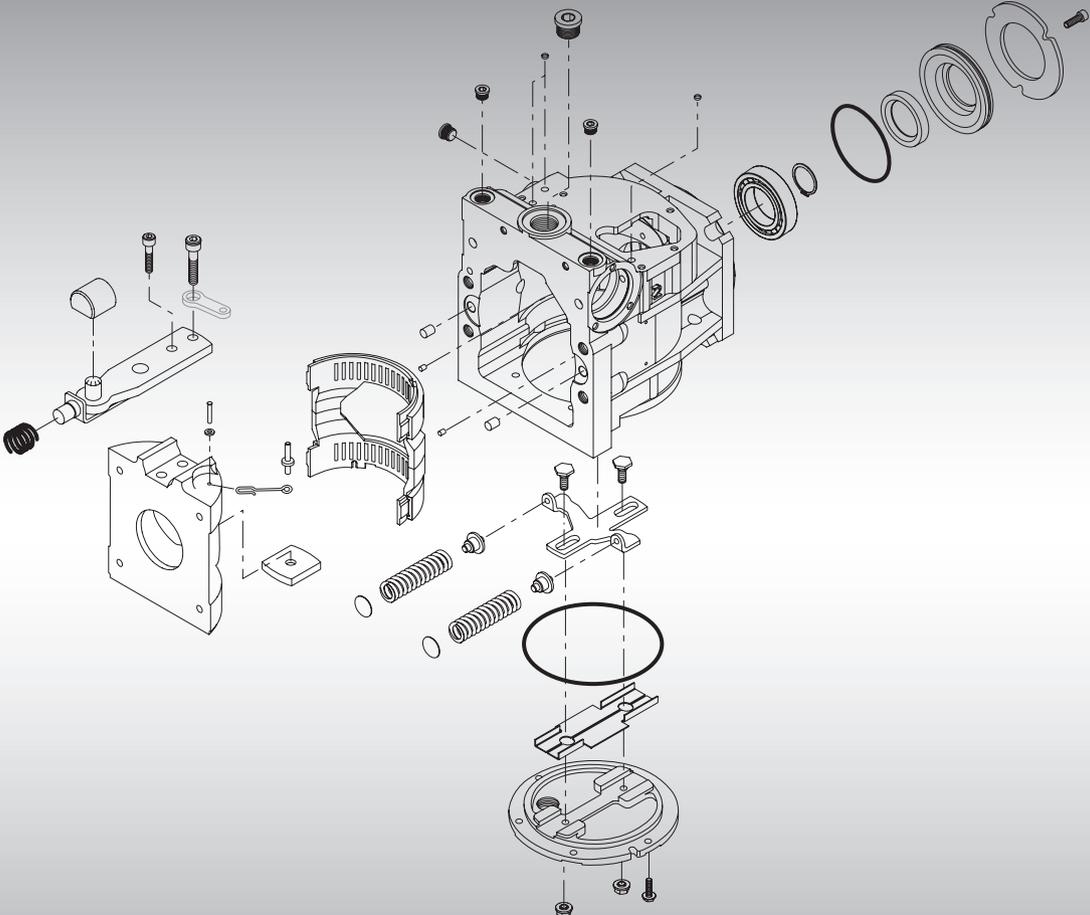




Parts Manual

Series 90

55cc Axial Piston Pump





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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 55 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 55 cc pump.

Nameplate

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

Model Code

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

Model Number

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

Serial Number

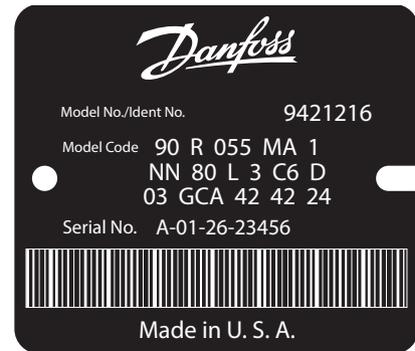
The Sauer-Danfoss serial number is used to identify the manufacture date and the unit sequence in the build. The serial number is also used to identify the units warranty time period.

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

The first number (2 digits) indicates the year of manufacture. (“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 G30

Order Code	Item	Date Begin	Date End	Part Number	Part Name	Qty. per Model/Kit
80	G30	89-17		8000243	End cap gasket	1
	G30	87-02	89-16	8000151	End cap gasket (SB-1995-006)	1

All units using this order code with a date code of 87-02 and up to and including 89-16, must use part number "8000151". All units with a date code of 89-17 and newer must use part number "8000243".

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: 314583 (9008000-0118), customers would order 9008000-0118 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 90R055 MA 1 NN 80 L 3 C6 D 03 GCA 42 42 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 "C6". (90R055 MA 1 NN 80 L 3 **C6** D 03 GCA 42 42 24)

2) Referring to the Service Parts List, find the shaft group. Next find the order code that relates to this unit, which is "C6". The shaft is found to be item L100 and part number 8000079.

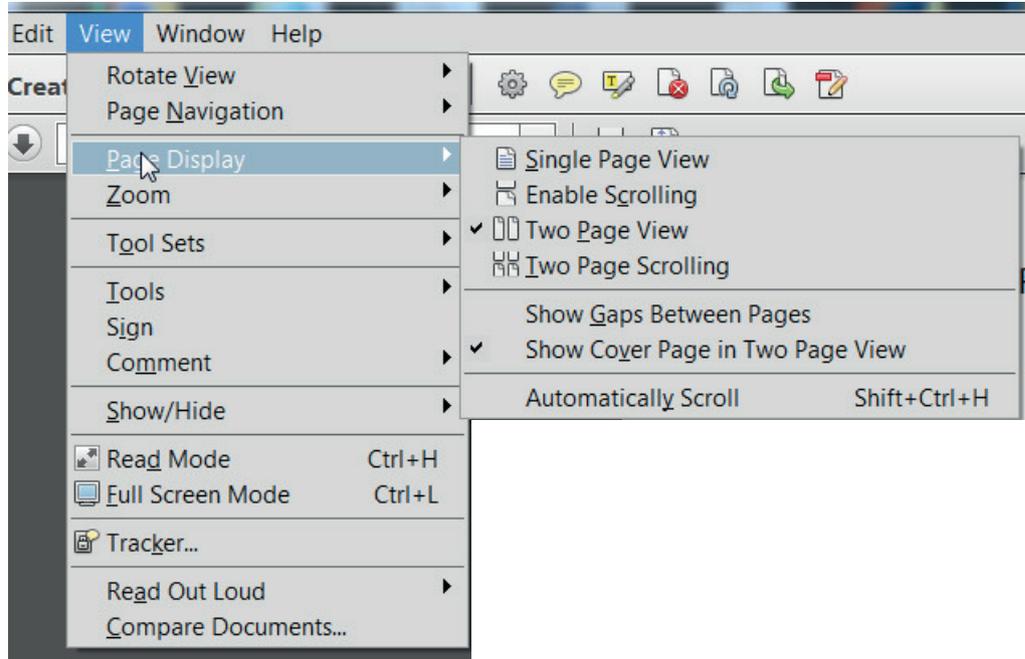


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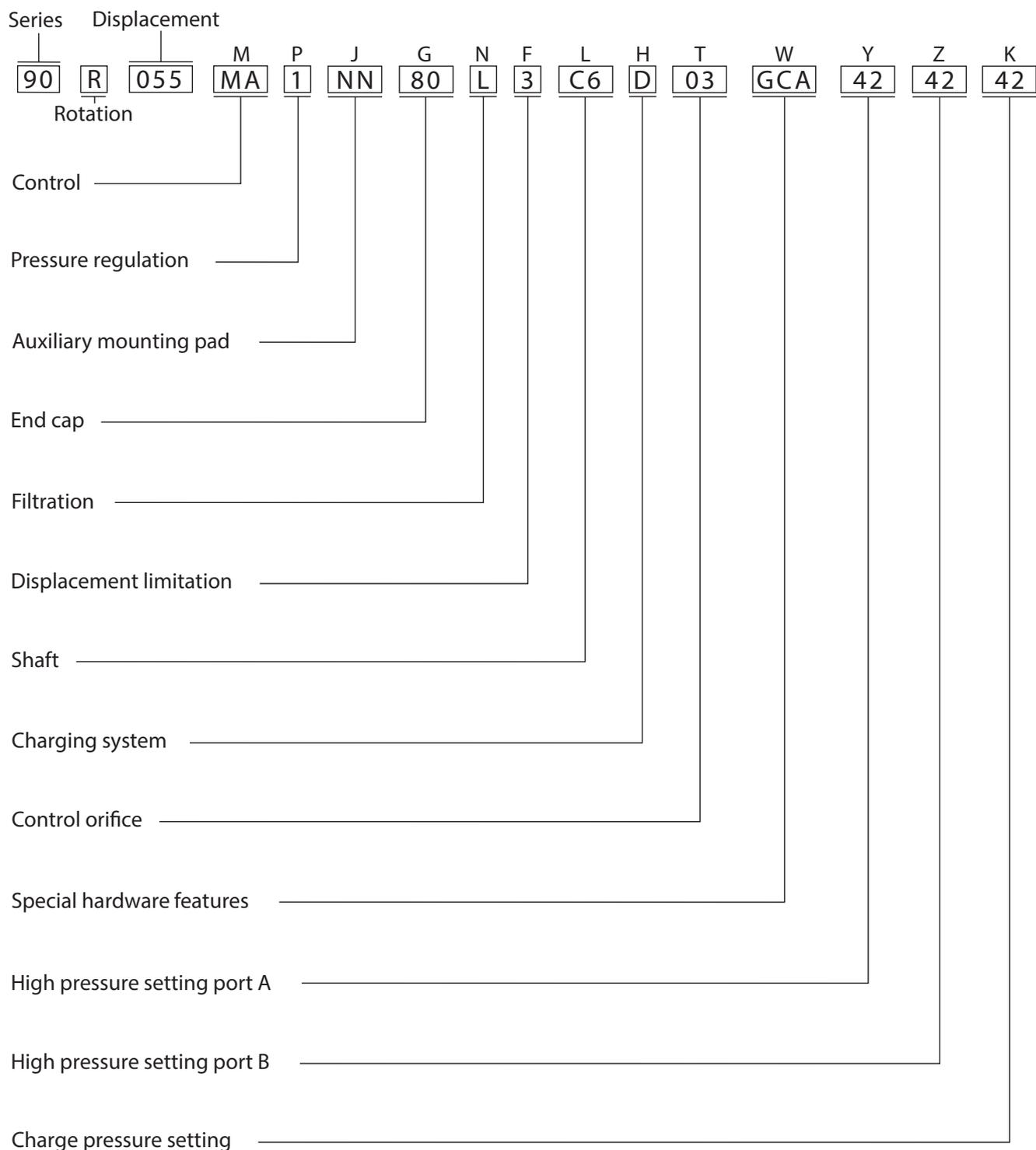
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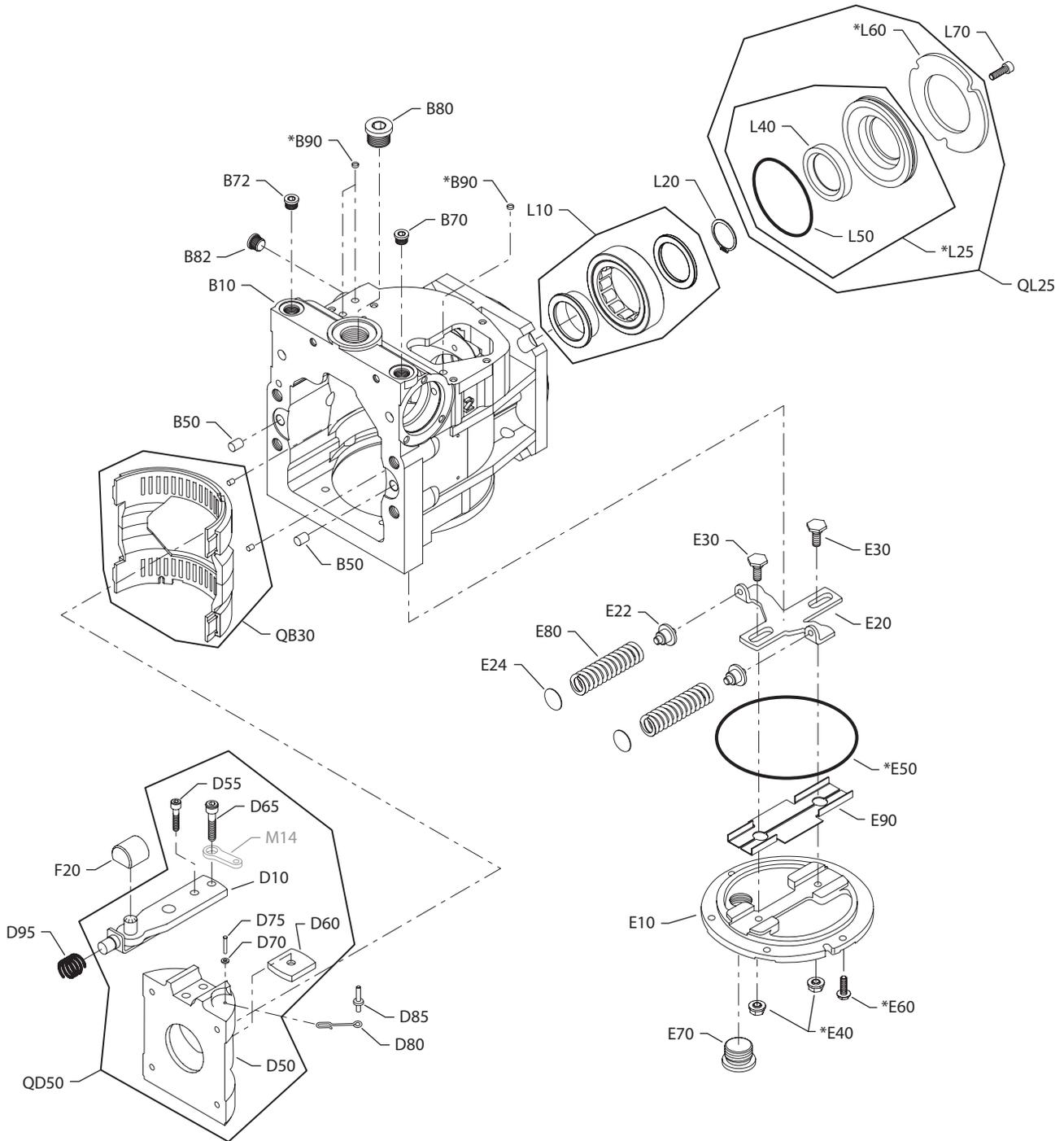


Order Code





Variable displacement pump



E100 703E

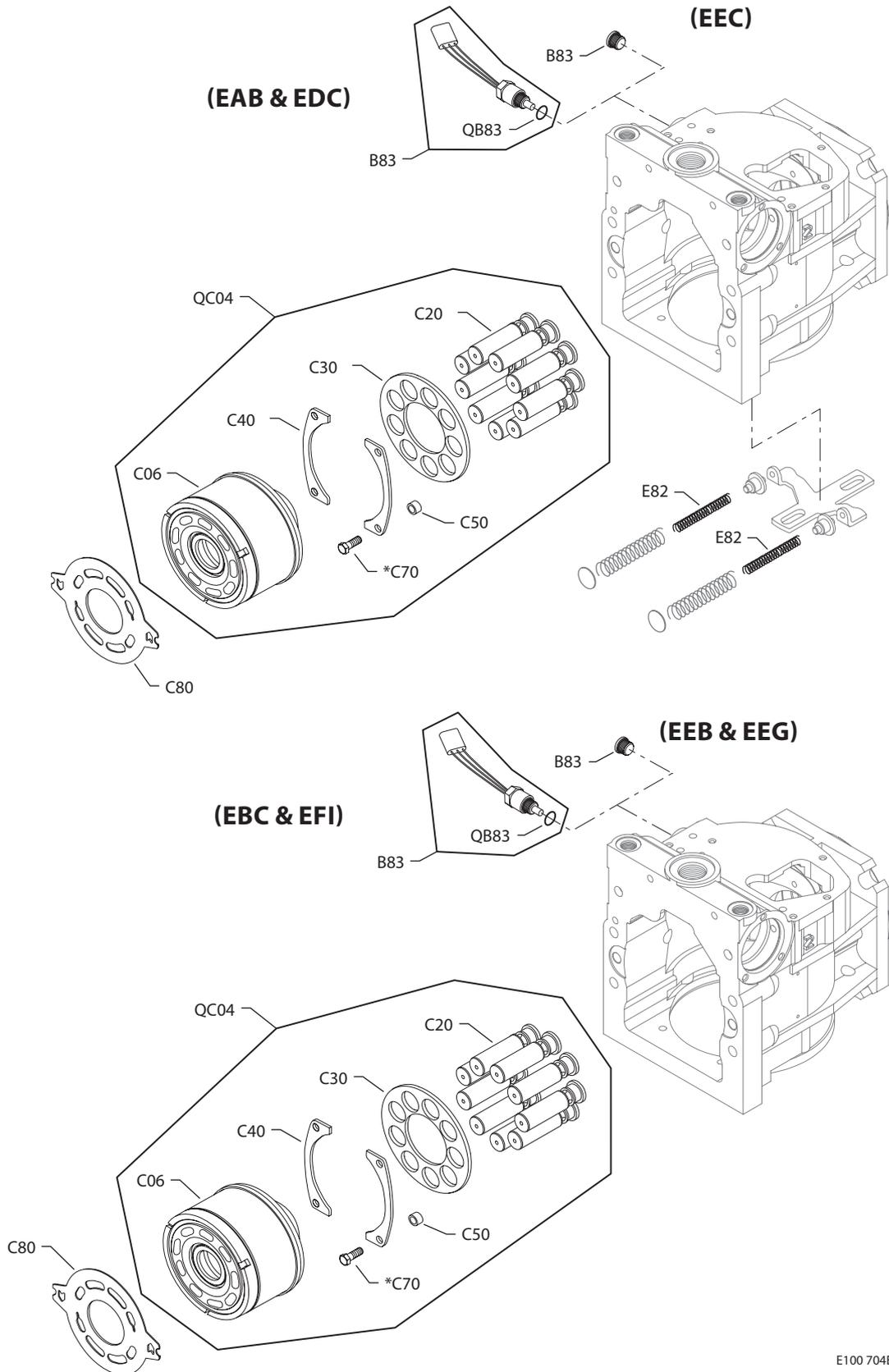
* = included in overhaul seal kit Q210


Variable displacement pump
Common parts

Order Code	Item	Date Begin	Date End	Part Number	Part Name	Qty. per Model/Kit
	B10	95-06		8000387	Housing (SB-1992-003)	1
	B50	87-02		9004800-3708	Pin	2
	B70	87-02		327007 (9005110-4400)	Plug assembly	1
	B72	87-02		327007 (9005110-4400)	Plug assembly	1
	B80	87-02		664524 (9005110-9000)	Plug assembly	1
	B82	87-02		9005110-5600	Plug assembly (SB-1992-003)	1
	B90	87-02		9803390	Control filter screen	3
	D10	88-14		8000318	Servo arm assembly (SB-1993-015)	1
	D50	88-14		8000188	Swashplate (SB-1988-009)	1
	D55	87-02		666032 (9007276-0107)	Screw	1
	D60	87-02		8800669	Swashplate guide	1
	D65	87-02		9007375-0044	Screw (SB-1992-011)	1
	D70	87-02		9009625-0146	Washer	1
	D75	87-02		9004875-0098	Spiral head pin	1
	D80	87-02		8100506	Cage locator link (SB-1994-017)	1
	D85	04-43		8801235	Pin (SB-2004-012)	1
	D85	87-02	04-42	8801135	Pin (SB-1998-018)	1
	D95	87-02		8100035	Spring	1
	E10	95-50		8000400	Side cover (SB-1995-025)	1
	E20	87-02		8000094	Leveler (SB-1989-003)	1
	E22	87-02		358838	Spring seat (SB-1989-003)	2
	E24	92-06		8801225	Shim (SB-1989-003 & SB-2000-041)	2
	E30	95-50		11056530	Guide post	2
	E30	87-02	95-49	8100353	Guide post (SB-1995-025)	2
	E40	87-02		505412 (9003509-0008)	Seal nut	2
	E50	87-02		056739 (9004104-1580)	O-ring	1
	E60	87-02		5000206	Screw (SB-1994-018)	6
	E70	87-02		664524 (9005110-9000)	Plug assembly	1
	E80	87-02		8000186	Spring	2
	E90	95-50		513886	Insert assembly (SB-1995-025 & SB-1999-041)	1
	F20	88-14		11116313	Slider block (SB-1988-009 & SB-2015-005)	1
	L10	87-02		5000504	Roller bearing	1
	L20	87-02		9006300-0137	Retaining ring	1
	L25	10-40		11083637	Seal carrier assembly	1
	L40	10-40		11013519	Lip seal (SB-2010-025)	1
	L50	87-02		071845 (9004104-1510)	O-ring	1
	L60	87-02		11083638	Retainer plate (SB-2010-025)	1
	L70	87-02		041160 (9007314-0605)	Screw	3
	QB30	87-02		8000131	Bearing/pin assembly	1
	QD50	88-14		8000200	Swashplate kit (SB-1988-009)	1
	QD50	87-02	88-14	8000201	Swashplate kit	1
	QL25	87-02	10-39	11084372	Seal carrier replacement kit (SB-2010-025)	1



Variable displacement pump



E100 704E

* = included in base pump seal kit Q210


Variable displacement pump
Common parts

Order Code	Item	Date Begin	Date End	Part Number	Part Name	Qty. per Model/Kit
	C20	87-02		367672	Piston assembly (SB-1988-023)	9
	C30	87-02		11067348	Slipper guide	1
	C40	88-43		8000137	Slipper guide bearing (SB-1988-016)	2
	C50	88-43		11065864	Spacer (SB-1988-016, SB-1998-041 & SB-2009-038)	4
	C70	88-43		648477	Screw (SB-1988-016 & SB-1998-041)	4

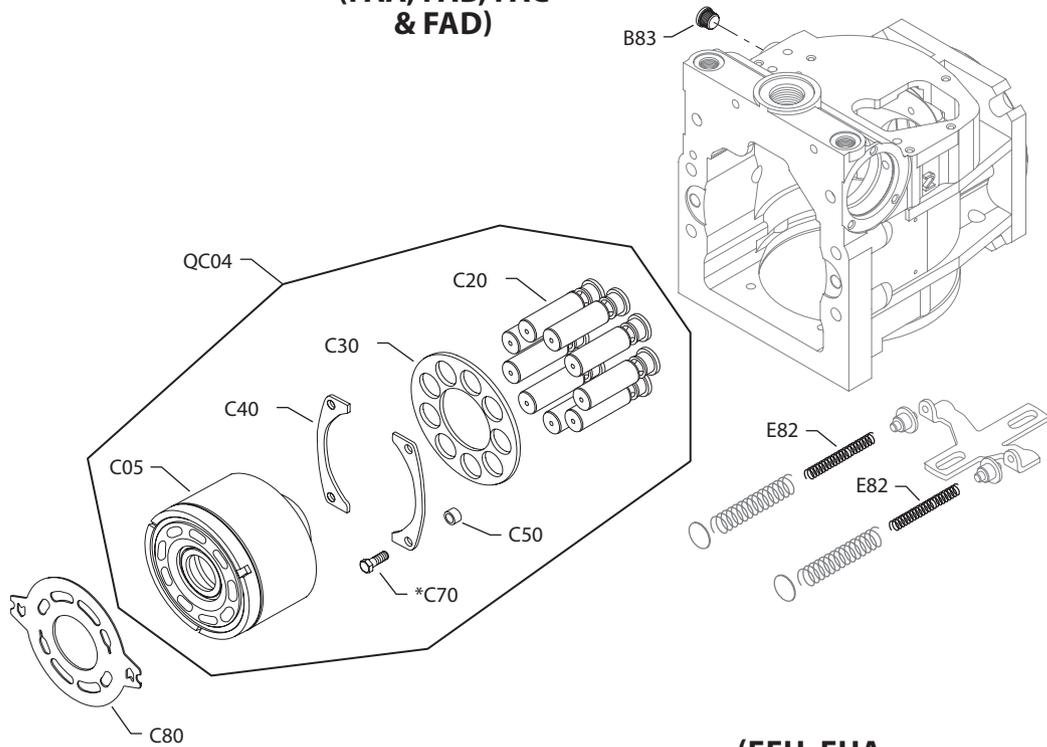
Special hardware

EAB & NMS & NWN	B83	92-06		KPPG12508	Speed sensor	1
	C06	92-06		8000336	Cylinder block assembly, with speed ring	1
	C80	92-06		11015185	Valve plate	1
	E82	92-06		8000203	Spring	2
	QB83	92-06		085043 (9004201-3700)	O-ring	1
	QC04	92-06		8510362	Cylinder block kit, with speed ring	1
EBC	B83	96-06		KPPG13408	Speed sensor	1
	C06	96-06		8000336	Cylinder block assembly, with speed ring	1
	C80	96-06		11015186	Valve plate	1
	QB83	96-06		085043 (9004201-3700)	O-ring	1
	QC04	96-06		8510362	Cylinder block kit, with speed ring	1
	EDC	B83	96-39	12-35	KPPG13403	Speed sensor
C06		96-39	12-35	8000336	Cylinder block assembly, with speed ring	1
C80		96-39	12-35	11018343	Valve plate, CW	1
E82		96-39	12-35	8000203	Spring	2
QB83		96-39	12-35	085043 (9004201-3700)	O-ring	1
QC04		96-39	12-35	8510362	Cylinder block kit, with speed ring	1
EEB	B83	96-06		9005110-5600	Plug assembly	1
	C06	96-06		8000336	Cylinder block assembly, with speed ring	1
	C80	96-06		11015186	Valve plate	1
	QC04	96-06		8510362	Cylinder block kit, with speed ring	1
EEC	B83	94-51		9005110-5600	Plug assembly	1
	C06	94-51		8000336	Cylinder block assembly, with speed ring	1
	C80	94-51		11018330	Valve plate, CCW	1
	C80	94-51		11018343	Valve plate, CW	1
	E82	94-51		8000203	Spring	2
	QC04	94-51		8510362	Cylinder block kit, with speed ring	1
EEG	B83	00-06		9005110-5600	Plug assembly	1
	C06	00-06		8000336	Cylinder block assembly, with speed ring	1
	C80	00-06		11018330	Valve plate, CCW	1
	C80	00-06		11018343	Valve plate, CW	1
	QC04	00-06		8510362	Cylinder block kit, with speed ring	1
	EFI	B83	07-38		KPPG156	Speed sensor
C06		07-38		8000336	Cylinder block assembly, with speed ring	1
C80		07-38		11018343	Valve plate, CW	1
QB83		07-38		085043 (9004201-3700)	O-ring	1
QC04		07-38		8510362	Cylinder block kit, with speed ring	1

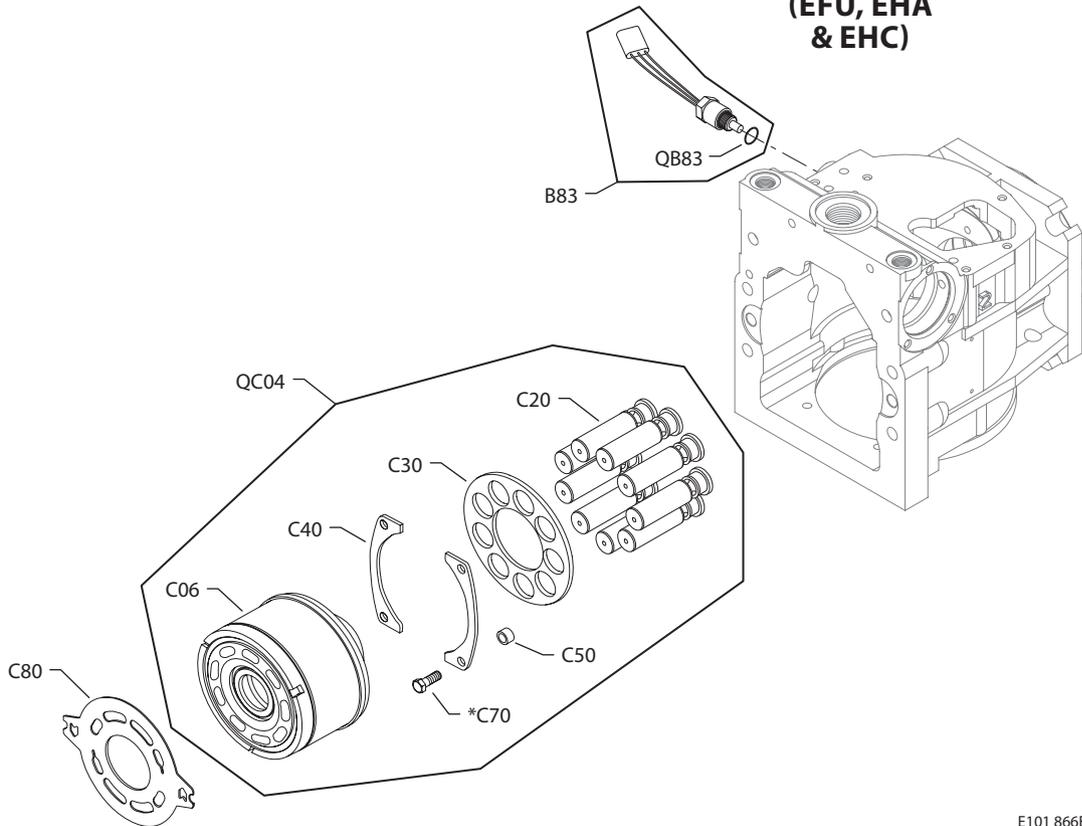


Variable displacement pump

(FAA, FAB, FAC & FAD)



(EFU, EHA & EHC)



* = included in overhaul seal kit Q210

E101 866E


Variable displacement pump
Common parts

Order Code	Item	Date Begin	Date End	Part Number	Part Name	Qty. per Model/Kit
	C20	87-02		367672	Piston assembly (SB-1988-023)	9
	C30	87-02		11067348	Slipper guide	1
	C40	88-43		8000137	Slipper guide bearing (SB-1988-016)	2
	C50	88-43		11065864	Spacer (SB-1988-016, SB-1998-041 & SB-2009-038)	4
	C70	88-43		648477	Screw (SB-1988-016 & SB-1998-041)	4

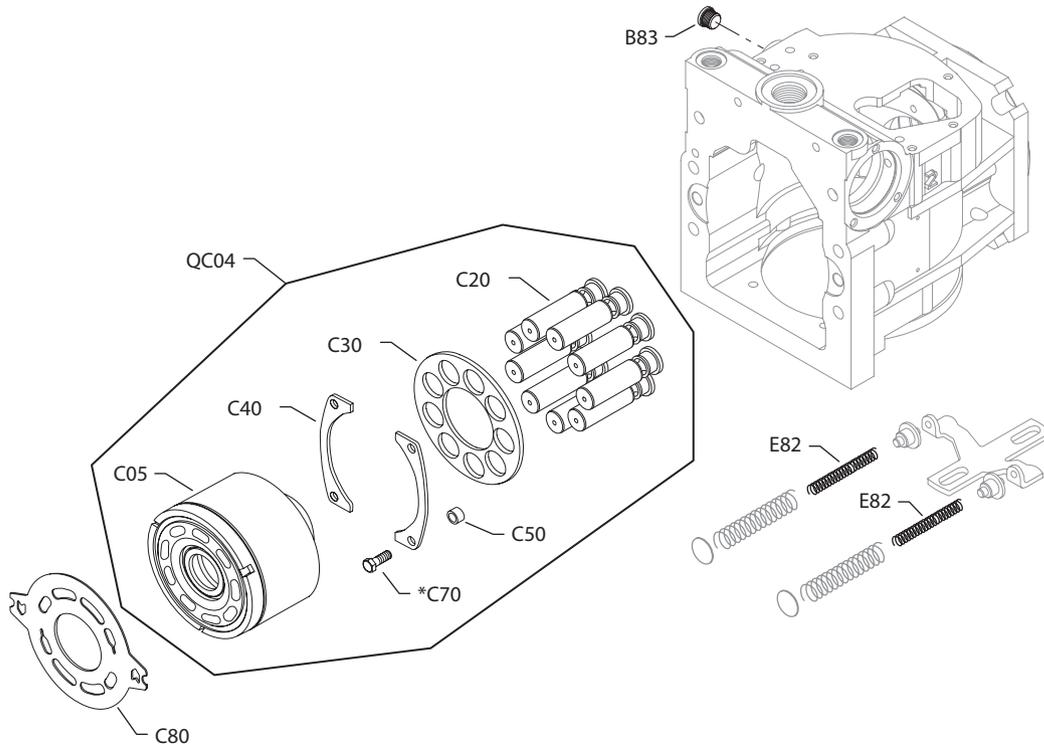
Special hardware

EFU	B83	14-04		KPPG156	Speed sensor	1
	C06	14-04		8000336	Cylinder block assembly, with speed ring	1
	C80	14-04		11018343	Valve plate, CW	1
	QB83	14-04		085043 (9004201-3700)	O-ring	1
	QC04	14-04		8510362	Cylinder block kit, with speed ring	1
EHA	B83	99-14		KPPG16408	Speed sensor	1
	C06	99-14		8000336	Cylinder block assembly, with speed ring	1
	C80	99-14		11015186	Valve plate	1
	QB83	99-14		085043 (9004201-3700)	O-ring	1
	QC04	99-14		8510362	Cylinder block kit, with speed ring	1
EHC	B83	99-14		KPPG12408	Speed sensor	1
	C06	99-14		8000336	Cylinder block assembly, with speed ring	1
	C80	99-14		11015186	Valve plate	1
	QB83	99-14		085043 (9004201-3700)	O-ring	1
	QC04	99-14		8510362	Cylinder block kit, with speed ring	1
FAA & NDN	B83	91-04		9005110-5600	Plug assembly	1
	C05	91-04		8000128	Cylinder block assembly, without speed ring	1
	C80	91-04		11017478	Valve plate	1
	E82	91-04		8000203	Spring	2
	QC04	91-04		8510363	Cylinder block kit, without speed ring	1
FAB & NBN	B83	91-46		9005110-5600	Plug assembly	1
	C05	91-46		8000128	Cylinder block assembly, without speed ring	1
	C80	91-46		363713	Valve plate	1
	E82	91-46		8000203	Spring	2
	QC04	91-46		8510363	Cylinder block kit, without speed ring	1
FAC	B83	94-23		9005110-5600	Plug assembly	1
	C05	94-23		8000128	Cylinder block assembly, without speed ring	1
	C80	94-23		11015185	Valve plate	1
	E82	94-23		8000203	Spring	2
	QC04	94-23		8510363	Cylinder block kit, without speed ring	1
FAD & NSN	B83	94-23		9005110-5600	Plug assembly	1
	C05	94-23		8000128	Cylinder block assembly, without speed ring	1
	C80	94-23		11015186	Valve plate (SB-1997-003)	1
	E82	94-23		8000203	Spring	2
	QC04	94-23		8510363	Cylinder block kit, without speed ring	1



Variable displacement pump

(FAK, FAP, FAR,
FAU, FBD, FBE &
FBG)



E101 867E

* = included in overhaul seal kit Q210


Variable displacement pump
Common parts

Order Code	Item	Date Begin	Date End	Part Number	Part Name	Qty. per Model/Kit
	C20	87-02		367672	Piston assembly (SB-1988-023)	9
	C30	87-02		11067348	Slipper guide	1
	C40	88-43		8000137	Slipper guide bearing (SB-1988-016)	2
	C50	88-43		11065864	Spacer (SB-1988-016 & SB-1998-041)	4
	C70	88-43		648477	Screw (SB-1988-016 & SB-1998-041)	4

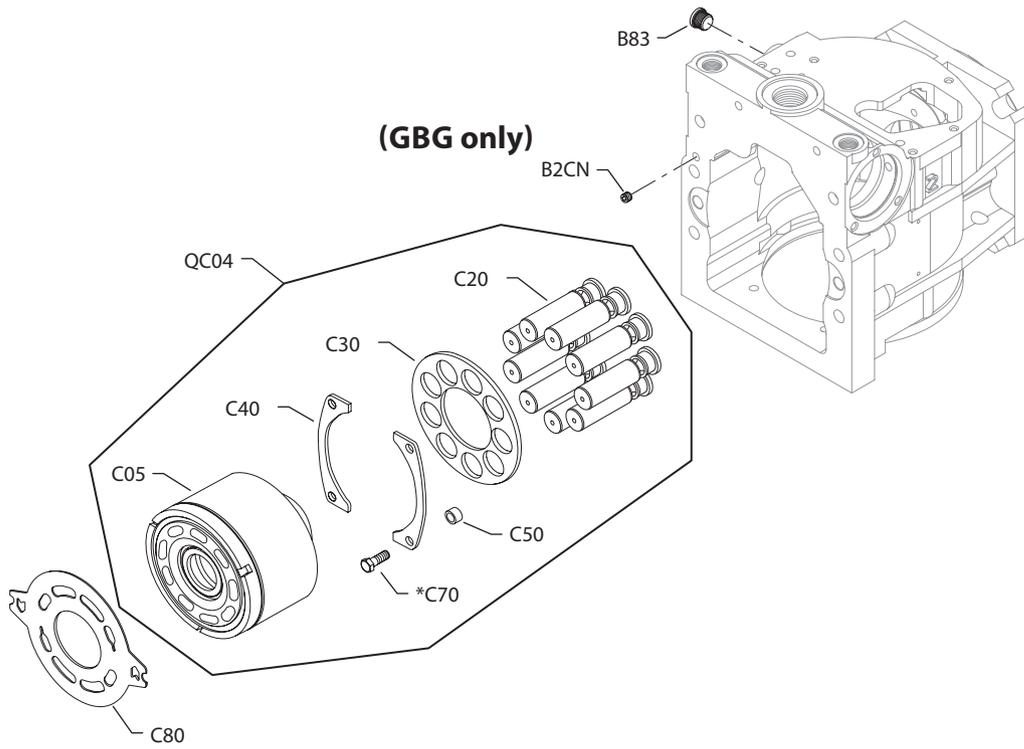
Special hardware

FAK	B83	99-45	13-15	9005110-5600	Plug assembly	1
	C05	99-45	13-15	8000128	Cylinder block assembly, without speed ring	1
	C80	99-45	13-15	11015186	Valve plate	1
	E82	99-45	13-15	8000203	Spring	2
	QC04	99-45	13-15	8510363	Cylinder block kit, without speed ring	1
FAP	B83	96-08		9005110-5600	Plug assembly	1
	C05	96-08		8000128	Cylinder block assembly, without speed ring	1
	C80	96-08		11018330	Valve plate, CCW	1
	C80	96-08		11018343	Valve plate, CW	1
	E82	96-08		8000203	Spring	2
QC04	96-08		8510363	Cylinder block kit, without speed ring	1	
FAR	B83	99-11	06-34	9005110-5600	Plug assembly	1
	C05	99-11	06-34	8000128	Cylinder block assembly, without speed ring	1
	C80	99-11	06-34	510714	Valve plate	1
	E82	99-11	06-34	8000203	Spring	2
	QC04	99-11	06-34	8510363	Cylinder block kit, without speed ring	1
FAU	B83	99-11	06-34	9005110-5600	Plug assembly	1
	C05	99-11	06-34	8000128	Cylinder block assembly, without speed ring	1
	C80	99-11	06-34	11015186	Valve plate	1
	E82	99-11	06-34	8000203	Spring	2
	QC04	99-11	06-34	8510363	Cylinder block kit, without speed ring	1
FBD	B83	06-12		9005110-5600	Plug assembly	1
	C05	06-12		8000128	Cylinder block assembly, without speed ring	1
	C80	06-12		510714	Valve plate	1
	E82	06-12		8000203	Spring	2
	QC04	06-12		8510363	Cylinder block kit, without speed ring	1
FBE	B83	06-12		9005110-5600	Plug assembly	1
	C05	06-12		8000128	Cylinder block assembly, without speed ring	1
	C80	06-12		11015186	Valve plate	1
	E82	06-12		8000203	Spring	2
	QC04	06-12		8510363	Cylinder block kit, without speed ring	1
FBG	B83	06-17		9005110-5600	Plug assembly	1
	C05	06-17		8000128	Cylinder block assembly, without speed ring	1
	C80	06-17		11015186	Valve plate	1
	E82	06-17		8000203	Spring	2
	QC04	06-17		8510363	Cylinder block kit, without speed ring	1



Variable displacement pump

(GAA, GBA, GBG ,GCA, GCR, GDE,
GEA & GFD)



E100 708E

* = included in overhaul seal kit Q210


Variable displacement pump
Common parts

Order Code	Item	Date Begin	Date End	Part Number	Part Name	Qty. per Model/Kit
	C20	87-02		367672	Piston assembly (SB-1988-023)	9
	C30	87-02		11067348	Slipper guide	1
	C40	88-43		8000137	Slipper guide bearing (SB-1988-016)	2
	C50	88-43		11065864	Spacer (SB-1988-016 & SB-1998-041)	4
	C70	88-43		648477	Screw (SB-1988-016 & SB-1998-041)	4

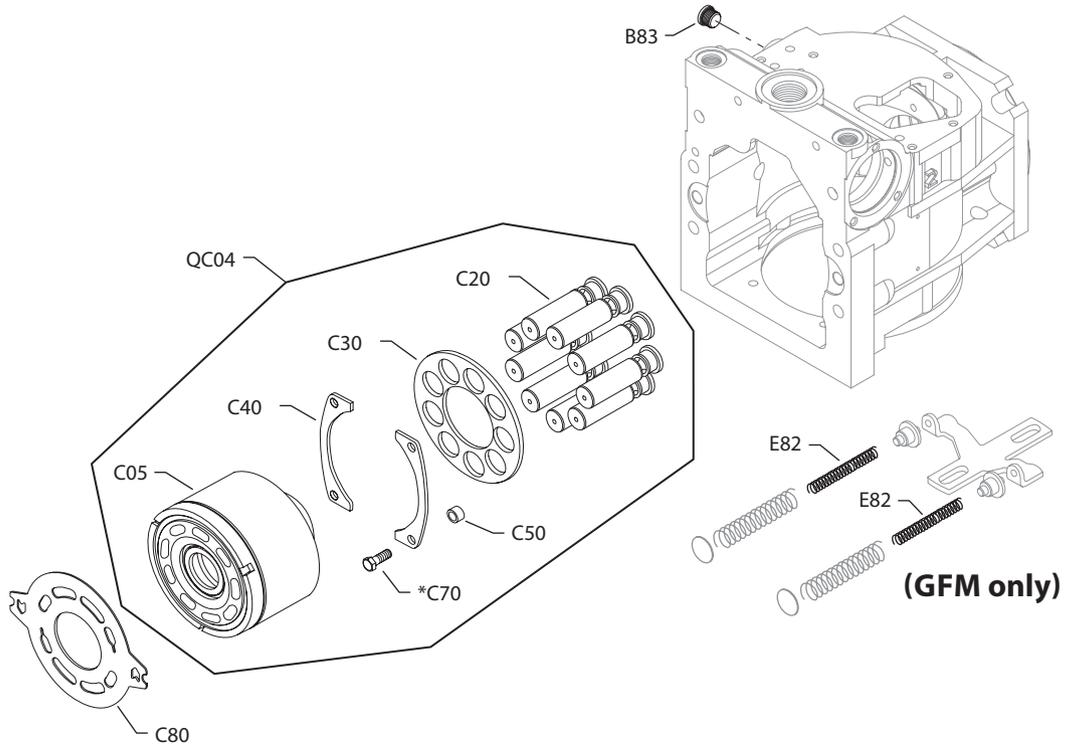
Special hardware

GAA & NCN	B83	91-07	09-49	9005110-5600	Plug assembly	1
	C05	91-07	09-49	8000128	Cylinder block assembly, without speed ring	1
	C80	91-07	09-49	11017479	Valve plate	1
	QC04	91-07	09-49	8510363	Cylinder block kit, without speed ring	1
GBA, NNN & NWN	B83	92-06		9005110-5600	Plug assembly	1
	C05	87-02		8000128	Cylinder block assembly, without speed ring	1
	C80	87-02		11015186	Valve plate (SB-1995-026, SB-1997-003)	1
	QC04	87-02		8510363	Cylinder block kit, without speed ring	1
GBG	B83	99-45		9005110-5600	Plug assembly	1
	B2CN	99-45		042457	Set screw	1
	C05	99-45		8000128	Cylinder block assembly, without speed ring	1
	C80	99-45		11015186	Valve plate	1
	QC04	99-45		8510363	Cylinder block kit, without speed ring	1
GCA	B83	94-27		9005110-5600	Plug assembly	1
	C05	94-27		8000128	Cylinder block assembly, without speed ring	1
	C80	94-27		11015185	Valve plate	1
	QC04	94-27		8510363	Cylinder block kit, without speed ring	1
GCR	B83	11-23		9005110-5600	Plug assembly	1
	C05	11-23		8000128	Cylinder block assembly, without speed ring	1
	C80	11-23		11015186	Valve plate	1
	QC04	11-23		8510363	Cylinder block kit, without speed ring	1
GDE	B83	15-20		9005110-5600	Plug assembly	1
	C05	15-20		8000128	Cylinder block assembly, without speed ring	1
	C80	15-20		11015186	Valve plate	1
	QC04	15-20		8510363	Cylinder block kit, without speed ring	1
GEA & SLN	B83	92-06		9005110-5600	Plug assembly	1
	C05	90-07		8000128	Cylinder block assembly, without speed ring	1
	C80	90-07		11087562	Valve plate	1
	QC04	90-07		8510363	Cylinder block kit, without speed ring	1
GFD	B83	98-14		9005110-5600	Plug assembly	1
	C05	98-14		8000128	Cylinder block assembly, without speed ring	1
	C80	98-14		11015186	Valve plate	1
	QC04	98-14		8510363	Cylinder block kit, without speed ring	1



Variable displacement pump

(GFH, GFJ, GLK, GFL, GFM,
GFN, GFS & GFW)



E101 867E

* = included in overhaul seal kit Q210


Variable displacement pump
Common parts

Order Code	Item	Date Begin	Date End	Part Number	Part Name	Qty. per Model/Kit
	C20	87-02		367672	Piston assembly (SB-1988-023)	9
	C30	87-02		8000007	Slipper guide	1
	C40	88-43		8000137	Slipper guide bearing (SB-1988-016)	2
	C50	88-43		11065864	Spacer (SB-1988-016 & SB-1998-041)	4
	C70	88-43		648477	Screw (SB-1988-016 & SB-1998-041)	4

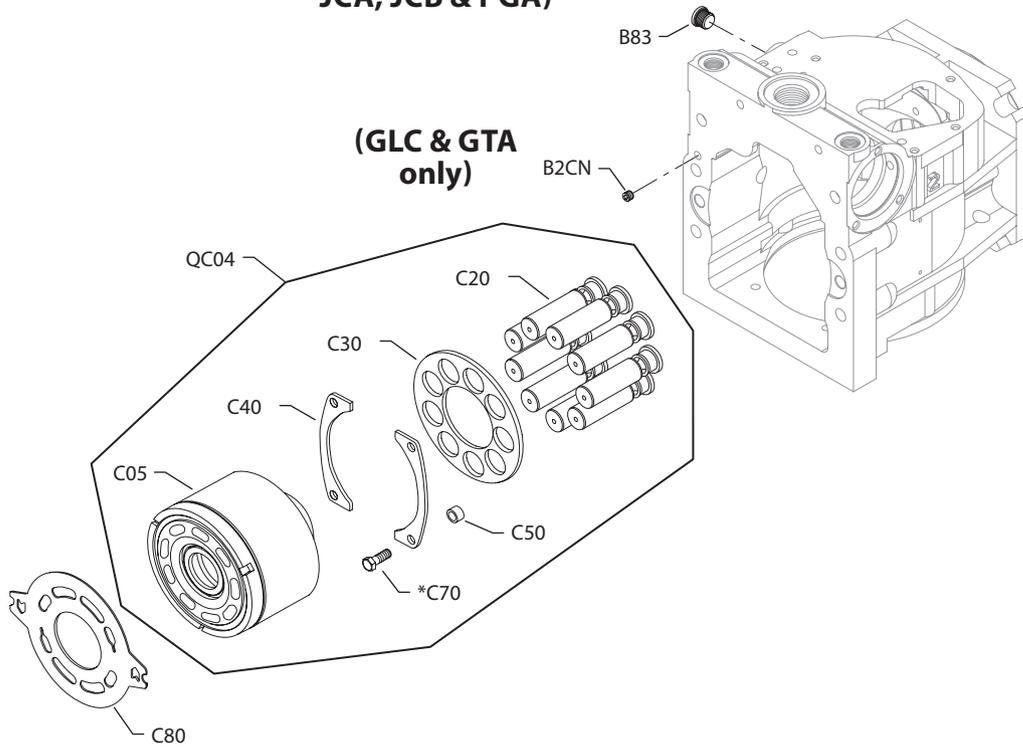
Special hardware

GFH	B83	98-14		9005110-5600	Plug assembly	1
	C05	98-14		8000128	Cylinder block assembly, without speed ring	1
	C80	98-14		11015186	Valve plate	1
	QC04	98-14		8510363	Cylinder block kit, without speed ring	1
GFJ	B83	06-12		9005110-5600	Plug assembly	1
	C05	06-12		8000128	Cylinder block assembly, without speed ring	1
	C80	06-12		11015186	Valve plate	1
	QC04	06-12		8510363	Cylinder block kit, without speed ring	1
GFK	B83	06-12		9005110-5600	Plug assembly	1
	C05	06-12		8000128	Cylinder block assembly, without speed ring	1
	C80	06-12		11015186	Valve plate	1
	QC04	06-12		8510363	Cylinder block kit, without speed ring	1
GFL	B83	13-51		9005110-5600	Plug assembly	1
	C05	13-51		8000128	Cylinder block assembly, without speed ring	1
	C80	13-51		11015186	Valve plate	1
	QC04	13-51		8510363	Cylinder block kit, without speed ring	1
GFM	B83	13-51		9005110-5600	Plug assembly	1
	C05	13-51		8000128	Cylinder block assembly, without speed ring	1
	C80	13-51		11015186	Valve plate	1
	E82	13-51		8000203	Spring	2
	QC04	13-51		8510363	Cylinder block kit, without speed ring	1
GFN	B83	06-12		9005110-5600	Plug assembly	1
	C05	06-12		8000128	Cylinder block assembly, without speed ring	1
	C80	06-12		11015186	Valve plate	1
	QC04	06-12		8510363	Cylinder block kit, without speed ring	1
GFS	B83	06-12		9005110-5600	Plug assembly	1
	C05	06-12		8000128	Cylinder block assembly, without speed ring	1
	C80	06-12		11015186	Valve plate	1
	QC04	06-12		8510363	Cylinder block kit, without speed ring	1
GFW	B83	06-12		9005110-5600	Plug assembly	1
	C05	06-12		8000128	Cylinder block assembly, without speed ring	1
	C80	06-12		11015185	Valve plate	1
	QC04	06-12		8510363	Cylinder block kit, without speed ring	1



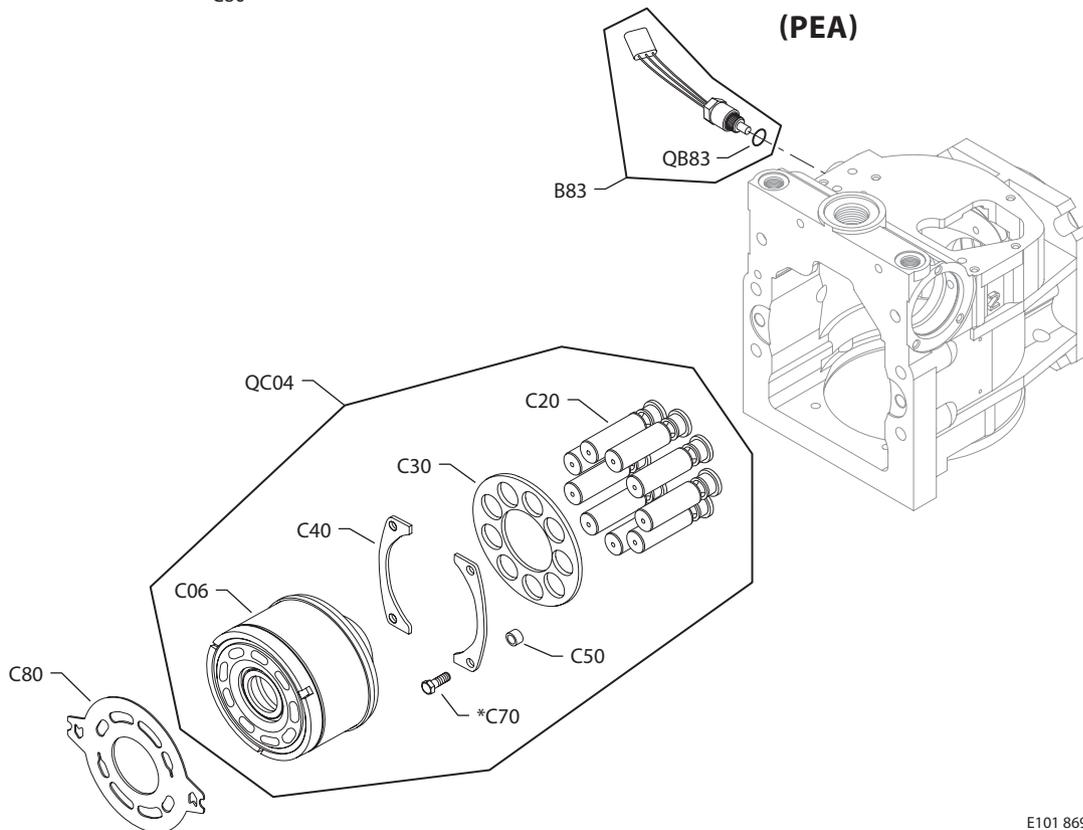
Variable displacement pump

(GFY, GLA, GLC, GTA,
JCA, JCB & PGA)



(GLC & GTA
only)

(PEA)



* = included in overhaul seal kit Q210

E101 869E


Variable displacement pump
Common parts

Order Code	Item	Date Begin	Date End	Part Number	Part Name	Qty. per Model/Kit
	C20	87-02		367672	Piston assembly (SB-1988-023)	9
	C30	87-02		8000007	Slipper guide	1
	C40	88-43		8000137	Slipper guide bearing (SB-1988-016)	2
	C50	88-43		11065864	Spacer (SB-1988-016 & SB-1998-041)	4
	C70	88-43		648477	Screw (SB-1988-016 & SB-1998-041)	4

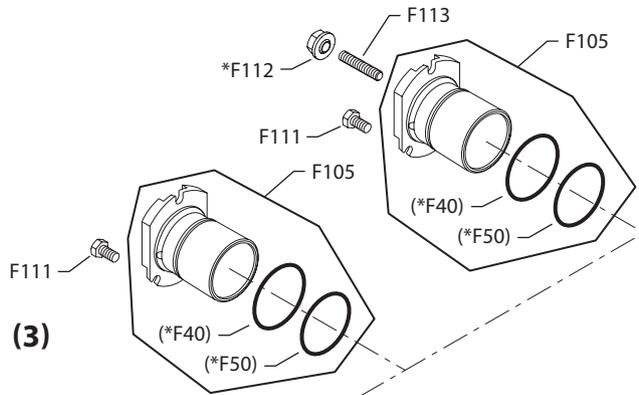
Special hardware

GFY	B83	06-12		9005110-5600	Plug assembly	1
	C05	06-12		8000128	Cylinder block assembly, without speed ring	1
	C80	06-12		11087562	Valve plate	1
	QC04	06-12		8510363	Cylinder block kit, without speed ring	1
GLA	B83	98-14		9005110-5600	Plug assembly	1
	C05	98-14		8000128	Cylinder block assembly, without speed ring	1
	C80	98-14		11018330	Valve plate, CCW	1
	C80	98-14		11018343	Valve plate, CW	1
	QC04	98-14		8510363	Cylinder block kit, without speed ring	1
GLC	B83	04-38		9005110-5600	Plug assembly	1
	B2CN	04-38		042457	Set screw	1
	C05	04-38		8000128	Cylinder block assembly, without speed ring	1
	C80	04-38		11018343	Valve plate, CW	1
	QC04	04-38		8510363	Cylinder block kit, without speed ring	1
GTA	B83	14-21		9005110-5600	Plug assembly	1
	B2CN	14-21		042457	Set screw	1
	C05	14-21		8000128	Cylinder block assembly, without speed ring	1
	C80	14-21		11015186	Valve plate	1
	QC04	14-21		8510363	Cylinder block kit, without speed ring	1
JCA	B83	10-18		9005110-5600	Plug assembly	1
	C05	10-18		8000128	Cylinder block assembly, without speed ring	1
	C80	10-18		11015186	Valve plate	1
	QC04	10-18		8510363	Cylinder block kit, without speed ring	1
JCB	B83	09-10	12-35	9005110-5600	Plug assembly	1
	C05	09-10	12-35	8000128	Cylinder block assembly, without speed ring	1
	C80	09-10	12-35	11015186	Valve plate	1
	QC04	09-10	12-35	8510363	Cylinder block kit, without speed ring	1
PEA	B83	07-03		KPPG156	Speed sensor	1
	C06	07-03		8000336	Cylinder block assembly, with speed ring	1
	C80	07-03		11015186	Valve plate	1
	QB83	92-06		085043 (9004201-3700)	O-ring	1
	QC04	07-03		8510362	Cylinder block kit, with speed ring	1
PGA	B83	08-01		9005110-5600	Plug assembly	1
	C05	08-01		8000128	Cylinder block assembly, without speed ring	1
	C80	08-01		11015186	Valve plate	1
	QC04	08-01		8510363	Cylinder block kit, without speed ring	1

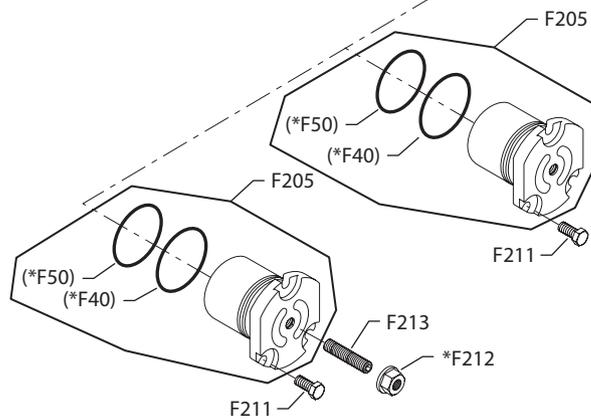
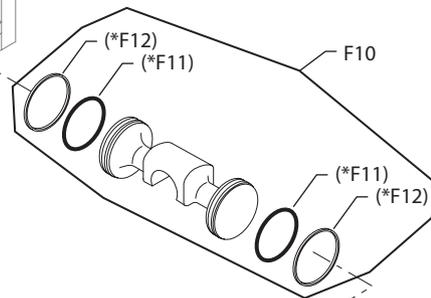
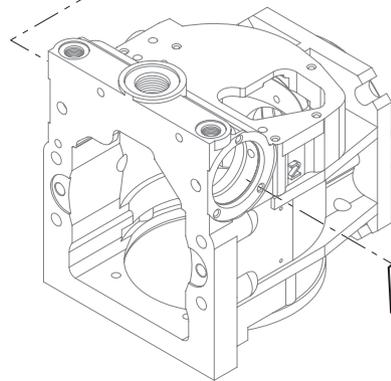


Variable displacement pump

(1 & 4)



(3)



(1 & 3)

(4)

E100 688E

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



Variable displacement pump

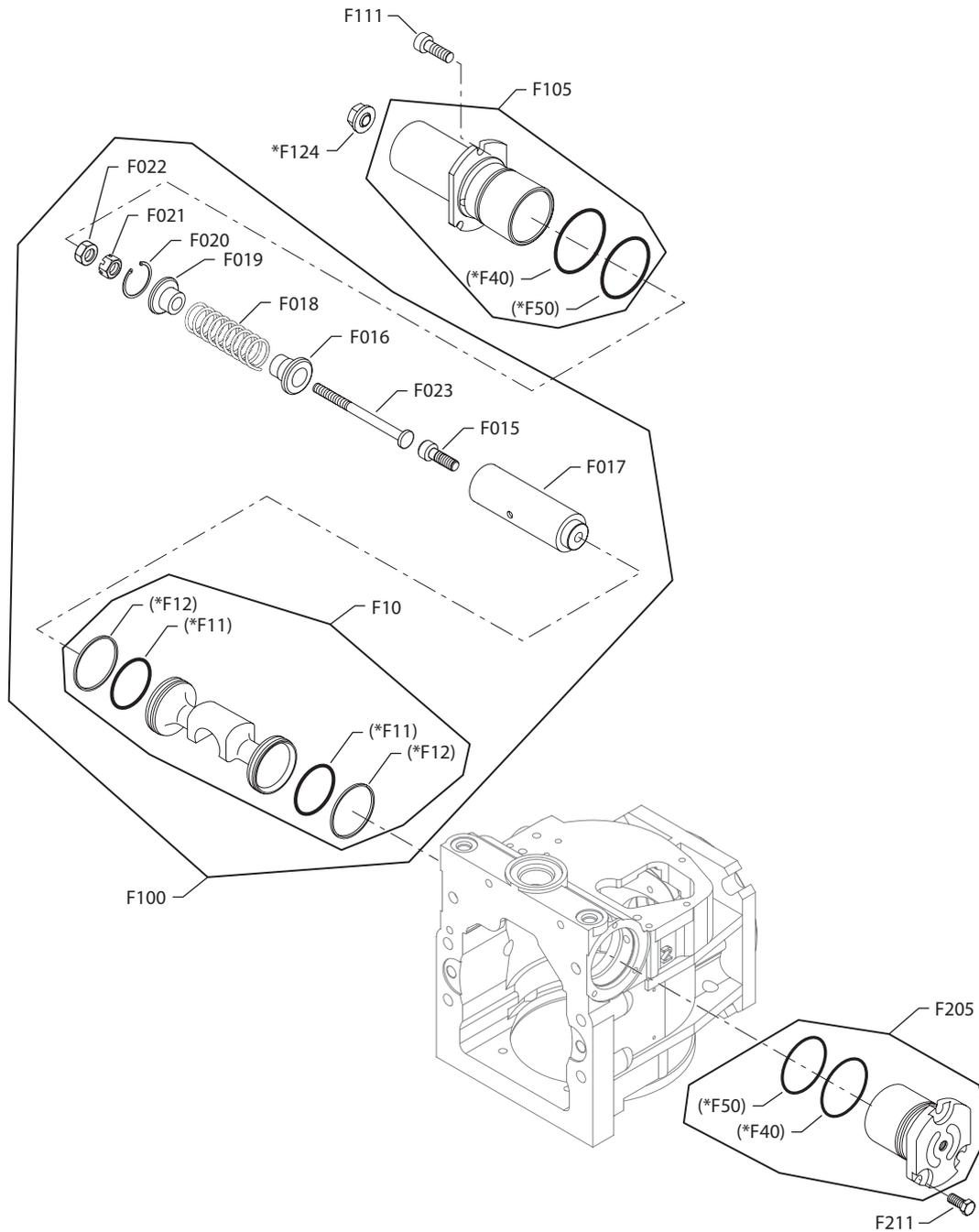
Displacement limitation

Order Code	Item	Date Begin	Date End	Part Number	Part Name	Qty. per Model/Kit
1	F10	91-07		11046668	Servo piston assembly	1
	F105	91-07		11054834	Servo cylinder assembly	1
	F111	91-07		9007210-0604	Screw	3
	F112	91-07		505412 (9003509-0008)	Seal nut	1
	F113	91-07		5000747	Set screw	1
	F205	91-07		11054864	Servo cylinder assembly	1
	F211	91-07		9007210-0604	Screw	3
	3	F10	87-02		11046668	Servo piston assembly
F105		91-07		11054864	Servo cylinder assembly	1
F111		87-02		9007210-0604	Screw	3
F205		91-07		11054864	Servo cylinder assembly	1
F211		87-02		9007210-0604	Screw	3
4		F10	91-07		11046668	Servo piston assembly
	F105	91-07		11054834	Servo cylinder assembly	1
	F111	91-07		9007210-0604	Screw	3
	F112	91-07		505412 (9003509-0008)	Seal nut	1
	F113	91-07		5000747	Set screw	1
	F205	91-07		11054834	Servo cylinder assembly	1
	F211	91-07		9007210-0604	Screw	3
	F212	91-07		505412 (9003509-0008)	Seal nut	1
	F213	91-07		5000747	Set screw	1



Variable displacement pump

(7)



E100 705E

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

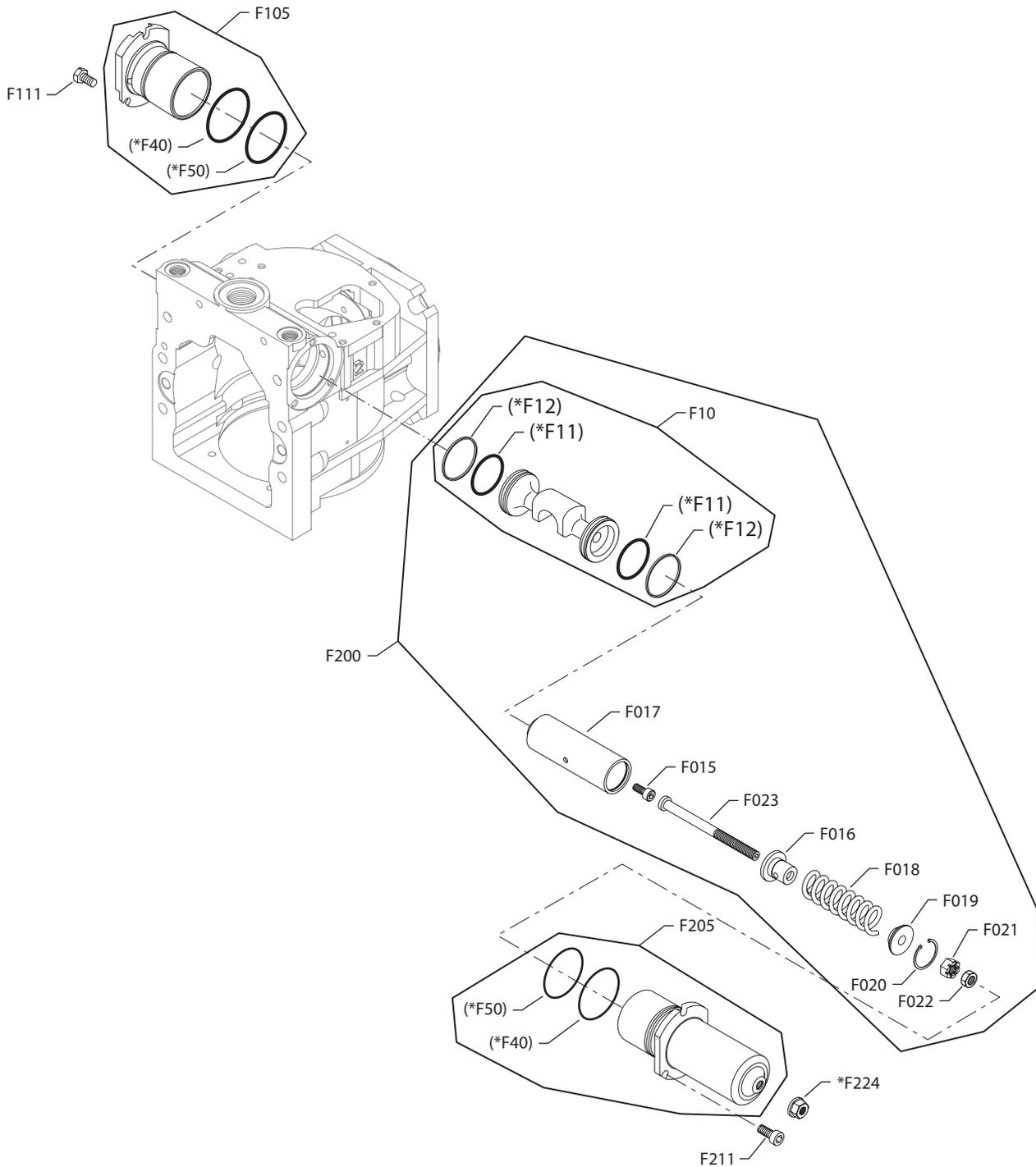

Variable displacement pump
Displacement limitation

Order Code	Item	Date Begin	Date End	Part Number	Part Name	Qty. per Model/Kit
7	F10	95-31		11046669	Servo piston assembly	1
	F015	95-31		346395	Screw	1
	F016	95-31		507092	Spring guide	1
	F017	95-31		346320	Servo spring housing	1
	F018	95-31		346254	Spring	1
	F019	95-31		507093	Spring guide	1
	F020	95-31		346379	Retaining ring	1
	F021	95-31		787887	Castle nut	1
	F022	95-31		336800	Nut	1
	F023	95-31		11140220	Adjusting screw	1
	F100	95-31		8000760	Servo assembly	1
	F105	95-31		11054838	Servo cylinder assembly, automotive control	1
	F111	95-31		704395 (9007314-0604)	Screw	3
	F124	95-31		336826	Seal nut	1
	F205	95-31		11054864	Servo cylinder assembly, non-adjustable	1
	F211	95-31		9007210-0604	Screw	3



Variable displacement pump

(B)



E101 870E

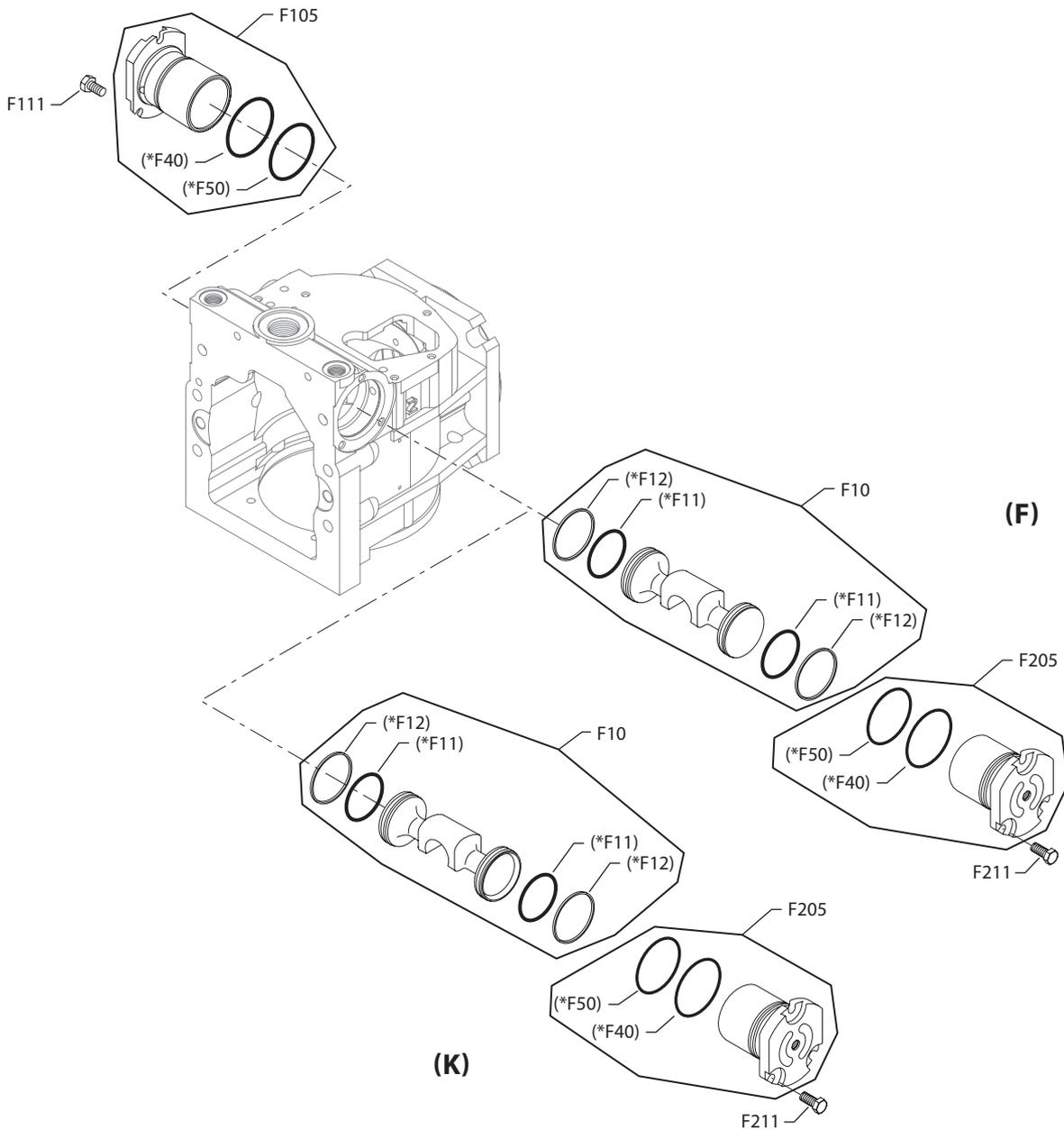
* = included in overhaul seal kit Q210
 () = not available individually


Variable displacement pump
Displacement limitation

Order Code	Item	Date Begin	Date End	Part Number	Part Name	Qty. per Model/Kit
B	F10	98-40		11046669	Servo piston assembly	1
	F015	98-40		346395	Screw	1
	F016	98-40		507092	Spring guide	1
	F017	98-40		346320	Servo spring housing	1
	F018	98-40		346254	Spring	1
	F019	98-40		507093	Spring guide	1
	F020	98-40		346379	Retaining ring	1
	F021	98-40		787887	Castle nut	1
	F022	98-40		336800	Nut	1
	F023	98-40		11140220	Adjusting screw	1
	F105	98-40		11054864	Servo cylinder assembly	1
	F111	98-40		9007210-0604	Screw	3
	F200	98-40		8000760	Servo assembly	1
	F205	98-40		11054838	Servo cylinder assembly	1
	F211	98-40		704395 (9007314-0604)	Screw	3
	F224	98-40		336826	Seal nut	1



Variable displacement pump



E101 871E

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



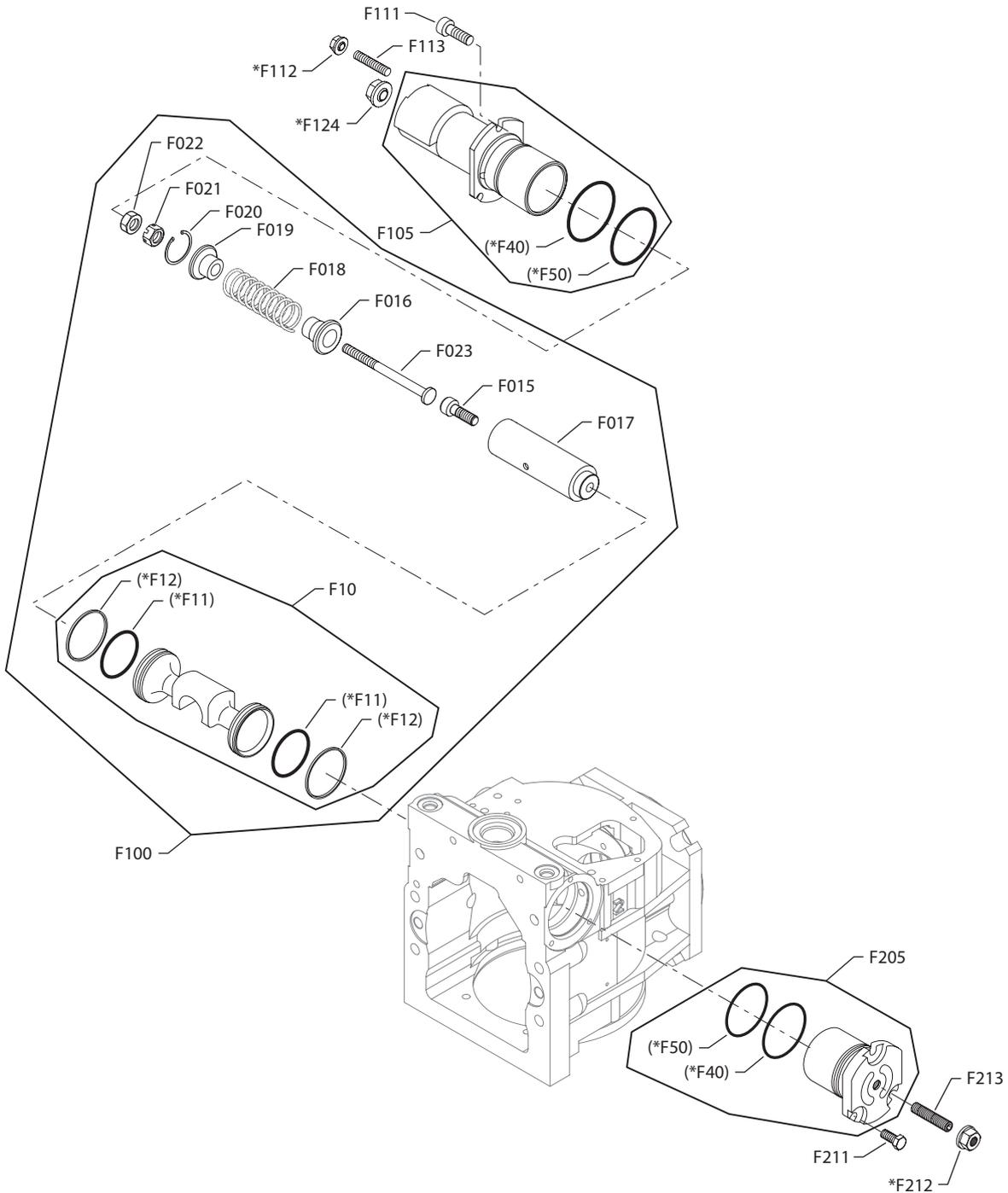
Variable displacement pump

Displacement limitation

Order Code	Item	Date Begin	Date End	Part Number	Part Name	Qty. per Model/Kit
F	F10	91-30		11046668	Servo piston assembly	1
	F105	91-30		11054836	Servo cylinder assembly	1
	F111	91-30		9007210-0604	Screw	3
	F205	91-30		11054836	Servo cylinder assembly	1
	F211	91-30		9007210-0604	Screw	3
K	F10	95-02		11046669	Servo piston assembly	1
	F105	95-02		11054864	Servo cylinder assembly	1
	F111	95-02		9007210-0604	Screw	3
	F205	95-02		11054864	Servo cylinder assembly	1
	F211	95-02		9007210-0604	Screw	3



Variable displacement pump



E100 706E

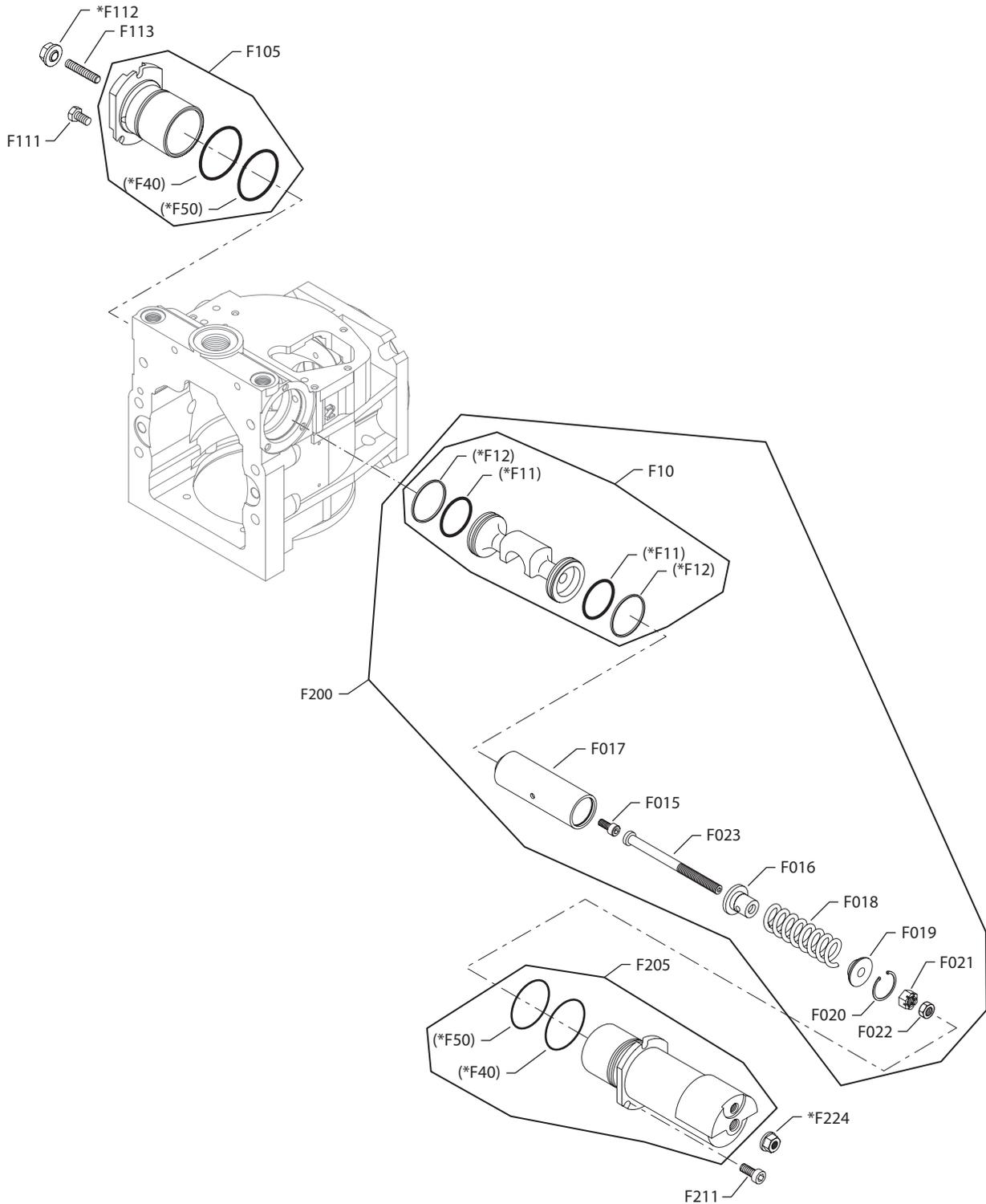
* = included in overhaul seal kit Q210
 () = not available individually


Variable displacement pump
Displacement limitation

Order Code	Item	Date Begin	Date End	Part Number	Part Name	Qty. per Model/Kit
L	F10	98-14		11046669	Servo piston assembly	1
	F015	98-14		346395	Screw	1
	F016	98-14		507092	Spring guide	1
	F017	98-14		346320	Servo spring housing	1
	F018	98-14		346254	Spring	1
	F019	98-14		507093	Spring guide	1
	F020	98-14		346379	Retaining ring	1
	F021	98-14		787887	Castle nut	1
	F022	98-14		336800	Nut	1
	F023	98-14		11140220	Adjusting screw	1
	F100	98-14		8000760	Servo assembly	1
	F105	98-14		11054840	Servo cylinder assembly	1
	F111	98-14		704395 (9007314-0604)	Screw	3
	F112	98-40		505412 (9003509-0008)	Seal nut	1
	F113	98-40		5000747	Set screw	1
	F124	98-14		336826	Seal nut	1
	F205	98-14		11054834	Servo cylinder assembly	1
	F211	98-14		9007210-0604	Screw	3
	F212	98-14		505412 (9003509-0008)	Seal nut	1
	F213	98-14		5000747	Set screw	1



Variable displacement pump



E100 707E

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

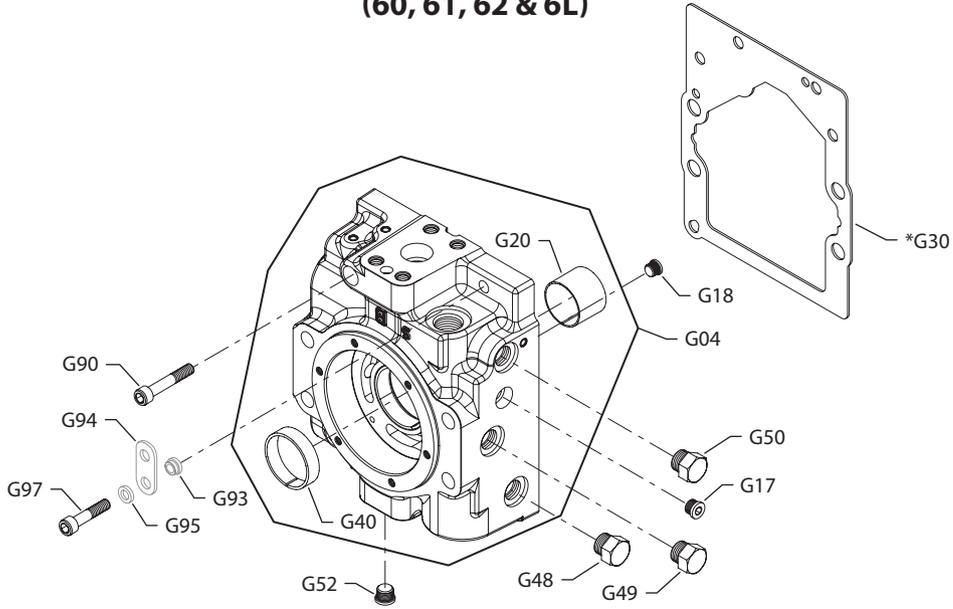

Variable displacement pump
Displacement limitation

Order Code	Item	Date Begin	Date End	Part Number	Part Name	Qty. per Model/Kit
N	F10	98-40		11046669	Servo piston assembly	1
	F015	98-40		346395	Screw	1
	F016	98-40		507092	Spring guide	1
	F017	98-40		346320	Servo spring housing	1
	F018	98-40		346254	Spring	1
	F019	98-40		507093	Spring guide	1
	F020	98-40		346379	Retaining ring	1
	F021	98-40		787887	Castle nut	1
	F022	98-40		336800	Nut	1
	F023	98-40		11140220	Adjusting screw	1
	F105	98-40		11054834	Servo cylinder assembly	1
	F111	98-40		9007210-0604	Screw	3
	F112	98-40		505412 (9003509-0008)	Seal nut	1
	F113	98-40		5000747	Set screw	1
	F200	98-40		8000760	Servo assembly	1
	F205	98-40		11054840	Servo cylinder assembly	1
	F211	98-40		704395 (9007314-0604)	Screw	3
	F212	98-14		505412 (9003509-0008)	Seal nut	1
	F213	98-14		5000747	Set screw	1
	F224	98-40		336826	Seal nut	1

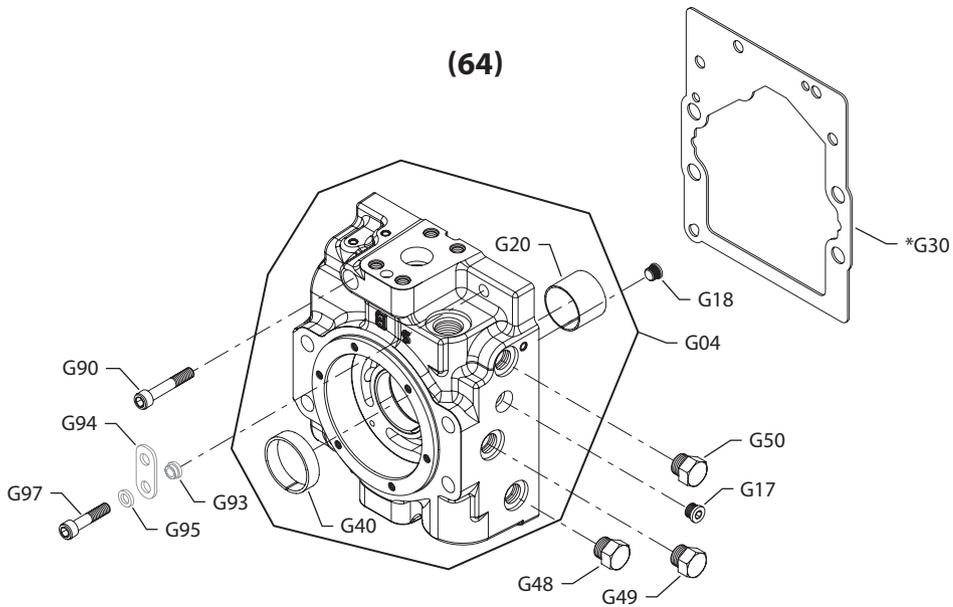


Variable displacement pump

(60, 61, 62 & 6L)



(64)



* = included in overhaul seal kit Q210

E100 709E

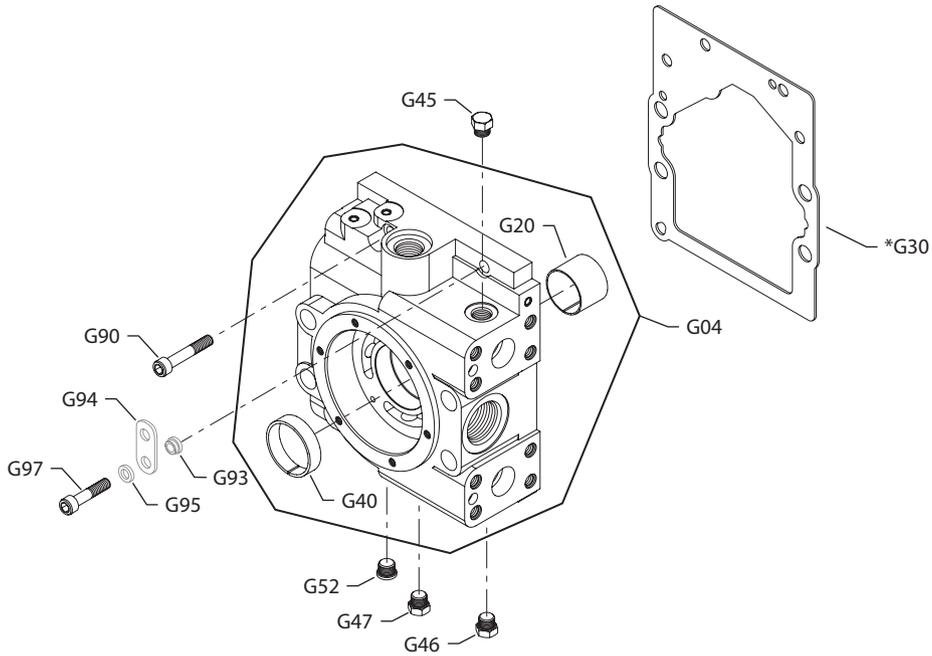

Variable displacement pump
End cap

Order Code	Item	Date Begin	Date End	Part Number	Part Name	Qty. per Model/Kit
	G17	92-06		327007 (9005110-4400)	Plug (SB-1992-0003)	1
	G18	92-06		327007 (9005110-4400)	Plug (SB-1992-0003)	1
	G20	87-02		8700018	Journal bearing	1
	G30	89-17		8000243	End cap gasket (SB-1989-037 & SB-1992-003)	1
	G30	87-02	89-16	8000107	End cap gasket (SB-1989-009)	1
	G40	87-02		8700008	Bushing	1
	G48	87-02		046151 (9005100-5600)	Plug assembly	1
	G49	87-02		046151 (9005100-5600)	Plug assembly	1
	G50	87-02		046151 (9005100-5600)	Plug assembly	1
	G90	89-47		713768 (9007314-0812)	Screw (SB-1989-037)	1
	G93	89-47		713800 (8800564)	Spacer	1
	G93	87-02	89-46	8800404	Spacer	1
	G94	89-47		8800565	Lifting bracket	1
	G94	87-02	89-46	8800522	Lifting bracket	1
	G95	89-47		002311 (9009610-3459)	Washer	1
	G95	87-02	89-46	002295 (9009610-2850)	Washer	1
	G97	89-47		746644 (9007314-0810)	Screw (SB-1989-037)	1
	G97	87-02	89-46	694356 (9007314-0608)	Screw	1
6 & 60	G04	92-06		8000259	End cap assembly, side ports (SB-1992-003)	1
	G52	92-06		9005110-5600	Plug assembly	1
2 & 61	G04	92-06		8000259	End cap assembly, side ports (SB-1992-003)	1
	G52	92-06		9005110-5600	Plug assembly	1
H & 62	G04	94-33		8000353	End cap assembly, metric side ports	1
	G52	94-33		9005110-5600	Plug assembly	1
4 & 64	G04	95-03	10-39	771410	End cap assembly, side ports, FBA	1
6L	G04	97-24		8000543	End cap assembly, metric side ports, lapped	1
	G52	97-24		9005110-5600	Plug assembly	1



Variable displacement pump

(80, 81, 82 & 8L)



* = included in overhaul seal kit Q210

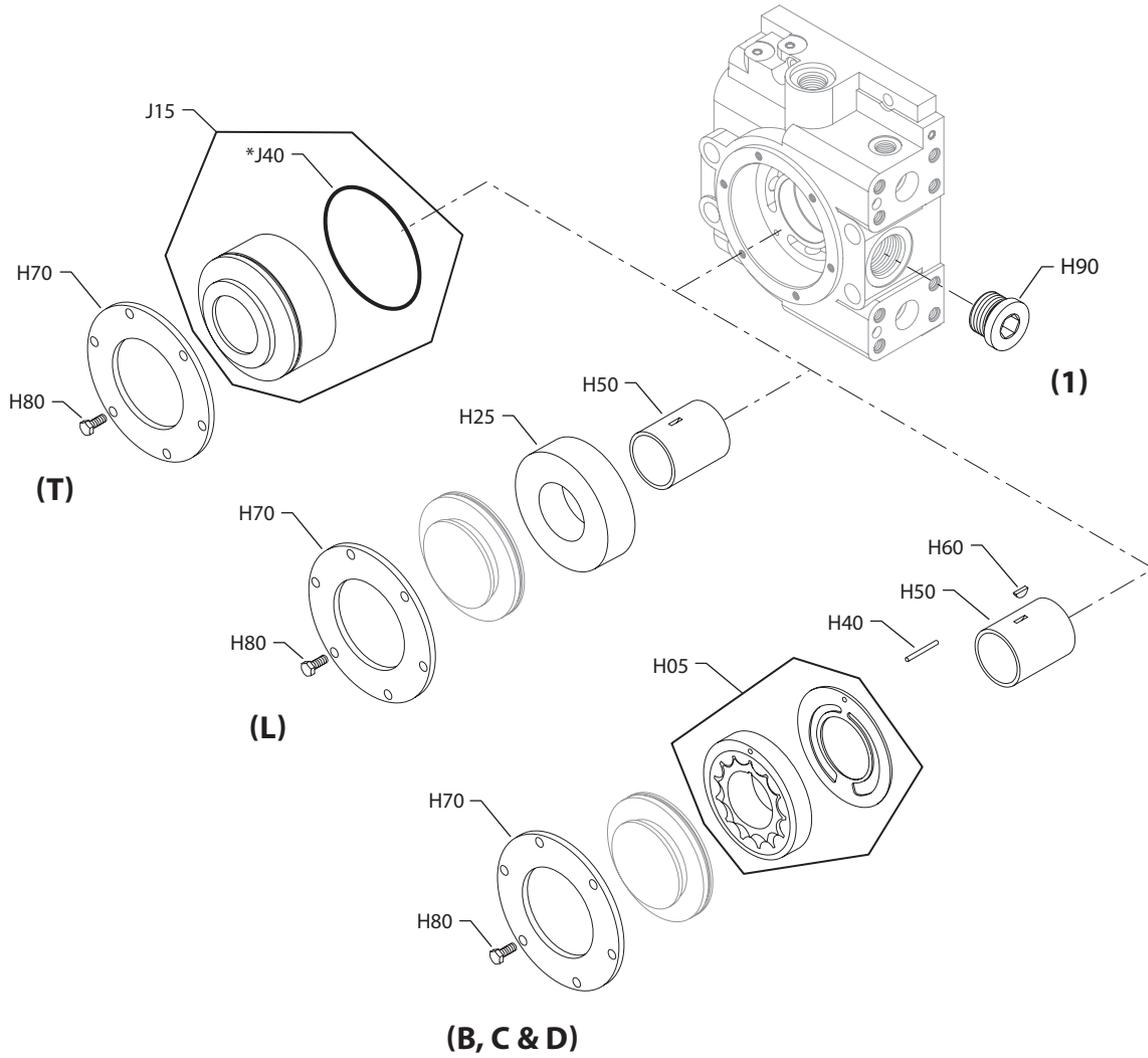
E100 710E


Variable displacement pump
End cap

Order Code	Item	Date Begin	Date End	Part Number	Part Name	Qty. per Model/Kit
	G20	87-02		8700018	Journal bearing	1
	G30	89-17		8000243	End cap gasket (SB-1989-037 & SB-1992-003)	1
	G30	87-02	89-16	8000107	End cap gasket (SB-1989-009)	1
	G40	87-02		8700008	Bushing	1
	G45	87-02		046151 (9005100-5600)	Plug assembly	1
	G46	87-02		046151 (9005100-5600)	Plug assembly	1
	G47	87-02		046151 (9005100-5600)	Plug assembly	1
	G52	87-02		9005110-5600	Plug assembly	1
	G90	89-47		713768 (9007314-0812)	Screw (SB-1989-037)	1
	G93	89-47		713800 (8800564)	Spacer	1
	G93	87-02	89-46	8800404	Spacer	1
	G94	89-47		8800565	Lifting bracket	1
	G94	87-02	89-46	351643 (8800522)	Lifting bracket	1
	G95	89-47		002311 (9009610-3459)	Washer	1
	G95	87-02	89-46	002295 (9009610-2850)	Washer	1
	G97	89-47		746644 (9007314-0810)	Screw (SB-1989-037)	1
	G97	87-02	89-46	694356 (9007314-0608)	Screw	1
8 & 80	G04	92-06		8000260	End cap assembly, twin ports (SB-1992-003)	1
1 & 81	G04	92-06		8000260	End cap assembly, twin ports (SB-1992-003)	1
82	G04	97-01		8000414	End cap assembly, metric twin ports	1
8L	G04	97-24		8000540	End cap assembly, metric twin ports, lapped	1



Variable displacement pump



E100 712E

* = included in overhaul seal kit


Variable displacement pump
Charging system

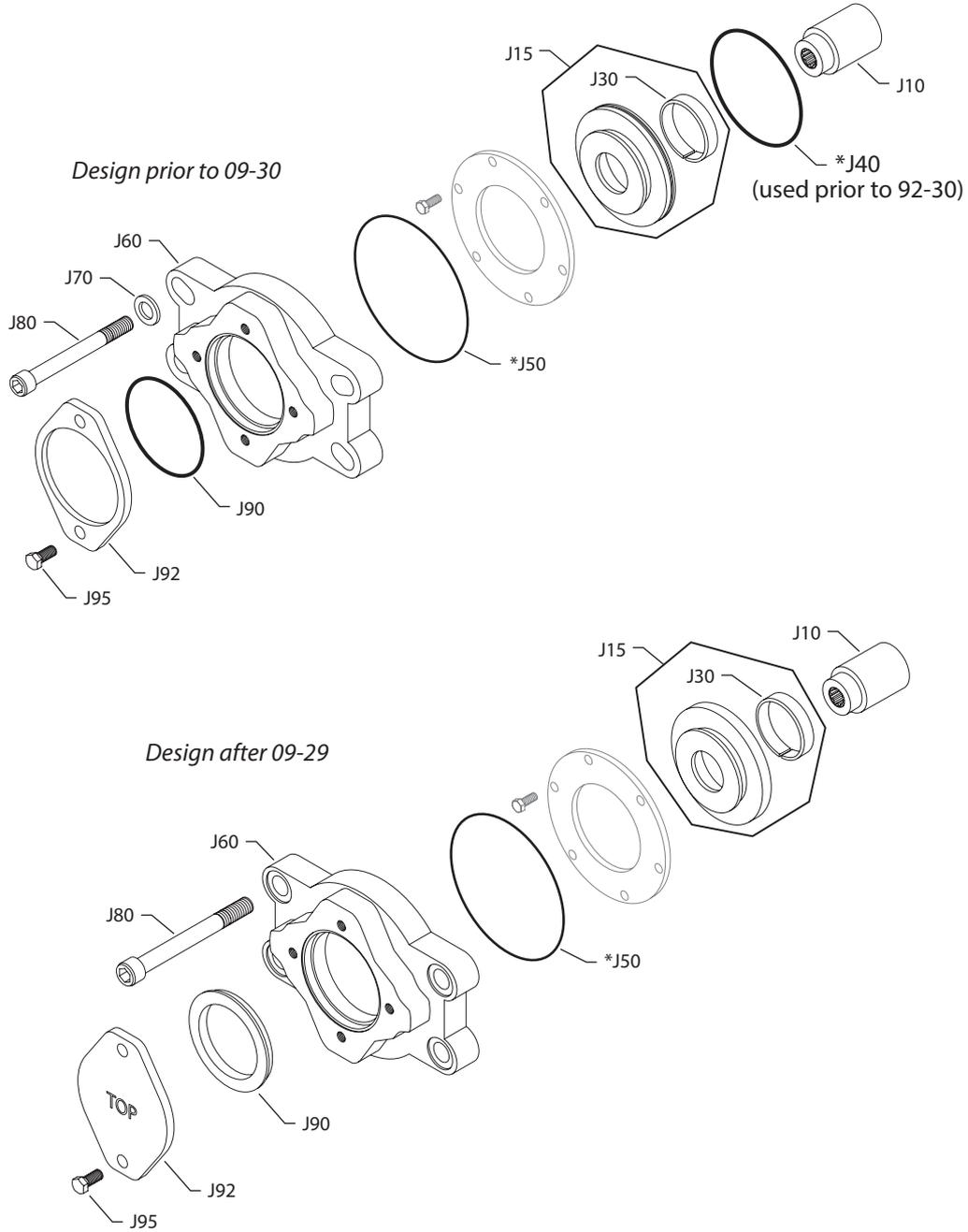
Order Code	Item	Date Begin	Date End	Part Number	Part Name	Qty. per Model/Kit
1	H90	92-22		320002 (9005110-9200)	Plug assembly	1
2	H90	95-02		None		
B	H05	93-10		8000268	Charge pump set, 11 cc (SB-1993-001*)	1
	H40	87-02		9004800-1221	Pin	1
	H50	93-10		8801177	Charge pump shaft (SB-1993-001* & SB-1998-066)	1
	H50	87-02	89-16	8000078	Charge pump shaft (SB-1989-006)	1
	H60	87-02		9003310-1206	Key	1
	H70	87-02		516761	Retaining plate	1
	H80	87-02		9007210-0604	Screw	6
C	H05	93-10		8000269	Charge pump set, 14 cc (SB-1993-001*)	1
	H40	87-02		9004800-1221	Pin	1
	H50	93-10		8801177	Charge pump shaft (SB-1993-001* & SB-1998-066)	1
	H50	87-02	89-16	8000078	Charge pump shaft (SB-1989-006)	1
	H60	87-02		9003310-1206	Key	1
	H70	87-02		516761	Retaining plate	1
	H80	87-02		9007210-0604	Screw	6
D	H05	93-10		8000270	Charge pump set, 17 cc (SB-1993-001*)	1
	H40	87-02		9004800-1221	Pin	1
	H50	93-10		8801177	Charge pump shaft (SB-1993-001* & SB-1998-066)	1
	H50	87-02	89-16	8000078	Charge pump shaft (SB-1989-006)	1
	H60	87-02		9003310-1206	Key	1
	H70	87-02		516761	Retaining plate	1
	H80	87-02		9007210-0604	Screw	6
L	H25	87-02		342543 (8800466-0055)	Charge pump spacer	1
	H50	93-10		8801177	Charge pump shaft (SB-1993-001* & SB-1998-066)	1
	H50	87-02	89-16	8000078	Charge pump shaft (SB-1989-006)	1
	H70	87-02		516761	Retaining plate	1
	H80	87-02		9007210-0604	Screw	6
	H90	87-02		320002 (9005110-9200)	Plug assembly	1
T	H70	99-11		516761	Retaining plate	1
	H80	99-11		9007210-0604	Screw	6
	J15	99-11		8000704	Spacer assembly	1
	J40	99-11		680892 (9004104-0440)	O-ring	1

* For information regarding replacement parts for units built from 89-17 to 93-09, refer to BLN-10107 in the appendix.



Variable displacement pump

(AB, AC, AD & AF)



E100 713E

* = included in overhaul seal kit Q210

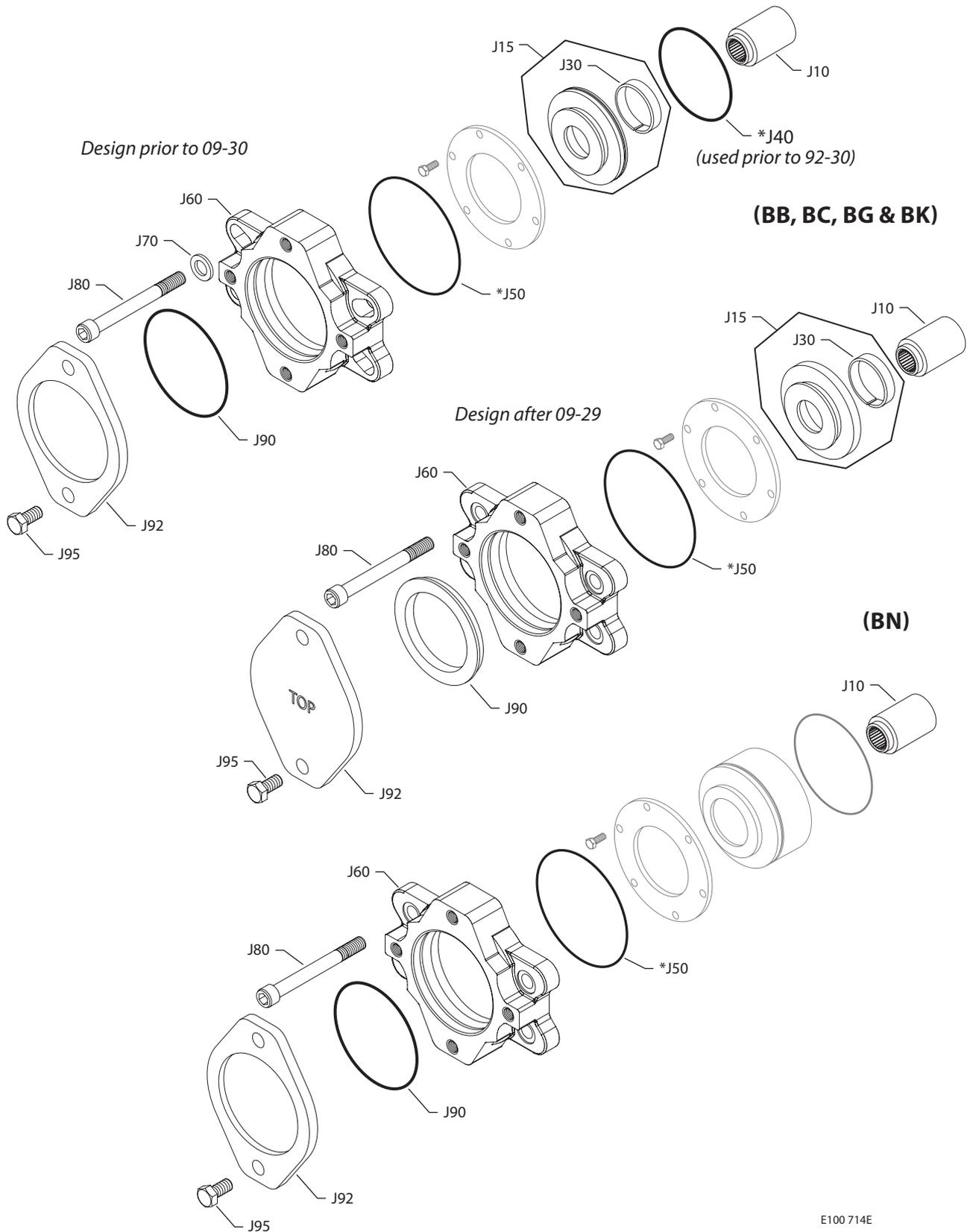

Variable displacement pump
Auxiliary mounting

Order Code	Item	Date Begin	Date End	Part Number	Part Name	Qty. per Model/Kit
AB & AD	J10	87-02		8000075	Coupling, 9 tooth	1
	J15	87-02		8800832	Cover assembly, CW (SB-1993-001* & SB-2005-011)	1
	J15	87-02		8800833	Cover assembly, CCW (SB-1993-001* & SB-2005-011)	1
	J30	87-02		8700008	Bushing	1
	J40	87-02	92-29	680892 (9004104-0440)	O-ring	1
	J50	87-02		056739 (9004104-1580)	O-ring	1
	J60	87-02		8000641	Flange adaptor (SB-2007-027B)	1
	J70	87-02	07-43	5000601	Washer (SB-2007-027B)	4
	J80	87-02		324152 (9007314-1221)	Screw, M12 x 120	4
	J90	07-44		4800482	A pad seal	1
	J90	87-02	07-43	726950 (9004104-0420)	O-ring (SB-2007-027B)	1
	J92	07-44		4460586	Cover plate	1
	J92	87-02	07-43	9802336	Cover plate (SB-2007-027B)	1
	J95	87-02		9007200-3714	Screw	2
	AC & AF	J10	87-02		11053344	Coupling, 11 tooth
J15		87-02		8800832	Cover assembly, CW (SB-1993-001* & SB-2005-011)	1
J15		87-02		8800833	Cover assembly, CCW (SB-1993-001* & SB-2005-011)	1
J30		87-02		8700008	Bushing	1
J40		87-02	92-29	680892 (9004104-0440)	O-ring	1
J50		87-02		056739 (9004104-1580)	O-ring	1
J60		87-02		8000641	Flange adaptor (SB-2007-027B)	1
J70		87-02	07-43	5000601	Washer (SB-2007-027B)	4
J80		87-02		324152 (9007314-1221)	Screw, M12 x 120	4
J90		07-44		4800482	A pad seal	1
J90		87-02	07-43	726950 (9004104-0420)	O-ring	1
J92		07-44		4460586	Cover plate	1
J92		87-02	07-43	9802336	Cover plate	1
J95		87-02		9007200-3714	Screw	2

* For information regarding replacement parts for units built from 89-17 to 93-09, refer to BLN-10107 in the appendix.



Variable displacement pump



E100 714E

* = included in overhaul seal kit Q210


Variable displacement pump
Auxiliary mounting

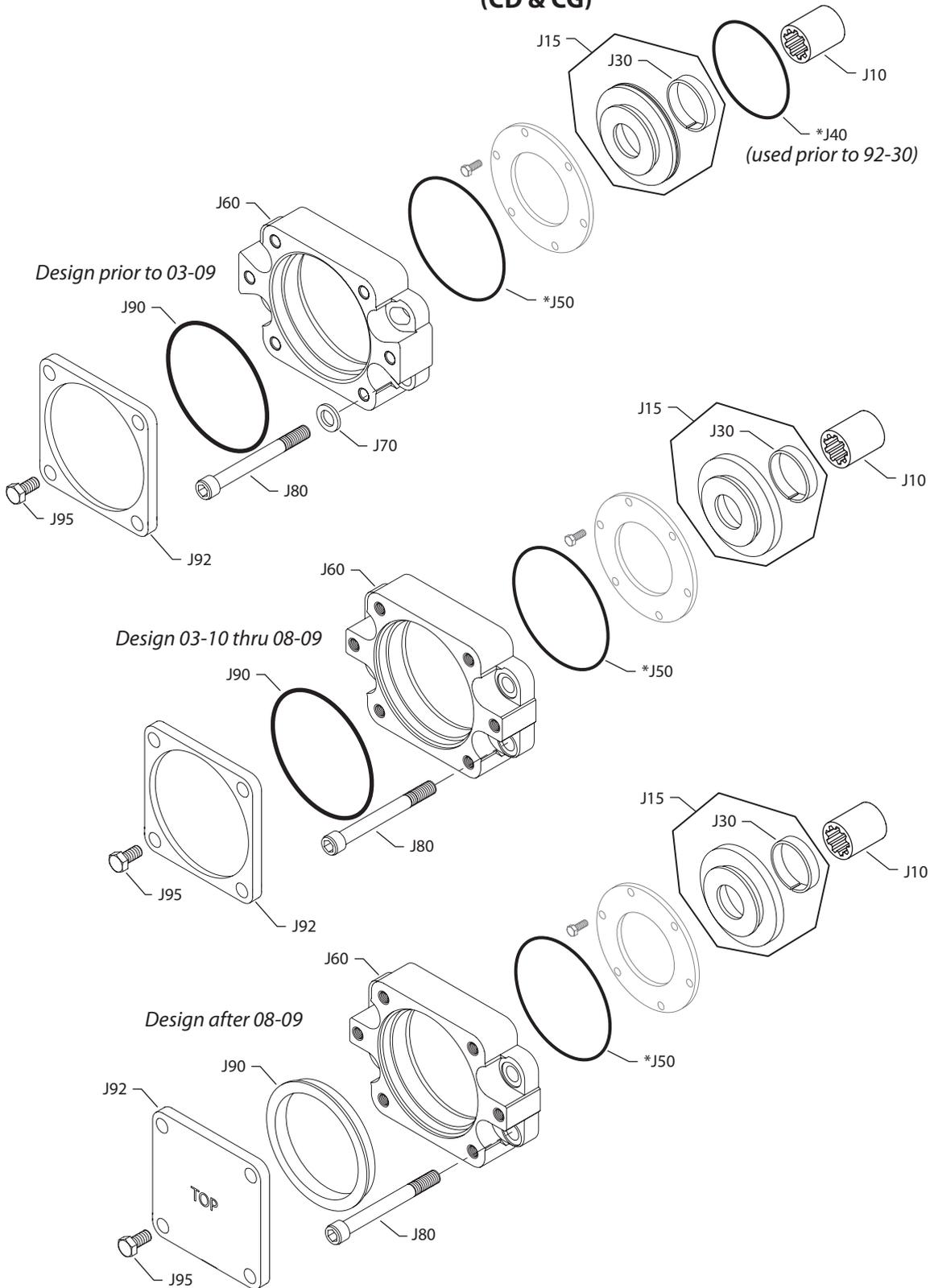
Order Code	Item	Date Begin	Date End	Part Number	Part Name	Qty. per Model/Kit
BB & BK	J10	87-02		11053343	Coupling, 15 tooth	1
	J15	87-02		8800832	Cover assembly, CW (SB-1993-001* & SB-2005-011)	1
	J15	87-02		8800833	Cover assembly, CCW (SB-1993-001* & SB-2005-011)	1
	J30	87-02		8700008	Bushing	1
	J40	87-02	92-15	680892 (9004104-0440)	O-ring	1
	J50	87-02		056739 (9004104-1580)	O-ring	1
	J60	87-02		8000642	Flange adaptor (SB-2007-055A)	1
	J70	87-02	08-10	5000601	Washer (SB-2007-027B)	4
	J80	87-02		324152 (9007314-1221)	Screw, M12 x 120	4
	J90	08-11		8801061	B pad seal	1
	J90	87-02	08-10	726935 (9004104-0450)	O-ring (SB-2007-055A)	1
	J92	08-11		8801059	Cover plate	1
	J92	87-02	08-10	4460370	Cover plate (SB-2007-055A)	1
	J95	87-02		9007200-5021	Screw	2
	BC & BG	J10	87-02		8000076	Coupling, 13 tooth
J15		87-02		8800832	Cover assembly, CW (SB-1993-001* & SB-2005-011)	1
J15		87-02		8800833	Cover assembly, CCW (SB-1993-001* & SB-2005-011)	1
J30		87-02		8700008	Bushing	1
J40		87-02	92-15	680892 (9004104-0440)	O-ring	1
J50		87-02		056739 (9004104-1580)	O-ring	1
J60		87-02		8000642	Flange adaptor (SB-2007-055A)	1
J70		87-02	08-10	5000601	Washer (SB-2007-055A)	4
J80		87-02		324152 (9007314-1221)	Screw, M12 x 120	4
J90		07-44		8801061	B pad seal	1
J90		87-02	08-10	726935 (9004104-0450)	O-ring (SB-2007-055A)	1
J92		08-11		8801059	Cover plate (SB-2007-055A)	1
J92		87-02	08-10	4460370	Cover plate (SB-2007-055A)	1
J95		87-02		9007200-5021	Screw	2
BN		J10	98-24		8000076	Coupling, 13 tooth
	J50	98-24		056739 (9004104-1580)	O-ring	1
	J60	98-24		8000771	Flange adaptor, metric (SB-2010-005)	1
	J70	98-24	10-49	506753	Washer (SB-2010-005)	4
	J80	98-24		507585	Screw, M12 x 110	4
	J90	10-50		9004104-1540	O-ring	1
	J90	98-24	10-49	726935 (9004104-0450)	O-ring (SB-2010-005)	1
	J92	98-24		4460370	Cover plate	1
	J95	98-24		370320	Screw	2

* For information regarding replacement parts for units built from 89-17 to 93-09, refer to BLN-10107 in the appendix.



Variable displacement pump

(CD & CG)



E101 872E

* = included in overhaul seal kit Q210


Variable displacement pump
Auxiliary mounting

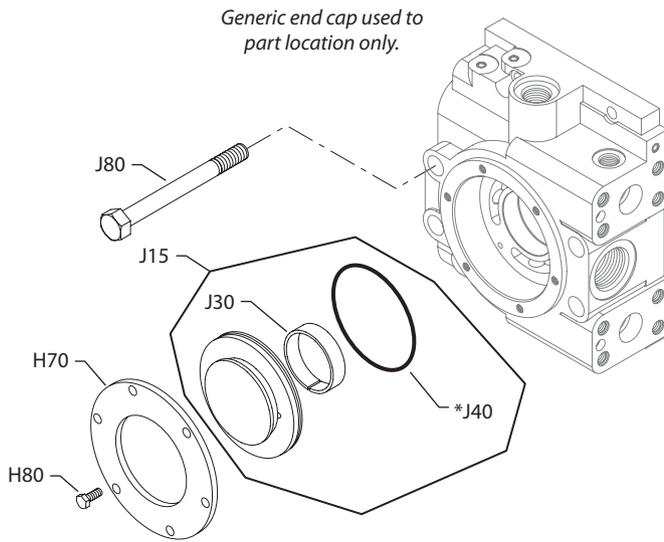
Order Code	Item	Date Begin	Date End	Part Number	Part Name	Qty. per Model/Kit
CD	J10	87-02		11053340	Coupling, 14 tooth	1
	J15	87-02		8800832	Cover assembly, CW (SB-1993-001* & SB-2005-011)	1
	J15	87-02		8800833	Cover assembly, CCW (SB-1993-001* & SB-2005-011)	1
	J30	87-02		8700008	Bushing	1
	J40	87-02	92-15	680892 (9004104-0440)	O-ring	1
	J50	87-02		056739 (9004104-1580)	O-ring	1
	J60	87-02		8000740	Flange adaptor (SB-2002-050 & SB-2007-051)	1
	J70	87-02	03-10	5000602	Washer (SB-2002-050)	4
	J80	87-02		324152 (9007314-1221)	Screw, M12 x 120	4
	J90	08-10		11081805	C pad seal	1
	J90	87-02	08-09	719179 (9004100-0480)	O-ring (SB-2007-051)	1
	J92	08-10		8801060	Cover plate	1
	J92	87-02	08-09	8800406	Cover plate (SB-2007-051)	1
	J95	87-02		9007200-5021	Screw	4
	CG	J10	04-44		11053343	Coupling, 15 tooth
J15		04-44		8800832	Cover assembly, CW (SB-2005-011)	1
J15		04-44		8800833	Cover assembly, CCW (SB-2005-011)	1
J30		04-44		8700008	Bushing	1
J50		04-44		056739 (9004104-1580)	O-ring	1
J60		04-44		8000740	Flange adaptor (SB-2007-051)	1
J80		04-44		324152 (9007314-1221)	Screw, M12 x 120	4
J90		08-10		11081805	C pad seal	1
J90		04-44	08-10	719179 (9004100-0480)	O-ring (SB-2007-051)	1
J92		08-10		8801060	Cover plate	1
J92		04-44	08-09	8800406	Cover plate (SB-2007-051)	1
J95		04-44		9007200-5021	Screw	4

* For information regarding replacement parts for units built from 89-17 to 93-09, refer to BLN-10107 in the appendix.

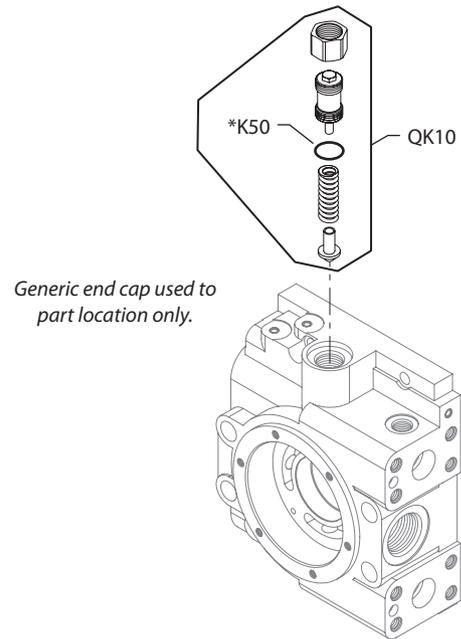


Variable displacement pump

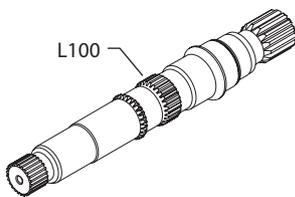
(NN)



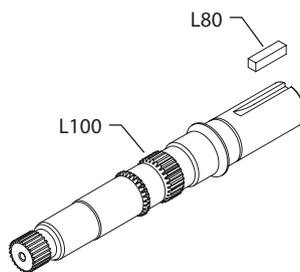
(00-42 & XX)



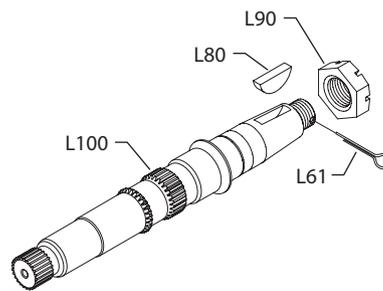
(C6, C9, D9 & S1)



(K1)



(T1)



E100 715E

* = included in control seal kit Q210


Variable displacement pump
Auxiliary mounting

Order Code	Item	Date Begin	Date End	Part Number	Part Name	Qty. per Model/Kit
NN	J15	87-02		8800834	Cover assembly, (SB-1993-001)	1
	J30	87-02		8700008	Bushing	1
	J40	87-02		680892 (9004104-0440)	O-ring	1
	J80	87-02		324202 (9007210-1219)	Screw, M12 x 100	4

Charge pressure setting

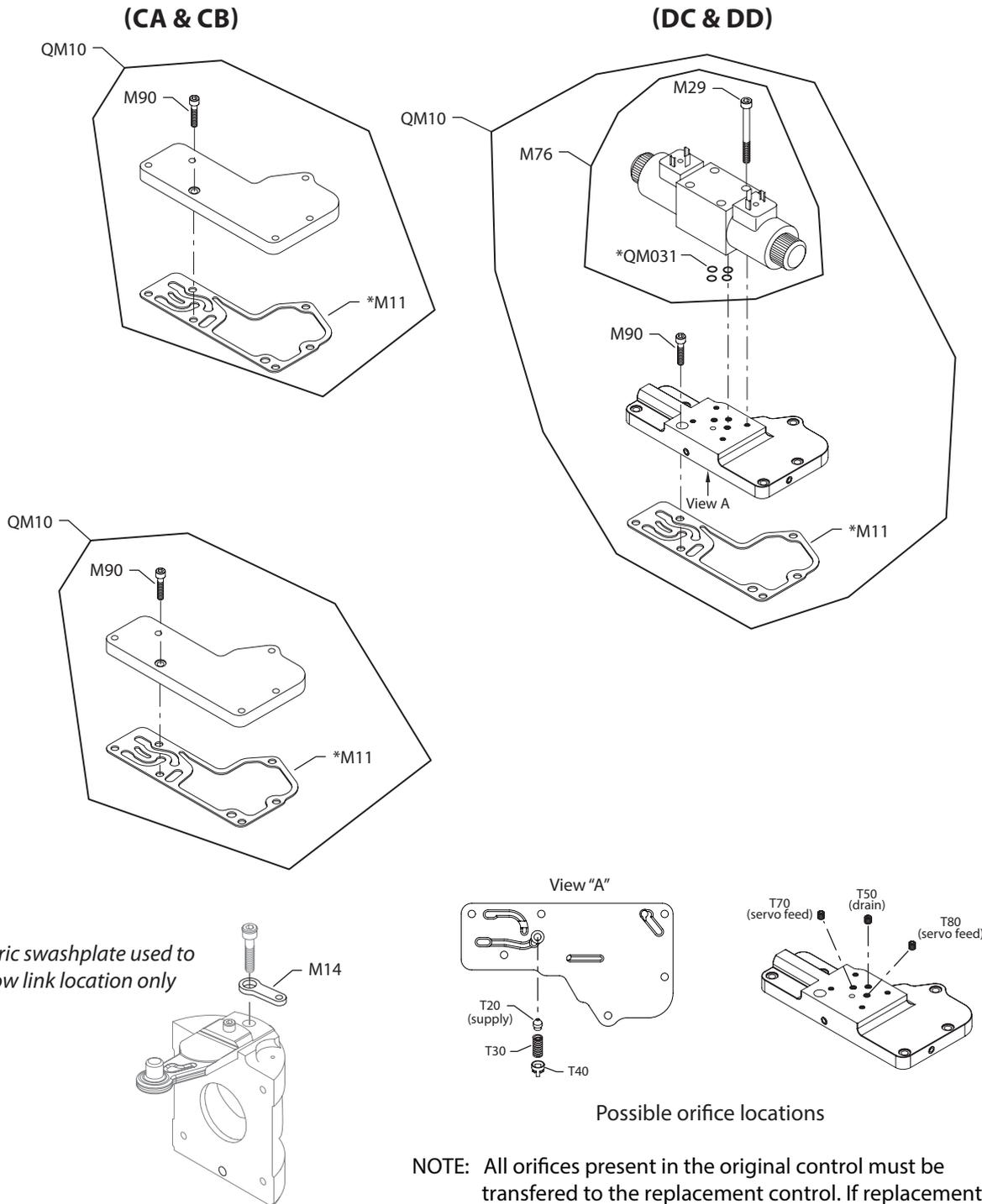
00-30	QK10	87-42		8002K000-A	Charge relief valve kit, 10-30 bar (SB-1989-002)	1
	K50	87-42		001149 (9004201-6200)	O-ring (SB-1989-002)	1
32-42	QK10	94-13		8510269	Charge relief valve kit, 30-42 bar	1
	K50	94-13		001149 (9004201-6200)	O-ring	1
XX	QK10	96-23		11086335	Charge relief valve kit, viton	1
	K50	96-23		012559 (9004202-6200)	O-ring, viton	1

Shaft

C6	L100	87-02		8000079	Shaft, 21 tooth spline	1
C9	L100	96-10		503396	Shaft, 21 tooth spline	1
D9	L100	96-40		500069	Shaft, 21 tooth spline, M10 threaded tapped hole	1
K1	L80	87-36		9003261-3124	Key	1
	L100	87-36		8000175	Shaft, straight key, 1.375" diameter	1
S1	L100	87-02		8000112	Shaft, 14 tooth spline	1
T1	L61	87-34		716779 (9004600-1230)	Cotter pin	1
	L80	87-34		9003310-3724	Key	1
	L90	87-34		5000606	Slotted nut	1
	L100	87-34		8000166	Shaft, tapered	1



Variable displacement pump



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 716E

* = included in control seal kit QM210

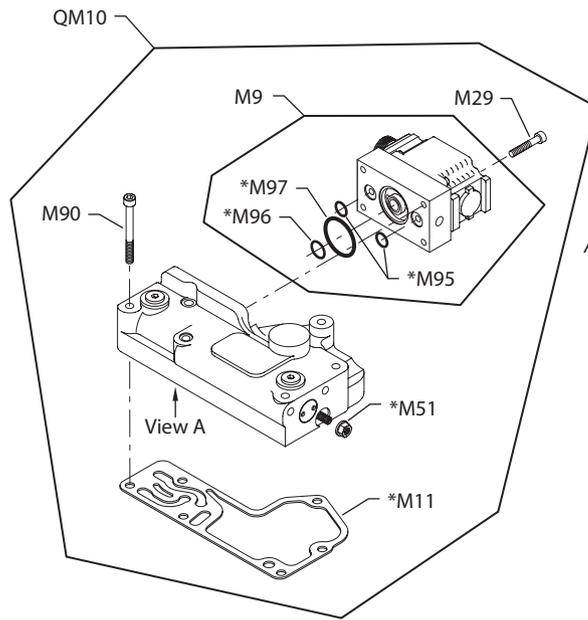

Variable displacement pump
Control

Order Code	Item	Date Begin	Date End	Part Number	Part Name	Qty. per Model/Kit
CA	M11	87-02		8800520	Control gasket	1
	M90	87-02		693341 (9007314-0606)	Screw	6
	QM10	87-02		8002M0CA-A	Control cover plate kit	1
CB	M11	87-02		8800520	Control gasket	1
	M14	96-40		11070305	Feedback link (SB-1999-019, SB-2013-011)	1
	M14	87-02	96-39	8000481	Feedback link (SB-1996-009)	1
	M90	87-02		693341 (9007314-0606)	Screw	6
	QM10	87-02		8002M0CA-A	Control cover plate kit	1
DC	M11	87-02		8800520	Control gasket	1
	M29	87-02		035592	Screw	4
	M76	87-02		687103	Solenoid valve, 12 volt	1
	M90	87-02		693341 (9007314-0606)	Screw	6
	QM10	87-02		8002M0DC-A	3-position control kit, 12 volt	1
	QM031	87-02		11099647	Valve seal kit	1
	QM210	87-02		11096161	Control seal kit	1
DD	M11	87-02		8800520	Control gasket	1
	M29	87-02		035592	Screw	4
	M76	87-02		549907/P	Solenoid valve, 24 volt	1
	M90	87-02		693341 (9007314-0606)	Screw	6
	QM10	87-02		8510314	3-position control kit, 24 volt	1
	QM031	87-02		11099647	Valve seal kit	1
	QM210	87-02		11096161	Control seal kit	1

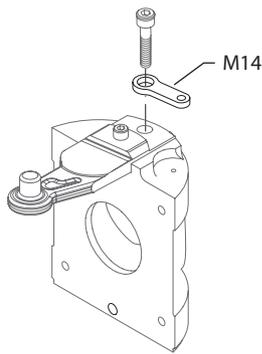


Variable displacement pump

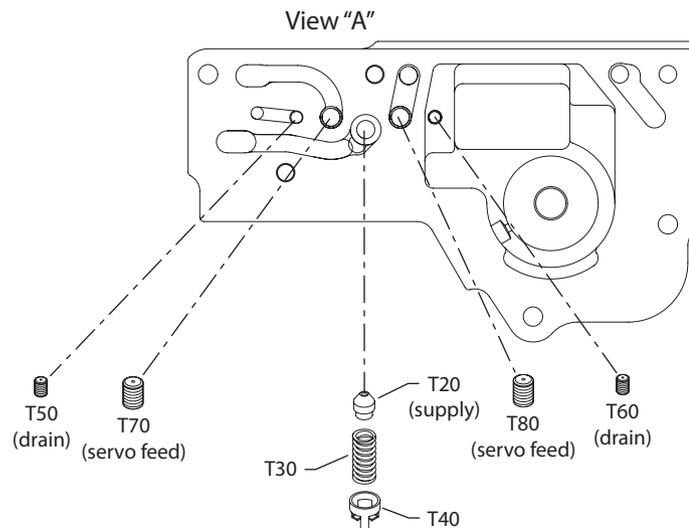
(EA, EF, EG & EK)



A generic PCP is shown.



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 717E

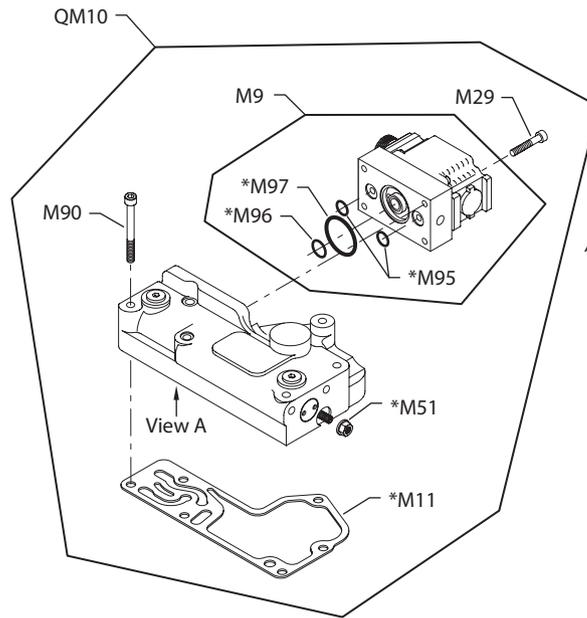

Variable displacement pump
Control

Order Code	Item	Date Begin	Date End	Part Number	Part Name	Qty. per Model/Kit	
EA	M9	91-16		MCV110A1017	PCP, MS connector	1	
	M11	91-16		8800520	Control gasket	1	
	M14	96-40		11070305	Feedback link (SB-1999-019, SB-2013-011)	1	
	M14	91-16	96-39	8000481	Feedback link (SB-1996-009)	1	
	M29	91-16		K07067	Screw	4	
	M51	91-16		505412 (9003509-0008)	Seal nut	1	
	M90	91-16		692889 (9007314-0611)	Screw	6	
	M95	91-16		318337 (9004104-0120)	O-ring	2	
	M96	91-16		011304 (9004104-0140)	O-ring	1	
	M97	91-16		318345 (9004104-0240)	O-ring	1	
	QM10	91-16		8002M0EA-B	EDC kit, MS connector	1	
	QM210	91-16		11096173	Control kit	1	
	EF	M9	92-18		MCV110A1058	PCP, Weatherpack connector	1
M11		92-18		8800520	Control gasket	1	
M14		96-40		11070305	Feedback link (SB-1999-019, SB-2013-011)	1	
M14		92-18	96-39	8000481	Feedback link (SB-1996-009)	1	
M29		92-18		K07067	Screw	4	
M51		92-18		505412 (9003509-0008)	Seal nut	1	
M90		92-18		692889 (9007314-0611)	Screw	6	
M95		92-18		318337 (9004104-0120)	O-ring	2	
M96		92-18		011304 (9004104-0140)	O-ring	1	
M97		92-18		318345 (9004104-0240)	O-ring	1	
QM10		92-18		8510125	EDC kit, Weatherpack connector	1	
QM210		92-18		11096173	Control seal kit	1	
EG		M9	98-44		MCV110A1018	PCP, MS connector	1
	M11	98-44		8800520	Control gasket	1	
	M14	98-44		11070305	Feedback link (SB-1999-019, SB-2013-011)	1	
	M29	98-44		K07067	Screw	4	
	M51	98-44		505412 (9003509-0008)	Seal nut	1	
	M90	98-44		692889 (9007314-0611)	Screw	6	
	M95	98-44		318337 (9004104-0120)	O-ring	2	
	M96	98-44		011304 (9004104-0140)	O-ring	1	
	M97	98-44		318345 (9004104-0240)	O-ring	1	
	QM10	98-44		11097000	EDC kit, MS connector	1	
	QM210	98-44		11096173	Control seal kit	1	
	EK	M9	99-16		MCV110A1014	PCP, Deutsch connector	1
		M11	99-16		8800520	Control gasket	1
M14		99-16		11070305	Feedback link	1	
M29		99-16		K07067	Screw	4	
M51		99-16		505412 (9003509-0008)	Seal nut	1	
M90		99-16		692889 (9007314-0611)	Screw	6	
M95		99-16		318337 (9004104-0120)	O-ring	2	
M96		99-16		011304 (9004104-0140)	O-ring	1	
M97		99-16		318345 (9004104-0240)	O-ring	1	
QM10		99-16		8510379	EDC kit, Deutsch connector	1	
QM210		99-16		11096173	Control seal kit	1	

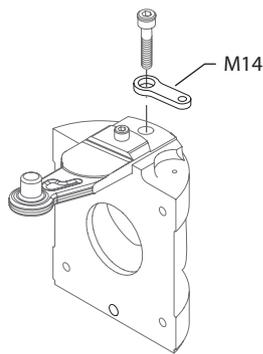


Variable displacement pump

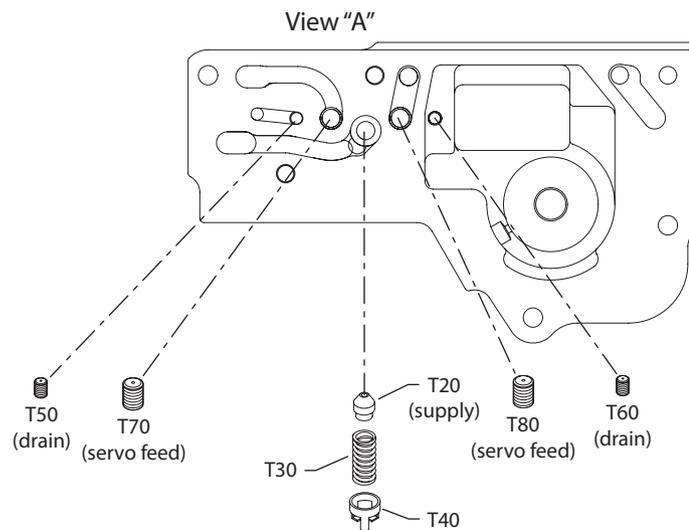
(EP & EX)



A generic PCP is shown.



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 717E

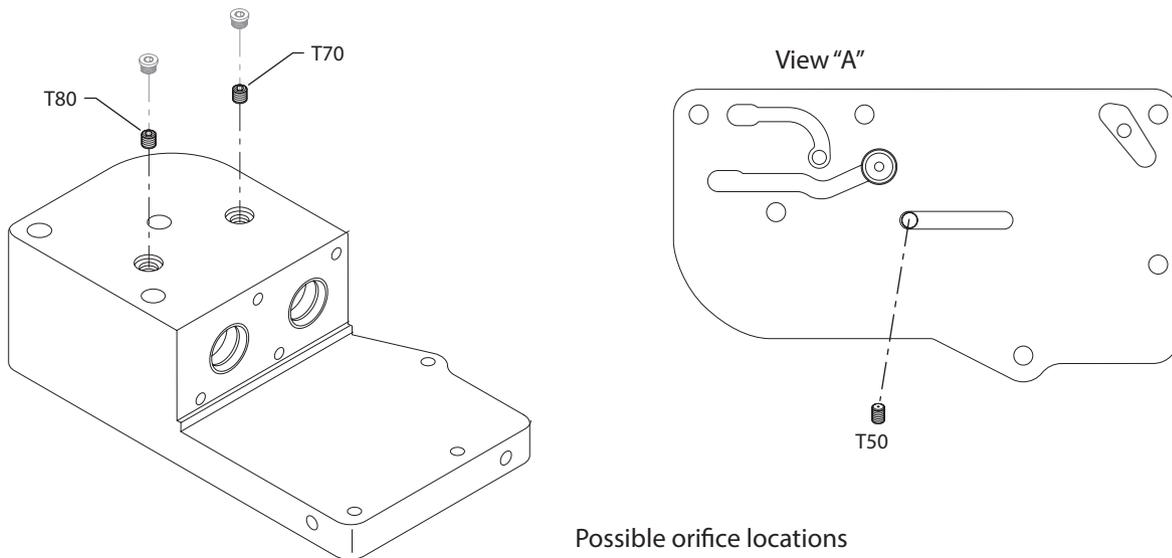
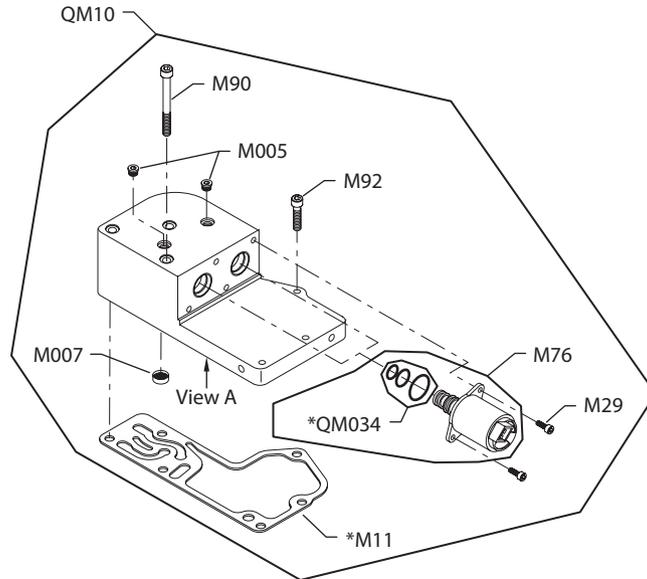

Variable displacement pump
Control

Order Code	Item	Date Begin	Date End	Part Number	Part Name	Qty. per Model/Kit	
EP	M9	91-07		MCV110A1058	PCP, Packard connector	1	
	M11	91-07		8800520	Control gasket	1	
	M14	96-40		11070305	Feedback link (SB-1999-019, SB-2013-011)	1	
	M14	91-07	96-39	8000481	Feedback link (SB-1996-009)	1	
	M29	91-07		K07067	Screw	4	
	M51	91-07		505412 (9003509-0008)	Seal nut	1	
	M90	91-07		692889 (9007314-0611)	Screw	6	
	M95	91-07		318337 (9004104-0120)	O-ring	2	
	M96	91-16		011304 (9004104-0140)	O-ring	1	
	M97	91-16		318345 (9004104-0240)	O-ring	1	
	QM10	91-16		8002M0EP-B	EDC kit, Packard connector	1	
	QM210	91-16		11096173	Control seal kit	1	
	EX	M9	93-16		MCV110A1090	PCP, Metri-pack connector	1
		M11	93-16		8800520	Control gasket	1
M14		96-40		11070305	Feedback link (SB-1999-019, SB-2013-011)	1	
M14		93-16	96-39	8000481	Feedback link (SB-1996-009)	1	
M29		93-16		K07067	Screw	4	
M51		93-16		505412 (9003509-0008)	Seal nut	1	
M90		93-16		692889 (9007314-0611)	Screw	6	
M95		93-16		318337 (9004104-0120)	O-ring	2	
M96		93-16		011304 (9004104-0140)	O-ring	1	
M97		93-16		318345 (9004104-0240)	O-ring	1	
QM10		93-16		8002M0EX-B	EDC kit, Metri-pack connector	1	
QM210		93-16		11096173	Control seal kit	1	



Variable displacement pump

(FA, FB, FC & FD)



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 873E

* = included in control seal kit QM210

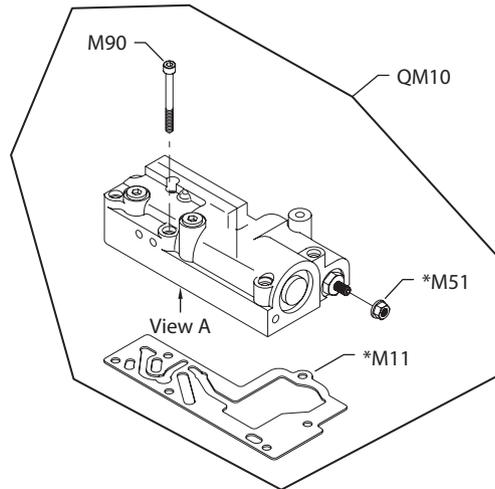

Variable displacement pump
Control

Order Code	Item	Date Begin	Date End	Part Number	Part Name	Qty. per Model/Kit
FA	M11	98-14		8800520	Control gasket	1
	M29	98-14		067694	Screw	4
	M76	98-14		518080	Solenoid valve, 12 volt, 25 bar	2
	M90	98-14		9007314-0614	Screw	3
	M92	98-14		041160 (9007314-0605)	Screw	3
	M005	98-14		11040532	Plug assembly	2
	M007	98-14		K00775	Filter screen	1
	QM10	98-14		11067537	NFPE control, 12 volt, 25 bar	1
	QM034	98-14		11099849	Valve seal kit	2
	QM210	98-14		11100027	Control seal kit	1
FB	M11	98-14		8800520	Control gasket	1
	M29	98-14		067694	Screw	4
	M76	98-14		518081	Solenoid valve, 24 volt, 25 bar	2
	M90	98-14		9007314-0614	Screw	3
	M92	98-14		041160 (9007314-0605)	Screw	3
	M005	98-14		11040532	Plug assembly	2
	M007	98-14		K00775	Filter screen	1
	QM10	98-14		11067538	NFPE control, 24 volt, 25 bar	1
	QM034	98-14		11099849	Valve seal kit	2
	QM210	98-14		11100027	Control seal kit	1
FC	M11	98-14		8800520	Control gasket	1
	M29	98-14		067694	Screw	4
	M76	98-14		521709	Solenoid valve, 12 volt, 32 bar	2
	M90	98-14		9007314-0614	Screw	3
	M92	98-14		041160 (9007314-0605)	Screw	3
	M005	98-14		11040532	Plug assembly	2
	M007	98-14		K00775	Filter screen	1
	QM10	98-14		8510220	NFPE control, 12 volt, 32 bar	1
	QM034	98-14		11099849	Valve seal kit	2
	QM210	98-14		11100027	Control seal kit	1
FD	M11	98-14		8800520	Control gasket	1
	M29	98-14		067694	Screw	4
	M76	98-14		517214	Solenoid valve, 24 volt, 32 bar	2
	M90	98-14		9007314-0614	Screw	3
	M92	98-14		041160 (9007314-0605)	Screw	3
	M005	98-14		11040532	Plug assembly	2
	M007	98-14		K00775	Filter screen	1
	QM10	98-14		8510380	NFPE control, 24 volt, 32 bar	1
	QM034	98-14		11099849	Valve seal kit	2
	QM210	98-14		11100027	Control seal kit	1

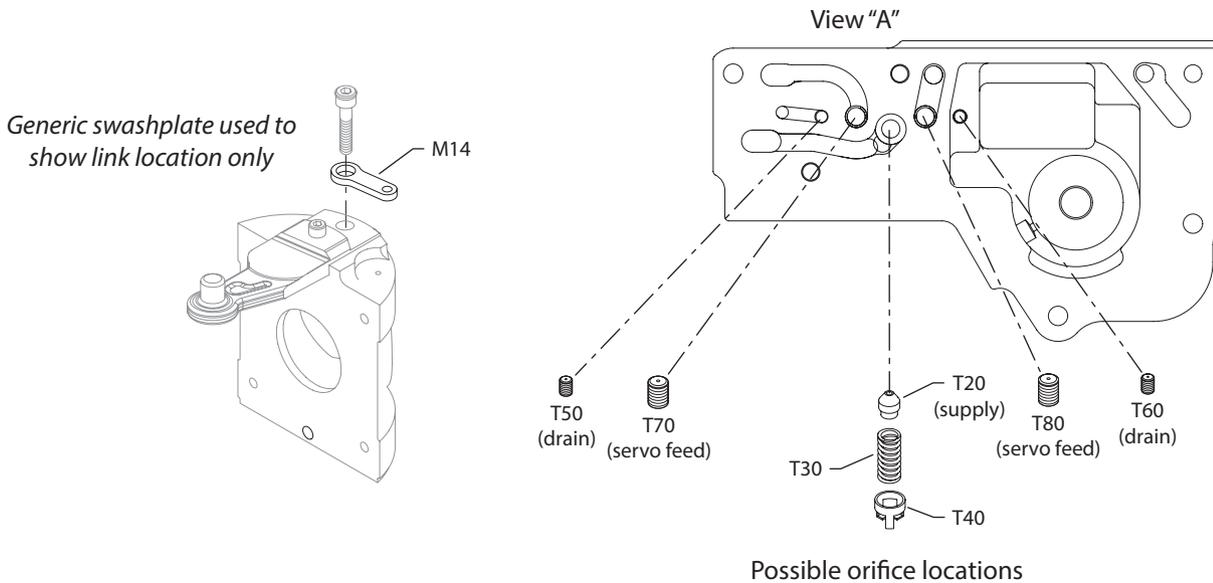


Variable displacement pump

(HF, HK, HM, HP,
HS & JB)



* = 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.

E101 874E

* = included in control seal kit QM210

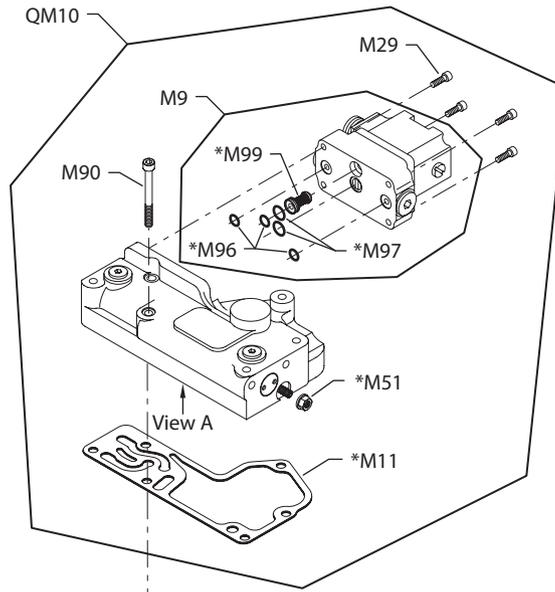

Variable displacement pump
Control

Order Code	Item	Date Begin	Date End	Part Number	Part Name	Qty. per Model/Kit
HF	M11	92-15		K11419	Control gasket (SB-1993-002)	1
	M14	96-40		11070305	Feedback link (SB-1999-019, SB-2013-011)	1
	M14	92-15	96-39	8000481	Feedback link (SB-1996-009)	1
	M51	92-15		505412 (9003509-0008)	Seal nut	1
	M90	92-15		692889 (9007314-0611)	Screw	6
	QM10	92-15		8002M0HF-A	HDC kit, 3-11 bar	1
	QM210	92-15		11096267	Control seal kit	1
	HK	M11	92-15		K11419	Control gasket (SB-1993-002)
M14		96-40		11070305	Feedback link (SB-1999-019, SB-2013-011)	1
M14		92-15	96-39	8000481	Feedback link (SB-1996-009)	1
M51		92-15		505412 (9003509-0008)	Seal nut	1
M90		92-15		692889 (9007314-0611)	Screw	6
QM10		92-15		8002M0HK-A	HDC kit, 1-11 bar	1
QM210		92-15		11096267	Control seal kit	1
HM		M11	92-15		K11419	Control gasket (SB-1993-002)
	M14	96-40		11070305	Feedback link (SB-1999-019, SB-2013-011)	1
	M14	92-15	96-39	8000481	Feedback link (SB-1996-009)	1
	M51	92-15		505412 (9003509-0008)	Seal nut	1
	M90	92-15		692889 (9007314-0611)	Screw	6
	QM10	92-15		8002M0HM-A	HDC kit, 1.1 -6.7 bar	1
	QM210	92-15		11096267	Control seal kit	1
	HP	M11	94-05		K11419	Control gasket (SB-1993-002)
M14		96-40		11070305	Feedback link (SB-1999-019, SB-2013-011)	1
M14		94-05	96-39	8000481	Feedback link (SB-1996-009)	1
M51		94-05		505412 (9003509-0008)	Seal nut	1
M90		94-05		692889 (9007314-0611)	Screw	6
QM10		94-05		8002M0HP-A	HDC kit, 4-19 bar	1
QM210		94-05		11096267	Control seal kit	1
HS		M11	94-19		K11419	Control gasket (SB-1993-002)
	M14	96-40		11070305	Feedback link (SB-1999-019, SB-2013-011)	1
	M14	94-19	96-39	8000481	Feedback link (SB-1996-009)	1
	M51	94-19		505412 (9003509-0008)	Seal nut	1
	M90	94-19		692889 (9007314-0611)	Screw	6
	QM10	94-19		8002M0HS-A	HDC kit, 6-18 bar	1
	QM210	94-19		11096267	Control seal kit	1
	JB	M11	02-22		K11419	Control gasket (SB-1993-002)
M14		96-40		11070305	Feedback link (SB-1999-019, SB-2013-011)	1
M51		02-22		505412 (9003509-0008)	Seal nut	1
M90		02-22		692889 (9007314-0611)	Screw	6
QM10		02-22		8510305	HDC kit, 5-15 bar	1
QM210		02-22		11096267	Control seal kit	1

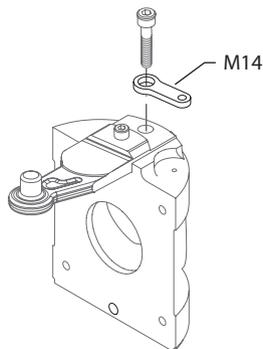


Variable displacement pump

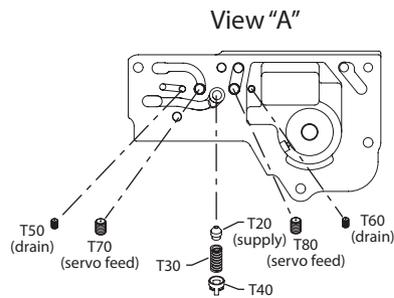
(K7, K8, K9 & KA)



A generic PCP is shown.



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.

E100 718E

* = included in control seal kit QM210

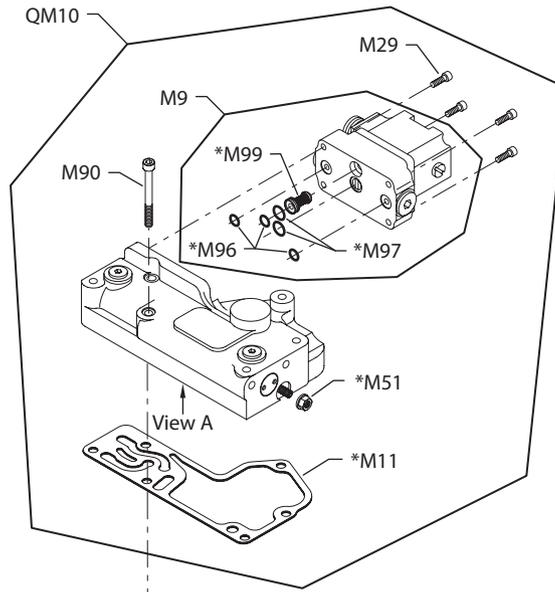

Variable displacement pump
Control

Order Code	Item	Date Begin	Date End	Part Number	Part Name	Qty. per Model/Kit
K7	M9	14-12		11101116	PCP, MS connector, 4-20MA, single coil	1
	M11	14-12		8800520	Control gasket	1
	M14	14-12		11070305	Feedback link	1
	M29	14-12		K07067	Screw	4
	M51	14-12		505412 (9003509-0008)	Seal nut	1
	M90	14-12		692889 (9007314-0611)	Screw	6
	M96	14-12		011296 (9004105-0120)	O-ring	3
	M97	14-12		9004105-0130	O-ring	1
	M99	14-12		K08572	Filter assembly	1
	QM10	14-12		11139992	EDC3 kit, MS connector	1
	QM210	14-12		11096131	Control seal kit	1
K8	M9	14-12		11101106	PCP, MS connector, 24-160MA	1
	M11	14-12		8800520	Control gasket	1
	M14	14-12		11070305	Feedback link	1
	M29	14-12		K07067	Screw	4
	M51	14-12		505412 (9003509-0008)	Seal nut	1
	M90	14-12		692889 (9007314-0611)	Screw	6
	M96	14-12		011296 (9004105-0120)	O-ring	3
	M97	14-12		9004105-0130	O-ring	1
	M99	14-12		K08572	Filter assembly	1
	QM10	14-12		11140003	EDC3 kit, MS connector	1
	QM210	14-12		11096131	Control seal kit	1
K9	M9	14-37		11101118	PCP, MS connector, 14-85MA	1
	M11	14-37		8800520	Control gasket	1
	M14	14-37		11070305	Feedback link	1
	M29	14-37		K07067	Screw	4
	M51	14-37		505412 (9003509-0008)	Seal nut	1
	M90	14-37		692889 (9007314-0611)	Screw	6
	M96	14-37		011296 (9004105-0120)	O-ring	3
	M97	14-37		9004105-0130	O-ring	1
	M99	14-37		K08572	Filter assembly	1
	QM10	14-37		11139998	EDC3 kit, MS connector	1
	QM210	14-37		11096131	Control seal kit	1
KA	M9	95-26		MCV116G4201	PCP, MS connector	1
	M11	95-26		8800520	Control gasket	1
	M14	96-40		11070305	Feedback link (SB-1999-019, SB-2013-011)	1
	M14	95-26	96-39	8000481	Feedback link (SB-1996-009)	1
	M29	95-26		K07067	Screw	4
	M51	95-26		505412 (9003509-0008)	Seal nut	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		8510113	EDC3 kit, MS connector, dual coil	1
QM210	95-26		11096131	Control seal kit	1	

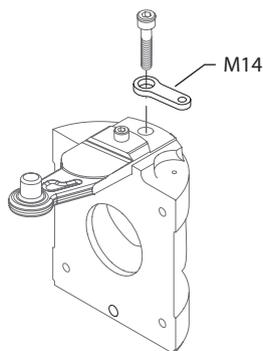


Variable displacement pump

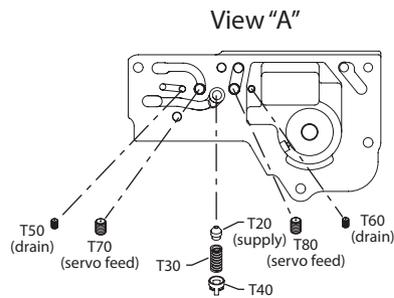
(KN, KP, KS & KT)



A generic PCP is shown.



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.

E100 718E

* = included in control seal kit QM210

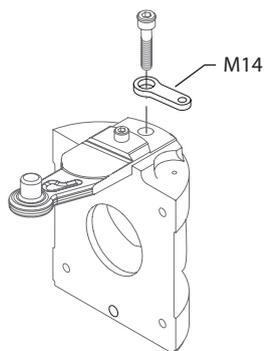
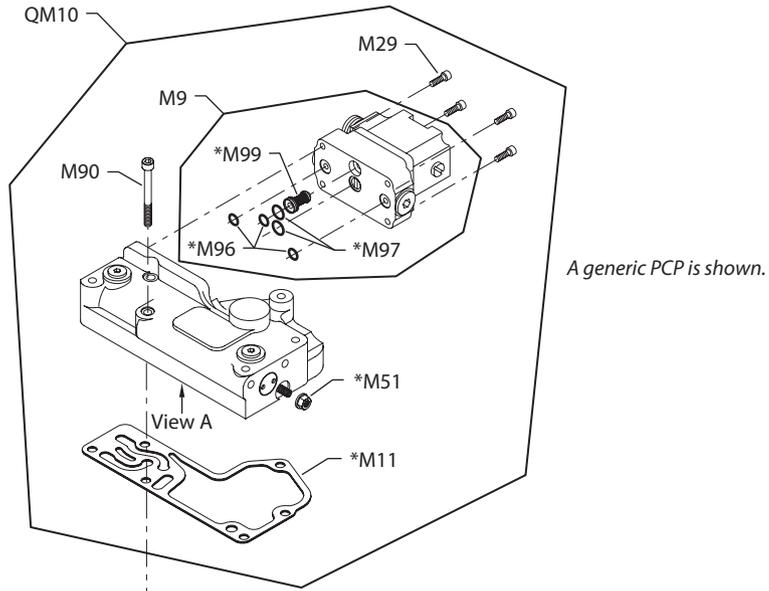

Variable displacement pump
Control

Order Code	Item	Date Begin	Date End	Part Number	Part Name	Qty. per Model/Kit	
KN	M9	95-51		MCV116A3501	PCP, MS connector	1	
	M11	95-51		8800520	Control gasket	1	
	M14	96-40		11070305	Feedback link (SB-1999-019, SB-2013-011)	1	
	M14	95-51	96-39	8000481	Feedback link (SB-1996-009)	1	
	M29	95-51		K07067	Screw	4	
	M51	95-51		505412 (9003509-0008)	Seal nut	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		8510381	EDC3 kit, MS connector	1	
	QM210	95-51		11096131	Control seal kit	1	
	KP	M9	95-26		MCV116G4204	PCP, Weather-pack connector	1
M11		95-26		8800520	Control gasket	1	
M14		96-40		11070305	Feedback link (SB-1999-019, SB-2013-011)	1	
M14		95-26	96-39	8000481	Feedback link (SB-1996-009)	1	
M29		95-26		K07067	Screw	4	
M51		95-26		505412 (9003509-0008)	Seal nut	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		8510114	EDC3 kit, Weather-pack connector, dual coil	1	
QM210		95-26		11096131	Control seal kit	1	
KS		M9	97-30		MCV116G4201	PCP, MS connector, dual coil	1
	M11	97-30		8800520	Control gasket	1	
	M14	97-30		11070305	Feedback link (SB-1999-019, SB-2013-011)	1	
	M29	97-30		K07067	Screw	4	
	M51	97-30		505412 (9003509-0008)	Seal nut	1	
	M90	97-30		692889 (9007314-0611)	Screw	6	
	M96	97-30		011296 (9004105-0120)	O-ring	3	
	M97	97-30		9004105-0130	O-ring	1	
	M99	97-30		K08572	Filter assembly	1	
	QM10	97-30		8510177	EDC3 kit, MS connector, dual coil	1	
	QM210	97-30		11096131	Control seal kit	1	
	KT	M9	03-10		MCV116G4214	PCP, Deutsch connector, dual coil	1
		M11	03-10		8800520	Control gasket	1
M14		03-10		11070305	Feedback link	1	
M29		03-10		K07067	Screw	4	
M51		03-10		505412 (9003509-0008)	Seal nut	1	
M90		03-10		692889 (9007314-0611)	Screw	6	
M96		03-10		011296 (9004105-0120)	O-ring	3	
M97		03-10		9004105-0130	O-ring	1	
M99		03-10		K08572	Filter assembly	1	
QM10		03-10		8510317	EDC3 kit, Deutsch connector, dual coil	1	
QM210		03-10		11096131	Control seal kit	1	

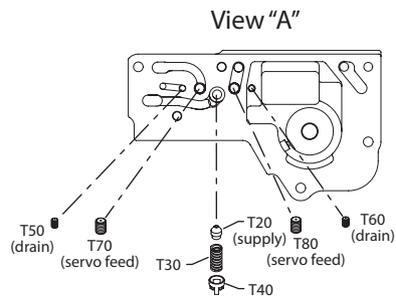


Variable displacement pump

(KZ)



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.

E100 718E

* = included in control seal kit QM210



Variable displacement pump

Control

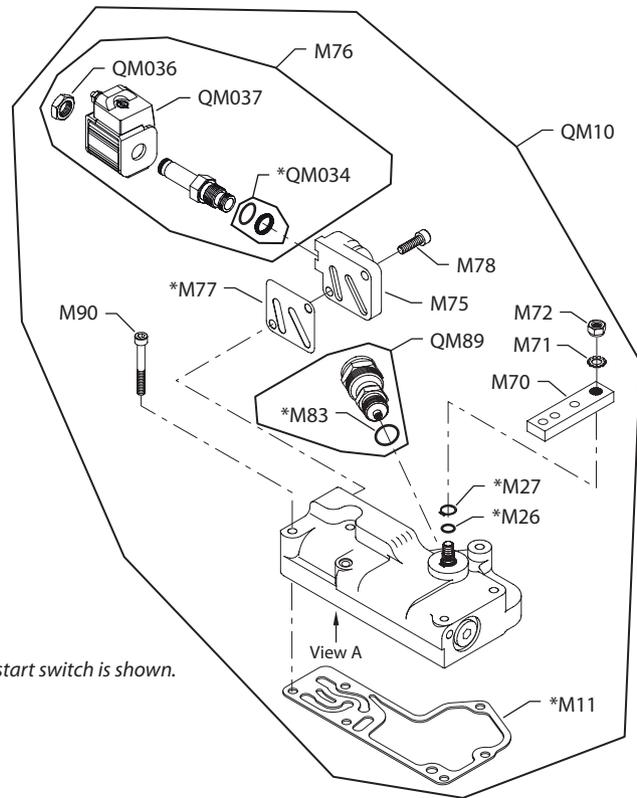
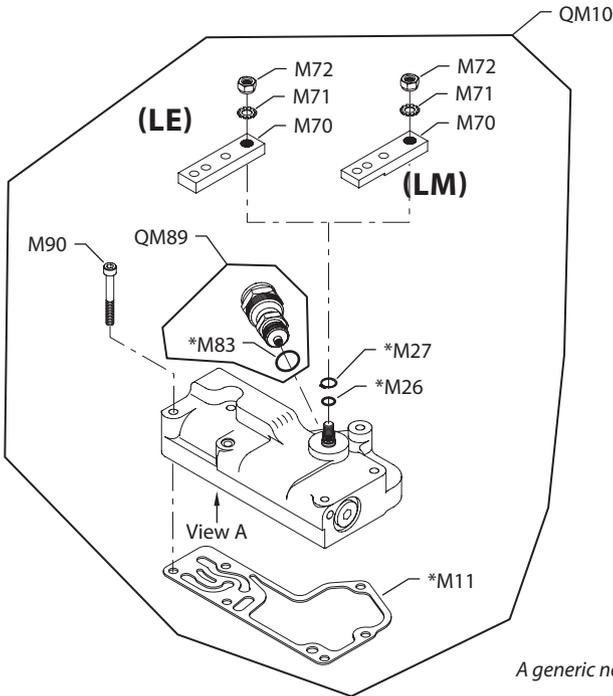
Order Code	Item	Date Begin	Date End	Part Number	Part Name	Qty. per Model/Kit
KZ	M9	98-10		MCV116G4204	PCP, Weather-pack connector	1
	M11	98-10		8800520	Control gasket	1
	M14	98-10		11070305	Feedback link	1
	M29	98-10		K07067	Screw	4
	M51	98-10		505412 (9003509-0008)	Seal nut	1
	M90	98-10		692889 (9007314-0611)	Screw	6
	M96	98-10		011296 (9004105-0120)	O-ring	3
	M97	98-10		9004105-0130	O-ring	1
	M99	98-10		K08572	Filter assembly	1
	QM10	98-10		8510355	EDC3 kit, Weather-pack connector, dual coil	1
	QM210	98-10		11096131	Control seal kit	1



Variable displacement pump

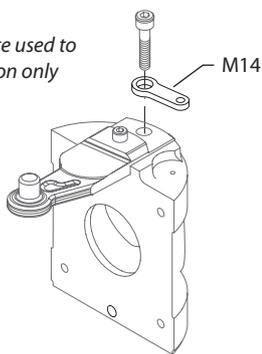
(LE & LM)

(LL)

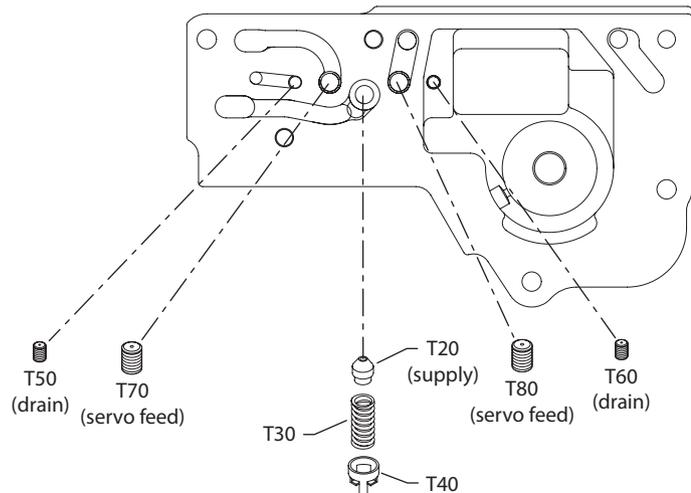


A generic neutral start switch is shown.

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.

E100 719E

* = included in control seal kit QM210

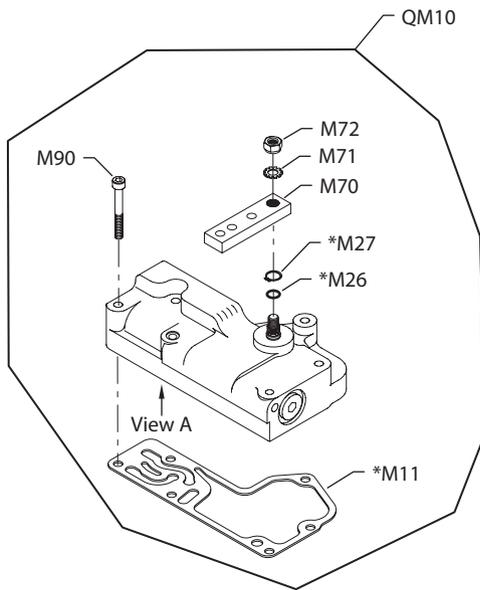

Variable displacement pump
Control

Order Code	Item	Date Begin	Date End	Part Number	Part Name	Qty. per Model/Kit
LE	M11	01-27		8800520	Control gasket	1
	M14	01-27		11070305	Feedback link	1
	M26	01-27		144725 (9004105-0110)	O-ring	1
	M27	01-27		9006300-0044	Retaining ring	1
	M70	01-27		9800916	Control handle	1
	M71	01-27		9009660-3100	Toothlock washer	1
	M72	01-27		040642 (9003513-0800)	Nut	1
	M83	01-27		001123 (9004201-5000)	O-ring	1
	M90	01-27		692889 (9007314-0611)	Screw	6
	QM10	01-27		8510301	MDC kit, high force neutral start switch	1
	QM89	01-27		8510316	Neutral start switch kit, high force, Weather-pack	1
	QM210	01-27		11096275	Control seal kit	1
	LL	M11	00-07		8800520	Control gasket
M14		00-07		11070305	Feedback link	1
M26		00-07		144725 (9004105-0110)	O-ring	1
M27		00-07		9006300-0044	Retaining ring	1
M70		00-07		9800916	Control handle	1
M71		00-07		9009660-3100	Toothlock washer	1
M72		00-07		040642 (9003513-0800)	Nut	1
M75		00-07		505022	Control manifold	1
M76		14-06		11127988	Solenoid valve, 12 volt, single pole (SB-2014-020)	1
M77		00-07		8800882	Manifold gasket	1
M78		00-07		693341 (9007314-0606)	Screw	2
M83		00-07		001123 (9004201-5000)	O-ring	1
M90		00-07		692889 (9007314-0611)	Screw	6
QM10		00-07		8510373	MDC kit w/12 volt solenoid, high force nss	1
QM034		00-07		11099649	Solenoid valve seal kit	1
QM036		14-06		11100383	Coil nut	1
QM037		14-06		11100388	Coil kit, 12 volt, single pole	1
QM89		00-07		8510316	Neutral start switch kit, high force	1
QM210		14-06		11100049	Control seal kit	1
LM		M11	01-27		8800520	Control gasket
	M14	01-27		11070305	Feedback link	1
	M26	01-27		144725 (9004105-0110)	O-ring	1
	M27	01-27		9006300-0044	Retaining ring	1
	M70	01-27		8801260	Control handle, special	1
	M71	01-27		9009660-3100	Toothlock washer	1
	M72	01-27		040642 (9003513-0800)	Nut	1
	M83	01-27		001123 (9004201-5000)	O-ring	1
	M90	01-27		692889 (9007314-0611)	Screw	6
	QM10	01-27		8510382	MDC kit, high force neutral start switch	1
	QM89	01-27		8510027	Neutral start switch kit, high force	1
	QM210	01-27		11096275	Control seal kit	1

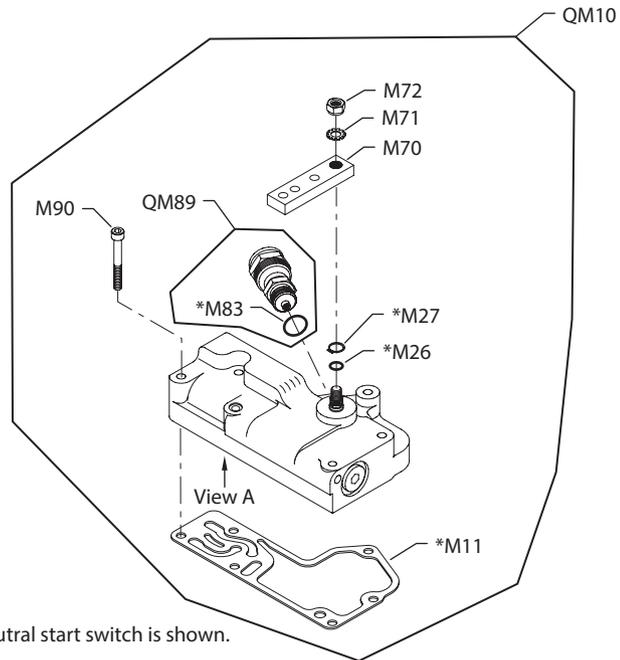


Variable displacement pump

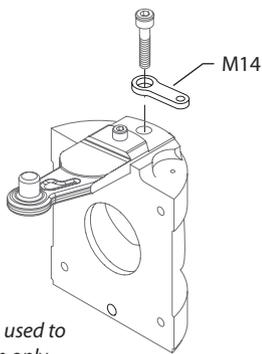
(M1 & M4)



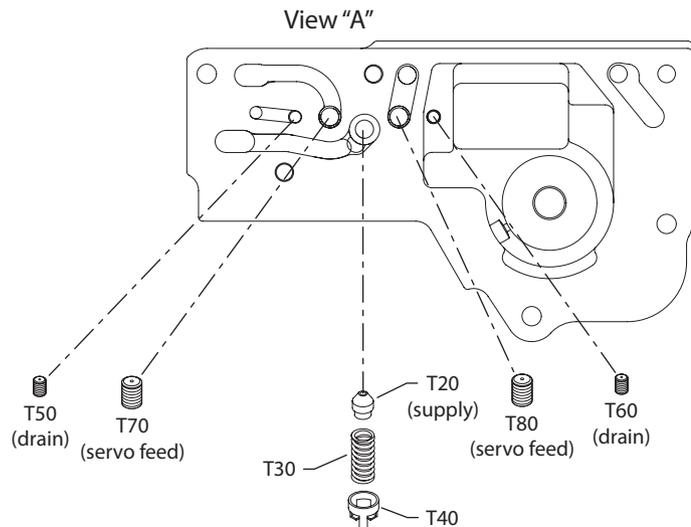
(M2)



A generic neutral start switch is shown.



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.

E100 720E

* = included in control seal kit QM210


Variable displacement pump
Control

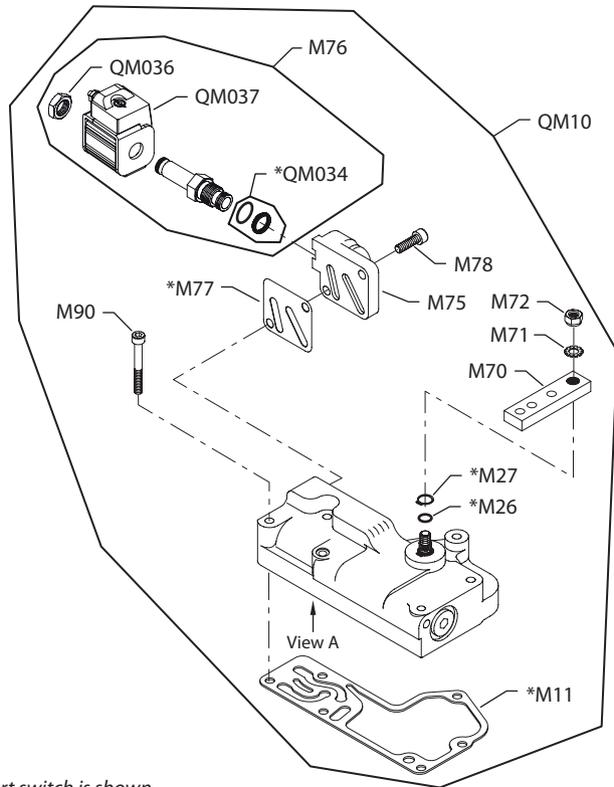
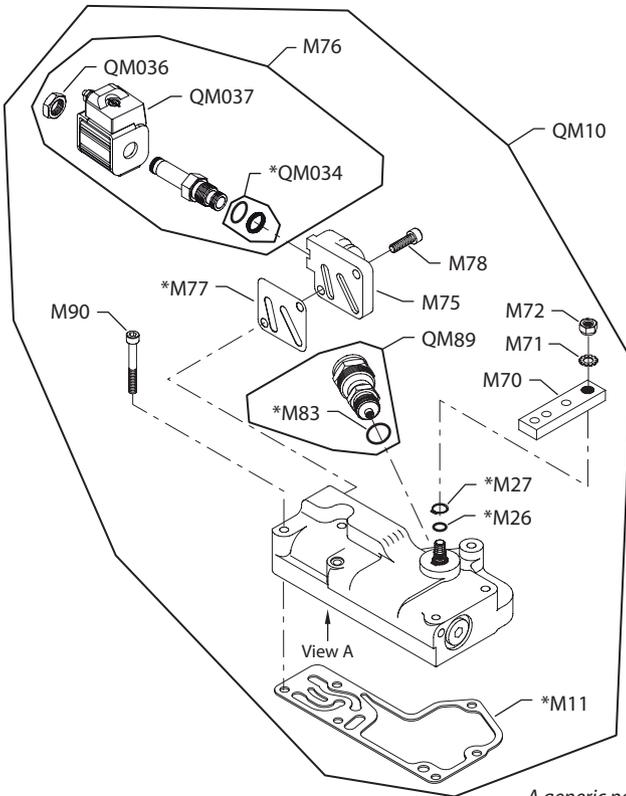
Order Code	Item	Date Begin	Date End	Part Number	Part Name	Qty. per Model/Kit	
M1	M11	95-37		8800520	Control gasket	1	
	M14	96-40		11070305	Feedback link (SB-1999-019, SB-2013-011)	1	
	M14	95-37	96-39	8000481	Feedback link (SB-1996-009)	1	
	M26	95-37		144725 (9004105-0110)	O-ring	1	
	M27	95-37		9006300-0044	Retaining ring	1	
	M70	95-37		9800916	Control handle	1	
	M71	95-37		9009660-3100	Toothlock washer	1	
	M72	95-37		040642 (9003513-0800)	Nut	1	
	M90	95-37		692889 (9007314-0611)	Screw	6	
	QM10	95-37		8510109	MDC kit, brass sleeve	1	
	QM210	95-37		11096275	Control seal kit	1	
	M2	M11	95-37		8800520	Control gasket	1
		M14	96-40		11070305	Feedback link (SB-1999-019, SB-2013-011)	1
M14		95-37	96-39	8000481	Feedback link (SB-1996-009)	1	
M26		95-37		144725 (9004105-0110)	O-ring	1	
M27		95-37		9006300-0044	Retaining ring	1	
M70		95-37		9800916	Control handle	1	
M71		95-37		9009660-3100	Toothlock washer	1	
M72		95-37		040642 (9003513-0800)	Nut	1	
M83		95-37		001123 (9004201-5000)	O-ring	1	
M90		95-37		692889 (9007314-0611)	Screw	6	
QM10		95-37		8510110	MDC kit, with neutral start switch, brass sleeve	1	
QM89		95-37		80020540	Neutral start switch kit	1	
QM210		95-37		11096275	Control seal kit	1	
M4		M11	96-22		8800520	Control gasket	1
		M14	96-40		11070305	Feedback link (SB-1999-019, SB-2013-011)	1
	M14	96-22	96-39	8000481	Feedback link (SB-1996-009)	1	
	M26	96-22		144725 (9004105-0110)	O-ring	1	
	M27	96-22		9006300-0044	Retaining ring	1	
	M70	96-22		9800916	Control handle	1	
	M71	96-22		9009660-3100	Toothlock washer	1	
	M72	96-22		040642 (9003513-0800)	Nut	1	
	M90	96-22		692889 (9007314-0611)	Screw	6	
	QM10	96-22		8510264	MDC kit	1	
	QM210	96-22		11096275	Control seal kit	1	



Variable displacement pump

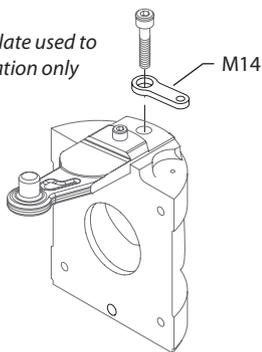
(M5)

(M6)

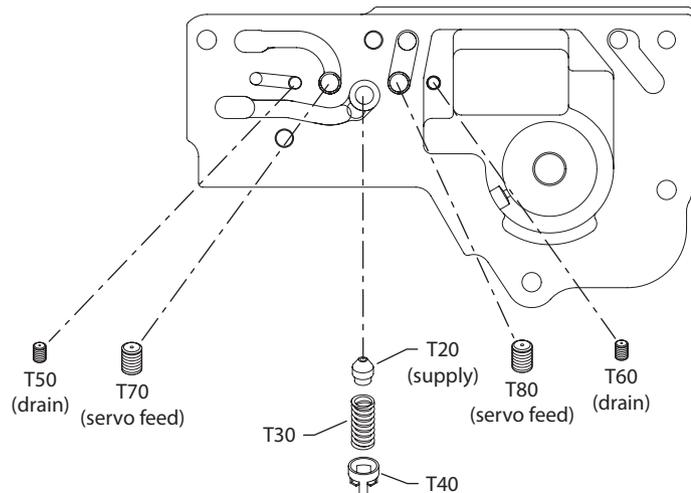


A generic neutral start switch is shown.

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.

E101 875E

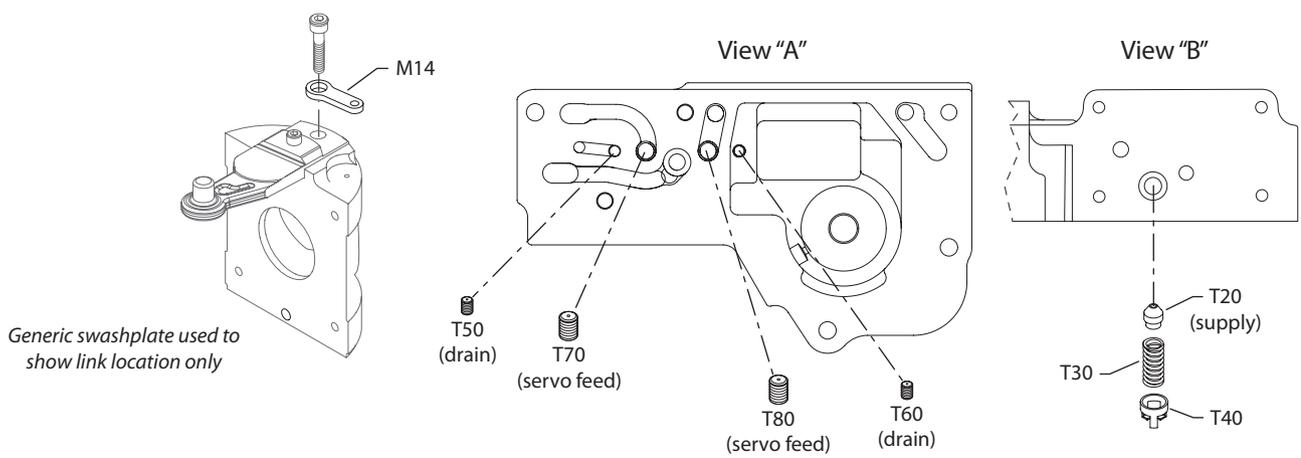
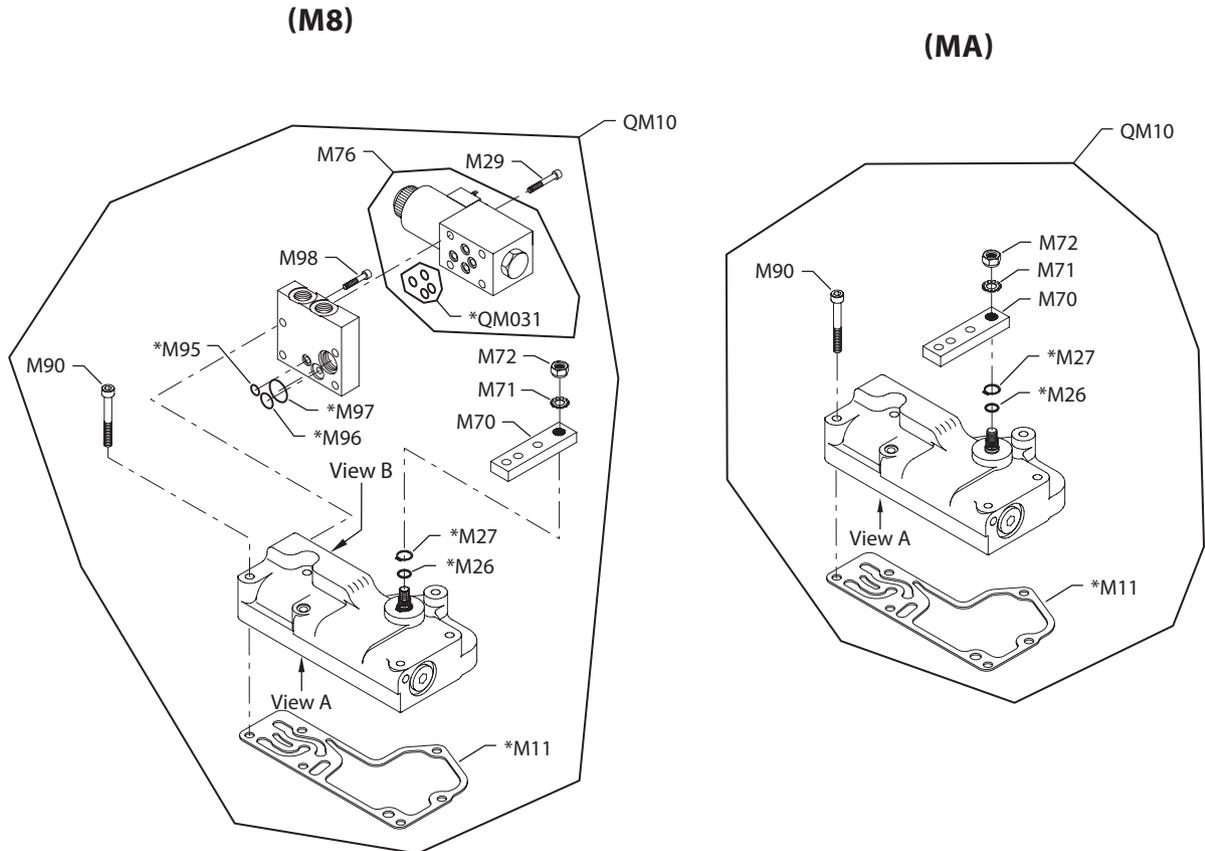
* = included in control seal kit QM210


Variable displacement pump
Control

Order Code	Item	Date Begin	Date End	Part Number	Part Name	Qty. per Model/Kit
M5	M11	00-07		8800520	Control gasket	1
	M14	00-07		11070305	Feedback link	1
	M26	00-07		144725 (9004105-0110)	O-ring	1
	M27	00-07		9006300-0044	Retaining ring	1
	M70	00-07		9800916	Control handle	1
	M71	00-07		9009660-3100	Toothlock washer	1
	M72	00-07		040642 (9003513-0800)	Nut	1
	M75	00-07		505022	Control manifold	1
	M76	14-06		11127988	Solenoid valve, 12 volt, single pole (SB-2014-020)	1
	M77	00-07		8800882	Manifold gasket	1
	M78	00-07		693341 (9007314-0606)	Screw	2
	M83	00-07		001123 (9004201-5000)	O-ring	1
	M90	00-07		692889 (9007314-0611)	Screw	6
	QM10	00-07		8510168	MDC kit w/12 volt solenoid, neutral start switch	1
	QM034	00-07		11099649	Solenoid valve seal kit	1
	QM036	14-06		11100383	Coil nut	1
	QM037	14-06		11100388	Coil kit, 12 volt, single pole	1
	QM89	00-07		8510170	Neutral start switch kit	1
	QM210	14-06		11100049	Control seal kit	1
	M6	M11	00-07		8800520	Control gasket
M14		00-07		11070305	Feedback link	1
M26		00-07		144725 (9004105-0110)	O-ring	1
M27		00-07		9006300-0044	Retaining ring	1
M70		00-07		9800916	Control handle	1
M71		00-07		9009660-3100	Toothlock washer	1
M72		00-07		040642 (9003513-0800)	Nut	1
M75		00-07		505022	Control manifold	1
M76		14-06		11127988	Solenoid valve, 12 volt, single pole (SB-2014-020)	1
M77		00-07		8800882	Manifold gasket	1
M78		00-07		693341 (9007314-0606)	Screw	2
M90		00-07		692889 (9007314-0611)	Screw	6
QM10		00-07		8510183	MDC kit w/12 volt solenoid	1
QM034		00-07		11099649	Solenoid valve seal kit	1
QM036		14-06		11100383	Coil nut	1
QM037		14-06		11100388	Coil kit, 12 volt, single pole	1
QM210		14-06		11100049	Control seal kit	1



Variable displacement pump



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.

Possible orifice locations

E100 721E

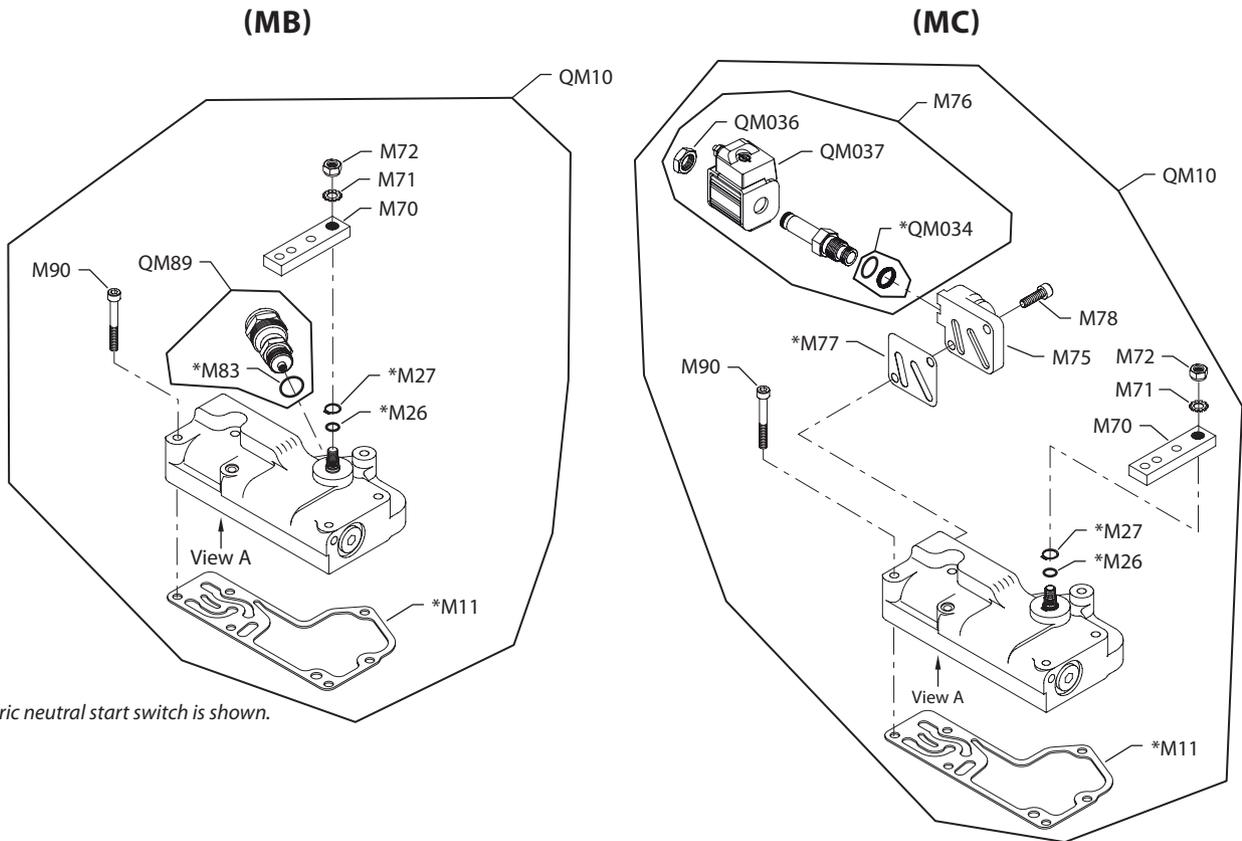
* = included in control seal kit QM210


Variable displacement pump
Control

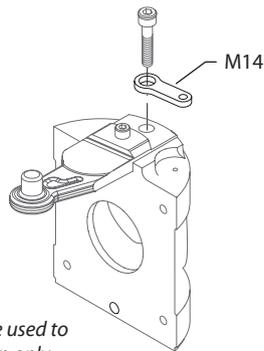
Order Code	Item	Date Begin	Date End	Part Number	Part Name	Qty. per Model/Kit
M8	M11	04-31		8800520	Control gasket	1
	M14	04-31		11070305	Feedback link (SB-1999-019, SB-2013-011)	1
	M26	04-31		144725 (9004105-0110)	O-ring	1
	M27	04-31		9006300-0044	Retaining ring	1
	M29	04-31		9007315-0507	Screw	4
	M70	04-31		9800916	Control handle	1
	M71	04-31		9009660-3100	Toothlock washer	1
	M72	04-31		040642 (9003513-0800)	Nut	1
	M76	04-31		508009	Solenoid valve	1
	M90	04-31		692889 (9007314-0611)	Screw	6
	M95	04-31		144725 (9004105-0110)	O-ring	1
	M96	04-31		056713 (9004105-0140)	O-ring	1
	M97	04-31		544742 (9004105-0190)	O-ring	1
	M98	04-31		9007315-0505	Screw	4
	QM10	04-31		11099889	MDC kit w/2-position solenoid valve, 12 volt	1
	QM031	04-31		11099647	Valve seal kit	1
	QM210	04-31		11099977	Control seal kit	1
	MA	M11	87-02		8800520	Control gasket
M14		96-40		11070305	Feedback link (SB-1999-019, SB-2013-011)	1
M14		87-02	96-39	8000481	Feedback link (SB-1996-009)	1
M26		87-02		144725 (9004105-0110)	O-ring	1
M27		87-02		9006300-0044	Retaining ring	1
M70		87-02		9800916	Control handle	1
M71		87-02		9009660-3100	Toothlock washer	1
M72		87-02		040642 (9003513-0800)	Nut	1
M90		87-02		692889 (9007314-0611)	Screw	6
QM10		87-02		8002M0MA-A	MDC kit	1
QM210		87-02		11096275	Control seal kit	1



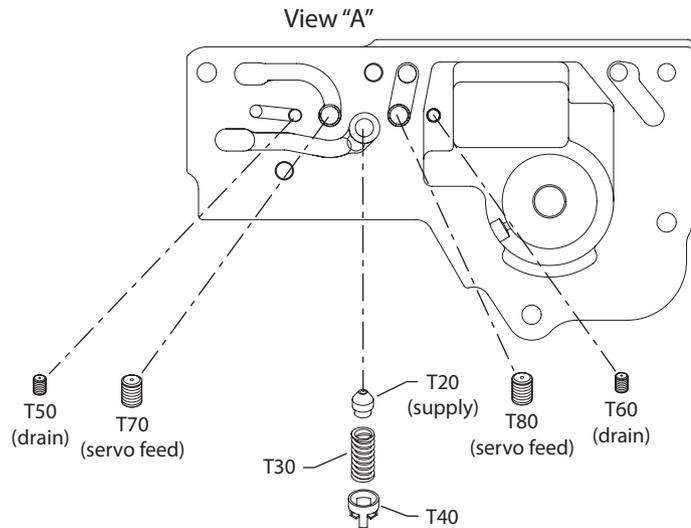
Variable displacement pump



A generic neutral start switch is shown.



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.

E101 876E

* = included in control seal kit QM210


Variable displacement pump
Control

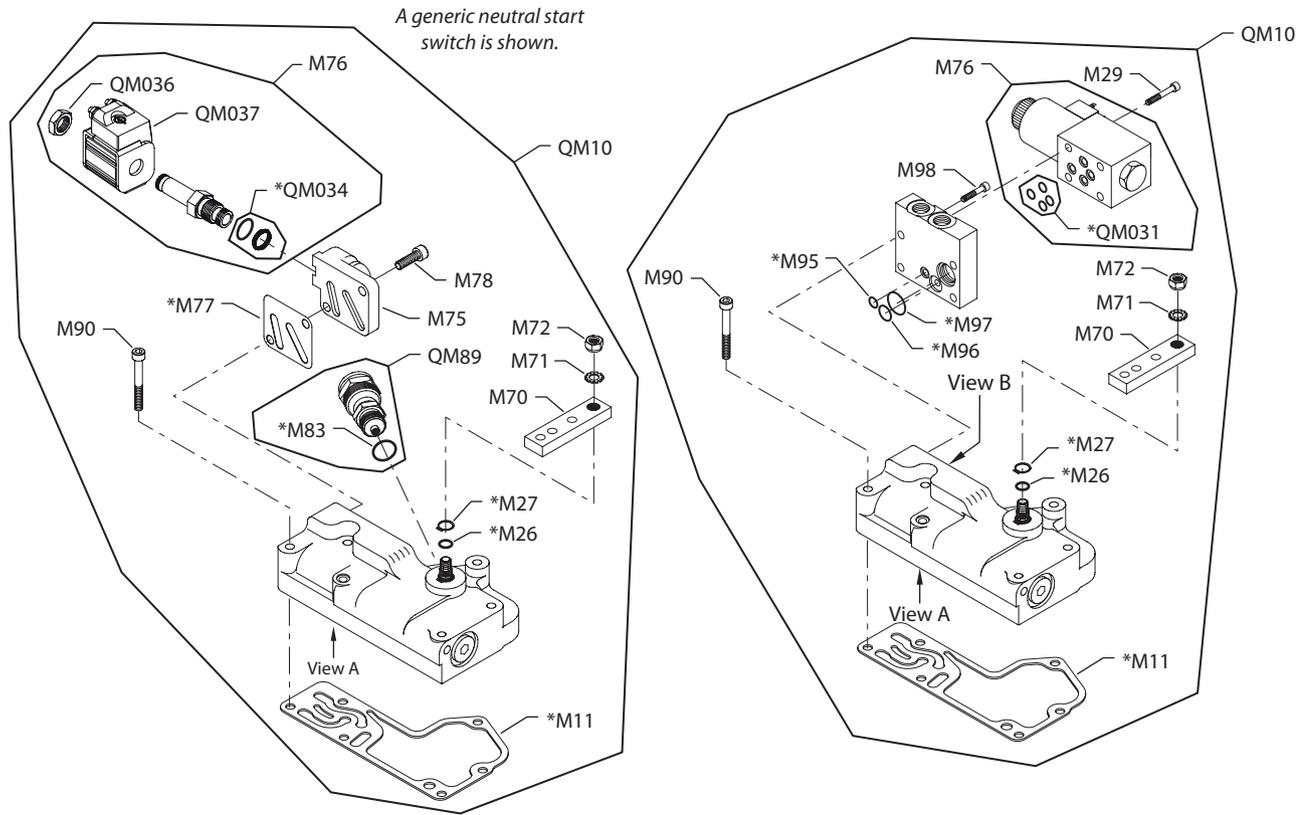
Order Code	Item	Date Begin	Date End	Part Number	Part Name	Qty. per Model/Kit
MB	M11	87-02		8800520	Control gasket	1
	M14	96-40		11070305	Feedback link (SB-1999-019, SB-2013-011)	1
	M14	87-02	96-39	8000481	Feedback link (SB-1996-009)	1
	M26	87-02		144725 (9004105-0110)	O-ring	1
	M27	87-02		9006300-0044	Retaining ring	1
	M70	87-02		9800916	Control handle	1
	M71	87-02		9009660-3100	Toothlock washer	1
	M72	87-02		040642 (9003513-0800)	Nut	1
	M83	87-02		001123 (9004201-5000)	O-ring	1
	M90	87-02		692889 (9007314-0611)	Screw	6
	QM10	87-02		8002M0MB-A	MDC kit, with neutral start switch	1
	QM89	87-02		80020540	Neutral start switch kit	1
	QM210	87-02		11096275	Control seal kit	1
	MC	M11	87-02		8800520	Control gasket
M14		96-40		11070305	Feedback link (SB-1999-019, SB-2013-011)	1
M14		87-02	96-39	8000481	Feedback link (SB-1996-009)	1
M26		87-02		144725 (9004105-0110)	O-ring	1
M27		87-02		9006300-0044	Retaining ring	1
M70		87-02		9800916	Control handle	1
M71		87-02		9009660-3100	Toothlock washer	1
M72		87-02		040642 (9003513-0800)	Nut	1
M75		87-02		505022	Control manifold (SB-1995-003)	1
M76		14-06		11127987	Solenoid valve, 12 volt, single pole (SB-2014-020)	1
M77		87-02		8800882	Manifold gasket	1
M78		95-10		693341 (9007314-0606)	Screw (SB-1995-003)	2
M78		87-02	95-09	041160 (9007314-0605)	Screw	2
M90		87-02		692889 (9007314-0611)	Screw	6
QM10		87-02		8002M0MC-A	MDC kit w/12 volt solenoid, single pole	1
QM034		00-07		11099649	Solenoid valve seal kit	1
QM036		14-06		11100383	Coil nut	1
QM037		14-06		11100388	Coil kit, 12 volt, single pole	1
QM210		14-06		11100049	Control seal kit	1



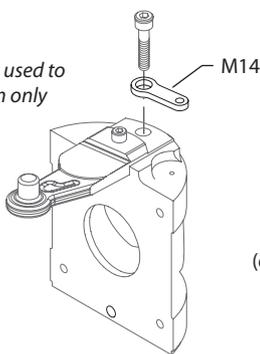
Variable displacement pump

(MD)

(ME)

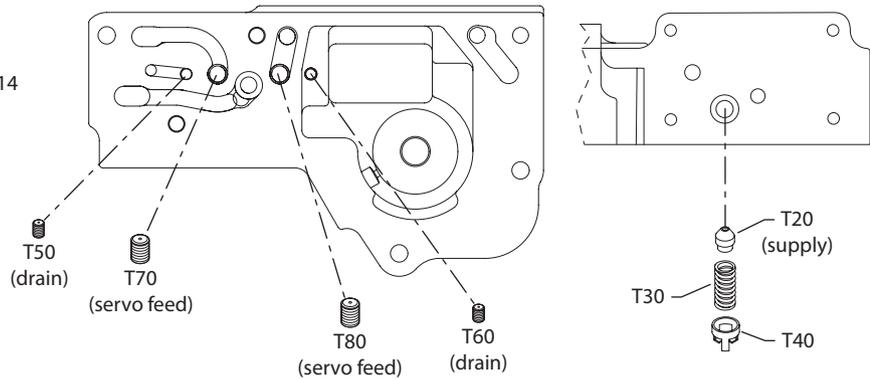


Generic swashplate used to show link location only



View "A"

View "B"



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.

E101 877E

* = included in control seal kit QM210

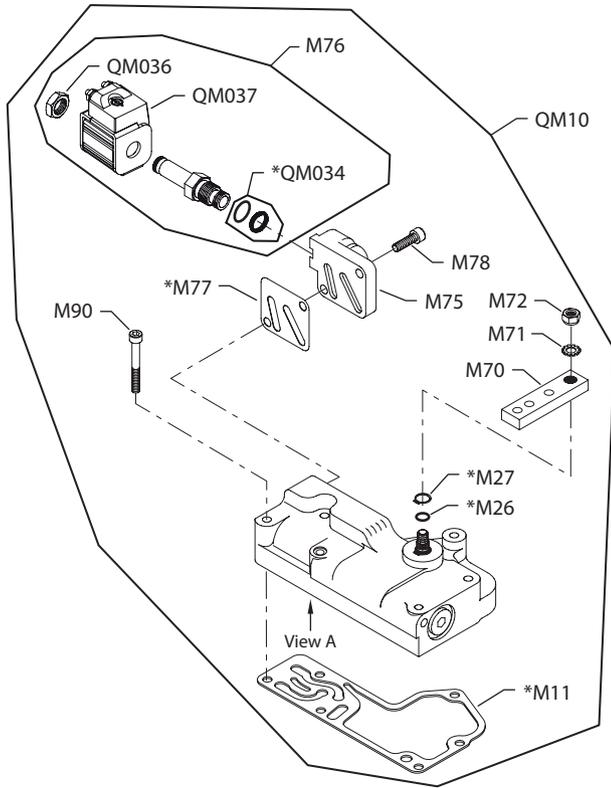

Variable displacement pump
Control

Order Code	Item	Date Begin	Date End	Part Number	Part Name	Qty. per Model/Kit
MD	M11	87-02		8800520	Control gasket	1
	M14	96-40		11070305	Feedback link (SB-1999-019, SB-2013-011)	1
	M14	87-02	96-39	8000481	Feedback link (SB-1996-009)	1
	M26	87-02		144725 (9004105-0110)	O-ring	1
	M27	87-02		9006300-0044	Retaining ring	1
	M70	87-02		9800916	Control handle	1
	M71	87-02		9009660-3100	Toothlock washer	1
	M72	87-02		040642 (9003513-0800)	Nut	1
	M75	87-02		505022	Control manifold (SB-1995-003)	1
	M76	14-06		11127986	Solenoid valve, 12 volt, double pole (SB-2014-020)	1
	M77	87-02		8800882	Manifold gasket	1
	M78	95-10		693341 (9007314-0606)	Screw (SB-1995-003)	2
	M78	87-02	95-09	041160 (9007314-0605)	Screw	2
	M83	87-02		001123 (9004201-5000)	O-ring	1
	M90	87-02		692889 (9007314-0611)	Screw	6
	QM10	87-02		8002M0MD-A	MDC kit w/12 volt double pole solenoid, high force nss	1
	QM034	00-07		11099649	Solenoid valve seal kit	1
	QM036	14-06		11100383	Coil nut	1
	QM037	14-06		11100385	Coil kit, 12 volt, double pole	1
	QM89	87-02		8510027	Neutral start switch kit, high force	1
QM210	14-06		11100049	Control seal kit	1	
ME	M11	87-02		8800520	Control gasket	1
	M14	96-40		11070305	Feedback link (SB-1999-019, SB-2013-011)	1
	M14	87-02	96-39	8000481	Feedback link (SB-1996-009)	1
	M26	87-02		144725 (9004105-0110)	O-ring	1
	M27	87-02		9006300-0044	Retaining ring	1
	M29	87-02		9007315-0510	Screw	4
	M70	87-02		9800916	Control handle	1
	M71	87-02		9009660-3100	Toothlock washer	1
	M72	87-02		040642 (9003513-0800)	Nut	1
	M76	87-02		519357	Solenoid valve, 12 volt	1
	M90	87-02		692889 (9007314-0611)	Screw	6
	M95	87-02		144725 (9004105-0110)	O-ring	1
	M96	87-02		056770 (9004105-0140)	O-ring	1
	M97	87-02		544742 (9004105-0190)	O-ring	1
	M98	87-02		9007315-0505	Screw	4
	QM10	87-02		8002M0ME-A	MDC kit w/2-position solenoid valve, 12 volt	1
	QM031	87-02		11099647	Valve seal kit	1
	QM210	87-02		11099977	Control seal kit	1

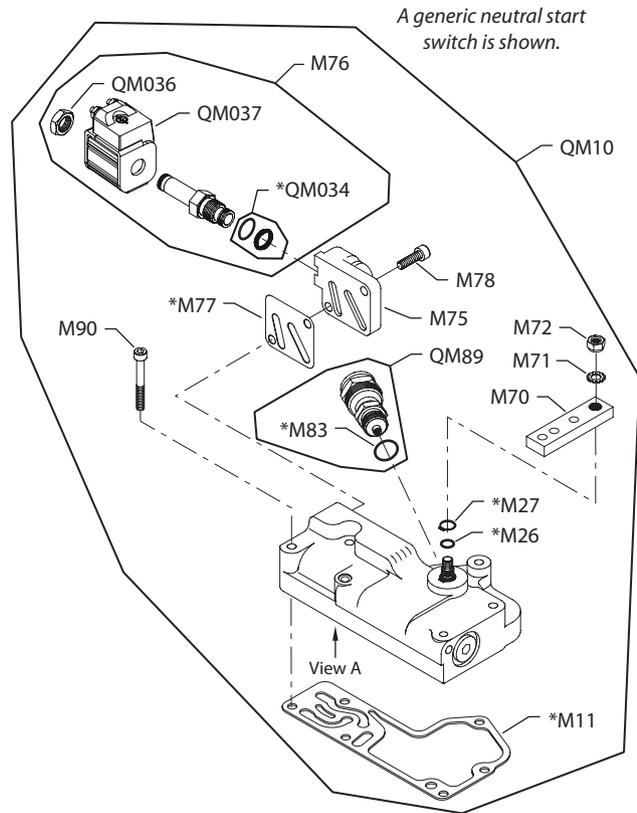


Variable displacement pump

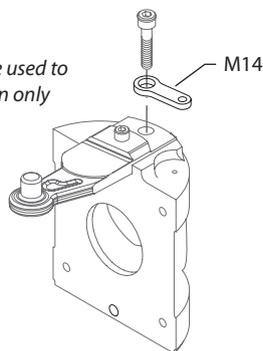
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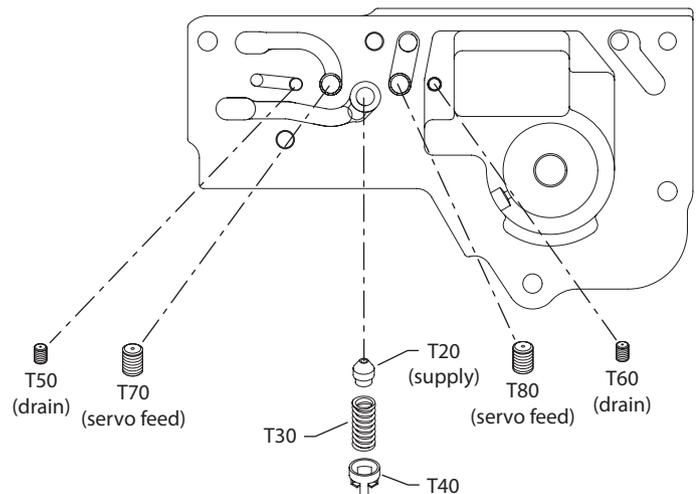
(MG)



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.

E101 878E

* = included in control seal kit QM210



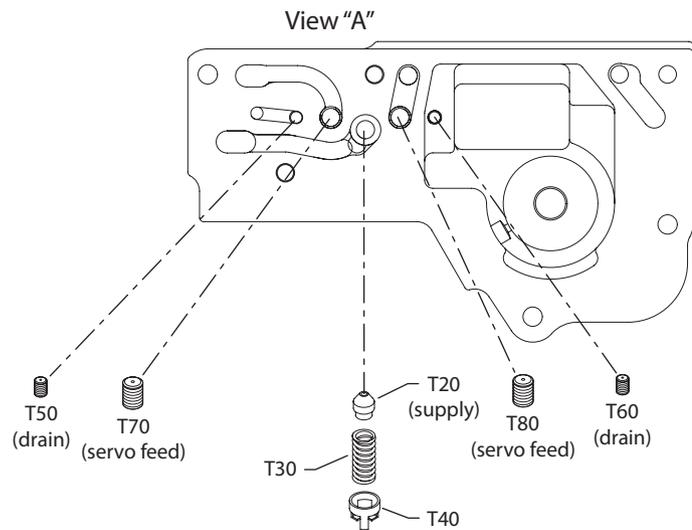
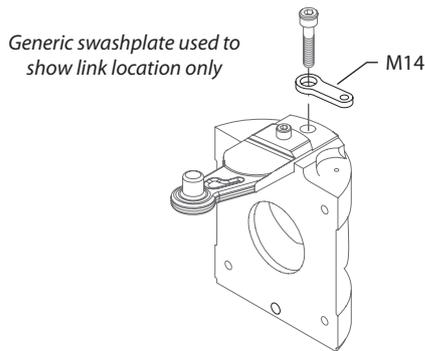
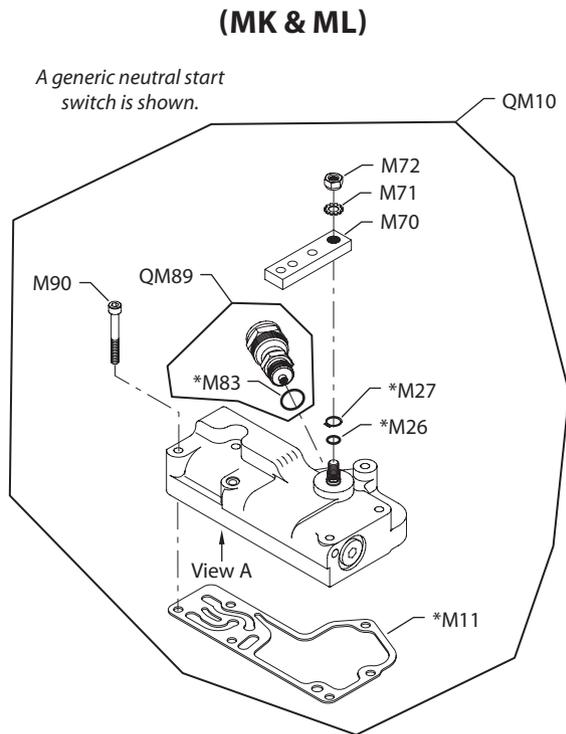
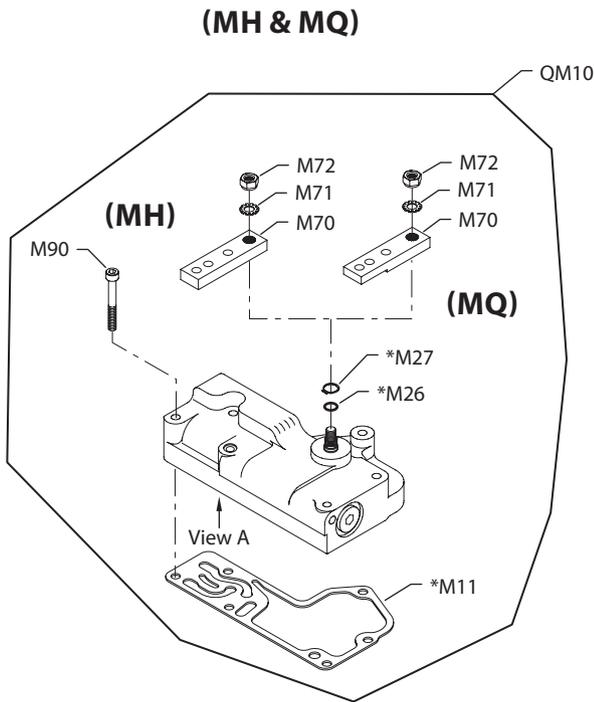
Variable displacement pump

Control

Order Code	Item	Date Begin	Date End	Part Number	Part Name	Qty. per Model/Kit
MF	M11	87-02		8800520	Control gasket	1
	M14	96-40		11070305	Feedback link (SB-1999-019, SB-2013-011)	1
	M14	87-02	96-39	8000481	Feedback link (SB-1996-009)	1
	M26	87-02		144725 (9004105-0110)	O-ring	1
	M27	87-02		9006300-0044	Retaining ring	1
	M70	87-02		9800916	Control handle	1
	M71	87-02		9009660-3100	Toothlock washer	1
	M72	87-02		040642 (9003513-0800)	Nut	1
	M75	87-02		505022	Control manifold (SB-1995-003)	1
	M76	87-02		11127985	Solenoid valve, 24 volt, double pole (SB-2014-020)	1
	M77	87-02		8800882	Manifold gasket	1
	M78	95-10		693341 (9007314-0606)	Screw (SB-1995-003)	2
	M78	87-02	95-09	041160 (9007314-0605)	Screw	2
	M90	87-02		692889 (9007314-0611)	Screw	6
	QM10	87-02		8002M0MF-A	MDC kit w/24 volt solenoid, double pole	1
	QM034	87-02		11099649	Solenoid valve seal kit	1
	QM036	14-06		11100383	Coil nut	1
	QM037	14-06		11100386	Coil kit, 24 volt, double pole	1
	QM210	14-06		11100049	Control seal kit	1
	MG	M11	87-02		8800520	Control gasket
M14		96-40		11070305	Feedback link (SB-1999-019, SB-2013-011)	1
M14		87-02	96-39	8000481	Feedback link (SB-1996-009)	1
M26		87-02		144725 (9004105-0110)	O-ring	1
M27		87-02		9006300-0044	Retaining ring	1
M70		87-02		9800916	Control handle	1
M71		87-02		9009660-3100	Toothlock washer	1
M72		87-02		040642 (9003513-0800)	Nut	1
M75		87-02		505022	Control manifold (SB-1995-003)	1
M76		87-02		11127985	Solenoid valve, 24 volt, double pole (SB-2014-020)	1
M77		87-02		8800882	Manifold gasket	1
M78		95-10		693341 (9007314-0606)	Screw (SB-1995-003)	2
M78		87-02	95-09	041160 (9007314-0605)	Screw	2
M83		87-02		001123 (9004201-5000)	O-ring	1
M90		87-02		692889 (9007314-0611)	Screw	6
QM10		87-02		8002M0MG-A	MDC kit w/24 volt solenoid, double pole, nss	1
QM034		00-07		11099649	Solenoid valve seal kit	1
QM036		14-06		11100383	Coil nut	1
QM037		14-06		11100386	Coil kit, 24 volt, double pole	1
QM89		87-02		8510027	Neutral start switch kit, high force	1
QM210	14-06		11100049	Control seal kit	1	



Variable displacement pump



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.

E100 722E

* = included in control seal kit QM210


Variable displacement pump
Control

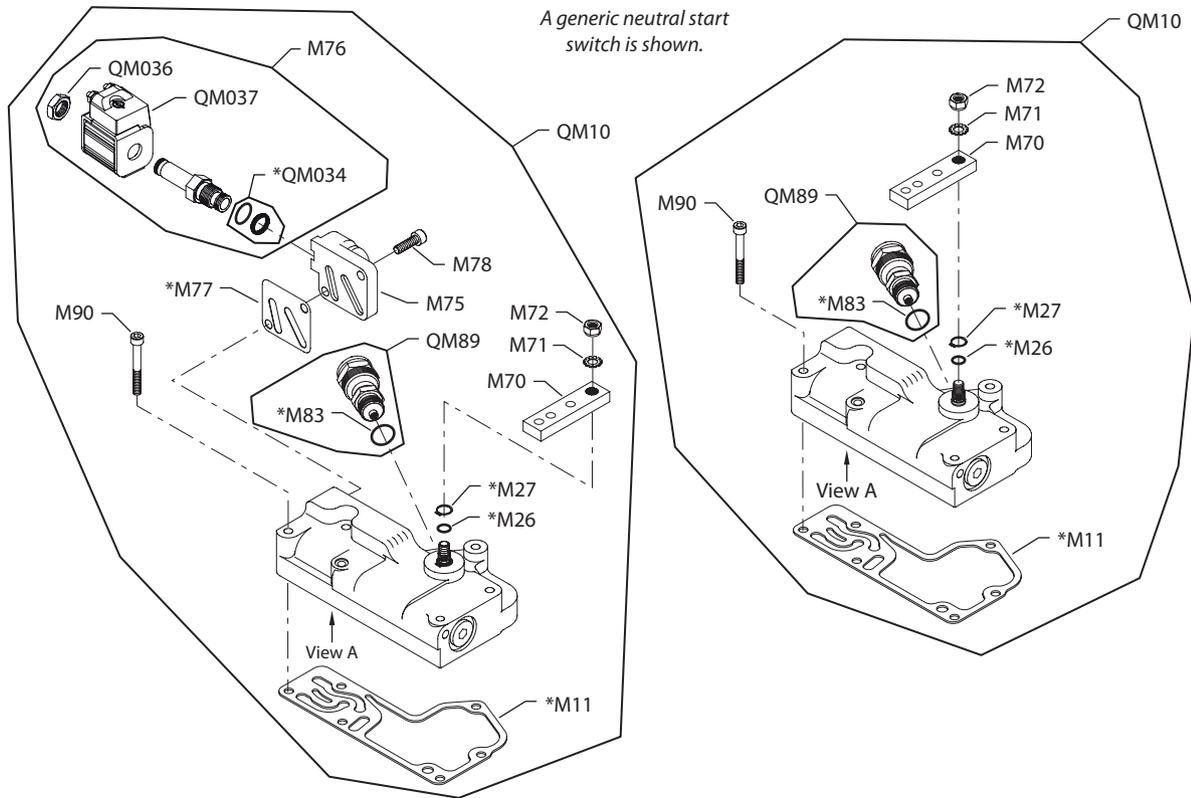
Order Code	Item	Date Begin	Date End	Part Number	Part Name	Qty. per Model/Kit
MH	M11	99-12		8800520	Control gasket	1
	M14	99-12		11070305	Feedback link (SB-1999-019, SB-2013-011)	1
	M26	99-12		144725 (9004105-0110)	O-ring	1
	M27	99-12		9006300-0044	Retaining ring	1
	M70	99-12		9800916	Control handle	1
	M71	99-12		9009660-3100	Toothlock washer	1
	M72	99-12		040642 (9003513-0800)	Nut	1
	M90	99-12		692889 (9007314-0611)	Screw	6
	QM10	99-12		8510383	MDC kit w/reduced deadband	1
	QM210	99-12		11096275	Control seal kit	1
MK	M11	87-02		8800520	Control gasket	1
	M14	96-40		11070305	Feedback link (SB-1999-019, SB-2013-011)	1
	M14	87-02	96-39	8000481	Feedback link (SB-1996-009)	1
	M26	87-02		144725 (9004105-0110)	O-ring	1
	M27	87-02		9006300-0044	Retaining ring	1
	M70	87-02		9800916	Control handle	1
	M71	87-02		9009660-3100	Toothlock washer	1
	M72	87-02		040642 (9003513-0800)	Nut	1
	M83	87-02		001123 (9004201-5000)	O-ring	1
	M90	87-02		692889 (9007314-0611)	Screw	6
	QM10	99-12		8002M0MK-A	MDC kit w/wide deadband, nss	1
	QM89	87-02		80020540	Neutral start switch kit	1
	QM210	99-12		11096275	Control seal kit	1
	ML	M11	87-02		8800520	Control gasket
M14		96-40		11070305	Feedback link (SB-1999-019, SB-2013-011)	1
M14		87-02	96-39	8000481	Feedback link (SB-1996-009)	1
M26		87-02		144725 (9004105-0110)	O-ring	1
M27		87-02		9006300-0044	Retaining ring	1
M70		87-02		9800916	Control handle	1
M71		87-02		9009660-3100	Toothlock washer	1
M72		87-02		040642 (9003513-0800)	Nut	1
M83		87-02		001123 (9004201-5000)	O-ring	1
M90		87-02		692889 (9007314-0611)	Screw	6
QM10		87-02		8510356	MDC kit w/wide deadband, high force nss	1
QM89		87-02		8510027	Neutral start switch kit, high force	1
QM210		87-02		11096275	Control seal kit	1
MQ		M11	10-27		8800520	Control gasket
	M14	10-27		11070305	Feedback link (SB-1999-019, SB-2013-011)	1
	M26	10-27		144725 (9004105-0110)	O-ring	1
	M27	10-27		9006300-0044	Retaining ring	1
	M70	10-27		8801260	Control handle, special	1
	M71	10-27		9009660-3100	Toothlock washer	1
	M72	10-27		040642 (9003513-0800)	Nut	1
	M90	10-27		692889 (9007314-0611)	Screw	6
	QM10	10-27		11099891	MDC kit w/special handle	1
	QM210	10-27		11096275	Control seal kit	1



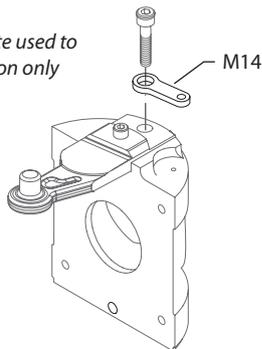
Variable displacement pump

(MR)

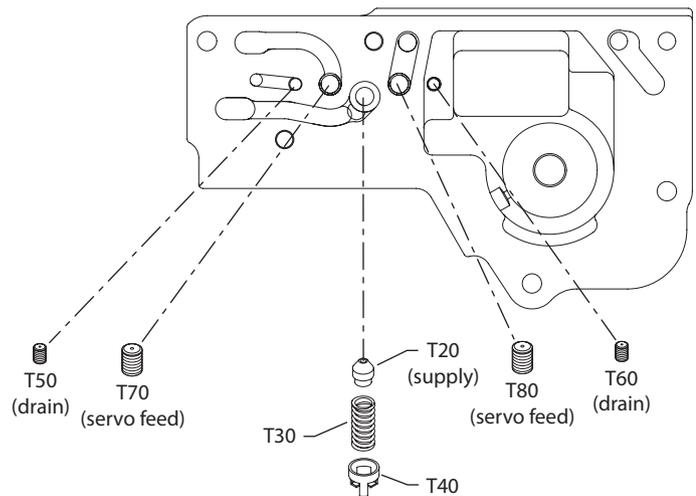
(MS)



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.

E101 879E

* = included in control seal kit QM210

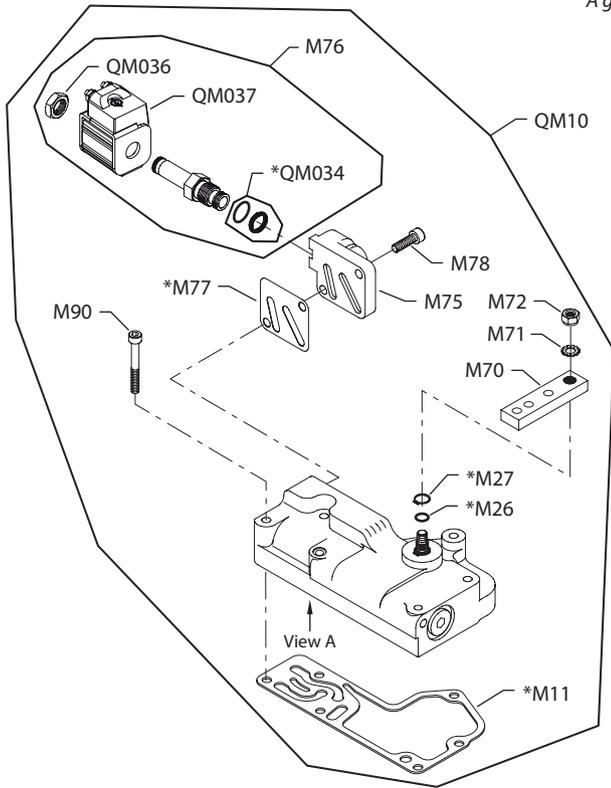

Variable displacement pump
Control

Order Code	Item	Date Begin	Date End	Part Number	Part Name	Qty. per Model/Kit
MR	M11	93-31		8800520	Control gasket	1
	M14	96-40		11070305	Feedback link (SB-1999-019, SB-2013-011)	1
	M14	93-31	96-39	8000481	Feedback link (SB-1996-009)	1
	M26	93-31		144725 (9004105-0110)	O-ring	1
	M27	93-31		9006300-0044	Retaining ring	1
	M70	93-31		9800916	Control handle	1
	M71	93-31		9009660-3100	Toothlock washer	1
	M72	93-31		040642 (9003513-0800)	Nut	1
	M75	93-31		505022	Control manifold (SB-1995-003)	1
	M76	93-31		11127985	Solenoid valve, 24 volt, double pole (SB-2014-020)	1
	M77	93-31		8800882	Manifold gasket	1
	M78	95-10		693341 (9007314-0606)	Screw (SB-1995-003)	2
	M78	93-31	95-09	041160 (9007314-0605)	Screw	2
	M83	93-31		001123 (9004201-5000)	O-ring	1
	M90	93-31		692889 (9007314-0611)	Screw	6
	QM10	93-31		8002M0MR-A	MDC kit w/24 volt solenoid, double pole, high force nss	1
	QM034	00-07		11099649	Solenoid valve seal kit	1
	QM036	14-06		11100383	Coil nut	1
	QM037	14-06		11100386	Coil kit, 24 volt, double pole	1
	QM89	93-31		8510027	Neutral start switch kit, high force	1
QM210	14-06		11100049	Control seal kit	1	
MS	M11	94-41		8800520	Control gasket	1
	M14	96-40		11070305	Feedback link (SB-1999-019, SB-2013-011)	1
	M14	94-41	96-39	8000481	Feedback link (SB-1996-009)	1
	M26	94-41		144725 (9004105-0110)	O-ring	1
	M27	94-41		9006300-0044	Retaining ring	1
	M70	94-41		9800916	Control handle	1
	M71	94-41		9009660-3100	Toothlock washer	1
	M72	94-41		040642 (9003513-0800)	Nut	1
	M83	94-41		001123 (9004201-5000)	O-ring	1
	M90	94-41		692889 (9007314-0611)	Screw	6
	QM10	94-41		8510127	MDC kit, high force nss	1
	QM89	94-41		8510027	Neutral start switch kit, high force	1
	QM210	94-41		11096275	Control seal kit	1



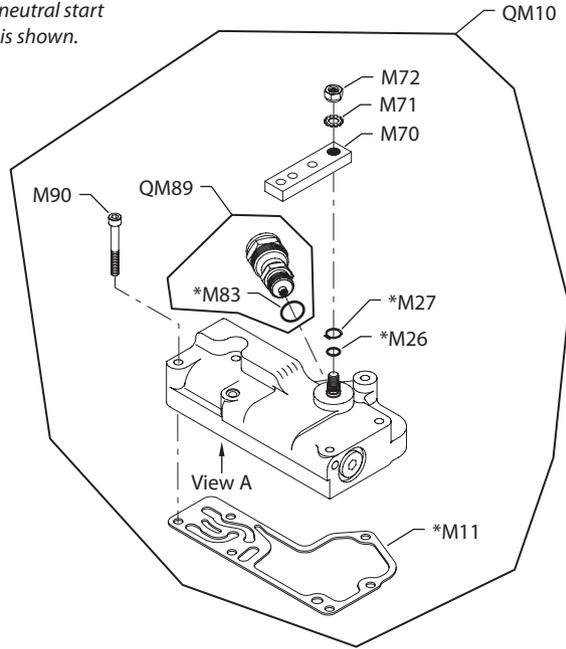
Variable displacement pump

(MT)

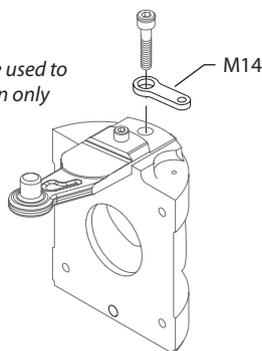


(MV & MW)

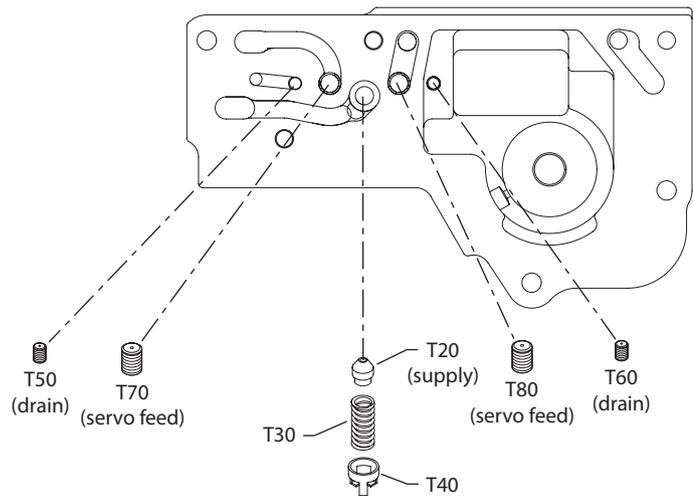
A generic neutral start switch is shown.



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.

E100 723E

* = included in control seal kit QM210

Variable displacement pump
Control

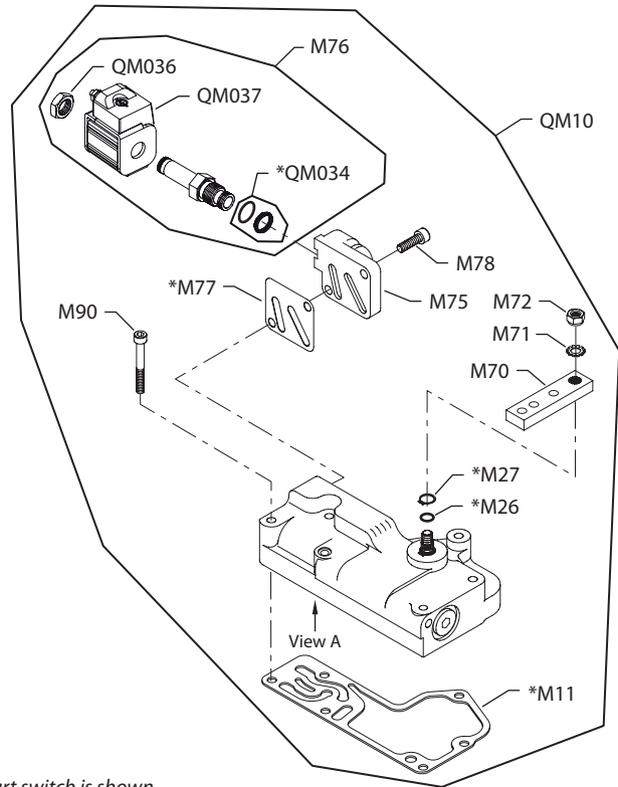
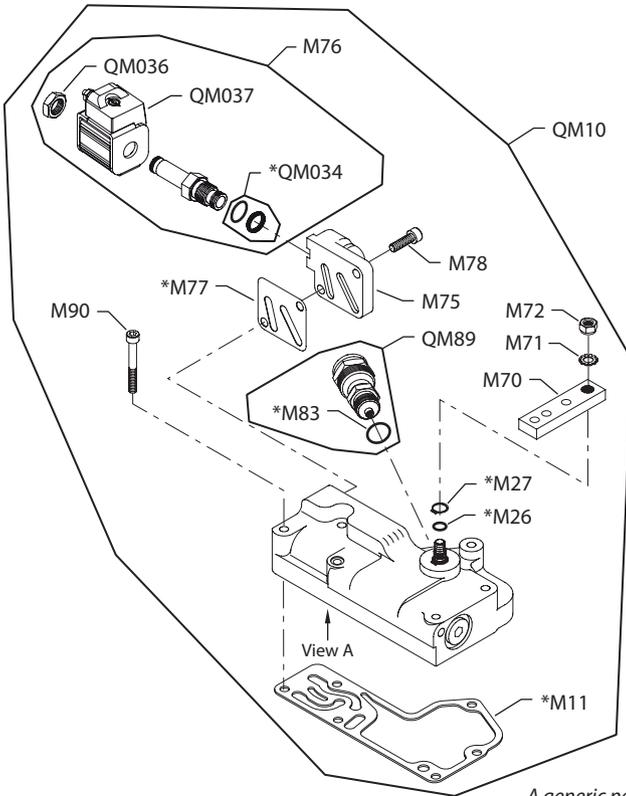
Order Code	Item	Date Begin	Date End	Part Number	Part Name	Qty. per Model/Kit	
MT	M11	01-50		8800520	Control gasket	1	
	M14	01-50		11070305	Feedback link	1	
	M26	01-50		144725 (9004105-0110)	O-ring	1	
	M27	01-50		9006300-0044	Retaining ring	1	
	M70	01-50		9800916	Control handle	1	
	M71	01-50		9009660-3100	Toothlock washer	1	
	M72	01-50		040642 (9003513-0800)	Nut	1	
	M75	01-50		505022	Control manifold	1	
	M76	93-31		11127986	Solenoid valve, 12 volt, double pole (SB-2014-020)	1	
	M77	01-50		8800882	Manifold gasket	1	
	M78	01-50		693341 (9007314-0606)	Screw	2	
	M90	01-50		692889 (9007314-0611)	Screw	6	
	QM10	01-50		8510319	MDC kit w/12 volt solenoid, double pole	1	
	QM034	00-07		11099649	Solenoid valve seal kit	1	
	QM036	14-06		11100383	Coil nut	1	
	QM037	14-06		11100385	Coil kit, 12 volt, double pole	1	
	QM210	14-06		11100049	Control seal kit	1	
	MV	M11	94-30		8800520	Control gasket	1
		M14	96-40		11070305	Feedback link (SB-1999-019, SB-2013-011)	1
		M14	94-30	96-39	8000481	Feedback link (SB-1996-009)	1
M26		94-30		144725 (9004105-0110)	O-ring	1	
M27		94-30		9006300-0044	Retaining ring	1	
M70		94-30		9800916	Control handle	1	
M71		94-30		9009660-3100	Toothlock washer	1	
M72		94-30		040642 (9003513-0800)	Nut	1	
M83		94-30		001123 (9004201-5000)	O-ring	1	
M90		94-30		692889 (9007314-0611)	Screw	6	
QM10		94-30		8510129	MDC kit, high force nss	1	
QM89		94-30		8510170	Neutral start switch kit	1	
QM210		94-30		11096275	Control seal kit	1	
MW		M11	94-30		8800520	Control gasket	1
		M14	96-40		11070305	Feedback link (SB-1999-019, SB-2013-011)	1
	M14	94-30	96-39	8000481	Feedback link (SB-1996-009)	1	
	M26	94-30		144725 (9004105-0110)	O-ring	1	
	M27	94-30		9006300-0044	Retaining ring	1	
	M70	94-30		9800916	Control handle	1	
	M71	94-30		9009660-3100	Toothlock washer	1	
	M72	94-30		040642 (9003513-0800)	Nut	1	
	M83	94-30		001123 (9004201-5000)	O-ring	1	
	M90	94-30		692889 (9007314-0611)	Screw	6	
	QM10	94-30		11099892	MDC kit, high force nss	1	
	QM89	94-30		80020540	Neutral start switch kit	1	
	QM210	94-30		11096275	Control seal kit	1	



Variable displacement pump

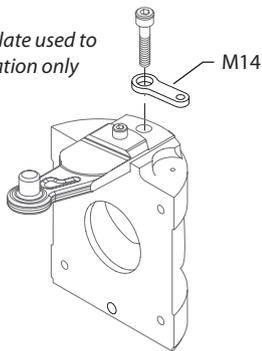
(MZ)

(MX)

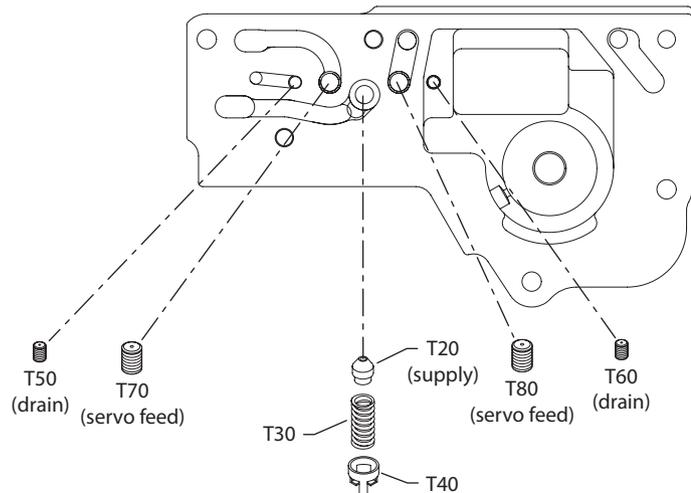


A generic neutral start switch is shown.

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.

E101 875E

* = included in control seal kit QM210

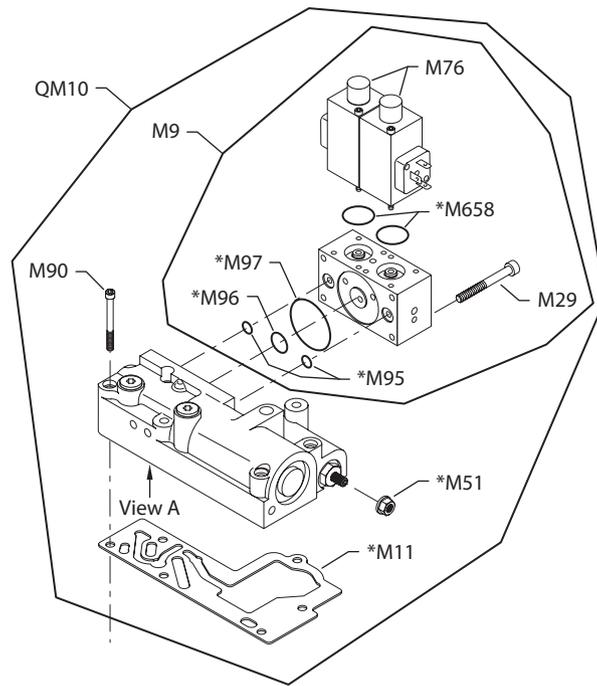

Variable displacement pump
Control

Order Code	Item	Date Begin	Date End	Part Number	Part Name	Qty. per Model/Kit
MX	M11	94-24		8800520	Control gasket	1
	M14	96-40		11070305	Feedback link (SB-1999-019, SB-2013-011)	1
	M14	94-24	96-39	8000481	Feedback link (SB-1996-009)	1
	M26	94-24		144725 (9004105-0110)	O-ring	1
	M27	94-24		9006300-0044	Retaining ring	1
	M70	94-24		9800916	Control handle	1
	M71	94-24		9009660-3100	Toothlock washer	1
	M72	94-24		040642 (9003513-0800)	Nut	1
	M75	94-24		505022	Control manifold (SB-1995-003)	1
	M76	94-24		11127988	Solenoid valve, 12 volt, single pole (SB-2014-020)	1
	M77	94-24		8800882	Manifold gasket	1
	M78	95-10		693341 (9007314-0606)	Screw (SB-1995-003)	2
	M78	94-24	95-09	041160 (9007314-0605)	Screw	2
	M90	94-24		692889 (9007314-0611)	Screw	6
	QM10	94-24		8510063	MDC kit w/12 volt solenoid, single pole	1
	QM034	94-24		11099649	Solenoid valve seal kit	1
	QM036	14-06		11100383	Coil nut	1
	QM037	14-06		11100388	Coil kit, 12 volt, single pole	1
	QM210	14-06		11100049	Control seal kit	1
	MZ	M11	87-02		8800520	Control gasket
M14		96-40		11070305	Feedback link (SB-1999-019, SB-2013-011)	1
M14		87-02	96-39	8000481	Feedback link (SB-1996-009)	1
M26		87-02		144725 (9004105-0110)	O-ring	1
M27		87-02		9006300-0044	Retaining ring	1
M70		87-02		9800916	Control handle	1
M71		87-02		9009660-3100	Toothlock washer	1
M72		87-02		040642 (9003513-0800)	Nut	1
M75		87-02		505022	Control manifold (SB-1995-003)	1
M76		14-06		11127988	Solenoid valve, 12 volt, single pole (SB-2014-020)	1
M77		87-02		8800882	Manifold gasket	1
M78		95-10		693341 (9007314-0606)	Screw (SB-1995-003)	2
M78		87-02	95-09	041160 (9007314-0605)	Screw	2
M83		87-02		001123 (9004201-5000)	O-ring	1
M90		87-02		692889 (9007314-0611)	Screw	6
QM10		87-02		8510108	MDC kit w/12 volt solenoid, single pole, high force nss	1
QM034		87-02		11099649	Solenoid valve seal kit	1
QM036		14-06		11100383	Coil nut	1
QM037		14-06		11100388	Coil kit, 12 volt, single pole	1
QM89		87-02		8510170	Neutral start switch kit	1
QM210	14-06		11100049	Control seal kit	1	

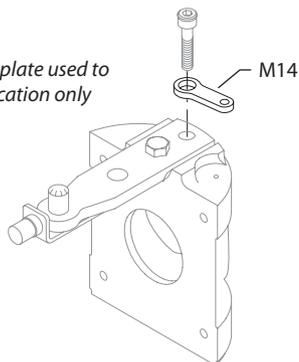


Variable displacement pump

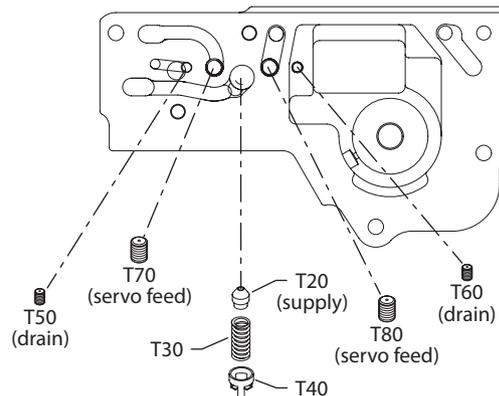
(PA & PB)



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.

E100 724E

* = included in control seal kit QM210

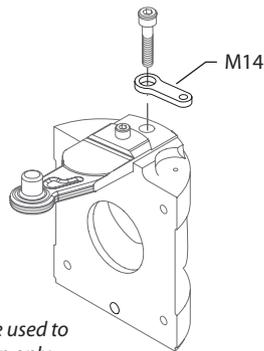
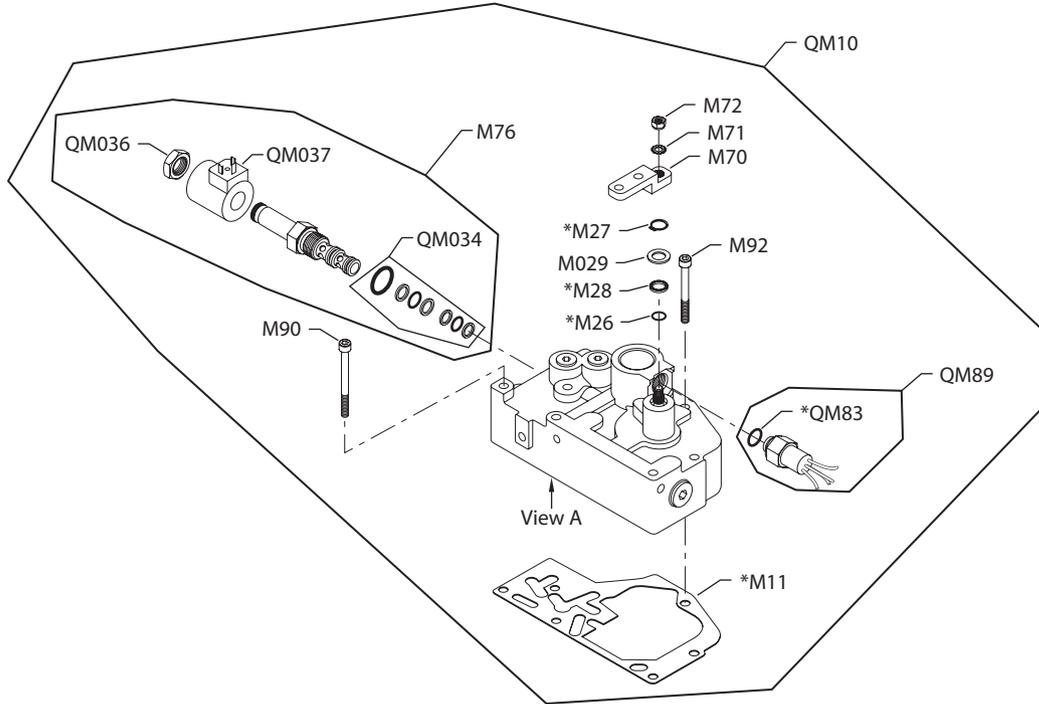

Variable displacement pump
Control

Order Code	Item	Date Begin	Date End	Part Number	Part Name	Qty. per Model/Kit	
PA	M9	96-33		782037	PDC, 12 volt	1	
	M11	96-33		K11419	Control gasket	1	
	M14	96-40		11070305	Feedback link (SB-1999-019, SB-2013-011)	1	
	M14	96-33	96-39	8000481	Feedback link (SB-1996-009)	1	
	M29	96-33		035592	Screw	4	
	M51	96-33		505412 (9003509-0008)	Seal nut	1	
	M76	96-33		11001795	Solenoid valve, 12 volt	2	
	M90	96-33		692889 (9007314-0611)	Screw	6	
	M95	96-33		011296 (9004105-0120)	O-ring	2	
	M96	96-33		688721	O-ring	1	
	M97	96-33		314534 (9004104-0310)	O-ring	1	
	M658	96-33		635938 (9004100-0210)	O-ring	2	
	QM10	96-33		8510165	HDC kit w/PDC, 12 volt	1	
	QM210	96-33		11096250	Control seal kit	1	
	PB	M9	08-29		782045	PDC, 24 volt	1
		M11	08-29		K11419	Control gasket	1
M14		08-29		11070305	Feedback link	1	
M29		08-29		035592	Screw	4	
M76		08-29		11001794	Solenoid valve, 24 volt	2	
M90		08-29		692889 (9007314-0611)	Screw	6	
M95		08-29		011296 (9004105-0120)	O-ring	2	
M96		08-29		688721	O-ring	1	
M97		08-29		314534 (9004104-0310)	O-ring	1	
M658		08-29		635938 (9004100-0210)	O-ring	2	
QM10		08-29		11034081	HDC kit w/PDC, 24 volt	1	
QM210		08-29		11096250	Control seal kit	1	

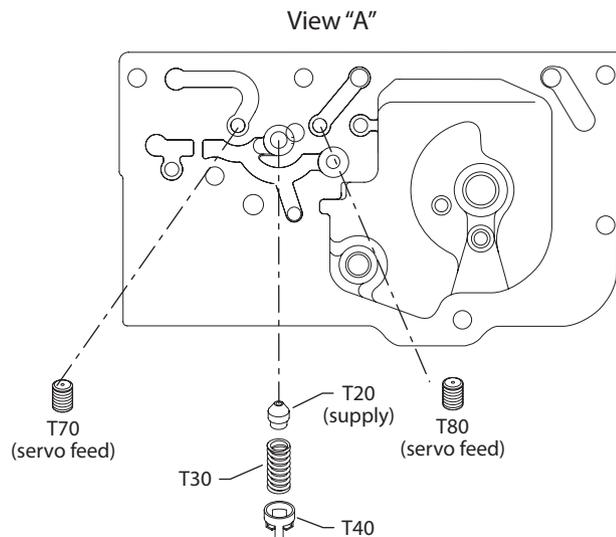


Variable displacement pump

(RU)



Generic washplate 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.

E100 725E

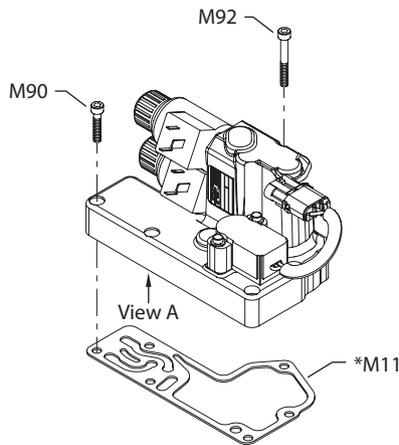

Variable displacement pump
Control

Order Code	Item	Date Begin	Date End	Part Number	Part Name	Qty. per Model/Kit
RU	M11	99-45		510379	Control gasket	1
	M14	99-45		11070305	Feedback link	1
	M26	99-45		144725	O-ring	1
	M27	99-45		042507	Retaining ring	1
	M28	99-45		510690	Lib seal	1
	M029	99-45		512047	Washer	1
	M70	99-45		769075	Control handle	1
	M71	99-45		9009660-3100	Toothlock washer	1
	M72	99-45		040642 (9003513-0800)	Nut	1
	M90	99-45		354407	Screw	5
	M92	99-45		510382	Screw	1
	M76	99-45		513017	Solenoid valve, 12 volt	1
	QM10	99-45		8510384	MDC kit, roller	1
	QM034	99-45		11099850	Solenoid valve seal kit	1
	QM036	14-06		11100383	Coil nut	1
	QM037	14-06		11100386	Coil kit, 12 volt, single pole	1
	QM83	99-45		001123 (9004201-3700)	O-ring	1
	QM89	99-45		11099847	Neutral start switch	1
	QM210	14-06		11100029	Control seal kit	1

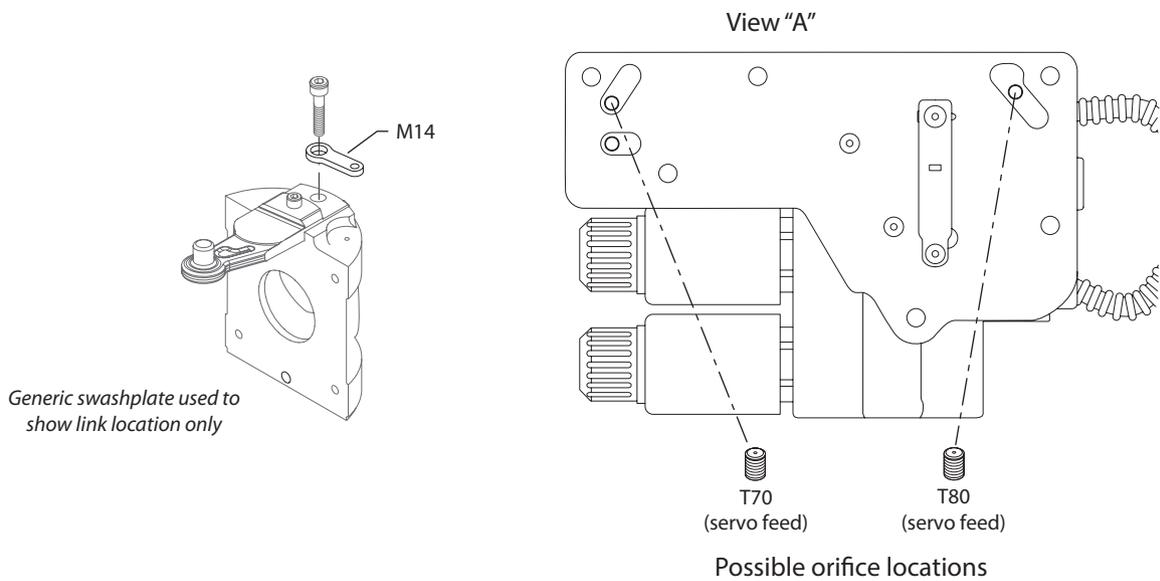


Variable displacement pump

(SA & SB)



NOTE: THIS CONTROL IS NOT AVAILABLE AS A SERVICE PART.



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 880E

* = included in control seal kit QM210



Variable displacement pump

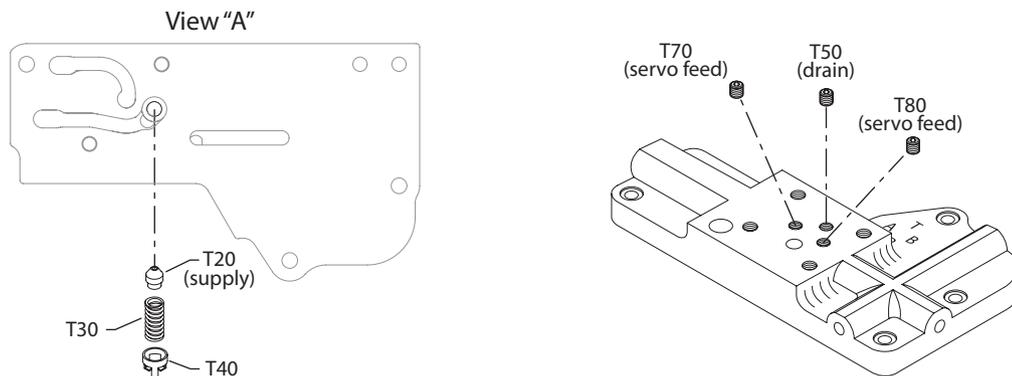
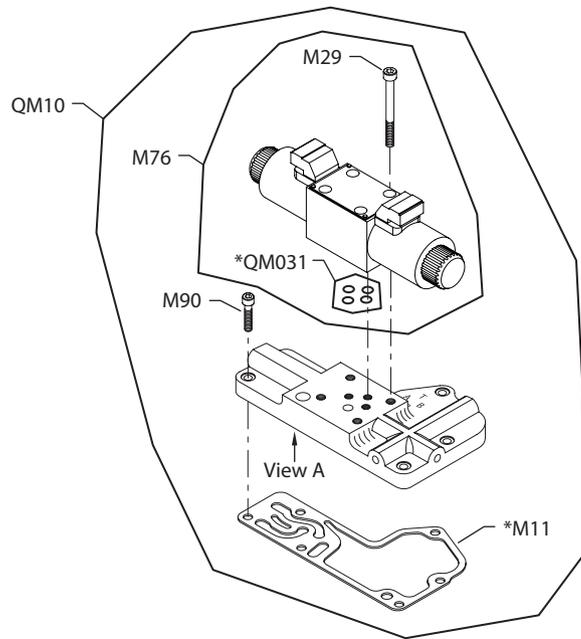
Control

Order Code	Item	Date Begin	Date End	Part Number	Part Name	Qty. per Model/Kit
SA	M11	07-03		8800520	Gasket	1
	M14	07-03		11070305	Feedback link	1
	M90	07-03		9007314-0608	Screw	5
	M92	07-03		9007314-0612	Screw	1
SB	M11	08-01		8800520	Gasket	1
	M14	08-01		11070305	Feedback link	1
	M90	08-01		9007314-0608	Screw	5
	M92	08-01		9007314-0612	Screw	1



Variable displacement pump

(SC)



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.

E101 881E

* = included in control seal kit QM210



Variable displacement pump

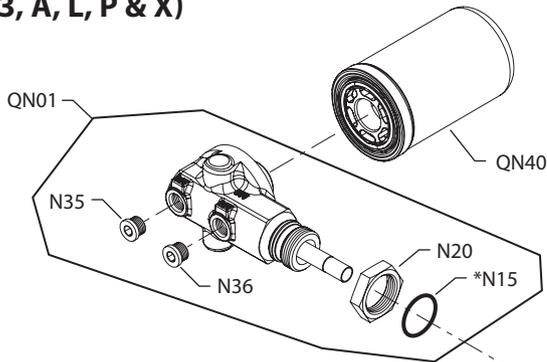
Control

Order Code	Item	Date Begin	Date End	Part Number	Part Name	Qty. per Model/Kit
SC	M11	99-11		8800520	Gasket	1
	M29	99-11		035592	Screw	4
	M76	99-11		509848/P	Solenoid valve	1
	M90	99-11		693341 (9007314-0606)	Screw	6
	QM10	99-11		8510385	Control kit, 3-position, 12 volt	1
	QM031	99-11		11099647	Valve seal kit	1
	QM210	99-11		11096161	Control seal kit	1

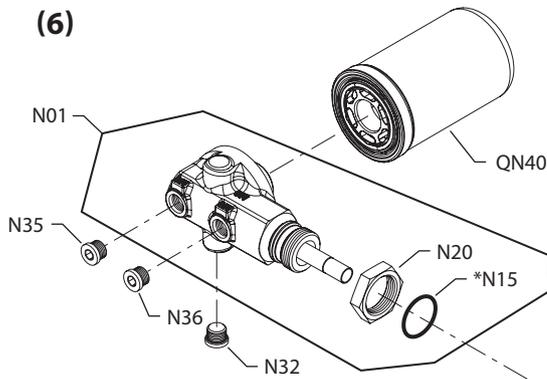


Variable displacement pump

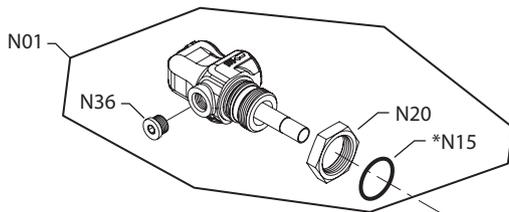
(3, A, L, P & X)



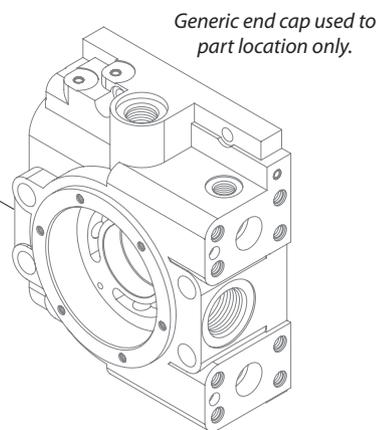
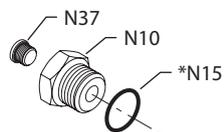
(6)



(R)



(S)



E100 726E

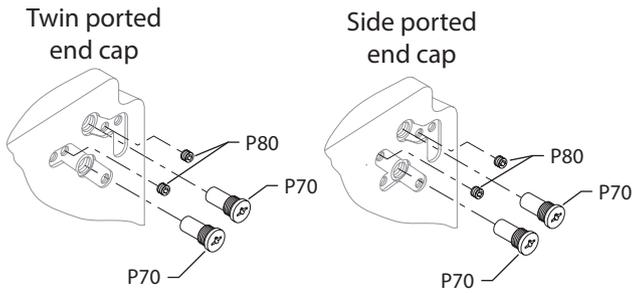
* = included in overhaul seal kit Q210


Variable displacement pump
Filtration

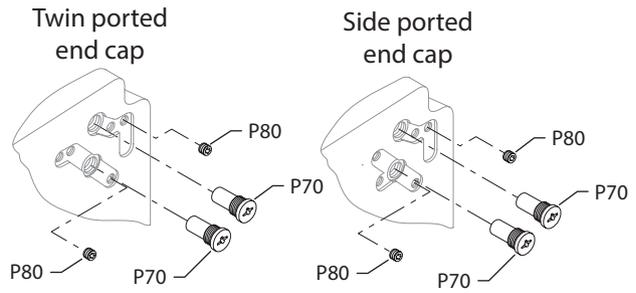
Order Code	Item	Date Begin	Date End	Part Number	Part Name	Qty. per Model/Kit
3 & X	N15	98-14		001172 (9004201-9000)	O-ring	1
	N20	98-14		11049997	Nut	1
	N35	98-14		140644	Plug assembly	1
	N36	98-14		140644	Plug assembly	1
	QN01	98-14		11145249	Filter manifold kit	1
	QN40	98-14		11004919	Filter, long	1
	6	N01	00-01		11060345	Filter manifold assembly
N15		00-01		001172 (9004201-9000)	O-ring	1
N20		00-01		11049997	Nut	1
N32		00-01		140644	Plug assembly	1
N35		00-01		140644	Plug assembly	1
N36		00-01		140644	Plug assembly	1
QN40		00-01		11004917	Filter, short	1
A		N15	98-14		001172 (9004201-9000)	O-ring
	N20	98-14		11049997	Nut	1
	N35	98-14		140644	Plug assembly	1
	N36	98-14		140644	Plug assembly	1
	QN01	98-14		11145249	Filter manifold kit	1
	QN40	98-14		11004917	Filter, short	1
	D				None	
L	N15	87-02		001172 (9004201-9000)	O-ring	1
	N20	95-18		11049997	Nut	1
	N20	87-02	95-17	700492 (9002863-1600)	Nut (SB-1994-036)	1
	N35	87-02		140644	Plug assembly	1
	N36	87-02		140644	Plug assembly	1
	QN01	98-14		11145249	Filter manifold kit	1
	QN40	87-02		11004919	Filter, long	1
	P	N15	87-02		001172 (9004201-9000)	O-ring
N20		95-18		11049997	Nut	1
N20		87-02	95-17	700492 (9002863-1600)	Nut (SB-1994-036)	1
N35		87-02		140644	Plug assembly	1
N36		87-02		140644	Plug assembly	1
QN01		98-14		11145249	Filter manifold kit	1
QN40		87-02		11004917	Filter, short	1
R		N01	87-42		11060427	Filter manifold assembly
	N15	87-42		001172 (9004201-9000)	O-ring	1
	N20	87-42		11049997	Nut	1
	N36	87-42		140644	Plug assembly	1
	S	N10	87-42		5000230	Reducer assembly
N15		87-42		001172 (9004201-9000)	O-ring	1
N37		87-42		140644	Plug assembly	1



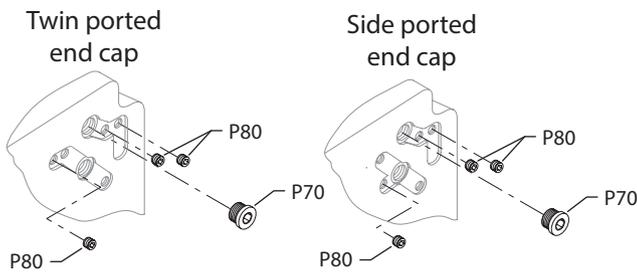
Variable displacement pump



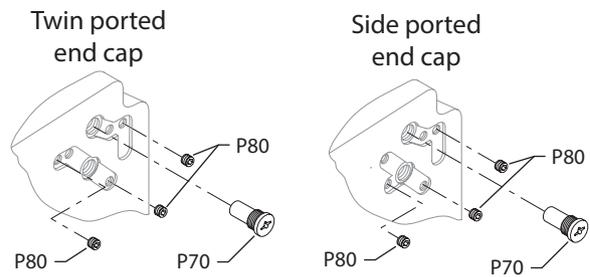
View "A" with pressure limiters, left hand rotation, (1, 5 & 6)



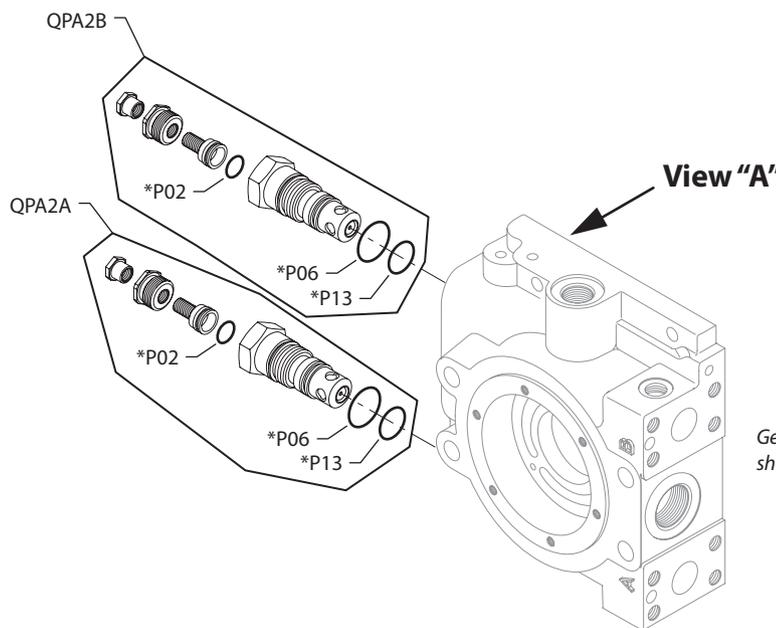
View "A" with pressure limiters, right hand rotation, (1, 5 & 6)



View "A" without pressure limiters, left/right hand rotation (2 & 7)



View "A" with pressure limiter port A, HPRV port B, right hand rotation (B)



Generic end caps used to show valve location only

E100 727E

* = included in overhaul seal kit Q210

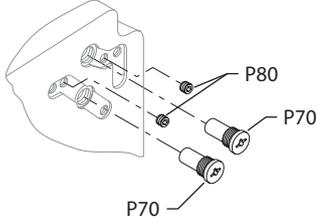

Variable displacement pump
High pressure regulation

Order Code	Item	Date Begin	Date End	Part Number	Part Name	Qty. per Model/Kit
1	P02	87-02		688721	O-ring	2
	P06	87-02		071811	O-ring	2
	P13	87-02		544742 (9004105-0190)	O-ring	2
	P70	87-02		8800188	Check valve assembly	2
	P80	87-02		9005475-0004	Special pipe plug	2
	QPA2A	87-02		8510022-1	Multi-function valve kit	1
	QPA2B	87-02		8510022-1	Multi-function valve kit	1
	2	P02	87-02		688721	O-ring
P06		87-02		071811	O-ring	2
P13		87-02		544742 (9004105-0190)	O-ring	2
P70		87-02		327007 (9005110-4400)	Plug assembly	1
P80		87-02		9005475-0004	Special pipe plug	3
QPA2A		87-02		8510022-2	Multi-function valve kit	1
QPA2B		87-02		8510022-2	Multi-function valve kit	1
5		P02	87-02		688721	O-ring
	P06	87-02		071811	O-ring	2
	P13	87-02		544742 (9004105-0190)	O-ring	2
	P70	87-02		8800188	Check valve assembly	2
	P80	87-02		9005475-0004	Special pipe plug	2
	QPA2A	87-02		8510240	Multi-function valve kit	1
	QPA2B	87-02		8510240	Multi-function valve kit	1
	6	P02	87-02		688721	O-ring
P06		87-02		071811	O-ring	2
P13		87-02		544742 (9004105-0190)	O-ring	2
P70		87-02		8800188	Check valve assembly	2
P80		87-02		9005475-0004	Special pipe plug	2
QPA2A		87-02		8510022-6	Multi-function valve kit	1
QPA2B		87-02		8510022-6	Multi-function valve kit	1
7		P02	87-02		688721	O-ring
	P16	87-02		071811	O-ring	2
	P13	87-02		544742 (9004105-0190)	O-ring	2
	P70	87-02		327007 (9005110-4400)	Plug assembly	1
	P80	87-02		9005475-0004	Special pipe plug	3
	QPA2A	87-02		8510022-7	Multi-function valve kit	1
	QPA2B	87-02		8510022-7	Multi-function valve kit	1
	B	P02	87-02		688721	O-ring
P06		87-02		071811	O-ring	2
P13		87-02		544742 (9004105-0190)	O-ring	2
P70		87-02		8800188	Check valve assembly	1
P80		87-02		9005475-0004	Special pipe plug	3
QPA2A		87-02		8510022-1	Multi-function valve kit	1
QPA2B		87-02		8510022-7	Multi-function valve kit	1

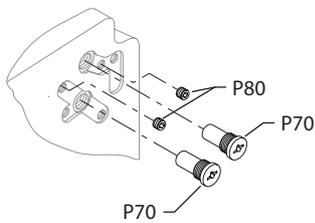


Variable displacement pump

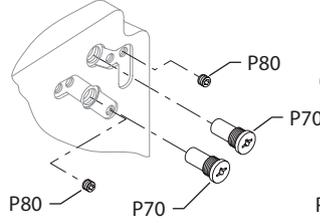
Twin ported end cap



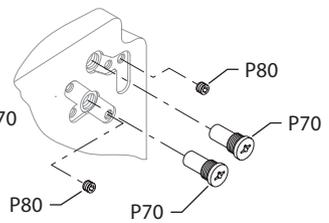
Side ported end cap



Twin ported end cap

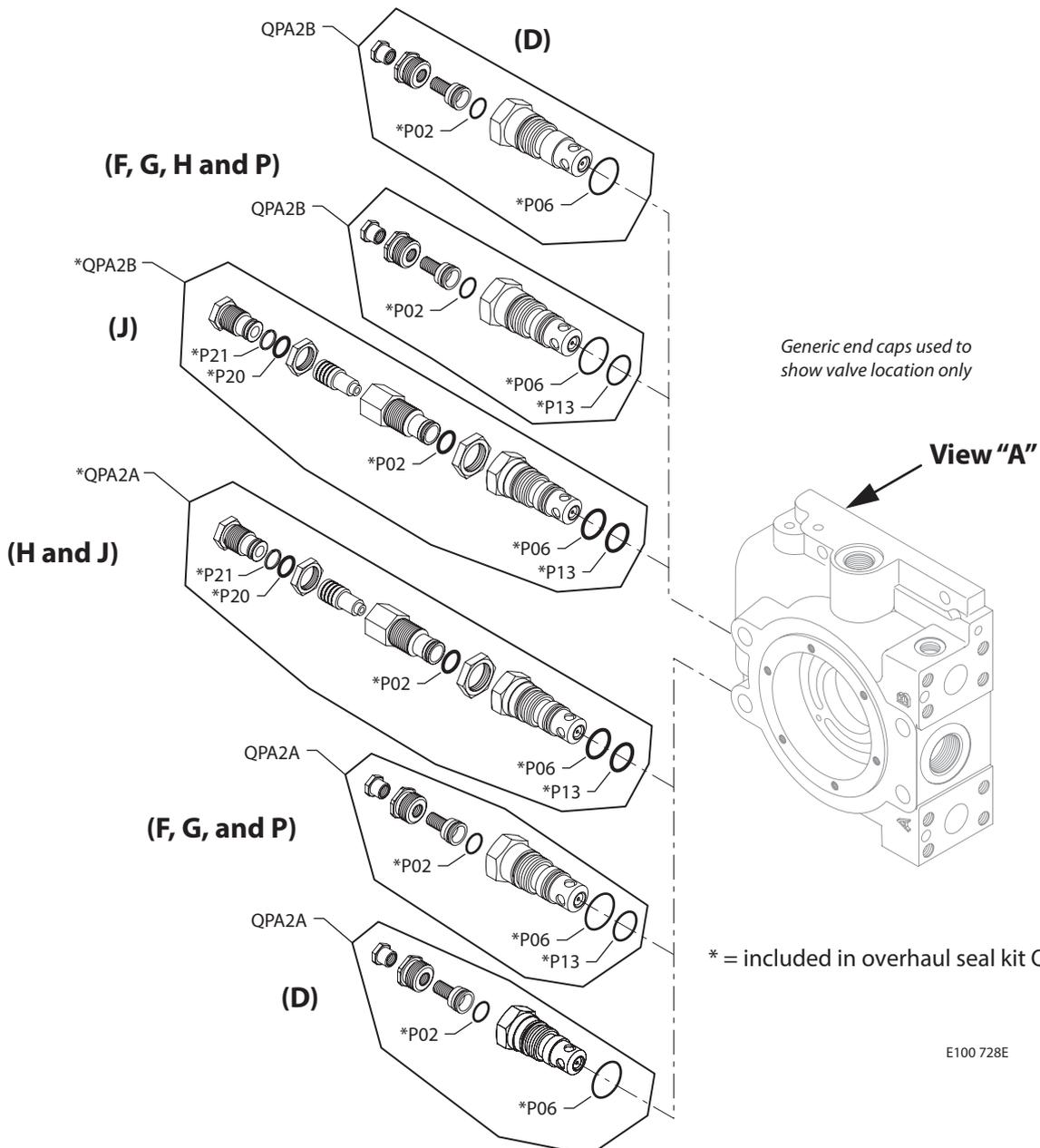


Side ported end cap



View "A" with pressure limiters, left hand rotation, (F, G, H and P)

View "A" with pressure limiters, right hand rotation, (F, G, H and P)



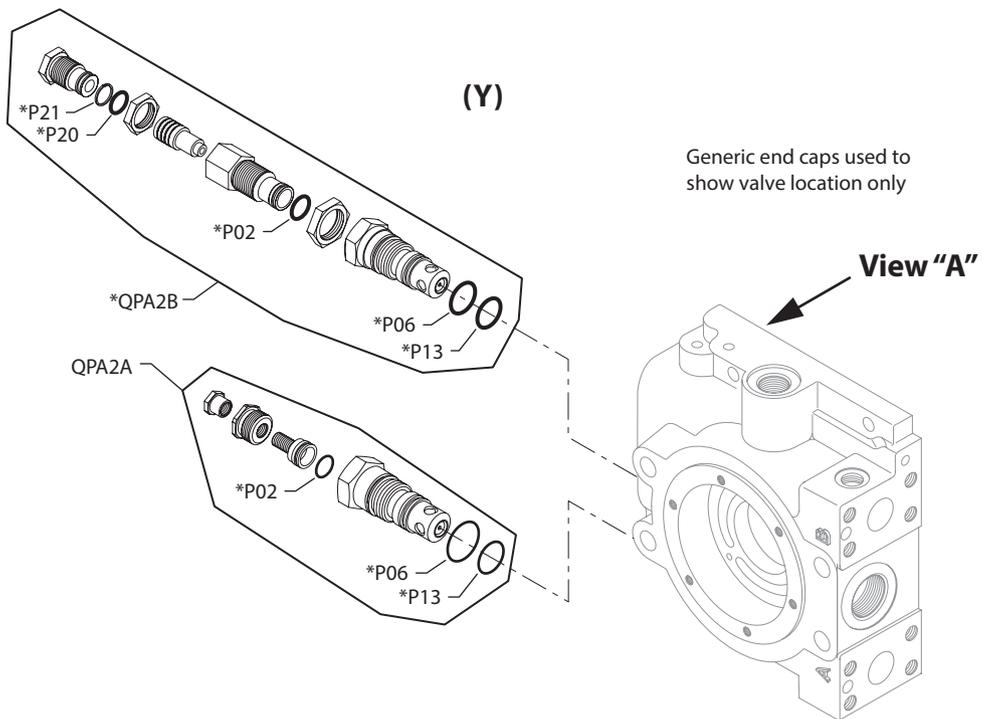
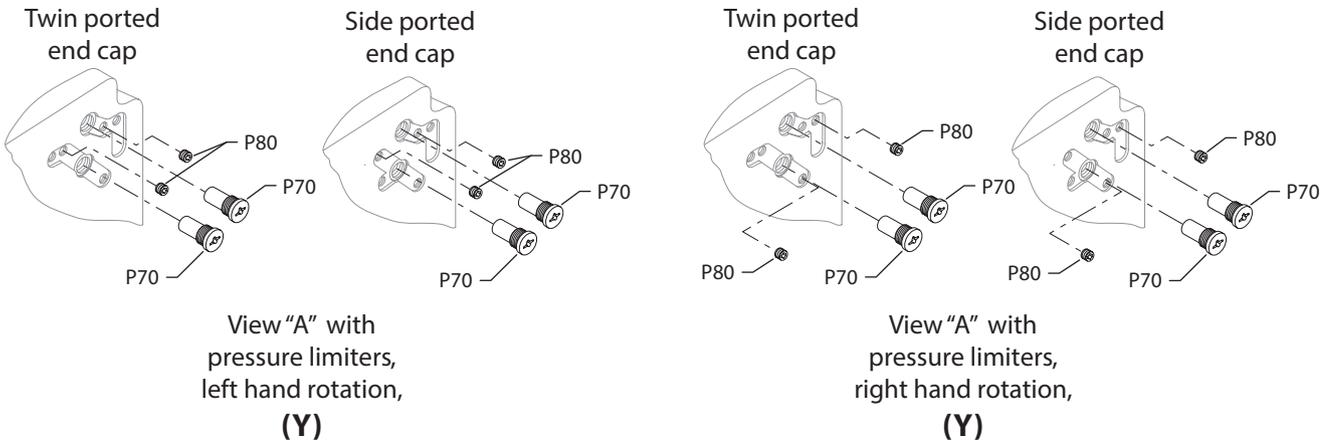
E100 728E


Variable displacement pump
High pressure regulation

Order Code	Item	Date Begin	Date End	Part Number	Part Name	Qty. per Model/Kit	
D	P02	92-22		688721	O-ring	2	
	P06	92-22		071811	O-ring	2	
	QPA2A	92-22		8510388	Multi-function valve kit	1	
	QPA2B	92-22		8510388	Multi-function valve kit	1	
F	P02	98-29		688721	O-ring	2	
	P06	98-29		071811	O-ring	2	
	P13	98-29		544742 (9004105-0190)	O-ring	2	
	P70	98-29		8800188	Check valve	2	
	P80	98-29		9005475-0004	Special plug	2	
	QPA2A	98-29		8510022-2	Multi-function valve kit	1	
	QPA2B	98-29		8510022-2	Multi-function valve kit	1	
	G	P02	97-06		688721	O-ring	2
P06		97-06		071811	O-ring	2	
P13		97-06		544742 (9004105-0190)	O-ring	2	
P70		97-06		8800188	Check valve	2	
P80		97-06		9005475-0004	Special plug	2	
QPA2A		97-06		8510196	Multi-function valve kit	1	
QPA2B		97-06		8510196	Multi-function valve kit	1	
H		P02	97-40		688721	O-ring	2
	P06	97-40		071811	O-ring	2	
	P13	97-40		544742 (9004105-0190)	O-ring	2	
	P20	97-40		9004105-0160	O-ring	1	
	P21	97-40		9006110-0160	Back up ring	1	
	P70	97-40		8800188	Check valve	2	
	P80	97-40		9005475-0004	Special plug	2	
	QPA2A	97-40		8510275	Multi-function valve kit, dual setting	1	
	QPA2B	97-40		8510022-1	Multi-function valve kit	1	
	J	P02	97-40		688721	O-ring	2
		P06	97-40		071811	O-ring	2
P13		97-40		544742 (9004105-0190)	O-ring	2	
P20		97-40		9004105-0160	O-ring	2	
P21		97-40		9006110-0160	Back up ring	2	
QPA2A		97-40		8510275	Multi-function valve kit, dual setting	1	
QPA2B		97-40		8510275	Multi-function valve kit, dual setting	1	
P		P02	99-26		688721	O-ring	2
	P06	99-26		071811	O-ring	2	
	P13	99-26		544742 (9004105-0190)	O-ring	2	
	P70	99-26		8800188	Check valve assembly	2	
	P80	99-26		9005475-0004	Special pipe plug	2	
	QPA2A	99-26		8510389	Multi-function valve kit	1	
	QPA2B	99-26		8510389	Multi-function valve kit	1	



Variable displacement pump



E101 882E

* = included in overhaul seal kit Q210



Variable displacement pump

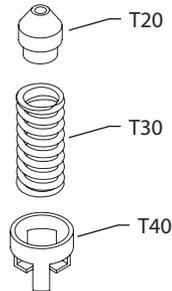
High pressure regulation

Order Code	Item	Date Begin	Date End	Part Number	Part Name	Qty. per Model/Kit
Y	P02	12-01		688721	O-ring	2
	P06	12-01		071811	O-ring	2
	P13	12-01		544742 (9004105-0190)	O-ring	2
	P20	12-01		9004105-0160	O-ring	1
	P21	12-01		9006110-0160	Back up ring	1
	P70	12-01		8800188	Check valve	2
	P80	12-01		9005475-0004	Special plug	2
	QPA2A	12-01		8510022-1	Multi-function valve kit	1
	QPA2B	12-01		8510275	Multi-function valve kit, dual setting	1



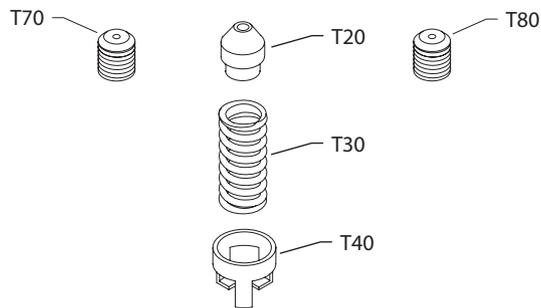
Variable displacement pump

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



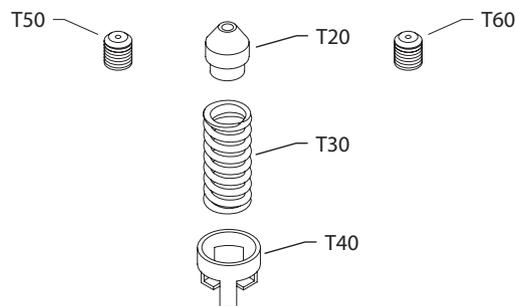
See control drawing
for orifice location

(07 & 21)



See control drawing
for orifice location

(20)



See control drawing
for orifice location

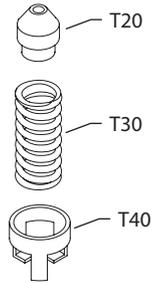

Variable displacement pump
Orifice

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
07	T20	87-42		8801139	Orificed check valve, 1.02mm	1
	T30	87-42		679506 (8700007)	Spring	1
	T40	87-42		8801303	Spring retainer	1
	T70	87-42		310771	Orifice plug, 1.2mm, M6 x 6	1
	T80	87-42		310771	Orifice plug, 1.2mm, M6 x 6	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
20	T20	87-42		8801136	Orificed check valve, .18mm	1
	T30	87-42		679506 (8700007)	Spring	1
	T40	87-42		8801303	Spring retainer	1
	T50	87-42		639161	Orifice plug, 1.4mm, M5 x 6	1
	T60	87-42		639161	Orifice plug, 1.4mm, M5 x 6	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		714477	Orifice plug, 0.8mm, M8 x 8	1



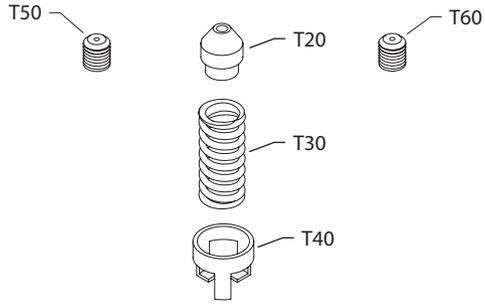
Variable displacement pump

(22)



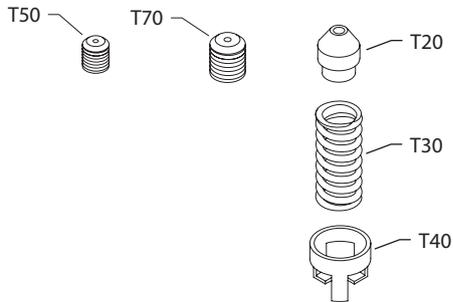
See control drawing
for orifice location

(26 & 29)



See control drawing
for orifice location

(28, 30 & 35)



See control drawing
for orifice location

(34)



See control drawing
for orifice location

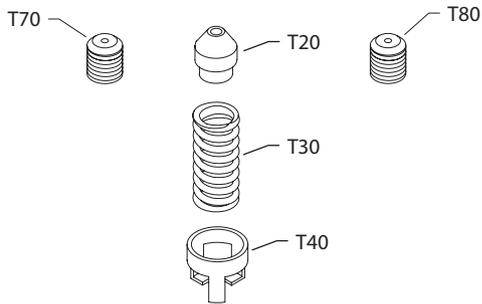

Variable displacement pump
Orifice

Order Code	Item	Date Begin	Date End	Part Number	Part Name	Qty. per Model/Kit
22	T20	87-42		8801137	Orificed check valve, .022"	1
	T30	87-42		679506 (8700007)	Spring	1
	T40	87-42		8801303	Spring retainer	1
26	T20	87-42		11061958	Orificed check valve, .81mm	1
	T30	87-42		679506 (8700007)	Spring	1
	T40	87-42		8801303	Spring retainer	1
	T50	87-42		11062004	Orifice plug, 0.8mm, M5 x 6	1
	T60	87-42		11062004	Orifice plug, 0.8mm, M5 x 6	1
28	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		11062012	Orifice plug, 0.7mm, M5 x 6	1
	T60	87-42		11062012	Orifice plug, 0.7mm, M5 x 6	1
	T70	87-42		11062018	Orifice plug, 0.7mm, M8 x 8	1
	T80	87-42		11062018	Orifice plug, 0.7mm, M8 x 8	1
29	T20	87-42		11061958	Orificed check valve, .81mm	1
	T30	87-42		679506 (8700007)	Spring	1
	T40	87-42		8801303	Spring retainer	1
	T50	87-42		11062012	Orifice plug, 0.7mm, M5 x 6	1
	T60	87-42		11062012	Orifice plug, 0.7mm, M5 x 6	1
30	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		639153	Orifice plug, 1.3mm, M5 x 6	1
	T60	87-42		639153	Orifice plug, 1.3mm, M5 x 6	1
	T70	87-42		11062018	Orifice plug, 0.7mm, M8 x 8	1
	T80	87-42		11062018	Orifice plug, 0.7mm, M8 x 8	1
33				None		
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
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		11062004	Orifice plug, 0.8mm, M5 x 6	1
	T60	87-42		11062004	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



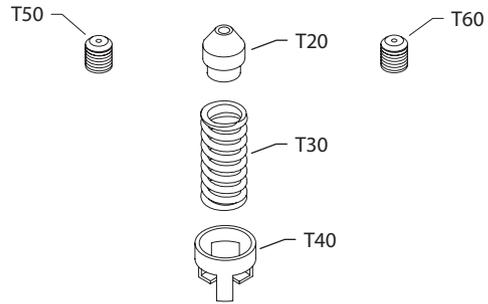
Variable displacement pump

(36 & 42)



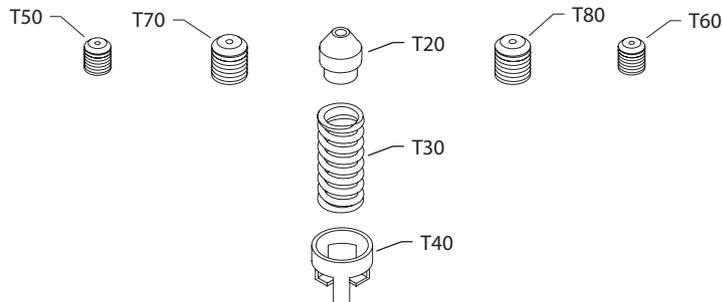
See control drawing
for orifice location

(39, 40 & 47)



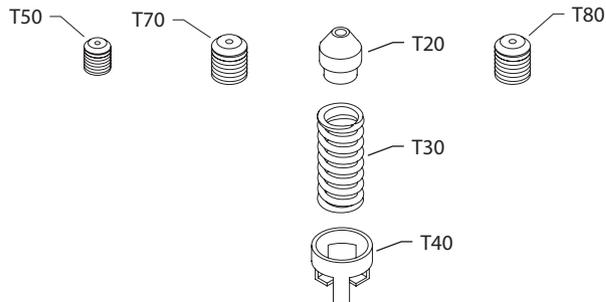
See control drawing
for orifice location

(48)



See control drawing
for orifice location

(50)



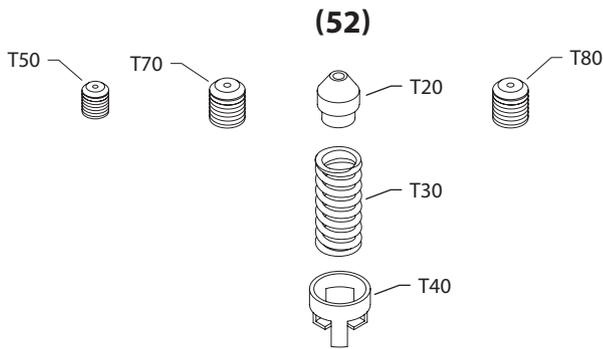
See control drawing
for orifice location


Variable displacement pump
Orifice

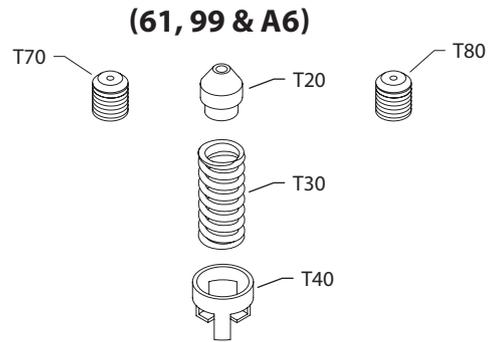
Order Code	Item	Date Begin	Date End	Part Number	Part Name	Qty. per Model/Kit
36	T20	87-42		11061958	Orificed check valve, 0.81mm	1
	T30	87-42		679506 (8700007)	Spring	1
	T40	87-42		8801303	Spring retainer	1
	T70	87-42		11062018	Orifice plug, 0.7mm, M8 x 8	1
	T80	87-42		11062018	Orifice plug, 0.7mm, M8 x 8	1
39	T20	87-42		8801139	Orificed check valve, 1.37mm	1
	T30	87-42		679506 (8700007)	Spring	1
	T40	87-42		8801303	Spring retainer	1
	T50	87-42		11066593	Orifice plug, 1.0mm, M5 x 6	1
	T60	87-42		11066593	Orifice plug, 1.0mm, M5 x 6	1
40	T20	87-42		11061970	Orificed check valve, 1.02mm	1
	T30	87-42		679506 (8700007)	Spring	1
	T40	87-42		8801303	Spring retainer	1
	T50	87-42		755793	Orifice plug, 1.0mm, M8 x 8	1
	T60	87-42		755793	Orifice plug, 1.0mm, M8 x 8	1
42	T20	87-42		11061958	Orificed check valve, 0.81mm	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		714477	Orifice plug, 0.8mm, M8 x 8	1
47	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		617159	Orifice plug, 1.8mm, M5 x 6	1
	T60	87-42		617159	Orifice plug, 1.8mm, M5 x 6	1
48	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		11062004	Orifice plug, 0.8mm, M5 x 6	1
	T60	87-42		11062004	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
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



Variable displacement pump

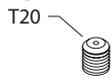


See control drawing
for orifice location



See control drawing
for orifice location

(70 & 71)

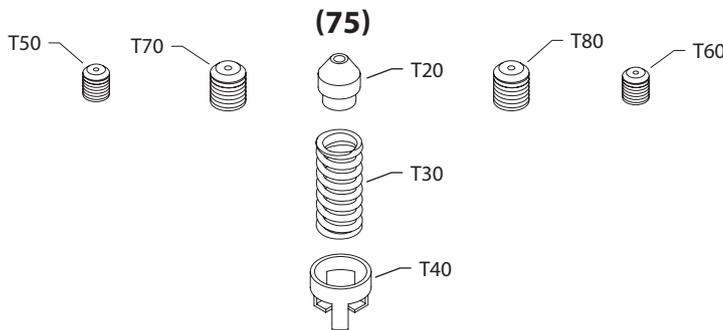


See control drawing
for orifice location

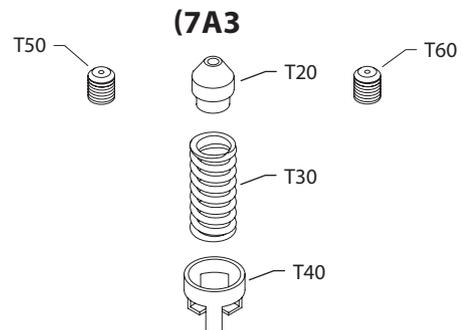
(72)



See control drawing
for orifice location



See control drawing
for orifice location



See control drawing
for orifice location

(A4)



See control drawing
for orifice location

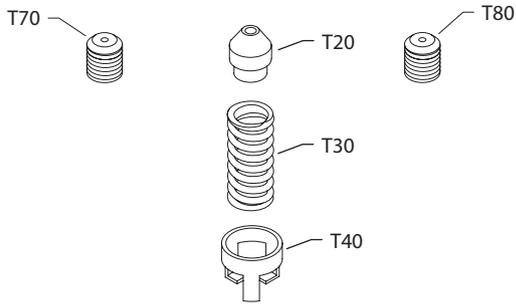

Variable displacement pump
Orifice

Order Code	Item	Date Begin	Date End	Part Number	Part Name	Qty. per Model/Kit
52	T20	87-42		11061970	Orificed check valve, 1.02mm	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		739144	Orifice plug, 0.8mm, M6 x 6	1
	T80	87-42		739144	Orifice plug, 0.8mm, M6 x 6	1
	61	T20	87-42		8801136	Orificed check valve, .018"
T30		87-42		679506 (8700007)	Spring	1
T40		87-42		8801303	Spring retainer	1
T70		87-42		755793	Orifice plug, 1.0mm, M8 x 8	1
T80		87-42		755793	Orifice plug, 1.0mm, M8 x 8	1
70		T20	87-42		11062005	Orificed check valve, 0.635mm
71	T20	87-42		11061957	Orificed check valve, 0.79mm	1
72	T50	87-42		617159	Orifice plug, 1.8mm, M5 x 6	1
	T60	87-42		617159	Orifice plug, 1.8mm, M5 x 6	1
75	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		11066593	Orifice plug, 1.0mm, M5 x 6	1
	T60	87-42		11066593	Orifice plug, 1.0mm, 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
	99	T20	87-42		8801301	Orificed check valve, .047"
T30		87-42		679506 (8700007)	Spring	1
T40		87-42		8801303	Spring retainer	1
T70		87-42		517572	Orifice plug, 1.5mm, M6 x 6	1
T80		87-42		517572	Orifice plug, 1.5mm, M6 x 6	1
A3		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		739136	Orifice plug, 0.7mm, M6 x 6	1
	T60	87-42		739136	Orifice plug, 0.7mm, M6 x 6	1
	A4	T70	87-42		11061979	Orifice plug, 0.8mm, M6 x 8
T80		87-42		11061979	Orifice plug, 0.8mm, M6 x 8	1
A6	T20	87-42		8801139	Orificed check valve, .026"	1
	T30	87-42		679506 (8700007)	Spring	1
	T40	87-42		8801303	Spring retainer	1
	T70	87-42		763680	Orifice plug, 0.6mm, M6 x 6	1
	T80	87-42		763680	Orifice plug, 0.6mm, M6 x 6	1



Variable displacement pump

(A7 & D3)



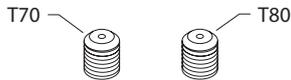
See control drawing
for orifice location

(B1 & G1)



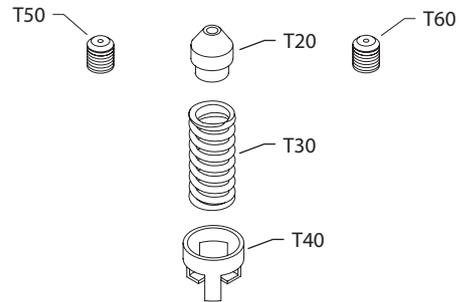
See control drawing
for orifice location

(B2)



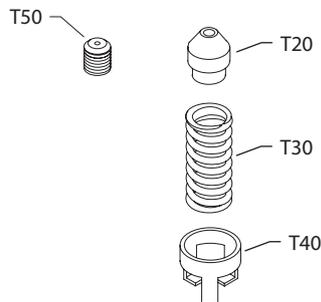
See control drawing
for orifice location

(C3, C5 & C6)



See control drawing
for orifice location

(G4 & G8)



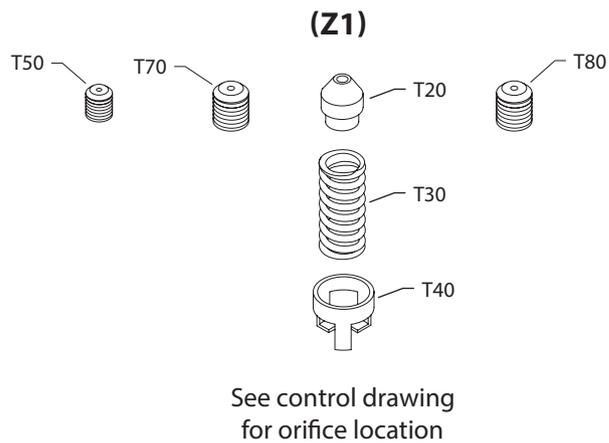
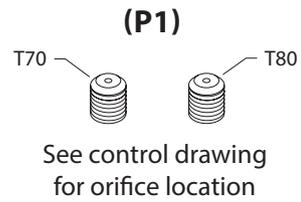
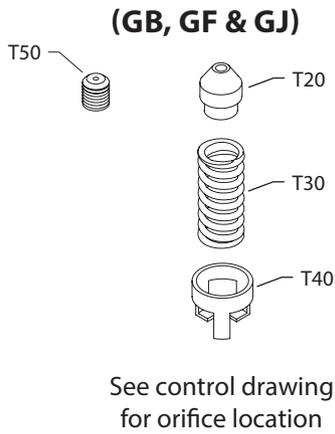
See control drawing
for orifice location


Variable displacement pump
Orifice

Order Code	Item	Date Begin	Date End	Part Number	Part Name	Qty. per Model/Kit
A7	T20	87-42		11061958	Orificed check valve, 0.81mm	1
	T30	87-42		679506 (8700007)	Spring	1
	T40	87-42		8801303	Spring retainer	1
	T70	87-42		11061979	Orifice plug, 0.8mm, M6 x 8	1
	T80	87-42		11061979	Orifice plug, 0.8mm, M6 x 8	1
B1	T50	87-42		507042	Orificed check valve, 1.5mm, M6 x 8	1
B2	T70	87-42		310771	Orifice plug, 1.2mm, M6 x 6	1
	T80	87-42		310771	Orifice plug, 1.2mm, M6 x 6	1
C3	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		11061989	Orifice plug, 1.3mm, M5 x 6	1
	T60	87-42		11061989	Orifice plug, 1.3mm, M5 x 6	1
C5	T20	87-42		11061958	Orificed check valve, .81mm	1
	T30	87-42		679506 (8700007)	Spring	1
	T40	87-42		8801303	Spring retainer	1
	T50	87-42		639161	Orifice plug, 1.4mm, M5 x 6	1
	T60	87-42		639161	Orifice plug, 1.4mm, M5 x 6	1
C6	T20	87-42		11061970	Orificed check valve, 1.02mm	1
	T30	87-42		679506 (8700007)	Spring	1
	T40	87-42		8801303	Spring retainer	1
	T50	87-42		639161	Orifice plug, 1.4mm, M5 x 6	1
	T60	87-42		639161	Orifice plug, 1.4mm, M5 x 6	1
D3	T20	87-42		11061981	Orificed check valve, 1.37mm	1
	T30	87-42		679506 (8700007)	Spring	1
	T40	87-42		8801303	Spring retainer	1
	T70	87-42		11062018	Orifice plug, 0.7mm, M8 x 8	1
	T80	87-42		11062018	Orifice plug, 0.7mm, M8 x 8	1
G1	T50	87-42		310771	Orificed check valve, 1.2mm, M6 x 6	1
G4	T20	87-42		8801136	Orificed check valve, .018"	1
	T30	87-42		679506 (8700007)	Spring	1
	T40	87-42		8801303	Spring retainer	1
	T50	87-42		310771	Orificed check valve, 1.2mm, M6 x 6	1
G8	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	Orificed check valve, 1.2mm, M6 x 6	1



Variable displacement pump




Variable displacement pump
Orifice

Order Code	Item	Date Begin	Date End	Part Number	Part Name	Qty. per Model/Kit
GB	T20	87-42		11061958	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
GF	T20	87-42		11061970	Orificed check valve, 1.02mm	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
GJ	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		310771	Orifice plug, 1.2mm, M6 x 6	1
P1	T70	87-42		508014	Orifice plug, 1.0mm, M6 x 8	1
	T80	87-42		508014	Orifice plug, 1.0mm, M6 x 8	1
Z1	T20	87-42		11061958	Orificed check valve, .81mm	1
	T30	87-42		679506 (8700007)	Spring	1
	T40	87-42		8801303	Spring retainer	1
	T50	87-42		519659	Orifice plug, 1.0mm, M6 x 6	1
	T70	87-42		519659	Orifice plug, 1.0mm, M6 x 6	1
	T80	87-42		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		11095647	Overhaul seal kit	1
	B90	87-42		9803390	Filter screen	3
	C70	87-42		648477	Screw	4
	E40	87-42		505412 (9003509-0008)	Seal nut	2
	E50	87-42		056739 (9004104-1580)	O-ring	1
	E60	87-02		5000206	Screw (SB-1994-018)	6
	F11	87-02		314500 (9004100-1250)	O-ring	2
	F12	87-02		8700065	Piston ring	2
	F40	88-43		353953 (9004104-1330)	O-ring	2
	F50	87-02		314534 (9004104-0310)	O-ring	2
	F112	87-02		505412 (9003509-0008)	Seal nut, M8	1
	F124	87-02		336826	Seal nut, M10	1
	F212	87-02		505412 (9003509-0008)	Seal nut, M8	1
	F224	87-02		336826	Seal nut, M10	1
	G30	89-17		8000243	End cap gasket (SB-1989-037 & SB-1992-003)	1
	J40	87-02		680892 (9004104-0440)	O-ring	1
	J50	87-02		056739 (9004104-1580)	O-ring	1
	K50	87-02		001149 (9004201-6200)	O-ring	1
	L25	87-02		11083637	Lip seal (SB-2010-025)	1
	L60	87-02		11083638	Retainer plate (SB-2010-025)	1
	N15	87-42		001172 (9004201-9000)	O-ring	1
	P02	87-02		688721	O-ring	2
	P06	87-42		071811	O-ring	2
	P13	87-42		544742 (9004105-0190)	O-ring	2
	P20	87-42		9004105-0160	O-ring	2
	P21	87-42		9006110-0160	Back up ring	2

**BLN-10107**

To improve efficiency and reliability, the number of parts in series 90 pumps is being reduced. The charge pump design on 55 cc - 130 cc frame sizes is being changed so that the outer port plate is an integral part of the charge pump cover and distance plates are eliminated. The change is taking effect at the following manufacturing dates:

55 cc: 93-10 75 cc: 93-10 100 cc: 93-15 130 cc: 93-34

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

The charge pump shaft also changes and must be replaced when using the new style hardware. The complete charge pump assembly can be interchanged with corresponding hardware from 89-17 and beyond. However, piece parts are not interchangeable. For units prior to 89-17, consult Sauer-Danfoss.

The old design charge pump hardware is obsolete and is no longer available. Refer to the chart on the next page to determine the replacement kit.


BLN-10107

The following information must be known to determine the correct charge pump replacement kit:

1. Unit size (055, 075, 100, or 130 cc)
2. Charge pump displacement (11, 14, 17, 20, 26, or 34 cc)
3. Auxiliary pad (Yes or No)
4. Rotation (LH or RH)

Obsolete Charge Pump Parts			Unit Size	Chg. pump displacement	Auxiliary pad	Rotation	Replacement Kit
Gear Set	Shaft	Cover					
8000169	8000174	8800513	055	11 cc	No	LH or RH	8510028
		8800514			Yes	LH	8510029
		8800514			Yes	RH	8510030
8000170	8000174	8800513	055	14 cc	No	LH or RH	8510031
		8800514			Yes	LH	8510032
		8800514			Yes	RH	8510033
8000171	8000174	8800513	055	17 cc	No	LH or RH	8510034
		8800514			Yes	LH	8510035
		8800514			Yes	RH	8510036
8100313	337956	8800513	075	14 cc	No	LH or RH	8510037
		8800514			Yes	LH	8510038
		8800514			Yes	RH	8510039
8100314	337956	8800513	075	17 cc	No	LH or RH	8510040
		8800514			Yes	LH	8510041
		8800514			Yes	RH	8510042
8100315	337956	8800513	075	20 cc	No	LH or RH	8510043
		8800514			Yes	LH	8510044
		8800514			Yes	RH	8510045
8200158	337956	8800513	100	17 cc	No	LH or RH	8510046
		8800514			Yes	LH	8510047
		8800514			Yes	RH	8510048
8200159	337956	8800513	100	20 cc	No	LH or RH	8510049
		8800514			Yes	LH	8510050
		8800514			Yes	RH	8510051
8200160	337956	8800513	100	26 cc	No	LH or RH	8510052
		8800514			Yes	LH	8510053
		8800514			Yes	RH	8510054
714444	303636	347518	130	20 cc	No	LH or RH	8510064
		347526			Yes	LH	8510065
		347526			Yes	RH	8510066
714451	303636	347518	130	26 cc	No	LH or RH	8510067
		347526			Yes	LH	8510068
		347526			Yes	RH	8510069
714469	303636	347518	130	34 cc	No	LH or RH	8510070
		347526			Yes	LH	8510071
		347526			Yes	RH	8510072



Service Bulletin: SB-1988-009

Products affected Series 90 pumps

Subject Servo arm change

Description As a product improvement, Sauer-Danfoss has changed the series 90 pump servo arm and swashplate (item D10 and D50). The old style servo arm and swashplate will become obsolete. Because this change creates non-interchangeability between new and old swashplates, servo arms, and possibly servo piston (item S10) and slider block (item F20), separate servo arms and swashplates will no longer be sold as service parts.

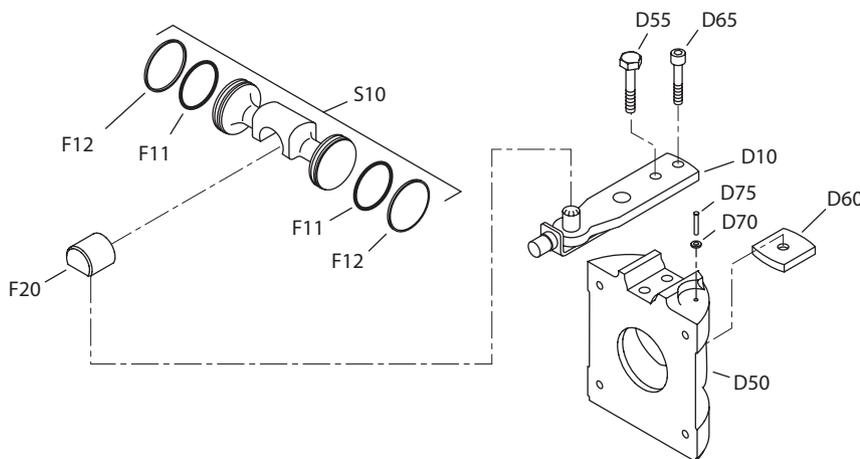
Also, the new servo arm is actually a press fit into a groove in the new swashplate. This situation requires special tooling for assembly, therefore, pre-assembled kits will be created for 55, 75, and 100 cc pumps. The kits will work in any vintage pump.

The kit for 55 cc pumps will include all the items in the figure, except item S10

The kit for 75 cc pumps will include all item in the figure.

The kit for 100 cc pumps will include all items in the figure, except items S10 and F20.

Note: The slider block (item F20) in 55 cc pumps and the slider block and the servo piston (item S10) in 75 cc pumps had to be changed slightly to allow clearance for the new servo arm. The new servo piston and slider block will work in any vintage pump.



Models affected All 94-2xxx (55 cc), 95-2xxx (75 cc), and 96-2xxx (100 cc) pumps

Serial numbers Change goes into effect with s/n 88-14-xxxxx on 55 cc pumps and with s/n 88-16-xxxxx for 75 cc and 100 cc pumps.

Part numbers affected

- New 55 cc slider block is p/n 8000189
- New 75 cc slider block is p/n 8100368
- New 100 cc slider block is p/n 8100369
- New 55 cc servo arm/swashplate kit is p/n 8000201
- New 75 cc servo arm/swashplate kit is p/n 8100377
- New 100 cc servo arm/swashplate kit is p/n 8200192

Parts disposition ■ Non-interchangeable



Service Bulletin: SB-1988-016

Products affected

Series 90 pumps

Subject

Change to fixed clearance slipper hold down

Description

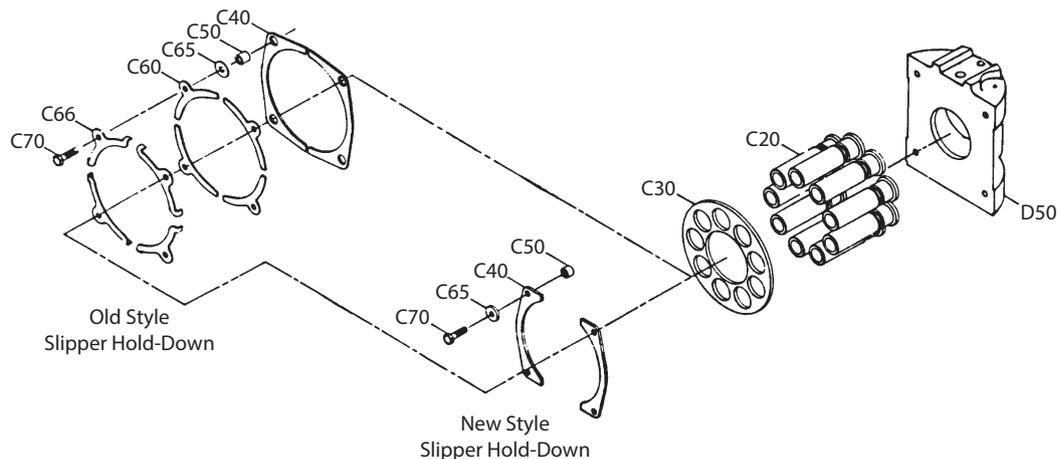
As a product improvement, Sauer-Danfoss has simplified the design of the series 90 pump slipper hold down mechanism. The hold down changes from spring loaded with a fixed maximum clearance design.

The leaf spring (item C60) and spring aligner (item C66) will be eliminated and will not be available as service parts.

The spacer (item C50), bearing (item C40), and washer (item C65) will change and the old part numbers will not be available as service parts.

The swashplate (item D50), pistons (item C20), slipper retainer (item C30), and screws (item C70) will remain the same.

If any of the affected parts (item C66, C60, C65, C50, or C40) require replacement during repair of older style pumps, discard these parts and rebuild using new style parts (items C40, C50, and C65). As before, the screws (item C70) which are coated with locking compound **MUST** always be replaced after removal.



Models affected

All 94-2xxx (55 cc), 95-2xxx (75 cc), and 96-2xxx (100 cc) pumps

Serial numbers

55 cc pumps, 94-2xxx, changed at s/n 88-43-xxxxx
 75 cc pumps, 95-2xxx, changed at s/n 88-22-xxxxx
 100 cc pumps, 96-2xxx, changed at s/n 88-20-xxxxx

Part numbers affected

Item	Qty/pump	55 cc	75 cc	100 cc
C40	2	8000137	8100294	8200144
C50	4	8000138	8100295	8200145
C65	4	9009625-0159	9009625-0159	9009625-0159
C70	4	9007276-0114	9007276-0099	9007276-0099

Parts disposition

■ Non-interchangeable as individual parts, but new style C40, C50, and C65 can be used in any vintage pump, if all three are changed.



Service Bulletin: SB-1988-023

Products affected Series 90 pumps and motors

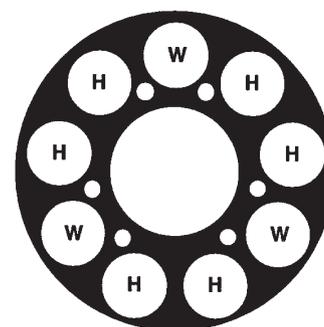
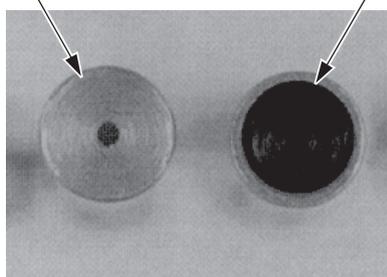
Subject Piston improvement

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 obsoleted. 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-1988-024

Products affected

Series 90 pumps

Subject

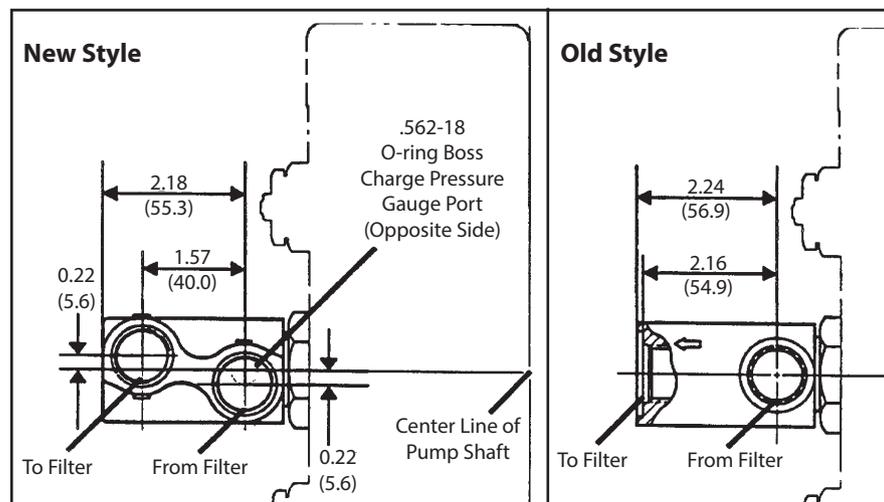
Remote pressure filtration adapter change

Description

The configuration of the remote pressure filtration adapter, available as an option on Sauer-Danfoss series 90 variable pumps (55, 75, and 100 cc) is changing. This improved design adapter incorporates a charge pressure test port. In addition, the remote filter connections have been relocated to improve the customer interface and the routing for filter plumbing on most applications. Port sizes did not change. (A version of the improved design adapter is already being used on Series 90 42 cc variable pumps.)

This change does not affect the pump end cap, and either design filtration adapter can be used on any vintage pump. Only the new style adapter will be available as service parts or on new production pumps.

The outline dimensional differences between the new and old adapters are shown below.



Models affected

All series 90 pumps (93-2xxx, 94-2xxx, 95-2xxx, and 96-2xxx) with remote pressure filtration. (option R)

Serial numbers

Remote pressure filtration equipped pumps shipped after April 24, 1989, or with serial number x-89-17-xxxxx and up will include the new adapter.

Part numbers affected

Part number	Description
8002N00R-A	Remote filtration kit (new style)

Parts disposition

■ Interchangeable



Service Bulletin: SB-1989-002

Products affected Series 90 pumps

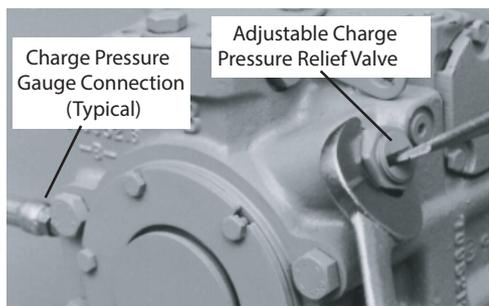
Subject Incorporation of adjustable charge relief valve

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].

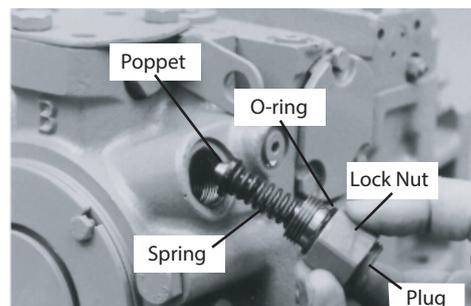
Note: This improvement changes the design of the charge relief valve poppet and plug. The new style charge relief may protrude from the pump end cap approximately 0.27 in [6.9 mm] farther than the shim adjustable r

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-1989-003

Products affected

Series 90 pumps

Subject

Swashplate leveler spring seat change and servo pressure relief valve deletion

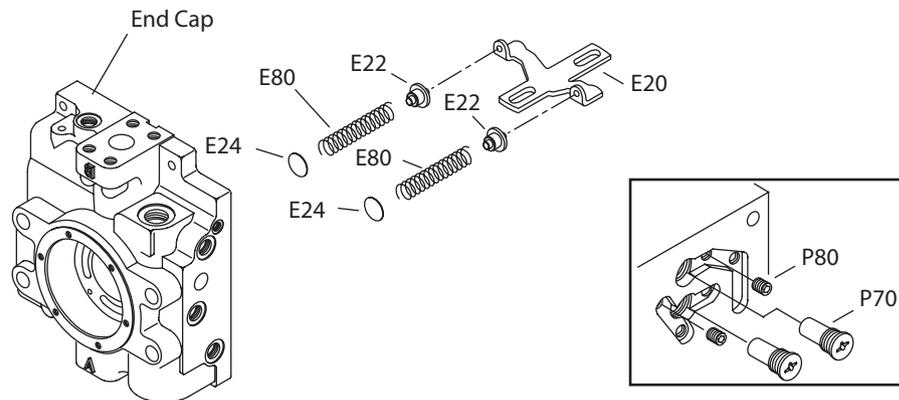
Description

As a product improvement, Sauer-Danfoss is adding hardened shims between the swashplate leveler springs and the end cap in series 90 variable pumps. In addition, the leveler spring seats have been hardened, and are now separate pieces from the leveler. Previously, the seats were peened to the leveler.

These improvements require some minor changes in the repair procedures for the series 90 pumps. When installing the lever springs (E80), take care that the spring seats (E22) are in position on the swashplate leveler (E20). Before installing the end cap, assemble the hardened shims (E24) into their pockets in the end cap and retain with petroleum jelly.

In an unrelated change, the servo pressure check relief valves installed in the pump end cap (or rotation valve housing) are no longer required. These valves (P70) will be replaced by standard socket head, straight thread O-ring plugs.

The swashplate leveler, plus the separate spring seats, are directly interchangeable with the old design part. When performing major repairs on any series 90 pump, the hardened shims should be installed between the leveler springs and the end cap. The plugs are also interchangeable with the servo pressure check relief valves.



Models affected

All 93-2xxx (42 cc), 94-2xxx (55 cc), 95-2xxx (75 cc), and 96-2xxx (100 cc) pumps

Serial numbers

The hardened swashplate leveler spring seats and hardened shims incorporated at serial number 89-09-xxxx. Due to the interchangeability of the straight thread plugs with the servo pressure check relief valves, this change will be incorporated during the 1st quarter of 1989.

Part numbers affected

Item	Description	Qty	42 cc	55 cc	75 cc	100 cc
E20	Leveler	1	673897	8000094	8100130	8200007
E22	Spring seat	2	358820	358838	358523	358846
E24	Shim	2	359034	359042	359042	359059
P70	Plug	2	9005110-4400	9005110-4400	9005110-4400	9005110-4400

Parts disposition

■ Non-interchangeable

Service Bulletin: SB-1989-006

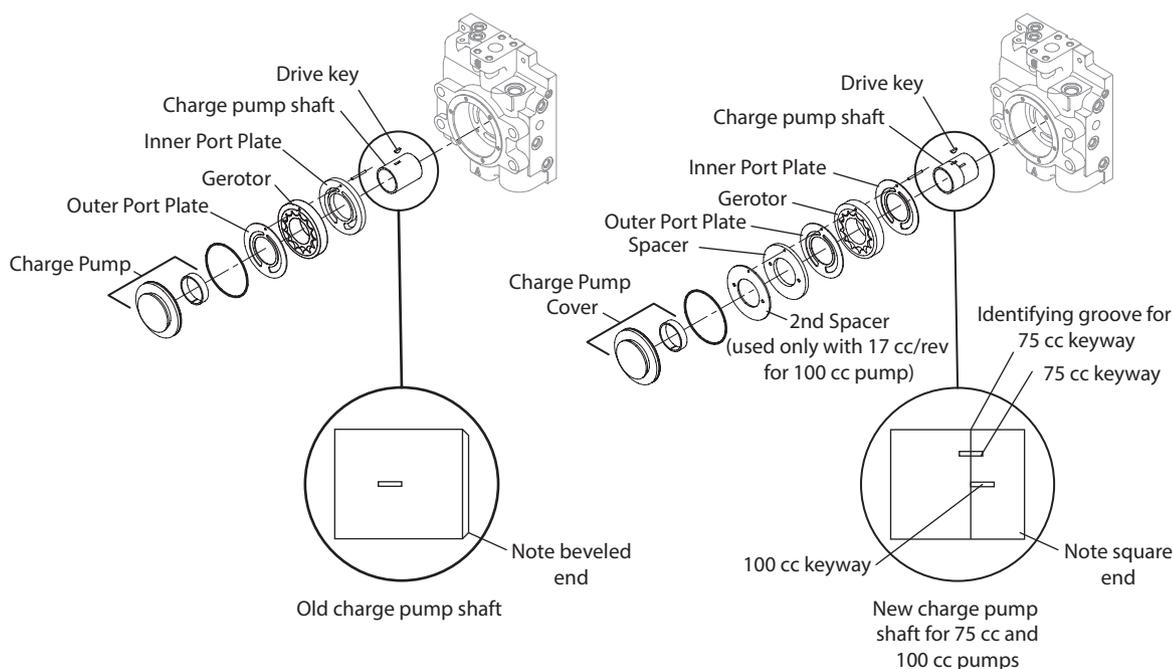
Products affected Series 90 pumps

Subject Charge pump design change

Description The original series 90 charge pump design included two (2) port plates, one (1) on each side of the gerotor. If the charge pump displacement was less than the maximum available for the pump's frame size, the inside port plate was thicker than the 0.050 in. (1.27 mm) outside port plate.

The new design charge pump will always have two (2) 0.050 in (1.27 mm) thickness port plates, one (1) on each side of the gerotor. Additionally, if the charge pump displacement is less than the maximum available for the pump's frame size, one (1) or two (2) spacers were install between the outside port plate and the charge pump cover.

In addition, the location of the keyway in the charge pump shaft has been changed to ensure full engagement of the drive key in the gerotor. The new charge pump shaft used in 75 and 100 cc pumps has two (2) keyways. The rear keyway (farthest from the end cap and splined end of the shaft) is used for 75 cc pumps, while the front keyway is used for 100 cc pumps. The new style charge pump shafts for 55, 75, and 100 cc pumps also changed from having a beveled end to a square end on the end closest to the pump end cap.



**Service Bulletin: SB-1989-006****Models affected**

All 94-2xxx (55 cc), 95-2xxx (75 cc), and 96-2xxx (100 cc) pumps

Serial numbers

A-89-17-xxxxx for all pumps manufactured in Ames, Iowa.

N-89-07-xxxxx for all 95-2xxx (75 cc) pumps manufacture in Neumunster, West Germany.

N-88-48-xxxxx for all 96-2xxx (100 cc) pumps manufacture in Neumunster, West Germany.

Part numbers affected

Proper part number versus pump serial number information can be found in the series 90 Parts Manuals.

The thicker inside port plates (thicker than 0.050 in (1.27 mm) will be obsoleted and no longer available as service parts. If these parts require replacement, use the 0.050 in. 1.27 mm) port plate and appropriate spacer(s) as service parts. On 100 cc pumps only, the new charge pump shaft must be used if the new style spacer is used,

On 55 and 75 cc pumps, the charge pump shaft clearance pocket in the end cap changed from a beveled to a straight corner to correspond with the change in the charge pump shaft. Old style charge pump shafts will remain available as service parts and must be used in the 55 and 75 cc beveled pocket end caps.

Old style (beveled pocket) end caps will be obsoleted and no longer available as service parts. If an old style end cap needs replacement, new style end caps can be used with any vintage charge pump hardware and charge pump shaft.

Parts disposition

- Non-interchangeable - must use correct charge pump shaft per serial number of pump



Service Bulletin: SB-1989-009

Products affected

Series 90 55 cc pumps

Subject

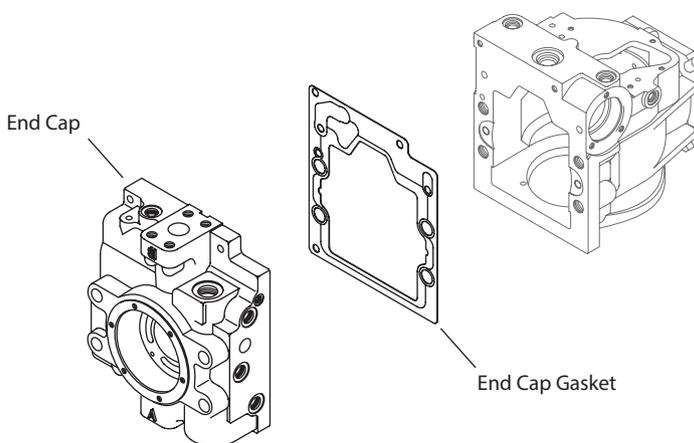
End cap gasket consolidation

Description

Sauer-Danfoss is changing the design of 55 cc pump end caps to allow a single part number gasket to be used for both the twin port and axial port end cap options.

Both old style end caps will be obsoleted and will not be available as service parts. The new end caps can be used on any vintage pump. The new end cap gasket **MUST** be used with new end caps.

The old style end cap gaskets will be available as service parts to repair earlier vintage pumps.



Models affected

All 94-2xxx (55 cc) pumps

Serial numbers

Change takes place at serial number A-89-17-xxxxx.

Part numbers affected

End cap type	Gasket p/n prior to 89-17	Gasket p/n 98-17 and beyond	End cap p/n prior to 89-17	End cap p/n 98-17 and beyond
Axial port	8000107	8000180	8000117*	8000183
Twin port	8000151	8000180	8000149*	8000184

Parts disposition

■ Non-interchangeable



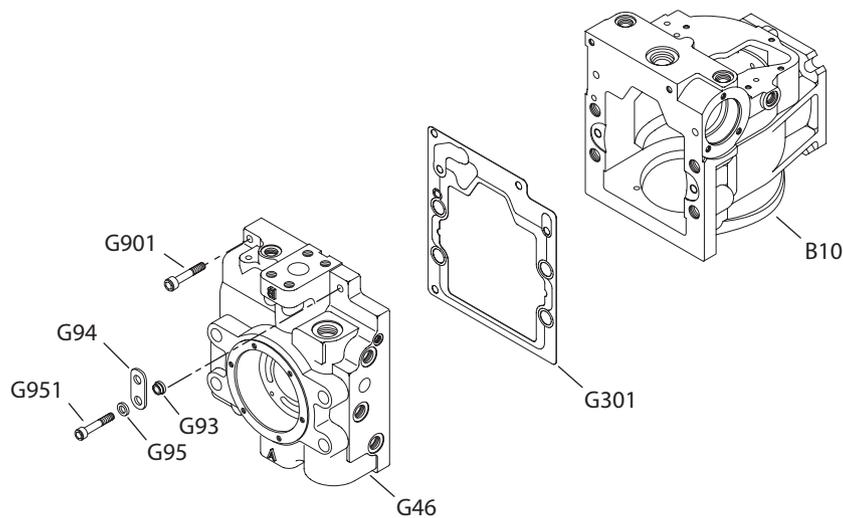
Service Bulletin: SB-1989-037

Products affected Series 90 55 cc pumps

Subject End cap and housing change

Description A product improvement has taken place on series 90 55 cc pumps, adding one end cap screw and increasing the size of another. Part number of the housing, end caps, screws, bracket, washer, and gasket changed, as indicated on the following page.

The new end cap gasket is interchangeable with the previous design used since A-89-17-xxxxx (see SB-1989-009). The new and previous design housings and end caps are not interchangeable, however, both of these parts are rarely sold as service parts.



Models affected All 94-2xxx (55 cc) pumps

Serial numbers Change takes place at serial number A-89-47-xxxxx.

Part numbers affected

Item	Description	Part number for old design	Part number for new design
B10	Housing	8000105	8000217
G93	Spacer	8800404	8800564
G94	Lifting bracket	8800522	8800565
G95	Washer	9009610-2850	9009610-3459
G46	Twin port end cap	8000184	8000220
G46	Axial port end cap	8000183	8000219
G951	Screw	9007314-0608	9007314-0810
G901	Screw	N/A	9007314-0812
G301	Gasket - twin & axial port	8000214	8000218

- Parts disposition**
- Interchangeable - gasket
 - Non-interchangeable - housing and end cap



Service Bulletin: SB-1992-003A

Products affected Series 90: 55, 75, 100, 130 cc pumps

Subject Block point change: components redesign

Description 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.

Frame size 55 cc

Item	Description	Pre-block point part number	New part number 92-06 & later
Common parts group, 55 cc			
B10	Variable housing	8000217 (O)	729848
B82	Plug	n/a	9005110-5600
End cap, 55 cc			
G048	End cap - twin ports	8000220 (O)	8000260
G308	End cap gasket	8000218 (I) (O)	8000243 (I)
G968	Screw	9007314-0606	n/a
G046	End cap - side ports	8000219 (O)	8000259
G306	End cap gasket	8000218 (I) (O)	8000243 (I)
G968	Screw	9007314-0606	n/a
G172	Plug	n/a	9005110-4400
G182	Plug	n/a	9005110-4400
Common parts group, 55 cc			
B83	Plug	n/a	9005110-5600

Models affected All series 90 94-2xxx variable pumps

Serial numbers Changes will take place at the serial number 92-06-xxxxx

Part numbers affected Refer to text of this bulletin for specific part numbers
 Housing: Thickness adjacent to the side cover has been increased
 End cap: Match housing change; small end cap screws will be larger, orientation of charge relief valve on side port end caps has benn changed from oblique to vertical.

Note: Reference PIB-9102 for design changes and outline dimensions.

Parts disposition ■ Non-interchangeable

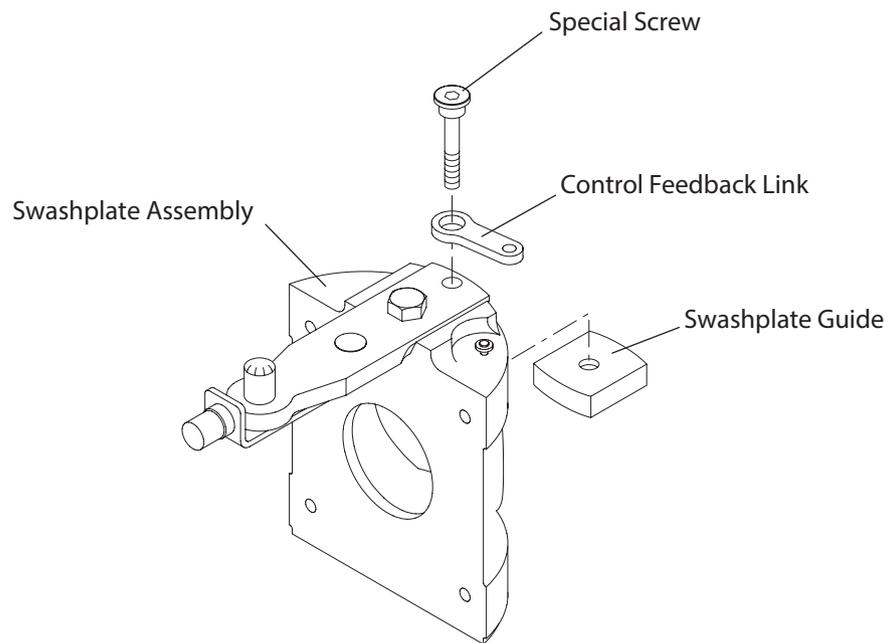


Service Bulletin: SB-1992-011

Products affected Series 90 - 055, 075, and 100 frame size pumps

Subject Feedback link retention

Description Effective in September of 1992, the feedback link in series 90 pumps will be mechanically retained to the swashplate. In the past, the link slipped over a specially ground socket head screw and could fall off the screw during assembly. The screw has changed to include a head to retain the link. The feedback link does not change.



Models affected All 94-2xxx (55 cc), 95-2xxx (75 cc), and 96-2xxx (100 cc) pumps

Serial numbers Pumps with serial number A-92-38-xxxx and beyond include the new feature.

Part numbers affected

Frame size	Old screw	New "headed screw
55 & 75 cc	9007276-0109	9007375-0044
100 cc	9007375-0030	9007375-0032

Parts disposition ■ Interchangeable


Service Bulletin: SB-1993-001A

Products affected Series 90 - 55, 75, and 100 cc pumps

Subject Charge pump design change

Description **The serial numbers mentioned apply only to Ames production units. Neumunster will incorporate the change in July or August of this year.**

To improve efficiency and reliability, the number of parts in series 90 charge pumps is being reduced. The charge pump design on 55 cc thru 100 cc frame sizes is being changed such that the outer port plate (H30) is an integral part of the charge pump cover (J15) and distance plates are eliminated.

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 charge pump shaft also changes and must be replaced when using the new style hardware. The complete charge pump assembly can be interchanged with corresponding hardware from 89-17 and beyond. **However, piece parts are not interchangeable.** For units prior to 89-17, consult Sauer-Danfoss.

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

Serial numbers
 55 cc: A-93-10 & beyond
 75 cc: A-93-10 & beyond
 100 cc: A93-15 & beyond

Part numbers affected

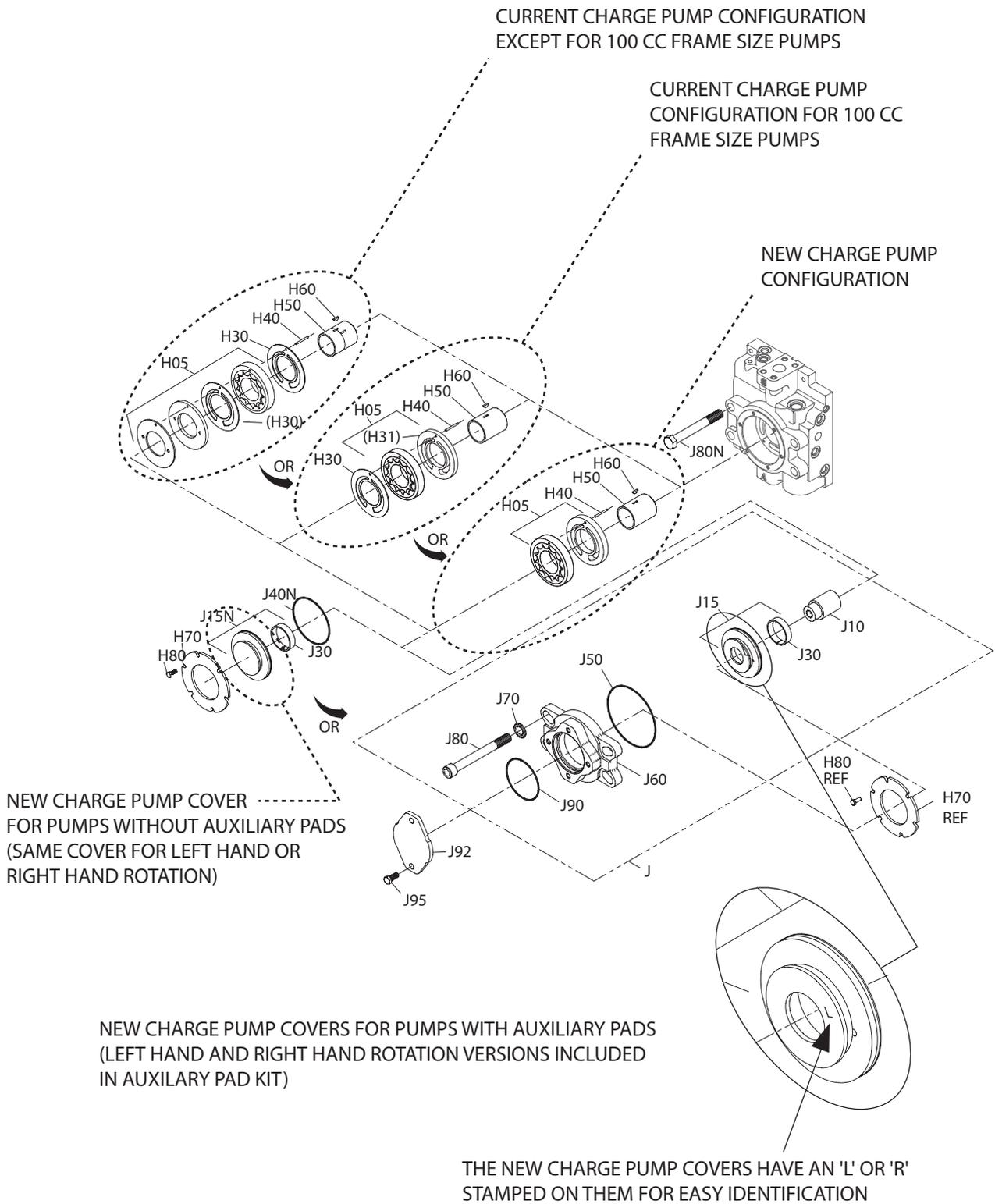
55 cc		75 cc		100 cc		Item number	Description
Before 93-10	After 93-10	Before 93-10	After 93-10	Before 93-15	After 93-15		
8000169	8000268	N/A	N/A	N/A	N/A	H05	11 cc charge pump set
8000170	8000269	8100313	8100479	N/A	N/A	H05	14 cc charge pump set
8000171	8000270	8100314	8100480	8200158	8200238	H05	17 cc charge pump set
N/A	N/A	8100315	8100481	8200159	8200239	H05	20 cc charge pump set
N/A	N/A	N/A	N/A	8200160	8200240	H05	26 cc charge pump set
8800314	N/A	8800314	N/A	8800314	N/A	H30	Port plate
N/A	Incl. in H05	N/A	Incl. in H05	8800315	Incl. in H05	H31	Port plate
8000174	8000267	337956	8100476	337956	8100476	H50	Charge pump shaft
8800513	8800834	8800513	8800834	8800513	8800834	J15N	Charge pump cover assy.
8800514	See J15L/R	8800514	See J15L/R	8800514	See J15L/R	J15	Aux. charge pump cover
N/A	8800833	N/A	8800833	N/A	8800833	J15L	Aux. L.H. cover assy.
N/A	8800832	N/A	8800832	N/A	8800832	J15R	Aux. R.H. cover assy.

Note: Piece parts are not interchangeable

Parts disposition ■ Interchangeable for s/n 89-17-xxxxx and beyond. Piece parts are not interchangeable.



Service Bulletin: SB-1993-001A





Service Bulletin: SB-1993-002

Products affected

Series 90 pump: All frame sizes

Subject

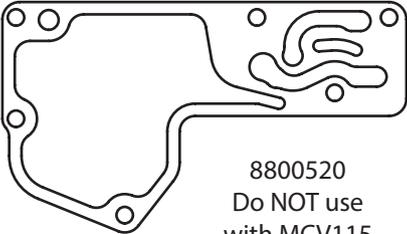
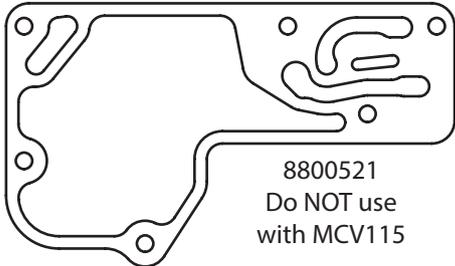
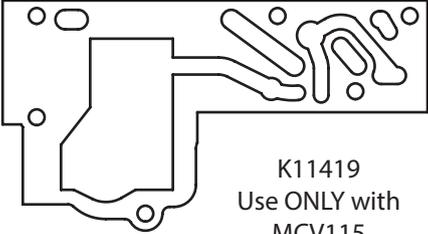
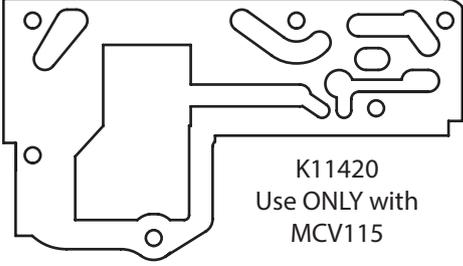
Control gasket changes for MCV115 hydraulic displacement control

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

30cc/42cc/55cc	75cc/100cc/130cc
 <p>8800520 Do NOT use with MCV115</p>	 <p>8800521 Do NOT use with MCV115</p>
 <p>K11419 Use ONLY with MCV115</p>	 <p>K11420 Use ONLY with MCV115</p>

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 (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-1993-015A

Products affected Series 90 pump: All frame sizes

Subject Servo arm interference with speed sensor ring

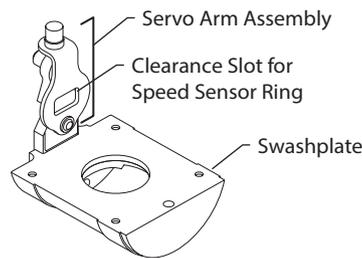
Description **Note: This service bulletin revision adds the 42 cc frame size and the incorporation date of 55 thru 1000 cc.**

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

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.

Part numbers affected

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.



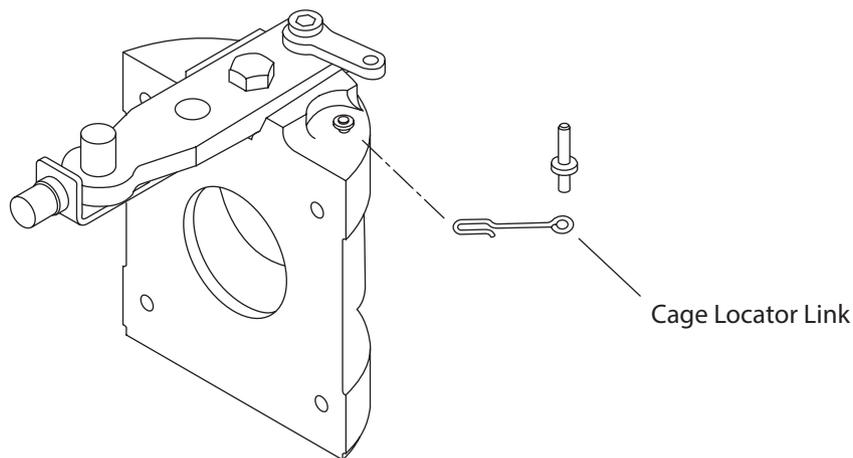
Service Bulletin: SB-1994-017

Products affected Series 90 55-100 cc variable pumps

Subject Swashplate cage locator

Description As a product improvement, Sauer-Danfoss has made a design change to the cage locator link used on the 55 thru 100 cc variable pumps.

The new link is made from square wire. In the past, the link was made from round wire. This is an interchangeable change.



Models affected All , 94-2xxx + 942xxx, 95-2xxx, + 952xxx and 96-2xxx + 962xxx variable pumps

Serial numbers 55 and 75 cc pumps serial number 94-18-xxxxx
100 cc pumps will begin 4th quarter 1994

Part numbers affected	Old link	New link
55 cc	8100241	8100506
75 cc	8100241	8100506
100 cc	8200108	8200273

Parts disposition ■ Interchangeable



Service Bulletin: SB-1994-018

Products affected

Series 90 variable pumps

Subject

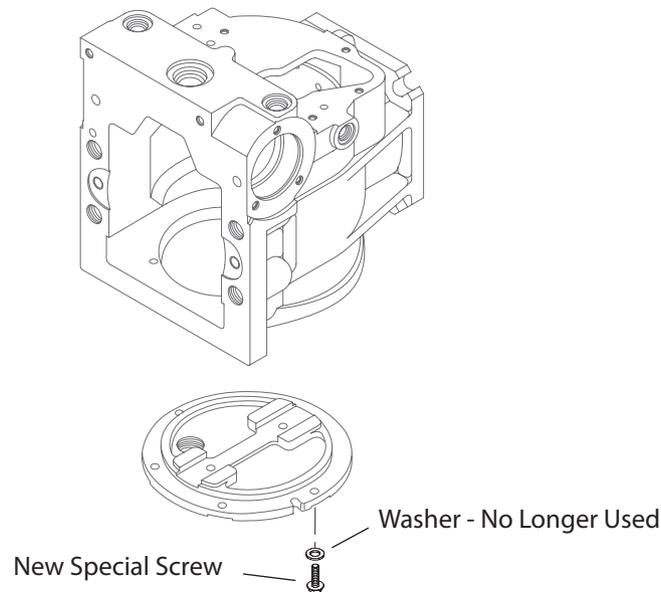
Side cover washer elimination

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 2nd and 3rd 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-1994-036

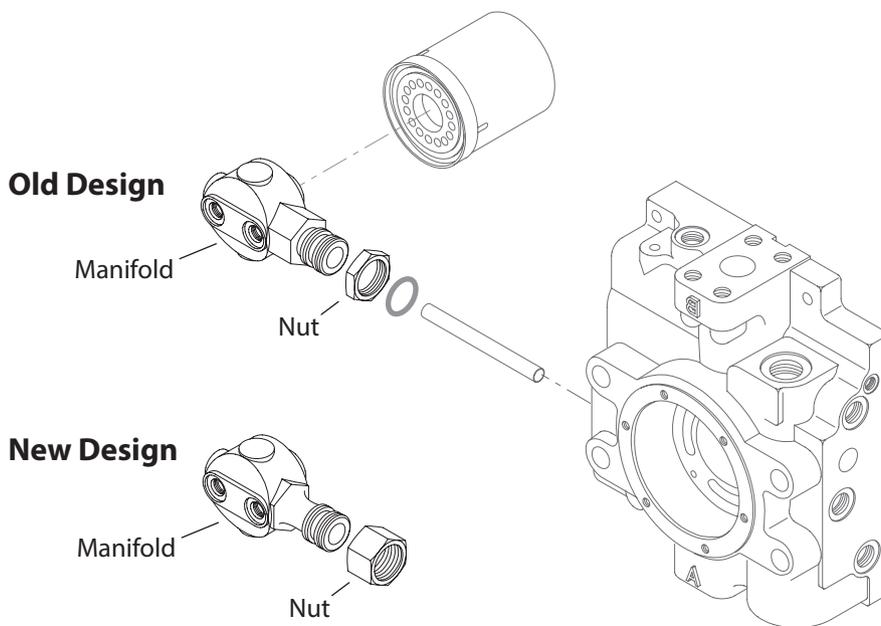
Products affected Series 90 55 thru 130 cc variable pumps

Subject Integral filtration manifold

Description As a product improvement, Sauer-Danfoss is changing the integral filter manifold and bulkhead nut to make it more easily indexed.

The old bulkhead nut may be used with either the old or new filter manifold. The new bulkhead nut can only be used with the new filter manifold.

The old bulkhead nut will remain available as a service part. The old filter manifold will be obsoleted and no longer available as a service part.



Models affected All series 90 55 thru 130 cc variable pumps with “L”, “M”, or “P” filtration option code

Serial numbers Change occurred at serial number 95-18-xxxxx

Part numbers affected

<u>Description</u>	<u>Part number (prior to 95-18)</u>	<u>Part number (95-18 & beyond)</u>
Filter manifold	8800200	8800896
Bulkhead nut	9002863-1600	5000222

Parts disposition ■ Interchangeable - new bulkhead nut can only be used with new filter manifold



Service Bulletin: SB-1995-003

Products affected

Series 90 variable pumps - all frame sizes

Subject

Manual displacement control (MDC) with DC electric solenoid override

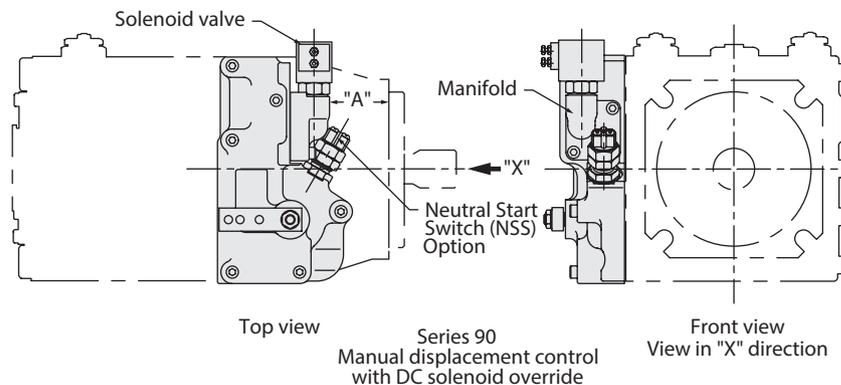
Description

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-1995-025

Products affected Series 90 55, 75, and 100 cc variable pumps

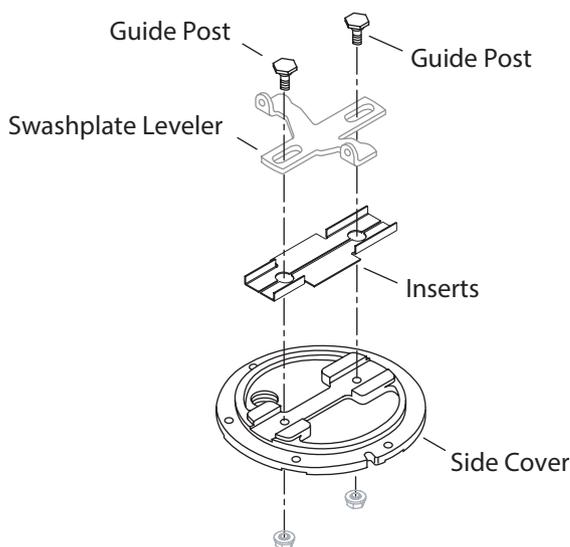
Subject Side cover design change

Description As a product improvement, Sauer-Danfoss 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 55,75, & 100 cc variable pumps

Serial numbers This change became effective at serial number A-95-50-xxxxx.

Part numbers affected

Description	Old part numbers		New part numbers		
	Guide post	Side cover	Insert assy.	Guide post	Side cover kit
55 cc	8100353	8000157	8000406	8000379	8510097
75 cc	8100353	8100226	8100562	8000379	8510098
100 cc	8100353	746560	8200321	8000379	8510099*

Parts disposition ■ Interchangeable as a kit. Piece parts are not interchangeable.



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 replaced 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



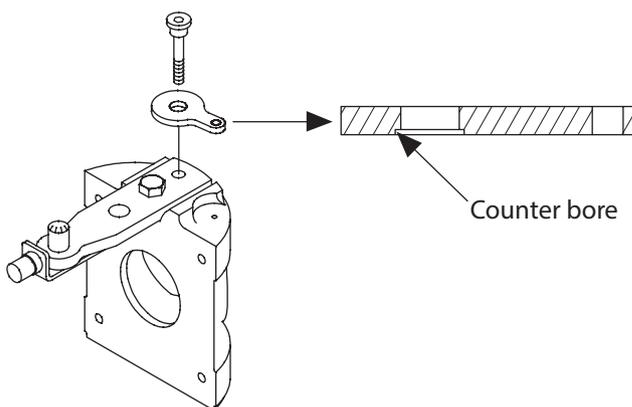
Service Bulletin: SB-1996-009

Products affected Series 90 55, 75, and 100 cc variable pumps

Subject Change swashplate feedback link

Description As a product improvement, Sauer-Danfoss is changing the design of the swashplate feedback link used on the 55, 75, and 100 cc variable pumps.

The new swashplate link has a counter bore that allows for clearance between the feedback link and the servo arm screw. The counter bore side of the link must be installed such that the counter bore is facing the surface of the servo arm.



Models affected All 942xxx, 952xxxx, and 962xxx variable pumps

Serial numbers For 55 and 75 cc pumps, the change became effective at serial number A-96-22-xxxxx. For 100 cc pumps, the change became effective at serial number A-96-12-xxxxx

Part numbers affected	Frame size	Old part number	New part number
	55 cc	8000096	8000481
	75 cc	8000096	8000481
	100 cc	8200106	8200344

Parts disposition ■ Interchangeable



Service Bulletin: SB-1998-018

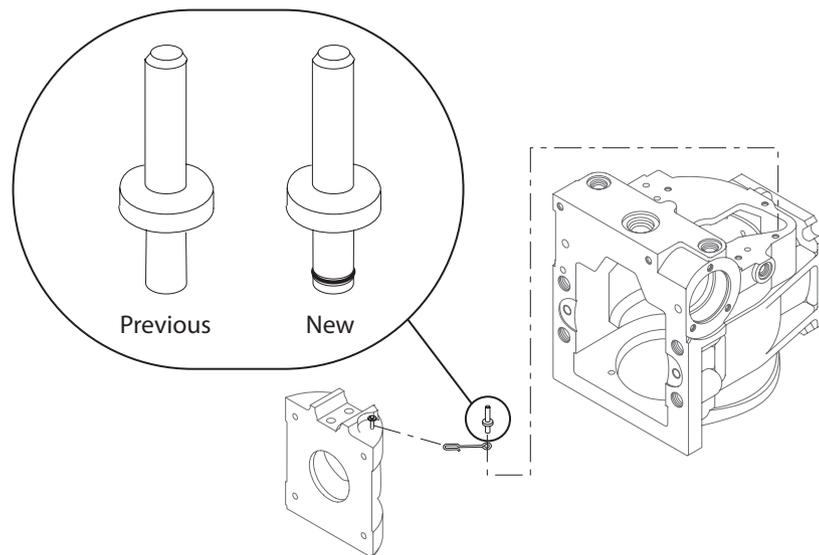
Products affected Series 90 55, 75, and 100 cc variable pumps

Subject Swashplate bearing cage locator pin

Description Sauer-Danfoss has modified the design of the swashplate bearing cage locator pin used in the series 90 55, 75, and 100 cc variable displacement pumps.

The improved design includes a rubber gripping element on the portion of the pin that is in the main pump housing. The rubber element aids in retaining the pin in the housing during normal pump assembly and servicing procedures, by increasing the interference fit between the pin and the pilot hole in the pump housing.

To aid in identifying this change, Sauer-Danfoss has released a new part number for the updated pin design. The new pin is completely interchangeable with the previous pin part number. The previous pin has been obsoleted.



Models affected All 94-2xxx, 942xxx, 95-2xxx, 952xxx, 96-2xxx and 962xxx variable pumps

Serial numbers This change became effective at serial number 98-24-xxxxx

Part numbers affected	<u>Prior to 98-24</u>	<u>98-24 and beyond</u>
	Pin part number	8801135

Parts disposition ■ Interchangeable

Service Bulletin: SB-1998-041

Products affected Series 90 55, 75, and 100 cc variable pumps
Series 90 55 and 75 cc variable motors

Subject Piston hold down mechanism design change

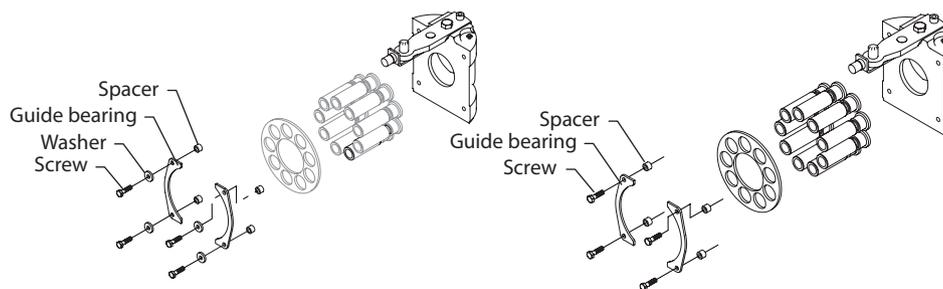
Description Sauer-Danfoss has initiated a change to the piston hold down mechanism used on series 90 55, 75, and 100 cc variable displacement pump and the series 90 55 and 75 cc variable displacement motors.

Previously, the hold down assembly consisted of a spacer, slipper guide bearing, washer, and screw. The spacer provides a fixed amount of operational clearance for the slipper and slipper retainer. The guide bearing provides a wear surface for the slipper retainer, while the hold down screws and washers retain the assembly.

The change involved with the current design update is the removal of the washer from the assembly. This design was initially introduced on the series 90 42 and 130 cc pumps in 1994, and with this change a uniform product family is achieved.

With the removal of the washer, the required length of the assembly screw is reduced. The change in the assembly screw also affects the dimensions of the spacer. Therefore, with this change, the part numbers associated with the assembly screw and spacer have been changed. Some of the assembly screws are parts already maintained in the parts system.

Although the new spacer and assembly screw are directly interchangeable with the previous swashplate assembly components, we recommend that the components be serviced in combination. Since the new spacer may be serviced as a stand alone item, the previous spacer has been obsoleted and will no longer be available as a service part.





Service Bulletin: SB-1998-041

Models affected

94-2xxx, 942xxxx, 95-2xxx, 952xxxx, 96-2xxx, and 962xxxx variable pumps
 94-2xxx, 942xxxx, 95-2xxx, and 952xxxx variable motors

Serial numbers

Sauer-Danfoss Ames production - effective at serial number A-98-48-xxxxx

Part numbers affected

Component	Displacement	Prior to 98-48	Current
Hold down screw	55 cc	9007276-0114	648477
Spacer	55 cc	8000266	8000619
Washer - pumps	55 cc	9009625-0159	N/A
Washer - motors	55 cc	9009625-0129	N/A
Hold down screw	75 cc	9007276-0099	9007276-0114
Spacer	75 cc	8100450	8100777
Washer - pumps	75 cc	9009625-0159	N/A
Washer - motors	75 cc	9009625-0129	N/A
Hold down screw	100 cc	9007276-0099	9007276-0114
Spacer	100 cc	8200216	8200422
Washer - pumps	100 cc	9009625-0159	N/A

Parts disposition

■ Interchangeable

Service Bulletin: SB-1998-066

Products affected Series 90 55, 75, and 100 cc variable pumps

Subject Charge pump shaft part number change

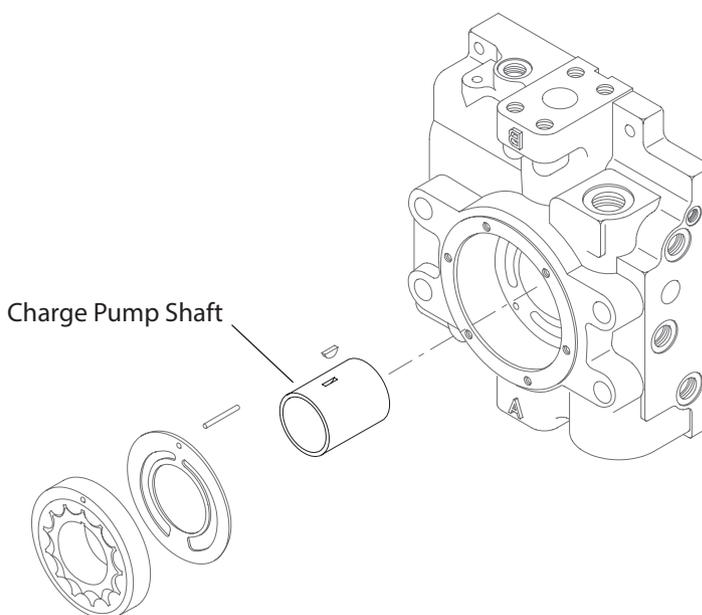
Description As a product improvement, Sauer-Danfoss has modified the design of the charge pump shaft used in series 90 55, 75 and 100 cc pumps. This change affects all charge pump sizes (11, 14, 17, 20, 26, and 31 cc) available in the series 90 displacement range.

The series 90 55 cc variable displacement pump uses the same charge pump shaft, regardless of charge pump size (11, 14, or 17 cc). The series 90 75 and 100 cc variable displacement pumps, utilize a common charge pump shaft for the standard size charge pumps (75 cc standard equals 14, 17, and 20 cc and 100 cc standard equals 17, 20, and 26 cc).

A unique charge pump shaft is utilized by series 90 75 cc variable displacement pumps equipped with the 26 cc size charge pump., while the same unique shaft is used by series 90 100 cc variable displacement pumps equipped with 31 cc size charge pumps.

The design modification includes a surface finish change to the charge pump shaft which improves the wear characteristics between the charge pump shaft and the journal bearings in the charge pump cover and end cap.

To assist in identifying this change, Sauer-Danfoss has released new charge pump shaft part numbers. The new shafts are completely interchangeable with the previous shafts. The new shaft has replaced the previous shaft in new pump assemblies and charge pump service kits. The previous shafts have been obsoleted and are no longer available as a service part. The chart on the next page will assist you in determining the part number changes.





Service Bulletin: SB-1998-066

Models affected

94-2xxx, 942xxxx, 95-2xxx, 952xxxx, 96-2xxx, and 962xxxx variable pumps

NOTE: Pump models 9621723 and 9622117 were released with a special charge pump option (code W - 26 cc charge pump with special shaft). With this product modification, the charge pump option code for these two models has been changed from W to the standard option (code F - 266 cc charge pump). The special shaft part number 8801176 has been obsoleted and replaced with shaft part number 8801178.

Serial numbers

Sauer-Danfoss Ames production - effective at serial number A-99-40-xxxxx
 Sauer-Danfoss Neumunster production - effective at serial number N-99-39-xxxxx

Part numbers affected

Series 90 Size	Charge pump	Previous shaft	New shaft	Charge kit		
				No aux. pad	LH w/aux.	RH w/aux.
55	11	8000267	8801177	8510028	8510029	8510030
55	14	8000267	8801177	8510031	8510032	8510033
55	17	8000267	8801177	8510034	8510035	8510036
75	14	8100476	8801178	8510037	8510038	8510039
75	17	8100476	8801178	8510040	8510041	8510042
75	20	8100476	8801178	8510043	8510044	8510045
75	26*	8100478	8801179	N/A	N/A	N/A
100	17	8100476	8801178	8510046	8510047	8510048
100	20	8100476	8801178	8510049	8510050	8510051
100	26	8100476	8801178	8510052	8510053	8510054
100	31*	8100478	8801179	N/A	N/A	N/A

* Special charge pump shaft option using unique charge pump shaft

Parts disposition

■ Interchangeable



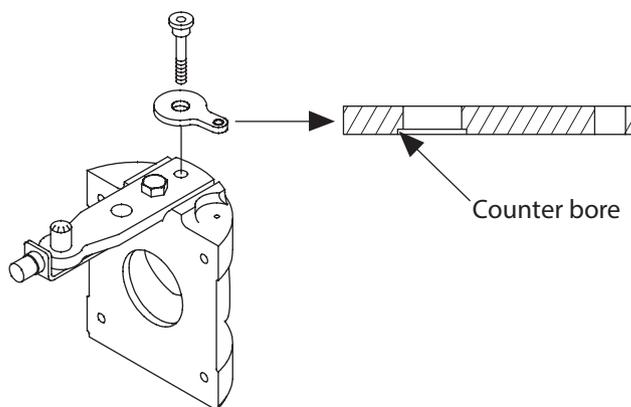
Service Bulletin: SB-1999-019

Products affected Series 90 55, 75, and 100 cc variable pumps

Subject Feedback link change

Description As a product improvement, Sauer-Danfoss is changing the design of the swashplate feedback link used on the 55, 75, and 100 cc variable pumps.

In 1996, a counter bore was added to the design of our swashplate link to allow for a higher clamping load when assembled to the servo arm. This change was described in SB-1996-009. The counter bore is no longer required on most units due to a design change to the servo arm. Sauer-Danfoss recommends the old feedback link be used when servicing pumps with dates codes prior to 96-40-xxxxx. The old feedback link will remain available as a service part.



Models affected All series 90 55, 75, and 100 cc variable pumps

Serial numbers This change became effective at serial number A-96-40-xxxxx.

Part numbers affected

	100 cc	55 & 75 cc
Old part number	8200344	8000481
New part number	8200413	8000602

Parts disposition ■ Non-interchangeable



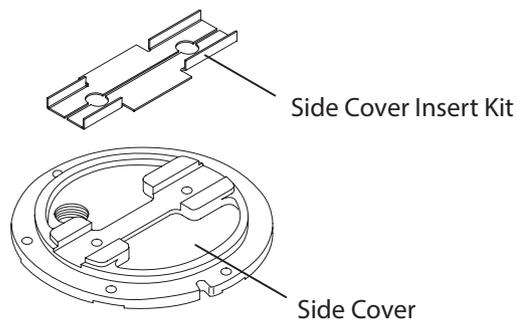
Service Bulletin: SB-1999-041A

Products affected Series 90 variable pumps

Subject Change to side cover insert material

Description As a continuous 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 93-2xxx, 94-2xxxx, 95-2xxx, 96-2xxxx, 97-2xxx, 98-2xxx, and 99-2xxx

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-2000-041A

Products affected

Series 90 55, 75, 1nd 100 cc variable displacement pumps

Subject

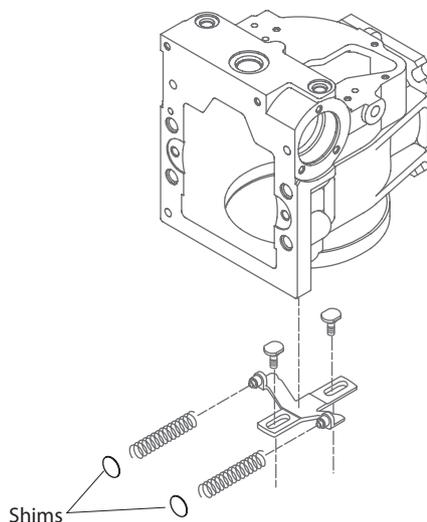
Common leveler spring shim.

Description

The date code for the series 90 55 cc should have been for a date code of A-92-06-xxxxx not A-02-06-xxxxx.

Sauer-Danfoss has standardized the leveler spring shim used on all 55, 75, and 100 cc variable displacement pumps. Two different shims were used in the past. One size was for 55 and 75 cc pumps, and the other for the 100 cc pumps. The new shim can be used in all three frame sizes.

Sauer-Danfoss has issued a new part number for the new shim. The new shim is interchangeable for 55 cc pumps built after A-92-06-xxxxx, 75 cc pumps built after A-96-19-xxxxx, and 100 cc pumps. For pumps manufactured prior to these dates, you will need to reuse the old shims, as the new shim outer diameter is larger, and this will cause the new shim to not seat correctly in the bottom of the pocket in the end cap. The old shim part numbers are obsolete.



Models affected

All 94-2xxx, 942xxxx, 95-2xxx, 952xxxx, 96-2xxx, and 962xxxx variable pumps.

Serial numbers

Sauer-Danfoss Ames, Iowa production change was effective at serial number A-00-40-xxxxx

Sauer-Danfoss Neumunster, Germany production change was effective at serial number N-01-27-xxxxx

Part numbers affected

Frame size	Old part number	New part number
55 cc	359042	8801225*
75 cc	359042	8801225**
100 cc	359059	8801225

* can only be used in pumps manufacture after A-92-06-xxxxx

** can only be used in pumps manufactured after A-96-19-xxxxx

Parts disposition

■ Interchangeable



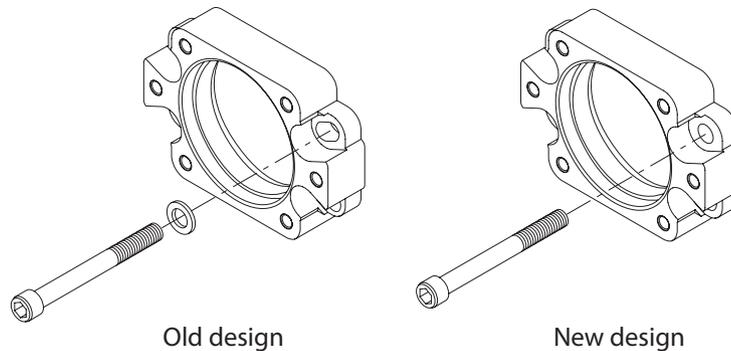
Service Bulletin: SB-2002-050

Products affected Series 90 55, 75, and 100 cc pumps

Subject Auxiliary mounting pad

Description As a product improvement, Sauer-Danfoss has changed the design of the SAE C auxiliary mounting pad to increase strength and reduce corrosion. The old auxiliary mounting pad and new auxiliary mounting pad are interchangeable. The new auxiliary mounting pads are frame size dependent, because they do not have slotted mounting holes. The auxiliary mounting pad screws remain the same, but they do not require washers.

The old auxiliary mounting pad is obsolete and no longer available as a service part. The washers will remain available.



Models affected Series 90 55, 75, and 100 cc pumps with SAE C auxiliary mounting.

Serial numbers This change became effective at serial number A-03-10-xxxxx

Part numbers affected

Frame size	Old auxiliary pad part number	New auxiliary pad part number	Old washer part number
55 cc	723205	8000643	5000602
75 cc	723205	8100848	9009625-0132
100 cc	723205	8200469	9009625-0132

The new auxiliary mounting pads are frame size dependent and do not use washers.

Parts disposition ■ Interchangeable



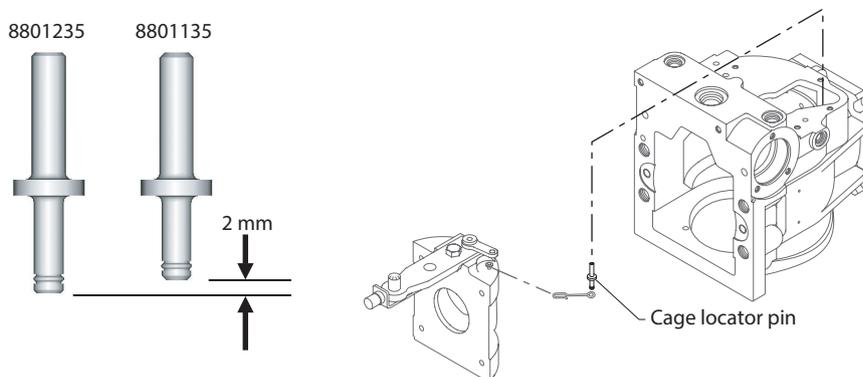
Service Bulletin: SB-2004-012

Products affected Series 90 55 and 75 cc pumps

Subject Cage locator pin

Description As a product improvement, Sauer-Danfoss is standardizing the cage locator pin for all series 90 55, 75, and 100 cc pumps. All 55 and 75 cc pumps will now use the same locator pin used in 100 cc pumps. The new locator pin extends 2 mm further into the housing than the old pin. The housings have been machined to accept the longer pin.

The old cage locator pin must be used in pumps that have not had the housings modified. The old pin can be used in any vintage pump and will remain available as a service part.



Models affected Series 90 55 and 75 cc pumps.

Serial numbers and part numbers affected

Frame size	Old pin part number	New pin part number	Housing modification date*
55 cc	8801135	8801235	A-04-43-xxxxx
			N-04-43-xxxxx
			S- not determined
75 cc	723205	8100848	A-01-26-xxxxx
			N-00-01-xxxxx
			S- not determined
100 cc	8801235	8801235	No change

* A = Ames, Iowa N = Neumunster, Germany
 S = Shanghai, China (a revision will be made when modification date has been determined).

Parts disposition ■ Non-interchangeable



Service Bulletin: SB-2005-011

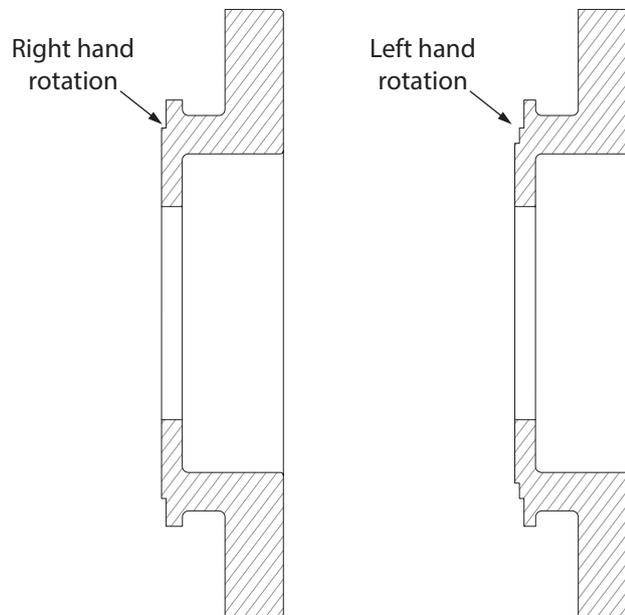
Products affected Series 90 42 thru 100 cc pumps

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-2007-027

Products affected Series 90; 55, 75 , and 100 cc pumps

Subject SAE A auxiliary mounting flange

Description Sauer-Danfoss is pleased to announce a design improvement on the SAE A auxiliary mounting flange adapter on all its series 90 pumps. All manufacturing locations producing these pumps will be changed to this configuration.

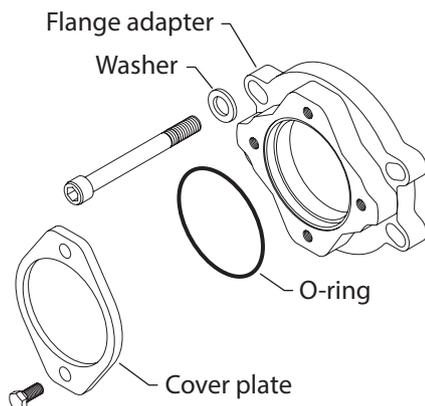
The improvement comes in the form of a more robust sealing geometry with a larger cross-section O-ring. The O-ring groove in the flange will now be sized to mate with a 2.62mm [0.103] cross section O-ring rather than the old 1.78mm [0.070] cross-section O-ring. The Sauer-Danfoss part number for the new O-ring is 9004104-1520 (2.62mm [0.103]. 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.

Also, the flanges will no longer have a slotted interface with a washer for the end cap screws. The flanges will now have round through holes for the end cap screws and will use no washers. The end cap screws do not change. This eliminates the area where water or high pressure wash chemicals can be trapped around the end cap screws. There now are specific part numbers for the flanges used on each of the three displacement size pumps; 55, 75 and 100 cc.

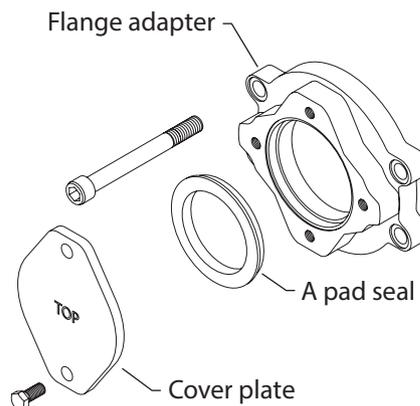
The pumps will now be supplied with the donut style A pad seal and new flat cover, instead of the small O-ring and cover plate (shown in the drawing below).

The overhaul seal kit will include the old O-ring, the new O-ring and the A pad seal.

Old Design



New Design




Service Bulletin: SB-2007-027

Models affected All series 90; 55, 75, and 100 cc pumps with SAE "A" auxiliary mounting flanges.

Serial numbers This change became affective at serial number; A 07-05-xxxxx.

Part numbers affected

Description	Old p/n	Used on	New p/n	Used on
Flange adapter	8000262	55 cc	8000641	55 cc
Flange adapter	8800172	55, 75 & 100 cc	8000641	55 cc
Flange adapter	8800172	55, 75 & 100 cc	8100846	75 cc
Flange adapter	8800172	55, 75 & 100 cc	8200467	100 cc
Washer	9009625-0132	55, 75 & 100 cc	NA	NA
O-ring	9004104-0420	All sizes	9004104-1520	All sizes
A Pad seal	NA	All sizes	4800482	All sizes
Flange cover	9802336	All sizes	4460586	All sizes

Note: If the new auxiliary flange adapter is used, the new O-ring or A pad seal and cover must also be used.

Parts disposition

- Interchangeable - if new O-ring or A pad seal and cover are replaced
- Use parts in stock
- Order replacement parts
- Revise existing part orders



Service Bulletin: SB-2007-051

Products affected Series 90; 55, 75 , and 100 cc pumps

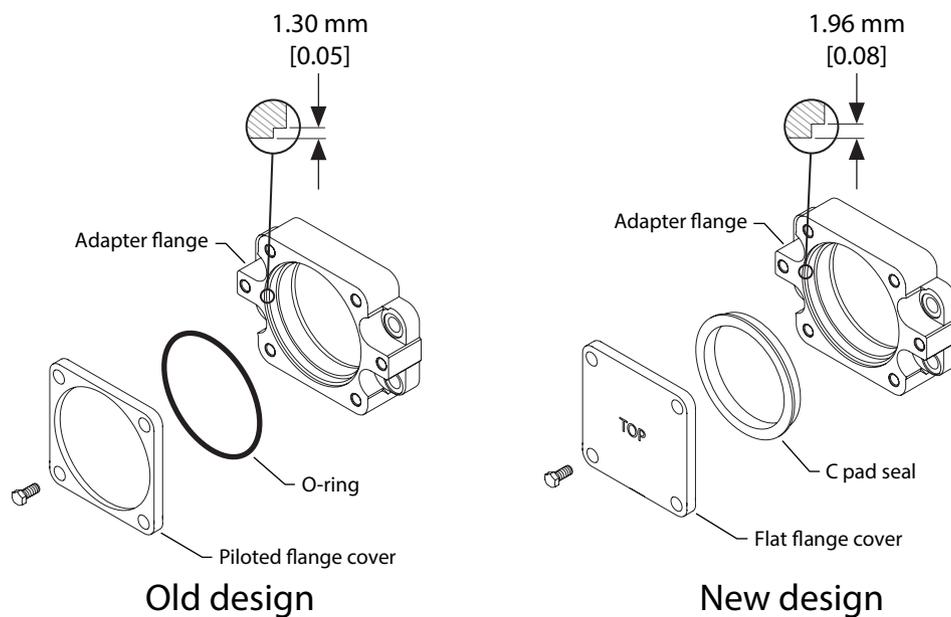
Subject SAE C auxiliary mounting flange

Part numbers affected 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 55, 75, and 100cc. 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 [0.103] 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 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 cover plate (shown in the drawing below).

The overhaul seal kit will include the old O-ring, the new O-ring and the new C pad seal





Service Bulletin: SB-2007-051

Models affected All series 90; 55, 75, and 100 cc pumps with SAE “C” auxiliary mounting flanges.

Serial numbers This change became affective at serial number; A 08-19-xxxxx and N 09-30-xxxxx.

Part numbers affected

Description	Old p/n	Used on	New p/n
SAE C flange	8200469	100 cc	8200515
SAE C flange	8100848	75 cc	8100897
SAE C flange	8000643	55 cc	8000740
O-ring	9004100-0480	55, 75 & 100 cc	9004104-1580
C Pad seal	N/A	55, 75 & 100 cc	8801062
Flange cover	8800406	55, 75 & 100 cc	8801060

Note: If the new auxiliary flange adapter is used, the new O-ring or C pad seal and cover must also be used.

Parts disposition

- Interchangeable - if new O-ring or C pad seal and cover are replaced
- Use parts in stock
- Order replacement parts
- Revise existing part orders

Service Bulletin: SB-2007-055

Products affected Series 90; 55, 75 , and 100 cc pumps

Subject SAE B auxiliary mounting flange

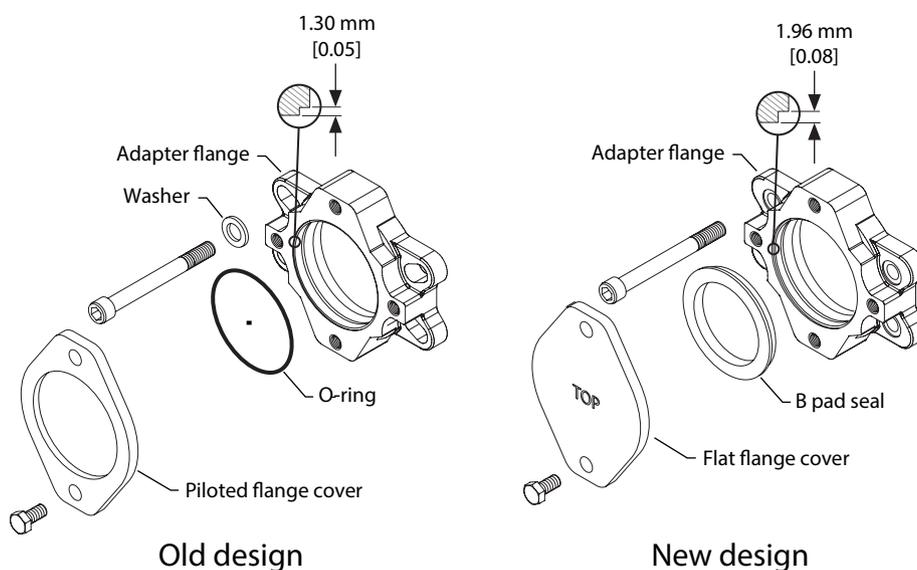
Part numbers affected Sauer-Danfoss is pleased to announce a design improvement on the SAE B auxiliary mounting flange adapter on its series 90 pumps. The frame sizes affected by this change are 55, 75, and 100cc. All manufacturing locations producing these pumps will be changed to this configuration.

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 [0.103] 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 part number 9004104-1540 O-ring used.

Also, the flanges will no longer have a slotted interface with a washer for the end cap screws. The flanges will now have round through holes for the end cap screws and will use no washers. The end cap screws do not change. This eliminates the area where water or high pressure wash chemicals can be trapped around the end cap screws. There now are specific part numbers for the flanges used on each of the three displacement size pumps; 55, 75 and 100 cc.

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

The overhaul seal kit will include the old O-ring, the new O-ring and the new B pad seal.





Service Bulletin: SB-2007-055

Models affected All series 90; 55, 75, and 100 cc pumps with SAE “B” auxiliary mounting flanges.

Serial numbers This change became affective at serial number; A 08-19-xxxxx.

Part numbers affected

Description	Old p/n	Used on	New p/n	Used on
Metric B flange	8800983	55, 75 & 100 cc	8200540	100 cc
SAE B flange	8800173	55, 75 & 100 cc	8200468	100 cc
SAE B flange	8800173	55, 75 & 100 cc	8100847	75 cc
Metric B flange	8800983	55, 75 & 100 cc	8100938	75 cc
SAE B flange	8800173	55, 75 & 100 cc	8000642	55 cc
SAE B flange	8000263	55, 75 & 100 cc	8000642	55 cc
Washer	9009625-0132	55, 75 & 100 cc	N/A	N/A
O-ring	9004104-0450	55, 75 & 100 cc	9004104-1540	55, 75 & 100 cc
B Pad seal	N/A	55, 75 & 100 cc	8801061	55, 75 & 100 cc
Flange cover	4460370	55, 75 & 100 cc	8801059	55, 75 & 100 cc

Note: If the new auxiliary flange adapter is used, the new O-ring or B pad seal and cover must also be used.

Parts disposition

- Interchangeable - if new O-ring or C pad seal and cover are replaced
- Use parts in stock
- Order replacement parts
- Revise existing part orders

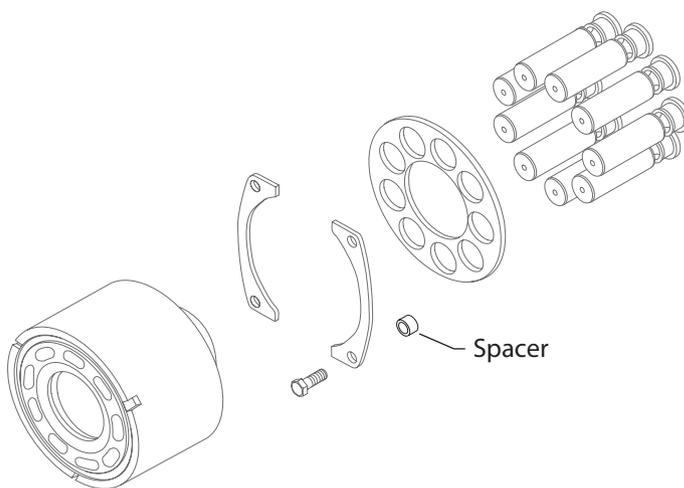


Service Bulletin: SB-2009-038

Products affected Series 90 55, 75 and 100 cc pumps

Subject Slipper hold down spacer

Description The supplier for the spacers, used for slipper hold down spacing in series 90 pumps, has changed. The new part is physically and functionally interchangeable in all applications. The part numbers have changed to better track this change. The old part numbers will become obsolete and not available for service.



Models affected Series 90 55, 75 and 100 cc pumps.

Serial numbers This change became effective at serial number: A09-38-XXXXX for 55cc (14-Sep-2009)
 A10-04-XXXXX for 75cc (22-Jan-2010)
 A09-38-XXXXX for 100cc (12-Aug-2009)

Part numbers affected

Spacer	Old part number	New part number
55cc	8000619	11065864
75cc	8100777	11065865
100cc	8200422	11065866

Parts disposition ■ Non-interchangeable



Service Bulletin: SB-2010-005

Products affected Series 90; 55cc pump

Subject SAE B auxiliary mounting flange

Part numbers affected Sauer-Danfoss is pleased to announce a design improvement on the SAE B auxiliary mounting flange adapter used on its series 90, 55cc pumps with auxiliary mounting flange order code of "BN".

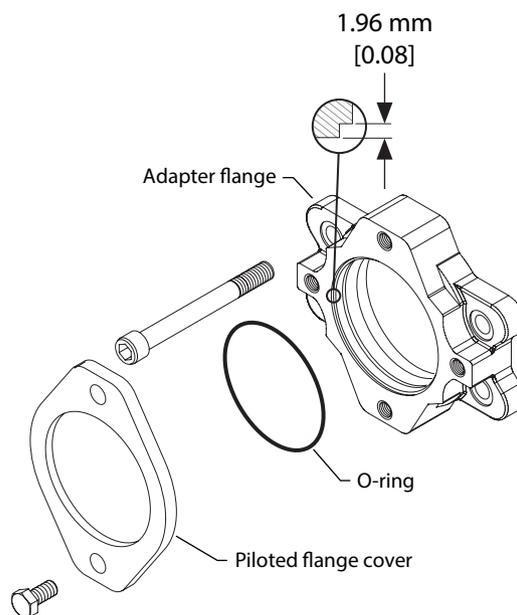
The improvement comes in the form of a more robust sealing geometry with a larger cross-section O-ring. The O-ring groove in the flange will now be sized to mate with a 2.62mm [0.103] cross section O-ring rather than the old 1.78mm [0.070] cross-section O-ring. The Sauer-Danfoss part number for the new O-ring is 9004104-1540 (2.62mm [0.103] x 94.92mm [3.737]). When installing an auxiliary pump, a new O-ring should be used.

Also, the flange will no longer have a slotted interface with a washer for the end cap screws. The flange will now have round through holes for the end cap screws and will use no washers. The end cap screws do not change. This eliminates the area where water or high pressure wash chemicals can be trapped around the end cap screws.

The overhaul seal kit will include the old O-ring, and the new O-ring.

The old auxiliary mounting flange will be obsolete and no longer available as a service part. It is interchangeable with the new auxiliary mounting flange only if the new O-ring is used.

The old O-ring and washers will remain available for service.





Service Bulletin: SB-2010-005

Models affected Series 90, 55cc pumps using “BN” order code for SAE B auxiliary mounting flange.

Serial numbers This change became affective at serial number; A 10-49-XXXXX. (08-Dec-2010)

Part numbers affected

Description	Old part number	New part number
SAE B flange	509258	8000771
Washer	506753	N/A
O-ring	9004104-0450	9004104-1540

Parts disposition

- Interchangeable - if new O-ring or C pad seal and cover are replaced
- Use parts in stock
- Order replacement parts
- Revise existing part orders



Service Bulletin: SB-2010-025

Products affected Series 90 55 cc pumps and motors

Subject Shaft seal change

Description As a product improvement, Sauer-Danfoss is changing the shaft seal used in the Series 90, 55cc pumps and motors. The new shaft seal carrier assembly is interchangeable, but piece parts are not. The new lip seal has a smaller O.D. and the I.D. of the seal carrier changed accordingly.

Because of the smaller O.D. of the new shaft seal, the old seal retainer plate must not be used with the new shaft seal carrier assembly. The new seal retainer plate can be used with the old shaft seal carrier assembly. The old shaft lip seal will not fit into the new shaft seal carrier and the new shaft lip seal will not fit into the old shaft seal carrier.

The overhaul seal kits will include the new shaft seal carrier assembly and the new retainer plate. Since the outer O-ring is part of the seal carrier assembly the separate O-ring has been removed from the overhaul seal kits.

The old seal carrier assembly and retainer plate are obsolete and no longer available for service.

The old shaft lip seal will be obsolete once the current service parts inventory is depleted.

Models affected All Series 90 55 cc pumps and motors.

Serial numbers This change became effective at serial number: A-10-40-XXXXX (01-Oct-2010)

Part numbers affected

Description	Old part number	Old part number
Seal carrier assembly	8000390	11083637
Shaft lip seal	9008000-0118	11013519
O-ring	9004104-1510	9004104-1510
Retainer plate	516766	11083638
Seal carrier replacement kit *	N/A	11084372*

* includes new seal carrier assembly and retainer plate

Parts disposition ■ Interchangeable - only when using the new seal carrier assembly and new retainer plate, or seal carrier replacement kit



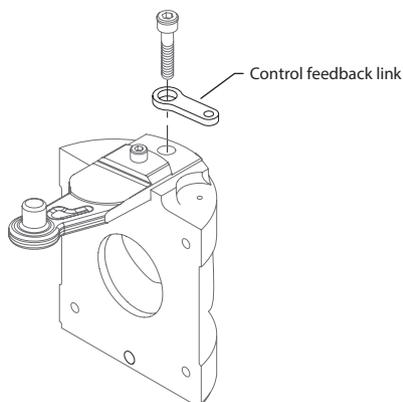
Service Bulletin: SB-2013-011

Products affected Series 90 42-250cc pumps

Subject Feedback link - Control

Description Sauer-Danfoss has changed to a global supplier for the control feedback links used in Series 90 42-250cc pumps.

Old parts and new parts are completely interchangeable. Part numbers will be changing for tracking purposes. Old parts will become obsolete and no longer available as a service part.



Models affected Series 90 42-250cc pumps

Control feedback link	Old part number	New part number
42cc pumps	648600	11070304
55 & 75cc pumps	8000602	11070305
100cc pumps	8200413	11070306
130cc pumps	340091	11070307
180 & 250cc pupms	747451	11070308

Parts disposition

- Interchangeable
- Use parts in stock



Service Bulletin: SB-2014-020

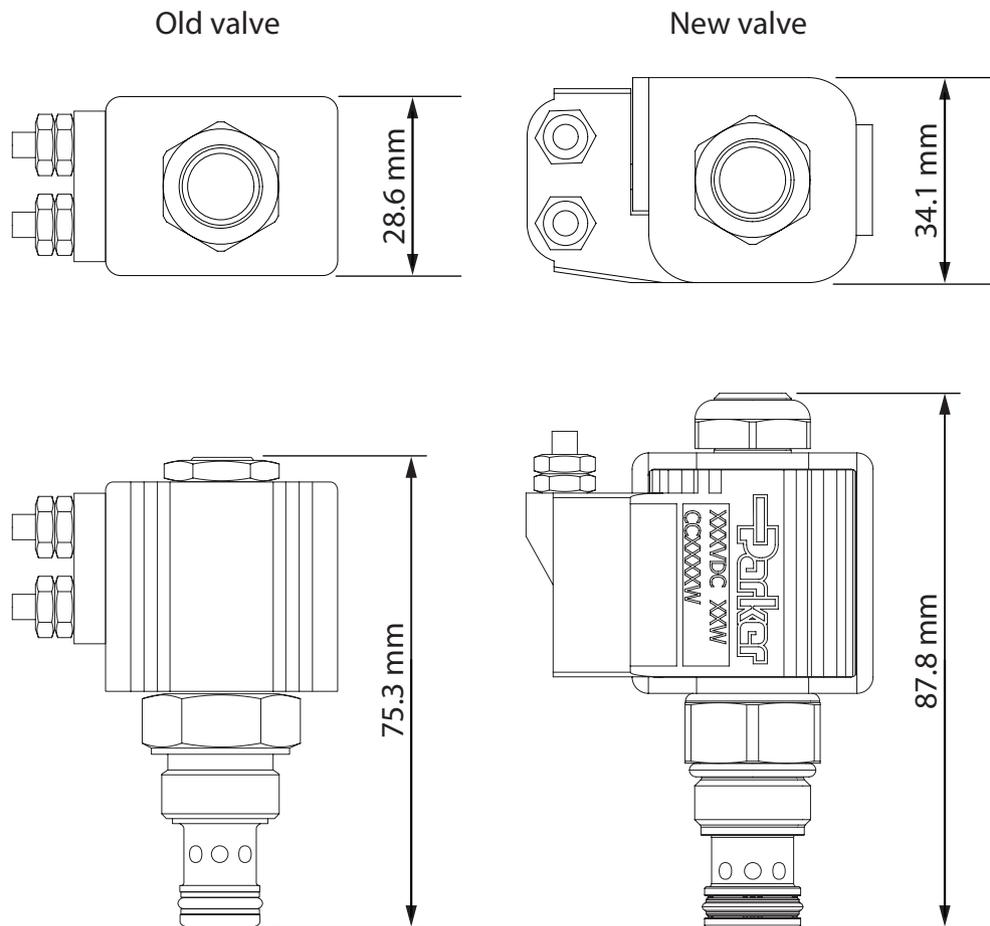
Products affected Series 90 30cc to 100cc pumps

Subject MDC Neutral Override Solenoid Valves

Description The supplier has discontinued manufacturing the current neutral override solenoid valves used on Series 90 manual displacement controls (MDC). New valves from the supplier will be used as the replacement.

The new valve fits into the same cavity, but the assemblies are slightly larger and the terminals have moved slightly compared to the old valves. Dimensions of the old and new valves are attached below.

New part numbers have been assigned for tracking purposes. The old valves are obsolete and no longer available as a service part.





Service Bulletin: SB-2014-020

Models affected Series 90 30cc to 100cc pumps

Part numbers affected	Description	Old Part Number	New Part Number
	Valve, Solenoid, N/O, 24V, 2-pole	8700087	11127985
	Valve, Solenoid, N/C, 12V, 1-pole	8700119	11127988
	Valve, Solenoid, N/O, 12V, 2-pole	9700886	11127986
	Valve, Solenoid, N/O, 12V, 1-pole	9700803	11127987

- Parts disposition**
- Non-interchangeable
 - Use parts in stock
 - Revise existing part orders



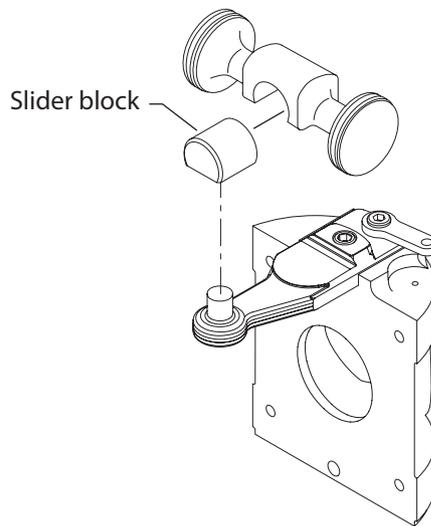
Service Bulletin: SB-2015-005

Products affected Series 90 42-250cc pumps

Subject Slider block supplier change

Description The supplier has changed for Series 90 pump slider blocks. Parts are completely interchangeable.

Part numbers have been changed for tracking purposes. As a result old part numbers will become obsolete and no longer available as service parts.



Models affected Series 90 42-250cc pumps

Part numbers affected

Description	Old Part Number	New Part Number	Effective Date
Slider block 42 NMS	648303	11116314	N/A
Slider block 55-75 NMS	8800750	11116313	6-Aug-2014
Slider block 55-75 AMS	11061964	11116313	6-Sept-2014
Slider block 100 AMS	11061908	11116312	10-Mar-2014
Slider block 100 NMS	756197	11116312	20-Feb-2015
Slider block 130 NMS	11000317	11116309	9-Dec-2014
Slider block 180-250 NMS	746479	11116308	24-Oct-2014

Parts disposition

- Interchangeable
- Use parts in stock



Notes



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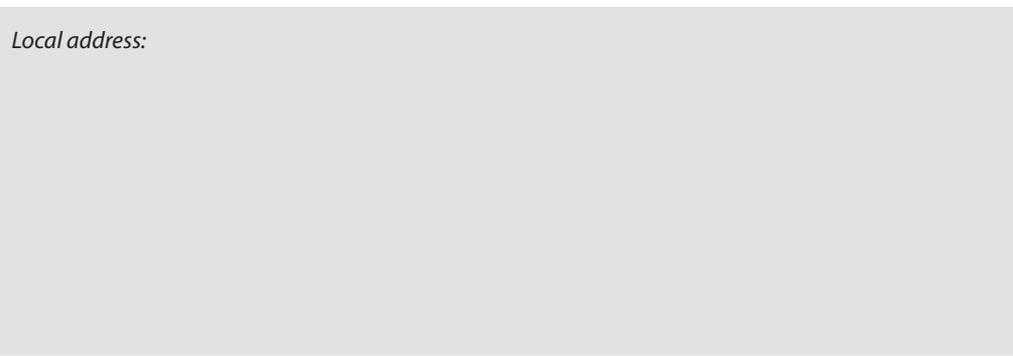
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