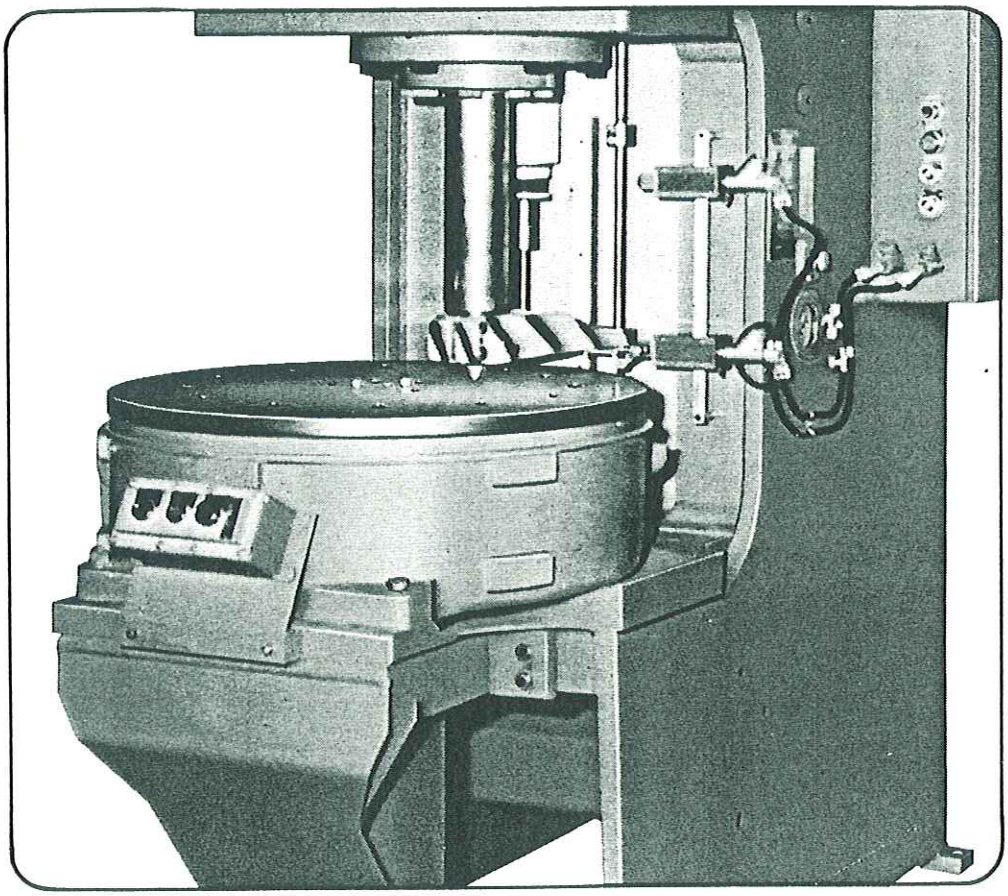
BULLETIN SM-9-2A

MULTIPRESS®

HYDRAULIC EQUIPMENT

service manual



IT-300 SERIES INDEX TABLE

MULTIPRESS®

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NOTICE

MULTIPRESS supplies service bulletins, parts lists and parts for presses with serial numbers below 30,000; only as a convenience to our customers.

Any press with a serial number below 30,000 was not manufactured by *MULTIPRESS*.

All guarding and safety considerations are the responsibility of the current owner per ANSI B11.2 1995.

INTRODUCTION

SERVICE POLICY

The simplicity of Multipress® Equipment, the unitized construction of its major components and observance of the instructions in this manual assure ease of servicing by the user.

All field service requested by the user and rendered by our factory representatives will be charged for at the established rate per day plus expenses. Multipress equipment sent to our factory for inspection and service will be rendered only upon receipt of purchase order for such service.

Current characteristics, dictated by the characteristics of the users' current are required at time of order.

MULTIPRESS® EQUIPMENT WARRANTY

If any Multipress equipment part of our manufacture which, after prepaid shipment to our factory and upon inspection at our factory or by a qualified factory representative, is proven defective in workmanship or material, it will be replaced free of charge providing that, within a period of six months from date of shipment from our factory it is still owned by the original purchaser and being used in recommended service and using an oil meeting our recommended specifications.

Parts other than of our manufacture bear only such warranties as their manufacturers allow. When upon inspection by a qualified representative, it is indicated that these parts are defective, we will endeavor to secure from the manufacturer the benefits of such warranties for our customers.

HYDRAULIC CIRCUIT

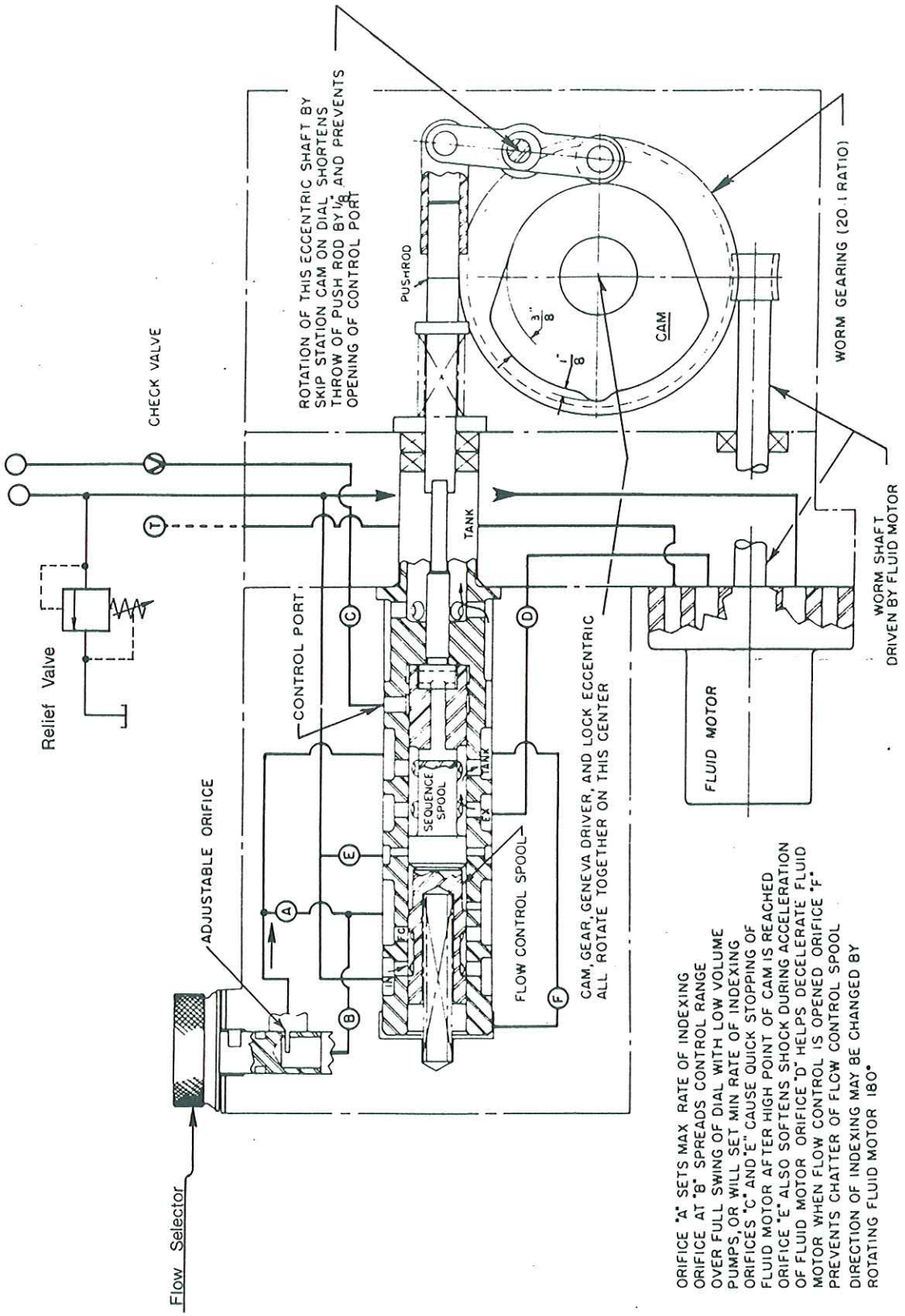


FIGURE 1

IT-300 SERIES INDEX TABLE

GENERAL

The Denison index table is a self-enclosed unit with geneva motion driven by fluid motor. It incorporates a mechanical driven lock pin in addition to the normal geneva motion lock, insuring greater accuracy of index.

SEQUENCE VALVE OPERATION

The valve cam has three levels for operating the internal spools to obtain "fast traverse", "speed control", and "control port" positions. When the press ram is up and oil is first delivered to the index table from the sequence port of the control valve, the cam is in the "fast traverse" position.

The follower is on the intermediate level of the cam so that the sequence and flow control spools are both 3/8 of an inch to the left of the position shown. The flow control port is blocked by the flow control spool, so that oil is directed through the sequence line to the inlet of the fluid motor. The fluid motor exhaust is open to tank through porting on the sequence spool.

The inlet oil is open to tank through orifice "E" which softens shock during acceleration of fluid motor.

During the "fast traverse" position of the cycle, the geneva driver does not engage the arbor; the lock eccentric, however, is disengaged. When the cam moves to the "speed control" position, the follower is on the low level of the cam as illustrated on the circuit. Thus, the sequence line is opened to the flow control port which opens to the bottom of the flow control spool, the adjustable orifice, and orifice "A".

With the adjustable orifice closed, the table will move at its maximum "speed control" rate of indexing. This maximum rate is determined by the size of orifice "A". Any rate of indexing between these two extremes can be obtained by simply adjusting the adjustable orifice. The orifice causes a pressure drop and this pressure difference is transmitted to both ends of the flow control spool.

When this pressure difference is great enough to over-come the flow control spring force, the flow control spool will move to the left, thus partially blocking the flow control port and diverting more oil to the fluid motor inlet.

It is during this "speed control" portion of the cycle that the geneva driver engages, the geneva arbor thus indexing the dial. After the dial is indexed, the geneva drive disengages. The cam then moves to the "fast traverse" position again. The flow control port is then blocked and full sequence flow is diverted to the fluid motor inlet (except the small amount that goes through orifice "E"). The lock eccentric engages during this "fast traverse" portion of the cycle thus locking the geneva arbor and dial in position.

When the cam moves to the "control port position", the cam follower is on the high point of the cam. The sequence spool then blocks the tank port and also opens the control port.

The pressure build up around the sequence spool is transmitted to the control port of the control valve, which initiates the rams cycle, thus closing the sequence port. Orifice "C, D" and "E" all help to decelerate the fluid motor so that the cam is stopped with the follower on the intermediate level and the cycle is completed.

INSTALLATION

The table must be located so that the center line of the ram coincides with the center line of the dial station under ram.

Before operating, the table must be filled with a mixture of 4 1/2 gallons of hydraulic fluid and 4 1/2 gallons of gear compound, such as Shell Omala #69 or equivalent. The fill pipe (83, Fig. 2) is located at the right rear of the table.

The table should also be lubricated before operating. See Lubrication instructions.

The speed sequence valve (9, Fig. 2) and fluid motor (8), are flange mounted to the left rear of the table. The sequence valve has a knurled knob for speed adjustment. Speeds are adjustable from 30 to 60 cycles per minute on the six and twelve station tables.

To reverse the direction of indexing, remove the fluid motor (8) from the subplate. Rotate the fluid motor 180° and reinstall the motor on the subplate.

NOTE

Put drip pan under motor before removing.

Operating pressures for the index table may be checked by installing a 2000 PSI gauge in the 1/4" pipe opening in the master relief valve, usually located near or at power source. A reading must be taken during indexing.

A cam arrangement can be installed on the dial to operate a skip station mechanism enabling indexing past any given station. The skip station plunger (76, Fig. 2) is located approximately 95° counterclockwise from pressing station.

DIAL REMOVAL PROCEDURES

To remove dial, first remove 3/4" socket set screw (3, Fig. 2) in center of dial. Remove the three 3/4" socket set screws (2) located around the center. Replace two of the 1/2" set screws (4) with eye bolts. Slide a rod through eye bolts and lift dial vertically.

When reassembling, the dial must be installed in the same relative position as is was originally.

CAUTION

With tooling and parts installed, clearance between dial (7) and housing (1) should be .005 to .015. Check this clearance at all points radially.

DIAL CLEARANCE ADJUSTMENT

Adjustment of this clearance is made by first loosening the socket head cap screws (2 & 3). Back off locknuts (5) and adjust set screws (4) to obtain proper clearances. Retighten cap screws (2 & 3) and recheck clearance.

DISASSEMBLY PROCEDURES

Remove drain plug (94, Fig. 3) and drain lubricant into clean container. This lubricant can be used over if it has not been over heated or contaminated.

Remove dial, see DIAL REMOVAL PROCEDURES.

Disassemble skip-station assembly (72 thru 82, 85 and 86, Fig. 2).

NOTE

Put drip pan under motor before removing.

Disconnect hydraulic lines from table and cap. Remove the four cap screws (10) and fluid motor (8). The sequence valve (9, Fig. 3) should then be removed.

Remove the six cap screws (93) securing the subplate (91) and gasket (92), and remove the subplate.

The cover (38) should be removed next by removing the seven 3/8" cap screws (37) and installing 1/2"-13 eye bolts in the taped holes provided around the periphery of the cover. A bar or other suitable lifting means can be employed to lift the cover vertically up off the housing (1). Remove pipe plus (33) and use a brass drift punch to tap worm gear (30) loose and remove gear from housing. Remove screws (39, Fig. 2) from lock guide (67) and remove plate (71) and dowel (68). Unbolt guide lock plate (67).

Install eye bolts in driver (50) and arbor (49). Use a strong rod or other suitable lifting apparatus and lift driver, arbor and lock assemblies simultaneously.

Remove bushing (14, Fig. 3), spring (15) and washer (16) from pushrod (18). Unscrew rod (18) from clevis (19) and remove pin (79, Fig. 2), clevis (19, Fig. 3) from housing.

Assemble components in reverse order.

CAUTION

When installing driver (50) and arbor (49), extreme care must be taken to insure the woodruff key (58) is positioned correctly, and cam (54) is set on high point.

Install pushrod (18, Fig. 3) and linkage with end of link (11) extending exactly 1/2" past subplate (91). If this 1/2" measurement is not held, sequence will be lost between ram and table. There is no locking mechanism needed after this distance is set.

After assembly, the pushrod (18) should be movable by hand. Be certain to try this before assembling fluid motor and sequence valve.

CAUTION

After assembly be sure to fill table with recommended oil.

NOTE

If either worm or worm gear need replacing they must be replaced as a set. Also Geneva driver must be replaced as an assembly.

LUBRICATION

Fill table with a mixture of 4 1/2 gallons of hydraulic fluid and 4 1/2 gallons of gear compound, such as "Shell Omala #69" or equivalent. The fillpipe (83, Fig. 2) is located at the right rear of the table.

On the housing (1, Fig. 2), spaced evenly around the periphery, are four lubrication fittings (90, Fig. 3) used to lubricate the underside of the dial. This area should be lubricated daily, with a soft grease, taking care not to overgrease.

MANUAL INDEXING

CAUTION

Before making any adjustments, have qualified personnel interrupt electric to machine.

To index dial manually, remove plug (33, Fig. 3) from housing. Use a 5/8" square socket wrench to turn worm gear. Turning worm gear clockwise will index table counterclockwise. It requires 20 revolutions of the worm gear to complete one index cycle.

SPEED ADJUSTMENT

Regulation of dial speeds is easily accomplished via the knurled knob on the speed sequence valve (9, Fig. 2), located at the left rear of the table.

Speed adjustment can be made with table running but do not exceed speed, tooling weight specifications listed below. These speeds are for continuous indexing of table and do not include press ram cycle time.

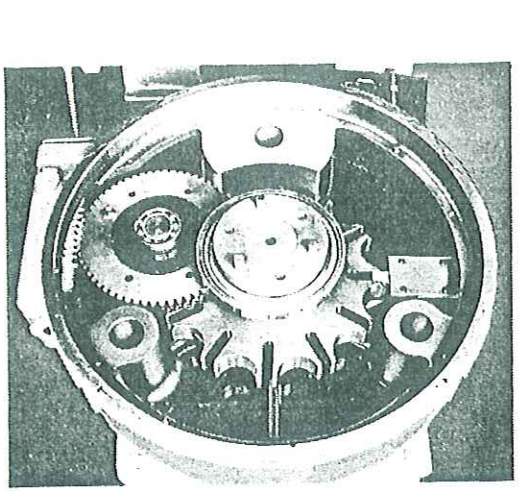
RECOMMENDED MAXIMUM TOOLING WEIGHT

(to be mounted on dial within work circle)

MODEL IT 306 (6 STATION)
50 lbs. @ 60 indexes/minute
225 lbs. @ 50 indexes/minute
500 lbs. @ 40 indexes/minute
1000 lbs. @ 30 indexes/minute

MODEL IT 312 (12 STATION)
700 lbs. @ 60 indexes/minute
1150 lbs. @ 50 indexes/minute
1500 lbs. @ 40 indexes/minute
1500 lbs. @ 30 indexes/minute

INDEX TABLE ASSEMBLY



SIX STATION SHOWN
(Items 98, 99, 105 and 106 Not Shown)

FIGURE 2

INDEX TABLE ASSEMBLY

ITEM	PART NO.	DESCRIPTION	QTY
1	032-13191	Housing-Index Table	1
2	358-26180	Screw-SHC 3/4-10 x 1 1/4	3
3	358-26380	Screw-SHC 3/4-10 x 4 1/2	1
4	312-19242	Screw-SS Flat Point 1/2-20 x 2	4
5	333-19000	Nut-Hex. Std. 1/2-20	4
6	324-24832	Pin-Dowel 3/4 x 2	6
7	032-19302	Dial - 6 & 12 Station (Semi-Finished)	1
8	See Fig. 3	Motor-Fluid TMC Series	1
9	See Fig. 4	Valve-Speed/Sequence	1
10	358-24280	Screw-SHC 5/8-11 x 2 1/2	8
11	032-13243	Link-Spacer	1
12	323-41012	Pin-"Driv-Lok" 5/32 x 3/4	1
13	620-60089	Seal	2
14	032-13242	Bushing	1
15	032-22296	Spring-Compression	1
16	032-22664	Washer	1
17	356-31062	Ring-External Retaining	1
18	032-13240	Rod-Push	1
19	032-13231	Clevis	1
20	321-39633	Pin-Flat Head 3/8 x 1 1/32	1
21	322-03240	Pin-Cotter 3/32 x 3/4	1
22	671-00239	O-Ring	1
23	032-13230	Retainer-Spring	1
24	*032-22087	Spring-Compression	1
25	032-13929	Retainer-Bearing	1
26	*671-00241	O-Ring	1
27	*620-50898	Seal	1
28	032-17681	Nut-Bearing Lock	1
29	350-01010	Washer-Bearing Lock	1
30	032-13192	Gear-Worm	1
31	230-10025	Bearing	1
32	230-08605	Bearing	1
33	410-92400	Plug-1 1/2 C'Sunk Pipe	1
34	341-10005	Nut-Bearing Lock	1
35	350-01005	Washer-Bearing Lock	1
36	431-90800	Plug-1/2 Soc. Pipe	3
37	358-16240	Screw-SHC 3/8-16 x 2	7
38	032-13200	Cover	1
39	358-12080	Screw-SHC 1/4-20 x 1/2	8
40	032-13234	Cover-Bearing	1
41	*032-13233	Gasket-Bearing Cover	1
42	358-12140	Screw-SHC 1/4-20 x 7/8	4
43	032-13232	Cover-Bearing	1
44	*032-13235	Gasket-Bearing Cover	1
45	230-10013	Bearing	1
46	032-13193	Gear-Worm	1
47	Not Used		1
48	230-00210	Bearing	2
49	032-13054	Arbor-(6 Station)	1
	032-13252	Arbor-(12 Station)	1
50	032-13053	Driver-Geneva, (6 Station)	1
	032-13254	Driver-Geneva, (12 Station)	1
51	032-13195	Pin-Geneva Drive, (6 Station)	1
	032-13261	Pin-Geneva Drive, (12 Station)	1
52	032-13198	Roller-Geneva Drive, (6 Station)	1
	032-13260	Roller-Geneva Drive, (12 Station)	1
53	358-12140	Screw-SHC 1/4-20 x 7/8	6
54	032-13223	Cam-Valve	1
55	358-16120	Screw-SHC 3/8-16 x 24	6
56	032-13196	Plug	1
57	032-13197	Plug	1
58	211-11004	Key-Woodruff	1
59	358-16100	Screw-SCH 3/8-16 x 5/8	4
60	032-13194	Retainer-Bearing	1
61	230-00212	Bearing	1
62	341-10012	Nut-Bearing Lock	1
63	350-01012	Washer-Bearing Lock	1
64	216-01042	Bushing	1
65	358-16160	Screw-SHC 3/8-16 x 1	4
	032-13227	Lock-(6 Station)	1
66	032-13257	Lock-(12 Station)	1
67	032-13221	Guide-Lock	1
68	032-13281	Pin	1
69	324-22416	Pin-Dowel	2
70	032-13222	Eccentric-Lock, (6 Station)	1
	032-13256	Eccentric-Lock, (12 Station)	1
71	032-13226	Plate-Lock	1
72	431-90100	Plug-1/16 Soc. Pipe	1
73	032-13927	Stop-Bell Crank Pin	1
74	311-10040	Screw-SS Cup Point 10-24 x 1/4	1
75	032-13924	Pin	1
76	032-13926	Rod-Cam Push	1
77	324-22012	Pin-Dowel 5/16 x 3/4	1
78	032-11607	Roller	1
79	032-13928	Pin-Bell Crank	1
80	306-10060	Screw-HHC 10-24 x 3/8	2
81	032-13279	Cover-Skip Station	1
82	032-13228	Crank-Bell	1
83	487-21405	Fitting-1" MPT Coupling Elbow	1
84	032-13932	Bushing	1
85	358-14180	Screw-SHC 5/16-18 x 1 1/4	1
86	*032-22815	Spring-Tension	1
87	*324-24016	Pin	1
88	*032-13942	Roller	1
89	431-92502	Plug-1" Pipe Flush	1
90	488-11610	Fitting-1/8" Alemite Straight	4
91	032-13199	Plate-Sub	1
92	*032-13241	Gasket	1
93	358-20340	Screw-SHC 1/2-13 x 3 1/2	6
94	431-91200	Plug-3/4 Soc. Pipe	1
95	431-90800	Plug-1/2 Soc. Pipe	1
96	032-13225	Gib, (6 Station)	2
	032-13258	Gib, (12 Station)	2
97	358-14140	Screw-SHC 5/16-18 x 7/8	6
98	311-12163	Screw-SS Cone Pt. 1/4-20 x 1, (12 Station)	1
99	333-12000	Nut-Hex. Std. 1/4-20, (12 Station)	1
100	311-16042	Screw-SS Flat Point 3/8-16 x 1/4	14
101	324-23236	Pin-Dowel 1/2 x 2 1/4	2
102	325-08160	Pin-Roll 1/8 x 1	1
103	325-16140	Pin-Roll 1/4 x 7/8	1
104	335-14100	Nut-Hex. Jam 5/16-18	1
105	032-13262	Pin-Clevis, (12 Station)	1
106	322-02320	Pin-Cotter 1/16 x 1, (12 Station)	1
	S11-23257	Kit-Basic Table & Sequence Repair	1

* Items Included In Repair Kit

TMC SERIES FLUID MOTOR

DISASSEMBLY

Before removing fluid motor from index table, mark motor housing to aid in correct remounting. The fluid motor will run in the opposite direction if the motor assembly in rotated 180° and remounted.

Remove the socket head cap screws (7) and slide pumping cartridge off shaft (13).

Be sure rotor (2) is held in cam ring (8) during disassembly to prevent vanes (4) and spring (3) from flying out.

Remove snap ring (11) from housing (18) and remove seal retainer (15) with enclosed seal (14). Seal (14) is press fit into seal retainer (15). The two tapped holes on the face of seal retainer (15) are tapped for No. 10-24 N.C. screws as a service aid in pulling seal retainer (15) from the housing (18). Grasp housing (18) with both hands and with spline end of the shaft down bump shaft (13) lightly on a block of wood. Once the shaft assembly is loose remove it carefully from the housing.

Remove inner bearing (9). Outer bearing (16) may now be removed from the shaft (13).

Place pumping cartridge flat on a clean surface and pull the rotor (2) out far enough so that a hose clamp or ring compressor can be securely fastened over the vanes (5) and around the rotor (2). Once the hose clamp or compressor is in place, remove the rotor (2) from the cam ring. Release the tension on the hose clamp or ring compressor slowly so that the spring loaded vanes (4) do not fly out of the rotor. After the hose clamp or ring compressor is removed, remove the vanes (4) and springs (3). Before attempting to clean any of the parts be sure that all "O" rings are removed.

Be sure all parts are thorougly cleaned and oiled before reassembling. Press outer bearing (16) and inner bearing (9) on shaft (13).

Place heavy grease on all the "O" ring seals. Carefully push shaft assembly into the port block (18). Place grease on shaft seal (14) and press into retainer (15). Grease the "O" ring (10) and insert into port block bore groove.

Push retainer (15) into bore of housing being careful not to damage the "O" ring (10). Install snap ring (11).

Lay rotor (2) face down on a clean flat surface. Install the springs (3) into the slots provided in the base of the rotor slots. Place vanes (4) carefully over the springs and into the rotor slots.

Place ring compressor or hose clamp around the edge of the rotor-spring-vane assembly and draw up to compress vanes (4) into the rotor. Carefully insert the rotor-vane assembly into the cam ring (8). Be certain that the assembly is inserted far enough into the cam ring (8) before the compressor is removed.

Place the two "O" rings (6) into the grooves on the sides of the cap (1) and port block (18). Be very careful that the rotor-vane assembly does not slide out of the cam ring at this point. Wash assembly in solvent, then oil thoroughly. Push rotor (2) on the shaft spline (13). Install the socket head cap screws or dowel pins (7) and tighten.

Secure cap (1) to port block (18) with socket head cap screws (5). Counterbores in the cap must line up with the heads of the socket head cap screws (5).

Be sure to tighten all socket head cap screws (5) evenly around the bolt circle. These should be tightened as per normal cap screw recommendations. TMC-Motor, 30# (lb/foot).

No shims or loose housing bolts are necessary in assembling this motor, since all clearances are held by the close tolerances in machining the component parts.

Fit key (12) to shaft (13). Install on index table. Fluid motor rotation can be changed by rotating complete motor assembly 180° and remounting.

FLUID MOTOR EXPLODED VIEW (TMC)

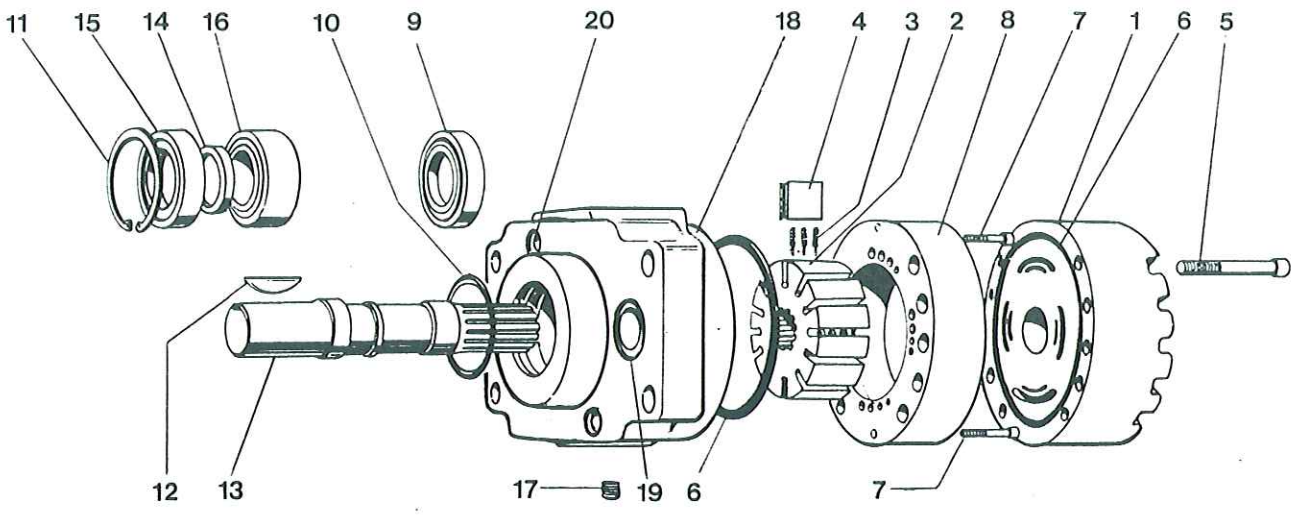


FIGURE 3

(TMCR-007) 012-00337
(TMCR-012) 014-00339

ITEM	PART NO.	DESCRIPTION	QTY.	
1	032-17075	Cap	1	1
2	034-15943	Rotor	1	1
3	034-16118	Spring-Vane	16	16
4	034-15944	Vane	8	8
5	358-16280	Screw-Soc. Hd. Cap 3/8-16 x 2 1/2"	10	10
6	*671-00243	O-Ring	2	2
7	358-12200	Screw-SHC 1/4-20x1 1/2	2	2
8	**034-18364**	Cam Ring		1
	034-18366	Cam Ring	1	
9	230-03205	Bearing	1	1
10	*671-00230	O-Ring	1	1
11	356-36250	Snap Ring-Internal	1	1
12	211-10016	Key-Woodruff #16	1	1
13	032-17076	Shaft	1	1
14	*620-50374	Seal-Shaft	1	1
15	032-17077	Seal Retainer	1	1
16	230-03206	Bearing	1	1
17	431-90100	Pipe Plug-1/16" Hex. Soc.	2	2
18	032-17074	Port Block	1	1
19	*630-42300	Vickerseal	2	2
20	*630-56215	Vickerseal	2	2
	S14-25578	Seal Kit		

* Items Included In Seal Kit.

WOODRUFF KEY
211-10016

4 BOLTS = NEW SHAFT 040-02867

8-10 BOLTS = OLD

SPEED/SEQUENCE VALVE ASSEMBLY

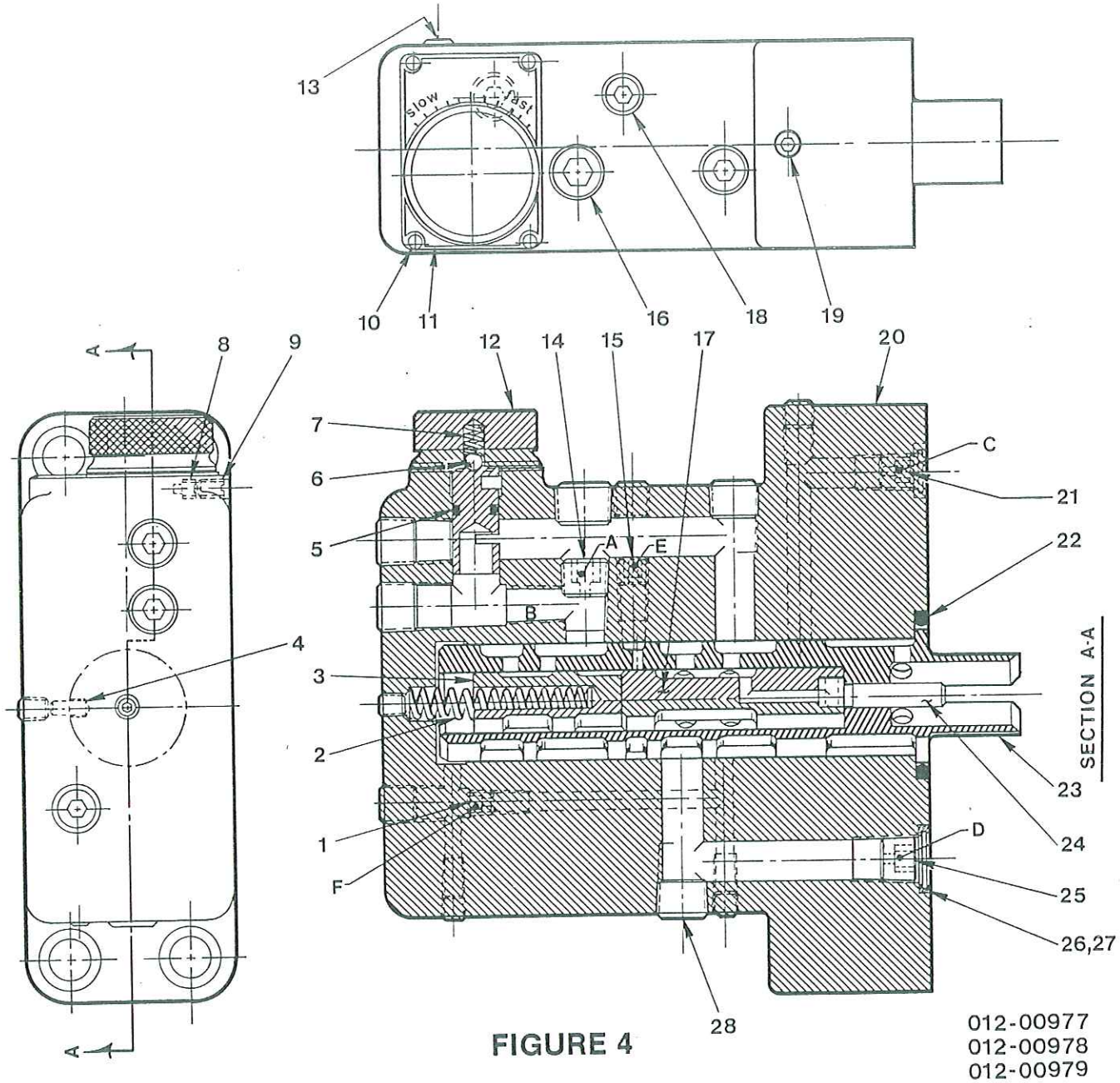


FIGURE 4

012-00977
012-00978
012-00979
012-20065

ITEM	PART NO.	DESCRIPTION	QTY
1	032-13085	Plug-Orifice "F"	1
2	032-46714	Spring-Compression	1
3	032-13219	Spool-Flow Control	1
4	324-21208	Pin-Dowel 3/16 Dia. x 1/2"	1
5	671-00112	O-Ring	1
6	201-08001	Ball-1/4 Dia.	2
7	032-22020	Spring-Compression	2
8	311-12065	Screw-SS Dog Pt. 1/4-20 x 3/8"	1
9	311-12061	Screw-SS Oval Pt. 1/4-20 x 3/8"	1
10	320-20204	Screw-ST Type "F" #2 x 1/4"	4
11	032-13236	Plate-Dial	1
12	See Fig.12	Flow Selector	1
13	431-90104	Plug-Hex. Soc. 1/16 Pipe Flush	4
14	See Fig.12	Plug-Orifice "A"	1

ITEM	PART NO.	DESCRIPTION	QTY
15	032-13539	Plug-Orifice "E"	1
16	431-90800	Plug-Hex. Soc. 1/2 Pipe Flush	1
17	032-13218	Spool-Sequence	1
18	431-90404	Plug-Hex. Soc. 1/4 Pipe Flush	2
19	431-90204	Plug-Hex. Soc. 1/8 Pipe Flush	1
20	032-13215	Body-Valve	1
21	032-16385	Plug-Orifice "C"	1
22	671-00330	O-Ring	1
23	032-13216	Sleeve	1
24	032-13217	Pin	1
25	See Fig.12	Plug-Orifice "D"	1
26	630-46146	Vickerseal	2
27	630-56215	Vickerseal	1
28	431-90604	Plug-Hex. Soc. 3/8 Pipe Flush	5

INDEX TABLE AUXILIARY MOUNTING

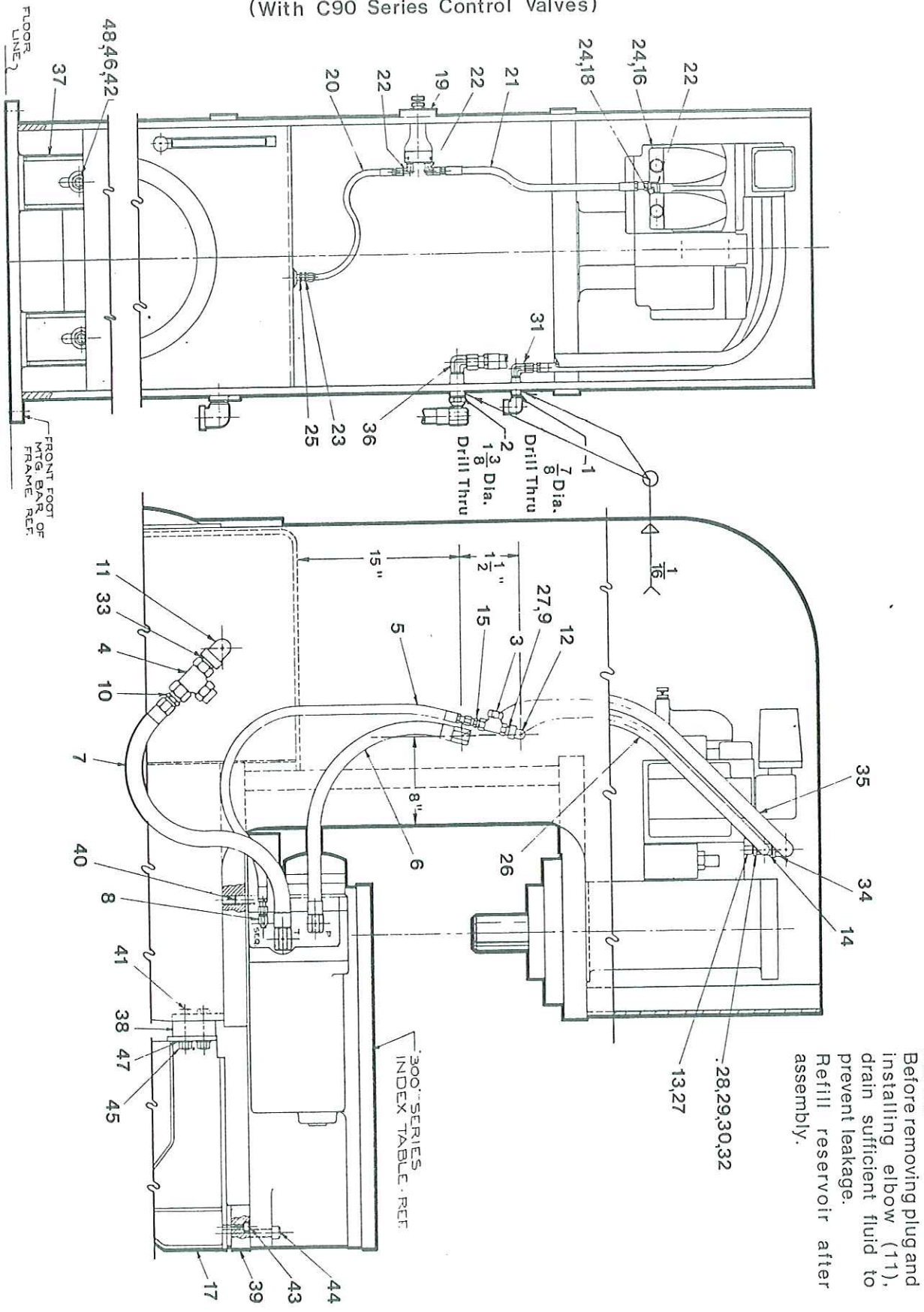
ITEM	PART NO.	DESCRIPTION	FH-20	FL-35 & FN-50	FQ-75	FX-100
1	421-30600	Coupling-3/8" Pipe	1	1	1	1
2	421-31200	Coupling-3/4" Pipe	1	1	1	1
3	513-05108	Valve-Check	1	1	1	1
4	513-50025	Valve-Check	1	1	1	1
5	031-29476	Hose-1/2" I.D. x 33" (Cont. Port)	1	1	1	1
6	032-69446	Hose-3/4" I.D. x 27" (Seq. Port)	1	1	1	1
7	032-69444	Hose-1" I.D. x 30" (Tank Return)	1	1	1	1
8	473-10806	Fitting-Tube 90° Elbow	1	1	1	1
9	442-06010	Nipple-3/8" Close	1	1	1	1
10	470-11616	Fitting-Rube	1	1	1	1
11	406-01600	Elbow-90° Street 1"	1	1	1	1
12	426-30600	Elbow-90° Street 3/8"	1	1	1	1
13	442-06180	Nipple-3/8" x 4 1/2"	1	1	1	1
14	442-12260	Nipple-3/4 x 6 1/2"	1	1	1	1
15	470-10808	Fitting-Tube, Straight	1	1	1	1
16	016-36494	Valve-RV12 (See Page 18)	1	1	1	1
17	032-42952	Bracket-Index Table	1	1	1	
	932-90955	Bracket-Index Table				1
18	016-36420	Valve-RV12 (See Page 18)	1			
	016-36574	Valve-RV12 (See Page 18)		1	1	1
19	016-65198	Valve-R1E02 (See Page 20)	1	1	1	1
20	031-29472	Hose-1/4" I.D. x 18" (Drain Line)	1	1	1	1
21	032-42936	Hose-1/4" I.D. (Press Line)	1			
	032-47479	Hose-1/4" I.D. (Press Line)		1		
	032-69746	Hose-1/4" I.D. (Press Line)			1	1
22	473-10404	Fitting-90° Tube Elbow	3	3	3	3
23	470-10404	Fitting-Tube Straight	1	1	1	1

ITEM	PART NO.	DESCRIPTION	FH-20	FL-35 & FN-50	FQ-75	FX-100
24	358-20330	Screw-SHC 1/2-13 x 3 1/4"	4	4	4	4
25	433-90604	Bushing-Hex. Pipe Redu. 3/8" x 1/4"	1	1	1	1
26	031-29476	Hose-(Cont. Port)	1			
	032-69305	Hose-(Cont. Port)		1		
	031-25914	Hose-(Cont. Port)			1	1
27	433-90806	Bushing-Hex. Pipe Redu. 1/2" x 3/8"	2	2	2	2
28	424-20800	Elbow-90° 1/2 Pipe		1		
29	474-11008	Fitting-Tube, 90° Elbow			1	1
30	474-10806	Fitting-Tube, 90° Elbow	1			
31	473-10806	Fitting-Tube, 90° Elbow	1	1		
	473-11006	Fitting-Tube, 90° Elbow			1	1
32	470-10606	Fitting-Tube Straight		1		
33	441-16010	Nipple-1" Pipe	1			
	442-16120	Nipple-1" Pipe		1		
	442-16240	Nipple-1" Pipe			1	1
34	474-11212	Fitting-Tube, 90° Elbow	1	1	1	1
35	031-69306	Hose-3/4" I.D. (Seq. Line)	1			
	031-69312	Hose-3/4" I.D. (Seq. Line)		1	1	1
36	473-11212	Fitting-Tube, 90° Elbow	1	1	1	1
37	032-42953	Pedestal	2	2	2	2
38	032-42954	Spacer	2	2	2	
39	032-42955	Adapter	1	1	1	
40	035-13910	Pin-Dowel 3/4" Dia. x 3"	2	2	2	2
41	306-24330	Screw-HHC 5/8-11 x 3 1/4"	4	4	4	4
42	306-26240	Screw-HHC 3/4-10 x 2"	2	2	2	2
43	358-20240	Screw-SHC 1/2-13 x 2"	2	2	2	
44	358-26320	Screw-SHC 3/4-10 x 3"	4	4	4	4
45	331-24100	Nut-Hex. 5/8-11	4	4	4	4
46	331-26000	Nut-Hex. 3/4-10	2	2	2	2
47	345-10040	Washer- SAE 5/8	4	4	4	4
48	344-10048	Washer-Std. 3/4	2	2	2	2

INDEX TABLE AUXILIARY MOUNTING

(FOR FH-20 THRU FX-100 SERIES PRESSES)

(With C90 Series Control Valves)



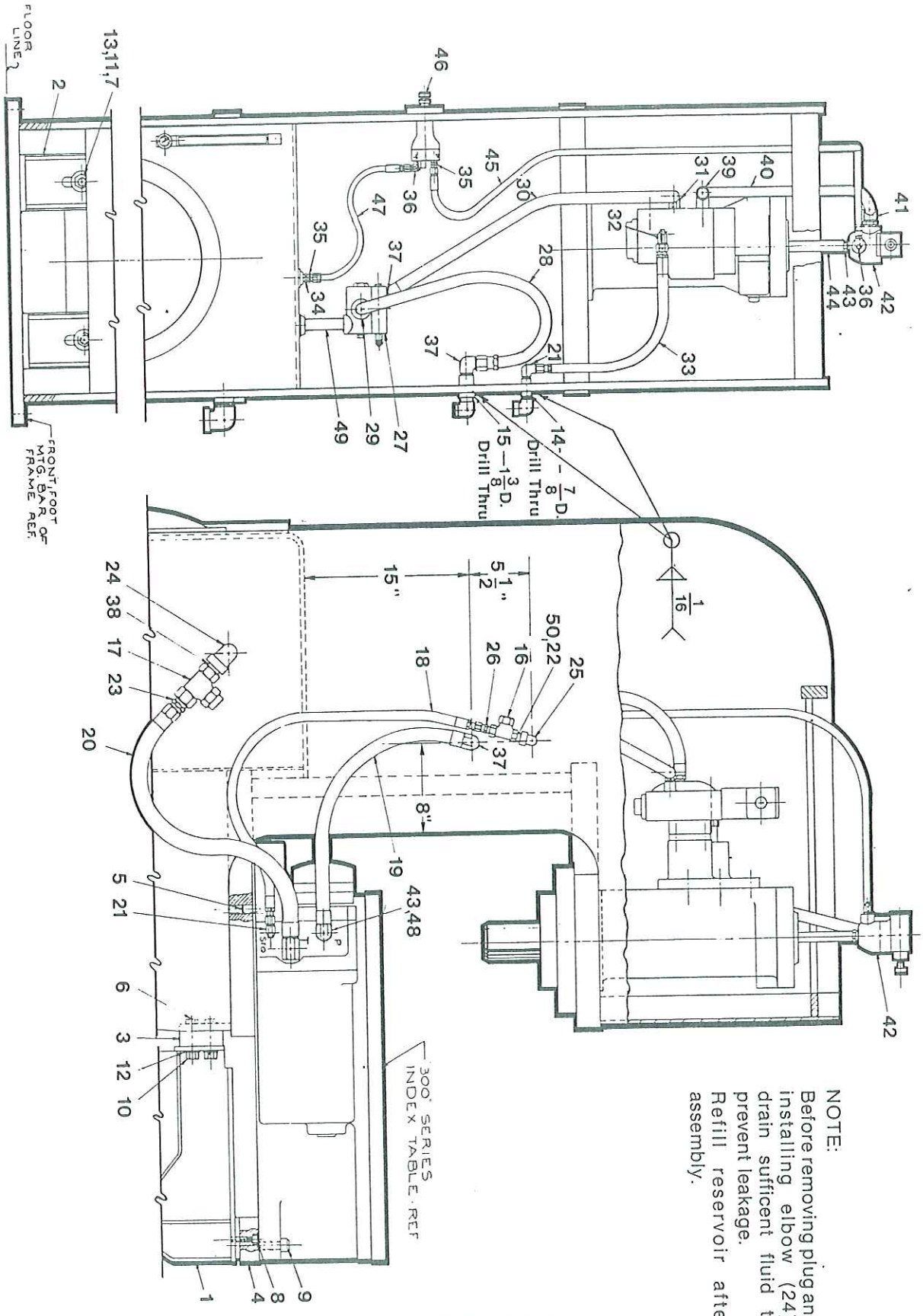
NOTE:
Before removing plug and installing elbow (11), drain sufficient fluid to prevent leakage. Refill reservoir after assembly.

FIGURE 5

INDEX TABLE AUXILIARY MOUNTING

ITEM	PART NO.	DESCRIPTION	QTY
1	032-42952	Bracket	1
2	032-42953	Pedestal	2
3	032-42954	Spacer	2
4	032-42955	Adapter	1
5	035-13910	Pin-Dowel, 3/4" Dia. x 3"	2
6	306-24330	Screw-HHC 5/8-11 x 3 1/4"	4
7	306-26240	Screw-HHC 3/4-10 x 2"	2
8	358-20240	Screw-SHC 1/2-13 x 2"	2
9	358-26320	Screw-SHC 3/4-10 x 3"	4
10	331-24100	Nut-Hex 5/8-11	4
11	331-26000	Nut-Hex 3/4-10	2
12	346-10040	Washer-SAE 5/8	6
13	344-10048	Washer-Std. 3/4	2
14	421-30600	Coupling - 3/8" Pipe	1
15	421-31200	Coupling-3/4" Pipe	1
16	513-05108	Valve-Horizontal Check 1/2"	1
17	513-50025	Valve-Horizontal Check 1"	1
18	031-41055	Hose-1/4" I.D. x 33" (Control Port)	1
19	035-27745	Hose-1/2" I.D. x 32" (Sequence Line)	1
20	032-42911	Hose-5/8" I.D. x 24" (Tank Return)	1
21	473-10606	Fitting-Tube 90°	2
22	442-06010	Nipple-3/8" Pipe x Close	1
23	470-11616	Fitting-Tube Straight	1
24	406-01600	Elbow-90° Street 1"	1
25	426-30600	Elbow-90° Street 3/8"	1
26	470-35014	Fitting-Straight	1
27	016-01119	Valve-RV-20 (See Page 17)	1
28	031-44416	Hose-1/2" I.D. x 23"	1
29	470-35015	Connector-Male	1
30	032-69046	Hose-1/2" I.D. x 20" (Sequence Line)	1
31	473-10808	Elbow-Male	1
32	473-10604	Elbow-Male	1
33	031-41054	Hose-1/4" I.D. x 28" (Control Port)	1
34	433-90604	Bushing-Pipe, Reducing 3/8" x 1/4"	1
35	470-10404	Control-Male	2
36	473-10404	Elbow-Male	2
37	473-15019	Elbow-Male	3
38	441-16010	Nipple-1" Pipe	1
39	427-21600	Tee-1" Pipe	1
40	032-44407	Hose-1" I.D. x 21"	1
41	473-11616	Elbow-Male	1
42	016-09030	Valve-3/4" Relief R1V12 (See Page 19)	1
43	433-91208	Bushing-Pipe, Hex. Reducing 3/4" x 1/2"	2
44	442-08240	Nipple-Pipe 1/2 x 6"	1
45	032-69311	Hose-1/4" I.D. x 60" (Vent Line)	1
46	016-65198	Valve-Remote R1E (See Page 20)	1
47	032-29472	Hose-1/4" x 18" (Draw Line)	1
48	426-31200	Elbow-Street 3/4"	1
49	441-12160	Nipple-Pipe 3/4 x 4"	1
50	433-90806	Bushing-Hex. Reducing 1/2" x 3/8"	1

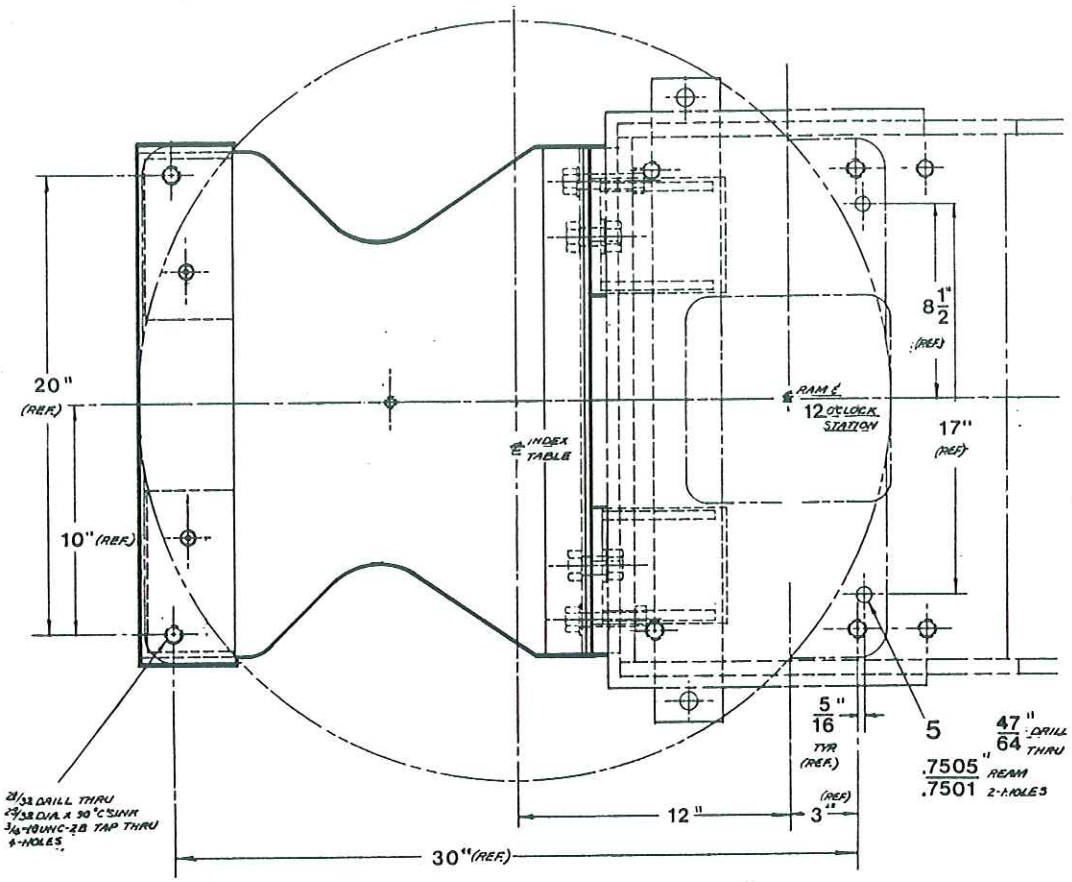
INDEX TABLE AUXILIARY MOUNTING
(FOR FH-SERIES PRESSES WITH C-300 CONTROL VALVE)

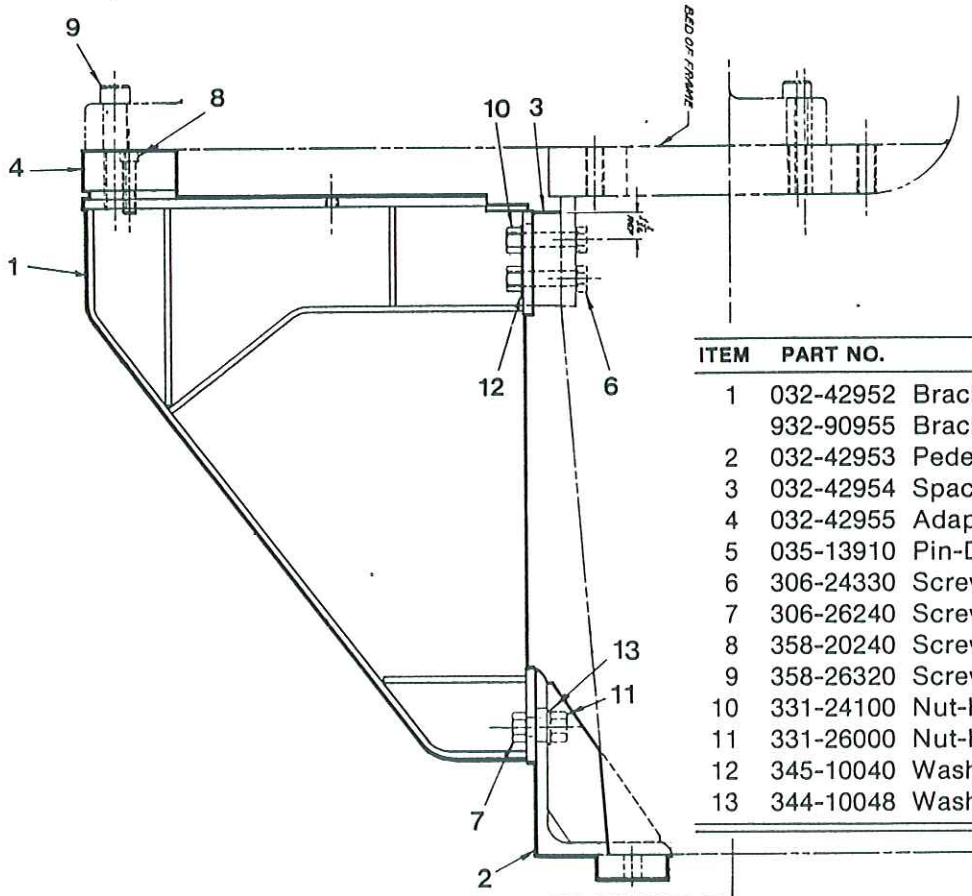


NOTE:
Before removing plug and installing elbow (24), drain sufficent fluid to prevent leakage. Refill reservoir after assembly.

FIGURE 6

MOUNTING BRACKET

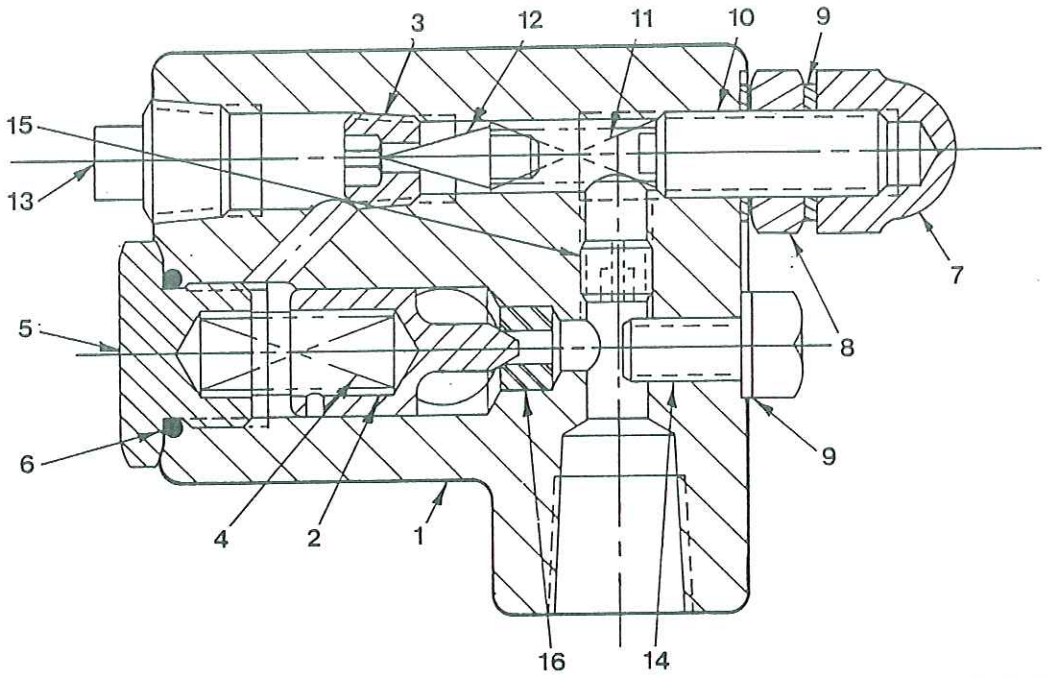




ITEM	PART NO.	DESCRIPTION	QTY (FX: S12-49104)	QTY (FH, FL, FN, FQ: S12-15395)
1	032-42952	Bracket	1	
	932-90955	Bracket		1
2	032-42953	Pedestal	2	2
3	032-42954	Spacer	2	
4	032-42955	Adapter	1	
5	035-13910	Pin-Dowel 3/4 Dia. x 3"	2	2
6	306-24330	Screw-HHC 5/8-11 x 3 1/4"	4	4
7	306-26240	Screw-HHC 3/4-10 x 2"	2	2
8	358-20240	Screw-SHC 1/2-13 x 2"	2	
9	358-26320	Screw-SHC 3/4-10 x 3"	4	4
10	331-24100	Nut-Hex. 5/8-11	4	4
11	331-26000	Nut-Hex. 3/4-10	2	2
12	345-10040	Washer-SAE 5/8	4	4
13	344-10048	Washer-Std. 3/4	2	2

FIGURE 7

RELIEF VALVE ASSEMBLY (RV-20)

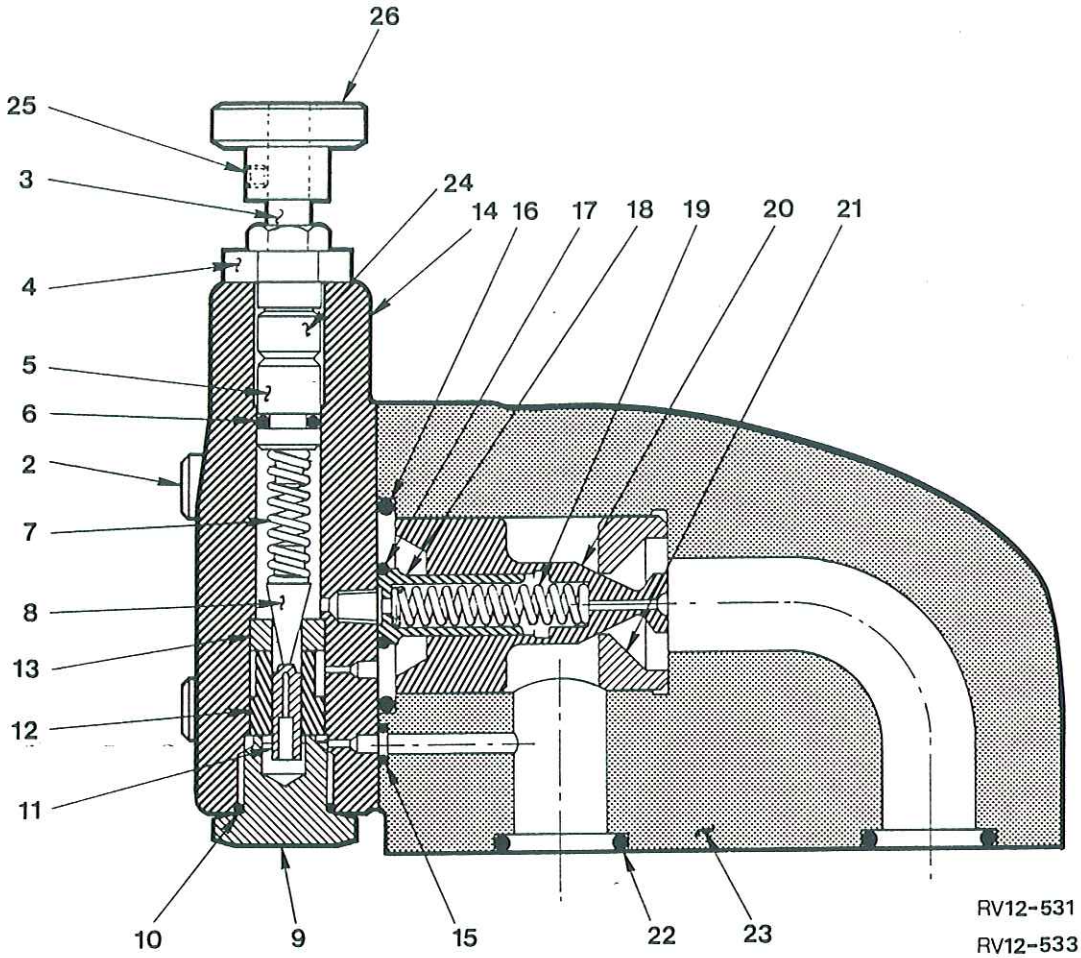


016-01119

FIGURE 8

ITEM	PART NO.	DESCRIPTION	QTY
1	036-17032	Body-Threaded	1
2	036-17033	Spool	1
3	036-17034	Seat-Control	1
4	036-22295	Spring-Compression	1
5	036-24238	Plug-Screw Thread, 1 5/8-12	1
6	671-00920	Gasket-"O" Ring	1
7	327-25000	Nut-Acorn, 1/2-20	1
8	335-19101	Nut-Hex Jam, 1/2-20	1
9	036-22745	Gasket-Washer	3
10	036-21001	Screw-Soc. Set, Dog Point 1/2-20	1
11	036-13244	Spring-Compression	1
12	036-12288	Cone	1
13	429-90600	Plug-3/8" Sq. Hd. Pipe	1
14	307-19121	Screw-HHC 1/2-20 x 3/4	1
15	036-17916	Plug-Orifice	1
16	036-17134	Seat	1

RELIEF VALVE ASSEMBLY (RV-12)



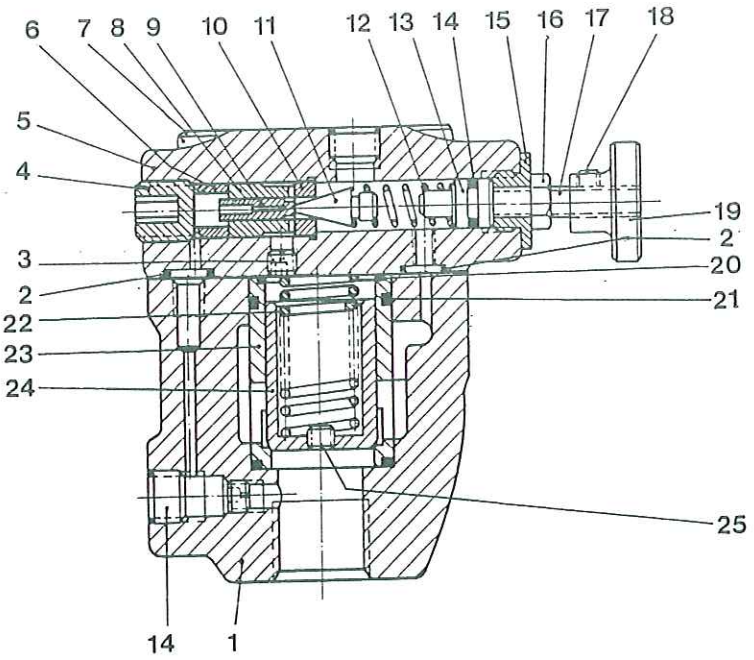
RV12-531	016-36494
RV12-533	016-36420
RV12-535	016-36574

FIGURE 9

ITEM	PART NO.	DESCRIPTION	QTY
1	431-90400	Plug-Soc. Pipe, 1/4" (Not Shown)	2
2	308-18200	Screw-SHC 7/16-14 x 1 1/2	4
3	312-13200	Screw-Adjusting	1
4	036-21765	Plug-Adjusting	1
5	036-11712	Piston-Seal	1
6	671-00012	"O" Ring	1
7	036-13244	Spring-Model (RV12-531)	
	036-13245	Spring-Model (RV12-533)	1
	036-12289	Spring-Model (RV12-535)	1
8	036-12288	Cone	1
9	036-15398	Plug	1
10	691-00908	"O" Ring	1
11	036-11694	Piston-Control	1
12	036-11710	Block-Control	1

ITEM	PART NO.	DESCRIPTION	QTY
13	036-11692	Seat-Control	1
14	036-15489	Cap-Valve	1
15	691-00008	"O" Ring	2
16	691-00221	"O" Ring	1
17	671-00112	"O" Ring	1
18	036-11866	Piston-Differential	1
19	036-22093	Spring-Differential Piston	1
20	036-12078	Spool	1
21	036-12077	Seat-Spool	1
22	691-00212	"O" Ring	2
23	036-12170	Body	1
24	036-33245	Spacer	1
25	312-09041	Screw-Soc. Set	1
26	036-24504	Knob-Control	1
27	333-13001	Nut-Lock	1

RELIEF VALVE ASSEMBLY (R1V-12)

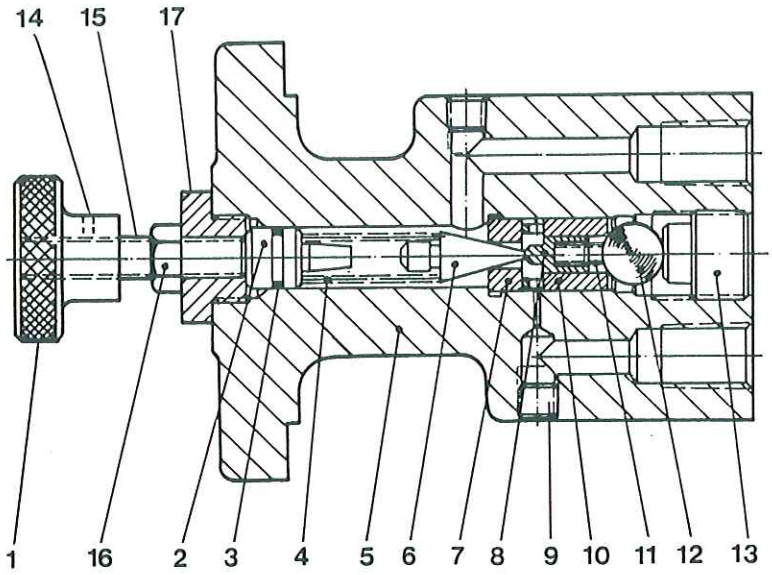


016-09030

FIGURE 10

ITEM	PART NO.	DESCRIPTION	QTY
1	036-24392	Body-3/4 NPTF	1
2	691-00013	"O" Ring	2
3	036-25528	Orifice Plug	1
4	312-35018	Screw-SJS 5/8-18 x 5/8	1
5	036-27545	Cap	1
6	036-27548	Spacer	1
7	359-15220	Screw-SHC 3/8-24 x 1 3/4	4
8	035-11710	Block-Control	1
9	036-11694	Piston-Control	1
10	036-11692	Seat	1
11	036-12288	Cone	1
12	036-13245	Spring-3000 PSI Max.	1
13	036-21767	Piston-Seal	1
14	671-00012	"O" Ring	1
15	036-21765	Plug-Adjusting	1
16	333-13001	Nut-Hex., 5/16-24	1
17	312-13200	Screw-SHS 5/16-24 x 1 1/2	1
18	312-09041	Screw-SHS 10-32 x 1/4	1
19	036-24504	Knob-Control	1
20	691-00026	"O" Ring	1
21	691-00125	"O" Ring	2
22	036-27547	Spring	1
23	036-27549	Sleeve	1
24	036-27550	Spool	1
25	431-90100	Plug-1/16" Soc. Pipe	1

REMOTE CONTROL VALVE ASSEMBLY (R1E)



016-65198

FIGURE 11

ITEM	PART NO.	DESCRIPTION	QTY
1	036-24504	Knob-Control	1
2	036-21767	Piston-Seal	1
3	671-00012	"O" Ring	1
4	036-12289	Spring-5000 PSI Max.	1
5	036-39860	Body	1
6	036-12288	Cone	1
7	036-11692	Seat	1
8	036-33348	Piston-Damping	1
9	431-90104	Plug-1/16" NPTF	2
10	036-33343	Sleeve-Damping	1
11	036-33350	Spring	1
12	700-70589	Ball	1
13	312-23104	Screw-SHS, 5/8-18 x 5/8	1
14	312-09041	Screw-SS Half Dog 10-32 x 1/4	1
15	312-13200	Screw-SS Half Dog 5/16-24 x 1 1/2	1
16	333-13001	Nut-Hex, 5/16-24	1
17	036-21765	Retainer-Spring	1

MOTOR, VALVE, FLOW SELECTOR MODEL NUMBER CHART

Pump Vol.	Fluid Motor	Sequence Valve	Flow Selector	Orifice A	Orifice D
20 – 30 GPM	TMCR-012 014-00339	012-00979	032-18779	35-19847	032-53483
15 GPM	TMCR-007 012-00337	012-00978	032-17096	35-12810	35-12810
11 GPM	TMCR-007 012-00337	012-00977	032-13220	35-20681	35-12810
9 GPM	TMCR-007 012-00337	012-20065	032-13220	35-20680	35-12810

FIGURE 12

QPI Multipress Corp.
A Subsidiary of Quality Products, Inc.
560 Dublin Ave. • Columbus, OH 43215
Ph. (614) 228-0185 • Fax (614) 228-2358