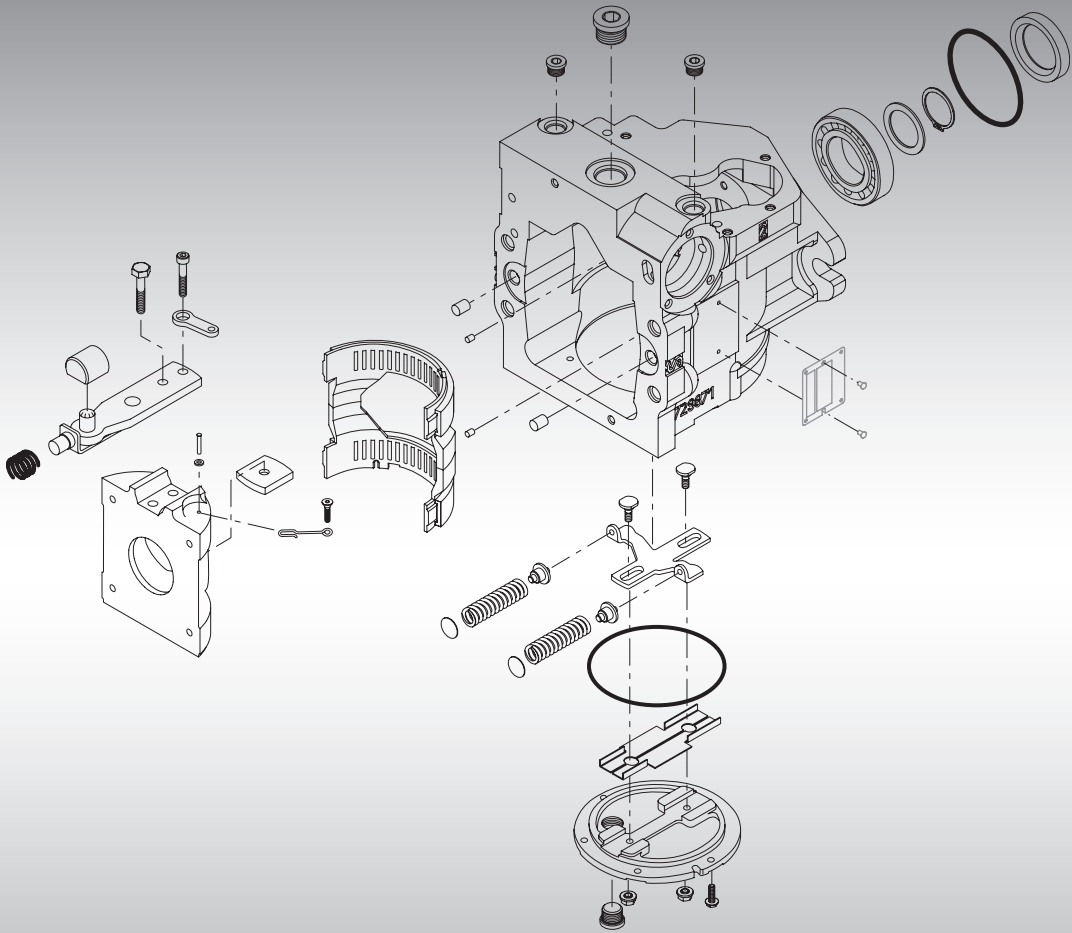




Parts Manual

Series 90

# 42cc Axial Piston Pump







**Contents**

<b>General information</b>	Service parts identification.....	4
	Nameplate .....	4
	Date code.....	5
	Service bulletins .....	5
	Procedure to identify a part .....	5
	Order code.....	7
<b>Variable displacement pump</b>	Common parts .....	8-9
	Special hardware.....	10-23
	Displacement limitation .....	24-33
	End cap .....	34-35
	Charging system.....	36-37
	Auxiliary mounting.....	38-41
	Charge pressure setting.....	42-43
	Shaft.....	42-43
	Control .....	44-67
	Filtration .....	68-69
	High pressure protection .....	70-73
	Orifice .....	74-85
	Overhaul seal kit.....	86
<b>Service bulletin</b>	SB-1988-023 (piston improvement) .....	89
	SB-1989-002 (incorporation of adjustable charge relief valve) .....	90
	SB-1992-008 (pump redesign).....	92-93
	SB-1993-002 (HDC gasket change).....	94
	SB-1993-012 (removal of valve plate from cylinder block kit) .....	95
	SB-1993-015 (servo arm/speed ring interference).....	96
	SB-1994-018 (side cover washer elimination).....	97
	SB-1995-002 (charge pump shaft key change) .....	98
	SB-1995-003 (MDC w/electric solenoid override manifold change) .....	99
	SB-1995-004 (charge pump design change).....	100-101
	SB-1995-005 (obsolete servo system parts) .....	102
	SB-1995-006 (end cap screw size change) .....	103
	SB-1995-026 ((valve plate part number change).....	104
	SB-1996-004 (side cover design change) .....	105
	SB-1997-014 (charge pump shaft part number change).....	106
	SB-1999-041 (side cover insert material change) .....	107
	SB-2002-016 (swashplate change).....	105
	SB-2005-011 (auxiliary flange charge pump cover) .....	106
	SB-2009-074 (A auxiliary pad).....	107
	SB-2009-075 (B auxiliary pad).....	108
	SB-2009-076 (C auxiliary pad).....	109
	SB-2011-025 (coupling change) .....	110
	SB-2015--031 (charge pump shaft).....	111



## General information

### 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 90, 42 cc variable displacement pumps.

The parts listed include all parts which may be used when performing either “Minor Repairs”, “Major Repairs” or “Conversions” on the Series 90, 42 cc pump.

### Nameplate

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

#### 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.

#### Model Code

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

#### 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. “N” indicates the unit was originally assembled in Neumunster, Germany.

The first number (2 digits) indicates the year of manufacture. (“01” would indicate the unit was manufactured in 2001)

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.





## General information

### 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 E10

Order Code	Item	Date Begin	Date End	Part Number	Part Name	Qty. per Model/Kit
80	E10	92-19		746107	Side cover	1
	G30	89-41	92-18	340133	Side cover (SB-1992-003)	1

All units using this order code with a date code of 89-41 and up to and including 92-18, must use part number "340133". All units with a date code of 92-19 and newer must use part number "746107."

### 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 90 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 L40 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: 001149 (9004201-6200), customers would order 9004201-6200 if ordering the part in the United States.)

#### Example of a Part Identification

The nameplate on a Series 90 pump has an Order Code of 90R042 MA 1 NN 80 R 3 C3 C 03 GBA 32 32 24. 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 "C3". (90R042 MA 1 NN 80 R 3 **C3** C 03 GBA 32 32 24)

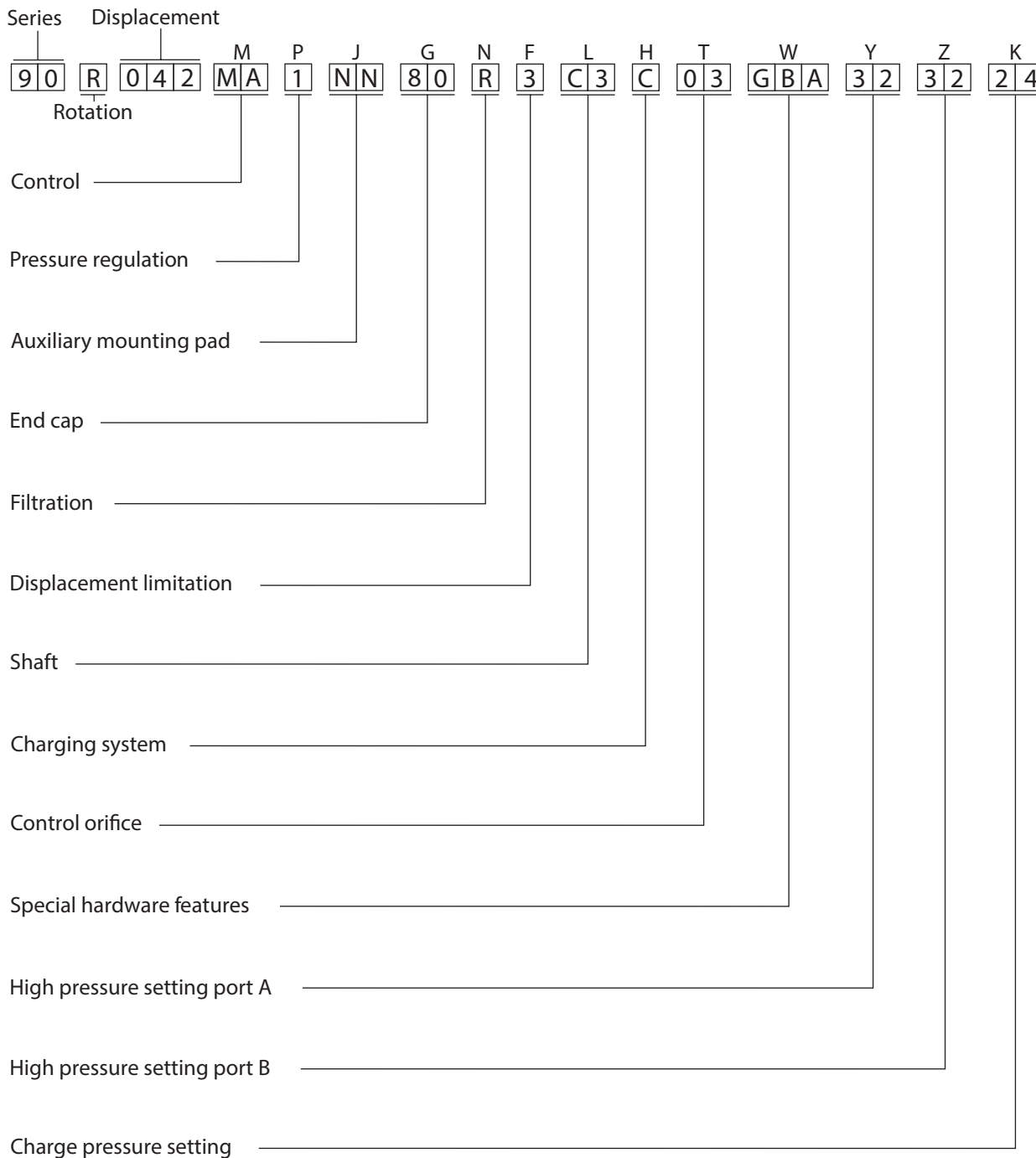
2) Referring to the Service Parts List, find the shaft group. Next find the order code that relates to this unit, which is "C3". The shaft is found to be item L100 and part number 340521.



**Notes**



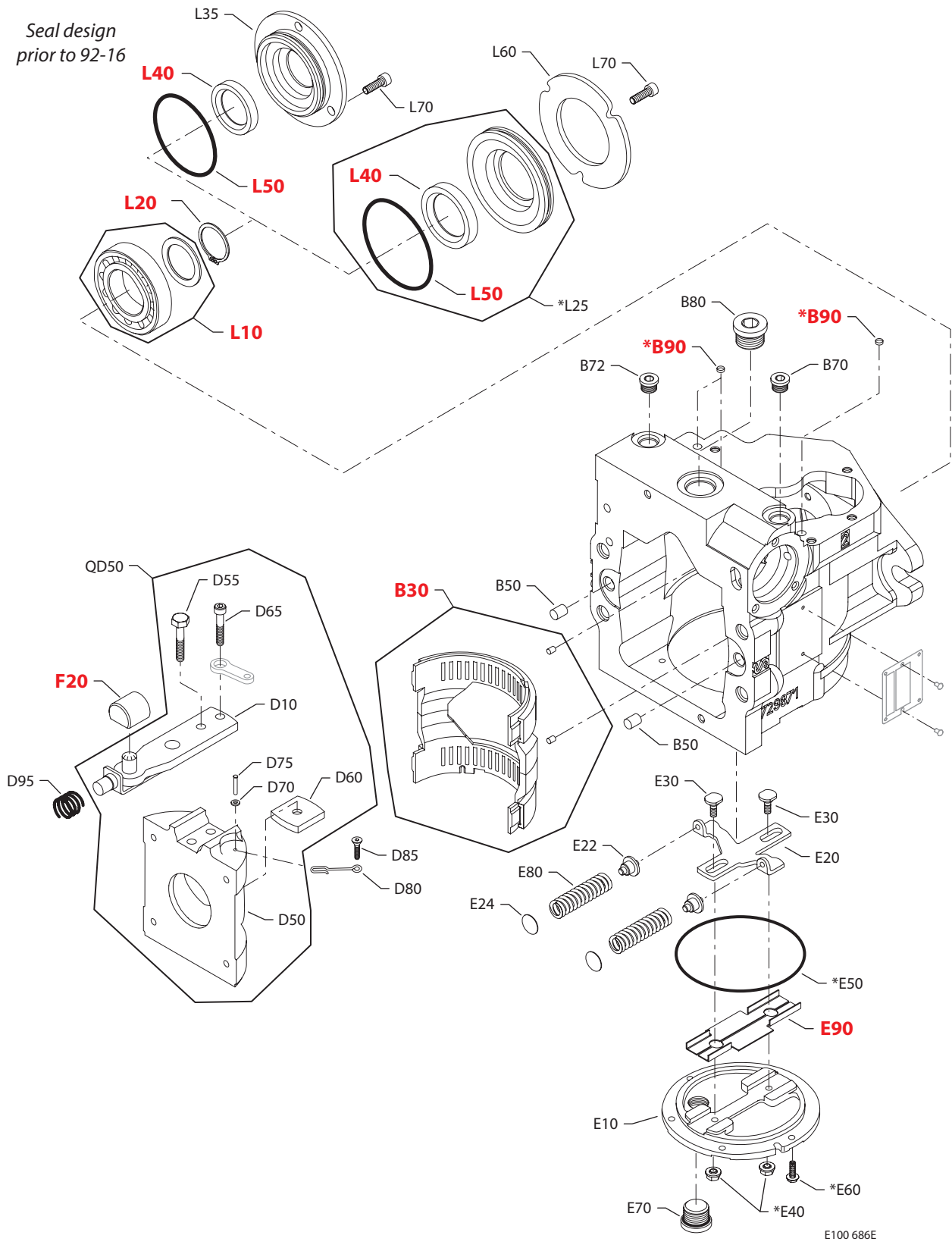
**Order Code**



P100 678E



Variable displacement pump



\* = included in overhaul seal kit Q210

Enlarged **bold** type item numbers are recommended part to stock for servicing.

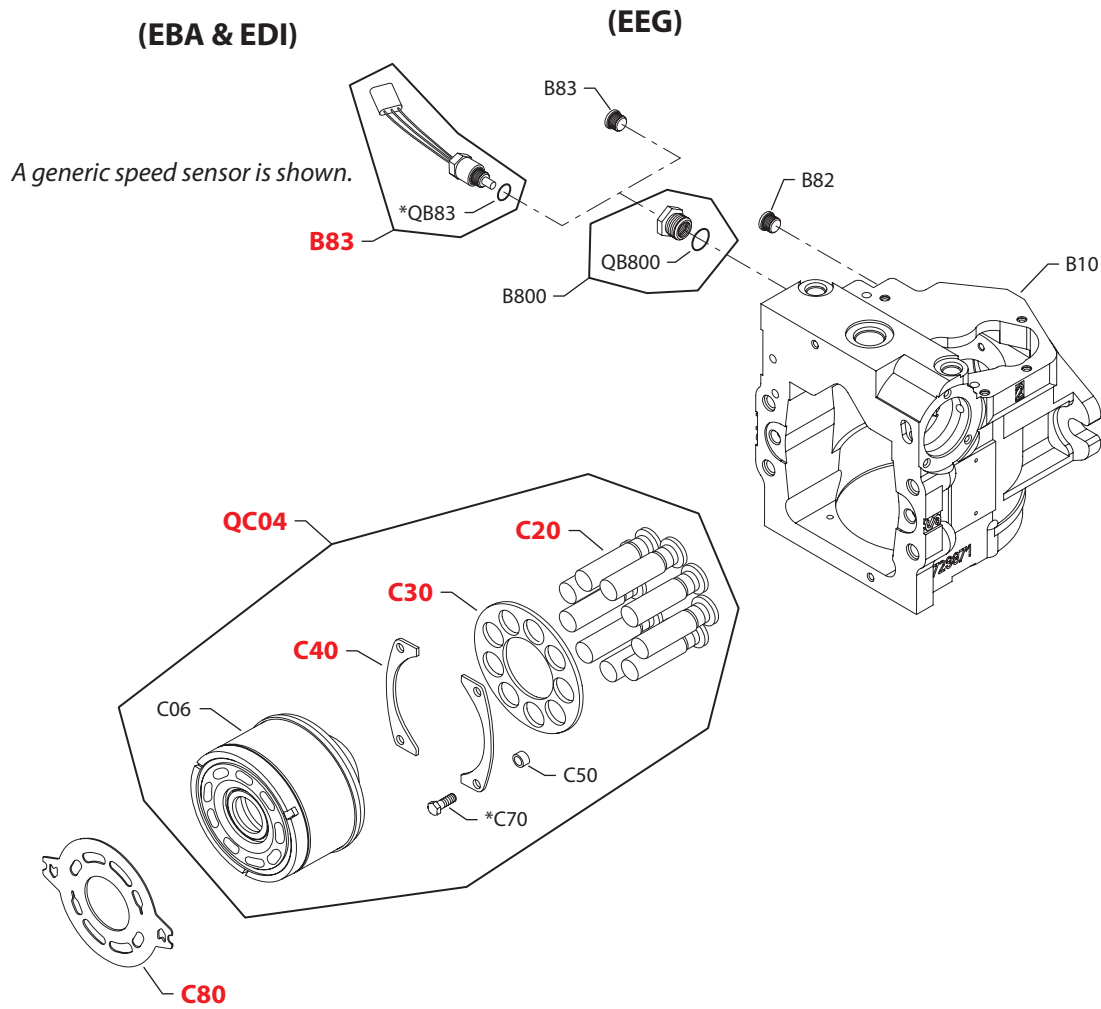



**Variable displacement pump**
**Common parts**

Order Code	Item	Date Begin	Date End	Part Number	Part Name	Qty. per Model/Kit
	B30	87-42		345124	Bearing assembly	1
	B50	87-42		9004800-3708	Pin	2
	B70	87-42		140644	Plug assembly	1
	B72	87-42		140644	Plug assembly	1
	B80	87-42		315325 (9005110-8700)	Plug assembly	1
	B90	87-42		9803390	Control filter screen	3
	D10	87-42		502976	Servo arm assembly (SB-2003-015)	1
	D50	87-42		516199	Swashplate (SB-2002-016)	1
	D55	87-42		648436	Screw	1
	D60	87-42		766014	Swashplate guide	1
	D65	87-42		354373	Fillister head screw	1
	D70	87-42		9009625-0146	Washer	1
	D75	87-42		326637	Spiral head pin	1
	D80	87-42		648402	Cage locator	1
	D85	87-42		509527	Screw	1
	D95	87-42		648675	Spring	1
	E10	96-03		501570	Side cover	1
	E10	92-16	96-02	506380	Side cover kit (SB-1992-008 & SB-1996-004)	1
	E20	87-42		731984	Leveler	1
	E22	87-42		720920	Spring seat	2
	E24	87-42		359034	Shim	2
	E30	96-07		11056529	Guide post	2
	E30	87-42	96-07	344465	Guide post (SB-1996-004)	2
	E40	87-42		517862	Seal nut	2
	E50	87-42		517376	O-ring	1
	E60	87-42		517229	Screw (SB-1994-018)	6
	E70	87-42		315325 (9005110-8700)	Plug assembly	1
	E80	87-42		332684	Spring	2
	E90	96-02		513885	Insert assembly (SB-1996-004 & SB-1999-041)	1
	F20	87-42		648303	Slider block	1
	L10	92-16		11018482	Bearing	1
	L10	87-42	92-15	690305	Bearing (SB-1992-008)	1
	L20	92-16		9006300-0137	Retaining ring	1
	L20	87-42	92-15	392134	Retaining ring (SB-1992-008)	1
	L25	92-16		11060010	Seal carrier assembly	1
	L35	87-42	92-15	689521	Seal carrier (SB-1992-008)	1
	L40	10-33		11013519	Lip seal	1
	L40	92-16	10-32	9008000-0118	Lip seal	1
	L40	87-42	92-15	510390	Lip seal (SB-1992-008)	1
	L50	92-16		780247	O-ring	1
	L50	87-42	92-15	552224 (9004104-0360)	O-ring (SB-1992-008)	1
	L60	92-16		516763	Retainer plate (SB-1992-008)	1
	L70	92-16		745208	Screw	3
	L70	87-42	92-15	672493 (9007210-0604)	Screw (SB-1992-008)	3
	QD50	87-42		365957	Swashplate kit	1



Variable displacement pump



E101 851E

\* = included in overhaul seal kit Q210

Enlarged **bold** type item numbers are recommended part to stock for servicing.


**Variable displacement pump**
**Special hardware**

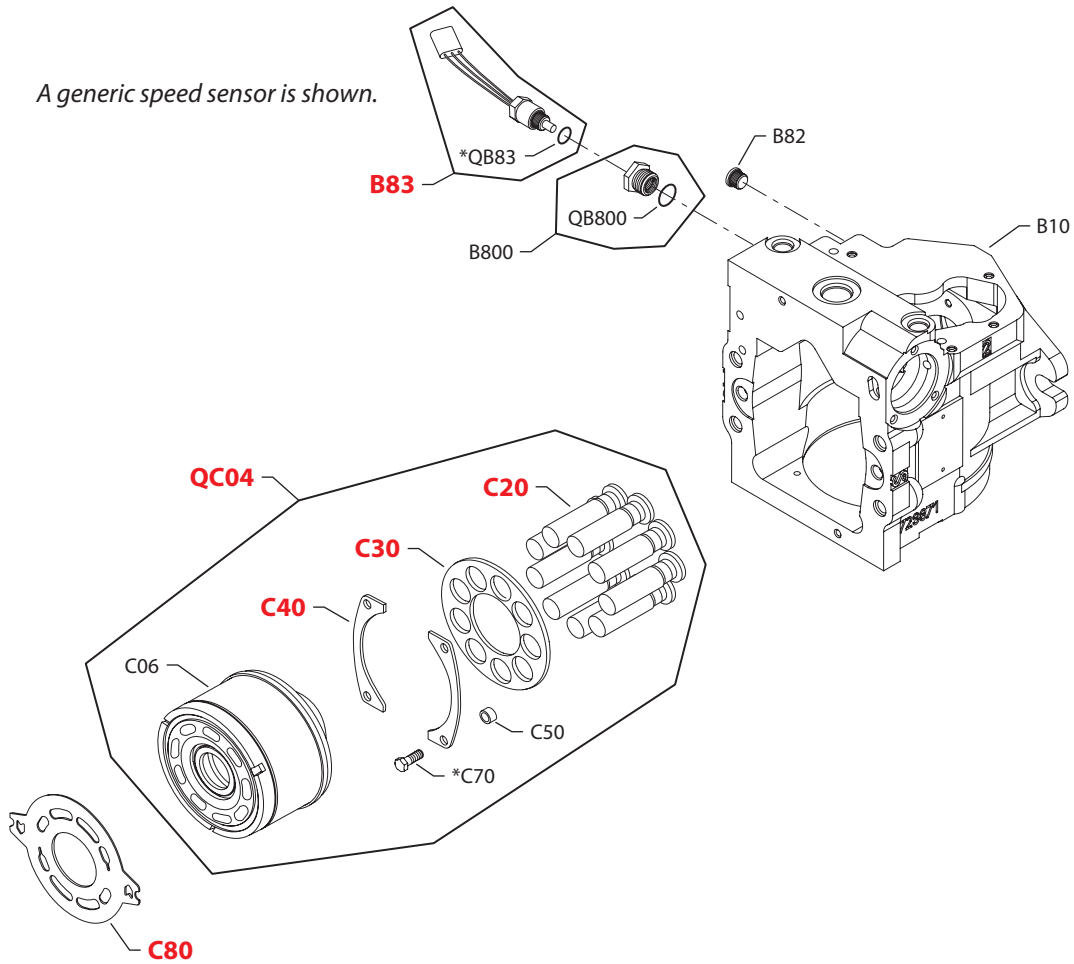
Order Code	Item	Date Begin	Date End	Part Number	Part Name	Qty. per Model/Kit
EBA	B10	06-24		510143	Housing	1
	B82	06-24		140644	Plug assembly	1
	B83	06-24		KPPG13408	Speed sensor	1
	B800	06-24		519414	Reducer plug assembly	1
	C06	06-24		11094174	Cylinder block assembly with speed ring	1
	C20	06-24		706101	Piston assembly (SB1988-023)	9
	C30	06-24		11067347	Slipper guide	1
	C40	06-24		321612	Slipper guide bearing	2
	C50	06-24		367631	Spacer	4
	C70	06-24		648477	Screw	4
	C80	06-24		11015183	Valve plate	1
	QB83	06-24		085043 (9004201-3700)	O-ring	1
	QB800	06-24		012567	O-ring	1
	QC04	06-24		11097869	Cylinder block kit with speed ring	1
	EDI	B10	00-29		510143	Housing
B82		00-29		140644	Plug assembly	1
B83		00-29		KPPG15408	Speed sensor	1
B800		00-29		519414	Reducer plug assembly	1
C06		00-29		11094174	Cylinder block assembly with speed ring	1
C20		00-29		706101	Piston assembly (SB1988-023)	9
C30		00-29		11067347	Slipper guide	1
C40		00-29		321612	Slipper guide bearing	2
C50		00-29		367631	Spacer	4
C70		00-29		648477	Screw	4
C80		00-29		11018107	Valve plate, CW	1
C80		00-29		11018106	Valve plate, CCW	1
QB83		00-29		085043 (9004201-3700)	O-ring	1
QB800		00-29		012567	O-ring	1
QC04		00-29		11097869	Cylinder block kit with speed ring	1
EEG	B10	00-13		510143	Housing	1
	B82	00-13		140644	Plug assembly	1
	B83	00-13		140644	Plug assembly	1
	B800	00-13		519414	Reducer plug assembly	1
	C06	00-13		11094174	Cylinder block assembly with speed ring	1
	C20	00-13		706101	Piston assembly (SB1988-023)	9
	C30	00-13		11067347	Slipper guide	1
	C40	00-13		321612	Slipper guide bearing	2
	C50	00-13		367631	Spacer	4
	C70	00-13		648477	Screw	4
	C80	00-13		11018107	Valve plate, CW	1
	C80	00-13		11018106	Valve plate, CCW	1
	QB800	00-13		012567	O-ring	1
	QC04	00-13		11097869	Cylinder block kit with speed ring	1



Variable displacement pump

(EFC, EFD & EFI)

A generic speed sensor is shown.



E101 850E

\* = included in overhaul seal kit Q210

Enlarged **bold** type item numbers are recommended part to stock for servicing.


**Variable displacement pump**
**Special hardware**

Order Code	Item	Date Begin	Date End	Part Number	Part Name	Qty. per Model/Kit
EFC	B10	04-14		510143	Housing	1
	B82	04-14		140644	Plug assembly	1
	B83	04-14		KPPG156	Speed sensor	1
	B800	04-14		519414	Reducer plug assembly	1
	C06	04-14		11094174	Cylinder block assembly with speed ring	1
	C20	04-14		706101	Piston assembly (SB1988-023)	9
	C30	04-14		11067347	Slipper guide	1
	C40	04-14		321612	Slipper guide bearing	2
	C50	04-14		367631	Spacer	4
	C70	04-14		648477	Screw	4
	C80	04-14		11015183	Valve plate	1
	QB83	04-14		085043 (9004201-3700)	O-ring	1
	QB800	04-14		012567	O-ring	1
	QC04	04-14		11097869	Cylinder block kit with speed ring	1
	EFD	B10	97-30	12-36	510143	Housing
B82		97-30	12-36	140644	Plug assembly	1
B83		97-30	12-36	KPPG156	Speed sensor	1
B800		97-30	12-36	519414	Reducer plug assembly	1
C06		97-30	12-36	11094174	Cylinder block assembly with speed ring	1
C20		97-30	12-36	706101	Piston assembly (SB1988-023)	9
C30		97-30	12-36	11067347	Slipper guide	1
C40		97-30	12-36	321612	Slipper guide bearing	2
C50		97-30	12-36	367631	Spacer	4
C70		97-30	12-36	648477	Screw	4
C80		97-30	12-36	11015184	Valve plate	1
E82		97-30	12-36	706853	Spring	1
QB83		97-30	12-36	085043 (9004201-3700)	O-ring	1
QB800		97-30	12-36	012567	O-ring	1
QC04		97-30	12-36	11097869	Cylinder block kit with speed ring	1
EFI	B10	98-12		510143	Housing	1
	B82	98-12		140644	Plug assembly	1
	B83	98-12		KPPG156	Speed sensor	1
	B800	98-12		519414	Reducer plug assembly	1
	C06	98-12		11094174	Cylinder block assembly with speed ring	1
	C20	98-12		706101	Piston assembly (SB1988-023)	9
	C30	98-12		11067347	Slipper guide	1
	C40	98-12		321612	Slipper guide bearing	2
	C50	98-12		367631	Spacer	4
	C70	98-12		648477	Screw	4
	C80	98-12		11018107	Valve plate, CW	1
	C80	98-12		11018106	Valve plate, CCW	1
	QB83	98-12		085043 (9004201-3700)	O-ring	1
	QB800	98-12		012567	O-ring	1
	QC04	98-12		11097869	Cylinder block kit with speed ring	1

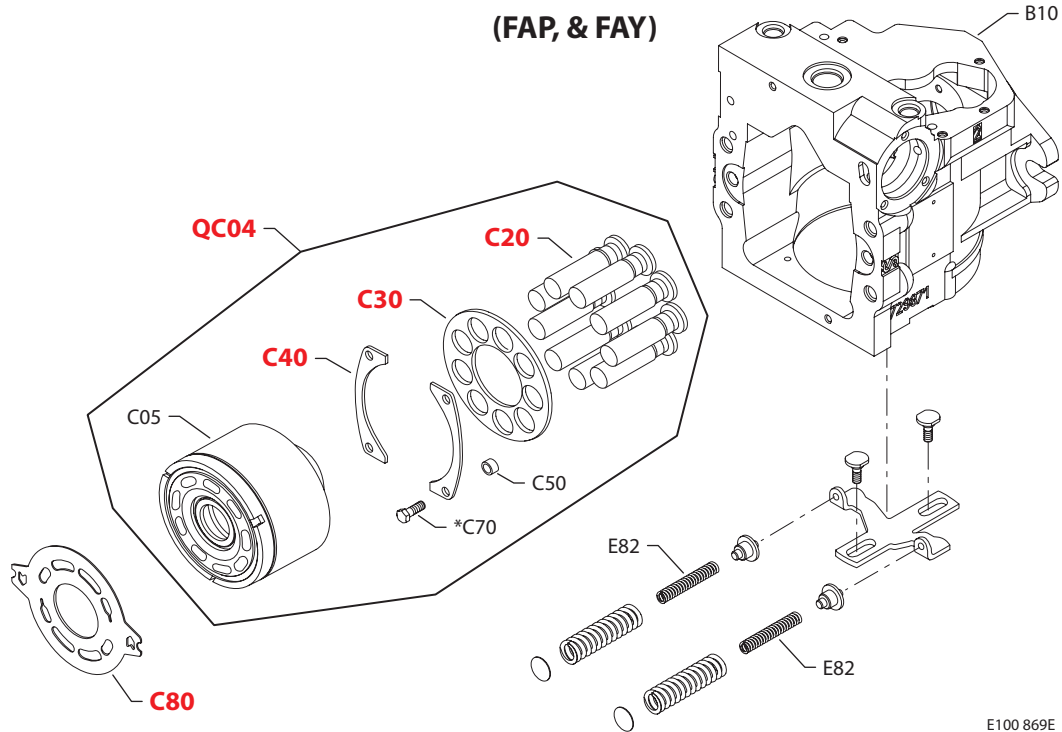
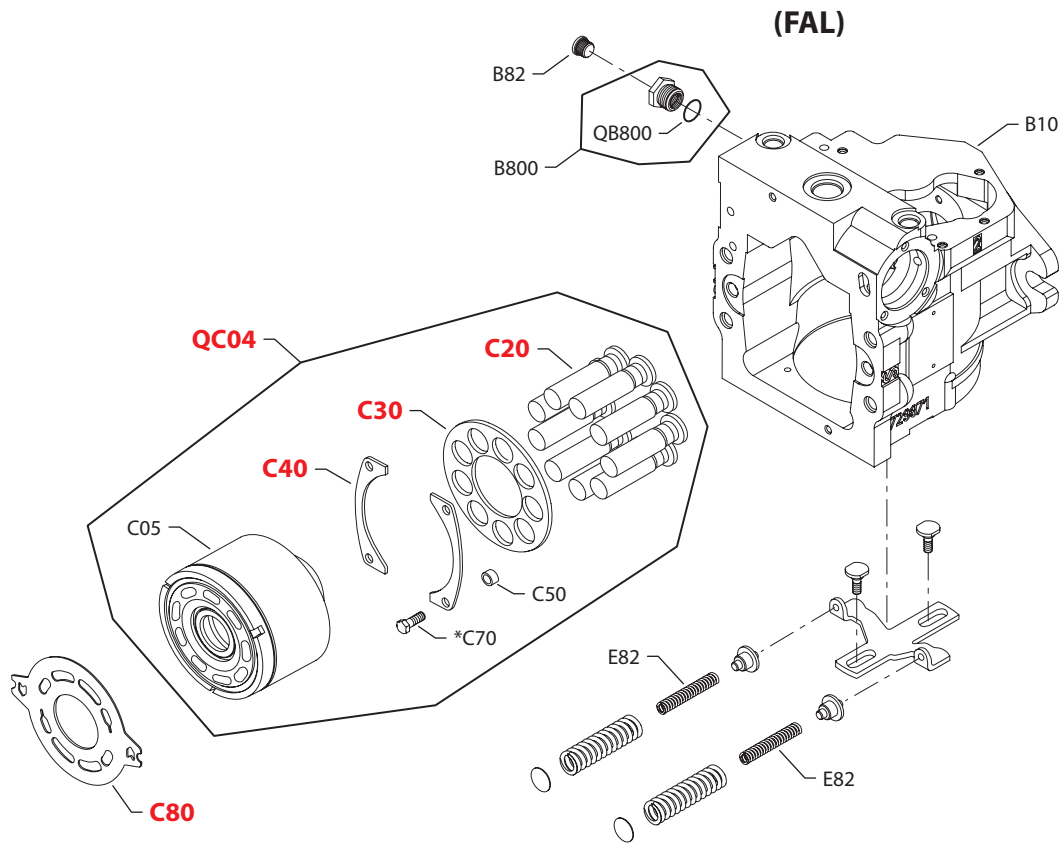



**Variable displacement pump**
**Special hardware**

Order Code	Item	Date Begin	Date End	Part Number	Part Name	Qty. per Model/Kit
EFU	B10	13-40		510143	Housing	1
	B82	13-40		140644	Plug assembly	1
	B83	13-40		KPPG156	Speed sensor	1
	B800	13-40		519414	Reducer plug assembly	1
	C06	13-40		11094174	Cylinder block assembly with speed ring	1
	C20	13-40		706101	Piston assembly (SB1988-023)	9
	C30	13-40		11067347	Slipper guide	1
	C40	13-40		321612	Slipper guide bearing	2
	C50	13-40		367631	Spacer	4
	C70	13-40		648477	Screw	4
	C80	13-40		11018107	Valve plate, CW	1
	QB83	13-40		085043 (9004201-3700)	O-ring	1
	QB800	13-40		012567	O-ring	1
	QC04	13-40		11097869	Cylinder block kit with speed ring	1
FAB	B10	95-15		510142	Housing	1
	C05	87-42		763920	Cylinder block assembly without speed ring	1
	C20	87-42		706101	Piston assembly (SB1988-023)	9
	C30	87-42		11067347	Slipper guide	1
	C40	87-42		321612	Slipper guide bearing	2
	C50	87-42		367631	Spacer	4
	C70	87-42		648477	Screw	4
	C80	87-42		11017476	Valve plate	1
	E82	87-42		706853	Spring	2
	QC04	87-42		510303 (80520S07)	Cylinder block kit	1
	FAC	B10	95-15		510142	Housing (SB-1992-008 and SB-1995-006)
C05		87-42		763920	Cylinder block assembly without speed ring	1
C20		87-42		706101	Piston assembly (SB1988-023)	9
C30		87-42		11067347	Slipper guide	1
C40		87-42		321612	Slipper guide bearing	2
C50		87-42		367631	Spacer	4
C70		87-42		648477	Screw	4
C80		87-42		11015184	Valve plate	1
E82		87-42		706853	Spring	2
QC04		87-42		510303 (80520S07)	Cylinder block kit (SB-1993-012)	1
FAD		B10	95-15		510142	Housing (SB-1992-008 and SB-1995-006)
	C05	87-42		763920	Cylinder block assembly without speed ring	1
	C20	87-42		706101	Piston assembly (SB1988-023)	9
	C30	87-42		11067347	Slipper guide	1
	C40	87-42		321612	Slipper guide bearing	2
	C50	87-42		367631	Spacer	4
	C70	87-42		648477	Screw	4
	C80	87-42		11015183	Valve plate	1
	E82	87-42		706853	Spring	2
	S07	87-42		510303 (80520S07)	Cylinder block kit (SB-1993-012)	1



Variable displacement pump



E100 869E

\* = included in overhaul seal kit Q210

Enlarged **bold** type item numbers are recommended part to stock for servicing.

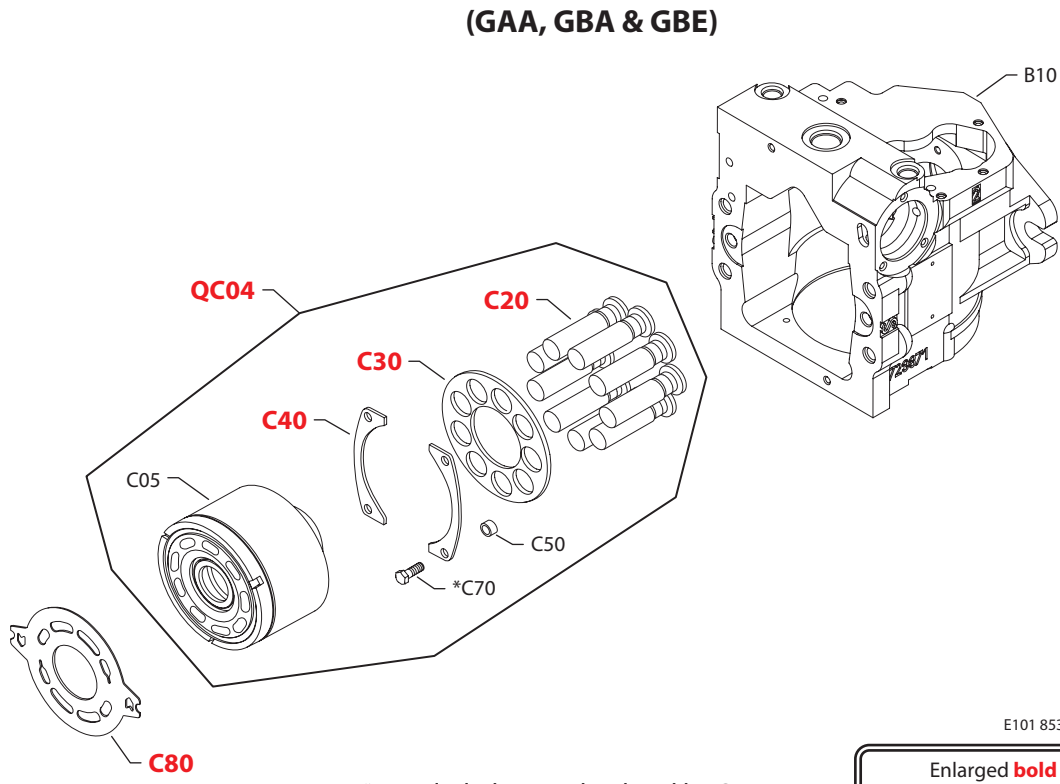
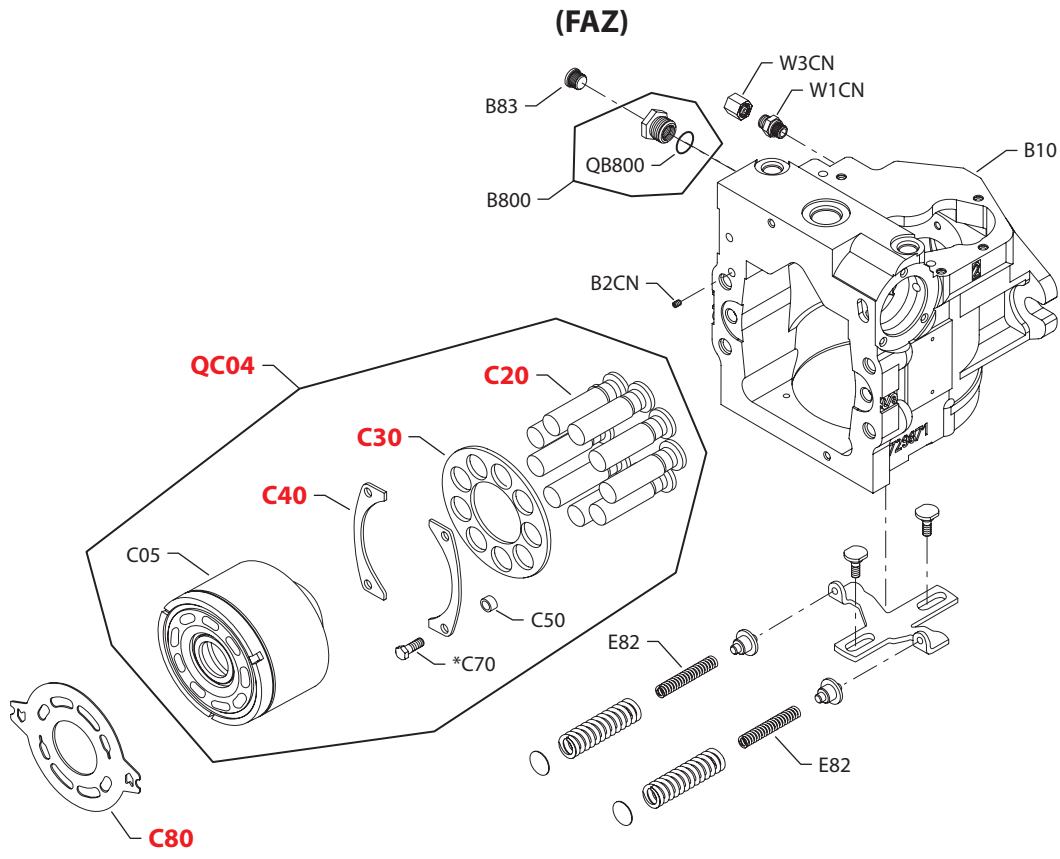



**Variable displacement pump**
**Special hardware**

Order Code	Item	Date Begin	Date End	Part Number	Part Name	Qty. per Model/Kit
FAL	B10	95-15		510143	Housing	1
	B82	95-15		140644	Plug assembly	1
	B83	95-15		140644	Plug assembly	1
	B800	95-15		519414	Reducer plug assembly	1
	C05	95-15		763920	Cylinder block assembly without speed ring	1
	C20	95-15		706101	Piston assembly (SB1988-023)	9
	C30	95-15		11067347	Slipper guide	1
	C40	95-15		321612	Slipper guide bearing	2
	C50	95-15		367631	Spacer	4
	C70	95-15		648477	Screw	4
	C80	95-15		11017476	Valve plate	1
	E82	95-15		706853	Spring	2
	QB800	95-15		012567	O-ring	1
	QC04	95-15		510303 (80520S07)	Cylinder block kit	1
FAP	B10	98-03		510142	Housing	1
	C05	98-03		763920	Cylinder block assembly without speed ring	1
	C20	98-03		706101	Piston assembly (SB1988-023)	9
	C30	98-03		11067347	Slipper guide	1
	C40	98-03		321612	Slipper guide bearing	2
	C50	98-03		367631	Spacer	4
	C70	98-03		648477	Screw	4
	C80	98-03		11018107	Valve plate, CW	1
	E82	98-03		706853	Spring	2
	QC04	98-03		510303 (80520S07)	Cylinder block kit	1
FAY	B10	95-15		510142	Housing	1
	C05	87-42		763920	Cylinder block assembly without speed ring	1
	C20	87-42		706101	Piston assembly (SB1988-023)	9
	C30	87-42		11067347	Slipper guide	1
	C40	87-42		321612	Slipper guide bearing	2
	C50	87-42		367631	Spacer	4
	C70	87-42		648477	Screw	4
	C80	87-42		11015183	Valve plate	1
	E82	87-42		706853	Spring	2
	QC04	87-42		510303 (80520S07)	Cylinder block kit	1



Variable displacement pump



E101 853E

\* = included in overhaul seal kit Q210

Enlarged **bold** type item numbers are recommended part to stock for servicing.

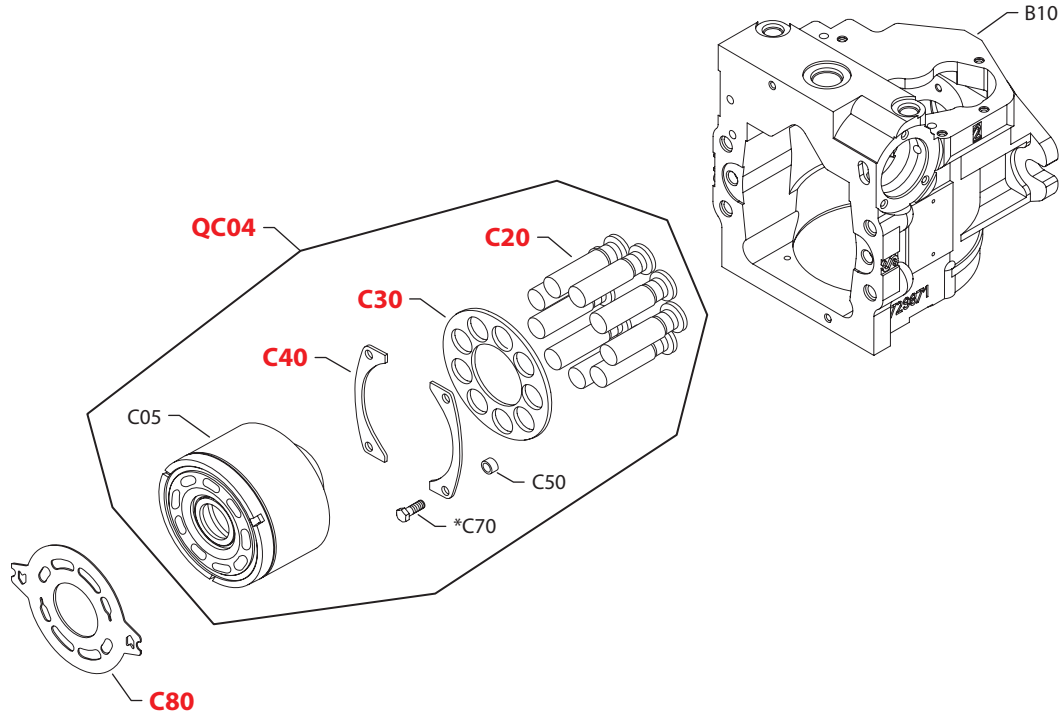

**Variable displacement pump**
**Special hardware**

Order Code	Item	Date Begin	Date End	Part Number	Part Name	Qty. per Model/Kit
FAZ	B10	07-27		510143	Housing	1
	B2CN	07-27		775312	Set screw	1
	B83	07-27		140644	Plug assembly	1
	B800	07-27		519414	Reducer plug assembly	1
	C05	07-27		763920	Cylinder block assembly without speed ring	1
	C20	07-27		706101	Piston assembly	9
	C30	07-27		11067347	Slipper guide	1
	C40	07-27		321612	Slipper guide bearing	2
	C50	07-27		367631	Spacer	4
	C70	07-27		648477	Screw	4
	C80	07-27		11015184	Valve plate	1
	E82	07-27		706853	Spring	2
	QB800	07-27		012567	O-ring	1
	QC04	07-27		510303 (80520S07)	Cylinder block kit	1
	W1CN	07-27		723726	Connector	1
	W3CN	07-27		574095	Cap	1
GAA	B10	87-42		510142	Housing (SB-1992-008 and SB-1995-006)	1
	C05	87-42		763920	Cylinder block assembly without speed ring	1
	C20	87-42		706101	Piston assembly	9
	C30	87-42		11067347	Slipper guide	1
	C40	87-42		321612	Slipper guide bearing	2
	C50	87-42		367631	Spacer	4
	C70	87-42		648477	Screw	4
	C80	87-42		11017474	Valve plate	1
	QC04	87-42		510303 (80520S07)	Cylinder block kit (SB-1993-012)	1
	GBA	B10	87-42		510142	Housing (SB-1992-008 and SB-1995-006)
C05		87-42		763920	Cylinder block assembly without speed ring	1
C20		87-42		706101	Piston assembly	9
C30		87-42		11067347	Slipper guide	1
C40		87-42		321612	Slipper guide bearing	2
C50		87-42		367631	Spacer	4
C70		87-42		648477	Screw	4
C80		87-42		11015183	Valve plate	1
QC04		87-42		510303 (80520S07)	Cylinder block kit (SB-1993-012)	1
GBE		B10	94-45		510142	Housing (SB-1992-008 and SB-1995-006)
	C05	94-45		763920	Cylinder block assembly without speed ring	1
	C20	94-45		706101	Piston assembly	9
	C30	94-45		11067347	Slipper guide	1
	C40	94-45		321612	Slipper guide bearing	2
	C50	94-45		367631	Spacer	4
	C70	94-45		648477	Screw	4
	C80	94-45		11015183	Valve plate	1
	QC04	94-45		510303 (80520S07)	Cylinder block kit (SB-1993-012)	1



Variable displacement pump

(GBH, GBV, GCA,  
GCP & GLA)



E100 870E

\* = included in overhaul seal kit Q210

Enlarged **bold** type item numbers are recommended part to stock for servicing.

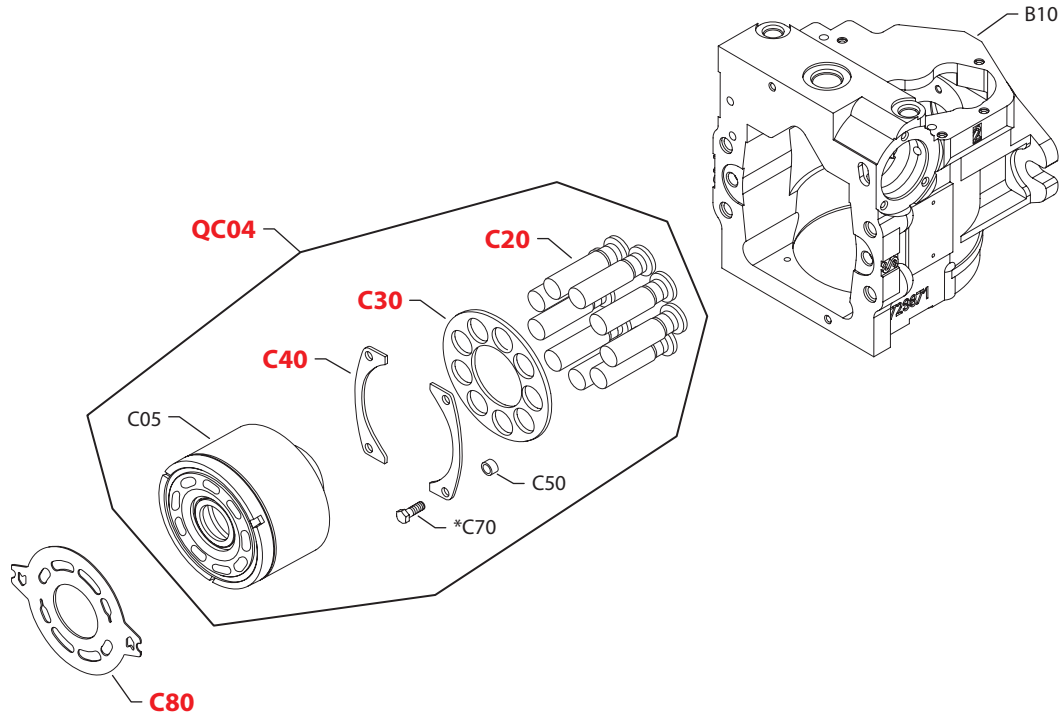

**Variable displacement pump**
**Special hardware**

Order Code	Item	Date Begin	Date End	Part Number	Part Name	Qty. per Model/Kit
GBH	B10	97-44		510144	Housing (SB-1992-008 and SB-1995-006)	1
	C05	97-44		763920	Cylinder block assembly without speed ring	1
	C20	97-44		706101	Piston assembly	9
	C30	97-44		11067347	Slipper guide	1
	C40	97-44		321612	Slipper guide bearing	2
	C50	97-44		367631	Spacer	4
	C70	97-44		648477	Screw	4
	C80	97-44		11015183	Valve plate	1
	QC04	97-44		510303 (80520S07)	Cylinder block kit (SB-1993-012)	1
GBV	B10	00-13		510142	Housing (SB-1992-008 and SB-1995-006)	1
	C05	00-13		763920	Cylinder block assembly without speed ring	1
	C20	00-13		706101	Piston assembly	9
	C30	00-13		11067347	Slipper guide	1
	C40	00-13		321612	Slipper guide bearing	2
	C50	00-13		367631	Spacer	4
	C70	00-13		648477	Screw	4
	C80	00-13		11015183	Valve plate	1
	QC04	00-13		510303 (80520S07)	Cylinder block kit (SB-1993-012)	1
GCA	B10	95-14		510142	Housing (SB-1992-008 and SB-1995-006)	1
	C05	87-42		763920	Cylinder block assembly without speed ring	1
	C20	87-42		706101	Piston assembly	9
	C30	87-42		11067347	Slipper guide	1
	C40	87-42		321612	Slipper guide bearing	2
	C50	87-42		367631	Spacer	4
	C70	87-42		648477	Screw	4
	C80	87-42		11015184	Valve plate	1
	QC04	87-42		510303 (80520S07)	Cylinder block kit (SB-1993-012)	1
GCP	B10	95-14		510142	Housing	1
	C05	95-14		763920	Cylinder block assembly without speed ring	1
	C20	95-14		706101	Piston assembly	9
	C30	95-14		11067347	Slipper guide	1
	C40	95-14		321612	Slipper guide bearing	2
	C50	95-14		367631	Spacer	4
	C70	95-14		648477	Screw	4
	C80	95-14		11015184	Valve plate	1
	QC04	95-14		510303 (80520S07)	Cylinder block kit	1
GLA	B10	98-04		510142	Housing	1
	C05	98-04		763920	Cylinder block assembly without speed ring	1
	C20	98-04		706101	Piston assembly	9
	C30	98-04		11067347	Slipper guide	1
	C40	98-04		321612	Slipper guide bearing	2
	C50	98-04		367631	Spacer	4
	C70	98-04		648477	Screw	4
	C80	98-04		11018107	Valve plate, CW	1
	C80	98-04		11018106	Valve plate, CCW	1
	QC04	98-04		510303 (80520S07)	Cylinder block kit	1



Variable displacement pump

(JCA & JCB)



E100 870E

\* = included in overhaul seal kit Q210

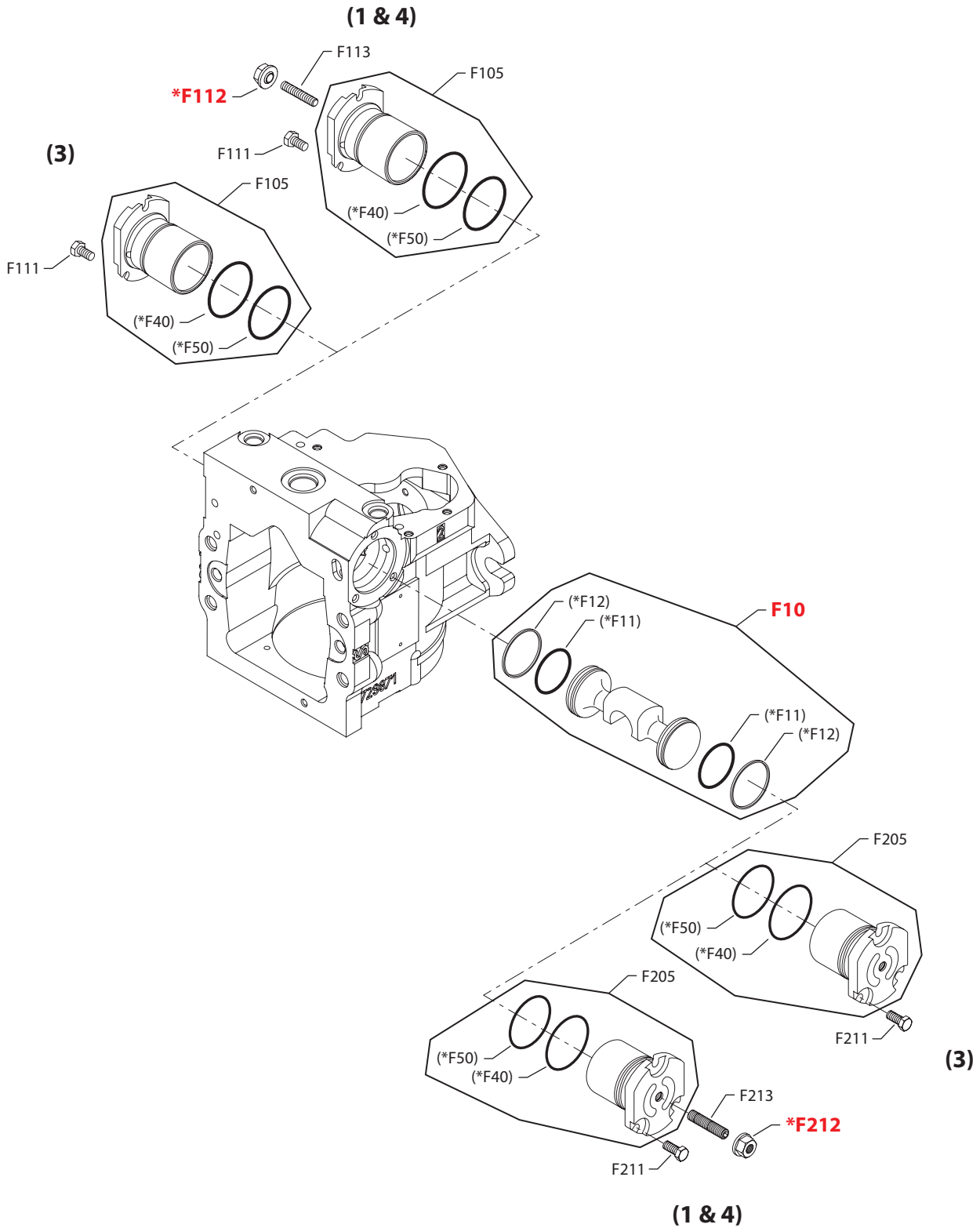
Enlarged **bold** type item numbers are recommended part to stock for servicing.


**Variable displacement pump**
**Special hardware**

Order Code	Item	Date Begin	Date End	Part Number	Part Name	Qty. per Model/Kit
JCA	B10	08-12		510142	Housing	1
	C05	08-12		763920	Cylinder block assembly without speed ring	1
	C20	08-12		706101	Piston assembly	9
	C30	08-12		11067347	Slipper guide	1
	C40	08-12		321612	Slipper guide bearing	2
	C50	08-12		367631	Spacer	4
	C70	08-12		648477	Screw	4
	C80	08-12		11015183	Valve plate	1
	QC04	08-12		510303 (80520S07)	Cylinder block kit	1
JCB	B10	09-14		510142	Housing	1
	C05	09-14		763920	Cylinder block assembly without speed ring	1
	C20	09-14		706101	Piston assembly	9
	C30	09-14		11067347	Slipper guide	1
	C40	09-14		321612	Slipper guide bearing	2
	C50	09-14		367631	Spacer	4
	C70	09-14		648477	Screw	4
	C80	09-14		11015183	Valve plate	1
	QC04	09-14		510303 (80520S07)	Cylinder block kit	1



Variable displacement pump



\* = included in overhaul seal kit Q210  
 ( ) = not available individually

Enlarged **bold** type item numbers are recommended part to stock for servicing.

E100 688E



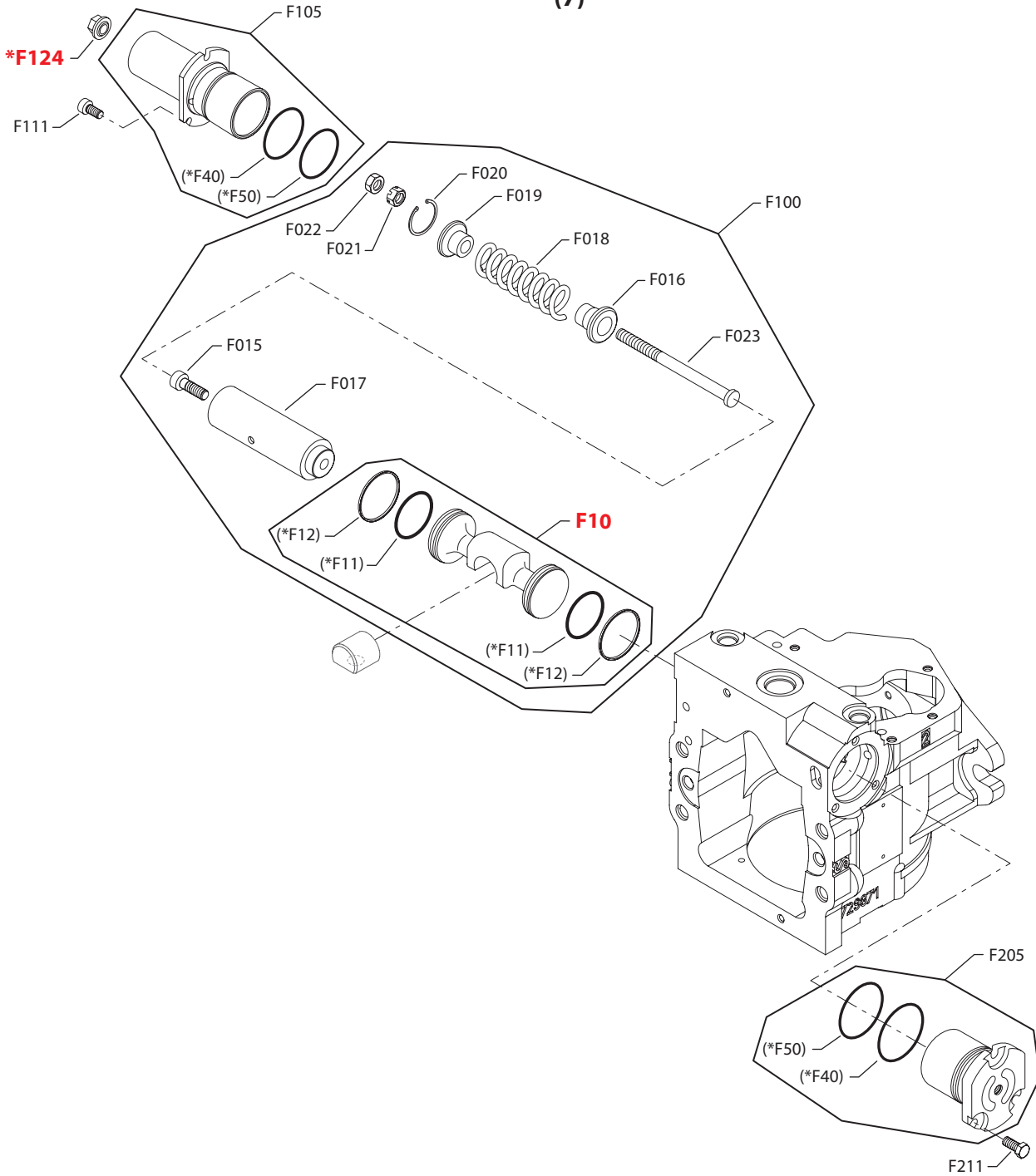

**Variable displacement pump**
**Displacement limitation**

Order Code	Item	Date Begin	Date End	Part Number	Part Name	Qty. per Model/Kit	
1	F10	01-01		11046683	Servo piston assembly	1	
	F105	01-01		11060702	Servo sleeve kit, adjustable	1	
	F111	01-01		508438	Screw	3	
	F112	01-01		505412 (9003509-0008)	Seal nut	1	
	F113	01-01		5000747	Set screw	1	
	F205	01-01		11059758	Servo sleeve kit, non-adjustable	1	
	F211	01-01		508438	Screw	3	
	3		87-42	90-50	8510089	Servo sleeve/piston replacement kit (SB-1995-005)	1
F10		90-51		11046683	Servo piston assembly	1	
F105		90-51		11059758	Servo sleeve assembly, non-adjustable	1	
F111		87-42		508438	Screw	3	
F205		90-51		11059758	Servo sleeve assembly, non-adjustable	1	
F211		87-42		508438	Screw	3	
4			87-42	90-50	8510090	Servo sleeve/piston replacement kit (SB-1995-005)	1
		F10	90-51		11046683	Servo piston assembly	1
	F105	90-51		11060702	Servo sleeve assembly, adjustable	1	
	F111	87-42		508438	Screw	3	
	F112	87-42		505412 (9003509-0008)	Seal nut	1	
	F113	87-42		5000747	Set screw	1	
	F205	90-51		11060702	Servo sleeve assembly, adjustable	1	
	F211	87-42		508438	Screw	3	
	F212	87-42		505412 (9003509-0008)	Seal nut	1	
	F213	87-42		5000747	Set screw	1	



Variable displacement pump

(7)



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 ( ) = not available individually

E101 854E  
 Enlarged **bold** type item numbers are recommended part to stock for servicing.

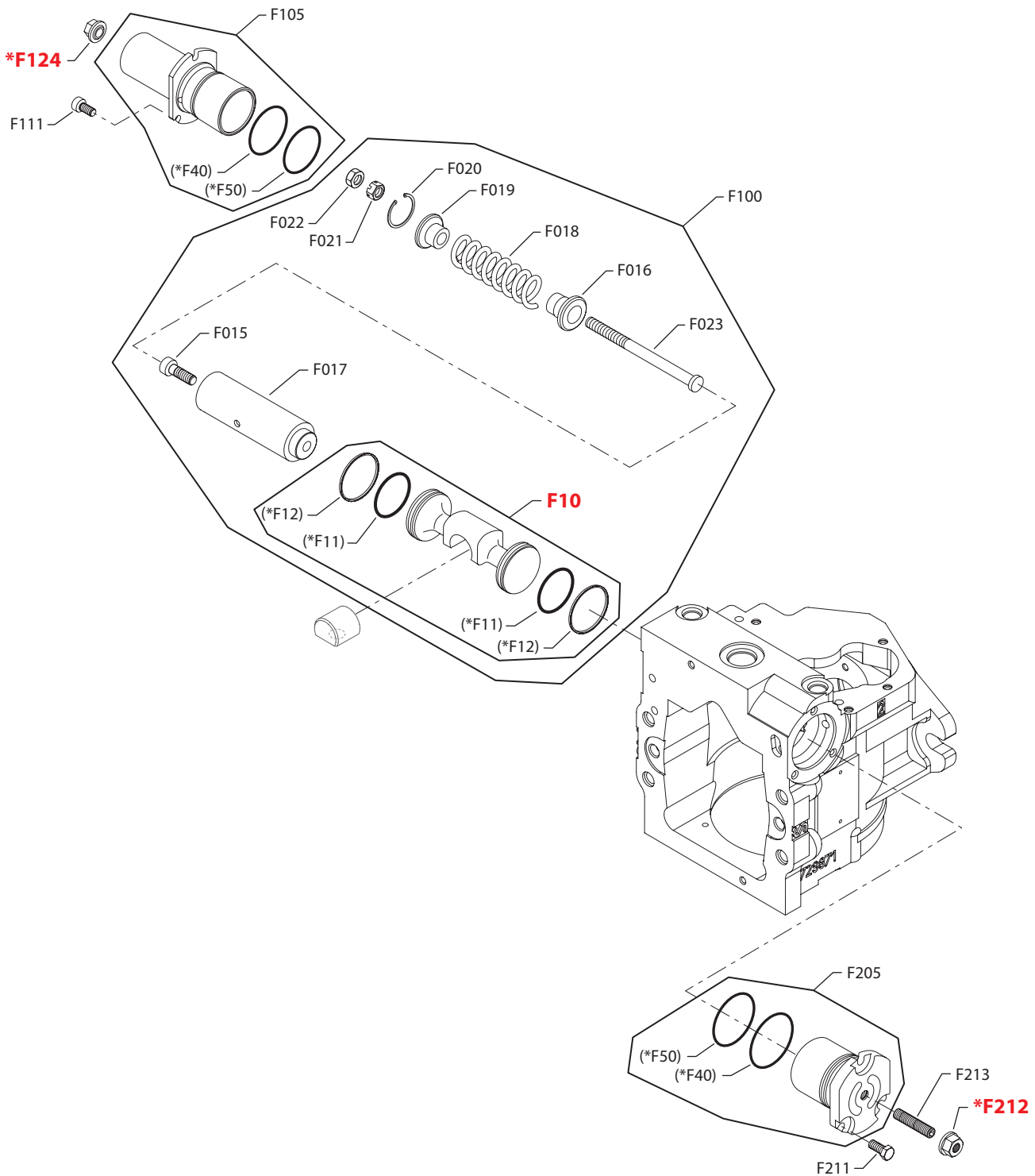

**Variable displacement pump**
**Displacement limitation**

Order Code	Item	Date Begin	Date End	Part Number	Part Name	Qty. per Model/Kit
7	F10	96-20		11046684	Servo piston assembly	1
	F015	96-20		345496	Screw	1
	F016	96-20		507098	Spring guide	1
	F017	96-20		345413	Spring housing	1
	F018	96-20		351791	Spring	1
	F019	96-20		507097	Spring guide	1
	F020	96-20		070169	Retaining ring	1
	F021	96-20		507044	Castle nut	1
	F022	96-20		345470	Hex nut	1
	F023	96-20		11140219	Adjust screw	1
	F100	96-20		513979	Servo assembly	1
	F105	96-20		11060671	Servo cylinder assembly, NFPE	1
	F111	96-20		503674	Screw	3
	F124	96-20		612291	Seal nut, M12	1
	F205	96-20		11059758	Servo cylinder assembly, non-adjustable	1
	F211	96-20		508438	Screw	3



Variable displacement pump

(D)



E101 855E

\* = included in overhaul seal kit Q210  
 ( ) = not available individually

Enlarged **bold** type item numbers are recommended part to stock for servicing.

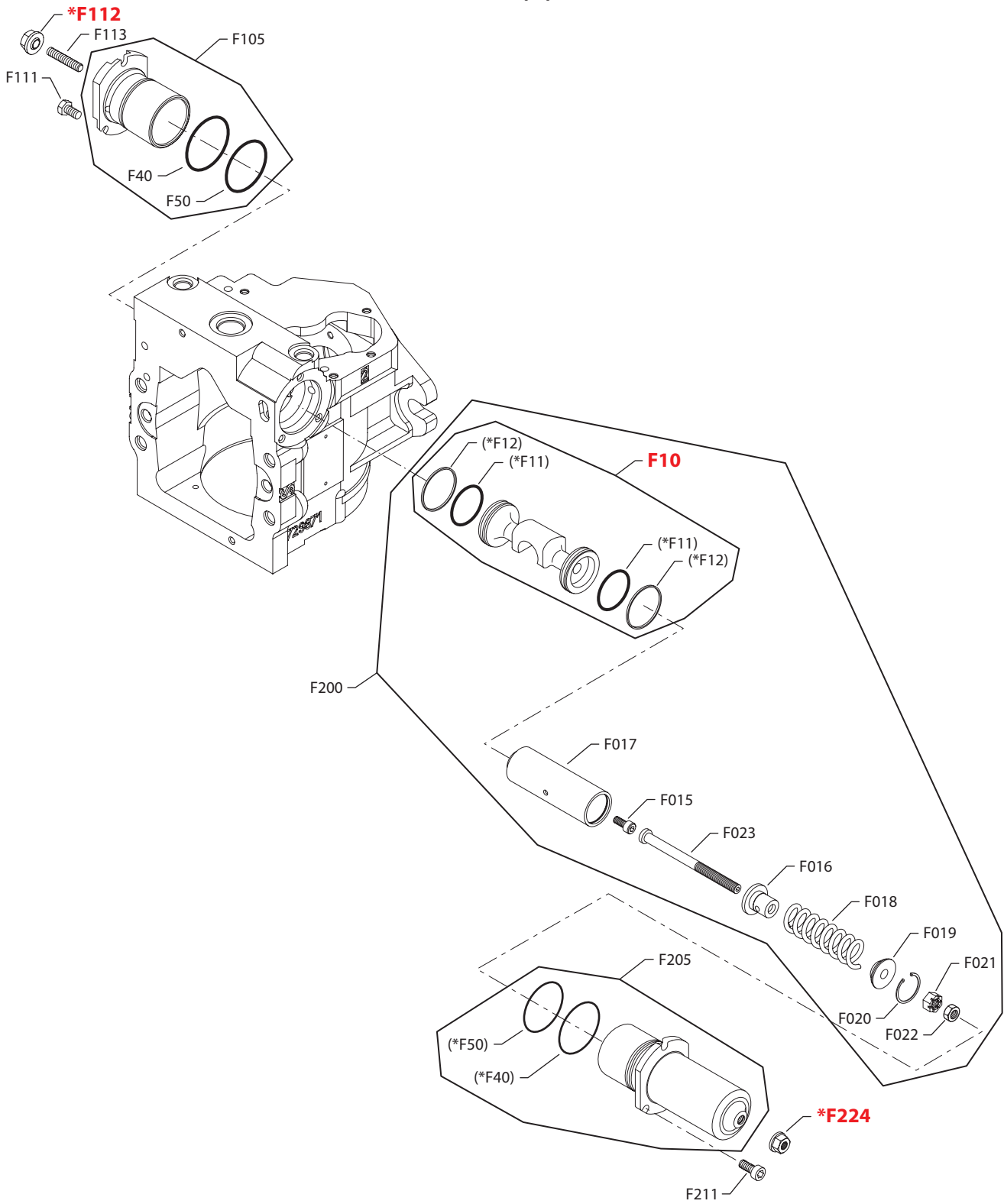

**Variable displacement pump**
**Displacement limitation**

Order Code	Item	Date Begin	Date End	Part Number	Part Name	Qty. per Model/Kit
D	F10	02-51		11046684	Servo piston assembly	1
	F015	02-51		345496	Screw	1
	F016	02-51		507098	Spring guide	1
	F017	02-51		345413	Spring housing	1
	F018	02-51		351791	Spring	1
	F019	02-51		507097	Spring guide	1
	F020	02-51		070169	Retaining ring	1
	F021	02-51		507044	Castle nut	1
	F022	02-51		345470	Hex nut	1
	F023	02-51		11140219	Adjust screw	1
	F100	02-51		513979	Servo assembly	1
	F105	02-51		11060671	Servo cylinder assembly, NFPE	1
	F111	02-51		503674	Screw	3
	F124	02-51		612291	Seal nut, M12	1
	F205	02-51		11060702	Servo cylinder assembly, non-adjustable	1
	F211	02-51		508438	Screw	3
	F212	02-51		505412	Seal nut	1
	F213	02-51		5000747	Set screw, M8 x 45	1



Variable displacement pump

(H)



E101 856E

\* = included in overhaul seal kit Q210  
 ( ) = not available individually

Enlarged **bold** type item numbers are recommended part to stock for servicing.

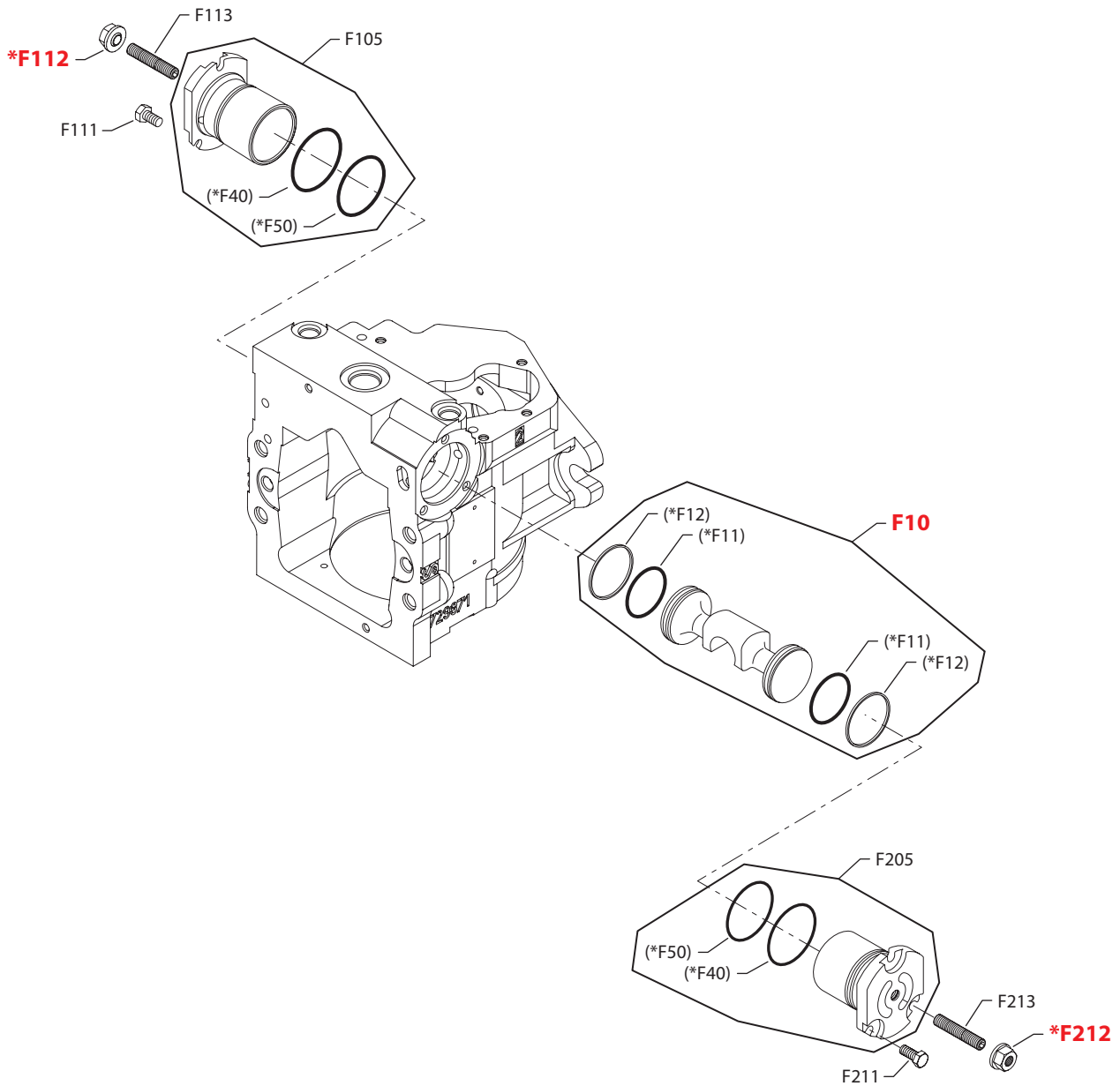

**Variable displacement pump**
**Displacement limitation**

Order Code	Item	Date Begin	Date End	Part Number	Part Name	Qty. per Model/Kit
H	F10	98-18		11046684	Servo piston assembly	1
	F015	98-18		345496	Screw	1
	F016	98-18		507098	Spring guide	1
	F017	98-18		345413	Spring housing	1
	F018	98-18		351791	Spring	1
	F019	98-18		507097	Spring guide	1
	F020	98-18		070169	Retaining ring	1
	F021	98-18		507044	Castle nut	1
	F022	98-18		345470	Hex nut	1
	F023	98-18		11140219	Adjust screw	1
	F105	98-18		11060702	Servo cylinder assembly, non-adjustable	1
	F111	98-18		508438	Screw	3
	F112	98-18		505412	Seal nut	1
	F113	98-18		5000747	Set screw, M8 x 45	1
	F200	98-18		513979	Servo assembly	1
	F205	98-18		11060671	Servo cylinder assembly, NFPE	1
	F211	98-18		503674	Screw	3
	F224	98-18		612291	Seal nut, M12	1



Variable displacement pump

(P)



E101 857E

\* = included in overhaul seal kit Q210  
 ( ) = not available individually

Enlarged **bold** type item numbers are recommended part to stock for servicing.





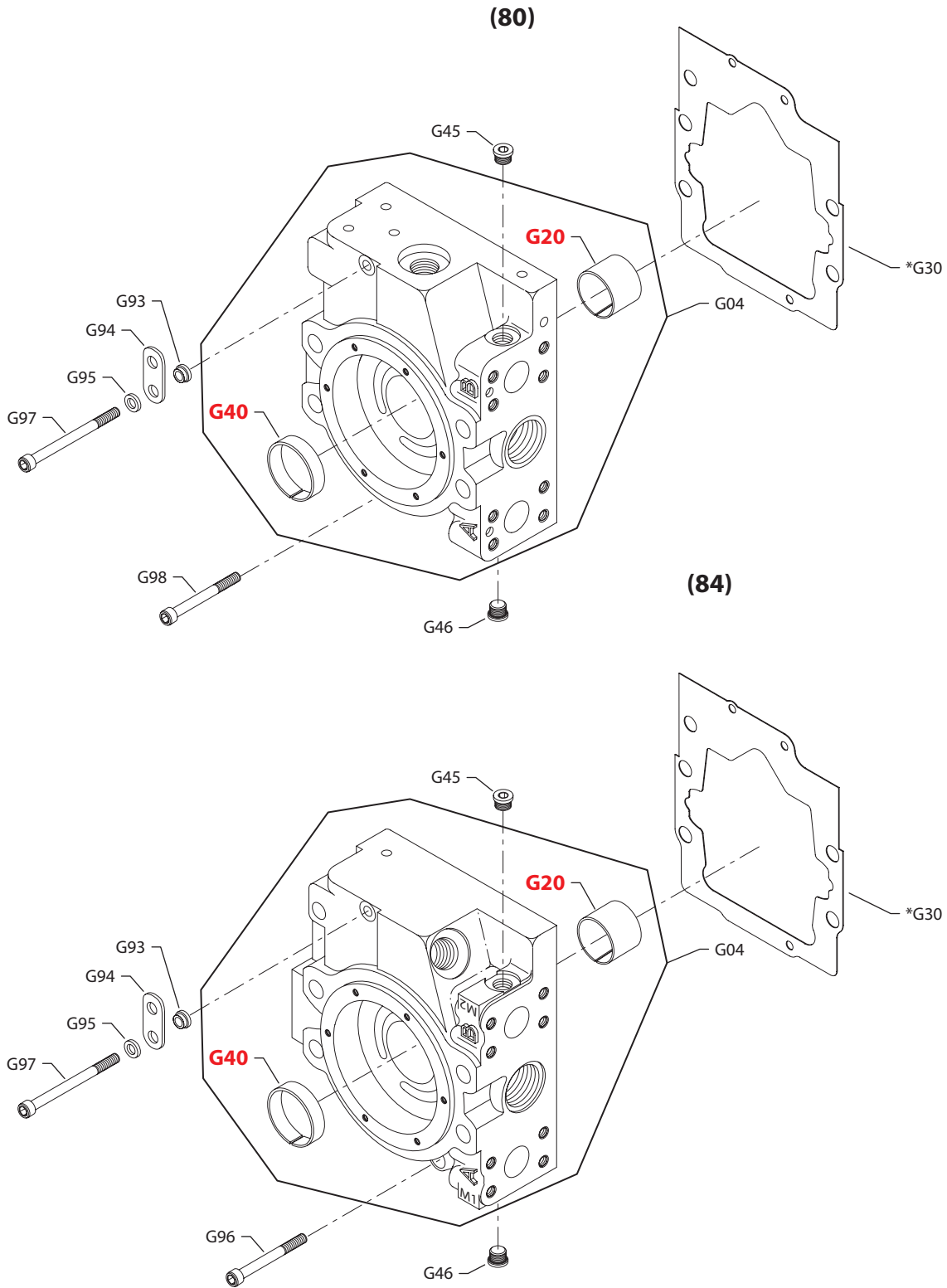
**Variable displacement pump**

**Displacement limitation**

Order Code	Item	Date Begin	Date End	Part Number	Part Name	Qty. per Model/Kit
P	F10	02-06		11046683	Servo piston assembly	1
	F105	02-06		11060702	Servo sleeve assembly, adjustable	1
	F111	02-06		508438	Screw	3
	F112	02-06		505412 (9003509-0008)	Seal nut	1
	F113	02-06		719401	Set screw, M8 x 50	1
	F205	02-06		11060702	Servo sleeve assembly, adjustable	1
	F211	02-06		508438	Screw	3
	F212	02-06		505412 (9003509-0008)	Seal nut	1
	F213	02-06		719401	Set screw, M8 x 50	1



Variable displacement pump



E100 689E

\* = included in overhaul seal kit Q210

Enlarged **bold** type item numbers are recommended part to stock for servicing.



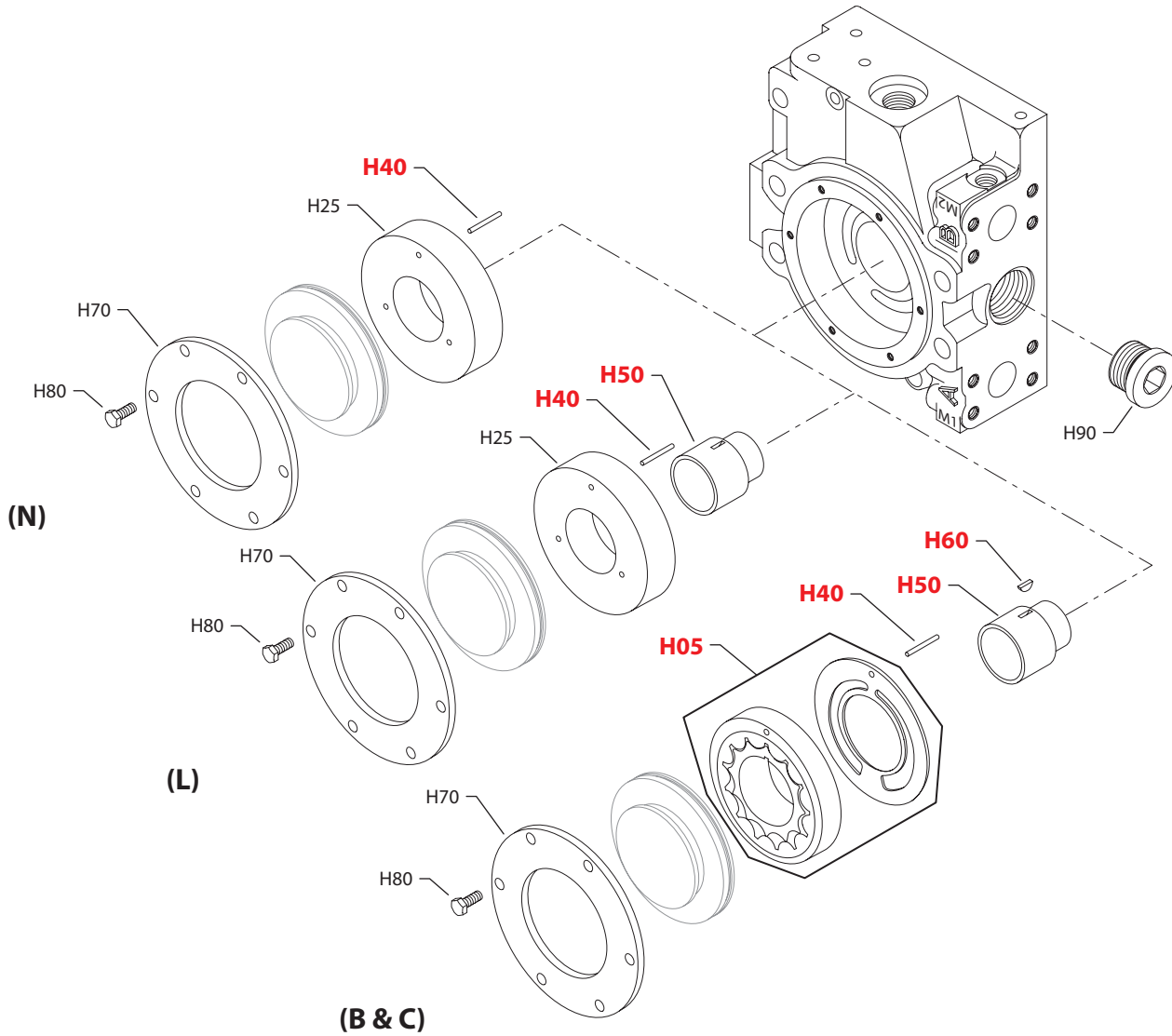
**Variable displacement pump**

**End cap**

Order Code	Item	Date Begin	Date End	Part Number	Part Name	Qty. per Model/Kit
80	G04	92-16		506785	End cap, twin ports (SB-1995-006)	1
	G20	92-16		343830	Jounal bearing (SB-1992-008)	1
	G20	87-42	92-15	648030	Jounal bearing	1
	G30	89-17		512833	End cap gasket	1
	G40	87-42		648055	Bushing	1
	G45	89-17		140644	Plug assembly	1
	G46	89-17		140644	Plug assembly	1
	G93	89-17		511930	Spacer	1
	G94	89-17		8800565	Lifting bracket	1
	G95	89-17		086637	Washer	1
	G97	92-16		511937	Screw	1
	G97	89-17	92-15	508994	Screw	1
	G98	89-17		354407	Screw	1\
	84	G04	04-48	13-28	506786	End cap, twin ports
G20		04-48	13-28	343830	Jounal bearing	1
G30		04-48	13-28	512833	End cap gasket	1
G40		04-48	13-28	648055	Bushing	1
G45		04-48	13-28	140644	Plug assembly	1
G46		04-48	13-28	140644	Plug assembly	1
G93		04-48	13-28	511930	Spacer	1
G94		04-48	13-28	8800565	Lifting bracket	1
G95		04-48	13-28	086637	Washer	1
G96		04-48	13-28	354407	Screw	1
G97		04-48	13-28	511937	Screw	1



Variable displacement pump



E100 690E

Enlarged **bold** type item numbers are recommended part to stock for servicing.

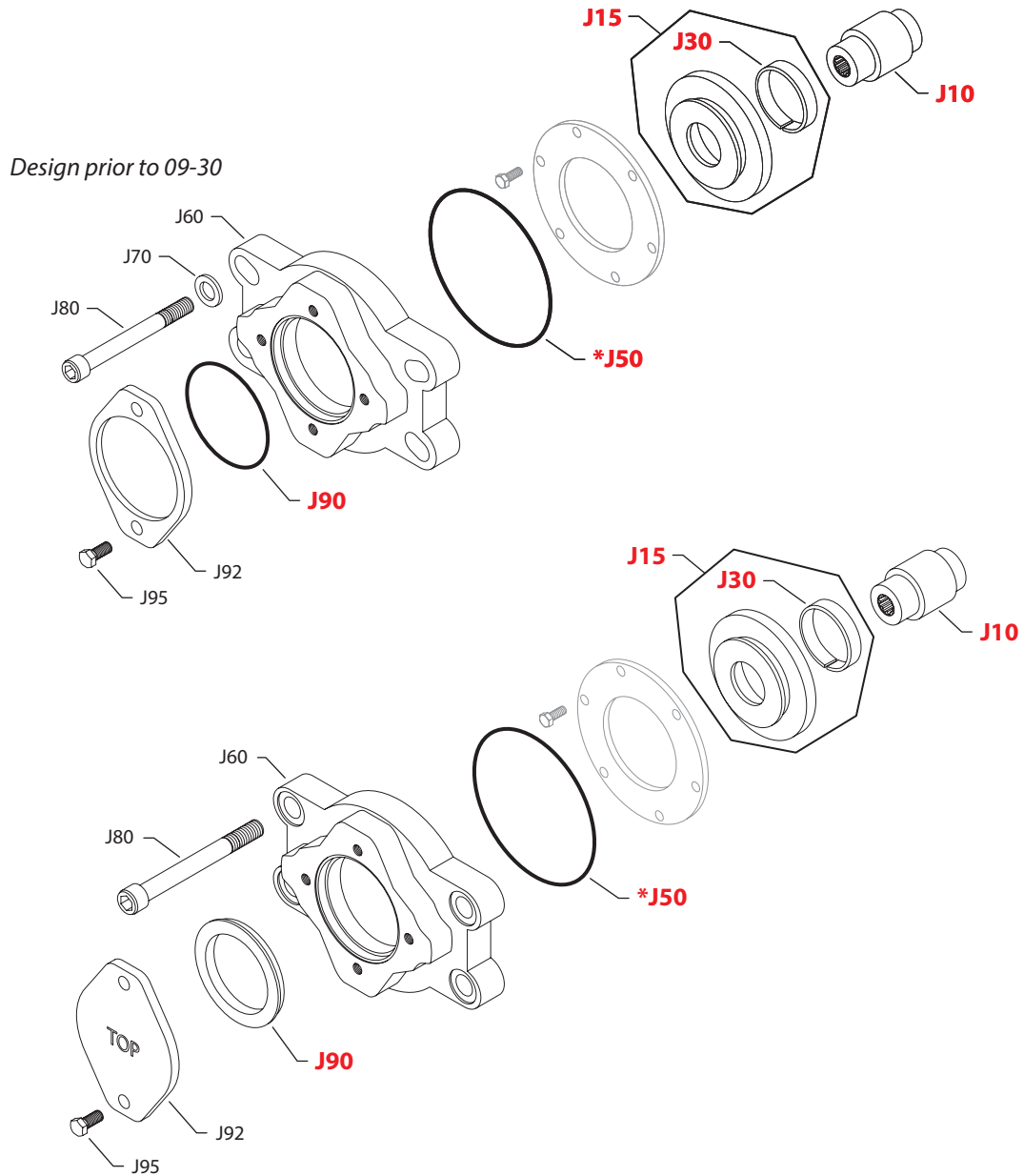

**Variable displacement pump**
**Charging system**

Order Code	Item	Date Begin	Date End	Part Number	Part Name	Qty. per Model/Kit
B	H05	92-16		501990	Charge pump set, 11 cc (SB-1995-004)	1
	H40	87-42		9004875-0013	Pin	1
	H50	92-16		11138376	Charge pump shaft (SB-1995-002,1997-014, 2015-031)	1
	H50	87-42	92-15	715243	Charge pump shaft (SB-1992-008)	1
	H60	92-16		9003310-1206	Key (SB-1995-002)	1
	H70	88-27		516761	Retaining plate	1
	H80	88-27		648451	Screw	6
	C	H05	92-16		501991	Charge pump set, 14 cc (SB-1995-004)
H40		87-42		9004875-0013	Pin	1
H50		92-16		11138376	Charge pump shaft (SB-1995-002,1997-014, 2015-031)	1
H50		87-42	92-15	715243	Charge pump shaft (SB-1992-008)	1
H60		92-16		9003310-1206	Key (SB-1995-002)	1
H70		88-27		516761	Retaining plate	1
H80		88-27		648451	Screw	6
L		H25	92-16		11077864	Charge pump spacer
	H40	09-47		9004875-013	Pin	1
	H50	92-16		11138376	Charge pump shaft (SB-1995-002,1997-014, 2015-031)	1
	H50	87-42	92-15	715243	Charge pump shaft (SB-1992-008)	1
	H70	88-27		516761	Retaining plate	1
	H80	88-27		648451	Screw	6
	H90	88-27		664524 (9005110-9000)	Plug assembly	1
	N	H25	92-16		11077864	Charge pump spacer
H40		09-47		9004875-0013	Pin	1
H70		88-27		516761	Retaining plate	1
H80		88-27		648451	Screw	6
H90		88-27		664524 (9005110-9000)	Plug assembly	1



Variable displacement pump

(AB & AC)



\* = included in overhaul seal kit Q210

E100 691E

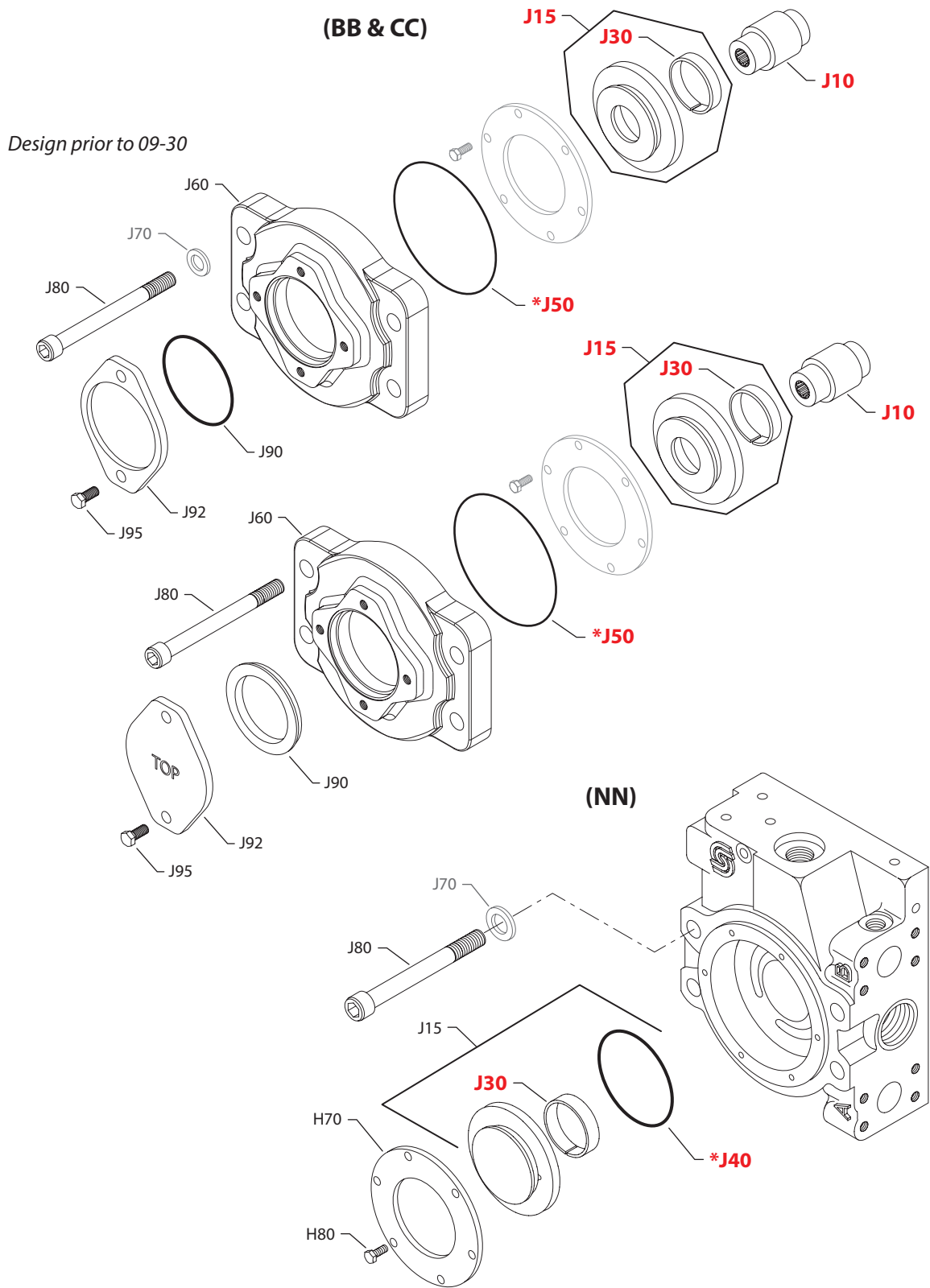
Enlarged **bold** type item numbers are recommended part to stock for servicing.


**Variable displacement pump**
**Auxiliary mounting**

Order Code	Item	Date Begin	Date End	Part Number	Part Name	Qty. per Model/Kit	
AB	J10	92-16		11053281	Coupling, 9 tooth (SB-1992-008 & SB-2011-025)	1	
	J15	92-16		8800832	Cover assembly, CW (SB-1995-004 & SB-2005-011)	1	
	J15	92-16		8800833	Cover assembly, CCW (SB-1995-004 & SB-2005-011)	1	
	J30	92-16		664771 (8700008)	Bushing (SB-1992-008)	1	
	J30	87-42	92-15	648055	Bushing	1	
	J40	87-42	92-15	680892 (9004104-0440)	O-ring (SB-1992-008)	1	
	J50	87-42		056739 (9004104-1580)	O-ring	1	
	J60	09-30		520944	Flange adapter (SB-1995-006 & SB-2009-074)	1	
	J70	95-15	09-30	506753	Washer (SB-2009-074)	4	
	J70	87-42	95-14	294462	Washer, hardened (SB-1995-006)	4	
	J80	95-15		507585	Screw, M12 x 110	4	
	J80	87-42	95-14	321893	Screw, M10 x 110	4	
	J90	09-30		4800482	A pad seal (SB-2009-074)	1	
	J90	87-42	09-29	726950 (9004104-0420)	O-ring	1	
	J92	09-30		4460586	Cover plate	1	
	J92	87-42	09-29	9802336	Cover plate (SB-2009-074)	1	
	J95	87-42		9007200-3714	Screw	2	
	AC	J10	93-47		11053277	Coupling, 11 tooth	1
		J15	92-16		8800832	Cover assembly, CW (SB-1995-004 & SB-2005-011)	1
		J15	92-16		8800833	Cover assembly, CCW (SB-1995-004 & SB-2005-011)	1
J30		92-16		664771 (8700008)	Bushing (SB-1992-008)	1	
J30		93-47	92-15	648055	Bushing	1	
J40		93-47	92-15	680892 (9004104-0440)	O-ring (SB-1992-008)	1	
J50		93-47		056739 (9004104-1580)	O-ring	1	
J60		09-30		520944	Flange adapter (SB-1995-006 & SB-2009-074)	1	
J70		95-15	09-30	506753	Washer (SB-2009-074)	4	
J70		93-47	95-14	294462	Washer, hardened (SB-1995-006)	4	
J80		95-15		507585	Screw, M12 x 110	4	
J80		93-47	95-14	321893	Screw, M10 x 110	4	
J90		09-30		4800482	A pad seal (SB-2009-074)	1	
J90		93-47	09-29	726950 (9004104-0420)	O-ring	1	
J92		09-30		4460586	Cover plate	1	
J92		93-47	09-29	9802336	Cover plate (SB-2009-074)	1	
J95		93-47		9007200-3714	Screw	2	



Variable displacement pump



\* = included in overhaul seal kit Q210

E100 692E

Enlarged **bold** type item numbers are recommended part to stock for servicing.

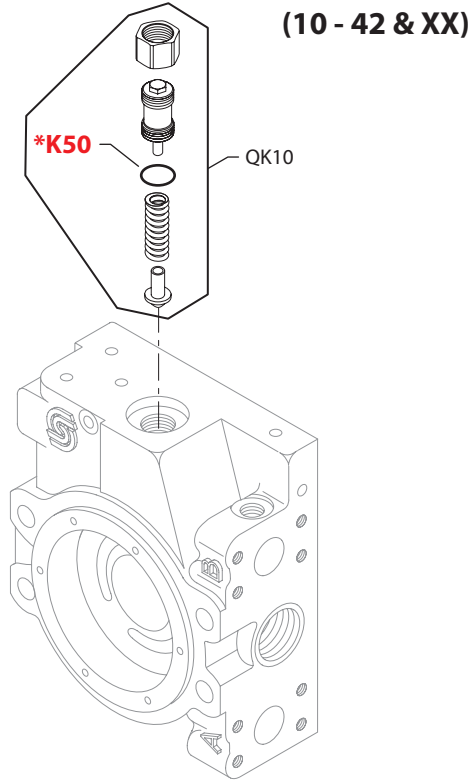



**Variable displacement pump**
**Auxiliary mounting**

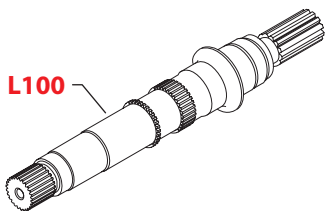
Order Code	Item	Date Begin	Date End	Part Number	Part Name	Qty. per Model/Kit	
BB	J10	92-16		11053280	Coupling, 15 tooth	1	
	J15	92-16		8800832	Cover assembly, CW (SB-1995-004 & SB-2005-011)	1	
	J15	92-16		8800833	Cover assembly, CCW (SB-1995-004 & SB-2005-011)	1	
	J30	92-16		664771 (8700008)	Bushing (SB-1992-008)	1	
	J30	87-42	92-15	648055	Bushing	1	
	J40	87-42	92-15	680892 (9004104-0440)	O-ring (SB-1992-008)	1	
	J50	87-42		056739 (9004104-1580)	O-ring	1	
	J60	09-30		520945	Flange adaptor (SB-1995-006 & SB-2009-075)	1	
	J70	95-15	09-30	506753	Washer	4	
	J70	87-42	95-14	294462	Washer, hardened (SB-1995-006)	4	
	J80	95-15		507585	Screw, M12 x 110	4	
	J80	87-42	95-14	321893	Screw, M10 x 110	4	
	J90	09-30		8801061	B pad seal (SB-2009-075)	1	
	J90	87-42	09-29	726935 (9004104-0450)	O-ring	1	
	J92	09-30		8801059	Cover	1	
	J92	87-42	09-29	4460370	Cover plate	1	
	J95	87-42		9007200-5021	Screw	2	
	BC	J10	92-16		11053279	Coupling, 13 tooth	1
		J15	92-16		8800832	Cover assembly, CW (SB-1995-004 & SB-2005-011)	1
		J15	92-16		8800833	Cover assembly, CCW (SB-1995-004 & SB-2005-011)	1
J30		92-16		664771 (8700008)	Bushing (SB-1992-008)	1	
J30		87-42	92-15	648055	Bushing	1	
J40		87-42	92-15	680892 (9004104-0440)	O-ring (SB-1992-008)	1	
J50		87-42		056739 (9004104-1580)	O-ring	1	
J60		09-30		520945	Flange adaptor (SB-1995-006 & SB-2009-075)	1	
J70		95-15	09-30	506753	Washer	4	
J70		87-42	95-14	294462	Washer, hardened (SB-1995-006)	4	
J80		95-15		507585	Screw, M12 x 110	4	
J80		87-42	95-14	321893	Screw, M10 x 110	4	
J90		09-30		8801061	B pad seal (SB-2009-075)	1	
J90		87-42	09-29	726935 (9004104-0450)	O-ring	1	
J92		09-30		8801059	Cover	1	
J92		87-42	09-29	4460370	Cover plate	1	
J95		87-42		9007200-5021	Screw	2	
NN		J15	92-16		8800834	Cover assembly, (SB-1995-004)	1
		J30	92-16		664771 (8700008)	Bushing (SB-1992-008)	1
		J30	87-42	92-15	648055	Bushing	1
	J40	87-42		680892 (9004104-0440)	O-ring (SB-1992-008)	1	
	J70	87-42	95-14	294462	Washer (SB-1995-006)	4	
	J80	95-15		506800	Screw, M12 x 110	4	
	J80	87-42	95-14	321661	Screw, M10 x 110	4	



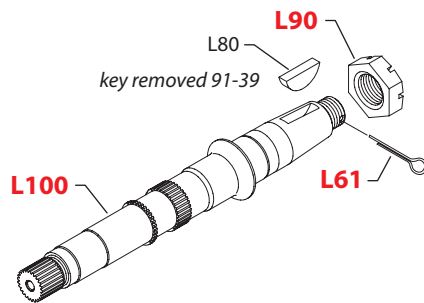
Variable displacement pump



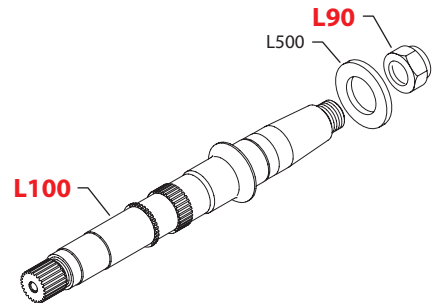
(C3 & C5)



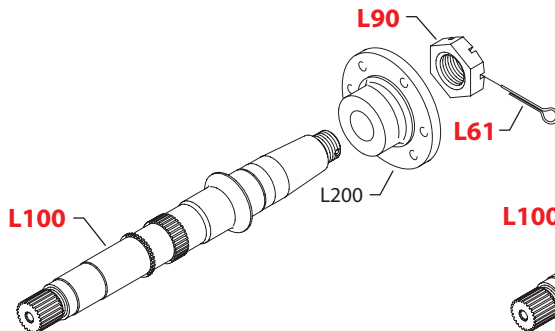
(T3)



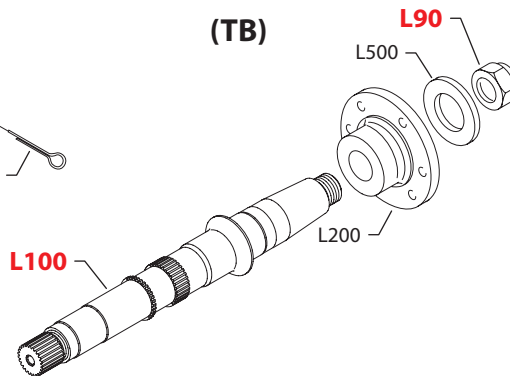
(T8)



(TL)



(TB)



E100 693E

\* = included in overhaul seal kit Q210

Enlarged **bold** type item numbers are recommended part to stock for servicing.


**Variable displacement pump**
**Charge pressure relief**

Order Code	Item	Date Begin	Date End	Part Number	Part Name	Qty. per Model/Kit
10-30	QK10	87-42		8002K000-A	Charge relief valve kit, 10-30 bar (SB-1989-002)	1
	K50	87-42		001149 (9004201-6200)	O-ring (SB-1989-002)	1
32-42	QK10	94-13		8510269	Charge relief valve kit, 30-42 bar	1
	K50	94-13		001149 (9004201-6200)	O-ring	1
XX	QK10	94-13		8510269	Charge relief valve kit, 30-42 bar	1
	K50	94-13		001149 (9004201-6200)	O-ring	1

**Shaft**

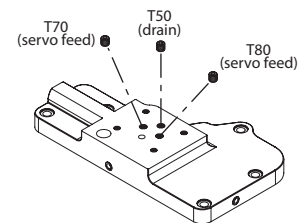
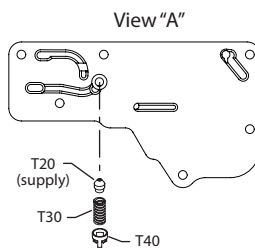
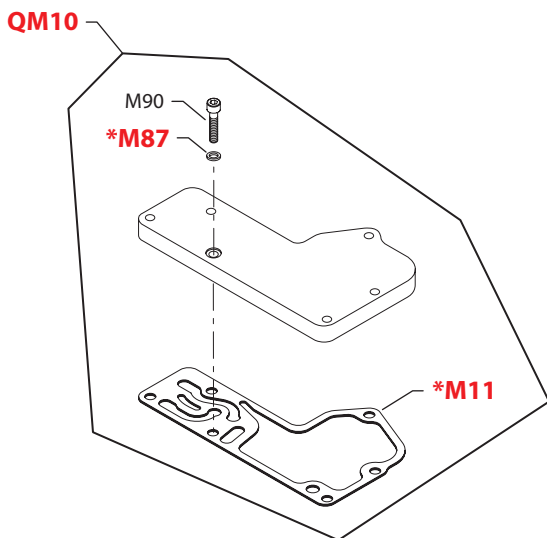
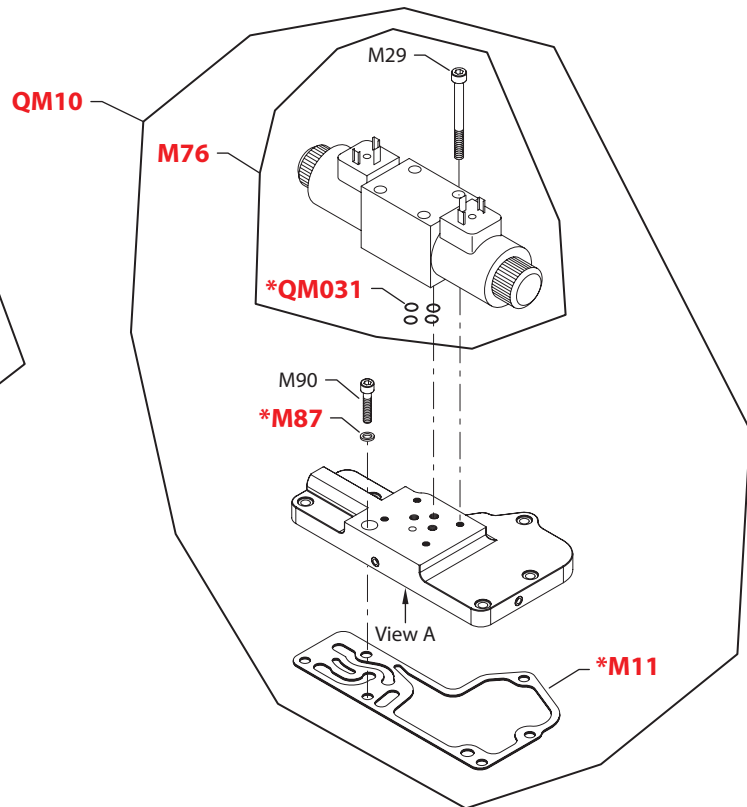
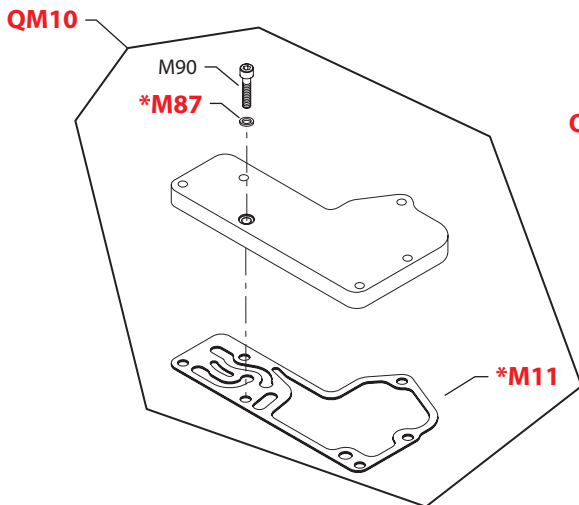
C3	L100	92-16		340521	Shaft, 15 tooth spline (SB-1992-008)	1
C5	L100	93-26		742775	Shaft, 19 tooth spline	1
T3	L61	92-16		716761 (9004600-1224)	Cotter pin	1
	L80	87-42	91-39	532432 (9003310-2514)	Key	1
	L90	87-42		9003575-0071	Slotted nut	1
	L100	92-16		342915	Shaft, 15, tapered (SB-1992-008)	1
T8	L90	98-48		512472	Nut	1
	L100	98-48		511778	Shaft, tapered without keyway	1
	L500	98-48		512473	Washer	1
TB	L61	04-50		716761 (9004600-1224)	Cotter pin	1
	L90	04-50		9003575-0071	Slotted nut	1
	L100	04-50		342915	Shaft, tapered	1
	L200	04-50		753848	Flange	1
TL	L90	98-48		512472	Nut	1
	L100	98-48		511778	Shaft, tapered	1
	L200	98-48		753848	Flange	1
	L500	98-48		512473	Washer	1



Variable displacement pump

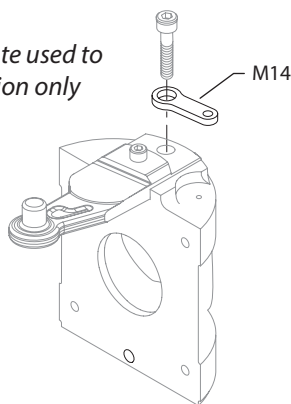
(CA & CB)

(DD)



Possible orifice locations

Generic swashplate used to show link location only



NOTE: All orifices present in the original control must be transferred to the replacement control. If replacement control contains pre-installed orifices, remove and discard them before transferring existing orifices to new control.

E100 868E

\* = included in control seal kit QM210

Enlarged **bold** type item numbers are recommended part to stock for servicing.

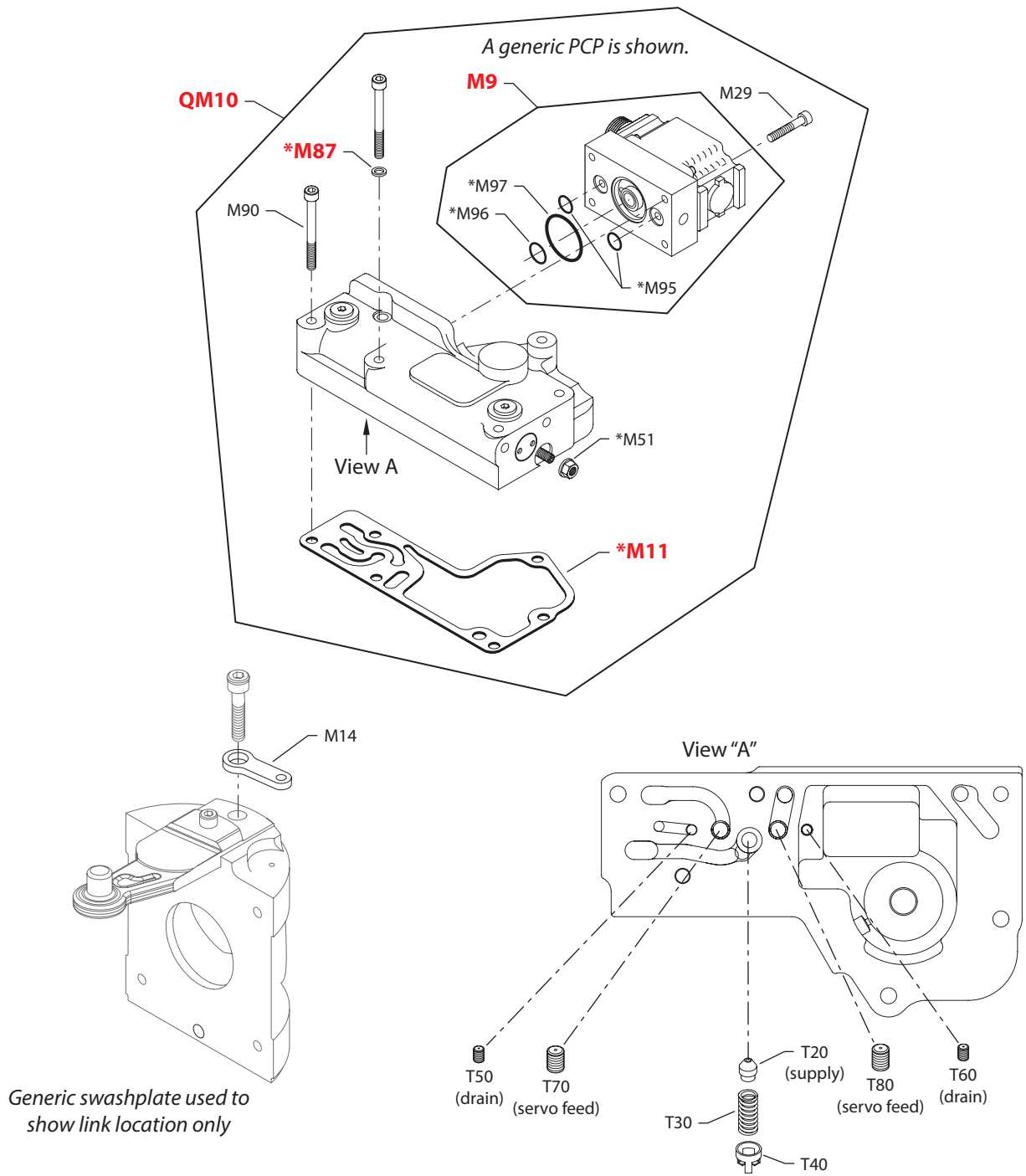

**Variable displacement pump**
**Control**

Order Code	Item	Date Begin	Date End	Part Number	Part Name	Qty. per Model/Kit
CA	M11	87-42		8800520	Control gasket	1
	M87	87-42		592386	Seal washer	1
	M90	87-42		693341 (9007314-0606)	Screw	6
	QM10	87-42		8002M0CA-A	Control cover plate kit	1
	QM210	87-42		11096319	Control seal kit	1
CB	M11	87-42		8800520	Control gasket	1
	M14	87-42		648600	Feedback link	1
	M87	87-42		592386	Seal washer	1
	M90	87-42		693341 (9007314-0606)	Screw	6
	QM10	87-42		8002M0CA-A	Control cover plate kit	1
	QM210	87-42		11096319	Control seal kit	1
DC	M11	87-42		8800520	Control gasket	1
	M87	87-42		592386	Seal washer	1
	M90	87-42		693341 (9007314-0606)	Screw	6
	QM10	87-42		8002M0DC-A	3-position control kit, 12 volt	1
	QM031	87-42		11099647	Valve seal kit	1
	QM210	87-42		11096161	Control seal kit	1
	DD	M11	87-42		8800520	Control gasket
M87		87-42		592386	Seal washer	1
M90		87-42		693341 (9007314-0606)	Screw	6
QM10		87-42		8510314	3-position control kit, 24 volt	1
QM031		87-42		11099647	Valve seal kit	1
QM210		87-42		11096161	Control seal kit	1



Variable displacement pump

(EA, EP & EX)



Possible orifice locations

NOTE: All orifices present in the original control must be transferred to the replacement control. If replacement control contains pre-installed orifices, remove and discard them before transferring existing orifices to new control.

\* = included in control seal kit QM210

E100 694E

Enlarged **bold** type item numbers are recommended part to stock for servicing.

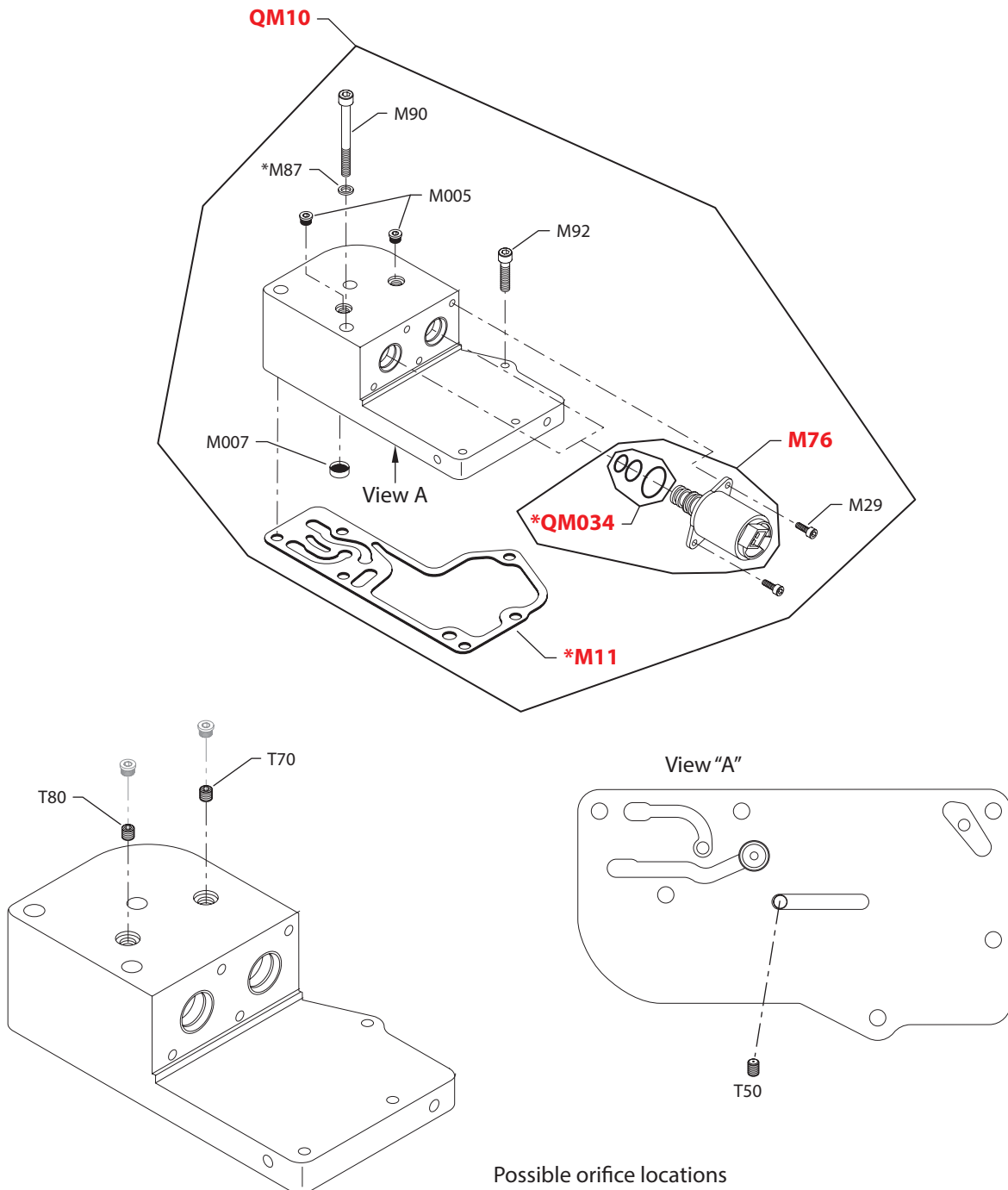

**Variable displacement pump**
**Control**

Order Code	Item	Date Begin	Date End	Part Number	Part Name	Qty. per Model/Kit
EA	M9	87-42		MCV110A1017	PCP, MS connector	1
	M11	87-42		8800520	Control gasket	1
	M14	87-42		648600	Feedback link	1
	M29	87-42		K07067	Screw	4
	M51	87-42		9003509-0008	Seal nut	1
	M87	87-42		592386	Seal washer	1
	M90	87-42		692889 (9007314-0611)	Screw	6
	M95	87-42		318337 (9004104-0120)	O-ring	2
	M96	87-42		011304 (9004104-0140)	O-ring	1
	M97	87-42		318345 (9004104-0240)	O-ring	1
	QM10	87-42		8002M0EA-B	EDC kit, MS connector	1
	QM210	87-42		11096173	Control seal kit	1
	EP	M9	87-42		MCV110A1058	PCP, Packard connector
M11		87-42		8800520	Control gasket	1
M14		87-42		648600	Feedback link	1
M29		87-42		K07067	Screw	4
M51		87-42		9003509-0008	Seal nut	1
M87		87-42		592386	Seal washer	1
M90		87-42		692889 (9007314-0611)	Screw	6
M95		87-42		318337 (9004104-0120)	O-ring	2
M96		87-42		011304 (9004104-0140)	O-ring	1
M97		87-42		318345 (9004104-0240)	O-ring	1
QM10		87-42		8002M0EP-B	EDC kit, Packard connector	1
QM210		87-42		11096173	Control seal kit	1
EX		M9	87-42		MCV110A1090	PCP, Metri-pack connector
	M11	87-42		8800520	Control gasket	1
	M14	87-42		648600	Feedback link	1
	M29	87-42		K07067	Screw	4
	M51	87-42		9003509-0008	Seal nut	1
	M87	87-42		592386	Seal washer	1
	M90	87-42		692889 (9007314-0611)	Screw	6
	M95	87-42		318337 (9004104-0120)	O-ring	2
	M96	87-42		011304 (9004104-0140)	O-ring	1
	M97	87-42		318345 (9004104-0240)	O-ring	1
	QM10	87-42		8002M0EX-B	EDC kit, Metri-pack connector	1
	QM210	87-42		11096173	Control seal kit	1



Variable displacement pump

(FA, FB, FC & FD)



Possible orifice locations

NOTE: All orifices present in the original control must be transferred to the replacement control. If replacement control contains pre-installed orifices, remove and discard them before transferring existing orifices to new control.

\* = included in control seal kit QM210

E101 858E

Enlarged **bold** type item numbers are recommended part to stock for servicing.



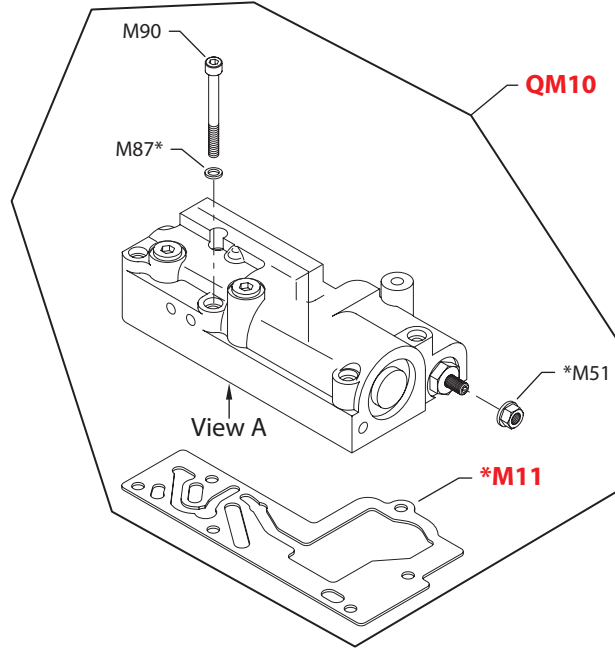

**Variable displacement pump**
**Control**

Order Code	Item	Date Begin	Date End	Part Number	Part Name	Qty. per Model/Kit
FA	M11	97-30		8800520	Control gasket	1
	M29	97-30		067694	Screw	4
	M76	97-30		518080	Solenoid valve, 12v	2
	M87	97-30		592386	Seal washer	1
	M90	97-30		9007314-0614	Screw	3
	M92	97-30		041160 (9007314-0605)	Screw	3
	M005	97-30		11040532	Plug assembly	2
	M007	97-30		K00775	Filter screen	1
	QM10	97-30		11067537	NFPE control kit, 12v	1
	QM034	97-30		11099849	Solenoid valve seal kit	1
	QM210	97-30		11100027	Control seal kit	1
FB	M11	97-35		8800520	Control gasket	1
	M29	97-35		067694	Screw	4
	M76	97-35		518081	Solenoid valve, 24v	2
	M87	97-35		592386	Seal washer	1
	M90	97-35		9007314-0614	Screw	3
	M92	97-35		041160 (9007314-0605)	Screw	3
	M005	97-35		11040532	Plug assembly	2
	M007	97-35		K00775	Filter screen	1
	QM10	97-35		11067538	NFPE control kit, 24v	1
	QM034	97-35		11099849	Solenoid valve seal kit	1
	QM210	97-35		11100027	Control seal kit	1
FC	M11	97-35		8800520	Control gasket	1
	M29	97-35		067694	Screw	4
	M76	97-35		521709	Solenoid valve, 12v	2
	M87	97-35		592386	Seal washer	1
	M90	97-35		9007314-0614	Screw	3
	M92	97-35		041160 (9007314-0605)	Screw	3
	M005	97-35		11040532	Plug assembly	2
	M007	97-35		K00775	Filter screen	1
	QM10	97-35		8510220	NFPE control kit, 12v	1
	QM034	97-35		11099849	Solenoid valve seal kit	1
	QM210	97-35		11100027	Control seal kit	1
FD	M11	97-35		8800520	Control gasket	1
	M29	97-35		067694	Screw	4
	M76	97-35		517214	Solenoid valve, 24v	2
	M87	97-35		592386	Seal washer	1
	M90	97-35		9007314-0614	Screw	3
	M92	97-35		041160 (9007314-0605)	Screw	3
	M005	97-35		11040532	Plug assembly	2
	M007	97-35		K00775	Filter screen	1
	QM10	97-35		8510380	NFPE control kit, 24v	1
	QM034	97-35		11099849	Solenoid valve seal kit	1
	QM210	97-35		11100027	Control seal kit	1

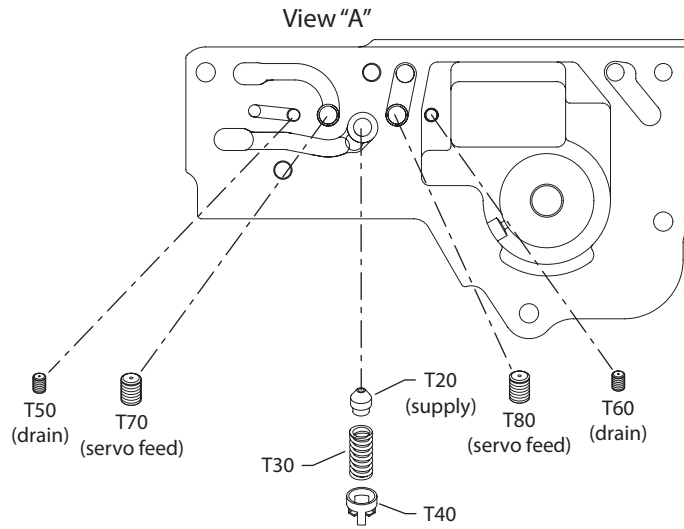
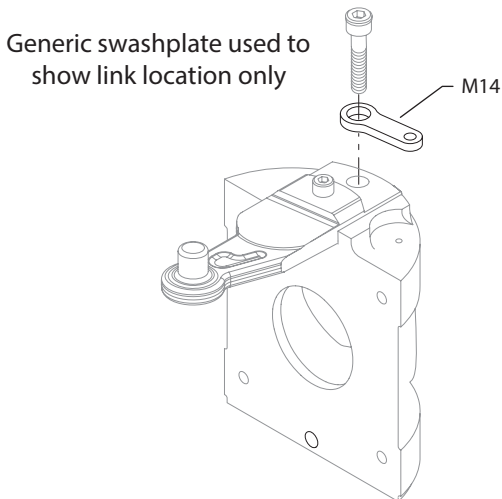


Variable displacement pump

(HF, HK & HM)



\* = included in control seal kit QM210



Possible orifice locations

NOTE: All orifices present in the original control must be transferred to the replacement control. If replacement control contains pre-installed orifices, remove and discard them before transferring existing orifices to new control.

\* = included in control seal kit QM210

E101 859E

Enlarged **bold** type item numbers are recommended part to stock for servicing.


**Variable displacement pump**
**Control**

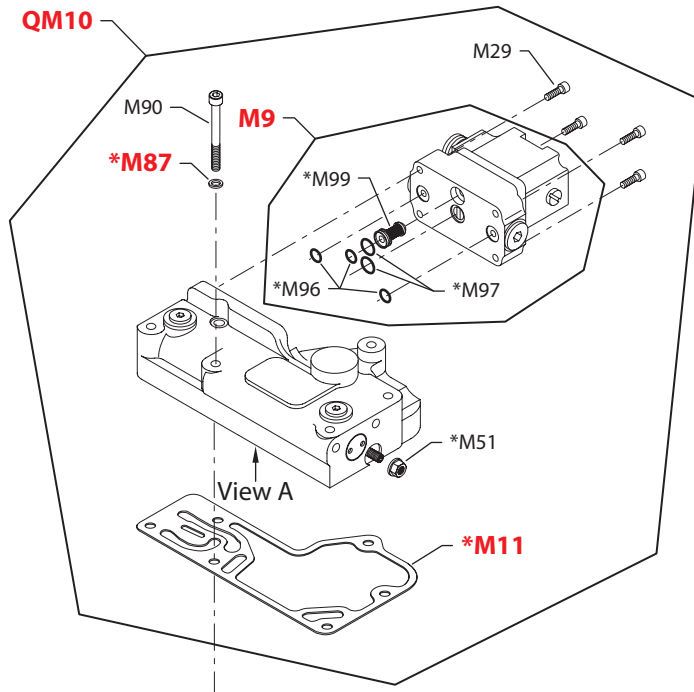
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HF	M11	93-47		K11419	Control gasket (SB-1993-002)	1
	M14	93-47		648600	Feedback link	1
	M51	93-47		9003509-0008	Seal nut	1
	M87	93-47		592386	Seal washer	1
	M90	93-47		692889 (9007314-0611)	Screw	6
	QM10	93-47		8002M0HF-A	HDC kit, 3-11 bar	1
	QM210	93-47		11096267	Control seal kit	1
	HK	M11	93-47		K11419	Control gasket (SB-1993-002)
M14		93-47		648600	Feedback link	1
M51		93-47		9003509-0008	Seal nut	1
M87		93-47		592386	Seal washer	1
M90		93-47		692889 (9007314-0611)	Screw	6
QM10		93-47		8002M0HK-A	HDC kit, 1-11 bar	1
QM210		93-47		11096267	Control seal kit	1
HM		M11	93-47		K11419	Control gasket (SB-1993-002)
	M14	93-47		648600	Feedback link	1
	M51	93-47		9003509-0008	Seal nut	1
	M87	93-47		592386	Seal washer	1
	M90	93-47		692889 (9007314-0611)	Screw	6
	QM10	93-47		8002M0HM-A	HDC kit, 1-6.7 barr	1
	QM210	93-47		11096267	Control seal kit	1



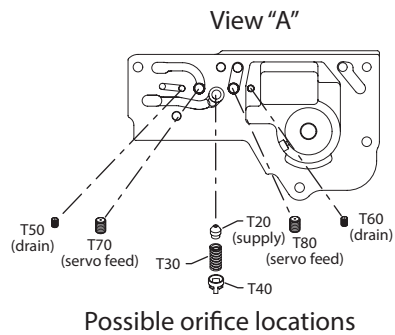
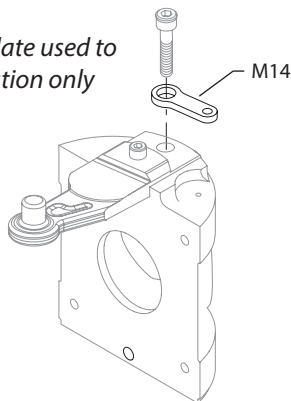
Variable displacement pump

(KA, KN & KP)

A generic PCP is shown.



Generic swashplate used to show link location only



NOTE: All orifices present in the original control must be transferred to the replacement control. If replacement control contains pre-installed orifices, remove and discard them before transferring existing orifices to new control.

E100 695E

\* = included in control seal kit QM210

Enlarged **bold** type item numbers are recommended part to stock for servicing.

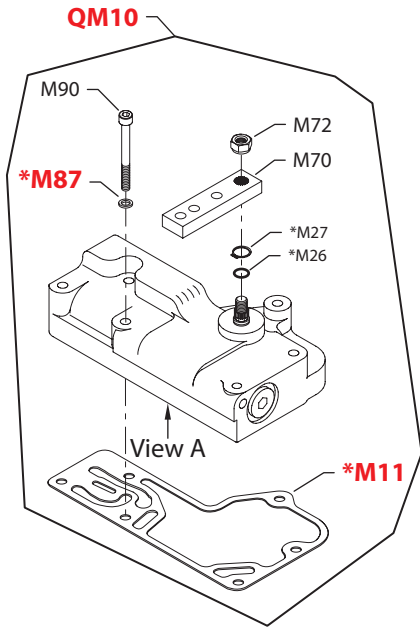

**Variable displacement pump**
**Control**

Order Code	Item	Date Begin	Date End	Part Number	Part Name	Qty. per Model/Kit
KA	M9	95-26		MCV116G4201	PCP, MS connector	1
	M11	95-26		8800520	Control gasket	1
	M14	95-26		648600	Feedback link	1
	M29	95-26		K07067	Screw	4
	M51	95-26		9003509-0008	Seal nut	1
	M87	95-26		592386	Seal washer	1
	M90	95-26		692889 (9007314-0611)	Screw	6
	M96	95-26		011296 (9004105-0120)	O-ring	3
	M97	95-26		9004105-0130	O-ring	1
	M99	95-26		K08572	Filter assembly	1
	QM10	95-26		8510177	EDC3 kit, MS connector, dual coil	1
	QM210	95-26		11096131	Control seal kit	1
	KN	M9	95-51		MCV116A3501	PCP, MS connector
M11		95-51		8800520	Control gasket	1
M14		95-51		648600	Feedback link	1
M29		95-51		K07067	Screw	4
M51		95-51		9003509-0008	Seal nut	1
M87		95-51		592386	Seal washer	1
M90		95-51		692889 (9007314-0611)	Screw	6
M96		95-51		011296 (9004105-0120)	O-ring	3
M97		95-51		9004105-0130	O-ring	1
M99		95-51		K08572	Filter assembly	1
QM10		95-51		11018295	EDC3 kit, MS connector, single coil	1
QM210		95-51		11096131	Control seal kit	1
KP		M9	95-26		MCV116G4204	PCP, Weather-pack connector
	M11	95-26		8800520	Control gasket	1
	M14	95-26		648600	Feedback link	1
	M29	95-26		K07067	Screw	4
	M51	95-26		9003509-0008	Seal nut	1
	M87	95-26		592386	Seal washer	1
	M90	95-26		692889 (9007314-0611)	Screw	6
	M96	95-26		011296 (9004105-0120)	O-ring	3
	M97	95-26		9004105-0130	O-ring	1
	M99	95-26		K08572	Filter assembly	1
	QM10	95-26		8510355	EDC3 kit, Weather-pack connector, dual coil	1
	QM210	95-26		11096131	Control seal kit	1

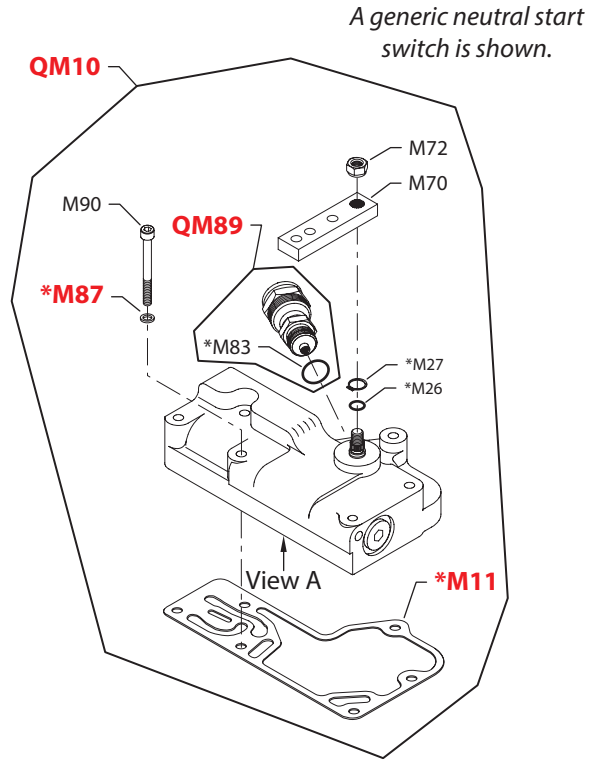


Variable displacement pump

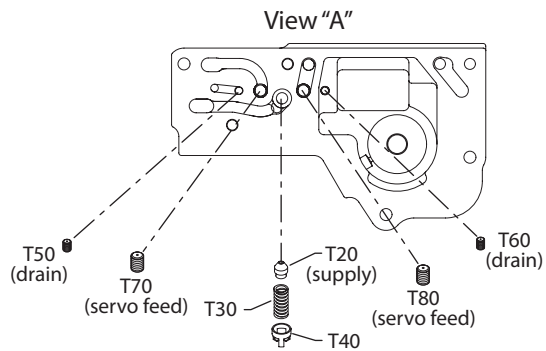
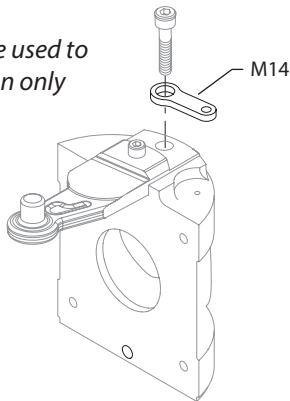
(MA)



(MB)



Generic swashplate used to show link location only



Possible orifice locations

NOTE: All orifices present in the original control must be transferred to the replacement control. If replacement control contains pre-installed orifices, remove and discard them before transferring existing orifices to new control.

\* = included in control seal kit QM210

E101 860E

Enlarged **bold** type item numbers are recommended part to stock for servicing.

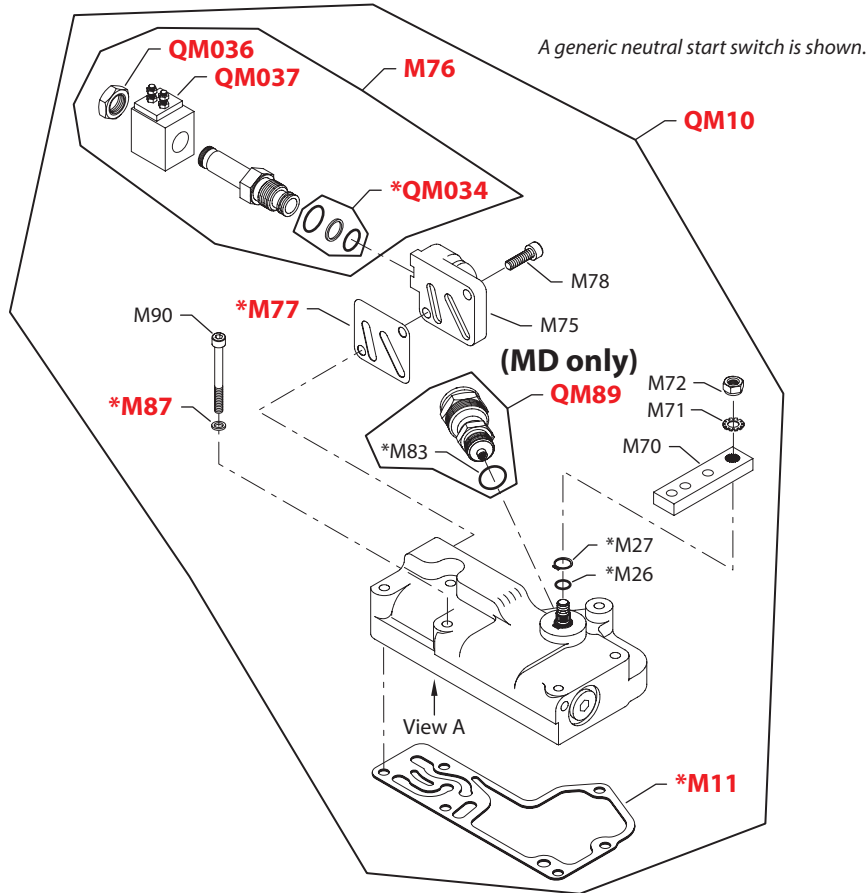

**Variable displacement pump**
**Control**

Order Code	Item	Date Begin	Date End	Part Number	Part Name	Qty. per Model/Kit
MA	M11	87-42		8800520	Control gasket	1
	M14	87-42		648600	Feedback link	1
	M26	87-42		144725 (9004105-0110)	O-ring	1
	M27	87-42		9006300-0044	Retaining ring	1
	M70	87-42		9800916	Control handle	1
	M72	87-42		040642 (9003513-0800)	Nut	1
	M87	87-42		592386	Seal washer	1
	M90	87-42		692889 (9007314-0611)	Screw	6
	QM10	87-42		8002M0MA-A	MDC kit	1
	QM210	87-42		11096275	Control seal kit	1
MB	M11	87-42		8800520	Control gasket	1
	M14	87-42		648600	Feedback link	1
	M26	87-42		144725 (9004105-0110)	O-ring	1
	M27	87-42		9006300-0044	Retaining ring	1
	M70	87-42		9800916	Control handle	1
	M72	87-42		040642 (9003513-0800)	Nut	1
	M83	87-42		001131 (9004201-5000)	O-ring	1
	M87	87-42		592386	Seal washer	1
	M90	87-42		692889 (9007314-0611)	Screw	6
	QM10	87-42		8002M0MB-A	MDC kit	1
	QM89	87-42		80020S40	Neutral start switch kit	1
	QM210	87-42		11096275	Control seal kit	1

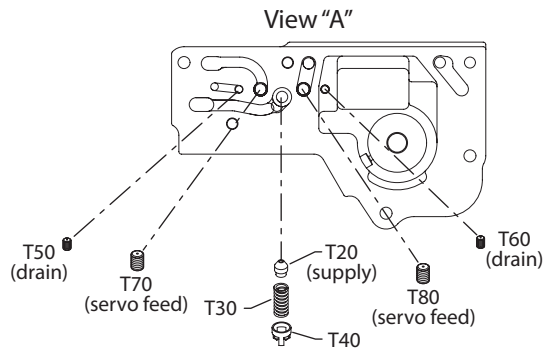
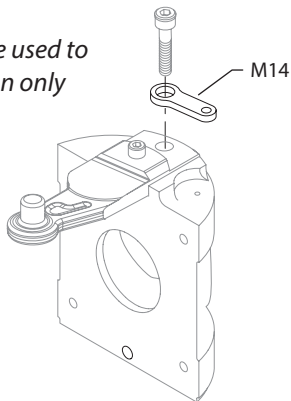


Variable displacement pump

(MC & MD)



Generic swashplate used to show link location only



Possible orifice locations

NOTE: All orifices present in the original control must be transferred to the replacement control. If replacement control contains pre-installed orifices, remove and discard them before transferring existing orifices to new control.

\* = included in control seal kit QM210

E100 696E

Enlarged **bold** type item numbers are recommended part to stock for servicing.

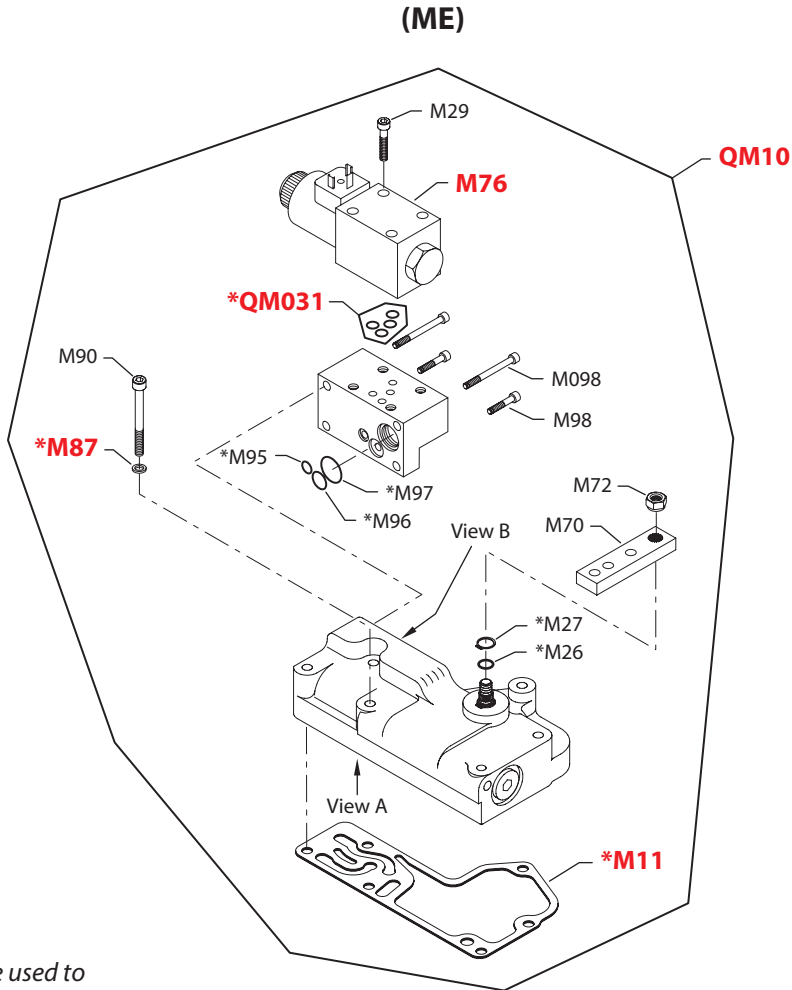



**Variable displacement pump**
**Control**

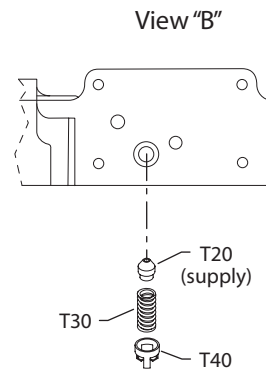
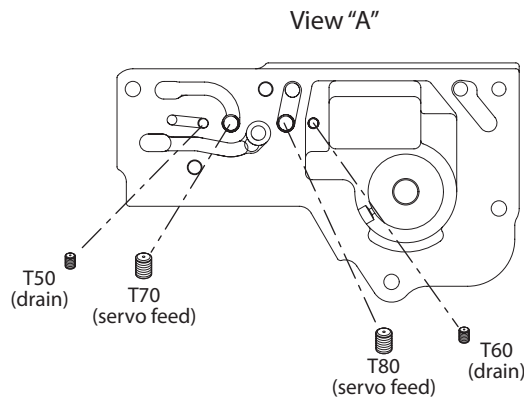
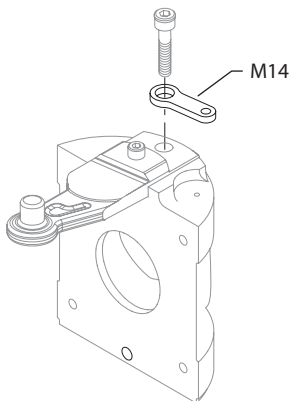
Order Code	Item	Date Begin	Date End	Part Number	Part Name	Qty. per Model/Kit
MC	M11	87-42	12-06	8800520	Control gasket	1
	M14	87-42	12-06	648600	Feedback link	1
	M26	87-42	12-06	144725 (9004105-0110)	O-ring	1
	M27	87-42	12-06	9006300-0044	Retaining ring	1
	M70	87-42	12-06	9800916	Control handle	1
	M71	87-42	12-06	9009660-3100	Toothlock washer	1
	M72	87-42	12-06	040642 (9003513-0800)	Nut	1
	M75	87-42	12-06	505022	Control manifold (SB-1995-003)	1
	M76	87-42	12-06	9700803	Solenoid valve, 12 volt, single pole	1
	M77	87-42	12-06	8800882	Manifold gasket	1
	M78	95-10	12-06	693341 (9007314-0606)	Screw (SB-1995-003)	2
	M78	87-42	95-09	041160 (9007314-0605)	Screw	2
	M87	87-42	12-06	592386	Seal washer	1
	M90	87-42	12-06	692889 (9007314-0611)	Screw	6
	QM10	87-42	12-06	8002M0MC-A	MDC kit w/12 volt solenoid, single pole	1
	QM034	87-42	12-06	11099649	Solenoid valve seal kit	1
	QM036	87-42	12-06	11100383	Nut	1
	QM037	87-42	12-06	11100388	Coil, 12v	1
	QM210	87-42	12-06	11100049	Control seal kit	1
	MD	M1	87-42	07-19	8002M0MD-A	MDC kit w/12 volt solenoid, high force nss
M11		87-42	07-19	8800520	Control gasket	1
M14		87-42	07-19	648600	Feedback link	1
M26		87-42	07-19	144725 (9004105-0110)	O-ring	1
M27		87-42	07-19	9006300-0044	Retaining ring	1
M70		87-42	07-19	9800916	Control handle	1
M71		87-42	07-19	9009660-3100	Toothlock washer	1
M72		87-42	07-19	040642 (9003513-0800)	Nut	1
M75		87-42	07-19	505022	Control manifold (SB-1995-003)	1
M76		87-42	07-19	326108 (9700886)	Solenoid valve, 12 volt, 2 pole	1
M77		87-42	07-19	8800882	Manifold gasket	1
M78		95-10	07-19	693341 (9007314-0606)	Screw (SB-1995-003)	2
M78		87-42	95-09	041160 (9007314-0605)	Screw	2
M83		87-42	07-19	001131 (9004201-5000)	O-ring	1
M87		87-42	07-19	592386	Seal washer	1
M90		87-42	07-19	692889 (9007314-0611)	Screw	6
QM10		87-42	07-19	8002M0MD-A	MDC kit w/12 volt solenoid, high force nss	1
QM034		87-42	12-06	11099649	Solenoid valve seal kit	1
QM036		87-42	12-06	11100383	Nut	1
QM037		87-42	12-06	11100385	Coil, 12v	1
QM210	87-42	12-06	11100049	Control seal kit	1	
QM89	87-42	07-19	8510027	Neutral start switch kit, high force	1	



Variable displacement pump



Generic swashplate used to show link location only



Possible orifice locations

NOTE: All orifices present in the original control must be transferred to the replacement control. If replacement control contains pre-installed orifices, remove and discard them before transferring existing orifices to new control.

\* = included in control seal kit QM210

E101 861E

Enlarged **bold** type item numbers are recommended part to stock for servicing.

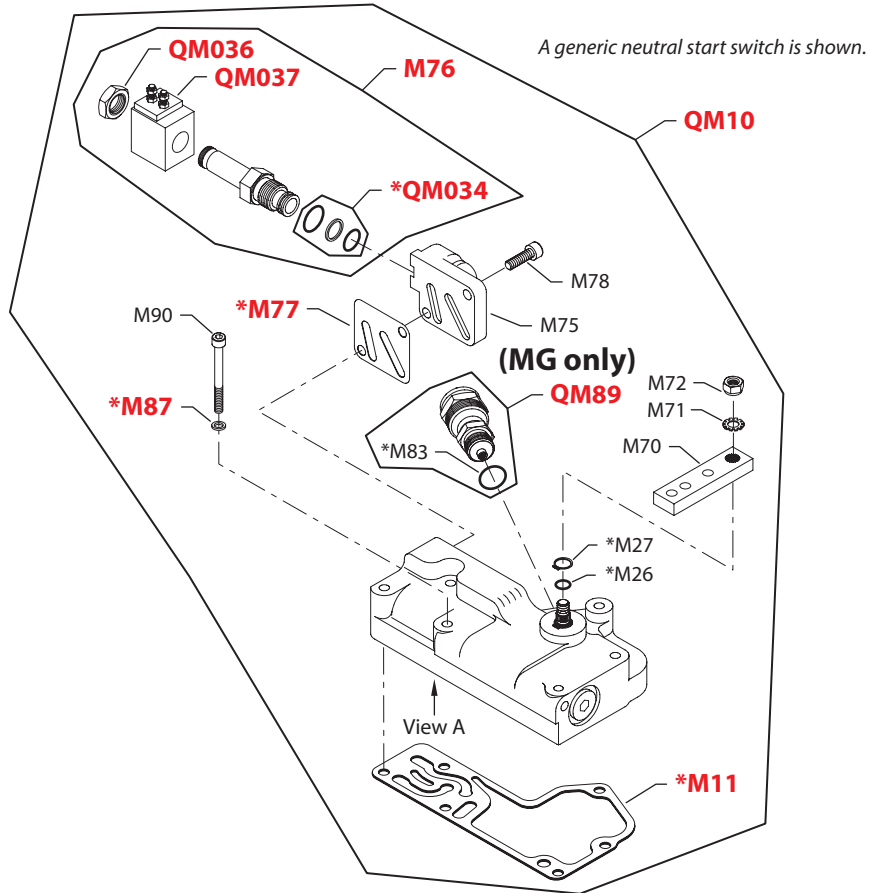

**Variable displacement pump**
**Control**

<b>Order Code</b>	<b>Item</b>	<b>Date Begin</b>	<b>Date End</b>	<b>Part Number</b>	<b>Part Name</b>	<b>Qty. per Model/Kit</b>
ME	M11	92-12		8800520	Control gasket	1
	M14	92-12		648600	Feedback link	1
	M26	92-12		144725 (9004105-0110)	O-ring	1
	M27	92-12		9006300-0044	Retaining ring	1
	M29	92-12		035592	Screw	4
	M70	92-12		9800916	Control handle	1
	M72	92-12		040642 (9003513-0800)	Nut	1
	M76	92-12		519357	Solenoid valve, 12 volt, 2 pole	1
	M87	92-12		592386	Seal washer	1
	M90	92-12		692889 (9007314-0611)	Screw	6
	M95	92-12		144725 (9004105-0110)	O-ring	1
	M96	92-12		056713 (9004105-0140)	O-ring	1
	M97	92-12		9004105-0180	O-ring	1
	M98	92-12		067686	Screw	2
	M098	92-12		035592	Screw	2
	QM10	92-12		11099385	MDC kit w/24 volt solenoid, 2 pole	1
	QM031	92-12		11099647	Seal kit	1
	QM210	92-12		11099976	Control seal kit	1

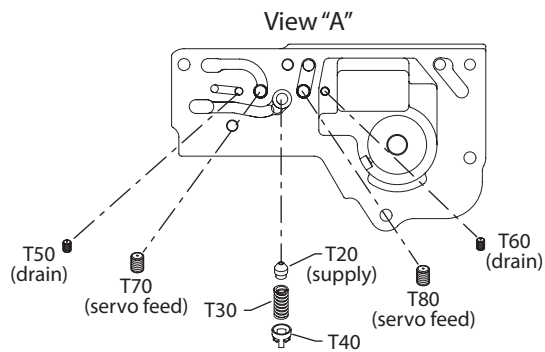
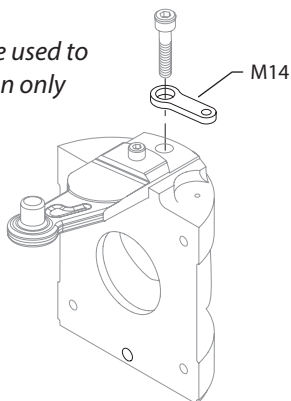


Variable displacement pump

(MF & MG)



Generic swashplate used to show link location only



Possible orifice locations

NOTE: All orifices present in the original control must be transferred to the replacement control. If replacement control contains pre-installed orifices, remove and discard them before transferring existing orifices to new control.

\* = included in control seal kit QM210

E100 696E

Enlarged **bold** type item numbers are recommended part to stock for servicing.


**Variable displacement pump**
**Control**

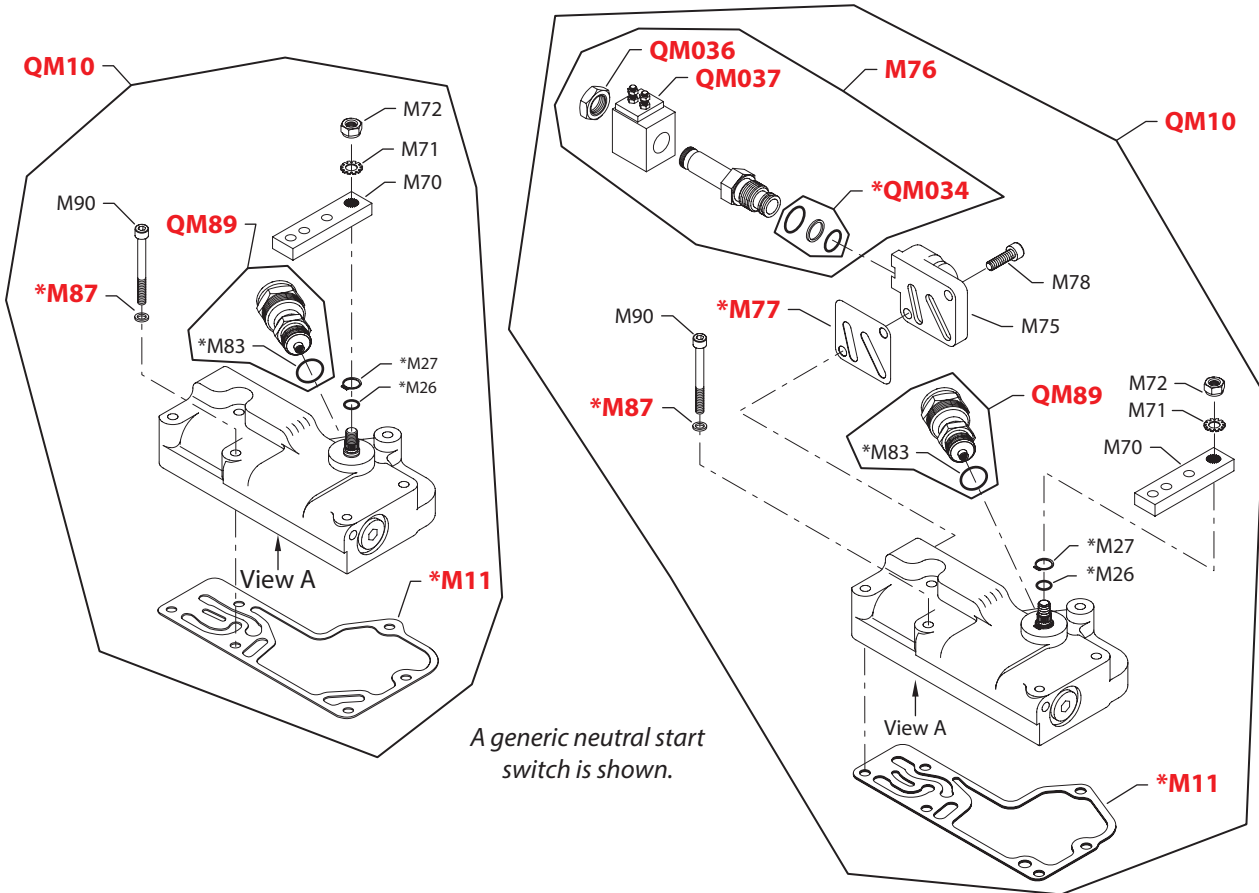
Order Code	Item	Date Begin	Date End	Part Number	Part Name	Qty. per Model/Kit	
MF	M11	87-42		8800520	Control gasket	1	
	M14	87-42		648600	Feedback link	1	
	M26	87-42		144725 (9004105-0110)	O-ring	1	
	M27	87-42		9006300-0044	Retaining ring	1	
	M70	87-42		9800916	Control handle	1	
	M72	87-42		040642 (9003513-0800)	Nut	1	
	M75	87-42		505022	Control manifold (SB-1995-003)	1	
	M76	87-42		711028 (8700087)	Solenoid valve, 24 volt, 2 pole	1	
	M77	87-42		8800882	Manifold gasket	1	
	M78	95-10		693341 (9007314-0606)	Screw (SB-1995-003)	2	
	M78	87-42	95-09	041160 (9007314-0605)	Screw	2	
	M87	87-42		592386	Seal washer	1	
	M90	87-42		692889 (9007314-0611)	Screw	6	
	QM10	87-42		8002M0MF-A	MDC kit w/24 volt solenoid, 2 pole	1	
	QM034	87-42		11099649	Solenoid valve seal kit	1	
	QM036	87-42		11100383	Nut	1	
	QM037	87-42		11100386	Coil, 12v	1	
	QM210	87-42		11100049	Control seal kit	1	
	MG	M11	87-42		8800520	Control gasket	1
		M14	87-42		648600	Feedback link	1
M26		87-42		144725 (9004105-0110)	O-ring	1	
M27		87-42		9006300-0044	Retaining ring	1	
M70		87-42		9800916	Control handle	1	
M72		87-42		040642 (9003513-0800)	Nut	1	
M75		87-42		505022	Control manifold (SB-1995-003)	1	
M76		87-42		711028 (8700087)	Solenoid valve, 24 volt, 2 pole	1	
M77		87-42		8800882	Manifold gasket	1	
M78		95-10		693341 (9007314-0606)	Screw (SB-1995-003)	2	
M78		87-42	95-09	041160 (9007314-0605)	Screw	2	
M83		87-42		001131 (9004201-5000)	O-ring	1	
M87		87-42		592386	Seal washer	1	
M90		87-42		692889 (9007314-0611)	Screw	6	
QM10		87-42		8002M0MG-A	MDC kit w/24 volt solenoid, 2 pole	1	
QM034		87-42		11099649	Solenoid valve seal kit	1	
QM036		87-42		11100383	Nut	1	
QM037		87-42		11100386	Coil, 12v	1	
QM89		87-42		80020540	Neutral start switch kit	1	
QM210		87-42		11100049	Control seal kit	1	



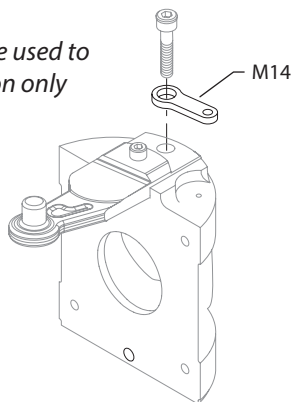
Variable displacement pump

(ML & MS)

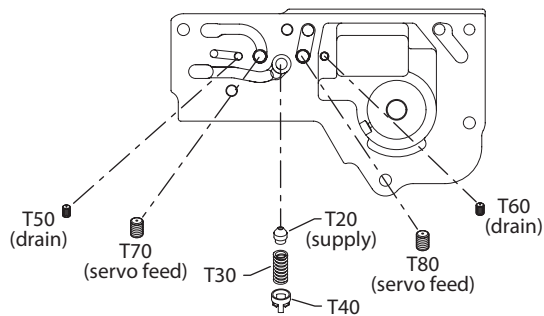
(MR)



Generic swashplate used to show link location only



View "A"



Possible orifice locations

NOTE: All orifices present in the original control must be transferred to the replacement control. If replacement control contains pre-installed orifices, remove and discard them before transferring existing orifices to new control.

\* = included in control seal kit QM210

E101 862E

Enlarged **bold** type item numbers are recommended part to stock for servicing.

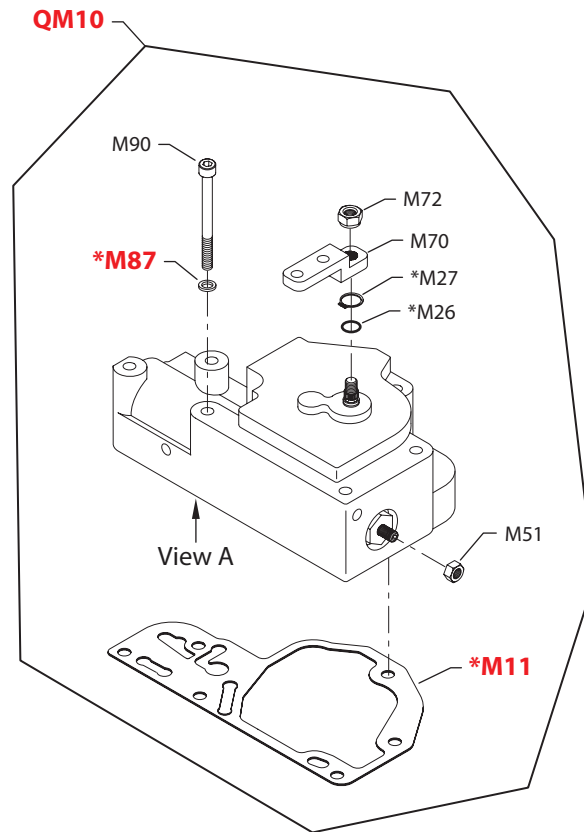

**Variable displacement pump**
**Control**

Order Code	Item	Date Begin	Date End	Part Number	Part Name	Qty. per Model/Kit	
ML	M11	87-42		8800520	Control gasket	1	
	M14	87-42		648600	Feedback link	1	
	M26	87-42		144725 (9004105-0110)	O-ring	1	
	M27	87-42		9006300-0044	Retaining ring	1	
	M70	87-42		9800916	Control handle	1	
	M72	87-42		040642 (9003513-0800)	Nut	1	
	M83	87-42		001131 (9004201-5000)	O-ring	1	
	M87	87-42		592386	Seal washer	1	
	M90	87-42		692889 (9007314-0611)	Screw	6	
	QM10	87-42		8510356	MDC kit w/wide deadband, high force nss	1	
	QM89	87-42		8510027	Neutral start switch kit	1	
	QM210	87-42		11096275	Control seal kit	1	
	MR	M11	87-42		8800520	Control gasket	1
M14		87-42		648600	Feedback link	1	
M26		87-42		144725 (9004105-0110)	O-ring	1	
M27		87-42		9006300-0044	Retaining ring	1	
M70		87-42		9800916	Control handle	1	
M72		87-42		040642 (9003513-0800)	Nut	1	
M75		87-42		505022	Control manifold (SB-1995-003)	1	
M76		87-42		711028 (8700087)	Solenoid valve, 24 volt, 2 pole	1	
M77		87-42		8800882	Manifold gasket	1	
M78		95-10		693341 (9007314-0606)	Screw (SB-1995-003)	2	
M78		87-42	95-09	041160 (9007314-0605)	Screw	2	
M83		87-42		001131 (9004201-5000)	O-ring	1	
M87		87-42		592386	Seal washer	1	
M90		87-42		692889 (9007314-0611)	Screw	6	
QM10		87-42		8002M0MR-A	MDC kit w/24 volt solenoid, 2 pole, high force nss	1	
QM034		87-42		11099649	Solenoid valve seal kit	1	
QM036		87-42		11100383	Nut	1	
QM037		87-42		11100386	Coil, 12v	1	
QM89		87-42		8510027	Neutral start switch kit, high force	1	
QM210		87-42		11100049	Control seal kit	1	
MS		M11	87-42		8800520	Control gasket	1
		M14	87-42		648600	Feedback link	1
		M26	87-42		144725 (9004105-0110)	O-ring	1
	M27	87-42		9006300-0044	Retaining ring	1	
	M70	87-42		9800916	Control handle	1	
	M72	87-42		040642 (9003513-0800)	Nut	1	
	M83	87-42		001131 (9004201-5000)	O-ring	1	
	M87	87-42		592386	Seal washer	1	
	M90	87-42		692889 (9007314-0611)	Screw	6	
	QM10	87-42		8510127	MDC kit w/wide deadband, high force nss	1	
	QM89	87-42		8510027	Neutral start switch kit	1	
	QM210	87-42		11096275	Control seal kit	1	

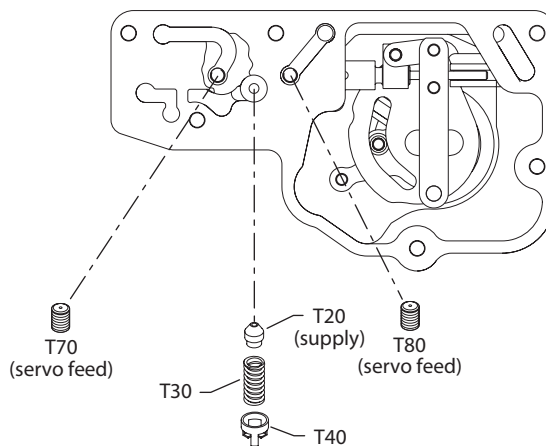
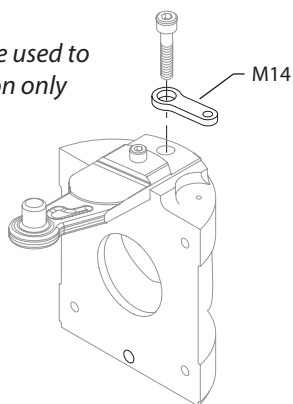


Variable displacement pump

(NA)



Generic swashplate used to show link location only



Possible orifice locations

NOTE: All orifices present in the original control must be transferred to the replacement control. If replacement control contains pre-installed orifices, remove and discard them before transferring existing orifices to new control.

\* = included in control seal kit QM210

E101 863E

Enlarged **bold** type item numbers are recommended part to stock for servicing.



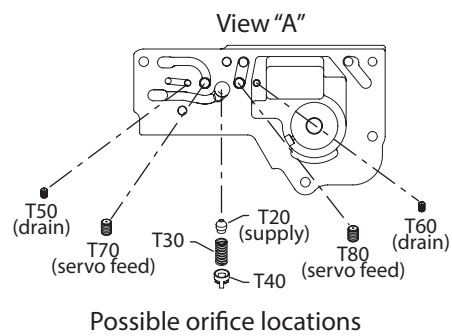
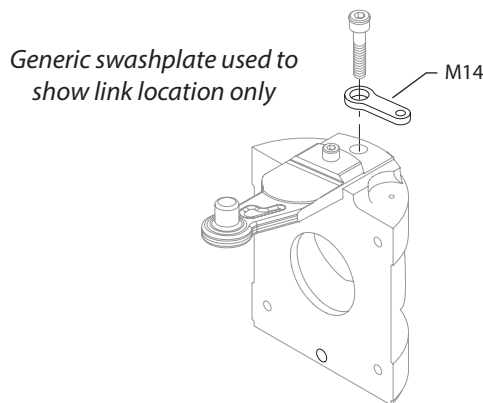
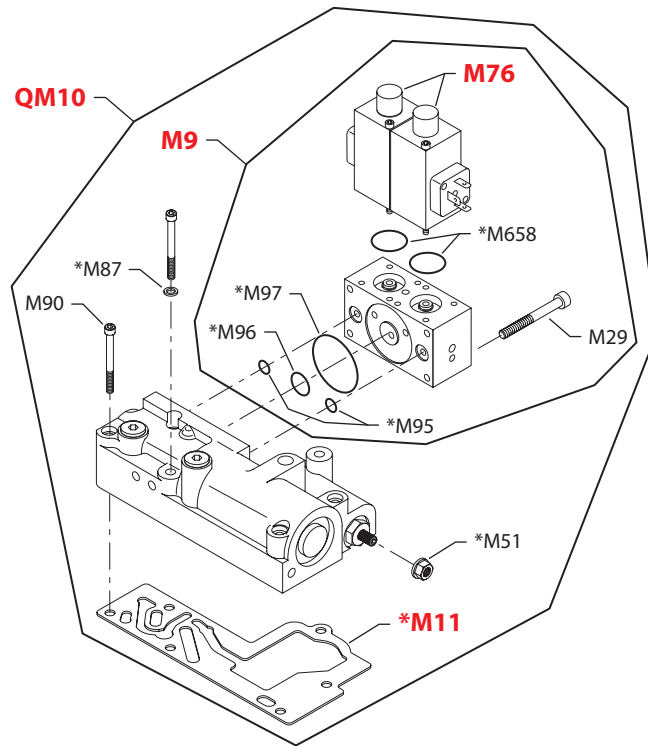

**Variable displacement pump**
**Control**

<b>Order Code</b>	<b>Item</b>	<b>Date Begin</b>	<b>Date End</b>	<b>Part Number</b>	<b>Part Name</b>	<b>Qty. per Model/Kit</b>
NA	M11	95-45		502386	Control gasket	1
	M14	95-45		648600	Feedback link	1
	M26	95-45		144725 (9004105-0110)	O-ring	1
	M27	95-45		9006300-0044	Retaining ring	1
	M51	95-45		345462	Nut	1
	M70	95-45		769075	Control handle	1
	M72	95-45		040642 (9003513-0800)	Nut	1
	M87	95-45		592386	Seal washer	1
	M90	95-45		9007314-0614	Screw	6
	QM10	95-45		11098770	MDC kit	1
	QM210	95-45		11096272	Control seal kit	1



Variable displacement pump

(PA & PB)



NOTE: All orifices present in the original control must be transferred to the replacement control. If replacement control contains pre-installed orifices, remove and discard them before transferring existing orifices to new control.

E101 864E

\* = included in control seal kit QM210

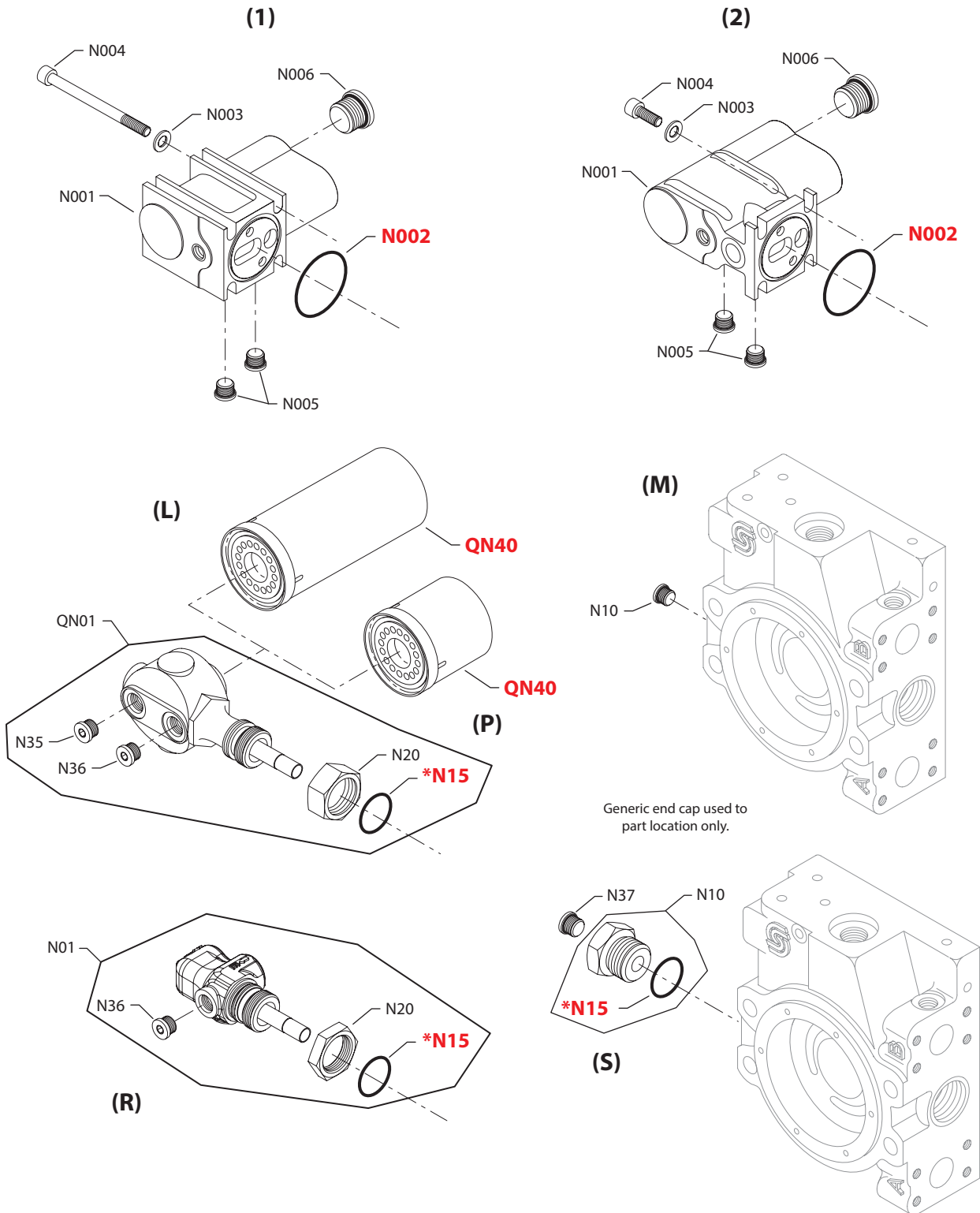
Enlarged **bold** type item numbers are recommended part to stock for servicing.


**Variable displacement pump**
**Control**

Order Code	Item	Date Begin	Date End	Part Number	Part Name	Qty. per Model/Kit	
PA	M9	99-20		782037	PDC, 12v	1	
	M11	99-20		K11419	Control gasket	1	
	M14	99-20		648600	Feedback link	1	
	M29	99-20		035592	Screw	4	
	M51	99-20		9003509-0008	Seal nut	1	
	M76	99-20		11001795	Solenoid valve, 12v	1	
	M87	99-20		592386	Seal washer	1	
	M90	99-20		500812	Screw	6	
	M95	99-20		011296 (9004105-0120)	O-ring	2	
	M96	99-20		688721 (9004104-0170)	O-ring	1	
	M97	99-20		314534 (9004104-0310)	O-ring	1	
	M658	99-20		635938 (9004100-0210)	O-ring	2	
	QM10	99-20		8510165	HDC kit w/PDC, 12v	1	
	QM210	99-20		11096250	Control seal kit	1	
	PB	M9	94-15		782045	PDC, 24v	1
		M11	94-15		K11419	Control gasket	1
M14		94-15		648600	Feedback link	1	
M29		94-15		035592	Screw	4	
M51		94-15		9003509-0008	Seal nut	1	
M76		94-15		11001794	Solenoid valve, 24v	1	
M87		94-15		592386	Seal washer	1	
M90		94-15		500812	Screw	6	
M95		94-15		011296 (9004105-0120)	O-ring	2	
M96		94-15		688721 (9004104-0170)	O-ring	1	
M97		94-15		314534 (9004104-0310)	O-ring	1	
M658		94-15		635938 (9004100-0210)	O-ring	2	
QM10		94-15		11034081	HDC kit w/PDC, 24v	1	
QM210		94-15		11096250	Control seal kit	1	



Variable displacement pump



E100 697E

\* = included in overhaul seal kit Q210

Enlarged **bold** type item numbers are recommended part to stock for servicing.


**Variable displacement pump**
**Filtration**

Order Code	Item	Date Begin	Date End	Part Number	Part Name	Qty. per Model/Kit
1	N001	94-43	12-36	504096	Filter manifold	1
	N002	94-43	12-36	9004104-0320	O-ring	1
	N003	94-43	12-36	002311 (9009610-3459)	Washer	4
	N004	94-43	12-36	505442	Screw	4
	N005	94-43	12-36	140644	Plug assembly	2
	N006	94-43	12-36	320002 (9005110-9200)	Plug assembly	1
2	N001	94-43	12-36	505414	Filter manifold	1
	N002	94-43	12-36	9004104-0320	O-ring	1
	N003	94-43	12-36	002311 (9009610-3459)	Washer	4
	N004	94-43	12-36	713594	Screw	4
	N005	94-43	12-36	140644	Plug assembly	2
	N006	94-43	12-36	320002 (9005110-9200)	Plug assembly	1
D				None		
L	N15	87-42		001156 (9004201-7500)	O-ring	1
	N20	87-42		11049921	Nut	1
	N35	87-42		140644	Plug assembly	1
	N36	87-42		140644	Plug assembly	1
	QN01	87-42		11145248	Filter manifold kit	1
	QN40	87-42		11004919	Filter, long	1
	M	N10	87-42	12-36	140644	Plug assembly
P	N15	87-42		001156 (9004201-7500)	O-ring	1
	N20	87-42		11049921	Nut	1
	N35	87-42		140644	Plug assembly	1
	N36	87-42		140644	Plug assembly	1
	QN01	87-42		11145248	Filter manifold kit	1
	QN40	87-42		11004917	Filter, short	1
	R	N01	87-42		11060426	Filter manifold assembly, remote
N15		87-42		001156 (9004201-7500)	O-ring	1
N20		87-42		11049921	Nut	1
N36		87-42		140644	Plug assembly	1
S	N10	87-42		671990 (9002842-1206)	Reducer assembly	1
	N15	87-42		001156 (9004201-7500)	O-ring	1
	N37	87-42		140644	Plug assembly	1

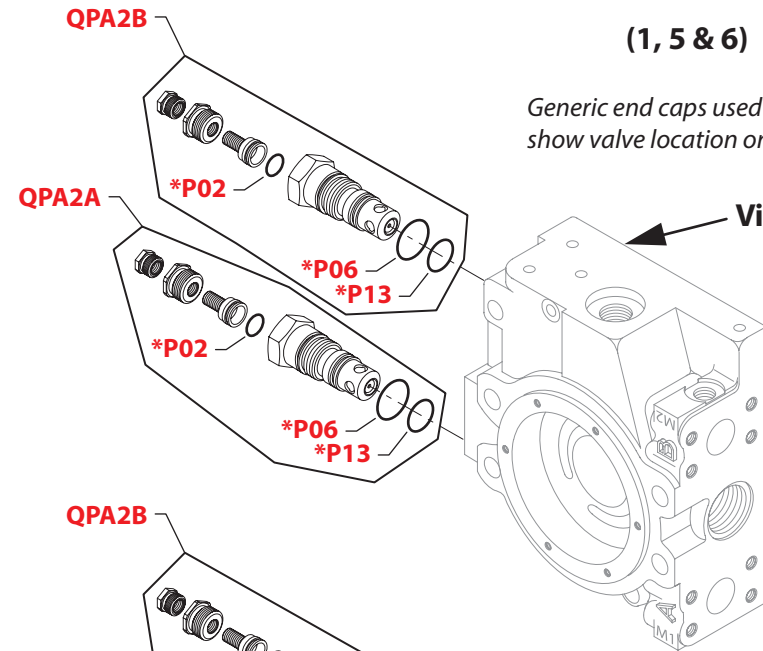
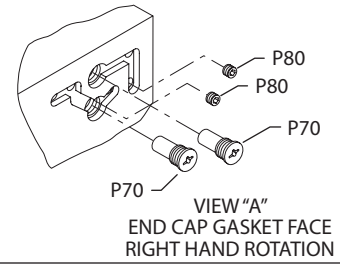


Variable displacement pump

(1, 5 & 6)

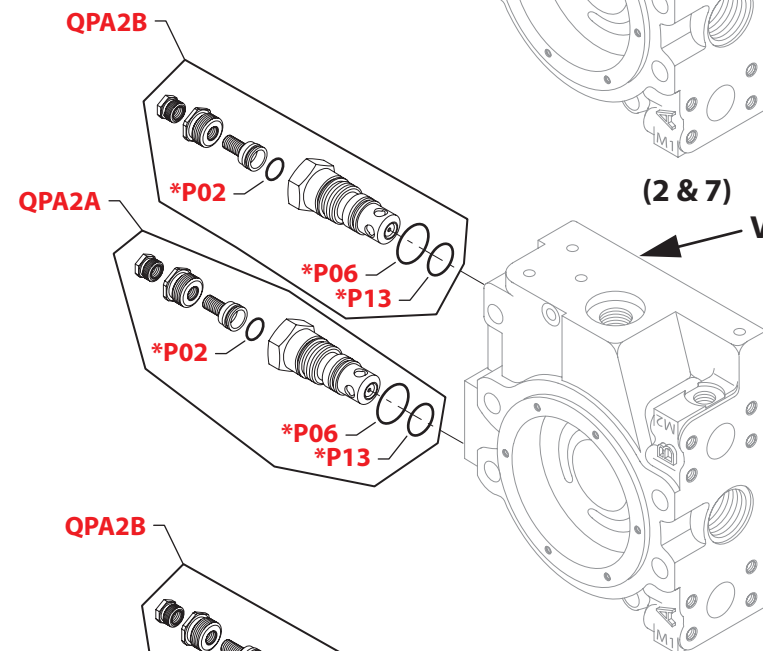
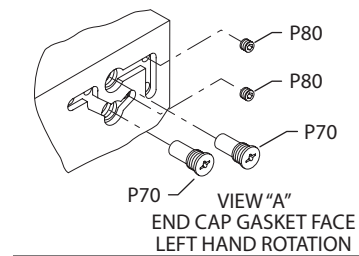
Generic end caps used to show valve location only

View "A"



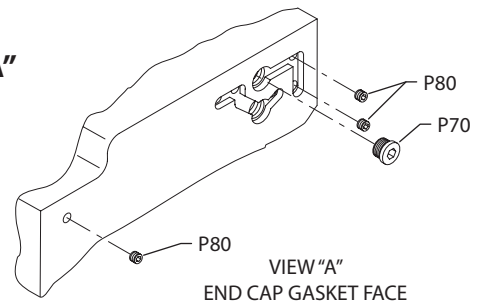
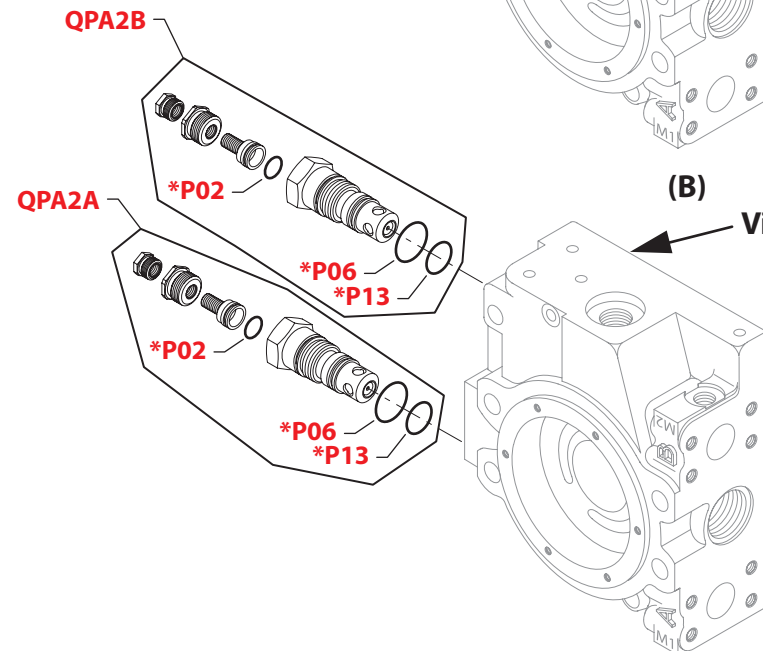
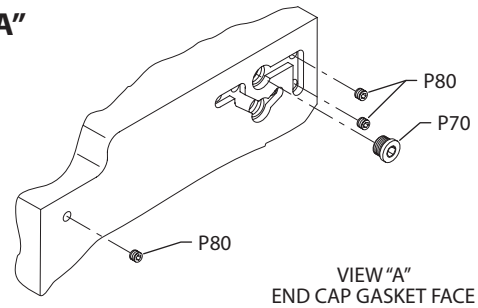
(2 & 7)

View "A"



(B)

View "A"



E100 698E

\* = included in overhaul seal kit Q210

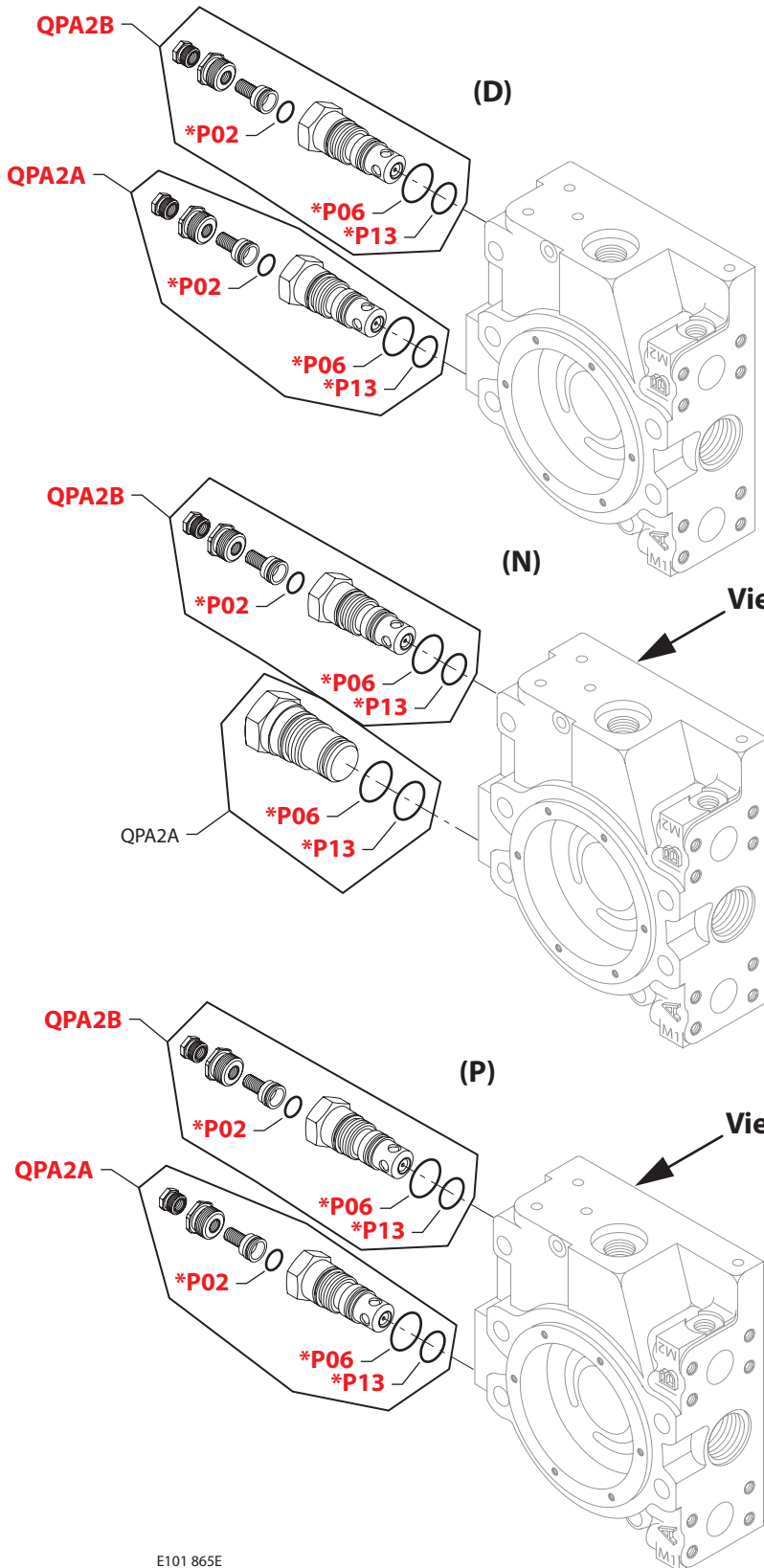
Enlarged **bold** type item numbers are recommended part to stock for servicing.


**Variable displacement pump**
**High pressure regulation**

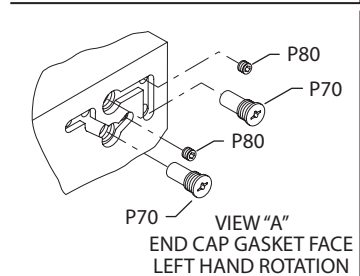
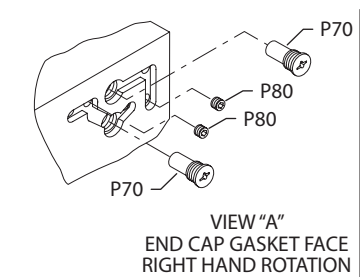
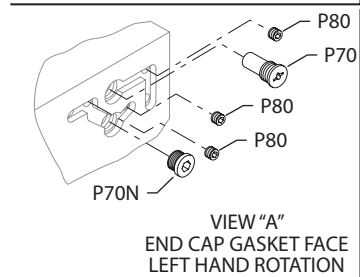
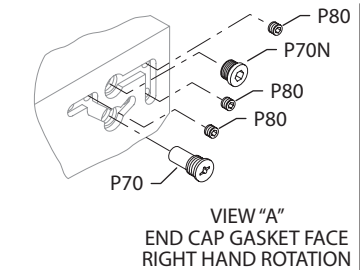
Order Code	Item	Date Begin	Date End	Part Number	Part Name	Qty. per Model/Kit
1	P02	87-42		688721 (9004104-0170)	O-ring	2
	P06	87-42		071811	O-ring	2
	P13	87-42		544742 (9004105-0190)	O-ring	2
	P70	87-42		8800188	Check valve assembly	2
	P80	87-42		9005475-0004	Special pipe plug	2
	QPA2A	87-42		8510022-1	Multi-function valve kit	1
	QPA2B	87-42		8510022-1	Multi-function valve kit	1
	2	P02	87-42		688721 (9004104-0170)	O-ring
P06		87-42		071811	O-ring	2
P13		87-42		544742 (9004105-0190)	O-ring	2
P70		87-42		327007 (9005110-4400)	Plug assembly	1
P80		87-42		9005475-0004	Special pipe plug	3
QPA2A		87-42		8510022-2	Multi-function valve kit	1
QPA2B		87-42		8510022-2	Multi-function valve kit	1
5		P02	87-42		688721 (9004104-0170)	O-ring
	P06	87-42		071811	O-ring	2
	P13	87-42		544742 (9004105-0190)	O-ring	2
	P70	87-42		8800188	Check valve assembly	2
	P80	87-42		9005475-0004	Special pipe plug	2
	QPA2A	87-42		8510240	Multi-function valve kit	1
	QPA2B	87-42		8510240	Multi-function valve kit	1
	6	P02	87-42		688721 (9004104-0170)	O-ring
P06		87-42		071811	O-ring	2
P13		87-42		544742 (9004105-0190)	O-ring	2
P70		87-42		8800188	Check valve assembly	2
P80		87-42		9005475-0004	Special pipe plug	2
QPA2A		87-42		8510022-6	Multi-function valve kit	1
QPA2B		87-42		8510022-6	Multi-function valve kit	1
7		P02	87-42		688721 (9004104-0170)	O-ring
	P16	87-42		071811	O-ring	2
	P13	87-42		544742 (9004105-0190)	O-ring	2
	P70	87-42		327007 (9005110-4400)	Plug assembly	1
	P80	87-42		9005475-0004	Special pipe plug	3
	QPA2A	87-42		8510022-7	Multi-function valve kit	1
	QPA2B	87-42		8510022-7	Multi-function valve kit	1
	B	P02	87-42		688721 (9004104-0170)	O-ring
P06		87-42		071811	O-ring	2
P13		87-42		544742 (9004105-0190)	O-ring	2
P70		87-42		8800188	Check valve assembly	1
P80		87-42		9005475-0004	Special pipe plug	3
QPA2A		87-42		8510022-1	Multi-function valve kit	1
QPA2B		87-42		8510022-1	Multi-function valve kit	1



Variable displacement pump



Generic end caps used to show valve location only



E101 865E

Enlarged **bold** type item numbers are recommended part to stock for servicing.

\* = included in overhaul seal kit Q210



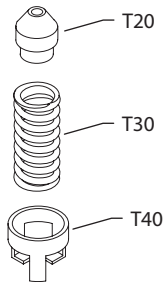

**Variable displacement pump**
**High pressure regulation**

Order Code	Item	Date Begin	Date End	Part Number	Part Name	Qty. per Model/Kit
D	P02	87-42		688721 (9004104-0170)	O-ring	2
	P06	87-42		071811	O-ring	2
	P13	87-42		544742 (9004105-0190)	O-ring	2
	P70	87-42		8800188	Check valve assembly	2
	QPA2A	87-42		8510388	Multi-function valve kit	1
	QPA2B	87-42		8510388	Multi-function valve kit	1
	N	P02	87-42		688721 (9004104-0170)	O-ring
P06		87-42		071811	O-ring	2
P13		87-42		544742 (9004105-0190)	O-ring	2
P70		87-42		8800188	Check valve assembly	1
P70N		87-42		327007 (9005110-4400)	Plug assembly	1
P80		87-42		9005475-0004	Special pipe plug	3
PA2A		87-42		781971	Plug assembly	1
QPA2B		87-42		8510022-1	Multi-function valve kit	1
P		P02	87-42		688721 (9004104-0170)	O-ring
	P06	87-42		071811	O-ring	2
	P13	87-42		544742 (9004105-0190)	O-ring	2
	P70	87-42		8800188	Check valve assembly	2
	P80	87-42		9005475-0004	Special pipe plug	2
	QPA2A	87-42		8510389	Multi-function valve kit	1
	QPA2B	87-42		8510389	Multi-function valve kit	1



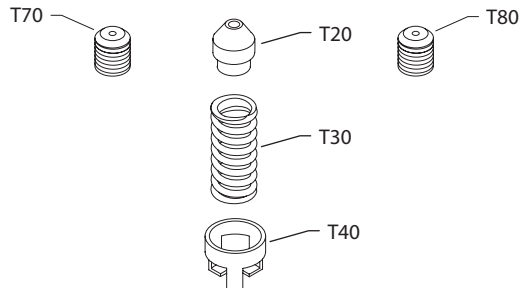
Variable displacement pump

**(01, 02, 03, 04, 05,  
06, 09 & 22)**



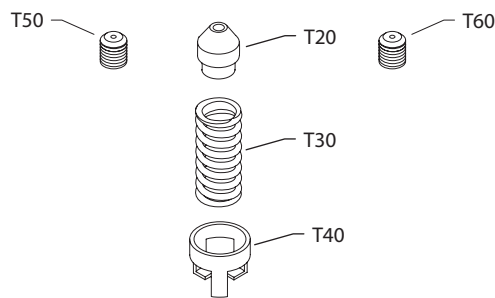
See control drawing  
for orifice location

**(21)**



See control drawing  
for orifice location

**(23)**



See control drawing  
for orifice location

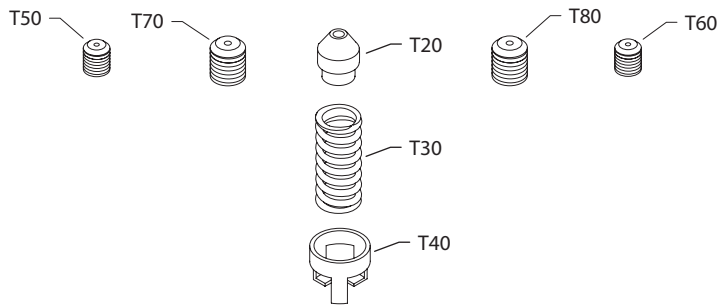

**Variable displacement pump**
**Orifice**

Order Code	Item	Date Begin	Date End	Part Number	Part Name	Qty. per Model/Kit
00				None		
01	T20	87-42		8801136	Orificed check valve, .018"	1
	T30	87-42		679506 (8700007)	Spring	1
	T40	87-42		8801303	Spring retainer	1
02	T20	87-42		8801139	Orificed check valve, .026"	1
	T30	87-42		679506 (8700007)	Spring	1
	T40	87-42		8801303	Spring retainer	1
03	T20	87-42		11061958	Orificed check valve, .81mm	1
	T30	87-42		679506 (8700007)	Spring	1
	T40	87-42		8801303	Spring retainer	1
04	T20	87-42		11061970	Orificed check valve, 1.02mm	1
	T30	87-42		679506 (8700007)	Spring	1
	T40	87-42		8801303	Spring retainer	1
05	T20	87-42		11061981	Orificed check valve, 1.37mm	1
	T30	87-42		679506 (8700007)	Spring	1
	T40	87-42		8801303	Spring retainer	1
06	T20	87-42		11061993	Orificed check valve, 1.57mm	1
	T30	87-42		679506 (8700007)	Spring	1
	T40	87-42		8801303	Spring retainer	1
09	T20	87-42		11062006	Orificed check valve, 2.34mm	1
	T30	87-42		679506 (8700007)	Spring	1
	T40	87-42		8801303	Spring retainer	1
21	T20	87-42		11061970	Orificed check valve, 1.02mm	1
	T30	87-42		679506 (8700007)	Spring	1
	T40	87-42		8801303	Spring retainer	1
	T70	87-42		714477	Orifice plug, 0.8mm, M8 x 8	1
	T80	87-42		716837	Orifice plug, 0.8mm, M8 x 8	1
22	T20	87-42		8801137	Orificed check valve, .022"	1
	T30	87-42		679506 (8700007)	Spring	1
	T40	87-42		8801303	Spring retainer	1
23	T20	87-42		11061958	Orificed check valve, 0.81mm	1
	T30	87-42		679506 (8700007)	Spring	1
	T40	87-42		8801303	Spring retainer	1
	T50	87-42		639153	Orifice plug, 1.3mm, M5 x 6	1
	T60	87-42		639153	Orifice plug, 1.3mm, M5 x 6	1



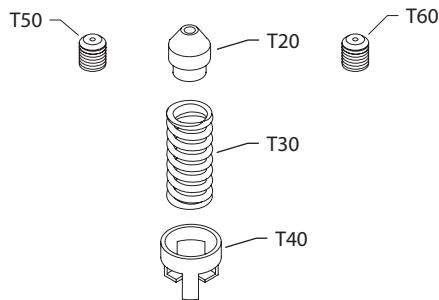
Variable displacement pump

**(25, 28 & 30)**



See control drawing  
for orifice location

**(26 & 29)**



See control drawing  
for orifice location

**(32 & 33)**



See control drawing  
for orifice location

**(34)**



See control drawing  
for orifice location

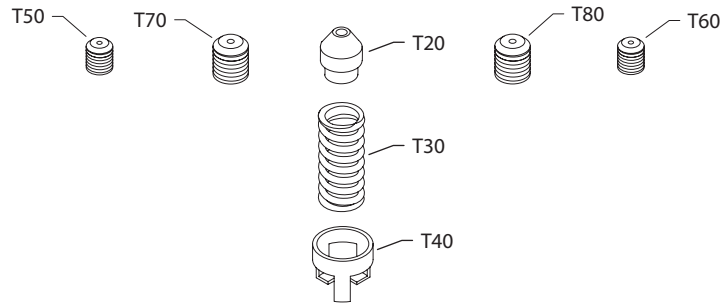

**Variable displacement pump**
**Orifice**

Order Code	Item	Date Begin	Date End	Part Number	Part Name	Qty. per Model/Kit
25	T20	87-42		8801139	Orificed check valve, .026"	1
	T30	87-42		679506 (8700007)	Spring	1
	T40	87-42		8801303	Spring retainer	1
	T50	87-42		606657	Orifice plug, 0.5mm, M5 x 6	1
	T60	87-42		606657	Orifice plug, 0.5mm, M5 x 6	1
	T70	87-42		716837	Orifice plug, 0.6mm, M8 x 8	1
	T80	87-42		716837	Orifice plug, 0.6mm, M8 x 8	1
	26	T20	87-42		11061958	Orificed check valve, .81mm
T30		87-42		679506 (8700007)	Spring	1
T40		87-42		8801303	Spring retainer	1
T50		87-42		598292	Orifice plug, 0.8mm, M5 x 6	1
T60		87-42		598292	Orifice plug, 0.8mm, M5 x 6	1
28		T20	87-42		8801139	Orificed check valve, .026"
	T30	87-42		679506 (8700007)	Spring	1
	T40	87-42		8801303	Spring retainer	1
	T50	87-42		639104	Orifice plug, 0.7mm, M5 x 6	1
	T60	87-42		639104	Orifice plug, 0.7mm, M5 x 6	1
	T70	87-42		704650	Orifice plug, 0.7mm, M8 x 8	1
	T80	87-42		704650	Orifice plug, 0.7mm, M8 x 8	1
	29	T20	87-42		11061958	Orificed check valve, .81mm
T30		87-42		679506 (8700007)	Spring	1
T40		87-42		8801303	Spring retainer	1
T50		87-42		639104	Orifice plug, 0.7mm, M5 x 6	1
T60		87-42		639104	Orifice plug, 0.7mm, M5 x 6	1
30		T20	87-42		8801139	Orificed check valve, .026"
	T30	87-42		679506 (8700007)	Spring	1
	T40	87-42		8801303	Spring retainer	1
	T50	87-42		639153	Orifice plug, 1.3mm, M5 x 6	1
	T60	87-42		639153	Orifice plug, 1.3mm, M5 x 6	1
	T70	87-42		704650	Orifice plug, 0.7mm, M8 x 8	1
	T80	87-42		704650	Orifice plug, 0.7mm, M8 x 8	1
	32	T50	87-42		639120	Orifice plug, 1.0mm, M5 x 6
T60		87-42		639153	Orifice plug, 1.3mm, M5 x 6	1
33	T50	87-42		639153	Orifice plug, 1.3mm, M5 x 6	1
	T60	87-42		639153	Orifice plug, 1.3mm, M5 x 6	1
34	T70	87-42		755793	Orifice plug, 1.0mm, M8 x 8	1
	T80	87-42		755793	Orifice plug, 1.0mm, M8 x 8	1



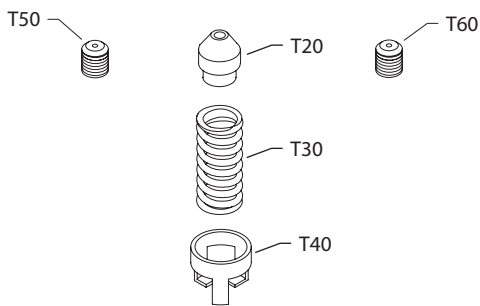
Variable displacement pump

**(35)**



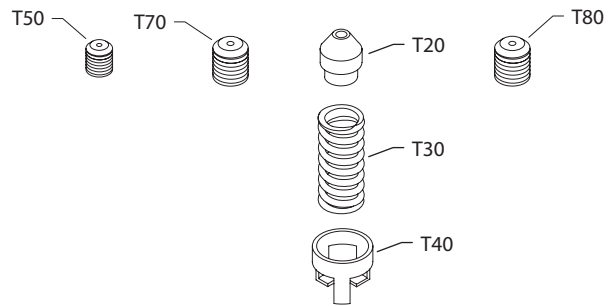
See control drawing  
for orifice location

**(37, 45, 46 & 49)**



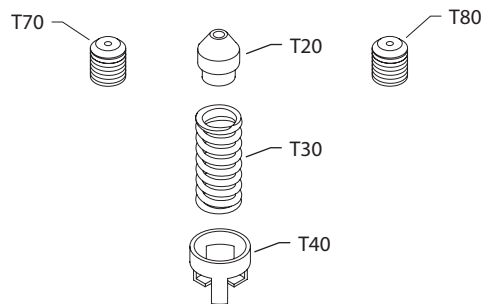
See control drawing  
for orifice location

**(50)**



See control drawing  
for orifice location

**(59 & 74)**



See control drawing  
for orifice location

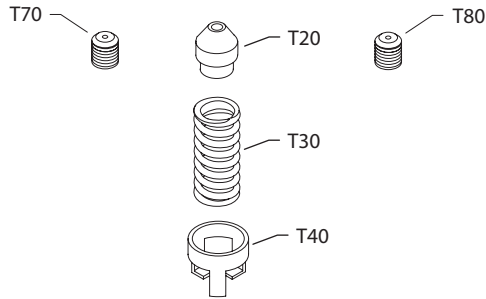

**Variable displacement pump**
**Orifice**

Order Code	Item	Date Begin	Date End	Part Number	Part Name	Qty. per Model/Kit	
35	T20	87-42		11061958	Orificed check valve, 0.81mm	1	
	T30	87-42		679506 (8700007)	Spring	1	
	T40	87-42		8801303	Spring retainer	1	
	T50	87-42		598292	Orifice plug, 0.8mm, M5 x 6	1	
	T60	87-42		598292	Orifice plug, 0.8mm, M5 x 6	1	
	T70	87-42		714477	Orifice plug, 0.8mm, M8 x 8	1	
	T80	87-42		714477	Orifice plug, 0.8mm, M8 x 8	1	
	37	T20	87-42		11061981	Orificed check valve, 1.37mm	1
T30		87-42		679506 (8700007)	Spring	1	
T40		87-42		8801303	Spring retainer	1	
T50		87-42		639120	Orifice plug, 1.0mm, M5 x 6	1	
T60		87-42		639120	Orifice plug, 1.0mm, M5 x 6	1	
45		T20	87-42		11061958	Orificed check valve, 0.81mm	1
	T30	87-42		679506 (8700007)	Spring	1	
	T40	87-42		8801303	Spring retainer	1	
	T50	87-42		639153	Orifice plug, 1.3mm, M5 x 6	1	
	T60	87-42		598292	Orifice plug, 0.8mm, M5 x 6	1	
	46	T20	87-42		8801139	Orificed check valve, .026"	1
T30		87-42		679506 (8700007)	Spring	1	
T40		87-42		8801303	Spring retainer	1	
T50		87-42		598292	Orifice plug, 0.8mm, M5 x 6	1	
T60		87-42		598292	Orifice plug, 0.8mm, M5 x 6	1	
49		T20	87-42		11061958	Orificed check valve, 0.81mm	1
	T30	87-42		679506 (8700007)	Spring	1	
	T40	87-42		8801303	Spring retainer	1	
	T50	87-42		639120	Orifice plug, 1.0mm, M5 x 6	1	
	T60	87-42		639120	Orifice plug, 1.0mm, M5 x 6	1	
	50	T20	87-42		8801139	Orificed check valve, .026"	1
T30		87-42		679506 (8700007)	Spring	1	
T40		87-42		8801303	Spring retainer	1	
T50		87-42		310771	Orifice plug, 1.2mm, M6 x 6	1	
T70		87-42		517571	Orifice plug, 0.9mm, M6 x 6	1	
T80		87-42		517571	Orifice plug, 0.9mm, M6 x 6	1	
59		T20	87-42		8801139	Orificed check valve, 0.026	1
		T30	87-42		679506 (8700007)	Spring	1
	T40	87-42		8801303	Spring retainer	1	
	T70	87-42		739144	Orifice plug, 0.8mm, M6 x 6	1	
	T80	87-42		739144	Orifice plug, 0.8mm, M6 x 6	1	
	74	T20	89-41		11061958	Orificed check valve, .026"	1
T30		89-41		679506 (8700007)	Spring	1	
T40		89-41		8801303	Spring retainer	1	
T70		89-41		755793	Orifice plug, 1.0mm, M8 x 8	1	
T80		89-41		755793	Orifice plug, 1.0mm, M8 x 8	1	



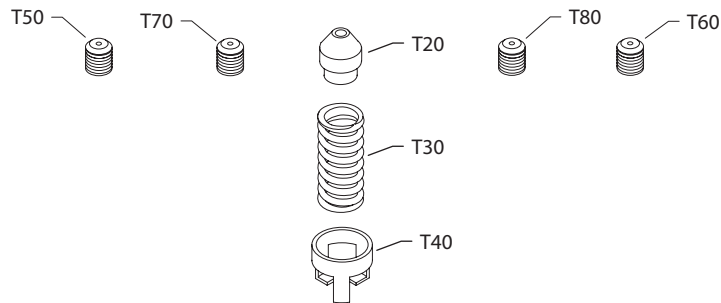
Variable displacement pump

**(76, 99 & A5)**



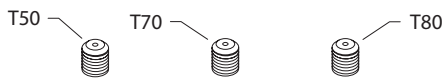
See control drawing  
for orifice location

**(78)**



See control drawing  
for orifice location

**(82, B3 & B4)**



See control drawing  
for orifice location

**(84, A4 & B2)**



See control drawing  
for orifice location




**Variable displacement pump**
**Orifice**

Order Code	Item	Date Begin	Date End	Part Number	Part Name	Qty. per Model/Kit
76	T20	89-41		8801139	Orificed check valve, .026"	1
	T30	89-41		679506 (8700007)	Spring	1
	T40	89-41		8801303	Spring retainer	1
	T70	89-41		578542	Orifice plug, 0.8mm, M6 x 8	1
	T80	89-41		578542	Orifice plug, 0.8mm, M6 x 8	1
78	T20	87-42		8801139	Orificed check valve, 0.81mm	1
	T30	87-42		679506 (8700007)	Spring	1
	T40	87-42		8801303	Spring retainer	1
	T50	87-42		513026	Orifice plug, 1.3mm, M6 x 8	1
	T60	87-42		513026	Orifice plug, 1.3mm, M6 x 8	1
	T70	87-42		578542	Orifice plug, 0.8mm, M6 x 8	1
	T80	87-42		578542	Orifice plug, 0.8mm, M6 x 8	1
	82	T50	89-41		310771	Orifice plug, 1.2mm, M6 x 6
T70		89-41		310771	Orifice plug, 1.2mm, M6 x 6	1
T80		89-41		310771	Orifice plug, 1.2mm, M6 x 6	1
84	T70	89-41		310771	Orifice plug, 1.2mm, M6 x 6	1
	T80	89-41		310771	Orifice plug, 1.2mm, M6 x 6	1
99	T20	89-41		8801301	Orificed check valve, .047"	1
	T30	89-41		679506 (8700007)	Spring	1
	T40	89-41		8801303	Spring retainer	1
	T70	89-41		517572	Orifice plug, 1.5mm, M6 x 6	1
	T80	89-41		517572	Orifice plug, 1.5mm, M6 x 6	1
A4	T70	89-41		578542	Orifice plug, 0.8mm, M6 x 8	1
	T80	89-41		578542	Orifice plug, 0.8mm, M6 x 8	1
A5	T20	89-41		11061970	Control orifice kit, 1.02mm	1
	T30	89-41		679506 (8700007)	Spring	1
	T40	89-41		8801303	Spring retainer	1
	T70	89-41		578542	Orifice plug, 0.8mm, M6 x 8	1
	T80	89-41		578542	Orifice plug, 0.8mm, M6 x 8	1
B1	T50	89-41		507042	Orifice plug, 1.5mm, M6 x 8	1
B2	T70	89-41		310771	Orifice plug, 1.2mm, M6 x 6	1
	T80	89-41		310771	Orifice plug, 1.2mm, M6 x 6	1
B3	T50	89-41		507042	Orifice plug, 1.5mm, M6 x 8	1
	T70	89-41		739144	Orifice plug, 0.8mm, M6 x 6	1
	T80	89-41		739144	Orifice plug, 0.8mm, M6 x 6	1
B4	T50	89-41		507042	Orifice plug, 1.5mm, M6 x 8	1
	T70	89-41		310771	Orifice plug, 1.2mm, M6 x 6	1
	T80	89-41		310771	Orifice plug, 1.2mm, M6 x 6	1



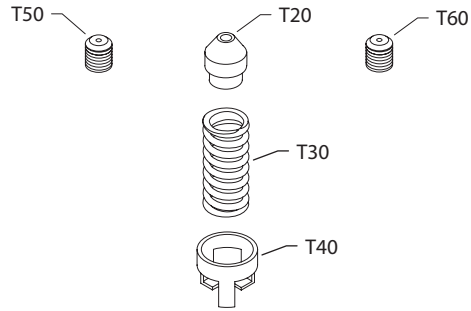
Variable displacement pump

**(C4)**



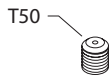
See control drawing  
for orifice location

**(C5, C6 & C7)**



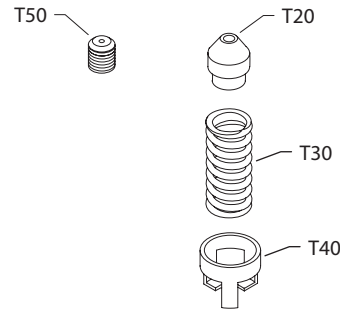
See control drawing  
for orifice location

**(G1)**



See control drawing  
for orifice location

**(G4, G8, GB, GD & GF)**



See control drawing  
for orifice location

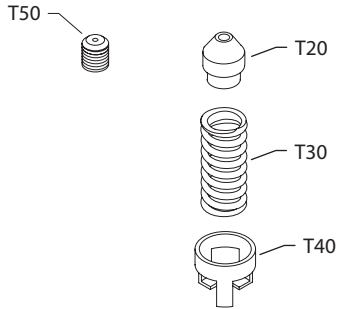

**Variable displacement pump**
**Orifice**

Order Code	Item	Date Begin	Date End	Part Number	Part Name	Qty. per Model/Kit
C4	T50	89-41		639161	Orifice plug, 1.4 mm, M5 x 6	1
	T60	89-41		639161	Orifice plug, 1.4 mm, M5 x 6	1
C5	T20	89-41		11061958	Orificed check valve, 0.81mm	1
	T30	89-41		679506 (8700007)	Spring	1
	T40	89-41		8801303	Spring retainer	1
	T50	89-41		639161	Orifice plug, 1.4 mm, M5 x 6	1
	T60	89-41		639161	Orifice plug, 1.4 mm, M5 x 6	1
C6	T20	89-41		11061970	Control orifice kit, 1.02mm	1
	T30	89-41		679506 (8700007)	Spring	1
	T40	89-41		8801303	Spring retainer	1
	T50	89-41		639161	Orifice plug, 1.4 mm, M5 x 6	1
	T60	89-41		639161	Orifice plug, 1.4 mm, M5 x 6	1
C7	T20	89-41		11061981	Control orifice kit, 1.37mm	1
	T30	89-41		679506 (8700007)	Spring	1
	T40	89-41		8801303	Spring retainer	1
	T50	89-41		639161	Orifice plug, 1.4 mm, M5 x 6	1
	T60	89-41		639161	Orifice plug, 1.4 mm, M5 x 6	1
G1	T50	89-41		310771	Orifice plug, 1.2 mm, M6 x 6	1
G4	T20	89-41		8801136	Control orifice kit, .018"	1
	T30	89-41		679506 (8700007)	Spring	1
	T40	89-41		8801303	Spring retainer	1
	T50	89-41		310771	Orifice plug, 1.2 mm, M6 x 6	1
G8	T20	89-41		8801139	Orificed check valve, .026"	1
	T30	89-41		679506 (8700007)	Spring	1
	T40	89-41		8801303	Spring retainer	1
	T50	89-41		310771	Orifice plug, 1.2 mm, M6 x 6	1
GB	T20	89-41		11061958	Orificed check valve, 0.81mm	1
	T30	89-41		679506 (8700007)	Spring	1
	T40	89-41		8801303	Spring retainer	1
	T50	89-41		310771	Orifice plug, 1.2 mm, M6 x 6	1
GD	T20	89-41		11061993	Orificed check valve, 1.57mm	1
	T30	89-41		679506 (8700007)	Spring	1
	T40	89-41		8801303	Spring retainer	1
	T50	89-41		310771	Orifice plug, 1.2 mm, M6 x 6	1
GF	T20	89-41		11061970	Control orifice kit, 1.02mm	1
	T30	89-41		679506 (8700007)	Spring	1
	T40	89-41		8801303	Spring retainer	1
	T50	89-41		310771	Orifice plug, 1.2 mm, M6 x 6	1



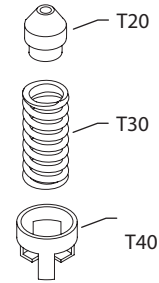
Variable displacement pump

**(GJ & Z2)**



See control drawing  
for orifice location

**(K1)**



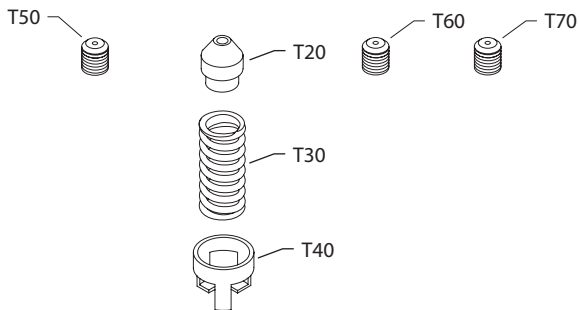
See control drawing  
for orifice location

**(P1)**



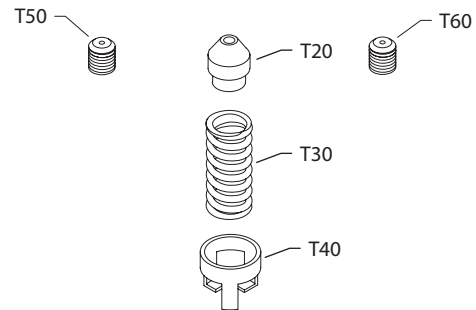
See control drawing  
for orifice location

**(Z1)**



See control drawing  
for orifice location

**(Z3)**



See control drawing  
for orifice location


**Variable displacement pump**
**Orifice**

Order Code	Item	Date Begin	Date End	Part Number	Part Name	Qty. per Model/Kit
GJ	T20	89-41		11061981	Control orifice kit, 1.37mm	1
	T30	89-41		679506 (8700007)	Spring	1
	T40	89-41		8801303	Spring retainer	1
	T50	89-41		310771	Orifice plug, 1.2 mm, M6 x 6	1
K1	T20	89-41		11061981	Control orifice kit, 1.37mm	1
	T30	89-41		679506 (8700007)	Spring	1
	T40	89-41		8801303	Spring retainer	1
P1	T70	11-40		508014	Orifice plug, 1.0mm, M6 x 6	1
	T80	11-40		508014	Orifice plug, 1.0mm, M6 x 6	1
Z1	T20	89-41		11061958	Control orifice kit, 0.81 mm	1
	T30	89-41		679506 (8700007)	Spring	1
	T40	89-41		8801303	Spring retainer	1
	T50	89-41		519659	Orifice plug, 1.0mm, M6 x 6	1
	T60	89-41		519659	Orifice plug, 1.0mm, M6 x 6	1
	T70	89-41		519659	Orifice plug, 1.0mm, M6 x 6	1
	Z2	T20	89-41		11061958	Control orifice kit, 0.81 mm
T30		89-41		679506 (8700007)	Spring	1
T40		89-41		8801303	Spring retainer	1
T50		89-41		739144	Orifice plug, 0.8mm, M6 x 6	1
Z3	T20	89-41		11061970	Control orifice kit, 1.02mm	1
	T30	89-41		679506 (8700007)	Spring	1
	T40	89-41		8801303	Spring retainer	1
	T50	89-41		519659	Orifice plug, 1.0mm, M6 x 6	1
	T60	89-41		519659	Orifice plug, 1.0mm, M6 x 6	1


**Variable displacement pump**
**Overhaul seal kit**

Order Code	Item	Date Begin	Date End	Part Number	Part Name	Qty. per Model/Kit
	Q210	87-42		11095646	Seal kit, base pump, 42cc	1
	B90	87-42		9803390	Filter screen	1
	C70	87-42		648477	Screw	4
	E40	87-42		517862 (9003509-0006)	Seal nut, M6	2
	E50	87-42		517376	O-ring	1
	E60	87-42		517229	Screw (SB-1994-018)	6
	F11	87-42		350397 (9004100-1220)	O-ring	2
	F12	87-42		507796	Piston ring	2
	F40	87-42		706242	O-ring	2
	F50	87-42		338517	O-ring	2
	F112	87-42		505412 (9003509-0008)	Seal nut, M8	1
	F124	87-42		612291 (9003508-0008)	Seal nut, M8	1
	F212	87-42		505412 (9003509-0008)	Seal nut, M8	1
	F224	87-42		612291	Seal nut, M12	1
	G30	87-42		512833	End cap gasket	1
	J40	87-42		680892 (9004104-0440)	O-ring	1
	J50	87-42		056739 (9004104-1580)	O-ring	1
	K50	87-42		001149 (9004201-6200)	O-ring, .755 x .097, nitrile, 90D	1
	L25	87-42		11060010	Seal carrier assembly	1
	N15	87-42		001156 (9004201-7500)	O-ring, .924 x .116, nitrile, 90D	1
	P02	87-42		688721 (9004104-0170)	O-ring	2
	P06	87-42		071811	O-ring	2
	P13	87-42		544742 (9004105-0190)	O-ring	2



**Service Bulletin: SB-1988-023**

**Products affected** Series 90 pumps and motors

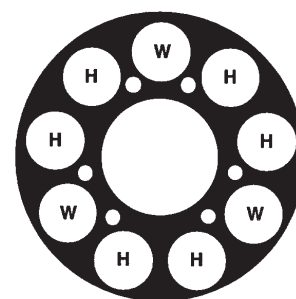
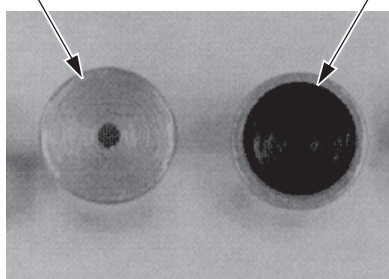
**Subject** Piston improvement

**Description** Product Information Bulletin PIB-8801 (March, 1988) announced the incorporation of fabricated (welded) piston assemblies, replacing non-fabricated (hollow) piston assemblies, in the cylinder blocks of all Series 90 pumps and motors. This change increases the overall efficiency of the Series 90 product line.

To simplify service parts inventory for all Series 90 units, only individual welded piston assemblies will be available as spare parts. The hollow pistons will be obsolete. Part numbers for individual welded piston assemblies are listed in this bulletin.

Since all Series 90 pumps and motors have nine (9) pistons, welded pistons being used to replace hollow pistons during repair **MUST** be install in the cylinder block symmetrically, in multiples of three (3).

Welded Piston Assembly                      Hollow Piston Assembly



When replacing hollow pistons with welded pistons, it is mandatory that the welded pistons be incorporated symmetrically in multiples of three.

**Models affected** All series 90 pumps and motors: 93-xxxx, 94-xxxx, 95-xxxx, and 96-xxxx pumps

**Serial numbers** Welded pistons will be incorporated into all series 90 pumps and motors by the end of the first quarter of 1998.

**Part numbers affected**

Part number	Description
706101	Piston assembly, welded - 42 cc
367672	Piston assembly, welded - 55 cc
708230	Piston assembly, welded - 75 cc
364000	Piston assembly, welded - 100 cc

**Parts disposition** ■ Interchangeable



**Service Bulletin: SB-1989-002**

**Products affected** Series 90 pumps

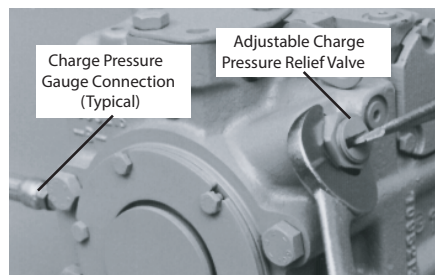
**Subject** Incorporation of adjustable charge relief valve

**Description** As a product improvement Sauer-Danfoss is incorporating an adjustable charge relief valve on all series 90 variable displacement pumps. This design replaces the previous shim adjustable charge relief valve. The new design valve provides a range of pressure adjustment which covers the available charge pressure options of 290, 348, and 406 psi [20, 24, and 28 bar].

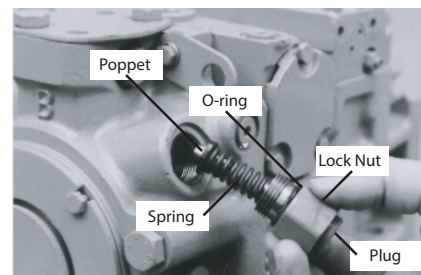
Note: This improvement changes the design of the charge relief valve poppet and plug. The new style charge relief may protrude from the pump end cap approximately 0.27 in [6.9 mm] farther than the shim adjustable design.

To adjust the new design valve, first install a gauge to measure charge pressure as described in the series 90 service manual. Loosen the adjustment lock nut with a 1-1/16 in hex wrench. Operate the pump at an input speed of 1700 to 2000 rpm and turn the adjustment plug with a large screwdriver while observing the charge pressure. Clockwise rotation of the plug increases the setting, while counterclockwise rotation decreases the setting at a rate of approximately 50 psi [3.4 bar] per turn. Once the desired setting is achieved, torque the lock nut to 34-41 lbf-ft [46-55 Nm], and remove the charge pressure gauge.

Sauer-Danfoss will offer an adjustable charge relief valve kit for sale as a service part. This kit can be used to service any vintage series 90 variable pump. Since the new and old style charge relief valves are interchangeable as an assembly, the old style parts will no longer be available as service parts.



Adjusting Charge Relief Valve



Charge Relief Valve Assembly

**Models affected** All 93-2xxx, 94-2xxx, 95-2xxx, and 96-2xxx pumps

**Serial numbers** Due to the interchangeability of the charge relief valve assemblies, this is a running change. It will be incorporated into all series 90 variable pumps by March of 1989.

**Part numbers affected**

Part number	Description
8002K000-A	Adjustable charge relief valve kit - new style (includes poppet, spring, plug, O-ring, and nut)

**Parts disposition** ■ Interchangeable (as an assembly)





**Service Bulletin: SB-1992-008**

<b>Products affected</b>	Series 90 pumps
<b>Subject</b>	Block point change: components redesign
<b>Description</b>	As part of our overall series 90 product improvement program, numerous components are being redesigned. This redesign is referred to as a “block point” change. The objective of the block point change is to minimize the number of times we change the units while we convert to high volume tooling at various plant sites. These design improvements will provide increased reliability and more application flexibility. The nature of these changes makes customer requalification unnecessary. Old style (pre-block point) variable housings and end caps will no longer be available as spare parts.
<b>Models affected</b>	All 93-2xxx pumps
<b>Serial numbers</b>	N/A
<b>Part numbers affected</b>	Refer to next page of this bulletin for specific part numbers Housing: Thickness adjacent to the side cover has been increased Side cover: Thickness increased to match change in housing. End cap: Match housing change. Input shaft: A 19 tooth option, thus a larger shaft roller bearing. Shaft seal hardware changed to accommodate new bearing and commonize the design with larger displacement units. Charge pump: Charge pump shaft and cover changed for commonality with the larger displacement units SAE “B” pad New charge pump shaft accommodates revised auxiliary pad drive couplings
<b>Parts disposition</b>	■ Not Applicable



Service Bulletin: SB-1992-008

**Frame size: 042 - parts affected**

Item	Description	Pre-block point part number	New part number 92-12 & later
<b>Common parts group, 42 cc</b>			
B10	Variable housing	325050 (O)	503422
E10	Side cover	671602 (I & O)	751305
E20	Leveler	673897	731984
L10	Bearing	690305	357616
L20	Retaining ring	392134	9006300-0137
L30	Seal carrier	N/A	340356
L35	Seal carrier	689521	Deleted
L40	Lip seal	656280	9008000-0118
L50	O-ring	9004104-0360	780247
L60	Retainer plate	N/A	340349
L70	Screw	9007210-0604	746208
<b>End cap group: G</b>			
G048	End cap, twin ports	333179 (O)	769562
G20	Journal bearing	648030	343830
G958	Screw	508994	500641
G968	Screw	36178 (I)	354407
<b>Charging system group: H (affects options B, C, and L)</b>			
H50	Charge pump shaft	715243	340364
<b>Auxiliary mounting, 'A' flange, 9 tooth</b>			
J10	Coupling	323972	341016
J15	Cover assembly	347542	347567
J30	Bushing	648055	8700008
<b>Auxiliary mounting, 'B' flange, 13 tooth</b>			
J10	Coupling	324228	341024
J15	Cover assembly	347542	347567
J30	Bushing	648055	8700008
J60	Flange adapter	664094	340539
<b>Auxiliary mounting, none</b>			
J15N	Cover assembly	717264	347559
J30	Bushing	648055	8700008
<b>Auxiliary mounting, 'B-B' flange, 15 tooth</b>			
J10	Coupling	664060	342907
J15	Cover assembly	347542	347567
J30	Bushing	648055	8700008
J60	Flange adapter	664094	340539
<b>Input shaft: L</b>			
L1C3	Shaft, 15T 16.32	689414	340521
L1T3	Shaft, 1.0 taper	753855	342915
<b>Special hardware: W</b>			
B83	Speed pickup plug	N/A	9005110-5600

(I) Interchangeable  
(O) Obsolete



**Service Bulletin: SB-1993-002**

**Products affected**

Series 90 pump: All frame sizes

**Subject**

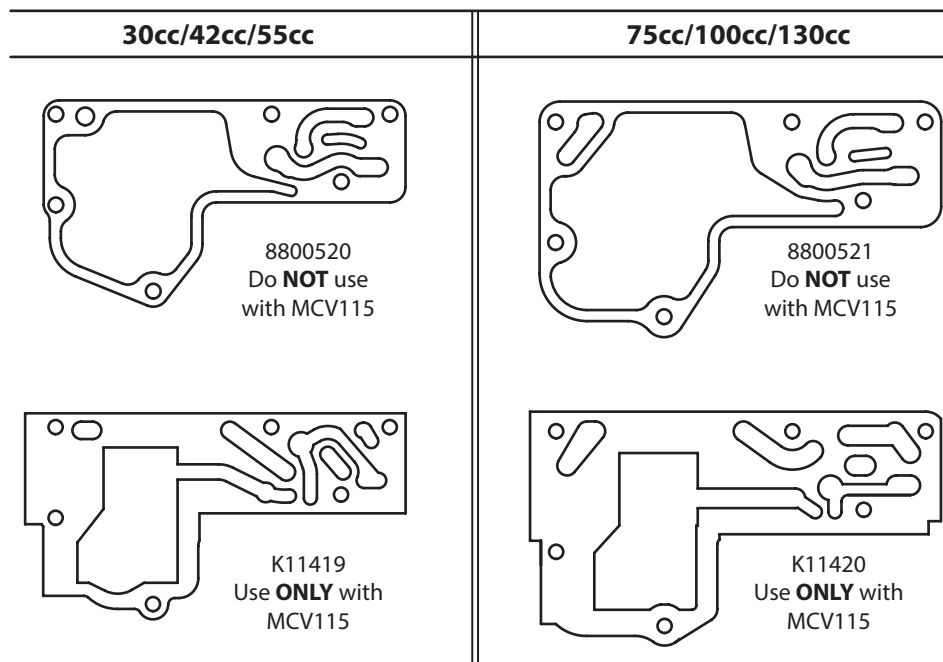
Control gasket changes for MCV115 hydraulic displacement control

**Description**

In October of 1992, Sauer-Danfoss began offering a new style hydraulic displacement control (MCV115) that is a direct replacement for the MCV112,

The control gasket also changed, and the new style gasket must be used with the MCV115 control. The old style gasket is to be used with the MCV112 control, all manual displacement controls, and MCV111 electric displacement controls.

**WARNING**  
**Failure to use the appropriate gasket may result in uncontrolled pump displacement**



**Models affected**

All 93-2xxx, 94-2xxx, 95-2xxx, 96-2xxx, and 97-2xxx pumps

**Serial numbers**

October 1992 and beyond

**Part numbers affected**

Frame size	Control gasket for EDC (MCV111)	Control gasket for HDC (MCV112)	Control gasket for HDC (MCV115)	Control gasket for MDC (8x02M0Mx)
30/42/55 cc	8800520	8800520	K11419	8800520
75/100/130 cc	8800521	8800521	K11420	8800521

**Parts disposition**

■ Non-interchangeable

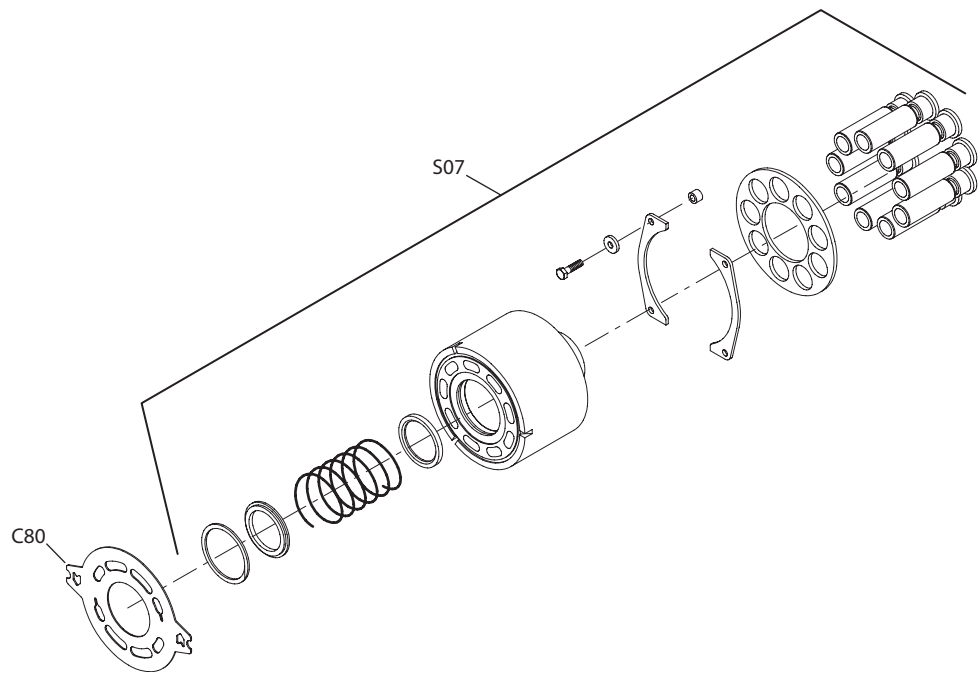


**Service Bulletin: SB-1993-012**

**Products affected** All Series 90 pumps

**Subject** Removal of valve plate from cylinder block kit

**Description** Due to the increasing number of valve plate options, the valve plate (item C80) will be no longer included in the cylinder block kit (item S07) on all series 90 variable pumps. Valve plates must be ordered separately for service parts. See special hardware features group in your Service Parts Manual for the appropriate valve plate number.



**Models affected** All 93-2xxx, 94-2xxx, 95-2xxx, 96-2xxx, 97-2xxx variable pumps

**Serial numbers** Not applicable

**Part numbers affected**

Frame size	Cylinder block kit
42 cc	80520S07
55 cc	80020S07
75 cc	81020S07
100 cc	82020S07
130 cc	83020S07

**Parts disposition** ■ Not Applicable



**Service Bulletin: SB-1993-015A**

**Products affected** Series 90 pump: All frame sizes

**Subject** Servo arm interference with speed sensor ring

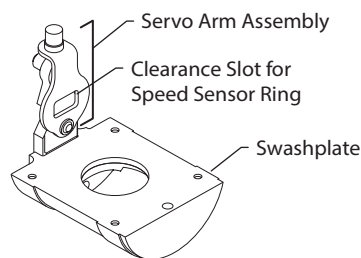
**Description** **Note: This service bulletin revision adds the 42 cc frame size and the incorporation date of 55 thru 100 cc.**

A potential interference problem has been identified in series 90 42, 55, 75, and 100 cc frame size pumps built since early 1992. Interference may occur between the swashplate hold down bracket on the servo arm and the speed sensor ring, which may be installed on the cylinder block as an option.

A new hold down bracket has been designed to provide clearance for the speed sensor ring.

If a cylinder block with speed ring must be installed in one of the subject pumps, a servo arm assembly with the new hold down will also be required.

Sometime during the first quarter of 1994, all 55, 75, and 100 cc pumps will be equipped with the new design hold down bracket. The 42 cc pumps will implement the new design hold down bracket in the second quarter of 1994.



**Models affected** All 93-2xxx, 94-2xxx, 95-2xxx, and 96-2xxx variable pumps

**Serial numbers**  
 42 cc at serial number 92-16-xxxxx  
 55 cc at serial number 92-06-xxxxx  
 75 cc at serial number 92-17-xxxxx  
 1000 cc at serial number 92-12-xxxxx

**Part numbers affected** All 55, 75 and 100 cc pumps built in Ames beginning with s/n A-94-11-xxxxx will have the new servo arm assembly installed. 100 cc pumps built in Neumunster will also incorporate on this date. The 75 cc pumps built in Neumunster will incorporate on N-94-14-xxxxx 42 cc pumps will incorporate on N-94-36-xxxxx.

Frame size	Old servo arm (no slot in bracket)	New servo arm (with slot in bracket)
42 cc	354282	502976
55 cc	8000191	8000318
75 cc	8100366	8100499
100 cc	8200182	8200268

**Parts disposition** ■ Non-interchangeable - Pumps with speed sensor ring must use the new servo arm.



**Service Bulletin: SB-1994-018**

**Products affected**

Series 90 variable pumps

**Subject**

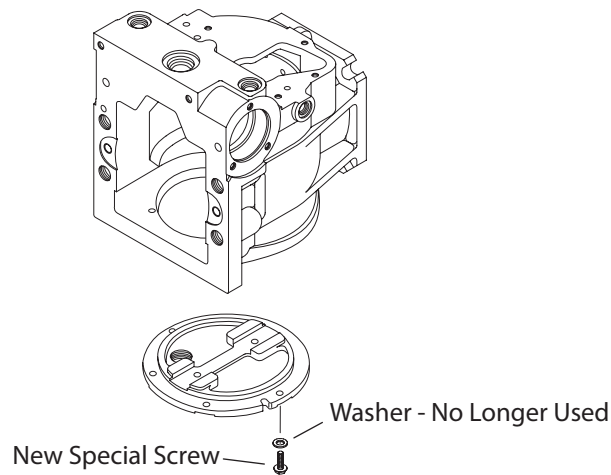
Side cover washer elimination

**Description**

The washers located under the side cover screws have been removed on all series 90 42 thru 130 cc variable pumps.

As before, the side cover screws must be replaced if they are removed for any reason. The special coating, which seals and retains the screws, wears off when the screws are removed.

The screw length changed on 55 thru 100 cc pumps, so it is important that the washers are discarded during repair. The proper screw is included in the overhaul seal kits.



**Models affected**

All 93-2xxx, 94-2xxx, 95-2xxx, 96-2xxx, and 97-2xxx variable pumps

**Serial numbers**

Change took place during the 2<sup>nd</sup> and 3<sup>rd</sup> quarter of 1994

**Part numbers affected**

Pump size	Old screw	New screw
42 cc	648477	Same part number
55-100 cc	9007276-0115	5000206
130 cc	308700	Same part number

**Parts disposition**

■ Interchangeable



**Service Bulletin: SB-1995-002**

**Products affected** Series 90 42 cc variable pumps

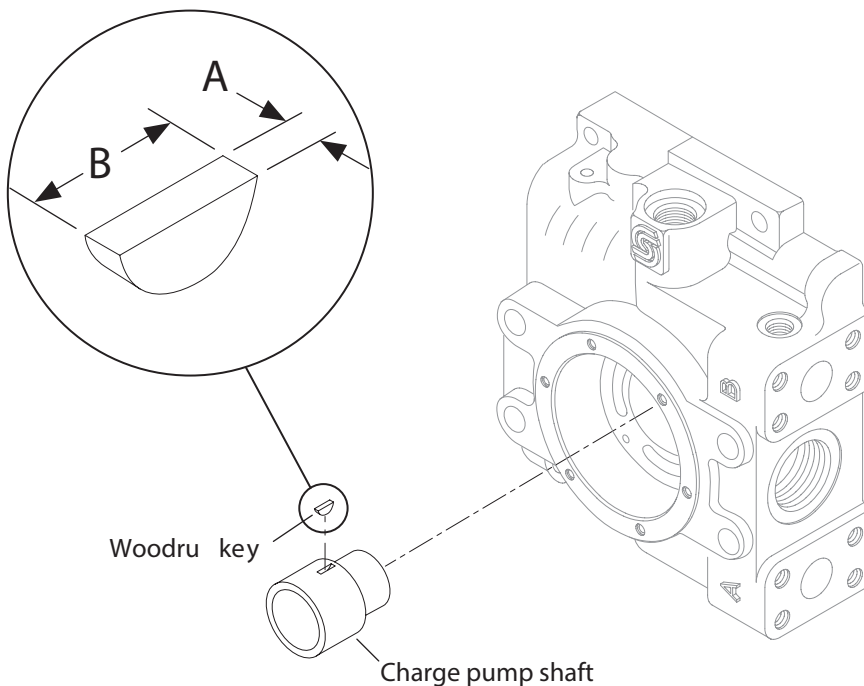
**Subject** Charge pump shaft key change

**Description** As a product improvement, Sauer-Danfoss has made a design change to the charge pump shaft and woodruff key used on 42 cc variable pumps

The new key is smaller to eliminate a potential interference problem. The old charge pump shaft will be obsolete and no longer available as a service part.

This is an interchangeable change within the affected serial number range, if the charge pump shaft and key are replaced together.

	Width "A" mm (in)	Length "B" mm (in)
Old key	3.14 (0.1235)	12.70 (0.500)
New key	3.09 (0.1215)	9.53 (0.375)



**Models affected** All 42 cc variable pumps

**Serial numbers** Serial number N-92-16-xxxxx and beyond

**Part numbers affected**

Description	Old part number	New part number
Woodruff key	9003310-1208	9003310-1206
Charge pump shaft	340364	505202

**Parts disposition** ■ Interchangeable if BOTH charge pump shaft and woodruff key are changed



**Service Bulletin: SB-1995-003**

**Products affected**

Series 90 variable pumps - all frame sizes

**Subject**

Manual displacement control (MDC) with DC electric solenoid override

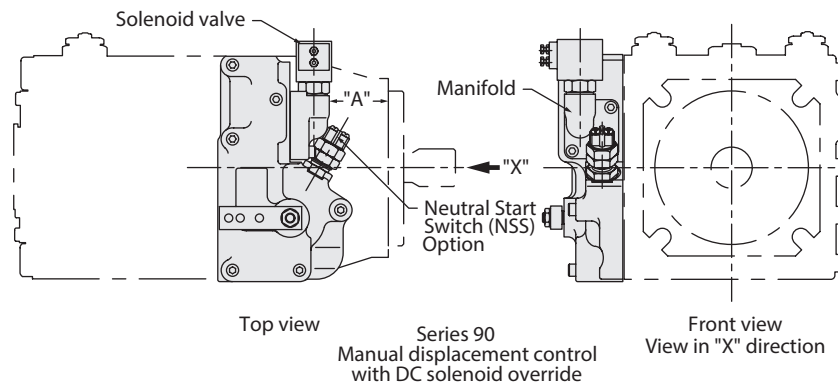
**Description**

In order to accommodate our European customers, the manifold which attaches to the front of the manual displacement control (MDC) housing is being changed.

The European solenoid valve requires a thicker manifold to provide clearance between the solenoid and the front of the MDC housing. The revised manifold will protrude closer to the mounting flange of the pump, reducing dimension "A" shown in the accompanying drawing by approximately 5 mm [0.2 in]. Please see chart below for specific clearances.

The thicker manifold requires longer screws and may be used with either the U.S. or European sourced solenoid.

This change will become effective during March of 1995. The old manifold will be obsoleted and no longer available as a service part.



Frame size		42	55	75	100	130
Dimension "A"	Current	39.9 [1.57]	55.9 [2.20]	54.1 [2.13]	60.2 [2.37]	74.4 [2.93]
	Future mm [in]	34.9 [1.37]	50.9 [2.0]	49.1 [1.93]	55.2 [2.17]	69.4 [2.73]

**Models affected**

All series 90 variable pumps using MDC with DC electric solenoid override.

**Serial numbers**

Change will take place in March 1995.

**Part numbers affected**

Description	Current part number	New part number	Quantity
Manifold	8800365	505022	1
Screw	9007314-0605	9007314-0606	2

**Parts disposition**

■ Interchangeable (new manifold requires longer screws)



**Service Bulletin: SB-1995-004**

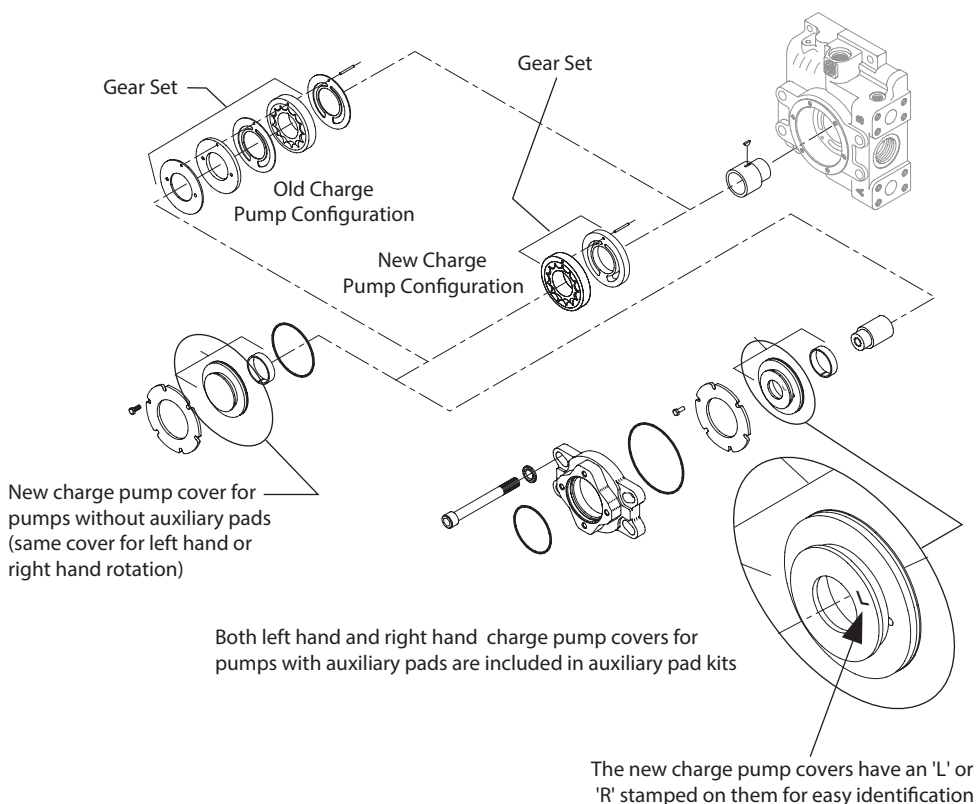
**Products affected** Series 90 42 cc variable pumps

**Subject** Charge pump design change

**Description** To improve efficiency and reliability, the number of charge pump parts in the series 90 42cc pump is being replaced. The charge pump design is being changed to make the outer port plate an integral part of the charge pump cover and to eliminate the distance plates.

For auxiliary pad options, the new charge pump cover is rotation dependent. The cover will be marked either left hand (L) or right hand (R). The non-auxiliary pad cover is not rotation dependent.

The complete charge pump assembly can be interchanged with corresponding hardware from 92-16 and beyond. **However, piece parts are not interchangeable.** For units prior to 95-16, consult Sauer-Danfoss.



**Models affected**

**Serial numbers**

**Part numbers affected**

**Parts disposition**



**Service Bulletin: SB-1995-004**

**Models affected** All 42 cc variable pumps

**Serial numbers** Units built between N-92-16-xxxxx and N-94-12-xxxxx

**Part numbers affected** The following information must be known to determine the correct charge pump replacement kit:

1. Charge pump displacement (11 or 14 cc)
2. Auxiliary pad (yes or no)
3. Rotation (LH or RH)

Obsolete charge pump parts		Chg. pump displacement	Auxiliary pad	Rotation	Replacement kit
Gear set	Cover				
8052043	347559	11 cc	No	LH or RH	8510078
	347567		Yes	LH	8510079
	347567		Yes	RH	8510080
8052044	347559	14 cc	No	LH or RH	8510081
	347567		Yes	LH	8510082
	347567		Yes	RH	8510083

The following information pertains to "L" charge pump option only:

Old cover (92-16 to 94-12)	Auxiliary pad	Rotation	Replacement cover
347559	No	LH or RH	8800834
347567	Yes	LH	8800833
347567	Yes	RH	8800832

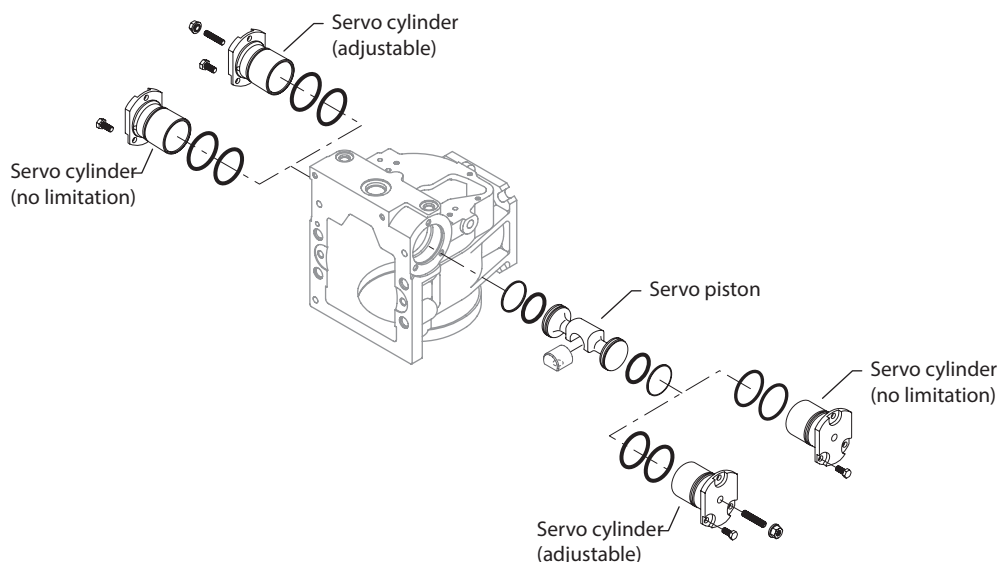
**Parts disposition** ■ Interchangeable for manufacture date 92-16 and beyond. Piece parts are not interchangeable.

**Service Bulletin: SB-1995-005**

**Products affected** Series 90 42 cc variable pumps

**Subject** Obsolete servo system parts

**Description** The servo piston diameter was increased on series 90 42 cc pumps in 1990. The old style parts are being obsoleted and will no longer be available as service parts. A kit containing the necessary replacement parts has been created. Refer to page two of this bulletin for the appropriate kit part number.



**Models affected** All 42 cc variable pumps

**Serial numbers** Units built prior to serial number N-90-51-xxxxx

**Part numbers affected**

Description	Old style p/n	Replacement p/n
Servo sleeve kit - No limitation	8052F003-A	8510089
Servo sleeve kit - adjustable	8052F004-A	8510090
Servo piston kit	80520S10	8510089* or 8510090*

\* The new servo piston hardware is included in these kits and must be used with the new servo cylinders. If a servo piston is required, the appropriate displacement limiter must be ordered.

**Parts disposition** ■ Non-interchangeable



**Service Bulletin: SB-1995-006**

**Products affected**

Series 90 42 cc variable pumps

**Subject**

End cap bolt size change

**Description**

As a product improvement, Sauer-Danfoss is changing the screws that fasten the end cap to the pump housing from M10 to M12.

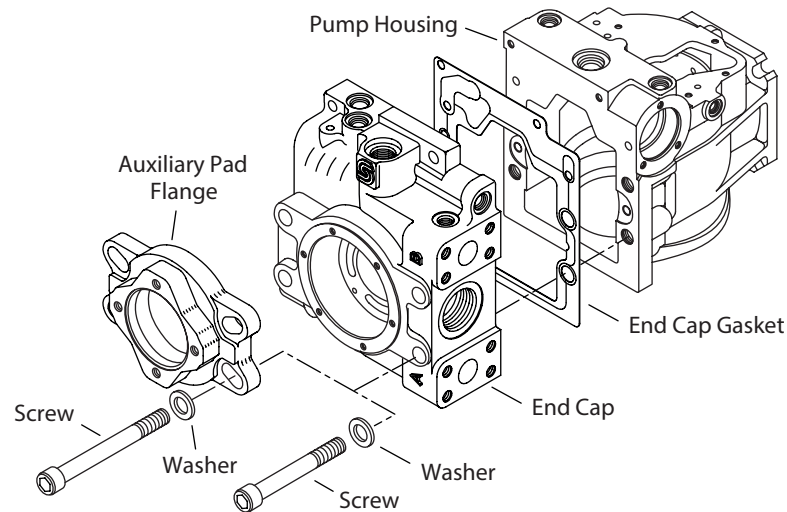
This change will require a new housing, end cap gasket, end cap, auxiliary mounting pad flange, and screws.

The new end cap and gasket can be used the old housing if hardened washers are used with the M10 end cap screws.

The new auxiliary mounting pad flange can be used with the old end cap and housing if hardened washers are used with the M10 end cap screws. The auxiliary mounting pad kits will include both the new washers and hardened washers for the M10 screws.

The new housing can only be used with all new style parts.

The old style housing will remain available as a service part as long as inventory lasts. All other parts will be obsoleted and no longer available.



**Models affected**

All 42 cc variable pumps

**Serial numbers**

Units built between serial number N-92-16-xxxxx and N-95-14-xxxxx.

**Part numbers affected**

Description	Old style p/n	New style p/n
End cap	769562	506785
End cap gasket	792937	506698
Screws (with auxiliary mounting pad)	321893	913590
Screws (without auxiliary mounting pad)	321661	506800
Washer	294462	506753
Hardened washer for M10 screws	N/A	294462
Pump housing	792705	506740

Note: Auxiliary mounting pad kit part numbers will not change.



**Service Bulletin: SB-1995-026**

**Products affected** Series 90 42 cc - 130 cc variable pumps

**Subject** Standard valve plate part number change

**Description** As a product improvement, Sauer-Danfoss is changing the standard valve plate used in series 90 42 thru 130 cc variable pumps. (refer to PIB-9507)

The purpose of this bulletin is notification of part number changes for the order codes affected. During unit repair, do not replace the new style valve plate with an old style valve plate. However, the old style may be replace with a new style valve plate.

The old style valve plates will be obsoleted and no longer available as a service part.

**Models affected** All 932xxx, 942xxx, 952xxx, 962xxx, and 972xxx variable pumps

**Serial numbers** This change became effective at serial number N-95-48-xxxxx

**Part numbers affected**

Unit	Old order code	Old valve plate part number	New order code	New valve plate part number
42 cc	NNN	500337	GBA	758383
55 cc	NNN	8000071	GBA	8000431
75 cc	NNN	8100145	GBA	501332
100 cc	NNN	8200041	GBA	501327
130 cc	NNN	700203	GBA	758425

**Parts disposition** ■ Interchangeable - do NOT substitute the old valve plate for the new valve plate



**Service Bulletin: SB-1996-004**

**Products affected**

Series 90 42, 130, 180, and 250cc variable pumps

**Subject**

Side cover design change

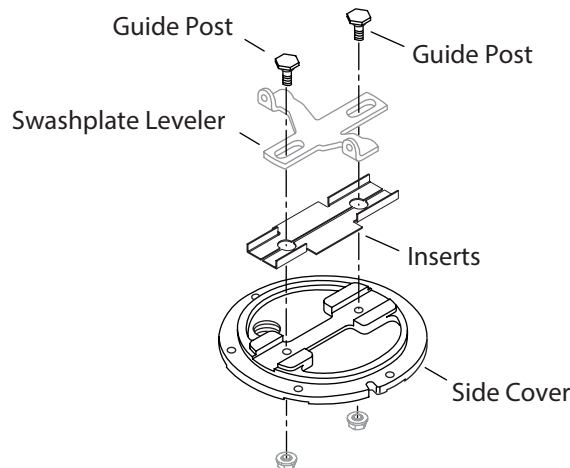
**Description**

As a product improvement, Sauer-Sundstrand is changing the side cover and swashplate leveler (T-Bar) guide post design.

The new design side cover will have two hardened inserts in the machined slot which serves as a guide for the swashplate leveler, and modified guide posts. The swashplate leveler does not change.

Old guide posts will remain available for service requirements of pumps with the old design side cover.

The old style side cover will be obsoleted and no longer available as a service part. A service kit has been created for replacing the old design side cover. The kit includes the new side cover, guide posts and inserts. Piece parts are not interchangeable..



**Models affected**

All series 42, 130, 180, and 250cc variable pumps

**Serial numbers**

Change occurred at serial number N-96-08-xxxxx.

**Part numbers affected**

Description	Old part numbers		New part numbers		
	Guide post	Side cover	Insert assy.	Guide post	Replacement kit
42 cc	344465	751305	506916	506369	506380
130 cc	503205	746107	8300004	506368	11027814
180 cc	503205	746404	506914	506368	506290
250 cc	503205	746404	506914	506368	506290

**Parts disposition**

■ Interchangeable - piece parts are not interchangeable



**Service Bulletin: SB-1997-014**

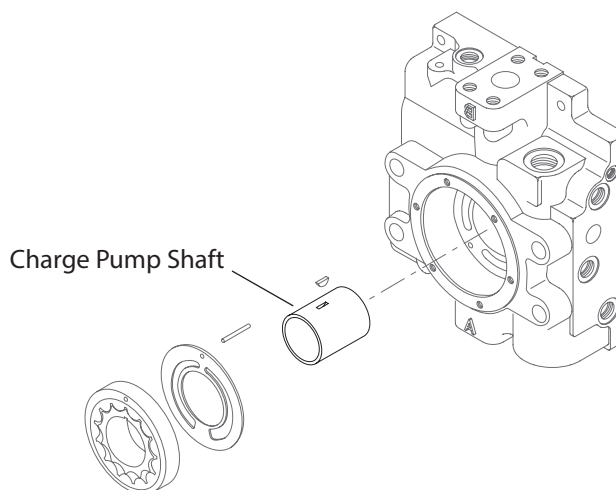
**Products affected** Series 90 42, 130, 180, and 250 cc variable pumps

**Subject** Charge pump shaft part number change

**Description** As a product improvement, Sauer-Danfoss has changed the design of the charge pump shaft used in series 90 42, 130, 180, and 250 cc variable pumps.

The new and old shafts are interchangeable.

The old style charge pump shaft will become obsolete and no longer available as a service part.



**Models affected** All 932xxx, 972xxx, 982xxx, and 992xxx variable pumps

**Serial numbers** See table below

**Part numbers affected**

Frame size	Old shaft part number	New shaft part number	Effectivity date
42	505202	509485	97-06
130	501399	509483	97-06
180	503519	509484	97-12
250	504439	509482	97-12

**Parts disposition** ■ Interchangeable



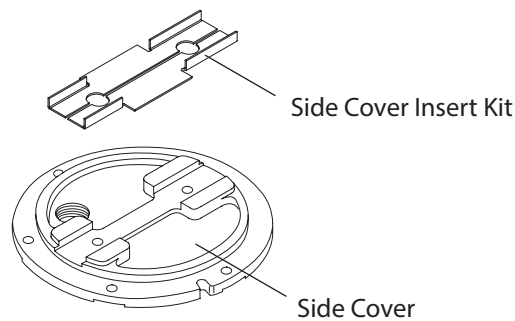
**Service Bulletin: SB-1999-041A**

**Products affected** Series 90 variable pumps

**Subject** Change to side cover insert material

**Description** As a product improvement, Sauer-Danfoss has changed the side cover insert material to improve wear characteristics. The new material is more wear resistant than the previous material.

In order to track this change, new part numbers have been created and the old part numbers will be obsolete.



**Models affected** 93-2xxxx, 94-2xxxx, 95-2xxxx, 96-2xxxx, 97-2xxxx, 98-2xxxx, and 99-2xxxx

**Serial numbers**

Frame size	NMS effectivity date	Ames effectivity date
42 cc	N-99-36-xxxxx	N/A
55 cc	N-00-18-xxxxx	A-00-18-xxxxx
75 cc	N-99-26-xxxxx	A-00-38-xxxxx
100 cc	N-99-31-xxxxx	A-00-38-xxxxx
130 cc	N-99-33-xxxxx	N/A
180 cc	N-99-36-xxxxx	N/A
250 cc	N-99-36-xxxxx	N/A

**Part numbers affected**

Frame size	Old part number	New part number
42 cc	506916	513885
55 cc	8000406	513886
75 cc	8000562	513888
100 cc	8200321	513889
130 cc	8300004	513890
180 cc	506914	513891
250 cc	506914	513891

**Parts disposition** ■ Interchangeable



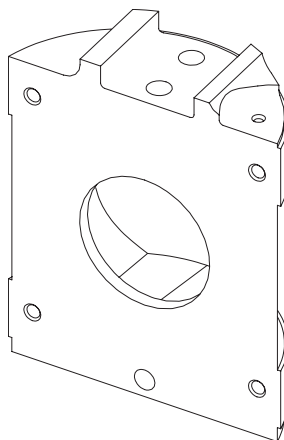


**Service Bulletin: SB-2002-016**

**Products affected**                      Series 90 42 cc variable pumps

**Subject**                                      Swashplate change in material heat treatment

**Description**                                Sauer-Danfoss has changed the heat treatment process of the swashplate in the series 90 42 cc pump. The new swashplate and old swashplate are interchangeable.



**Models affected**                          All series 90 42 cc variable pumps

**Serial numbers**                            This change became effective at serial number N-01-43-xxxxx.

**Part numbers affected**

Old part number	New part number
509630	516199

**Parts disposition**                        ■ Interchangeable



**Service Bulletin: SB-2005-011**

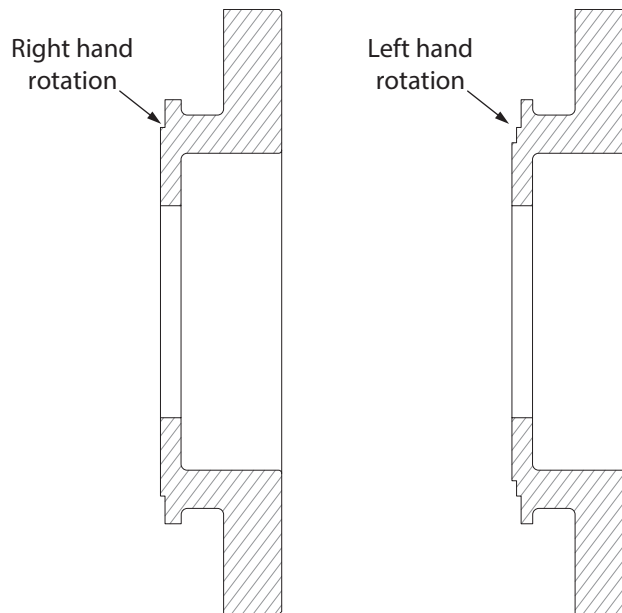
**Products affected** Series 90 42 thru 100 cc pumps

**Subject** Auxiliary flange charge pump cover

**Description** Sauer-Danfoss will no longer mark auxiliary flange charge pump cover with an “R” for right hand rotation or an “L” for left hand rotation.

The pilot surface has changed on the covers. The right hand rotation charge pump cover will have 1 step and the left hand rotation charge pump cover will have 2 steps. Refer to the drawings below for example.

The part numbers of the charge pump covers will not change.



**Models affected** Series 90 42 thru 100 cc pumps with auxiliary pad options.

**Serial numbers** This change became effective at serial number A-05-17-xxxxx

**Part numbers affected** None

**Parts disposition** ■ Interchangeable



**Service Bulletin: SB-2009-074**

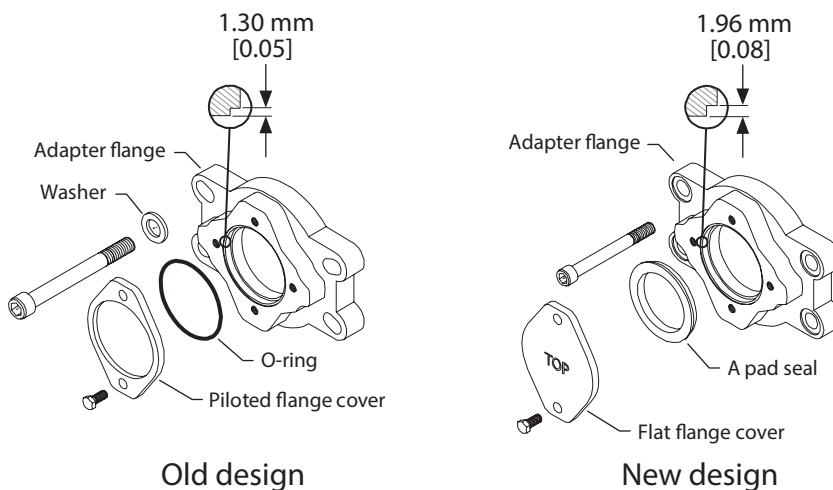
**Products affected** Series 90 42, 130, 180 and 250cc variable pumps

**Subject** SAE A auxiliary mounting flange, O-ring seal

**Description** Sauer-Danfoss is pleased to announce a design improvement on the SAE A auxiliary mounting flange adapter on its series 90 pumps. The frame sizes affected by this change are 42, 130, 180 and 250cc. All manufacturing locations producing these pumps will be changed to this configuration.

The improvement comes in the form of a more robust sealing geometry with a larger cross-section O-ring. The O-ring groove in the flange will now be sized to mate with a 2.62mm [0.103"] cross-section O-ring rather than the old 1.78mm [0.070"] cross-section O-ring. The Sauer-Danfoss part number for the new O-ring is 9004104-1520 (2.62mm [0.070"] x 82.22mm [3.237"]). The larger cross-section sealing geometry allows for the use of a donut style A pad seal and a new flat cover for improved assembly. This new configuration is qualified as a running cover. When installing an auxiliary pump, the donut style A pad seal must be discarded and the part number 9004104-1520 O-ring used.

The pumps will now be supplied with the donut style seal and new flat cover, instead of the small O-ring and stepped cover plate (shown in the drawing below).



**Models affected** All series 90 42, 130, 180 and 250cc pumps with an SAE A auxiliary mounting flange.

**Serial numbers** Change became effective at serial number N-09-30-xxxxx. (20 July 2009)

**Part numbers affected**

Description	Old part number	New part number	Used on
A flange adapter	511040	520944	42cc
A flange adapter	505113	520946	130cc
A flange adapter	505136	520949	180 and 250cc
O-ring	9004104-0420	9004104-1520	all sizes
A pad seal	N/A	4800482	all sizes
Flange cover	9802336	4460586	all sizes

**Parts disposition** ■ Interchangeable if new O-ring or if the pad seal and new cover are used.



**Service Bulletin: SB-2009-075**

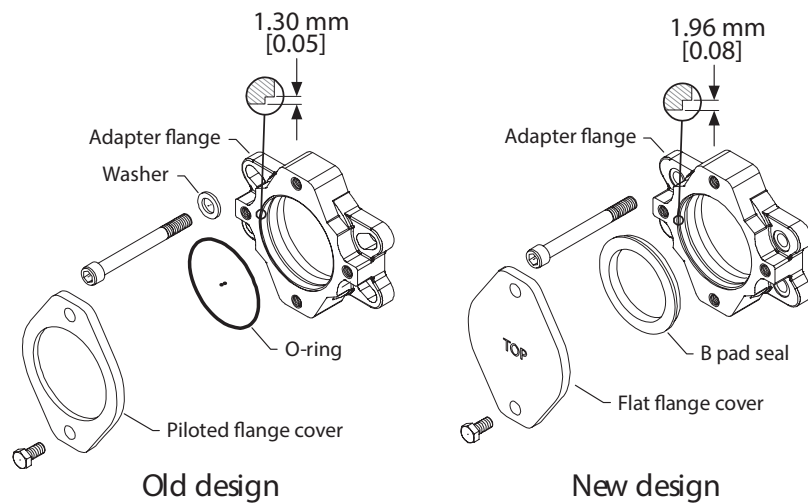
**Products affected** Series 90 42, 130, 180 and 250cc variable pumps

**Subject** SAE B auxiliary mounting flange, O-ring seal

**Description** Sauer-Danfoss is pleased to announce a design improvement on the SAE B auxiliary mounting flange adapter on its series 90 pumps. The frame sizes affected by this change are 42, 130, 180 and 250cc. All manufacturing locations producing these pumps will be changed to this configuration.

The improvement comes in the form of a more robust sealing geometry with a larger cross-section O-ring. The O-ring groove in the flange will now be sized to mate with a 2.62mm [0.103"] cross-section O-ring rather than the old 1.78mm [0.070"] cross-section O-ring. The Sauer-Danfoss part number for the new O-ring is 9004104-1540 (2.62mm [0.070"] x 94.92mm [3.737"]). The larger cross-section sealing geometry allows for the use of a donut style B pad seal and a new flat cover for improved assembly. This new configuration is qualified as a running cover. When installing an auxiliary pump, the donut style B pad seal must be discarded and the part number 9004104-1540 O-ring used.

The pumps will now be supplied with the donut style seal and new flat cover, instead of the small O-ring and stepped cover plate (shown in the drawing below).



**Models affected** All series 90 42, 130, 180 and 250cc pumps with an SAE B auxiliary mounting flange.

**Serial numbers** Change became effective at serial number N-09-30-xxxxx. (20 July 2009)

**Part numbers affected**

Description	Old part number	New part number	Used on
B flange adapter	506778	520945	42cc
B flange adapter	503230	520947	130cc
B flange adapter	11000255	11039180	130cc
B flange adapter	505132	520950	180 and 250cc
O-ring	9004104-0450	9004104-1540	all sizes
B pad seal	N/A	8801061	all sizes
Flange cover	4460370	8801059	all sizes

**Parts disposition** ■ Interchangeable if new O-ring or if the pad seal and new cover are used.



**Service Bulletin: SB-2009-076**

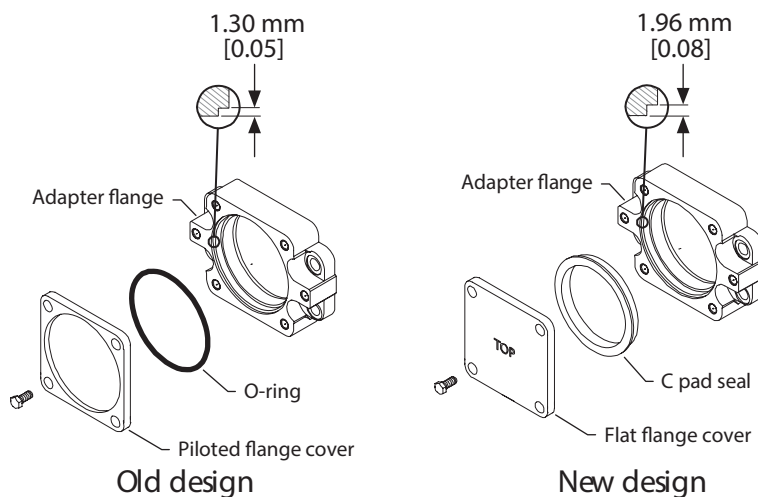
**Products affected** Series 90 130, 180 and 250cc variable pumps

**Subject** SAE C auxiliary mounting flange, O-ring seal

**Description** Sauer-Danfoss is pleased to announce a design improvement on the SAE C auxiliary mounting flange adapter on its series 90 pumps. The frame sizes affected by this change are 130, 180 and 250cc. All manufacturing locations producing these pumps will be changed to this configuration.

The improvement comes in the form of a more robust sealing geometry with a larger cross-section O-ring. The O-ring groove in the flange will now be sized to mate with a 2.62mm [0.103"] cross-section O-ring rather than the old 1.78mm [0.070"] cross-section O-ring. The Sauer-Danfoss part number for the new O-ring is 9004104-1580 (2.62mm [0.070"] x 120.32mm [4.737"]). The larger cross-section sealing geometry allows for the use of a donut style C pad seal and a new flat cover for improved assembly. This new configuration is qualified as a running cover. When installing an auxiliary pump, the donut style C pad seal must be discarded and the part number 9004104-1580 O-ring used.

The pumps will now be supplied with the donut style seal and new flat cover, instead of the small O-ring and stepped cover plate (shown in the drawing below).



**Models affected** All series 90 130, 180 and 250cc pumps with an SAE C auxiliary mounting flange.

**Serial numbers** Change became effective at serial number N-09-30-xxxxx. (20 July 2009)

**Part numbers affected**

Description	Old part number	New part number	Used on
C Flange adapter	505116	513617	130 cc
C Flange adapter	508407	11039184	130 cc
C Flange adapter	515116	513617	130 cc
C Flange adapter	505139	520951	180cc and 250cc
C Flange adapter	508406	11039178	180cc and 250cc
O-ring	9004100-0480	9004104-1580	All units
C pad seal	NA	8801062	All units
Flange cover	8800406	8801060	All units

**Parts disposition** ■ Interchangeable if new O-ring or if the pad seal and new cover are used.


**Service Bulletin: SB-2011-025**

**Products affected** Series 90 30cc, 42cc, 55cc, 75cc, 100cc, 130cc, 180cc, and 250cc pumps

**Subject** Supplier change for the auxiliary drive coupling

**Description** The supplier has changed for the auxiliary drive couplings used in the Series 90 pumps. The new couplings are completely interchangeable with the old couplings. New part numbers have been issued for tracking purposes. The old part numbers are obsolete and no longer available for service.

**Models affected** All Series 90 pumps with auxiliary drive.

**Serial numbers** N/A

**Part numbers affected**

Coupling description	Old part number	New part number
30cc & 42cc 9 tooth coupling	341016	11053281
30cc & 42cc 13 tooth coupling	341024	11053279
30cc & 42cc 15 tooth coupling	342907	11053280
42cc & 55cc 20 tooth coupling	503271	11053273
55cc 11 tooth coupling	8000142	11053344
55cc 15 tooth coupling	8000077	11053340
55cc 15 tooth coupling	8000130	11053343
75cc & 100cc 14 tooth coupling	8801196	11053346
75cc & 100cc 19 tooth coupling	8100407	11053342
75cc & 100cc 25 tooth coupling	503918	11053278
130cc 9 tooth coupling	310466	11053288
130cc 13 tooth coupling	310490	11053283
130cc 14 tooth coupling	310508	11053284
130cc 17 tooth coupling	501386	11053286
130cc 21 tooth coupling	705954	11053287
130cc – 250cc 25 tooth coupling	504517	11053338
180cc 17 tooth coupling	510100	11053337
180cc & 250cc 9 tooth coupling	766964	11053336
180cc & 250cc 27 tooth coupling	751701	11053335

**Parts disposition** Interchangeable



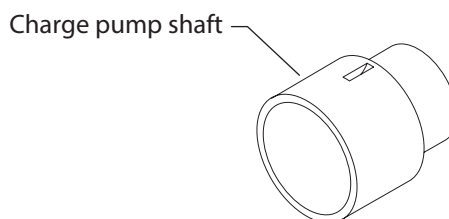
**Service Bulletin: SB-2015-031**

**Products affected** Series 90 pumps

**Subject** Charge pump shaft supplier change

**Description** The supplier for 42cc, 130cc, 180cc and 250cc charge pump shafts on Series 90 units has changed. Part numbers have been changed for tracking purposes.

Old and new parts are completely interchangeable. Old part numbers will become obsolete and no longer available as a service part.



**Models affected** Series 90 42cc, 130cc, 180cc and 250cc pumps.

**Serial numbers** See chart below for effective dates of change.

**Part numbers affected**

Description	Old part number	New part number	Implementation Date
Charge pump shaft 90/42	513438	11138376	20-Jul-2015 (15-30)
Charge pump shaft 90/130	513435	11138378	30-Nov-2015 (15-49)
Charge pump shaft 90/130	513436	11138379	11-Aug-2015 (15-33)
Charge pump shaft 90/180	11002443	11138380	N/A
Charge pump shaft 90/250	518691	11138381	N/A

**Parts disposition** Interchangeable  
Use parts in stock  
Revise existing part orders



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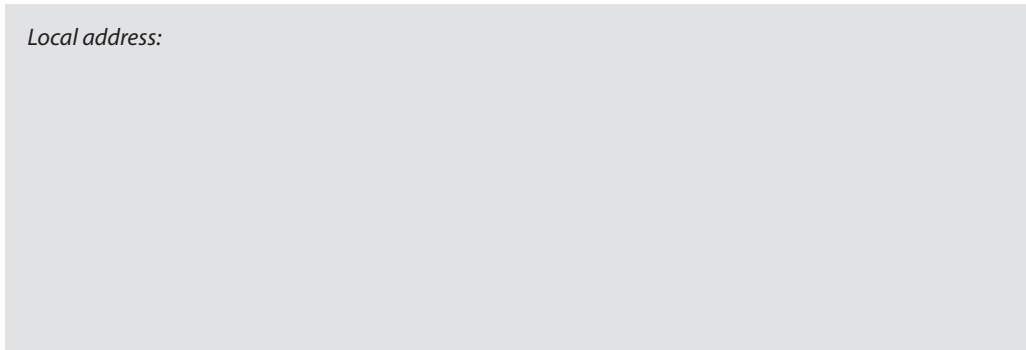
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