembly	1

AD	1207	84-31	86-13	4460316	Spool	1
	2910	84-31		9007276-0123	Screw (SB-1987-020)	1
	2914	84-31		4800315	Neutral return spring	1
	2915	84-31		4800086-0002	Handle	1
	2916	84-31		4800084	Neutral return bracket	1
	2965	86-14		4461327	Spool assembly	1

AE	1207	84-31	86-13	4460316	Spool	1
	2910	84-31		9007276-0123	Screw (SB-1987-020)	1
	2914	84-31		4800315	Neutral return spring	1
	2915	84-31		4800086-0002	Handle	1
	2916	84-31		4800084	Neutral return bracket	1
	2965	86-14		4461327	Spool assembly	1

AF	1207	84-31	86-13	4460316	Spool	1
	2910	84-31	03-07	9007276-0123	Screw (SB-1987-020)	1
	2914	84-31	03-07	4800315	Neutral return spring	1
	2915	84-31	03-07	4800137	Handle	1
	2916	84-31	03-07	4800084	Neutral return bracket	1
	2965	86-14	03-07	4461331	Spool assembly	1



E100 209E

Enlarged **bold** type item
numbers are recommended
parts to be stocked for servicing

COMMON CONTROL PARTS

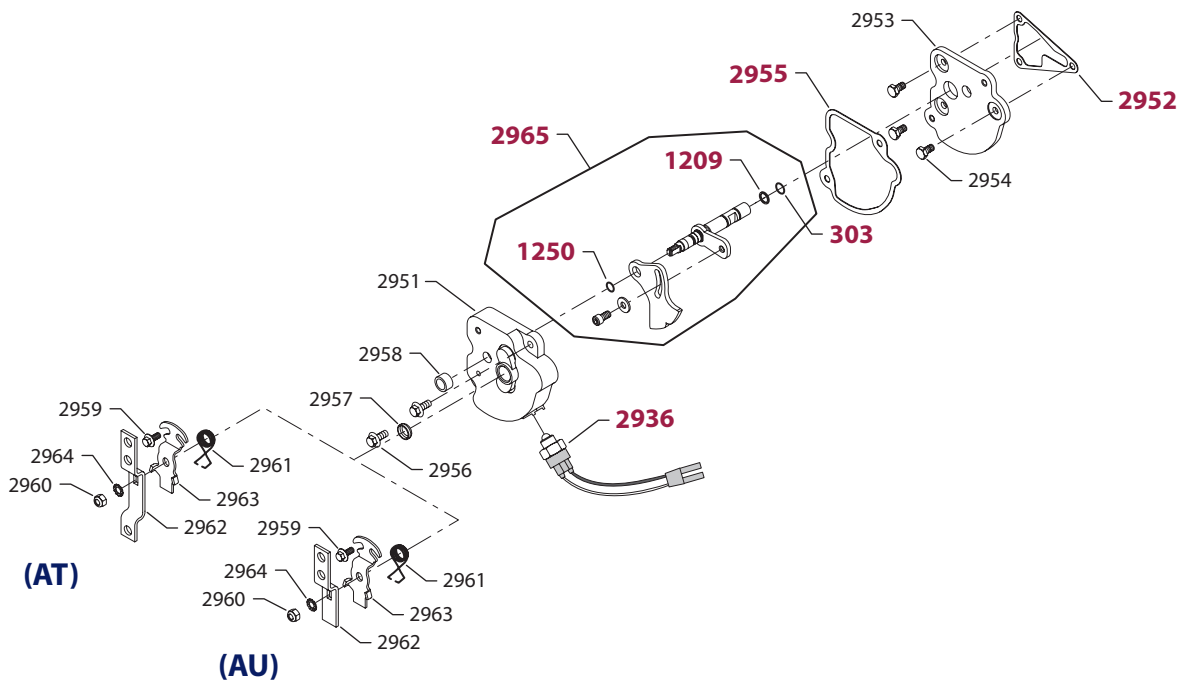
Order Code	Item	Date Begin	Date End	Part Number	Part Name	Qty. per Model/Kit
	303	84-31		5000654	O-ring	1
	1209	84-31		9006150-0120	Back up ring	1
	2913	84-31		9003575-0102	Lock nut	1
	2935	84-31		9009660-3100	Toothlock washer	1

CONTROL

AG	1207	84-31	86-13	4460316	Spool	1
	2910	84-31	03-07	9007276-0123	Screw (SB-1987-020)	1
	2914	84-31	03-07	4800315	Neutral return spring	1
	2915	84-31	03-07	4800086-0002	Handle	1
	2916	84-31	03-07	4800089	Neutral return bracket	1
	2965	84-31	03-07	4461327	Spool assembly	1

AK	2910	89-02		9007276-0123	Screw	1
	2914	89-02		4800315	Neutral return spring	1
	2915	89-02		4800153	Handle	1
	2916	89-02		4800084	Neutral return bracket	1
	2965	89-02		4461331	Spool assembly	1

AL	2910	89-39	03-08	9007276-0123	Screw	1
	2914	89-39	03-08	4800315	Neutral return spring	1
	2915	89-39	03-08	4800184	Handle	1
	2916	89-39	03-08	4800084	Neutral return bracket	1
	2965	89-39	03-08	4461331	Spool assembly	1

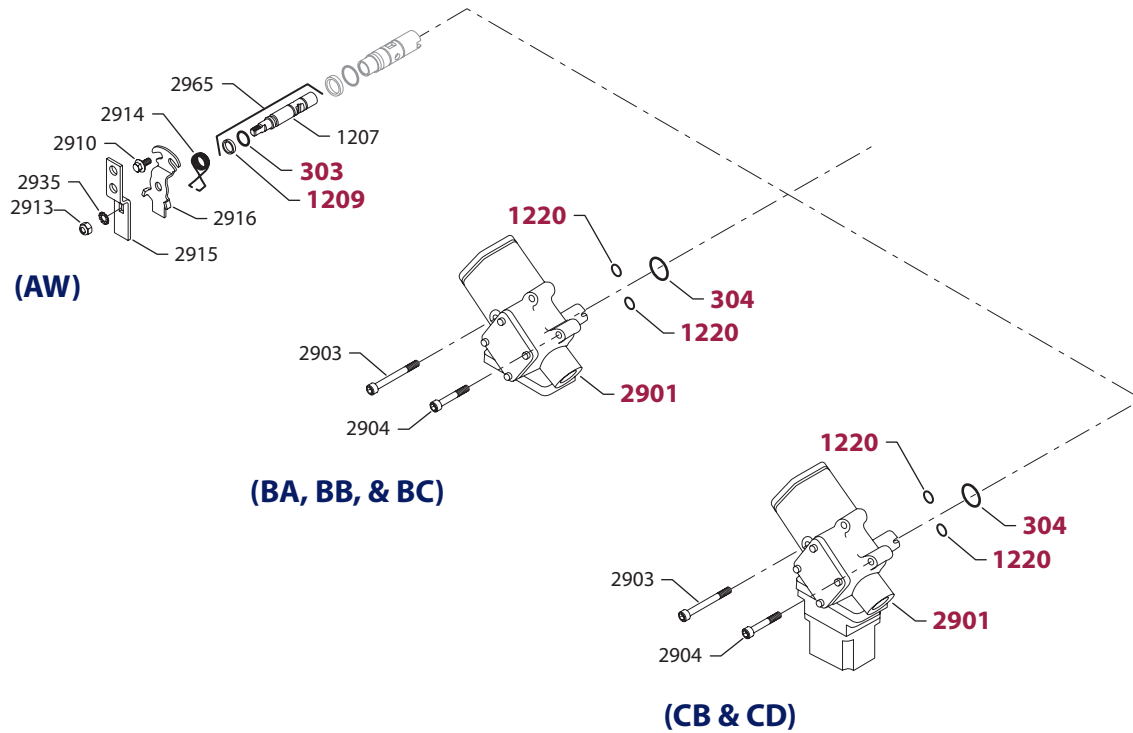


E100 210E

Enlarged **bold** type item
numbers are recommended
parts to be stocked for servicing

CONTROL

Order Code	Item	Date Begin	Date End	Part Number	Part Name	Qty. per Model/Kit
AT	303	95-38		5000654	O-ring	1
	1209	95-38		9006150-0120	Back up ring	1
	1250	95-38		9004100-0110	O-ring	1
	2936	95-38		4700033	Neutral start switch	1
	2951	95-38		4461049	Neutral start switch cover	1
	2952	95-38		4460789	Neutral start switch mounting plate gasket	1
	2953	95-38		4461051	Neutral start switch plate assembly	1
	2954	95-38		5000385	Screw	3
	2955	95-38		4461053	Neutral start switch cover gasket	1
	2956	95-38		9007276-0123	Screw	2
	2957	95-38		9005215-6200	Expansion plug	1
	2958	95-38		4460817	Control spring spacer	1
	2959	95-38		9007276-0123	Screw	1
	2960	95-38		9003575-0102	Nut	1
	2961	95-38		4800315	Neutral return spring	1
	2962	95-38		4800153	Control handle	1
	2963	95-38		4800084	Neutral return bracket	1
	2964	95-38		9009660-3100	Toothlock washer	1
	2965	95-38		4461305	Spool assembly	1
AU	303	97-24		5000654	O-ring	1
	1209	97-24		9006150-0120	Back up ring	1
	1250	97-24		9004100-0110	O-ring	1
	2936	97-24		503545	Neutral start switch	1
	2951	97-24		4461049	Neutral start switch cover	1
	2952	97-24		4460789	Neutral start switch mounting plate gasket	1
	2953	97-24		4461051	Neutral start switch plate assembly	1
	2954	97-24		5000385	Screw	3
	2955	97-24		4461053	Neutral start switch cover gasket	1
	2956	97-24		9007276-0123	Screw	2
	2957	97-24		9005215-6200	Expansion plug	1
	2958	97-24		4460817	Control spring spacer	1
	2959	97-24		9007276-0123	Screw	1
	2960	97-24		9003575-0102	Nut	1
	2961	97-24		4800315	Neutral return spring	1
	2962	97-24		4800086-0002	Control handle	1
	2963	97-24		4800084	Neutral return bracket	1
	2964	97-24		9009660-3100	Toothlock washer	1
	2965	97-24		4461305	Spool assembly	1

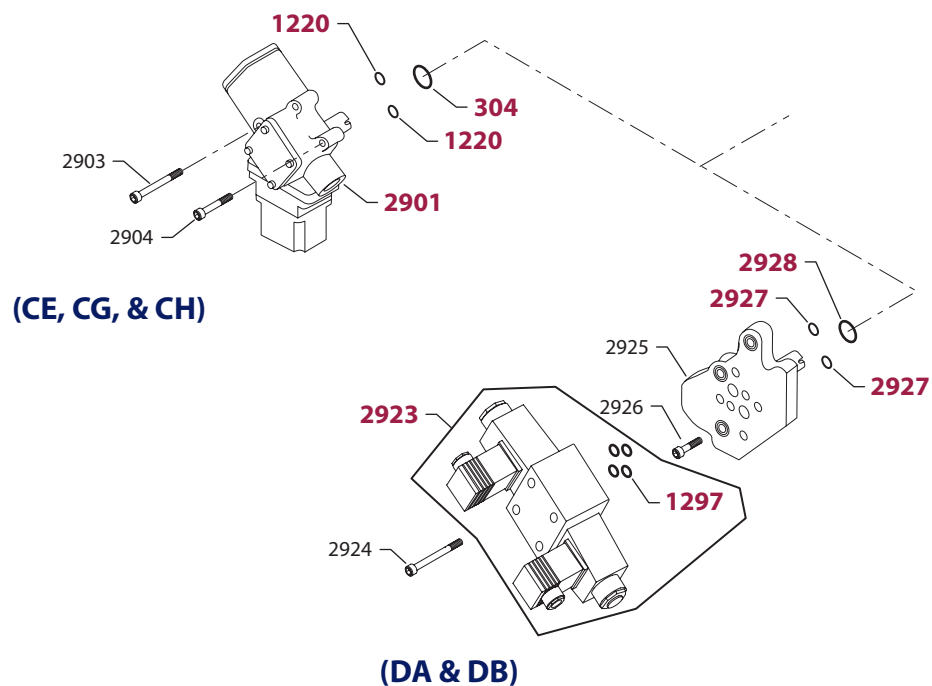


E100 221E

Enlarged **bold** type item
numbers are recommended
parts to be stocked for servicing

CONTROL

Order Code	Item	Date Begin	Date End	Part Number	Part Name	Qty. per Model/Kit
AW	303	06-02		5000654	O-ring	1
	1209	06-02		9006150-0120	Back up ring	1
	2910	06-02		9007276-0123	Screw	1
	2913	06-02		9003575-0102	Lock nut	1
	2914	06-02		4800315	Neutral return spring	1
	2915	06-02		4800086-0002	Handle	1
	2916	06-02		4800084	Neutral return bracket	1
	2935	06-02		9009660-3100	Toothlock washer	1
	2965	06-02		4461331	Spool assembly	1
BA	304	98-33		9004101-1190	O-ring (SB-1998-052)	1
	304	85-37	98-32	9004100-0210	O-ring	1
	1220	85-37		9004101-0140	O-ring	2
	2901	85-37		MCV108C3011	HDC (SB-1998-052 & SB-1997-001)	1
	2903	85-37		9007300-2532	Screw	2
	2904	85-37		9007300-2512	Screw	2
BB	304	98-33		9004101-1190	O-ring (SB-1998-052)	1
	304	90-17	98-32	9004100-0210	O-ring	1
	1220	90-17		9004101-0140	O-ring	2
	2901	90-17		MCV108C3014	HDC (SB-1998-052 & SB-1997-001)	1
	2903	90-17		9007300-2532	Screw	2
	2904	90-17		9007300-2512	Screw	2
BC	304	98-33		9004101-1190	O-ring (SB-1998-052)	1
	304	90-17	98-32	9004100-0210	O-ring	1
	1220	90-17		9004101-0140	O-ring	2
	2901	90-17		MCV108C3015	HDC (SB-1998-052 & SB-1997-001)	1
	2903	90-17		9007300-2532	Screw	2
	2904	90-17		9007300-2512	Screw	2
CA	Replaced by 'CB' (SB-1989-01)					
CB	304	98-31		9004101-1190	O-ring (SB-1998-052)	1
	304	85-37	98-30	9004100-0210	O-ring	1
	1220	85-37		9004101-0140	O-ring	2
	2901	85-37		MCV105C3022	EDC (SB-1998-052, SB-1997-001, & SB-1989-001)	1
	2903	85-37		9007300-2532	Screw	2
	2904	85-37		9007300-2512	Screw	2
CC	Replaced by 'CD' (SB-1989-01)					
CD	304	98-31		9004101-1190	O-ring (SB-1998-052)	1
	304	85-37	98-30	9004100-0210	O-ring	1
	1220	85-37		9004101-0140	O-ring	2
	2901	85-37		MCV105C3026	EDC (SB-1998-052, SB-1997-001, & SB-1989-001)	1
	2903	85-37		9007300-2532	Screw	2
	2904	85-37		9007300-2512	Screw	2

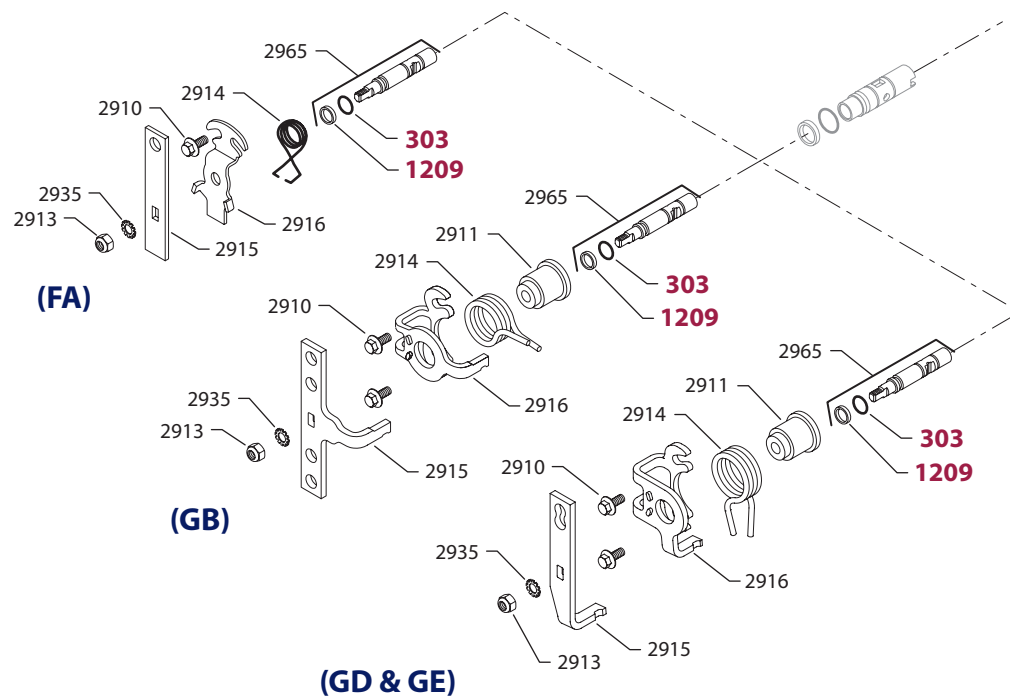


E100 215E

Enlarged **bold** type item
numbers are recommended
parts to be stocked for servicing

CONTROL

Order Code	Item	Date Begin	Date End	Part Number	Part Name	Qty. per Model/Kit
CE	304	98-31		9004101-1190	O-ring (SB-1998-052)	1
	304	85-37	98-30	9004100-0210	O-ring	1
	1220	85-37		9004101-0140	O-ring	2
	2901	85-37		MCV105C3023	EDC (SB-1998-052, SB-1997-001, & SB-1989-001)	1
	2903	85-37		9007300-2532	Screw	2
	2904	85-37		9007300-2512	Screw	2
CG	304	98-31		9004101-1190	O-ring (SB-1998-052)	1
	304	85-37	98-30	9004100-0210	O-ring	1
	1220	85-37		9004101-0140	O-ring	2
	2901	85-37		MCV105C3027	EDC (SB-1998-052, SB-1997-001, & SB-1989-001)	1
	2903	85-37		9007300-2532	Screw	2
	2904	85-37		9007300-2512	Screw	2
CH	304	98-31		9004101-1190	O-ring (SB-1998-052)	1
	304	94-23	98-30	9004100-0210	O-ring	1
	1220	94-23		9004101-0140	O-ring	2
	2901	94-23		MCV105C3046	EDC (SB-1998-052, SB-1997-001, & SB-1989-001)	1
	2903	94-23		9007300-2532	Screw	2
	2904	94-23		9007300-2512	Screw	2
DA	1297	91-07		9004104-0120	O-ring	4
	2923	91-07		9700873	Solenoid valve, 12 volt	1
	2924	91-07		9007315-0507	Screw	4
	2925	91-07		4460590	Manifold assembly	1
	2926	91-07		9007300-2512	Screw	3
	2927	91-07		9004101-0140	O-ring	2
	2928	91-07		9004100-0200	O-ring	1
DB	1297	91-07		9004104-0120	O-ring	4
	2923	91-07		9700918	Solenoid valve, 24 volt	1
	2924	91-07		9007315-0507	Screw	4
	2925	91-07		4460590	Manifold assembly	1
	2926	91-07		9007300-2512	Screw	3
	2927	91-07		9004101-0140	O-ring	2
	2928	91-07		9004100-0200	O-ring	1

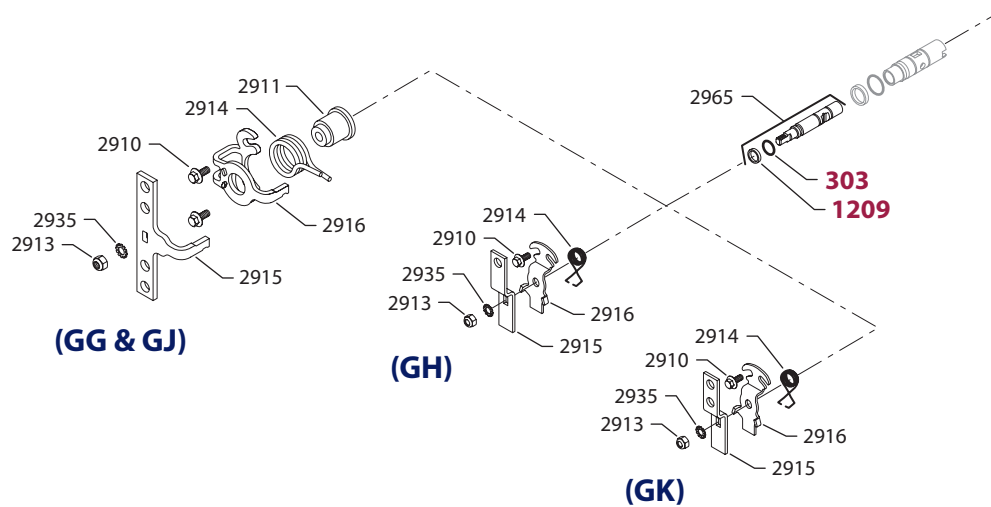


E101 754E

Enlarged **bold** type item
numbers are recommended
parts to be stocked for servicing

CONTROL

Order Code	Item	Date Begin	Date End	Part Number	Part Name	Qty. per Model/Kit
FA	303	02-46		5000654	O-ring	1
	1209	02-46		9006150-0120	Back up ring	1
	2910	02-46		9007276-0123	Screw (SB-1987-020)	2
	2913	02-46		9003575-0102	Nut	1
	2914	02-46		4800315	Neutral return spring	1
	2915	02-46		4461272	Handle	1
	2916	02-46		4800084	Neutral return bracket	1
	2935	02-46		9009660-3100	Toothlock washer	1
	2965	02-46		4461331	Spool assembly	1
GB	303	02-46		5000654	O-ring	1
	1209	02-46		9006150-0120	Back up ring	1
	2910	97-43		9007276-0123	Screw (SB-1987-020)	2
	2911	97-43		4461234	Spring guide	1
	2913	97-43		9003575-0102	Nut	1
	2914	97-43		4461061	Neutral return spring	1
	2915	97-43		4461065	Handle	1
	2916	97-43		4461187	Neutral return bracket	1
	2935	97-43		9009660-3100	Toothlock washer	1
	2965	97-43		4461329	Spool assembly	1
GD	303	02-46		5000654	O-ring	1
	1209	02-46		9006150-0120	Back up ring	2
	2910	98-24		9007276-0123	Screw (SB-1987-020)	1
	2911	98-24		4461234	Spring guide	1
	2913	98-24		9003575-0102	Nut	1
	2914	98-24		4461213	Neutral return spring	1
	2915	98-24		4461286	Handle	1
	2916	98-24		4461150	Neutral return bracket	1
	2935	98-24		9009660-3100	Toothlock washer	1
	2965	98-24		4461329	Spool assembly	1
GE	303	02-46		5000654	O-ring	1
	1209	02-46		9006150-0120	Back up ring	1
	2910	97-43		9007276-0123	Screw (SB-1987-020)	2
	2911	97-43		4461234	Spring guide	1
	2913	97-43		9003575-0102	Nut	1
	2914	97-43		4461213	Neutral return spring	1
	2915	97-43		4461286	Handle	1
	2916	97-43		4461150	Neutral return bracket	1
	2935	97-43		9009660-3100	Toothlock washer	1
	2965	97-43		4461328	Spool assembly	1



E101 755E

Enlarged **bold** type item
numbers are recommended
parts to be stocked for servicing

CONTROL

Order Code	Item	Date Begin	Date End	Part Number	Part Name	Qty. per Model/Kit
GG	303	02-49		5000654	O-ring	1
	1209	02-49		9006150-0120	Back up ring	1
	2910	02-49		9007276-0123	Screw	2
	2911	02-49		4461234	Spring guide	1
	2913	02-49		9003575-0102	Nut	1
	2914	02-49		4461060	Neutral return spring	1
	2915	02-49		4461065	Handle	1
	2916	02-49		4461187	Neutral return bracket	1
	2935	02-49		9009660-3100	Toothlock washer	1
	2965	02-49		4461329	Spool assembly	1

GH	303	00-28		5000654	O-ring	1
	1209	00-28		9006150-0120	Back up ring	1
	2910	00-28		9007276-0123	Screw	1
	2913	00-28		9003575-0102	Nut	1
	2914	00-28		4800315	Neutral return spring	1
	2915	00-28		4460952	Handle	1
	2916	00-28		4800084	Neutral return bracket	1
	2935	00-28		9009660-3100	Toothlock washer	1
	2965	00-28		4461331	Spool assembly	1

GJ	303	00-28		5000654	O-ring	1
	1209	00-28		9006150-0120	Back up ring	1
	2910	00-28		9007276-0123	Screw	2
	2911	00-28		4461234	Spring guide	1
	2913	00-28		9003575-0102	Nut	1
	2914	00-28		4461060	Neutral return spring	1
	2915	00-28		4461065	Handle	1
	2916	00-28		4461187	Neutral return bracket	1
	2935	00-28		9009660-3100	Toothlock washer	1
	2965	00-28		4461328	Spool assembly	1

GK	303	00-46		5000654	O-ring	1
	1209	00-46		9006150-0120	Back up ring	1
	2910	00-46		9007276-0123	Screw	2
	2913	00-46		9003575-0102	Nut	1
	2914	00-46		4800315	Neutral return spring	1
	2915	00-46		4800086-0002	Handle	1
	2916	00-46		4800084	Neutral return bracket	1
	2935	00-46		9009660-3100	Toothlock washer	1
	2965	00-46		4461357	Spool assembly	1

CONTROL HANDLE POSITION

A	Not applicable (no control handle)
B	Both up and down
D	Down
U	Up

OVERHAUL SEAL KIT

Order Code	Item	Date Begin	Date End	Part Number	Part Name	Qty. per Model/Kit
		93-39		4510018	Overhaul seal kit, M46 PT	1
	103	86-14		9004201-6200	O-ring	1
	166A	84-31		9004201-7500	O-ring	4
	168	88-05		4460648	Bearing ring (SB-1988-002 & SB-1991-009)	4
	301	84-31		9008000-0121	Lip seal	1
	302	86-14		5000653	O-ring	2
	303	84-31		5000654	O-ring	2
	304	98-33		9004101-1190	O-ring (SB-1998-052)	2
	304	94-23	98-30	9004100-0210	O-ring	2
	805	91-31		4460655	Filtration adaptor seal, suction (SB-1990-017)	1
	805	91-36		4460656	Filtration adaptor seal, remote (SB-1990-017)	1
	805	86-14	91-30	9004101-0170	O-ring	3
	916	88-01		8700067	Piston ring	2
	918	88-01		9004100-1310	O-ring	4
	922	88-01		8700067	Piston ring	2
	935	84-31		4461311	Servo cover gasket (SB-2002-037)	1
	936	84-31		4461311	Servo cover gasket	1
	1002	84-31		9006110-0120	Back up ring	2
	1003	84-31		5000654	O-ring	2
	1208	86-14		9006150-0160	Back up ring	2
	1209	84-31		9006150-0120	Back up ring	2
	1220	85-37		9004101-0140	O-ring	4
	1228	91-07		9004100-0200	O-ring	1
	1297	91-07		9004104-0120	O-ring	8
	1835	84-31		4461311	Servo cover gasket (SB-2002-037)	1
	1836	84-31		4461311	Servo cover gasket	1
	2115	84-31		9003575-0083	Seal nut	2
	2137	84-31		4460564	Front cover gasket	2
	2143	84-31		9004101-1160	O-ring	2
	2150	84-31		9004375-0022	O-ring	1
	2407	84-31		9004101-2240	O-ring	1
	2408	87-34		9004101-2380	O-ring	1
	2503	87-07		9004100-0440	O-ring (SB-1989-021)	1
	2618	96-28	08-04	5000373	O-ring	1
	2928	91-07		9004100-0200	O-ring	1

PRODUCTS AFFECTED

M46 variable pumps

SUBJECT

Parts identification

DESCRIPTION

The M46 single and tandem Variable displacement tandem pump Service Parts Manuals, 2-40608 and 2-40610, clearly define which part number cylinder block, valve plate, and housing belong to specific vintage pumps.

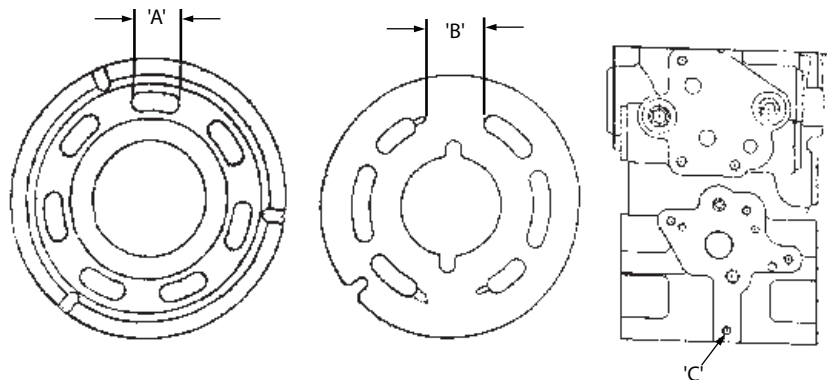
The purpose of this bulletin is to assist in easy identification of M46 cylinder blocks, valve plates, and housings, should they get "mixed up" in your stock.

IMPORTANT: For satisfactory pump efficiency, you must use the correct vintage housing, plate, and cylinder block within a given pump.

HOUSINGS: There are (2) vintages of housings, the current, which will accept EDC/HDC, and MDC, and the old version (prior to 86-14), which will accept only one or the other control. An easy housing identifier is that the current design housing has threaded hole "C", and the pre 86-14 has no hole in that area.

CYLINDER BLOCKS: There are (2) vintages of pump cylinder blocks. On the current, P/N 4460288, "A" dimension is approximately 1" and on the older P/N 4460174, "A" dimension is approximately .7"

VALVE PLATES: There are (3) vintages of pump valve plates. "B" dimension is approximately .55" on P/N 4460108 and P/N 4460109, .9" on P/N 4460318 and P/N 4460319, and 1.01" on P/N 4460417 and P/N 4460418.



MODELS AFFECTED

All M46 single and tandem pumps.

SERIAL NUMBERS

All M46 single and tandem pumps.

PART NUMBERS AFFECTED

See applicable Parts Manual

PARTS DISPOSITION

■ Not applicable

PRODUCTS AFFECTED

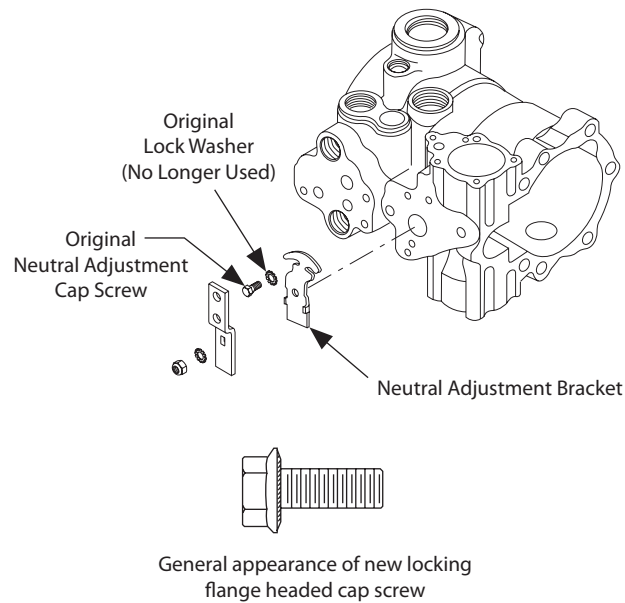
M46 Variable displacement tandem pumps and motors with mechanical displacement control.

SUBJECT

Improved neutral adjustment cap screw.

DESCRIPTION

As a product improvement, Sauer-Danfoss is changing the neutral adjustment cap screw on all M46 mechanical displacement control pumps and motors from a standard cap screw and star lockwasher, to a locking flangeheaded cap screw. There is no washer used with the new cap screw.



MODELS AFFECTED

All M46-2xxx single pumps, M91-46xxx tandem pumps, and M46-4xxx variable motors with mechanical displacement controls.

SERIAL NUMBERS

New hardware incorporated at serial number A-87-28-xxxxx.

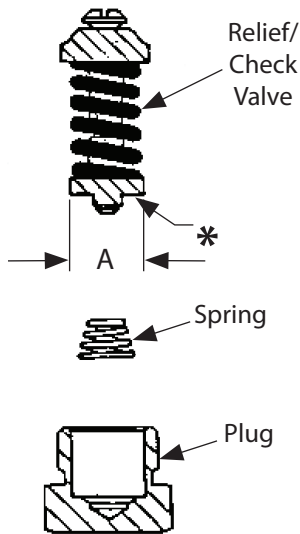
PART NUMBERS AFFECTED

New cap screw part number is 9007276-0123.

PARTS DISPOSITION

■ Use new parts at first repair

PRODUCTS AFFECTED	M46 Variable displacement tandem pumps and model 90-7001 transmission
SUBJECT	Notice of high pressure relief/check valve change.
DESCRIPTION	Service Bulletin 1987-004, dated 6/15/87, announced an upcoming high pressure relief/check valve design change to M46 and 90-7001 transmissions. This change, which takes affect October 1987, provides a higher performance and more cost effective design. The new design part will affect the housing and relief/check valve on M46 pumps and the center section and relief/check valve on the Model 90-7001 transmission. The new and current design relief valve plug, relief valve, housing, and center section will not be interchangeable. Sauer-Danfoss will no longer produce the current design M46 housings and Model 90-7001 center section. Service part requirements for the housing or center section on units built before this change will also require the purchase of the new design relief/check valve, however, experience has shown housings or center sections are rarely needed as service parts. Sundstrand-Sauer will continue to offer both the current and new design relief/check valve as service parts. New design valves will be sold in kit form only. The kit includes a relief valve plug, spring, and relief/check valve.
MODELS AFFECTED	All M46 single and tandem pumps, and model 90-7001 transmission.
SERIAL NUMBERS	On M46, new style relief/check valves will be incorporated with serial number A-87-40-xxxxx. On 90-7001, new style relief/check valves will be incorporated with serial number A-87-39-xxxxx.
PART NUMBERS AFFECTED	see attachment
PARTS DISPOSITION	■ Non-interchangeable



ATTACHMENT "A"

Part Identification Information

Should different vintage parts get mixed, below are some identifiers.

"A" diameter on the new style relief/check valves .55".

"A" diameter on the old style M46 relief/check is .64".

"A" diameter on the old style 90-7001 relief/check valve is .467"

"B" diameter on the new style relief/check valve plug is .554".

"B" diameter on the old style M46 relief/check valve plug is .65".

"B" diameter on old style 90-7001 relief/check valve plug is .475".

*The pressure setting of the relief valve, in bar, will be marked on this surface.

M46

Current Check/Relief Valve	Description	New Style Check/Relief Valve
4510001-0000	Kit-charge Check Only	4510004-0000
4510001-0050	Kit-175 Bar Relief/check	4510004-0175
4510001-0051	Kit-210 Bar Relief/Check	4510004-0210
4510001-0052	Kit-230 Bar Relief/Check	4510004-0230
4510001-0053	Kit-250 Bar Relief/Check	4510004-0250
4510001-0054	Kit-280 Bar Relief/Check	4510004-0280
4510001-0055	Kit-300 Bar Relief/Check	4510004-0300
4510001-0056	Kit 345 Bar Relief/Check	4510004-0345
4510001-0057	Kit-415 Bar Relief/Check	4510004-0415
4510001-0058	Kit-190 Bar Relief/Check	4510004-0190
4510001-0062	Kit-360 Bar Relief/Check	4510004-0360

P/N of new style M46 single housing is 4460440.

P/N of new style M46 tandem front housing is 4460438.

P/N of new style M46 tandem rear housing is 4460439.

PRODUCTS AFFECTED

All M46 single and tandem pumps.

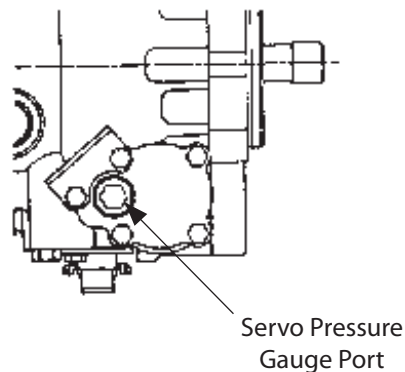
SUBJECT

Notice of gauge port change.

DESCRIPTION

Effective in mid-October, the servo pressure gauge ports on M46 servo covers was changed from 7/16"-20 straight thread O-ring to 9/16-18 straight thread O-ring.

This change is an effort for Sauer-Danfoss to have consistency in gauge port sizing.



MODELS AFFECTED

All M46-2xxx single pumps, M91-46xxx tandem pumps.

SERIAL NUMBERS

This change became effective at serial number A-87-42-xxxxx.

PART NUMBERS AFFECTED

Servo cover 4460388-xxxx is replaced by 4460455-xxxx.

4460388-xxxx servo covers are no longer available as service parts,

PARTS DISPOSITION

■ Use new parts at first repair

PRODUCTS AFFECTED

M46 pumps and variable motors

SUBJECT

Servo piston improvements

DESCRIPTION

Two product improvements have taken place in the M46 product line.

The first improvement involves a change in the servo backlash adjustment from one self locking nut to a stronger double nut arrangement. A .335" wide nut takes the place of the self locking nut, and is adjusted to set zero backlash as in the previous design. After backlash is set, a .225" wide nut is torqued to 18-27 ft. lbs. against the thicker nut to act as a lock nut. (Figure 2 and 3)

The second improvement involves the addition of a nonmetallic bearing ring to enhance the bearing characteristics of the housing bore/servo piston interface. The rings are of a split design and simply fit into grooves located inside the current grooves for the servo piston seal rings. Before installing the bearing rings to the servo piston, the bearing rings must be preformed. Simply curl the bearing ring around your finger until its O.D. is approximately 1", and let stand for approximately (5) minutes. To assemble, install the (2) bearing rings into the bearing ring grooves, (2) O-rings into the piston ring grooves, and (1) of the (2) piston rings over its O-ring. Do not install the piston ring closest to the neutral adjustment screw (Figure 3). Spread a light film of oil on the seal and bearing ring. Next slide the servo piston into the housing bore, adjustment screw first, until the adjustment screw end piston ring groove is just exposed. Then install the second piston ring and oil and slide the piston into position in the housing. (Figure 4).

MODELS AFFECTED

All M46 pumps and variable motors.

SERIAL NUMBERS

Double nut backlash was incorporated at serial number 87-41-xxxxx.
Bearing ring was incorporated at serial number 88-05-xxxxx.

**PART NUMBERS
AFFECTED**

.335" nut is p/n 9003535-3700
.225" nut is p/n 9003561-3700
Bearing ring is p/n 4460477
Servo piston with groove for bearing ring is 460474

PARTS DISPOSITION

■ Interchangeable - 4460474 servo piston with 4460477 ring will fit all vintages of M46 housings. See SB-1987-005 for installation instructions for older housing without a lead-in chamfer.

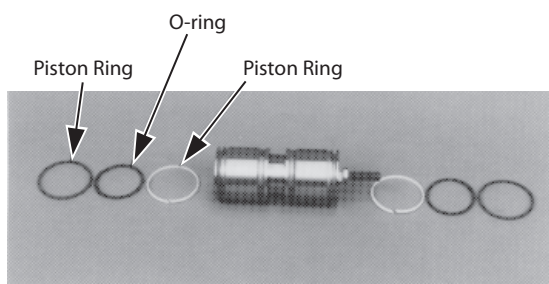


Fig. 1
Servo piston assembly with rings

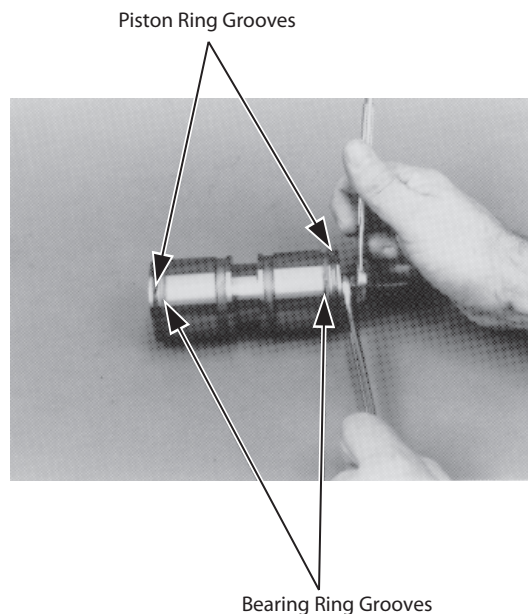


Fig. 2
Bearing ring grooves
Tightening the backlash locknut

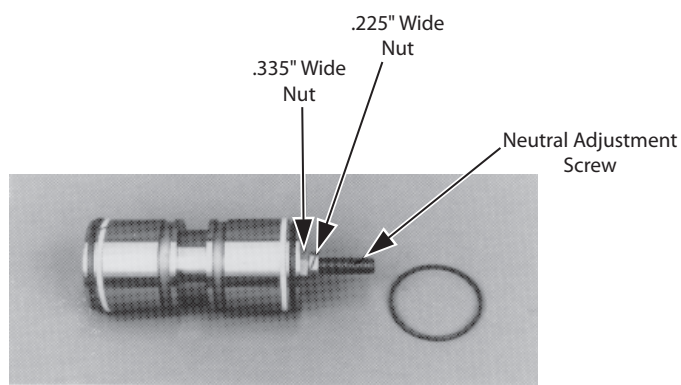


Fig. 3
Servo piston assembly with all
rings installed except the closest
to the neutral adjustment screw.

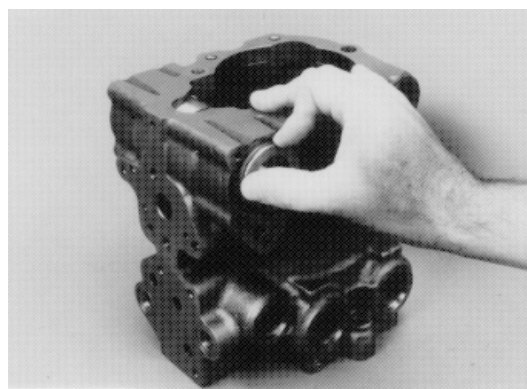


Fig. 4
Installing second piston ring

PRODUCTS AFFECTED

Series 20, series 30 and M46 pumps

SUBJECT

Change to silicone filled pilot on electrical displacement controls.

DESCRIPTION

During late 1988, all series 20, series 30, and M46 pumps with the electrical displacement control (EDC) option were updated to include the silicone oil filled pressure control pilot (PCP). Prior to this change the silicone oil filling was optional.

The addition of the silicone oil prevents moisture build up in the torque motor area of the valve and dampens vibrations.

The new valve is totally interchangeable with the old. The old style (dry) controls and (dry) PCP valves for controls will be obsoleted and unavailable as service parts.

Model numbers of M46 pumps with non silicone filled controls will be obsoleted and changed to new models with the silicone oil filled feature. Series 20 and 30 model numbers will not change.

MODELS AFFECTED

Series 20, series 30 and M46 pumps with electrical displacement controls. New M46 pump model numbers will be assigned upon order.

SERIAL NUMBERS

All pumps shipped after November 28, 1988 or with S/N 88-48-xxxx, include the silicone oil filled pilot.

PART NUMBERS AFFECTED

Control Valves		PCP Valves	
Old P/N	New P/N	Old P/N	New P/N
MCV104Axx01	MCV104Axx02	MCV101A1214	MCV101A1255
MCV104Axx05	MCV104Axx06	MCV101A1313	MCV101A1347
MCV104Axx04	MCV104Axx03	MCV101A1222	MCV101A1248
MCV104Axx08	MCV104Axx07	MCV101A1321	MCV101A1339
MCV105Axx01	MCV105Axx02	MCV101A1063	MCV101A1006
MCV105Axx05	MCV105Axx06	MCV101A1071	MCV101A1055
MCV105Axx04	MCV105Axx03		
MCV105Axx08	MCV105Axx07		
MCV109Axx01	MCV109Axx02		
MCV109Axx04	MCV109Axx03		

PARTS DISPOSITION

■ Interchangeable

PRODUCTS AFFECTED

M46 variable pumps, tandem pumps, and variable motors

SUBJECT

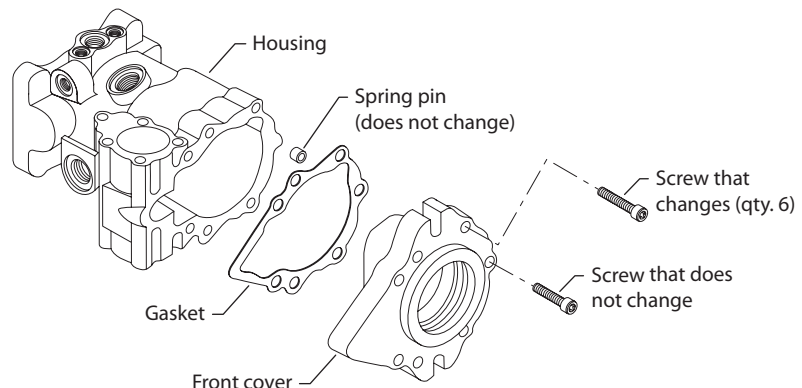
Front cover cap screw change

DESCRIPTION

As a product improvement, six (6) of the seven (7) front cover screws on M46 variable displacement units will increase in size from 3/8-16 to 7/16-14. This improvement increases the front cover to housing clamping force, and reduces the potential for leaks or screw breakage.

A 7/16" 12 point socket is required to remove and install the new 7/16" screws. The 3/8" screw continues to require a 3/8" 12 point socket. The installation torque is 60-74 lbf·ft. (81-100 Nm) for the 7/16" screws and 39-47 lbf·ft. (53-64 Nm) for the 3/8" screw.

All variable pump and motor housings, including both front and rear tandem pump housings, will change and the old (all 3/8" screw hole) housings will no longer be available as service parts. Housings are rarely sold as service part items, but if required, a new front cover and screws must be used with the new housing. The gasket will change, however, the new style gasket will fit any vintage pump. The front cover (plus rear cover on tandems) will also change, but old style covers will remain available as service parts, and must be used to repair older vintage pumps and variable motors.



MODELS AFFECTED

All M46-2xxx single pumps, M91-46xxx tandem pumps, and M46-4xxx variable motors.

SERIAL NUMBERS

The change will take place at serial number A-89-23-xxxxx.

PART NUMBERS AFFECTED

Description	Old part number	New part number
Housing - single pump	*4460440	4460579
Housing - front tandem pump	*4460438	4460568
Housing - rear tandem pump	*4460439	4460569
Housing - standard variable motor	*4460452	4460565
Housing - for thru shaft variable motor	*4460453	4460566
Front cover - standard	4460392	4460563
Front cover - special mounting	4460478	4460573
Rear cover - "A" flange tandem pump	4460449	4460571
Rear cover - "B" flange tandem pump	4460437	4460572
Cover gasket	*4460409	4460564
12 point screw (quantity 6)	9007510-3716	9007510-4416

PARTS DISPOSITION

■ Interchangeable

PRODUCTS AFFECTED

M25, M35 & M46 single and tandem pumps, with SAE A auxiliary pad.

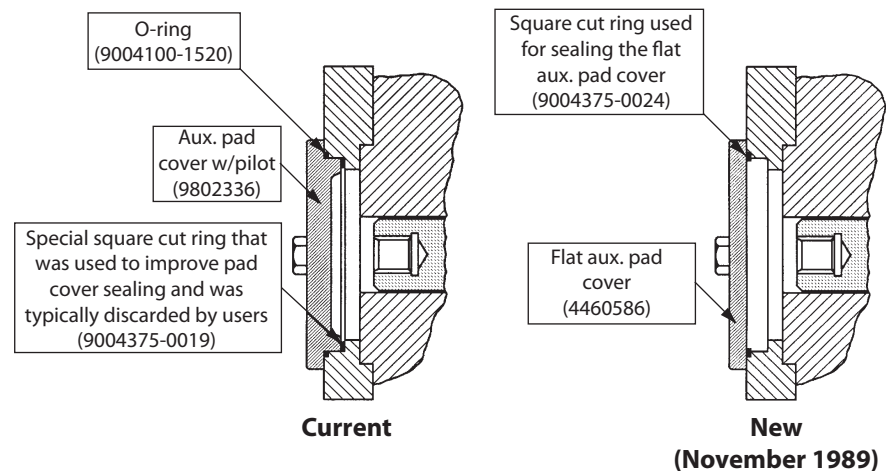
SUBJECT

Auxiliary pad cover seal change

DESCRIPTION

Effective in November of 1989, we will no longer supply an O-ring under the auxiliary pad cover that is capable of sealing an auxiliary pump. A new pad cover, with a square cut ring designed only for sealing the pad cover, will be used. Customers currently reusing the pad cover O-ring to seal an auxiliary pump must supply their own O-ring after this change.

The O-ring required to seal an auxiliary pad is a standard 70 durometer O-ring with a .103" cross section and 3.237" I.D. with ARP 568 uniform dash number -152. This O-ring can be purchased from Sundstrand-Sauer under part number 9004100-1520.



MODELS AFFECTED

All M25-2xxx, M35-xxx, and M46-2xxx single pumps. All M91-25xxx, M91-35xxx, and M91-46xxx tandem pumps with auxiliary mounting pad..

SERIAL NUMBERS

The change will take place at serial number A-89-45-xxxxx. for M46 pumps. The change will take place at serial number A-89-38-xxxxx. for M25 and M35 pumps.

PART NUMBERS AFFECTED

Refer to drawing on page one of this bulletin.

PARTS DISPOSITION

■ Interchangeable

PRODUCTS AFFECTED

M46 pumps & variable motors

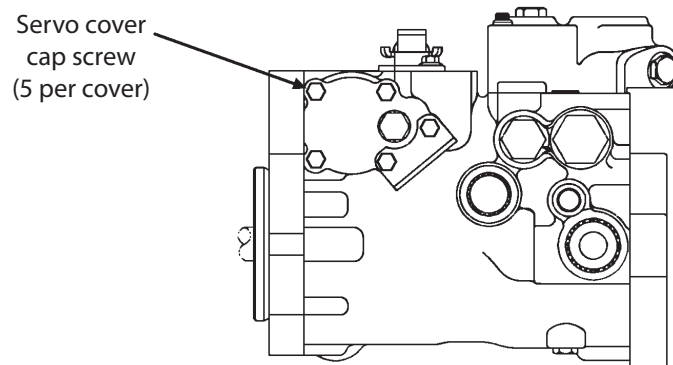
SUBJECT

Servo cover cap screw change

DESCRIPTION

In the 3rd quarter of 1990, the screws that retain the servo covers to the housing will change from hex head screws with flat washers to flange head screws with no washers.

The wrench size required to remove the screws decreases from 7/16" to 3/8". The screw torque remains unchanged at 11 to 13 lbf·ft [16 Nm].



MODELS AFFECTED

All M46-2xxx single pumps, M91-46xxx tandem pumps, and M46-4xxx variable motors.

SERIAL NUMBERS

N/A

PART NUMBERS AFFECTED

Description	Old part number	New part number
Screw	9007206-2522	9007276-0134
Washer	9009610-2850	not used

PARTS DISPOSITION

■ Interchangeable

PRODUCTS AFFECTED

M46 Variable displacement tandem pumps

SUBJECT

Filtration adapter changes

DESCRIPTION

This bulletin was issued in June, 1991 for advanced information. The purpose of this revision "C" is to reflect a correct P/N for the new style installation screw. (See part numbers affected on reverse side of the page.)

As part of our overall series 40 product improvement program, we have redesigned the filtration adapter blocks used on single and tandem M46 pumps. This change incorporates a more effective seal with the pump housing and reduces the adapter thickness, thus providing a more compact overall pump package. Three (3) O-rings seal the current filtration adapters to pump housings. The new design utilizes a single gasket for sealing.

This change will impact customers using remote filtration or an external source for charge pressure (no charge pump). Also, any vehicle with a charge pressure monitor connected to this adapter block could be affected. The new remote filtration adapter block does not have a filter inlet gauge port, however, this may be accomplished with a tee on the port leading to the remote filter. The new suction filtration adapter does not include the two (2) alternate charge pressure gauge ports.

The dimensional differences are shown on the attached comparative drawings. All port sizes remain the same.

MODELS AFFECTED

All M46-2xxx single pumps and M91-46xxx tandem pumps.

SERIAL NUMBERS

The change will take place during May, 1991 for the suction filtration adapter and late 1991 for the remote filtration adapter.

PART NUMBERS AFFECTED

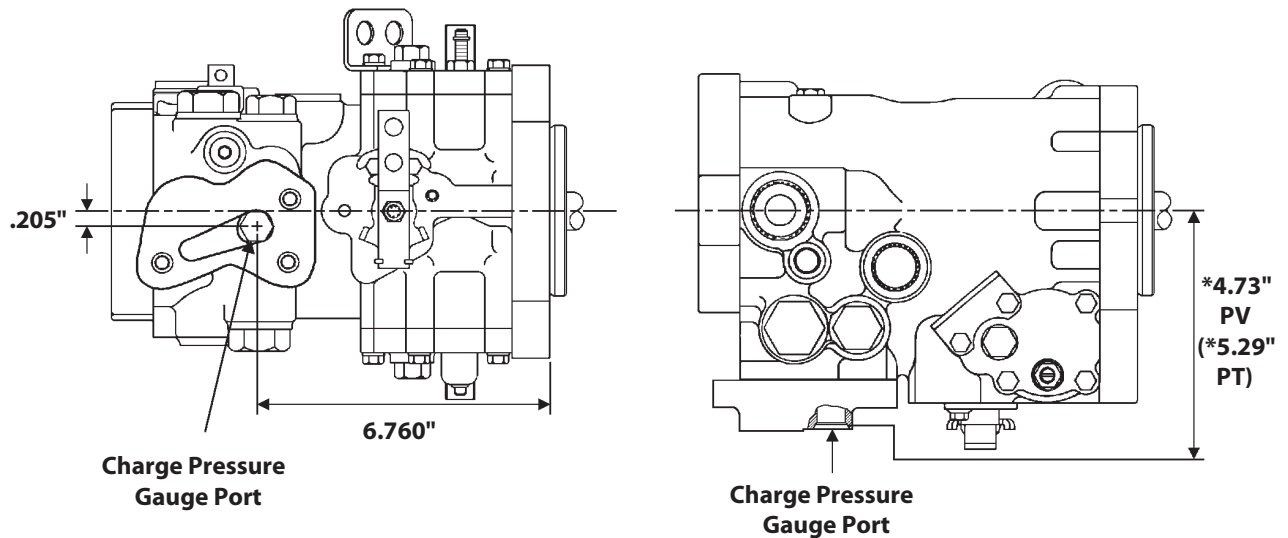
Option	Current Style P/N	New Style P/N
Suction filtration adapter	4460345	4460643
Remote filtration adapter	4460434	4460644
Seal gasket - suction	(3) 9004101-0170 O-rings	4460655
Seal gasket - remote	(3) 9004101-0170 O-rings	4460656
Installation screws	(2) 9007500-3130 (1) 9007500-3124	(3) 9007206-3116

PARTS DISPOSITION

■ Interchangeable - New adapter will fit all housings since serial number A-86-14-xxxxx.

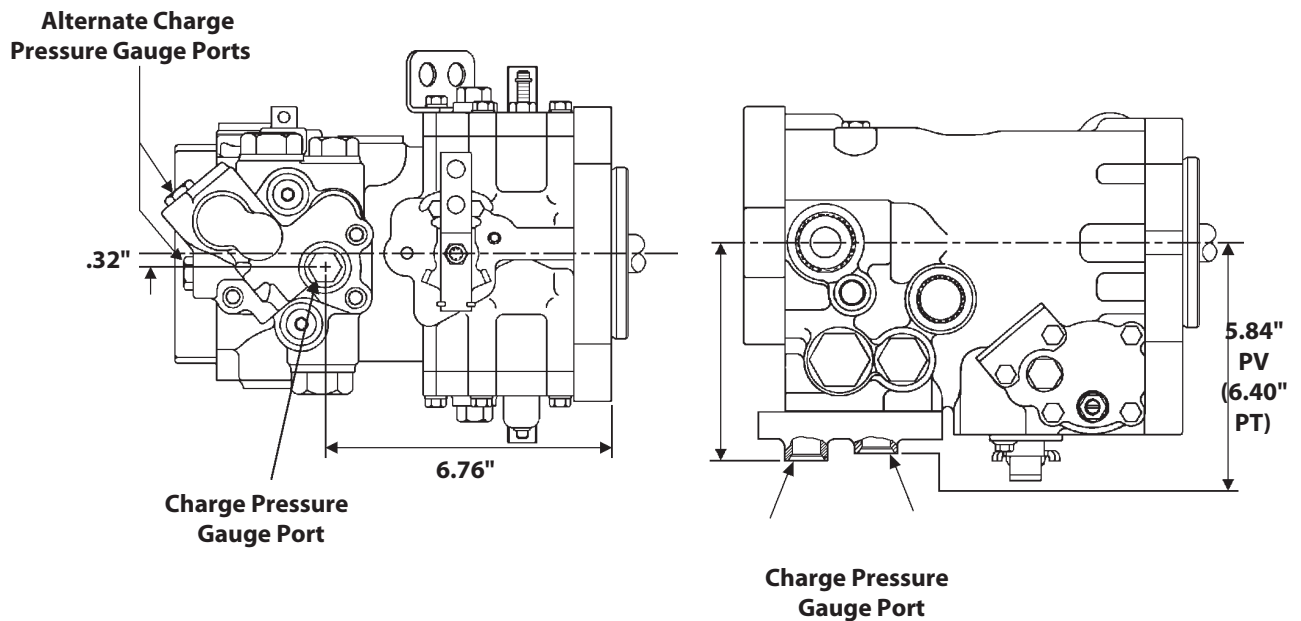
Suction Filtration Option

New Style



* On the April issue, these dimensions were 4.93" PV & 5.49" PT

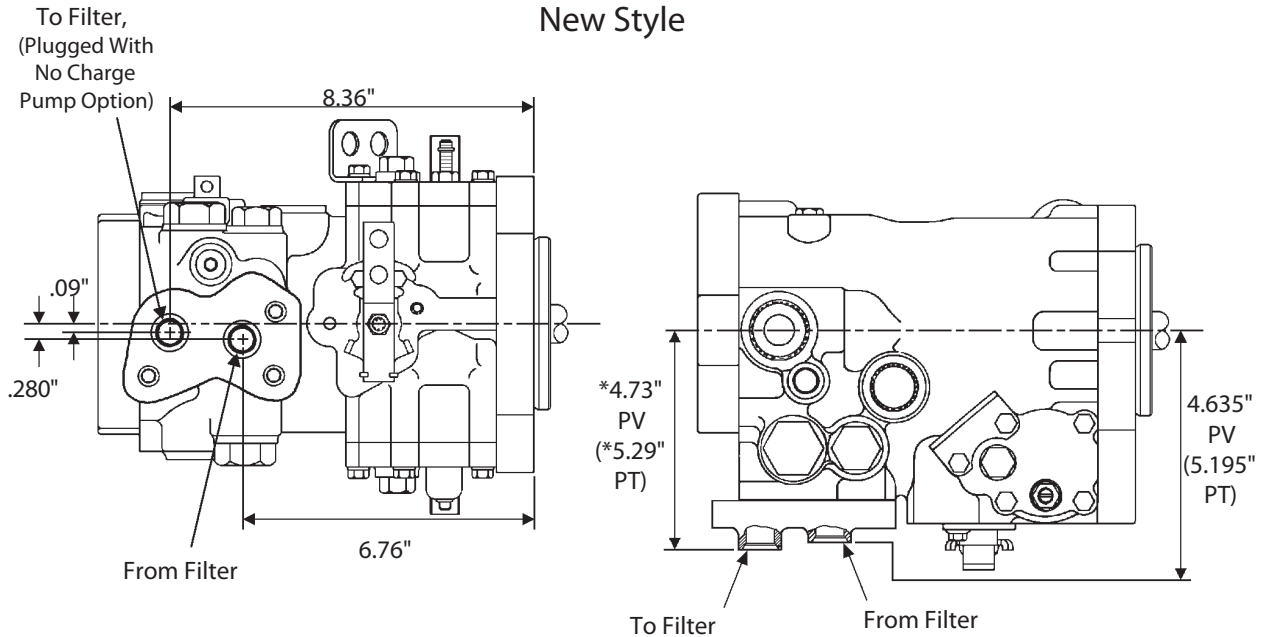
Old Style



Remote Pressure Filtration Option

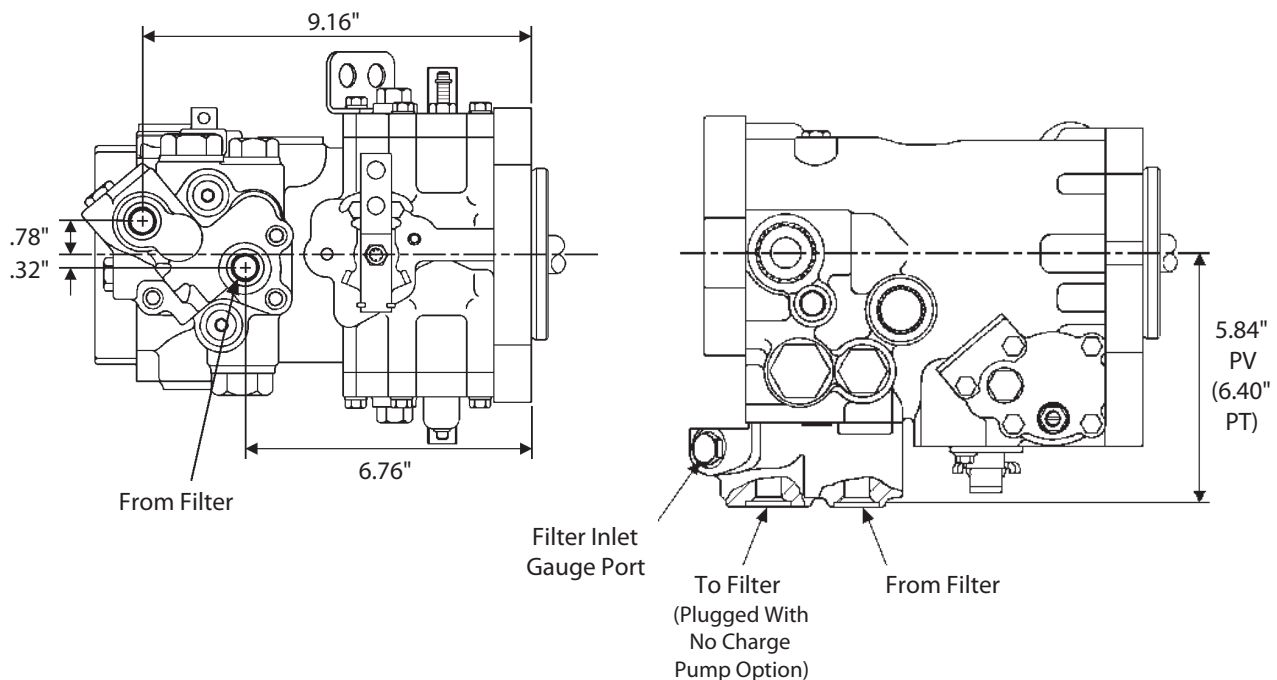
(Also "No Charge Pump Option")

New Style



* On the April issue, these dimensions were 4.93" PV and 5.49" PT

Old Style



PRODUCTS AFFECTED

M46 Variable displacement tandem pumps and motors

SUBJECT

Brass bearing ring

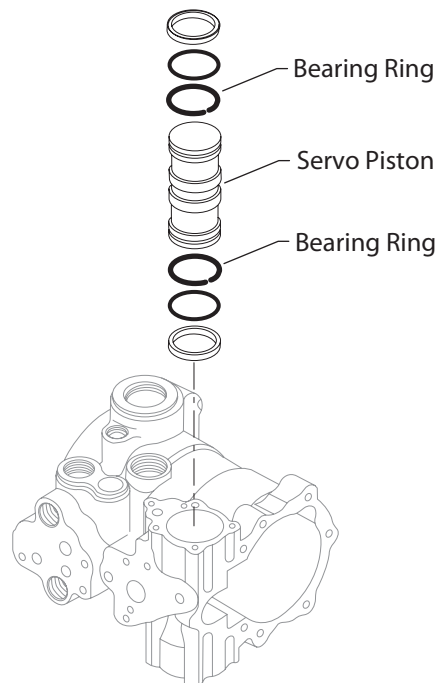
DESCRIPTION

The part number of the nylon bearing was incorrect in the 4-26-91 version of this bulletin. The purpose of this revision "A" is to correct that error.

The bearing rings, used on all M46 servo pistons, are changing from a glass filled nylon material to brass. The brass material will provide a better life in severe duty applications.

There are no functional or operational differences between the nylon and brass rings.

Assembly procedures remain the same except extreme care should be taken not to deform or twist the rings any more than necessary when sliding the rings over the piston and into their grooves.



MODELS AFFECTED

All M46-2xxx single pumps, M91-46xxx tandem pumps, and M46-4xxx variable motors.

SERIAL NUMBERS

The change will take place at serial number A-89-23-xxxxx.

PART NUMBERS AFFECTED

Description	Old part number	New part number
Bearing ring	4460477	4460648

PARTS DISPOSITION

- Interchangeable
- Use parts in stock

PRODUCTS AFFECTED

M46 variable pumps & variable motors

SUBJECT

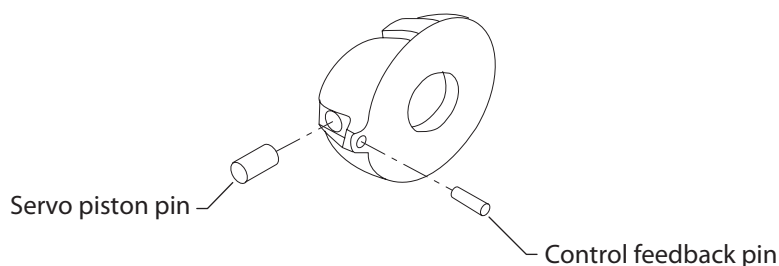
Swashplate kits

DESCRIPTION

When replacing the swashplate in M46 variable pumps and motors, the servo piston pin and control feedback pin also need to be replaced. Sauer-Danfoss will provide service kits containing swashplates with these pins installed. These swashplate kits will work in the variable motor with the control feedback pin installed, even though the control pin is not necessary.

Swashplates without the pins installed will no longer be available as spare parts.

These assemblies may be used in units from serial number A-86-23-xxxxx to the present



MODELS AFFECTED

All M46-2xxx single pumps, M91-46xxx tandem pumps, and M46-4xxx variable motors.

SERIAL NUMBERS

A-86-23 and beyond

PART NUMBERS AFFECTED

Description	Part number
Swashplate kit (non-balanced)	4510072
Swashplate kit (balanced)	4510073
Swashplate (non-balanced)	4460393
Swashplate (balanced)	4460394
Control feedback pin	9004700-2512
Servo piston pin	9004820-4416

PARTS DISPOSITION

■ Interchangeable

PRODUCTS AFFECTED

M46 variable pump, variable motor and tandem pump.

SUBJECT

Retained swashplate journal bearings.

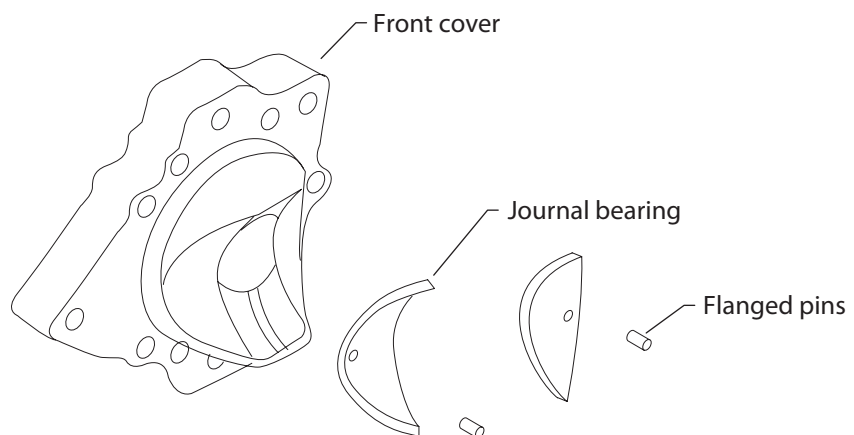
DESCRIPTION

As a product improvement Sauer-Danfoss is changing the way the journal bearings are held in place on the front cover of the M46 variable units. This change makes it easier to assemble the unit because the bearings are retained with a flanged pin to the front cover.

The hole in the bearing, along with the OD of the pin, became larger. The hole size of the old bearing was .125 inches and the hole size of the new bearing is .137 inches. The new bearing can be used with the old pin when repairing old style units. Thus the need to pull out the old pins and replace with flanged pins and new bearings is not necessary. The old bearing with the .125 hole will be obsoleted and replaced with the new bearing with the .137 hole.

To install the new bearings and pins, install the pin through the hole in the bearing from the running surface side. Using a small hammer and punch, seat the pin into the hole of the front cover. After completing the installation process, be sure the head of the pin is below the surface of the bearing material to insure the pin does not score the swashplate mating surface.

Since the non-balanced swashplate module was inactivated in new production units in second quarter 1994, the non-balanced swashplate bearings will not change.



MODELS AFFECTED

All M46-2xxx single pumps, M91-46xxx tandem pumps, and M46-4xxx variable motors.

SERIAL NUMBERS

The change will become effective per the following chart:

Tandem pumps	94-47 and beyond
Single pumps	94-47 and beyond
Variable motors (flange style)	95-02 and beyond
Variable motor (cartridge flange)	95-07 and beyond

PART NUMBERS AFFECTED

Description	Where used	Old p/n	New p/n
Journal bearing	PV & PT balanced swashplate	4460320-0001	4460696
Journal bearing	PV & PT non-balanced swashplate	4460325-0001	No change
Journal bearing	Variable motor (SAE flange)	4460320-0003	4460397
Journal bearing	Variable motor (cartridge flange)	4460320-0003	4460697
Slotted pin	All variable units*	9004700-1206	5000116

* Except variable units with the non-balanced swashplate

PARTS DISPOSITION

- Interchangeable - old pin/new bearing
- Non-interchangeable - new pin/old bearing

PRODUCTS AFFECTED

M46 variable pump, tandem pump, and variable motor

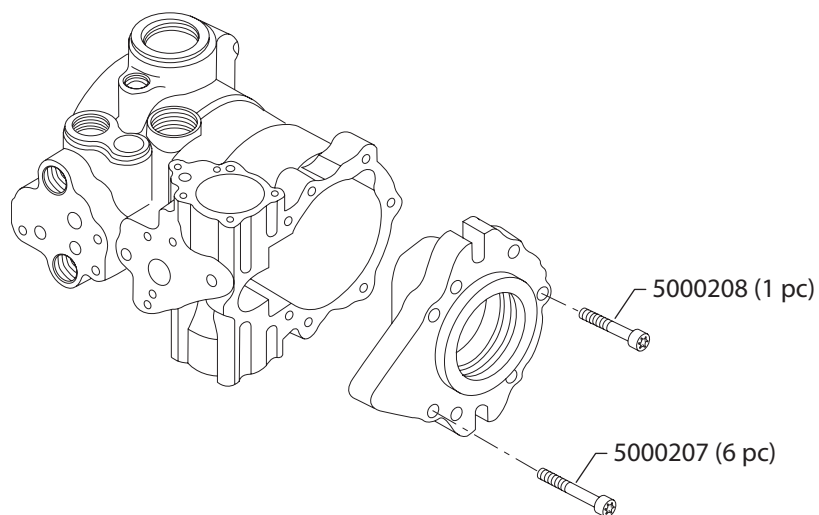
SUBJECT

Front cover screws

DESCRIPTION

As a product improvement, Sauer-Danfoss is changing the screws that fasten the front cover to the housing of the M46 pumps and variable motors.

The old screws had a 7/16 12 point head or 3/8 12 point head. The new screws have an internal T50 or an internal T55 torx head. The torque will remain the same as the old screws. The old screws are obsolete and no longer available as a service part.



MODELS AFFECTED

All M46-2xxx single pumps, M91-46xxx tandem pumps, and M46-4xxx variable motors.

SERIAL NUMBERS

This change became effective at serial number A-94-37-xxxxx.

PART NUMBERS AFFECTED

Description	Old part number	New part number
7/16 12 point screw	9007510-4416	-
3/8 12 point screw	9007510-3720	-
T55 torx screw	-	5000207
T50 torx screw	-	5000208

PARTS DISPOSITION

■ Interchangeable

PRODUCTS AFFECTED

15 Series, M25, M35 & M46 single and tandem pumps with SAE "A" pad

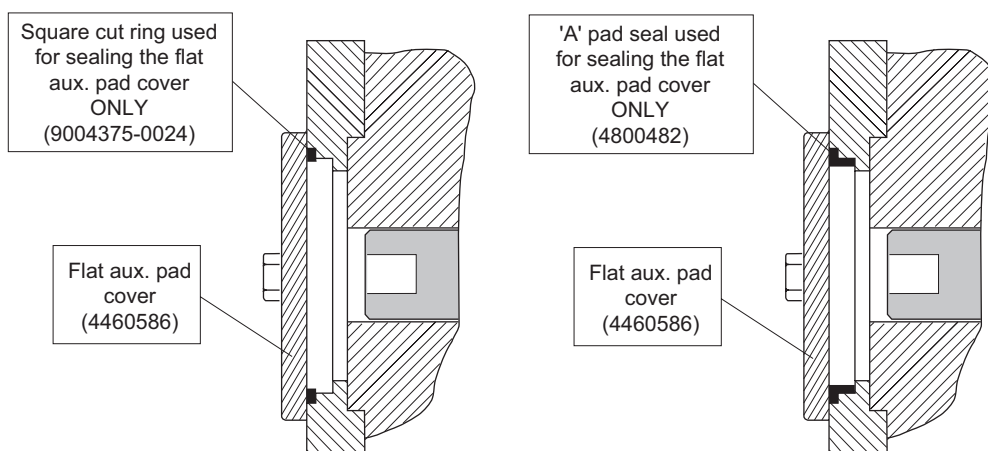
SUBJECT

Auxiliary pad cover seal change

DESCRIPTION

Effective in November of 1995, Sauer-Danfoss changed the auxiliary 'A' pad seal from a square cut ring to doughnut type seal. The sealing capacity of the new seal is equal to that of the square cut ring, but makes assembly much easier.

If the pad cover is removed to install an auxiliary pump, an O-ring must be used to seal that joint. The O-ring required is a standard 70 durometer O-ring with a .103" cross section and a 3.237" ID. This O-ring may be purchased from Sauer-Danfoss under part number 9004100-1520.



MODELS AFFECTED

All 15-2xxx, M25-2xxx, M91-25xxx, M46-2xxxx and M91-46xxx with SAE "A" pad.

SERIAL NUMBERS

The change will take place at serial number A-95-45-xxxxx.

PART NUMBERS AFFECTED

Description	Old part number	New part number
A pad seal	9004375-0024	4800482

PARTS DISPOSITION

■ Interchangeable

PRODUCTS AFFECTED M46 variable pumps & variable motors

SUBJECT Swashplate kits

DESCRIPTION As a product improvement, Sauer-Danfoss is changing the finish on M46 cylinder block. The old cylinder blocks had a shiny steel finish. The new cylinder blocks have a dark gray finish.

All repairs that call for a new cylinder block should use the new block. Return new 4460583 cylinder blocks and 4460289 cylinder block kits for credit and reorder the new part numbers.

MODELS AFFECTED All M46 pumps, fixed motors, and variable motors.

SERIAL NUMBERS This change became effective at week 96-19 on all fixed motors, and 96-35 for all variable pumps and variable motors.

**PART NUMBERS
AFFECTED**

Description	Old part number	New part number
Cylinder block	4460583	4460832
Cylinder block kit	4460289	4460890

PARTS DISPOSITION ■ Interchangeable

PRODUCTS AFFECTED

Series 40 M46 single and tandem pumps

SUBJECT

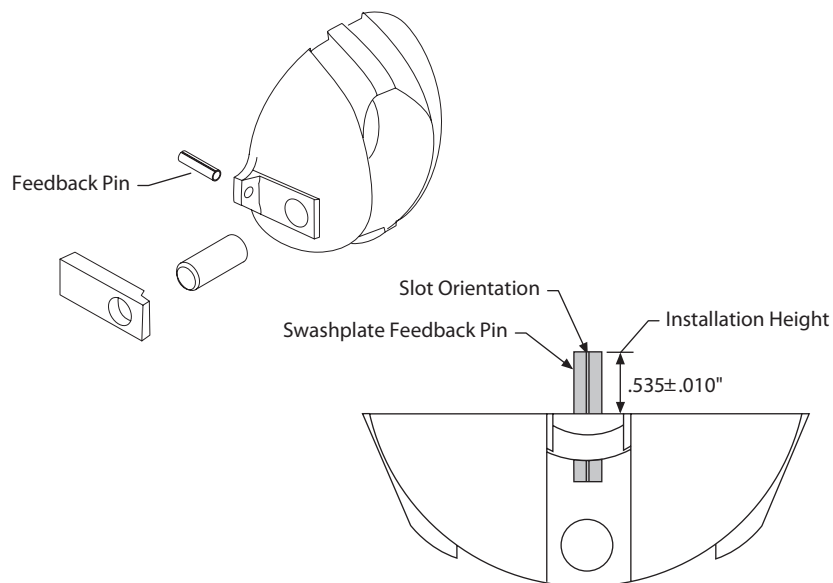
Increased length of feedback pin

DESCRIPTION

As a product improvement, Sauer-Danfoss is increasing the length of the swashplate feedback pin on the variable swashplate assembly. The installed height changes are from $.340 \pm .010$ to $.535 \pm .010$.

The feedback pin should be replaced with the new pin on any repair. The old pin will become obsolete. As a reminder when installing the slotted pin, the slot must be either facing the rotating kit or turned 180° away from the rotating kit.

If the pump you are working on was manufactured between A-86-14 and A-97-12, be sure and use a new style control sleeve. See service bulletin SB-1997-001. For product manufactured before 86-14, consult Sauer-Danfoss



MODELS AFFECTED

All M46-2xxx and M91-46xxx.

SERIAL NUMBERS

This change became effective at serial number A-96-01-xxxxx.

PART NUMBERS AFFECTED

Description	Old part number	New part number
Slotted pin	9004700-2512	5000381
Pin length	.075"	.9375"

PARTS DISPOSITION

■ Non-interchangeable

PRODUCTS AFFECTED

Series 40 M46 single and tandem pumps

SUBJECT

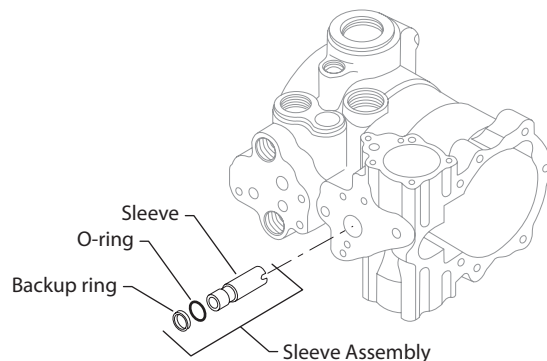
Improvement in serviceability of the control sleeve.

DESCRIPTION

To improve serviceability of the M46 control sleeve, Sauer-Danfoss is increasing the feedback slot width of the control valve sleeve. This is an interchangeable change from pump serial number A-86-14-xxxxx and newer. For pumps manufactured earlier, consult the M46 service parts manual BLN-2-41650.

When installing the new control sleeve, be sure that the slot engages the feedback roll pin. Also insure that there is no rotational free play between the feedback roll pin and the slot of the control valve sleeve. If there is rotational free play you must change the feedback roll pin. See service bulletin SB-1995-022.

A sleeve assembly has been created with the O-ring and backup ring installed. See page two for detailed part number information.



MODELS AFFECTED

All M46-2xxx and M91-46xxx.

SERIAL NUMBERS

For the MDC, effective at serial number A-97-12-xxxxx and newer.
For EDC/HDC, effective at serial number A-97-09-xxxxx and newer.

PART NUMBERS AFFECTED

Description	Old p/n	New p/n
MDC sleeve assembly (.046" orifice)	4460414-0002	4510159
MDC sleeve assembly (.031" orifice)	4460414-0003	4510160
MDC sleeve assembly (.025" orifice)	4460414-0004	4510157
MDC sleeve assembly (.036" orifice)	4460414-0005	4510158
MDC service sleeve assembly (.046" orifice)	4460640-0002	4510159
MDC service sleeve assembly (.031" orifice)	4460640-0003	4510160
MDC service sleeve assembly (.025" orifice)	4460640-0004	4510157
MDC service sleeve assembly (.036" orifice)	4460640-0005	4510158
Electric displacement control	MCV105A30xx	MCV105B30xx
Hydraulic displacement control	MCV108A30xx	MCV108B30xx
EDC/HDC sleeve assembly	K12679	K22539*

MDC = Manual Displacement Control

* will work on both EDC and HDC

PARTS DISPOSITION

■ Interchangeable from serial number A-86-14-xxxxx

PRODUCTS AFFECTED

Series 40, M46 single and tandem pumps

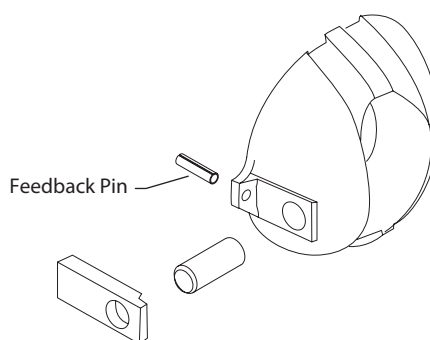
SUBJECT

New part number for swashplate feedback pin

DESCRIPTION

Sauer-Danfoss has improved the roundness for the swashplate feedback pin used in the M46 variable pumps. If you have any of the old pins in your stock, return them for credit and order the new part number.

If you are repairing an M46 pump and the slot in the feedback pin has turned and is no longer either facing the rotating group or 180 degrees away from the rotating group or is not of the increased length design, the pin must be changed. (Reference SB-9522)



MODELS AFFECTED

All M46-2xxx and M91-46xxx model numbers

SERIAL NUMBERS

Units built A-98-08-xxxxx and newer have the new pin.

PART NUMBERS AFFECTED

Description	Old part number	New part number	Status of old part
Feedback pin	5000381	5000507	Obsolete

PARTS DISPOSITION

■ Interchangeable

PRODUCTS AFFECTED

Series 40, M46 single and tandem pumps

SUBJECT

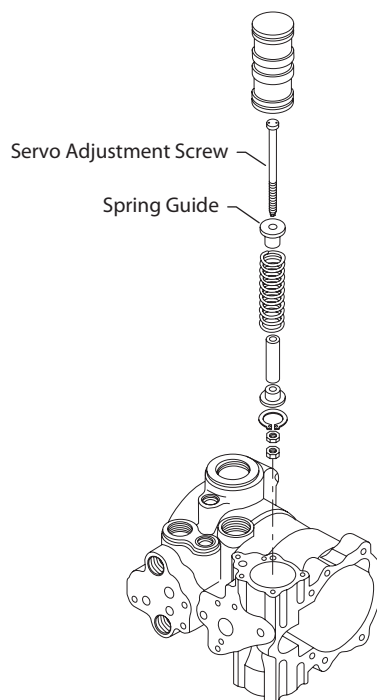
Servo adjustment screw

DESCRIPTION

As a product improvement, Sauer-Danfoss has modified the design of the servo adjustment screw in order to make it more robust and lengthen its fatigue life. In conjunction with this change, and as a result of it, the spring guide has also been changed. The new spring guide is compatible with both the old and the new servo screw.

If replacement of the old servo screw is required, both the new servo screw and the new spring guide need to be replaced because, the old spring guide is not compatible with the new servo screw.

The old spring guide and the old servo adjustment screw are obsolete and no longer available as a service part.



MODELS AFFECTED

All M46-2xxx and M91-46xxx model numbers

SERIAL NUMBERS

Units built after A-98-40-xxxxx have the old servo screw and new spring guide.
Units built after A-99-14-xxxxx have the new servo screw and new spring guide.

PART NUMBERS AFFECTED

Description	Old part number	New part number
Servo screw*	4460732	4461033
Spring guide	4460548	4461034

* If part number 4460732 is being replaced, both 4461033 and 4461034 need to be replaced

PARTS DISPOSITION

- Interchangeable - see text on front page
- Non-interchangeable - see text on front page

PRODUCTS AFFECTED

M46 single and tandem pumps

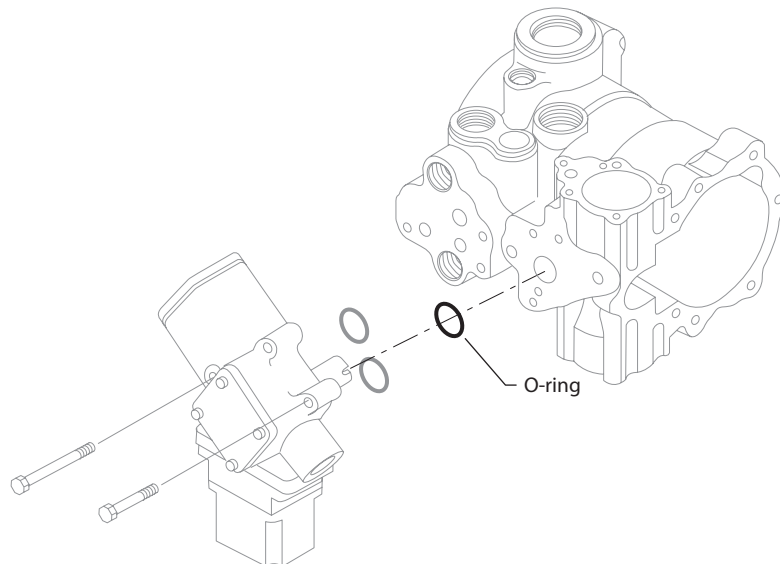
SUBJECT

EDC and HDC O-ring change

DESCRIPTION

In order to improve the robustness of the EDC and HDC control, Sauer-Danfoss has redesigned the control housing to accept a stiffer O-ring with a larger cross section. This change requires that a deeper O-ring groove be machined into the control's housing, thus making the two O-rings non-interchangeable.

EDCs and HDCs manufactured before this change took place, will require the smaller cross-sectional diameter O-ring and this part will still be available as a service part. New EDCs and HDCs when ordered will come with the new, larger, cross-sectional diameter O-ring. Overhaul seal kits have both the old and the new O-rings in them so that any vintage pump may be serviced.



MODELS AFFECTED

All single and tandem M46 pumps that are equipped with an EDC or HDC.

SERIAL NUMBERS

All EDC units produced prior to 98-31-xxxxx use the old O-ring.
All HDC units produced prior to 98-33-xxxxx use the old O-ring.

PART NUMBERS AFFECTED

Description	Old part number	New part number
O-ring, .070 x .926, 70D	9004100-0210	N/A
O-ring, .103 x .924, 90D	N/A	9004101-1190

PARTS DISPOSITION

■ Non-interchangeable

PRODUCTS AFFECTED

Series 40 - M46 pumps and motors

SUBJECT

Slipper material change

DESCRIPTION

Sauer-Danfoss has made a material change to the slipper component used in the piston assemblies of all Series 40 M46 pumps and motors. This change increases the robustness of the design while maintaining the consistency of the slipper's performance. To aid in tracking this change, Sauer-Danfoss has released a new part number for the piston assemblies.

The new piston assembly is fully interchangeable with the one previously used. The previous piston assembly has become obsolete, due to this part number change. (The cylinder block kits all incorporate the new slippers, but none of the cylinder block kit part numbers have been changed.)

This bulletin was issued in May of 1999. The purpose of this revision is to remove the slipper part number from page two, due to the fact that it is not available as a service part.

MODELS AFFECTED

All Series 40 M46 products.

SERIAL NUMBERS

All service parts and production units ordered or built after March 1, 1999 or serial number A-99-10-xxxxx.

**PART NUMBERS
AFFECTED**

Description	Old part number	New part number
Piston assembly	4460650	4461032

PARTS DISPOSITION

■ Interchangeable

PRODUCTS AFFECTED

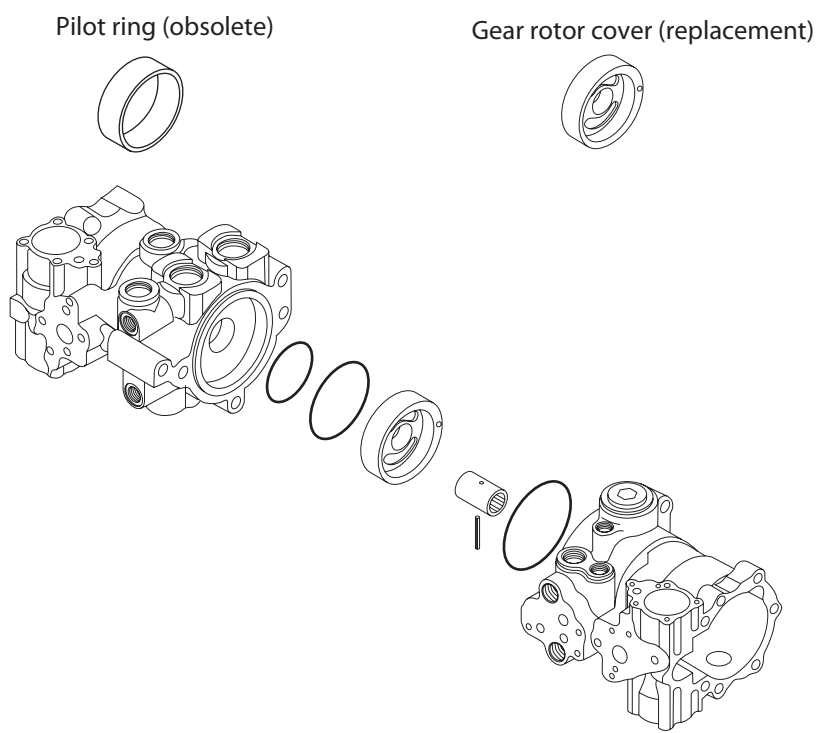
Series 40: M46 tandem pumps

SUBJECT

Obsolete pilot ring

DESCRIPTION

The pilot ring used in tandem pumps with the no charge pump option is obsolete and is being replaced by the gear rotor cover as shown in the below drawing. This is considered an interchangeable change, provided that the guidelines in either of the two methods shown on page three of this bulletin are followed.



Current configuration for tandems with no charge pump.

MODELS AFFECTED

All series 40 M46 tandem pumps.

SERIAL NUMBERS

This change became effective at serial number K-02-07-xxxxx

PART NUMBERS AFFECTED

Item description	Old part number	New part number
Pilot ring	4800079	N/A
CW,1.40 gear rotor cover	N/A	4800159-0002

Conversion method 1 applicable hardware	
Description	Part number
CW, 1.40 CIR gerotor cover	4800159-0002
Roll pin	9004700-3724

PARTS DISPOSITION

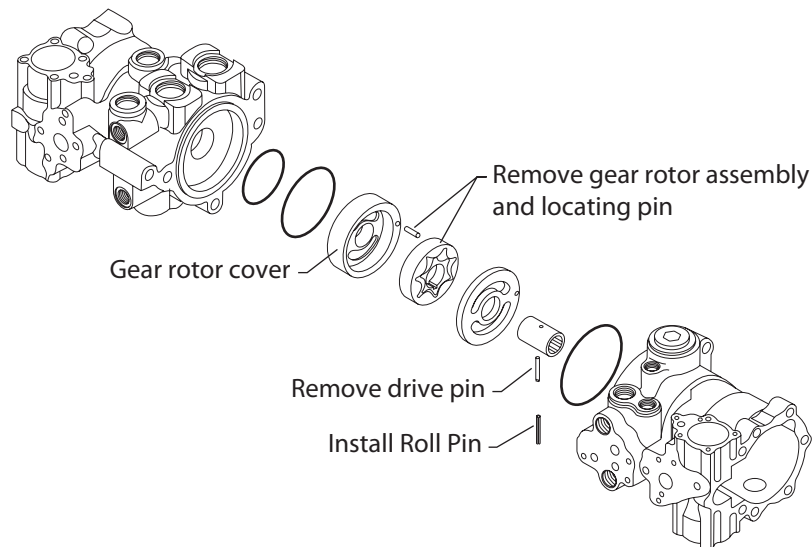
■ Interchangeable if shaft and key are both replaced

Converting pumps with a charge pump to the “no charge pump” option.

There are two approved methods for converting pumps with a charge pump to pumps without a charge pump. Method 1 accomplishes this by converting the pump to the configuration that Sauer-Danfoss production has adopted when building new units with the “no charge pump” option from the incorporation time of this service bulletin. Method 2 allows for conversion to the “no charge pump” option with the preexisting hardware available in the pump, without the need for additional parts.

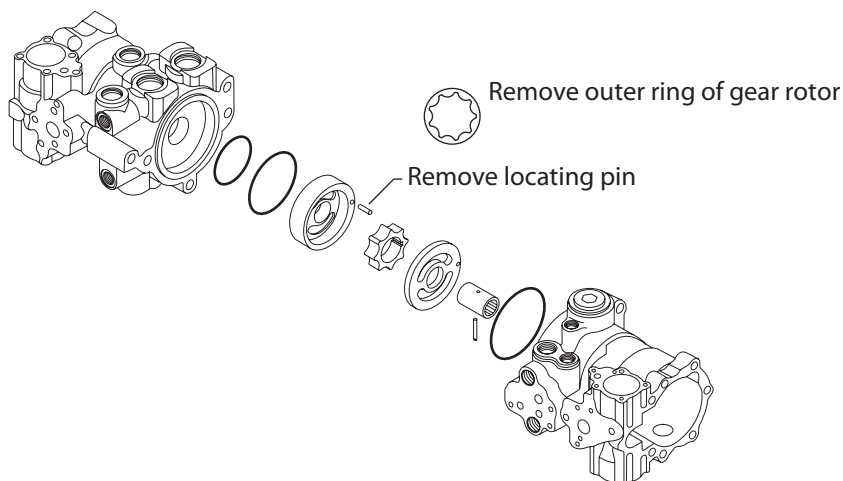
Method 1

Disassemble the unit and remove the gear rotor cover, gear rotor assembly, gear rotor drive pin, and gear rotor cover locating pin. Also remove the spacer plate, in instances where the 0.95 CIR charge pump is installed. Reassemble the unit by installing the roll pin, into the coupler, and install the clockwise 1.40 CIR displacement gear rotor cover.



Method 2

Disassemble the unit and remove the outer ring of the gear rotor assembly, and the gear rotor cover locating pin. Reassemble the unit. NOTE: If the 0.95 CIR displacement charge pump is installed, leave the spacer plate in place.



PRODUCTS AFFECTED

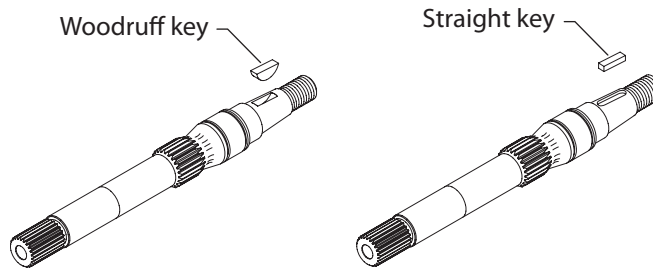
Series 40: M25, M35, M44, M46, and LV pumps and motors

SUBJECT

Change from woodruff key to straight key on tapered shaft.

DESCRIPTION

Sauer-Danfoss will use a straight key rather than a woodruff key in tapered shafts on all Series 40 pumps and motors. Tapered shafts requiring a woodruff key are obsolete. The woodruff key, however, will remain available for service requirements. Customers requiring a replacement shaft need the straight key.



MODELS AFFECTED

Series 40: M25, M35, M44, M46, and LV models using tapered shafts.

SERIAL NUMBERS

This change became effective during the 2002 build year.

PART NUMBERS AFFECTED

Old part number	New part number	Description
9003310-2514	-	Woodruff key, .248 x .875
-	5000664	Square key, .250 x .750
4250012	4250164	Shaft, pump
4254500	4254568	Shaft, LV, tapered
4350390	4350805	Shaft, fixedv motor, tapered
4350432	4350791	Shaft, tandem, tapered
4460309	4461308	Shaft, pump, tapered/9T aux.
4461290	4461302	Shaft, pump, tapered/13T aux.
4460577	4461309	Shaft, motor, tapered
4460804	4461306	Shaft, MV, 13 tooth/1" dia. 1.5" tapered
4460772	4461307	Shaft, Tandem, tapered

PARTS DISPOSITION

■ Interchangeable if shaft and key are both replaced

PRODUCTS AFFECTED

Series 40 M46 pumps and motors

SUBJECT

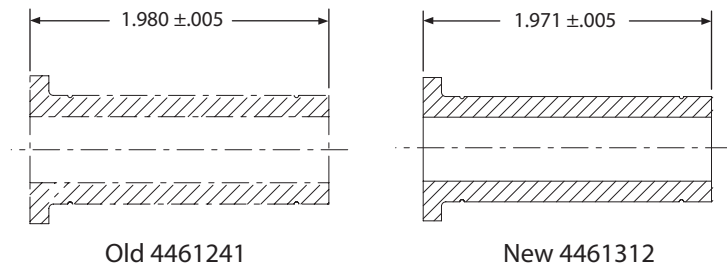
Servo gasket and 0 degree servo stop

DESCRIPTION

As a design improvement, Sauer-Danfoss has introduced a new servo gasket with improved sealing capability. The new servo gasket is interchangeable for service on all M46 pumps and motors, except for M46 motors, using the 0 degree servo stop option.

During service repair, if a motor has the obsolete 0 degree servo stop (4461241), and you replace the servo gaskets with the new servo gaskets (4461311), you must install a new 0 degree servo stop (4461312). This accommodates the new, thinner servo gaskets.

The old servo gasket and 0 degree servo stop are obsolete. They are no longer available.



MODELS AFFECTED

All series 40 M46 variable pumps and motors.

SERIAL NUMBERS

This change became effective at serial number K-02-47-xxxxx.

PART NUMBERS AFFECTED

Description	Old part number	New part number
Servo gasket	4460413	4461311
Servo stop	4461241	4461312

PARTS DISPOSITION

- Interchangeable (except for motors manufactured before serial number K-02-47-xxxxx using 0 degree servo stop)

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