

Change Bulletin

No: CB009

Rev: 0

Date: March 19, 2007

Description: Elevator Pressure Control and Rotary Seal Port Re-Assignment



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BACKGROUND INFORMATION:

A pressure control manifold has been added to the 250T EMI 400 Top Drive to address a number of operational issues associated with the use of hydraulic automated elevators. The manifold circuit, shown in attached drawing 590207 rev. 10, is designed to provide independent control of the elevator open and close pressures (set by two pressure reducing valves), as well as offering a bypass mode (open needle valves) where full pressure is available to operate a casing drive tool. Figure 1 shows the location of the manifold as installed on new production units.

The order in which the robotics functions were plumbed into the rotary seal was also modified to help minimize the impact of an external leak. Originally the two robotics functions that occupied the outboard channels would see high pressures for sustained periods while the rotary seal was rotated. In the new configuration the mud saver actuator is plumbed to the outboard channels. Actuation of the mud saver is a momentary function and when the control valve is in neutral the rotary seal channels are open to tank thus eliminating a sustained high pressure that may drive a leakage flow external to the seal.

These changes are documented fully by ECN 130-0003.

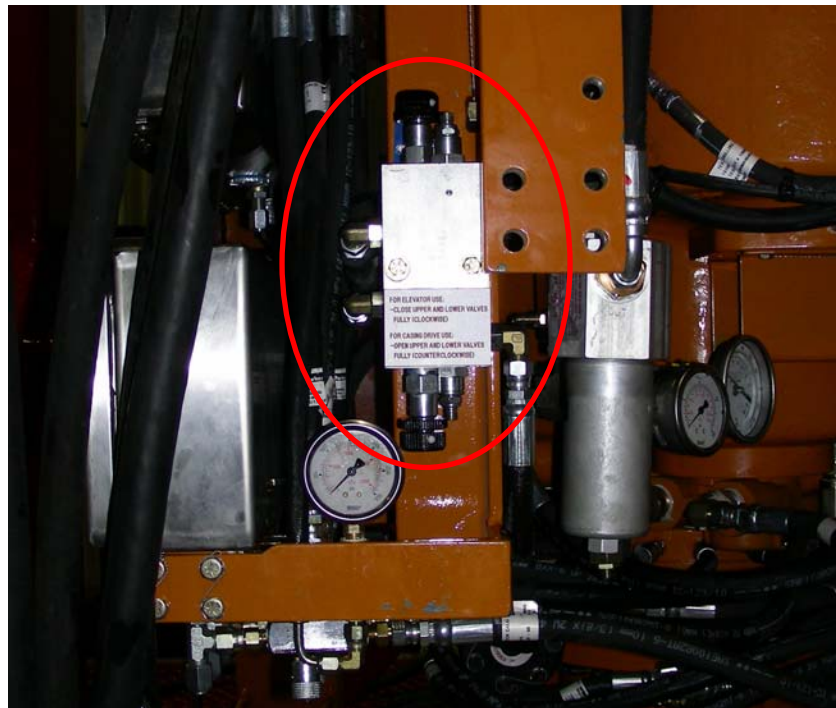


Figure 1 – Elevator pressure control manifold

AFFECTED PRODUCT:

This change is applicable to all 250T EMI 400 Top Drives with part numbers 730796 and 731226 manufactured prior to approximately January 1, 2007.

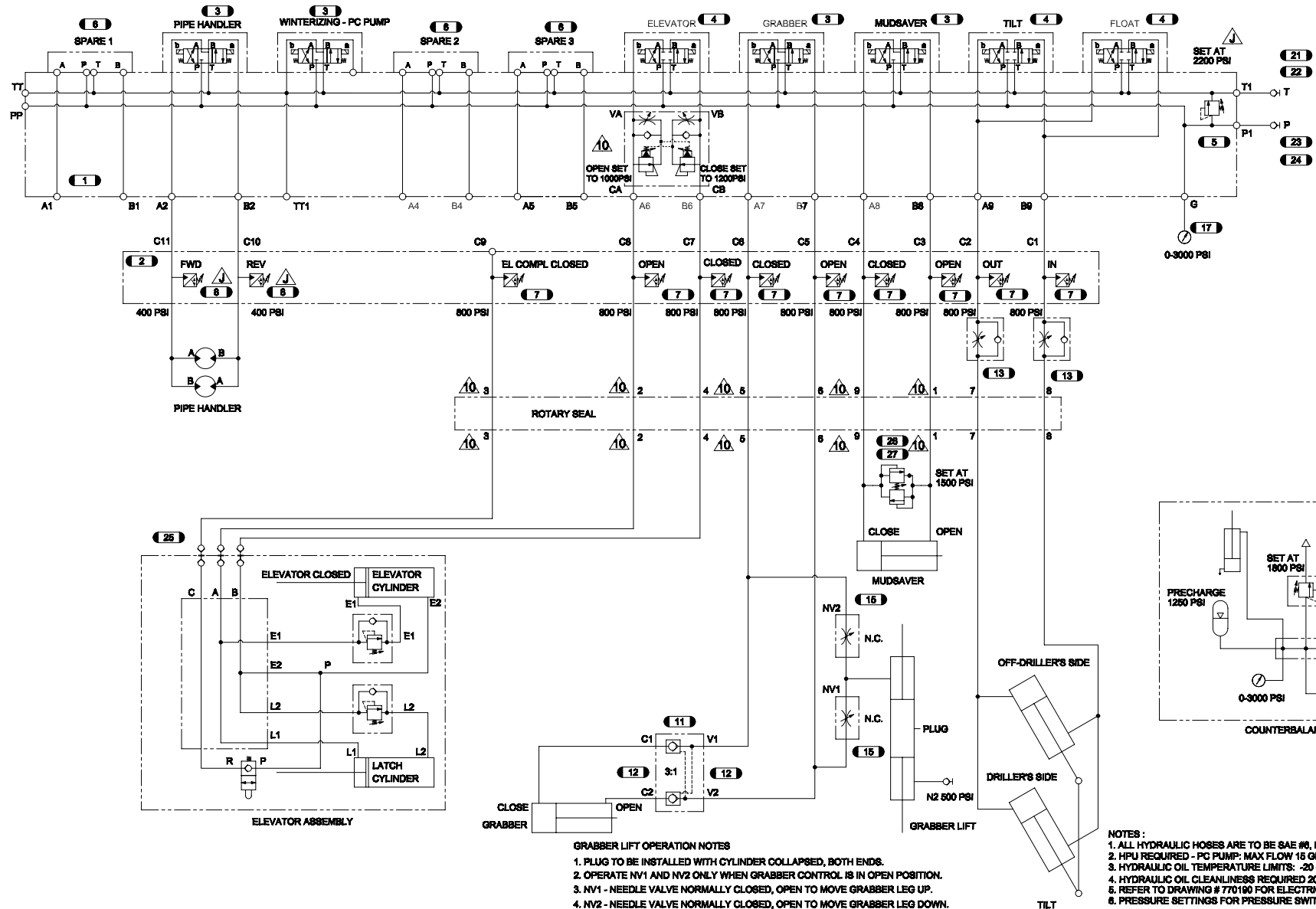
ACTION REQUIRED:

Affected top drives should be retrofit to add the manifold block and re-plumb the rotary seal according to drawing 590207 Rev 10. Please refer to the attached illustrations and bill of materials (I-730800 rev. 5 sheets 1 thru 12) to assist in the addition of the manifold block (Item 123) and re-plumbing of the rotary seal. The pressure reducing valves (Items 128) must be set to 1000 psi for the elevator open function and 1200 psi for the elevator close function.

The basic components required to complete a retrofit are given in the following table, additional hoses and fittings may be required depending on the original top drive configuration.

Quantity	Part Number	Description
1	720821	Body, Valve, Cartridge, Dual Pressure Reducing
2	1300014	Valve, Needle, T-13A Cavity, 4-psi Reverse Flow Check, Hand Knob
2	9139	Valve, Reducing, Cartridge, PO, T-11A, 100-3000 psi
1	1300002	Spacer, F/Valve Body
1	1300015	Label, Lamacoid, Valve, Manifold, Elevator, EMI400
2	1300003	Screw, Cap, Hex Hd, 1/4"-20UNCx5-1/2", Gr8,Pld,DrThd
2	11467	Washer, Flat, Type A, Narrow, 1/4", Hardened, Pld
2	9785	Nut, Hex, lock, Nylon, 1/4"-20UNC, Gr8, Pld
2	1091	Pin, Cotter, 1/8"ODx1"Lg, Pld
3	0199	Fitting, Hyd, 90Elb, #6MJICx#6ORB
1	1497	Fitting, Hyd, Str, #6MJICx#6ORB
1	3382	Hose, Hyd,100R2-AT,#6x30", FJICxFJIC
1	3716	Hose, Hyd,100R2-AT,#6x28", FJICxFJIC

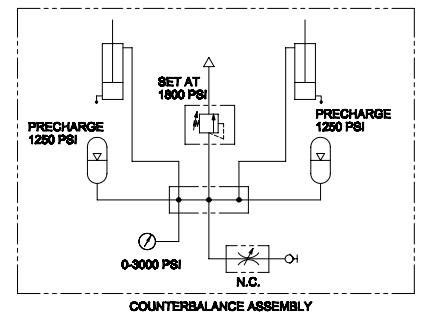
Contact your local TESCO Parts and Service Center for further information regarding this bulletin and or supply of affected components noted above.



GRABBER LIFT OPERATION NOTES

1. PLUG TO BE INSTALLED WITH CYLINDER COLLAPSED, BOTH ENDS.
2. OPERATE NV1 AND NV2 ONLY WHEN GRABBER CONTROL IS IN OPEN POSITION.
3. NV1 - NEEDLE VALVE NORMALLY CLOSED, OPEN TO MOVE GRABBER LEG UP.
4. NV2 - NEEDLE VALVE NORMALLY CLOSED, OPEN TO MOVE GRABBER LEG DOWN.

WARNING: DO NOT OPERATE GRABBER LIFT WHEN GRABBER IS IN CLOSE POSITION.



NOTES:

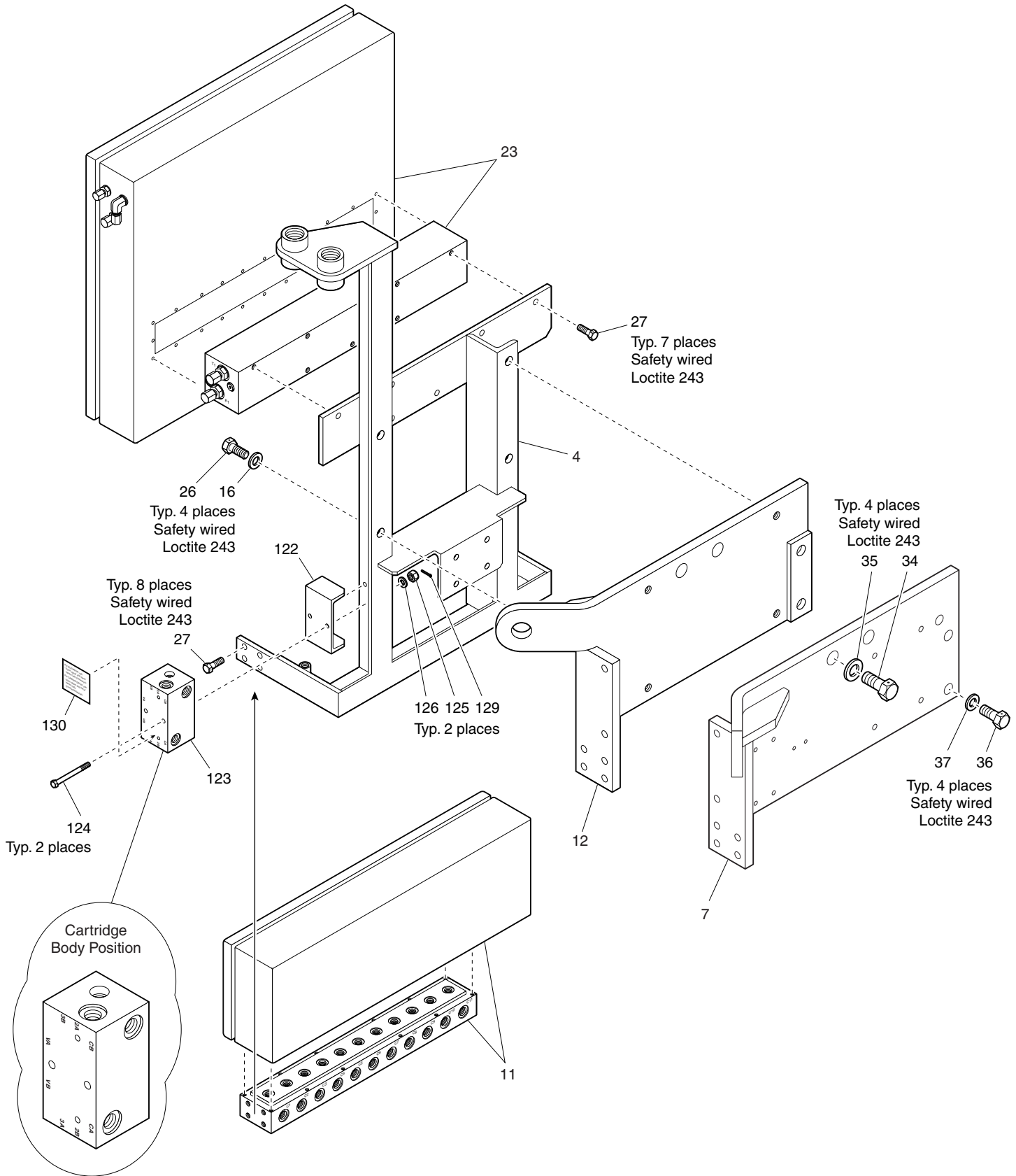
1. ALL HYDRAULIC HOSES ARE TO BE SAE #8, MINIMUM 3000 PSI WORKING PRESSURE
2. HPU REQUIRED - PC PUMP: MAX FLOW 15 GPM, MAX PRESSURE 2000 PSI
3. HYDRAULIC OIL TEMPERATURE LIMITS: -20 TO 70 DEG C
4. HYDRAULIC OIL CLEANLINESS REQUIRED 20/μm
5. REFER TO DRAWING # 770190 FOR ELECTRICAL SCHEMATIC.
6. PRESSURE SETTINGS FOR PRESSURE SWITCHES (ITEM 7) AS MARKED.

10 ESN 130-0002, ADD VALVE MANIFOLD & ASSIGN NEW PARTS 02JAN2007
 J KCD KIN401; ITEM No. W48 7; PRESSURE SETTING WAS 2000 PSI 01AUG2008


SCHEMATIC
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590207 10
 NTS 1 OF 1

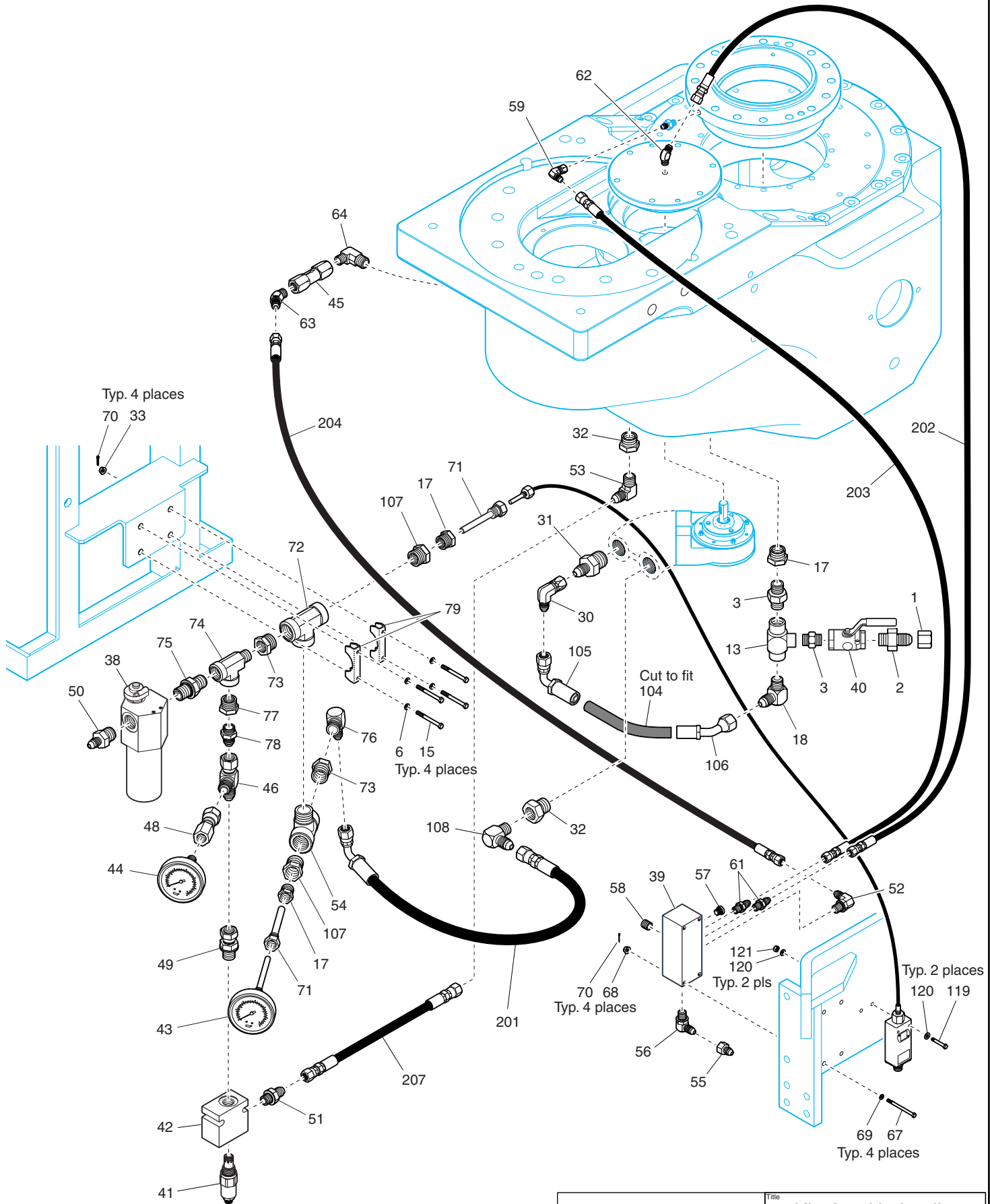
**HYDRAULIC SCH PC PUMP
 ROBOTICS EMI 400 TOP DRIVE**




Rev.	By	Date	ICD/ECN#	Description
D	LJW	060828	YFR-004	Refer to sheets 5, 6, 7 & 8
4	VNL	061130	072-0022	Refer to sheet 2
5	VNL	070306	130-0003	Added items 122-126, 129, 130



Title Kit, Aux Hydraulic, EMI 400,w/PC Pump, Press Switch			
File No.	I-730800-1.ai	Model	EMI 400
Dwg. No.	I-730800	Rev.	5 Sheet 1 of 12
Date	051102	Drawn	VNL
		Checked	Appd.

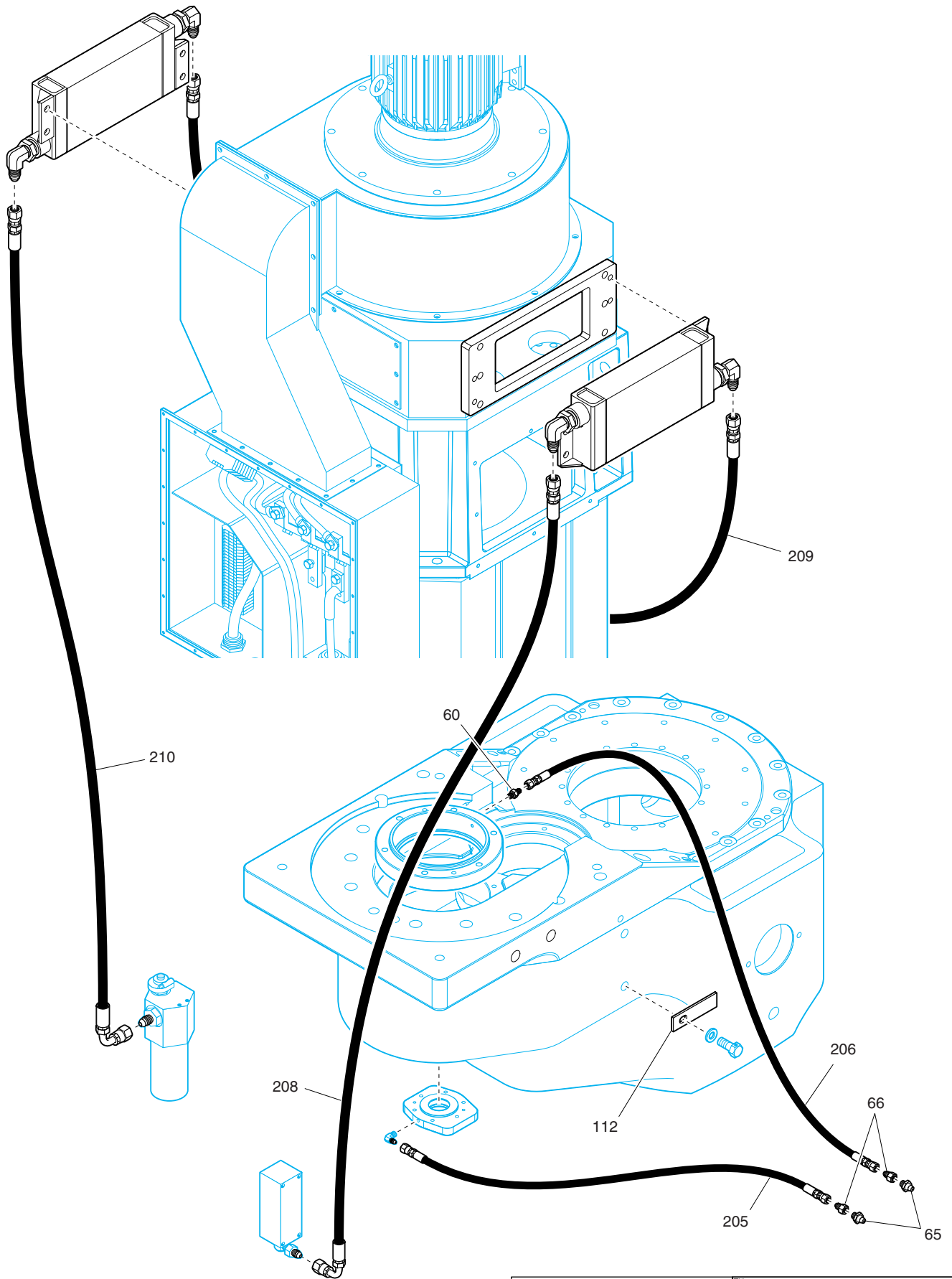


Rev.	By	Date	ICD/ECN#	Description
D	LJW	060828	YFR-004	Refer to sheets 5, 6, 7 & 8
4	VNL	061130	072-0022	Added items 119-121
5	VNL	070306	130-0003	Added hose numbers




**Kit, Aux Hydraulic,
EMI 400,w/PC Pump,
Press Switch**

File No. I-730800-2.ai	Model EMI 400
Dwg. No. I-730800	Rev. 5 Sheet 2 of 12
Date 051110	Drawn VNL
Checked	Appd.

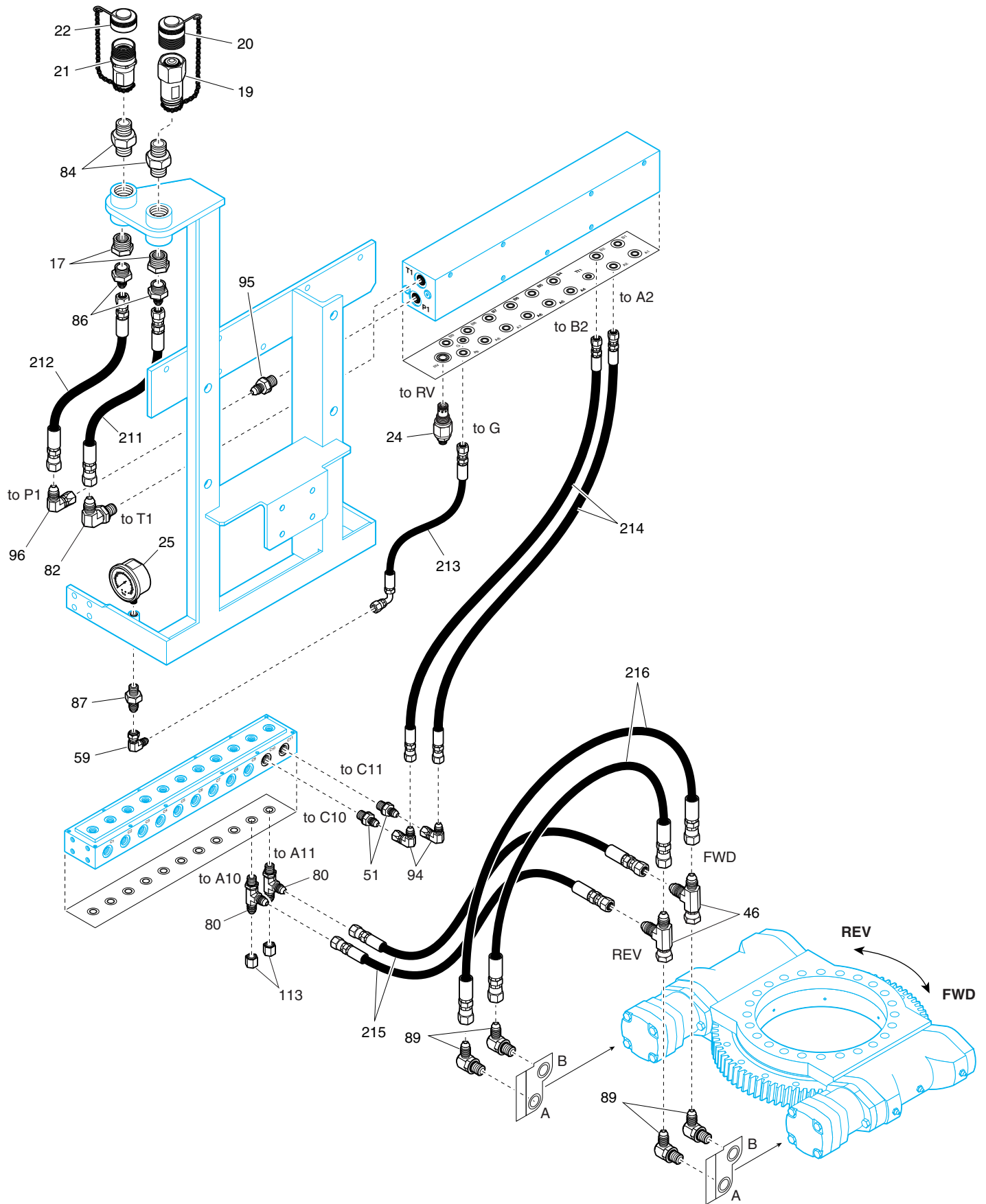


Rev.	By	Date	ICD/ECN#	Description
D	LJW	060828	YFR-004	Refer to sheets 5, 6, 7 & 8
4	VNL	061130	072-0022	Refer to sheet 2
5	VNL	070306	130-0003	Added hose numbers



**Kit, Aux Hydraulic,
EMI 400,w/PC Pump,
Press Switch**

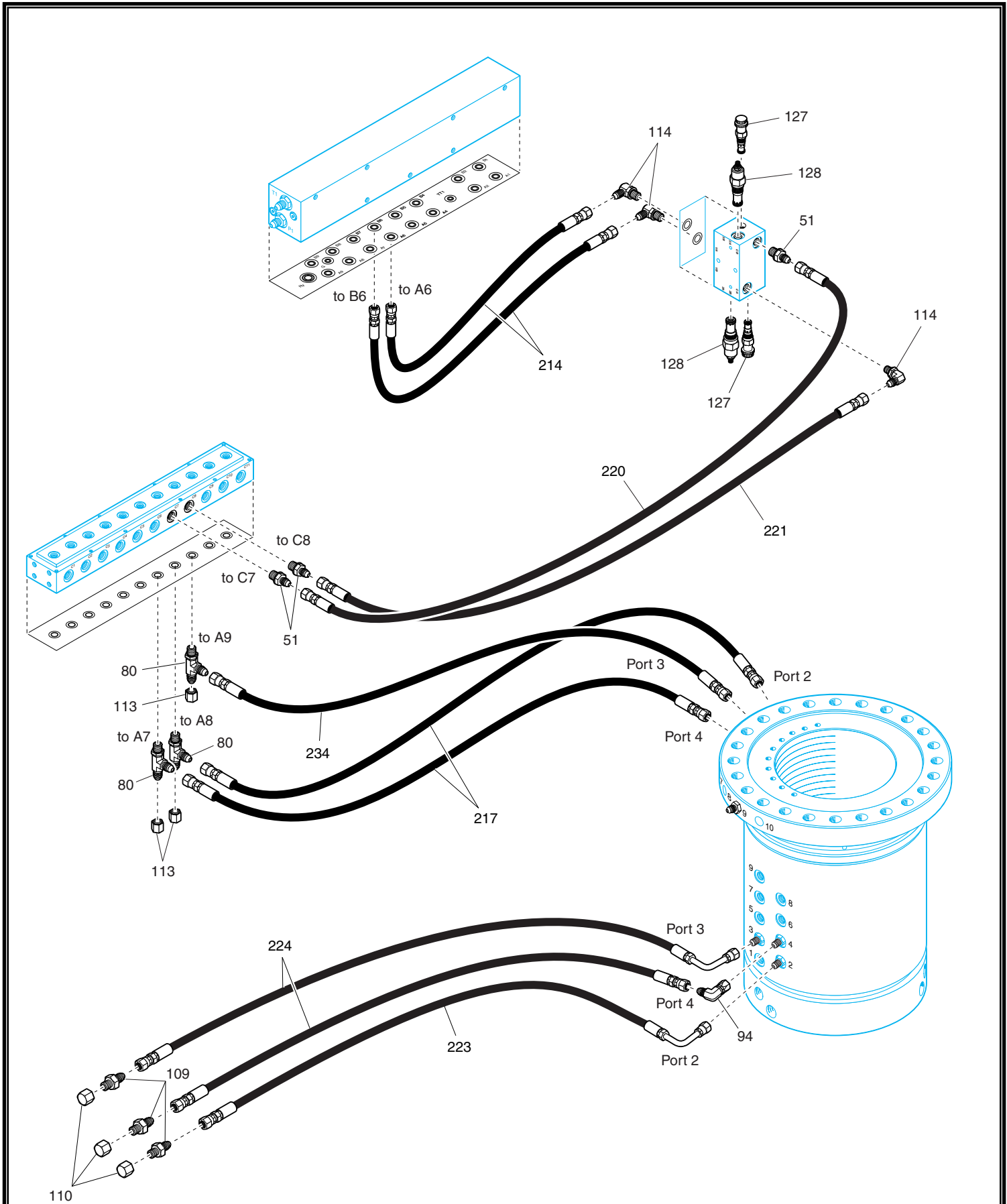
File No. I-730800-3.ai	Model EMI 400
Dwg. No. I-730800	Rev. 5 Sheet 3 of 12
Date 051114	Drawn VNL
Checked	Appd.



Rev.	By	Date	ICD/ECN#	Description
D	LJW	060828	YFR-004	Refer to sheets 5, 6, 7 & 8
4	VNL	061130	072-0022	Refer to sheet 2
5	VNL	070306	130-0003	Added hose numbers



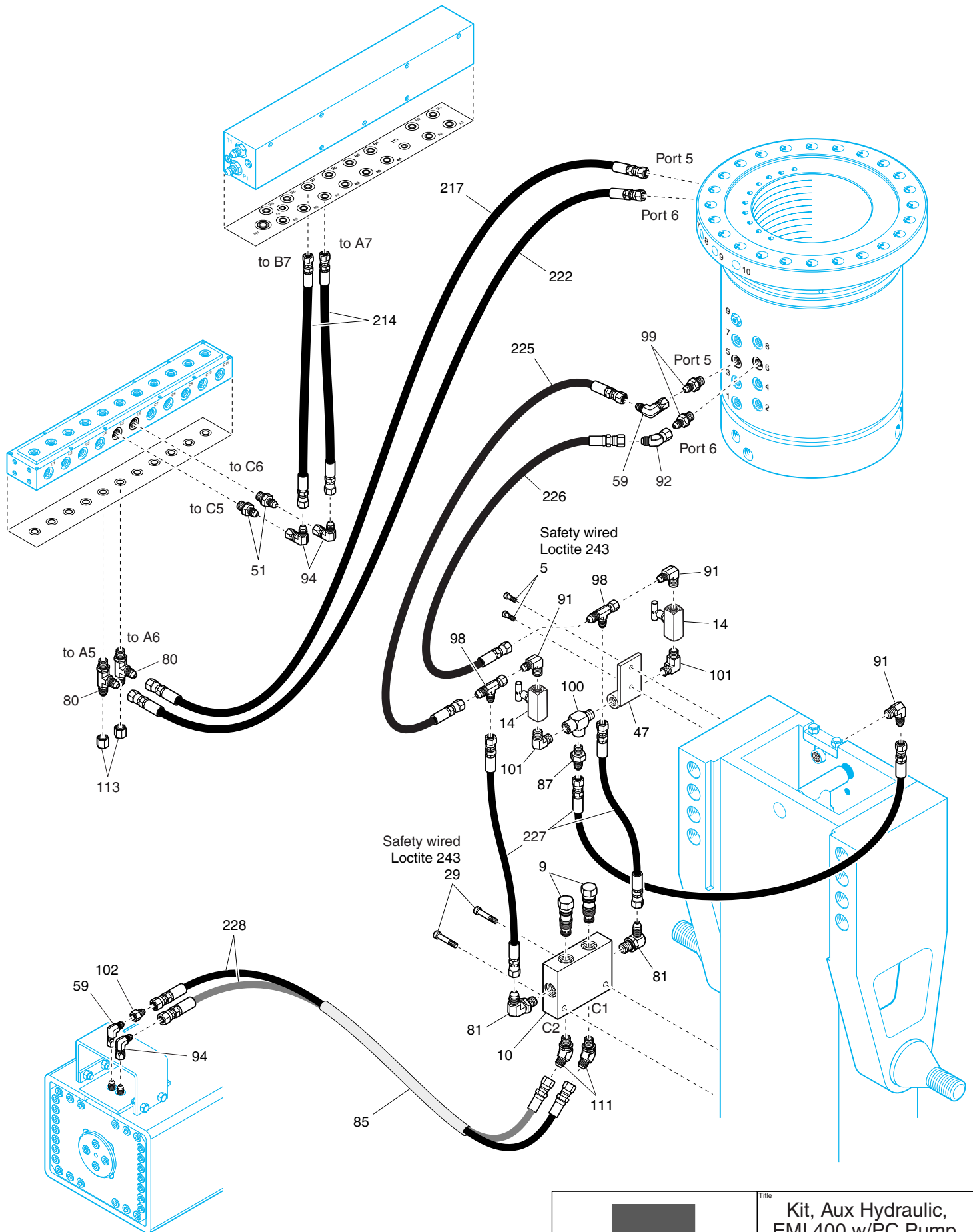
Title			
Kit, Aux Hydraulic, EMI 400,w/PC Pump, Press Switch			
File No.	I-730800-4.ai	Model	EMI 400
Dwg. No.	I-730800	Rev.	5
Date	051115	Drawn	VNL
Sheet	4 of 12	Checked	
		Appd.	



Rev.	By	Date	ICD/ECN#	Description
D	LJW	060828	YFR-004	Deleted item 94 at ports 1 and 2 on flange
4	VNL	061130	072-0022	Refer to sheet 2
5	VNL	070306	130-0003	Added hose numbers, items 114, 127, 128



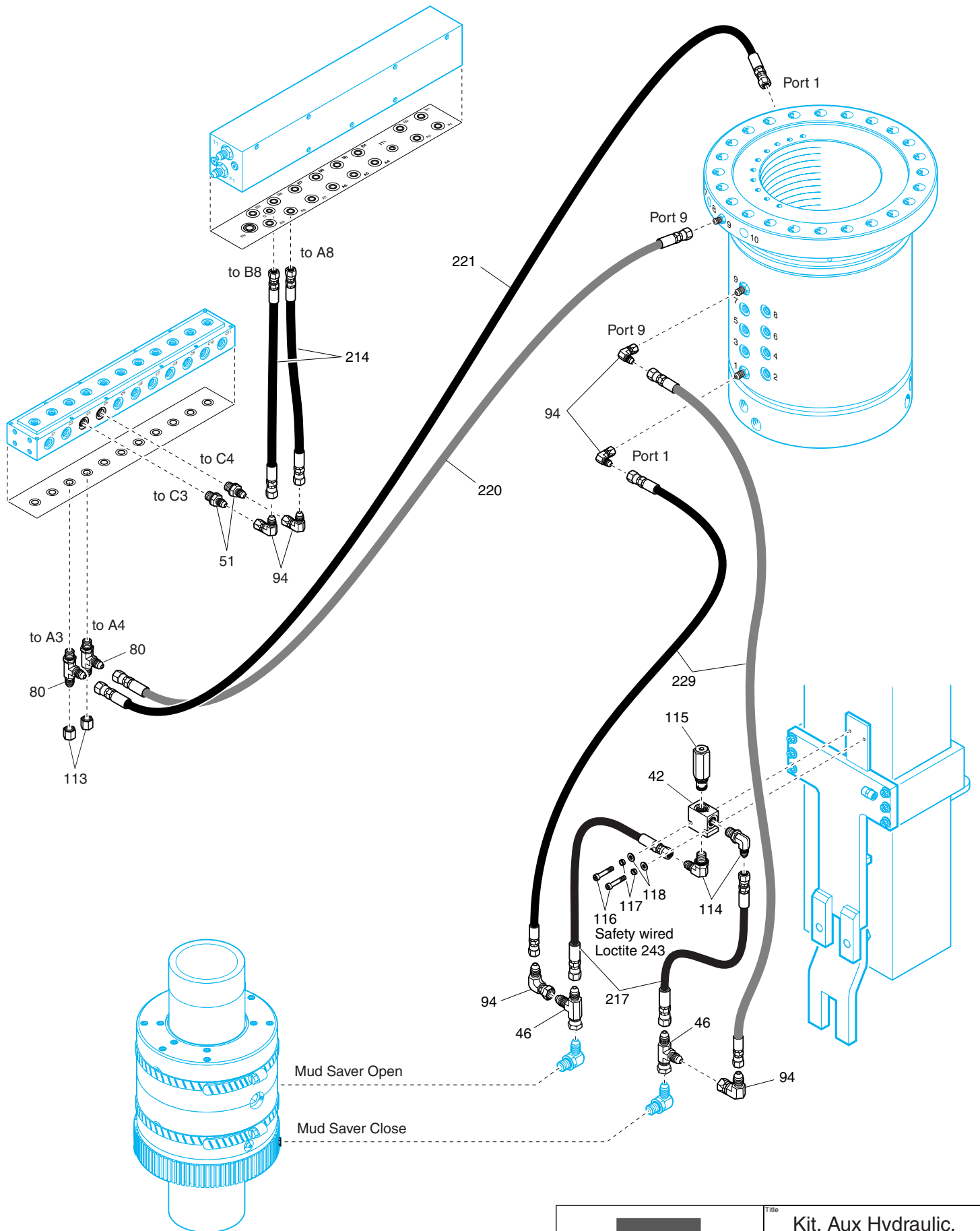
Title			
Kit, Aux Hydraulic, EMI 400, w/PC Pump, Press Switch			
File No.	I-730800-5.ai	Model	EMI 400
Dwg. No.	I-730800	Rev.	5
Date	051115	Drawn	VNL
Sheet	5 of 12	Checked	
		Appd.	




Rev.	By	Date	ICD/ECN#	Description
D	LJW	060828	YFR-004	Item 94 deleted from ports 3 & 4 at flange
4	VNL	061130	072-0022	Refer to sheet 2
5	VNL	070306	130-0003	Added hose numbers



Title			
Kit, Aux Hydraulic, EMI 400, w/PC Pump, Press Switch			
File No.	I-730800-6.ai	Model	EMI 400
Dwg. No.	I-730800	Rev	5
Date	051115	Sheet	6 of 12
Drawn	VNL	Checked	
Appd.			

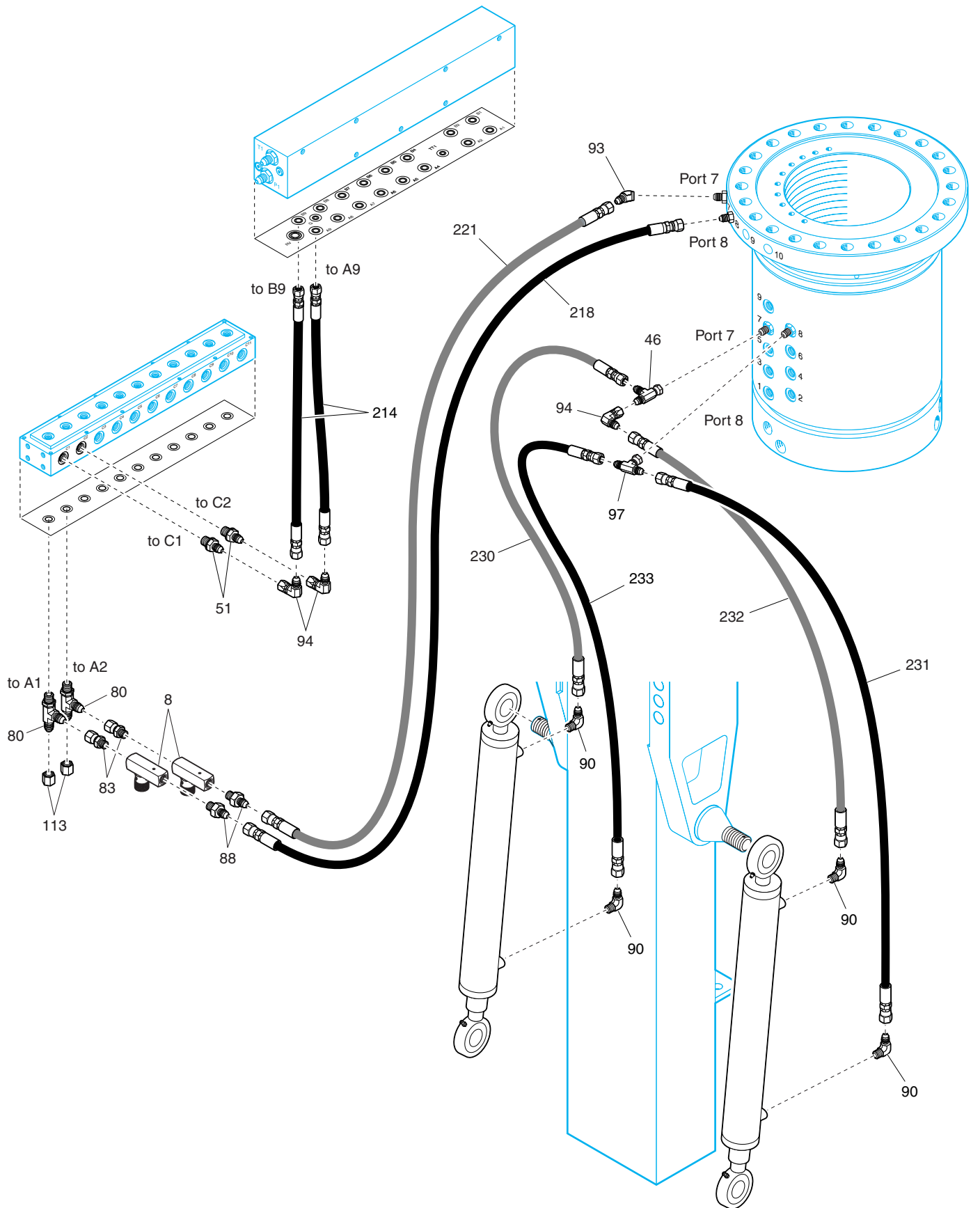


Rev.	By	Date	ICD/ECN#	Description
D	LJW	060828	YFR-004	Deleted item 94 from port 5 & item 93 from port 6
4	VNL	061130	072-0022	Refer to sheet 2
5	VNL	070306	130-0003	Added hose numbers




**Kit, Aux Hydraulic,
EMI 400,w/PC Pump,
Press Switch**

File No. I-730800-7.ai	Model EMI 400
Dwg. No. I-730800	Rev. 5 Sheet 7 of 12
Date 051116	Drawn VNL
Checked	Appd.



Rev.	By	Date	CD/ECN#	Description
D	LJW	060828	YFR-004	Added item 93 to port 7 at flange
4	VNL	061130	072-0022	Refer to sheet 2
5	VNL	070306	130-0003	Added hose numbers



Title			
Kit, Aux Hydraulic, EMI 400,w/PC Pump, Press Switch			
File No.	I-730800-8.ai	Model	EMI 400
Dwg. No.	I-730800	Rev.	5
Date	051116	Drawn	VNL
		Checked	
		Appd.	

Parts List



Part # 730800

Drawing # I-730800

Rev. 5 Pages 9 - 12 of 12

File # I-730800.xls

Refer: 8 Illustrations

Drawing Title: Kit,Aux Hydraulic,EMI 400,w/PC Pump,Press Switch

Item #	Tesco #	Qty	Description	Doc#
1	0403	1	Fitting,Hyd,Cap,#12FJIC,Stl	
2	0281	1	Fitting,Hyd,Str,#12MJICx#12MNPT	
3	0237	2	Fitting,Hyd,Str,#12MNPTx#12MNPT	
4	820101	1	Bracket,Aux & Press Manf Mnt,250T,EMI 400	820101
5	731067	2	Screw,Cap,Skt Hd,1/4"-20UNCx3/4",Dr Hd	SEE 55251107
6	7135	4	Washer,Lock,Helical Spring,3/8",Alloy,Pld	
7	820102	1	Plate,Mount,Aux Manf,DS,250T,EMI 400	820102
8	0022	2	Valve,Control,1/4"NPT,c/w Rev Flow Free Check	
9	2019	2	Valve,Check,PO,15-gpm,Sealed Pilot Piston,30psi-CP	
10	490125	1	Body,T11A Two Cavity,SAE-6,Cross Pilot,Aluminum	
11	730947	1	Manifold Assy,11 Stn,Press Switch,EMI 400	
12	820103	1	Plate,Mount,Aux Manf,ODS,250T,EMI 400	820103
13	0362	1	Fitting,Hyd,Tee,#12FNPTx#12FNPTx#12FNPT	
14	0024	2	Valve,Needle,6000-psig,1/4"FNPTx1/4"FNPT	
15	15240	4	Screw,Cap,Hex Hd,3/8"-16UNCx3-1/2",Gr8,Pld,Dr Thd	SEE 55251107
16	9232	4	Washer,Flat,Type A,Narrow,5/8",Hardened,Pld	
17	0249	5	Fitting,Hyd,Str,#16MNPTx#12FNPT	
18	0313	1	Fitting,Hyd,90°Elb,#12MJICx#12MNPT	
19	2895	1	Disconnect,Quick,Coupler,78Series,1"x1"FNPT	
20	0387	1	Plug,Quick Disconnect,Coupler,78-Ser,1"	
21	2008	1	Disconnect,Quick,Nipple,78Series,1"x1"FNPT	
22	0389	1	Cap,Quick Disconnect,Nipple,78-Ser,1"	
23	730818	1	Manifold Assy,10-Stn,EMI 400,w/PC Pump,Temp Switch	
24	6999	1	VALVE,RELIEF,CARTRIDGE,RVDA1ON	
25	0061	1	Gauge,Liq Filled,0-3000psi/kPa,2.5"ODx1/4"MNPT,LM	
26	12966	4	Screw,Cap,Hex Hd,5/8"-11UNCx1-1/4",Gr8,Pld,Dr Hd	SEE 55251107
27	3725	15	Screw,Cap,Hex Hd,3/8"-16UNCx1",Gr8,Pld,Dr Hd	SEE 55251107
28			Not used	
29	731068	2	Screw,Cap,Skt Hd,5/16"-18UNCx2",Dr Hd	SEE 55251107
30	0355	1	Fitting,Hyd,90°Elb,#12MJICx#12FJIC	
31	0293	1	Fitting,Hyd,Str,#12MJICx#16MNPT	
32	0248	2	Fitting,Hyd,Str,#16MNPTx#8FNPT	
33	720193	4	Nut,Hex,Lock,Spiralock,Flg,3/8"-16SPL,Gr8,Pld	
34	730958	4	Screw,Cap,Hex Hd,1"-8UNCx2-3/4",Gr8,Pld,Dr Hd	SEE 55251107
35	14249	4	Washer,Flat,Type A,Narrow,1",Hardened,Pld	
36	6085	4	Screw,Cap,Hex Hd,3/4"-10UNCx2",Gr8,Pld,Dr Hd	SEE 55251107
37	9231	4	Washer,Flat,Type A,Narrow,3/4",Hardened,Pld	
38	5772	1	Filter,Return Line,Spin-On,3000psi,20gpm	
39	6863	1	MANIFOLD,LUBRICATION,EC, G/BOX	15430010
40	0009	1	Valve,Ball,2-Way,2000-psi,WOG,3/4"FNPTx3/4"FNPT	
41	0033	1	VALVE,PILOT OPERATED RELIEF,F/AUX PUMP,CP2102	
42	0046	2	BODY,VALVE,2-WAY CAVITY,#6 SAE	
43	0070	1	THERMOMETER,BIMETAL,0-250,1/2	
44	5175	1	Gauge,Liq Fill,0-200psi/kPa,2.5ODx1/4MNPT,CBM,U-CI	
45	11874	1	VALVE,CHECK,1/4"FNPT,5PSI CRACKING	
46	0376	6	Fitting,Hyd,Tee,#6MJICx#6FJIC-Runx#6MJIC	
47	13923	1	MOUNT,NEEDLE VALVE,GRABBER HYD LOOP,EMI	23520856
48	0327	1	Fitting,Hyd,Str,#4FNPTx#6FJIC	

Item #	Tesco #	Qty	Description	Doc#
49	1506	1	Fitting,Hyd,Str,#6MORBx#6FJIC	
50	1494	1	Fitting,Hyd,Str,#8MJICx#12MORB	
51	1497	12	Fitting,Hyd,Str,#6MJICx#6MORB	
52	0201	1	Fitting,Hyd,90°Elb,#4MJICx#4MORB	
53	9176	1	Fitting,Hyd,90°Elb,#6MJICx#8MNPT	
54	0379	1	Fitting,Hyd,Tee,#20FNPTx#20FNPTx#20MNPT-Br	
55	1498	1	Fitting,Hyd,Str,#8MJICx#6MORB	
56	12303	1	Fitting,Hyd,90°Elb,#8MJICx#6MORB	
57	2799	1	Fitting,Hyd,Plug,Skt Hd,#4MORB	
58	4144	1	Fitting,Hyd,Plug,Skt Hd,1/4"MNPT	
59	0353	4	Fitting,Hyd,90°Elb,#4MJICx#4FJIC	
60	0286	1	Fitting,Hyd,Str,#4MJICx#2MNPT	
61	1488	2	Fitting,Hyd,Str,#4MJICx#4MORB	
62	10458	1	Fitting,Hyd,45°Elb,#4MJICx#2MNPT	
63	0307	1	Fitting,Hyd,45°Elb,#4MJICx#4MNPT	
64	13709	1	Fitting,Hyd,90°Elb,#8MNPTx#4MNPT	
65	1115	2	Fitting,Grease,Str,Short,1/4"MNPT	
66	10508	2	Fitting,Hyd,Str,#4MJICx#4FNPT	
67	731027	4	Screw,Cap,Hex Hd,5/16"-18UNCx3-3/4",Gr8,Pld,Dr Thd	SEE 55251107
68	720472	4	Nut,Hex,Lock,Spirallock,Flg,5/16"-18SPL,Gr8,Pld	
69	16585	4	Washer,Flat,Type A,Narrow,5/16",Hardened,Pld	
70	15608	8	Pin,Cotter,3/32"ODx3/4"Lg,Pld	
71	0072	2	THERMO,304,S/S,1/2X3/4X6.0 LAG	
72	0364	1	Fitting,Hyd,Tee,#20FNPTx#20FNPTx#20FNPT	
73	0246	2	Fitting,Hyd,Str,#20MNPTx#12FNPT	
74	7683	1	Fitting,Hyd,Tee,#12MNPT-Runx#12FNPTx#12FNPT	
75	0231	1	Fitting,Hyd,Str,#12MORBx#12MNPT	
76	0320	1	Fitting,Hyd,90°Elb,#8MJICx#12MNPT	
77	0243	1	Fitting,Hyd,Str,#12MNPTx#8FNPT	
78	0284	1	Fitting,Hyd,Str,#6MJICx#8MNPT	
79	14786	2	CLAMP,MUFFLER,1-3/4",YELLOW	
80	12141	11	Fitting,Hyd,Tee,#6MJICx#6MORB-Runx#6MJIC	
81	0200	2	Fitting,Hyd,90°Elb,#4MJICx#6MORB	
82	0204	1	Fitting,Hyd,90°Elb,#8MJICx#8MORB	
83	0214	2	Fitting,Hyd,Str,#4MNPTx#6FJIC	
84	0236	2	Fitting,Hyd,Str,#16MNPTx#16MNPT	
85	15473	10	SLEEVE,HOSE,NYLON,1.53"ID,BULK	
86	0282	2	Fitting,Hyd,Str,#8MJICx#12MNPT	
87	0285	2	Fitting,Hyd,Str,#4MJICx#4MNPT	
88	0289	2	Fitting,Hyd,Str,#6MJICx#4MNPT	
89	731009	4	Fitting,Hyd,90°Elb,#6MJICx#10MORB	
90	0316	4	Fitting,Hyd,90°Elb,#6MJICx#6MNPT	
91	0323	3	Fitting,Hyd,90°Elb,#4MJICx#4MNPT	
92	0348	1	Fitting,Hyd,45°Elb,#4MJICx#4FJIC	
93	0349	1	Fitting,Hyd,45°Elb,#6MJICx#6FJIC	
94	0352	15	Fitting,Hyd,90°Elb,#6MJICx#6FJIC	
95	1502	1	Fitting,Hyd,Str,#8MJICx#8MORB	
96	0354	1	Fitting,Hyd,90°Elb,#8MJICx#8FJIC	
97	0373	1	Fitting,Hyd,Tee,#6MJICx#6MJICx#6FJIC-Br	
98	0374	2	Fitting,Hyd,Tee,#4MJICx#4FJIC-Runx#4MJIC	
99	1491	2	Fitting,Hyd,Str,#4MJICx#6MORB	
100	0382	1	Fitting,Hyd,Tee,#4MNPT-Runx#4FNPTx#4FNPT	

Item #	Tesco #	Qty	Description	Doc#
101	11871	2	Fitting,Hyd,90°Elb,#4MNPTx#4MNPT	
102	0346	1	Fitting,Hyd,Str,#4FJICx#6MJIC	
103	731034	1	Kit,Hoses,Hyd,G/Box Lube & Open Loop,250T,EMI 400	I-731034
104	11499	1.5	Hose,Hyd,100R2-AT,3/4",2250psi,Parker	
105	11556	1	Fitting,Hose End,Crimp,90°Elb,Std,#12FJICx#12Hose	
106	11558	1	Fitting,Hose End,Crimp,45°Elb,Std,#12FJICx#12Hose	
107	0245	2	Fitting,Hyd,Str,#20MNPTx#16FNPT	
108	0318	1	Fitting,Hyd,90°Elb,#8MJICx#8MNPT	
109	0292	3	Fitting,Hyd,Str,#6MJICx#6MNPT	
110	731095	3	Fitting,Hyd,Cap,Hex Hd,3/8"FNPT	
111	12291	2	Fitting,Hyd,45°Elb,#6MJICx#6MORB	
112	930054	1	Bracket,Hose,Gearbox,150T,EMI 400	930054
113	0405	11	Fitting,Hyd,Cap,#6FJIC,Stl	
114	0199	5	Fitting,Hyd,90°Elb,#6MJICx#6MORB	
115	2902	1	Valve,Relief,Bi-Dir,Cart,10 gpm,600-3600 psi	
116	700077	2	Screw,Cap,Skt Hd,1/4"-20UNCx1-3/4",Dr Hd	SEE 55251107
117	3688	2	Washer,Lock,Helical Spring,Hi-Collar,1/4",Black	
118	11467	2	Washer,Flat,Type A,Narrow,1/4",Hardened,Pld	
119	4621	2	Screw,Cap,Skt Hd,#10-24UNCx3",18-8 SS	
120	6915	4	Washer,Flat,Type A,Narrow,#10,18-8 SS	
121	17419	2	Nut,Hex,Lock,Nylon,#10-24UNC,18-8 SS	
122	1300002	1	Spacer,F/Valve Body	1300002
123	720821	1	Body,Valve,Cartridge,Dual Pressure Reducing	
124	1300003	2	Screw,Cap,Hex Hd,1/4"-20UNCx5-1/2",Gr8,Pld.DrThd	
125	9785	2	Nut,Hex,Lock,Nylon,1/4"-20UNC,Gr8,Pld	
126	11467	2	Washer,Flat,Type A,Narrow,1/4",Hardened,Pld	
127	1300014	2	Valve,Needle,T-13A Cavity,4-psi Reverse Flow Check,Hand Knob Adj,Buna-N	
128	9139	2	Valve,Reducing,Cartridge,PO,T-11A,100-3000psi	
129	1091	2	Pin,Cotter,1/8"ODx1"Lg,Pld	
130	1300015	1	Label,Lamacoid,Valve Manifold,Elevator,EMI400	1300015
200	1300016	1	Kit,Hoses,Hyd,G/Box Lube & Open Loop,250T,EMI400	
201	731053	1	Hose,Hyd,100R2-AT,#8x22",FJICx45°FJIC	
202	5540	1	Hose,Hyd,100R2-AT,#4x43",FJICx45°FJIC	
203	11307	1	Hose,Hyd,100R2-AT,#4x41",FJICx45°FJIC	
204	731055	1	Hose,Hyd,100R2-AT,#4x17",FJICx45°FJIC	
205	731002	1	Hose,Hyd,100R2-AT,#4x27",FJICx45°FJIC	
206	6323	1	Hose,Hyd,100R2-AT,#4x32",FJICx45°FJIC	
207	3418	1	Hose,Hyd,100R2-AT,#6x13",FJICx45°FJIC	
208	731035	1	Hose,Hyd,100R2-AT,#8x66",FJICxLong 90°FJIC	
209	5483	1	Hose,Hyd,100R2-AT,#8x52",FJICx45°FJIC	
210	731054	1	Hose,Hyd,100R2-AT,#8x66",FJICx90°FJIC	
211	731242	1	Hose,Hyd,100R2-AT,#8x13",FJICx45°FJIC	
212	3371	1	Hose,Hyd,100R2-AT,#8x16",FJICx45°FJIC	
213	731051	1	Hose,Hyd,100R2-AT,#4x21",FJICx90°FJIC	
214	731049	10	Hose,Hyd,100R2-AT,#6x17.75",FJICx45°FJIC	
215	5461	2	Hose,Hyd,100R2-AT,#6x26",FJICx45°FJIC	
216	5440	2	Hose,Hyd,100R2-AT,#6x32",FJICx45°FJIC	
217	3487	5	Hose,Hyd,100R2-AT,#6x20",FJICx45°FJIC	
218	3476	1	Hose,Hyd,100R2-AT,#6x33",FJICx45°FJIC	
219			Not used	
220	3382	2	Hose,Hyd,100R2-AT,#6x30",FJICx45°FJIC	
221	3716	3	Hose,Hyd,100R2-AT,#6x28",FJICx45°FJIC	

Item #	Tesco #	Qty	Description	Doc#
222	3464	1	Hose,Hyd,100R2-AT,#6x25",FJICxFJIC	
223	3486	1	Hose,Hyd,100R2-AT,#6x132",FJICxFJIC	
224	731003	2	Hose,Hyd,100R2-AT,#6x132",FJICxLong 90°FJIC	
225	3369	1	Hose,Hyd,100R2-AT,#4x23",FJICxFJIC	
226	3713	1	Hose,Hyd,100R2-AT,#4x24",FJICxFJIC	
227	4376	3	Hose,Hyd,100R2-AT,#4x22",FJICxFJIC	
228	5546	2	Hose,Hyd,100R2-AT,#6x93",FJICxFJIC	
229	5465	2	Hose,Hyd,100R2-AT,#6x65",FJICxFJIC	
230	3420	1	Hose,Hyd,100R2-AT,#6x40",FJICxFJIC	
231	3475	1	Hose,Hyd,100R2-AT,#6x64",FJICxFJIC	
232	5464	1	Hose,Hyd,100R2-AT,#6x45",FJICxFJIC	
233	5441	1	Hose,Hyd,100R2-AT,#6x66.5",FJICxFJIC	
234	3718	1	Hose,Hyd,100R2-AT,#6x38",FJICxFJIC	