

MID-INLET
TANDEM PUMP APPLICATION
PARTS LIST

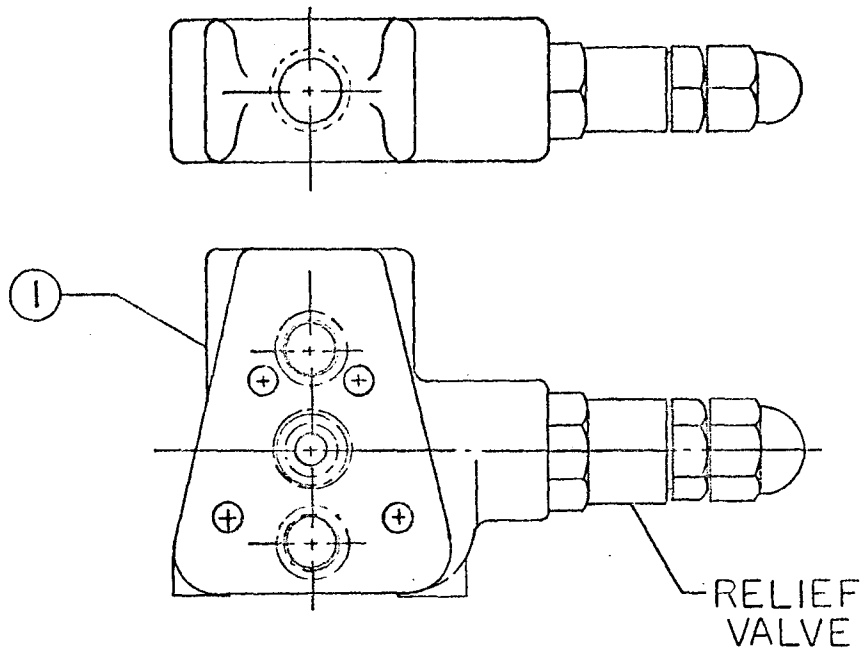


FIG. II-19

ITEM NO	QTY	DESCRIPTION	PART NUMBER
1	1	VALVE, section.....	51003

Effective: 1/1/75
Supercedes Page Dated: 3/15/74

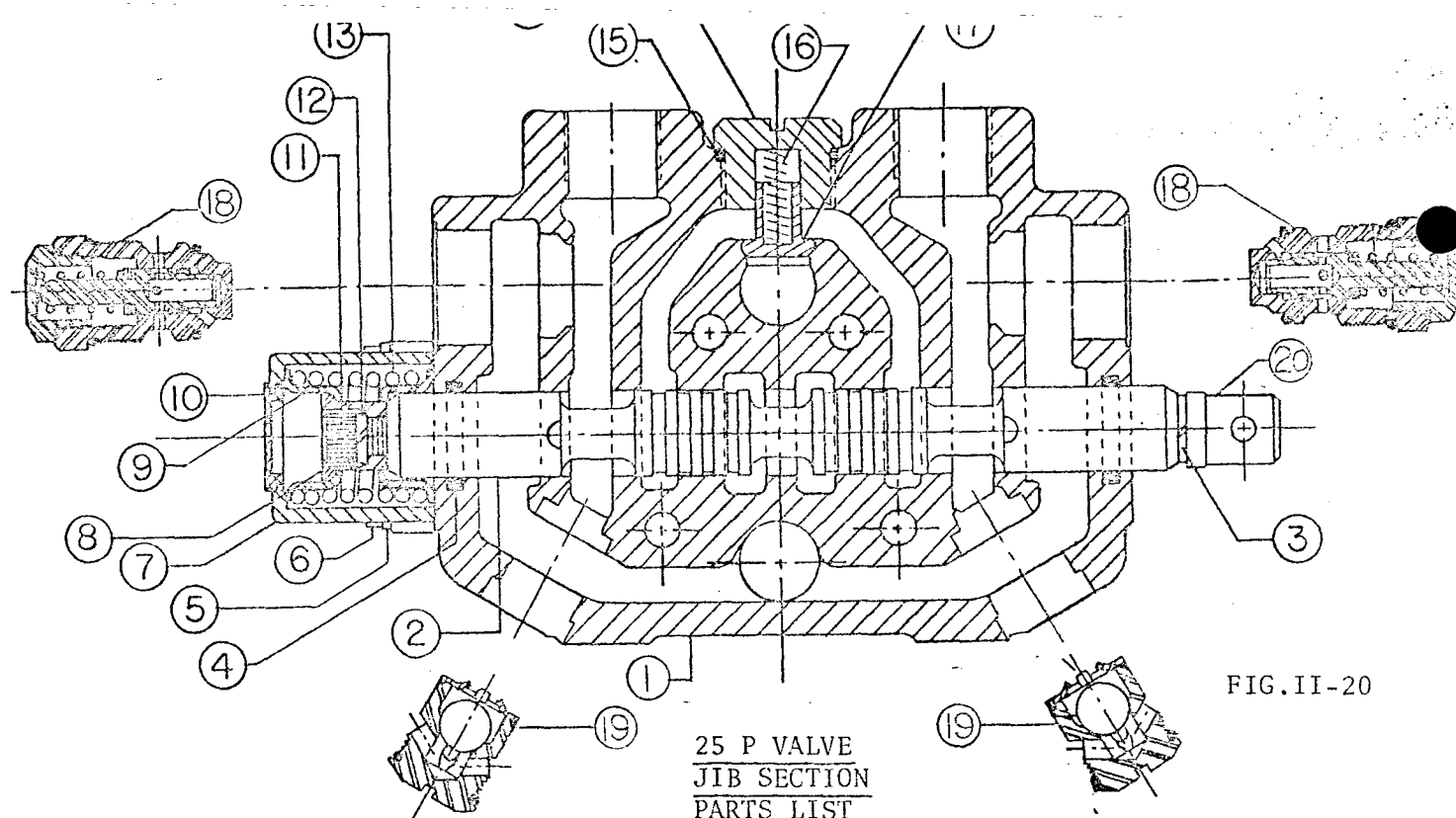


FIG.II-20

ITEM NO	QTY.	DESCRIPTION	PART NUMBER
-	-	VALVE, assembly, less handle.....	51002
1	1	HOUSING.....	(58016)
2	1	SPOOL, 4-way.....	(58016)
3	1	LOCKWASHER, handle adapter.....	58005
(1) 4	2	SEAL, spool.....	(58017)
5	4	LOCKWASHER.....	58002
6	4	SCREW, bonnet.....	58027
(2) 7	1	BONNET.....	(58014)
(2) 8	1	COLLAR, spool.....	(58013)
(2) 9	2	COLLAR, stop.....	(58012)
(2) 10	1	DIAPHRAM, bonnet.....	(58015)
(2) 11	1	SCREW, spool assembly.....	(58018)
(2) 12	1	LOCKWASHER, spool assembly.....	(58006)
(3) 13	1	SPRING, centering.....	(58021)
(3) 14	1	PLUG, check.....	(58025)
(1) (3) 15	1	SEAL, o-ring.....	(58028)
(3) 16	1	SPRING, check.....	(58029)
(3) 17	1	POPPET, check.....	(58026)
18	2	VALVE, relief, pressure setting stamped on cap.....	58518
19	2	ANTI-CAVITATION CHECK, lower.....	58534
20	1	ADAPTER, handle.....	58007
(1) 21	2	SEAL, section, small, (not shown).....	(58032)
(1) 22	1	SEAL, section, small, (not shown).....	(58033)

NOTE: Numbers in () indicates superceded numbers. Serviced only in appropriate kits.

(1) Included in Seal Kit #52012

(2) Included in Bonnet Kit #52004

(3) Included in Check Plug Kit #52005

Effective: 1/1/75

Supercedes Page Dated: 3/15/74

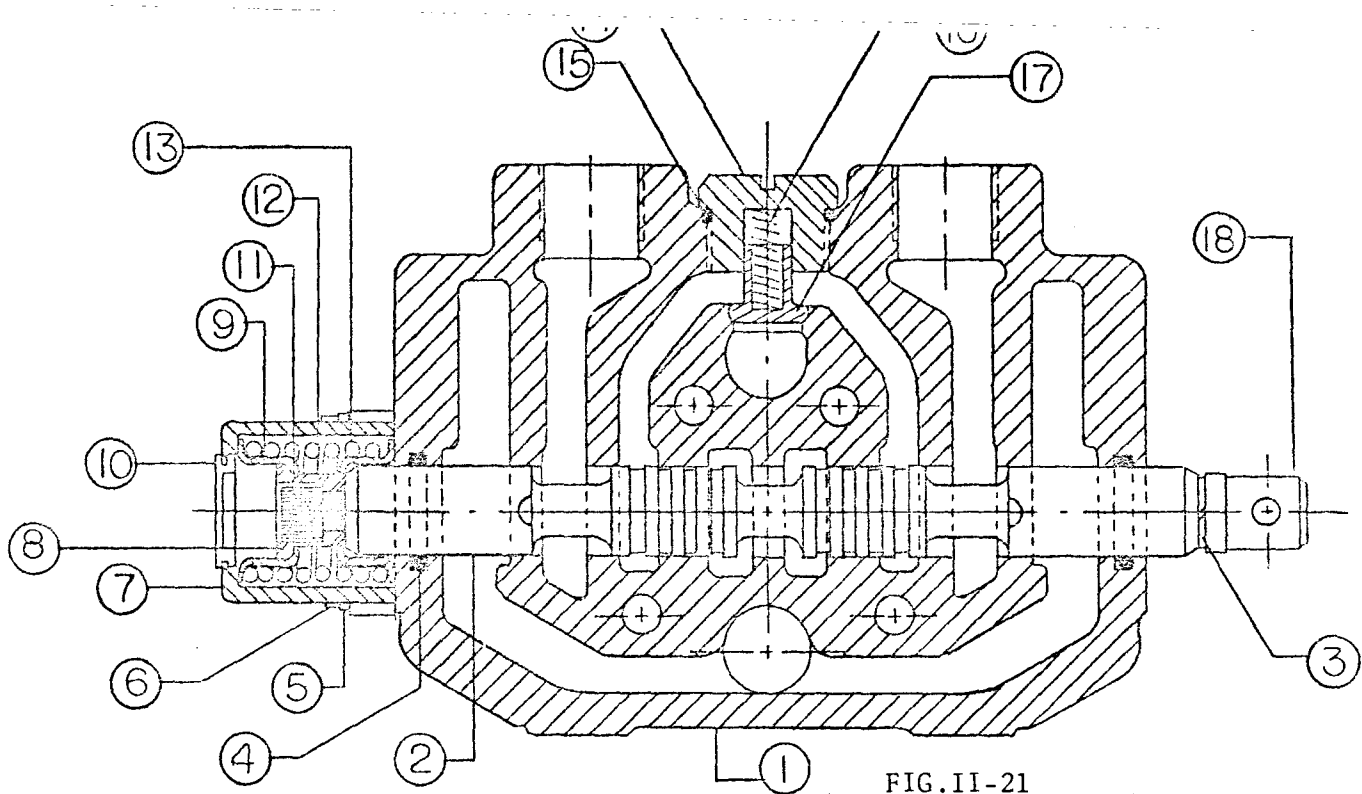


FIG. II-21

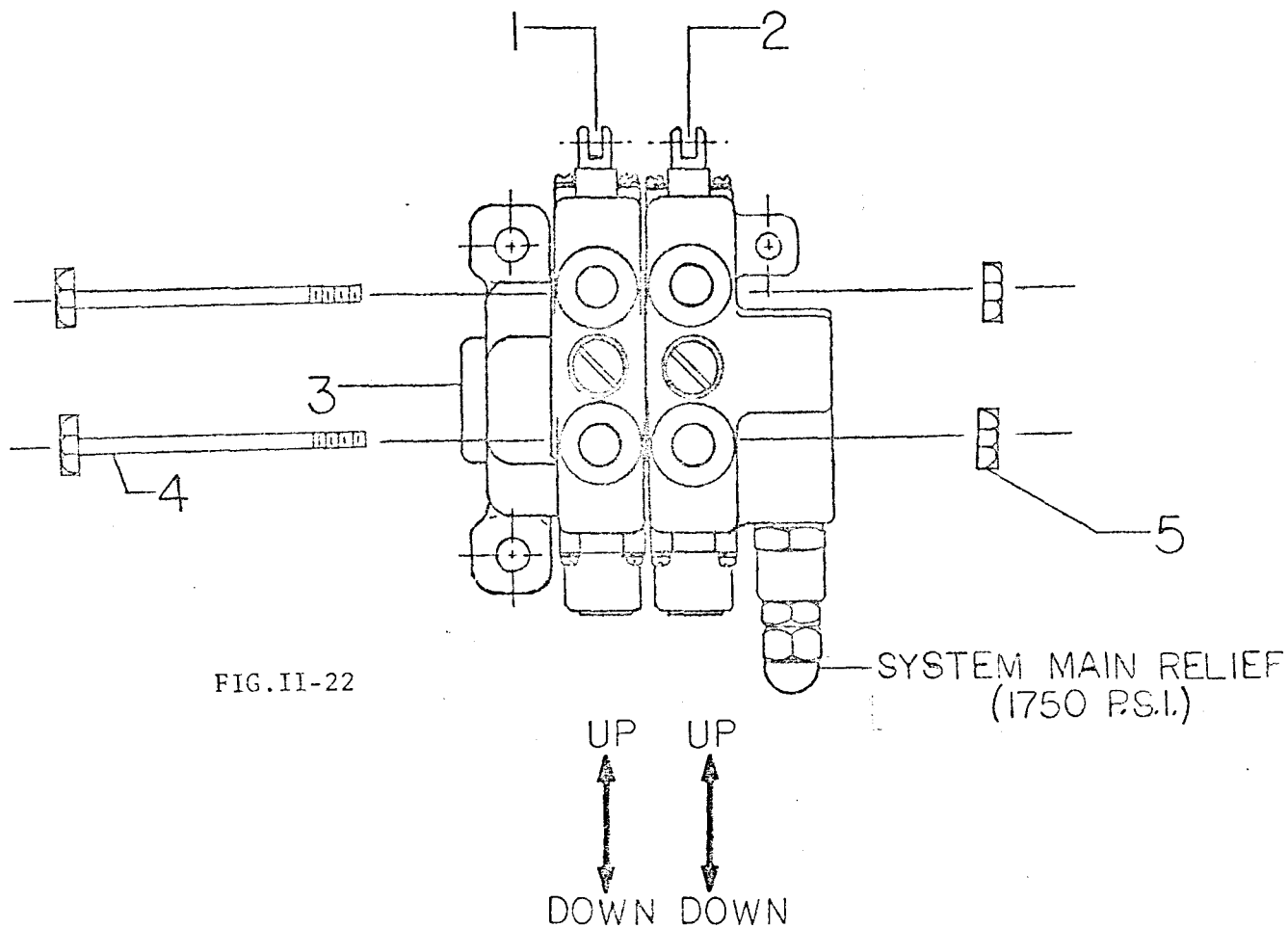
25 P VALVE
GRAPPLE ROTATE SECTION
PARTS LIST

ITEM NO.	QTY	DESCRIPTION	PART NUMBER
-	-	VALVE, assembly, less handle.....	51001
1	1	HOUSING....-.....	(58016)
2	1	SPOOL, 4-way.....	(58016)
3	1	LOCKWASHER, handle adaptor.....	58005
(1) 4	2	SEAL, spool.....	(58017)
5	4	LOCKWASHER.....	58002
6	4	SCREW, bonnet.....	58027
(2) 7	1	BONNET.....	(58014)
(2) 8	1	COLLAR, spool.....	(58013)
(2) 9	2	COLLAR, stop.....	(58012)
(2) 10	1	DIAPHRAM, bonnet.....	(58015)
(2) 11	1	SCREW, spool assembly.....	(58018)
(2) 12	1	LOCKWASHER, spool assembly.....	(58006)
(2) 13	1	SPRING, centering.....	(58021)
(3) 14	1	PLUG, check.....	(58025)
(1) (3) 15	1	SEAL, o-ring.....	(58028)
(3) 16	1	SPRING, check.....	(58029)
(3) 17	1	POPPER, check.....	(58026)
18	1	ADAPTER, handle.....	58007
(1) 19	2	SEAL, section, small (not shown).....	(58032)
(1) 20	1	SEAL, section, large (not shown).....	(58033)

NOTE: Numbers in () indicates superceded numbers. Serviced only in appropriate kits.

- (1) Included in Seal Kit #52012
- (2) Included in Bonnet Kit #52004
- (3) Included in Check Plug Kit #52005

Effective: 1/1/75
Supercedes Page Dated: 3/15/7



VALVE BANK ARRANGEMENT (STABILIZERS)

PARTS LIST

ITEM NO.	QTY.	DESCRIPTION	PART NUMBER
-	1	VALVE, group (2 spool).....	58563
1	1	VALVE, left stabilizer.....	51006
2	1	VALVE, right stabilizer.....	51007
3	1	OUTLET, end (Power Beyond).....	51005
4	4	BOLT.....	58036
5	4	NUT.....	58034
6	1	POWER BEYOND SLEEVE (not shown).....	58152

Effective: 1/1/75
 Supercedes Page Dated: 3/15/74

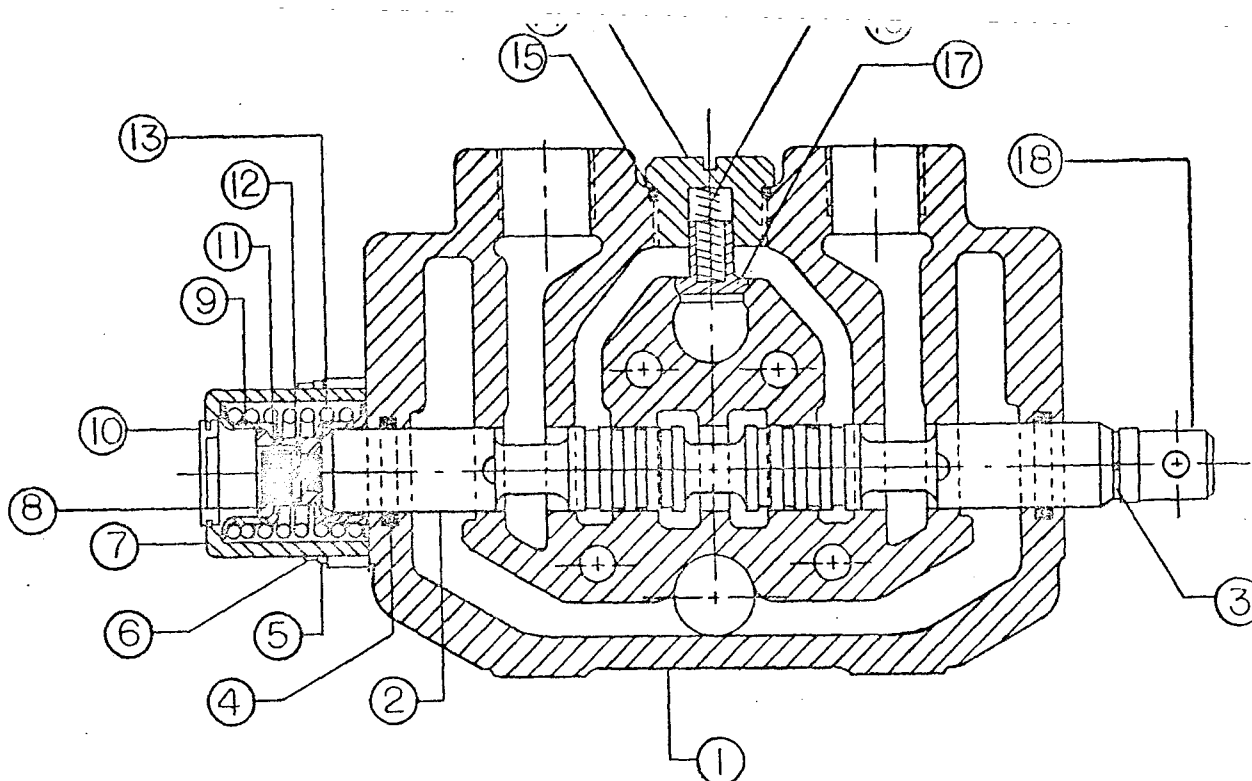


FIG.II-23

25 P VALVE
RIGHT STABILIZER SECTION
PARTS LIST

ITEM NO	QTY	DESCRIPTION	PART NUMBER
-	-	VALVE, assembly, less handle.....	51007
1	1	HOUSING.....	58023
2	1	SPOOL, 4-way.....	58023
3	1	LOCKWASHER, handle adapter.....	58005
(1) 4	2	SEAL, spool.....	(58017)
5	4	LOCKWASHER.....	58002
6	4	SCREW, bonnet.....	58027
(2) 7	1	BONNET.....	(58014)
(2) 8	1	COLLAR, spool.....	(58013)
(2) 9	2	COLLAR, stop.....	(58012)
(2) 10	1	DIAPHRAM, bonnet.....	(58015)
(2) 11	1	SCREW, spool assembly.....	(58018)
(2) 12	1	LOCKWASHER, spool assembly.....	(58006)
(2) 13	1	SPRING, centering.....	(58021)
(1) 14	1	PLUG, check.....	(58025)
(1) (3) 15	1	SEAL, o-ring.....	(58028)
(3) 16	1	SPRING, check.....	(58029)
(3) 17	1	POPPET, check.....	(58026)
18	1	ADAPTER, handle.....	58007
(1) 19	2	SEAL, section, small (not shown).....	(58032)
(1) 20	1	SEAL, section, large (not shown).....	(58033)

NOTE: Numbers in () indicate superceded numbers. Serviced only in appropriate kits.

(1) Included in Seal Kit #52012

(2) Included in Bonnet Kit #52004

(3) Included in Check Plug Kit #52005

Effective: 1/1/75

Supercedes Page Dated: 3/15/74

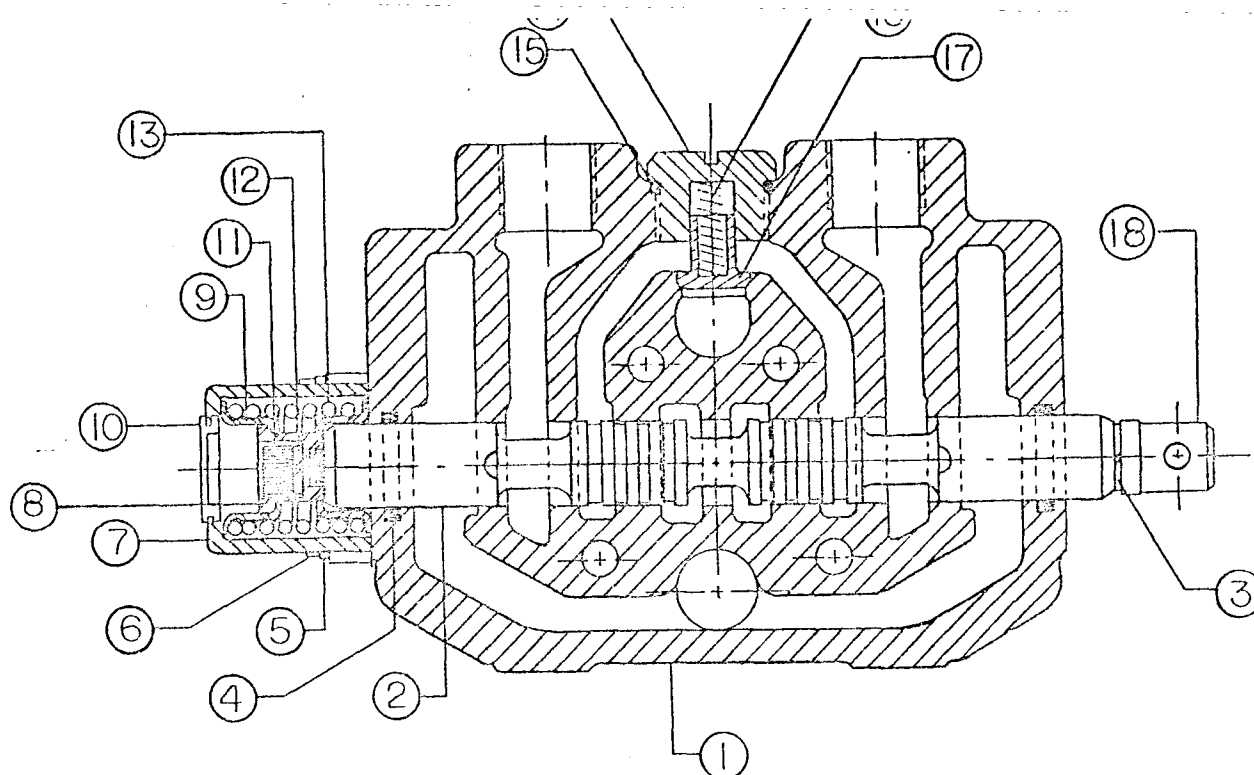


FIG.II-24

25 P VALVE
LEFT STABILIZER SECTION
PARTS LIST

ITEM NO.	QTY.	DESCRIPTION	PART NUMBER
-	-	VALVE, assembly, less handle.....	51006
1	1	HOUSING.....	58020
2	1	SPOOL, 4-way.....	58020
3	1	LOCKWASHER, handle adapter.....	58005
(1) 4	2	SEAL, spool.....	(58017)
5	4	LOCKWASHER.....	58002
6	4	SCREW, bonnet.....	58027
(2) 7	1	BONNET.....	(58014)
(2) 8	1	COLLAR, spool.....	(58013)
(2) 9	2	COLLAR, stop.....	(58012)
(2) 10	1	DIAPHRAM, bonnet.....	(58015)
(2) 11	1	SCREW, spool assembly.....	(58018)
(2) 12	1	LOCKWASHER, spool assembly.....	(58006)
(2) 13	1	SPRING, centering.....	(58021)
(3) 14	1	PLUG, check.....	(58025)
(1) (3) 15	1	SEAL, O-ring.....	(58028)
(3) 16	1	SPRING, check.....	(58029)
(3) 17	1	POPPET, check.....	(58026)
18	1	ADAPTER, handle.....	58007
(1) 19	2	SEAL, section, small (not shown).....	(58032)
(2) 20	1	SEAL, section, large (not shown).....	(58033)

NOTE: Numbers in () indicate superceded numbers. Serviced only in appropriate kits.

- (1) Included in Seal Kit #52012
- (2) Included in Bonnet Kit #52004
- (3) Included in Check Plug Kit #52005

Effective: 1/1/75
Supercedes Page Dated: 3/15/75

25 P VALVE
MAIN RELIEF VALVE SECTION
PARTS LIST

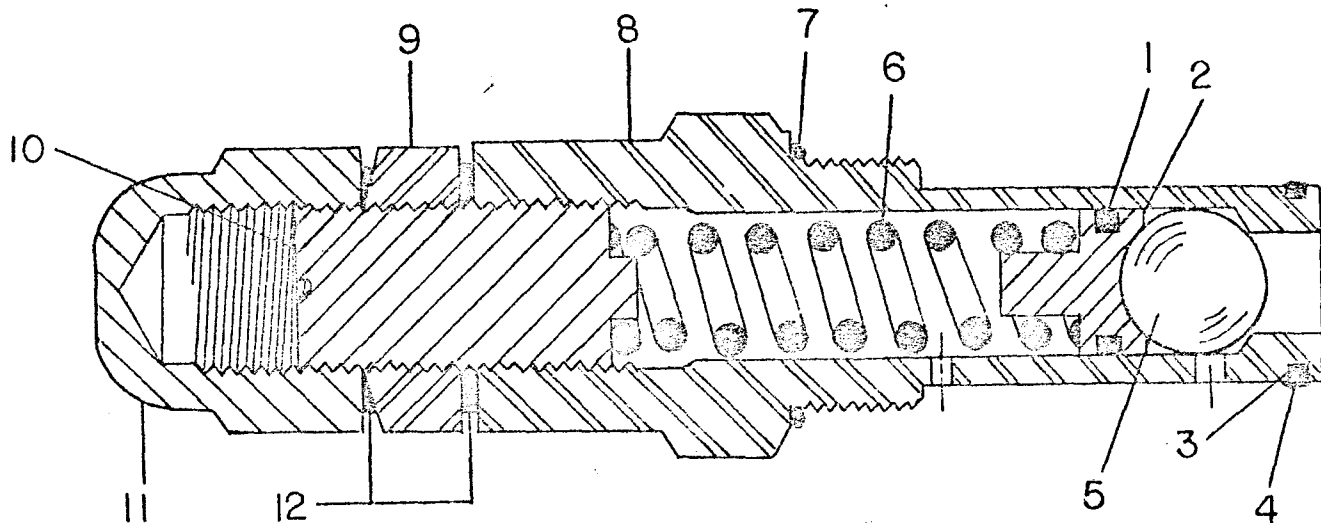


FIG. II-25

ITEM NO		QTY	DESCRIPTION	PART NUMBER
	-	1	VALVE, relief.....	58100
(1)	1	1	SEAL, ball guide.....	(58101)
(1)	2	1	GUIDE, ball.....	(58104)
(1) (2)	3	1	WASHER, back-up.....	(58112)
(1) (2)	4	1	SEAL, o-ring.....	(58111)
(1)	5	1	BALL, 3/4" dia.....	(58103)
(1)	6	1	SPRING, hp (1501 - 2000).....	(58102)
(1) (2)	7	1	SEAL, o-ring.....	(58111)
	8	1	BODY, relief.....	58113
	9	1	NUT, jam.....	58106
	10	1	SCREW, adjusting.....	58105
	11	1	CAP, acorn.....	58107
(1) (2)	12	1	WASHER, screw seal.....	(58109)

NOTE: Number in () indicate superceded numbers. Serviced only in appropriate kits.

(1) Rebuilding Kit (HP) # 52082

(2) Seal Kit # 52017

Effective: 1/1/75

Supercedes Page Dated: 3/15/74

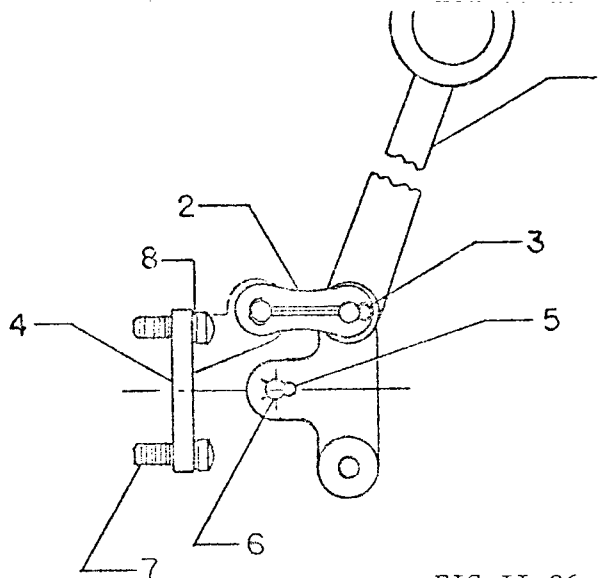


FIG. II-26

HANDLE ASSEMBLY

PARTS LIST

ITEM NO	QTY	DESCRIPTION	PART NUMBER
-	1	HANDLE, assembly.....	52006
(1)	1	HANDLE.....	(58009)
(2)	2	LINK, handle.....	(58003)
(3)	1	PIN, cotter.....	(58004)
(4)	1	BRACKET, handle.....	(58008)
(5)	1	PIN, cotter.....	(58001)
(6)	1	PIN, handle.....	(58000)
(7)	4	SCREW, machine.....	(58019)
(8)	4	LOCKWASHER.....	(58002)

NOTE: Numbers in brackets () indicate superceded numbers.
Serviced only in appropriate kits.

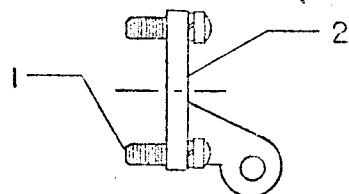


FIG. II-27

HANDLE BRACKET

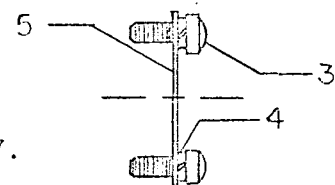


FIG. II-28

RETAINER ASSY.

ITEM NO	QTY	DESCRIPTION	PART NUMBER
-	1	BRACKET, handle.....	52007
1	4	SCREW.....	
2	1	BRACKET.....	
-	1	RETAINER, assembly.....	52029
3	4	SCREW.....	
4	4	LOCKWASHER.....	
5	1	PLATE, retainer.....	

Effective: 1/1/75

Supercedes Page Dated: 3/15/74

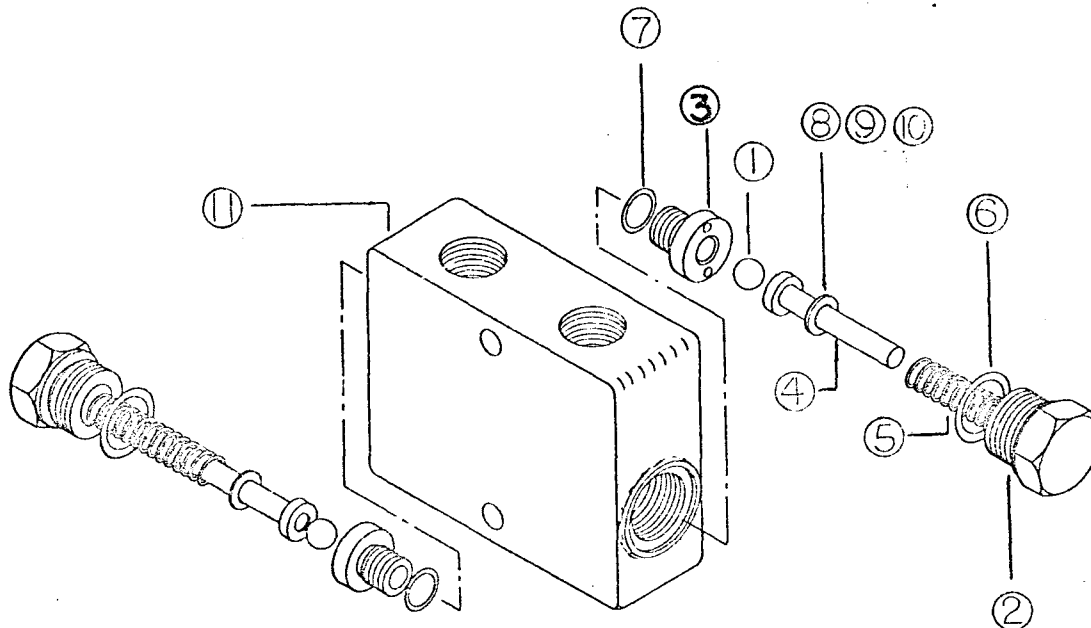


FIG.II-29

GRAPPLE CUSHION VALVE

PARTS LIST

ITEM NO	QTY	DESCRIPTION	PART NUMBER
-	1	VALVE, cushion.....	63010
(1) 1	2	BALL, steel.....	(58301)
(1) 2	2	CAP, spring.....	(58302)
(1) 3	2	SEAT, standard.....	(58303)
(1) 4	2	GUIDE, ball and spring.....	(58304)
(1) 5	2	SPRING.....	(58317)
(1) 6	2	O-RING, spring cap.....	(58306)
(1) 7	2	O-RING, seat.....	(58307)
8	as req'd	WASHER, steel spacer, .010" thick.....	58310
9	as req'd	WASHER, steel spacer, .040" thick.....	58311
10	as req'd	WASHER, steel spacer, .020" thick.....	58312
11	1	HOUSING, valve.....	58313

NOTE: NUMBERS IN BRACKETS () INDICATE SUPERCEDED NUMBERS.
 (1) Included in Cushion Valve Kit..... 52039

Change Notice No. 1
 Effective: 9/23/75
 Supercedes Page Dated: 1/1/75

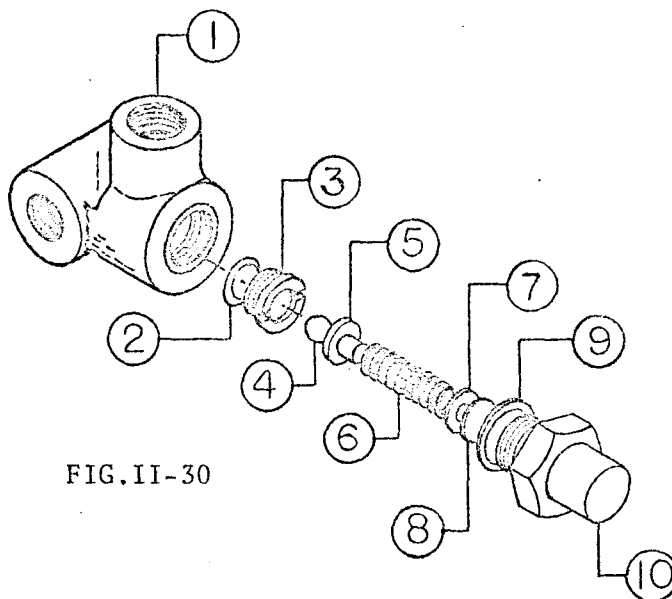
PARTS LIST

FIG.II-30

ITEM NO.		QTY.	DESCRIPTION	PART NUMBER
	-	-	VALVE, relief assembly.....	63026
	1	1	HOUSING.....	58118
(1) (2)	2	1	O-RING, seat.....	(58120)
(1)	3	1	RELIEF, seat.....	(58122)
	4	1	RELIEF, ball.....	58124
(1)	5	1	SPACER, spring.....	(58130)
(1)	6	1	SPRING.....	(58126)
(1)	7	As Req'd	WASHER, spacer.....	(58129)
	8	As Req'd	SHIM.....	58132
(1) (2)	9	1	GASKET, body.....	(58121)
	10	1	BODY.....	58128

NOTE: Numbers in () indicate superceded numbers. Serviced only in appropriate kits.

(1) Rebuilding kit includes items 2,3,5,6,7 and 9.... 52015
 (2) Seal kit includes items 2 and 9..... 52016

Effective: 1/1/75
 Supercedes Page Dated: 3/15/74

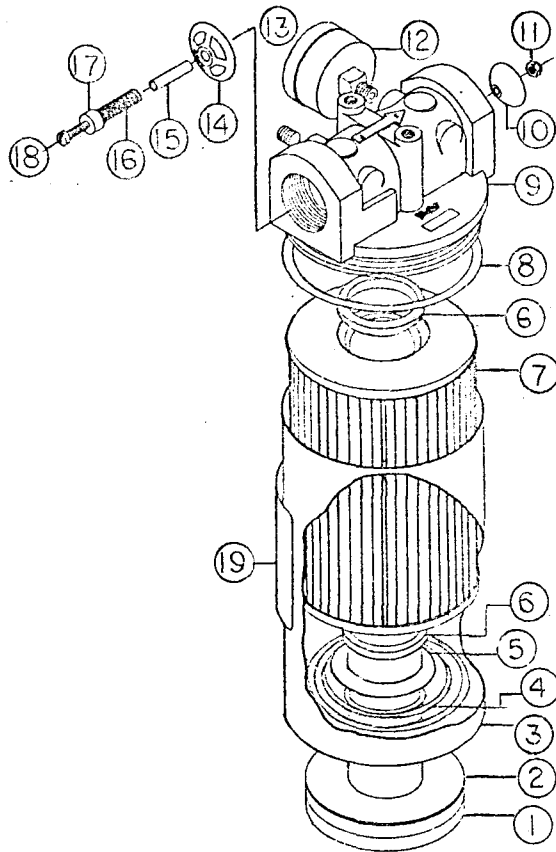


FIG.II-31

FILTER
 PARTS LIST

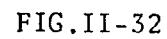
ITEM NO	QTY	DESCRIPTION	PART NUMBER
-	1	FILTER, hydraulic.....	65000
1	1	POST, center.....	59001
(2) 2	1	SEAL GASKET, center post.....	59016
3	1	HOUSING, filter.....	59003
4	1	SPRING, conical.....	59004
5	2	WASHER, back-up.....	59005
(3) (2) 6	2	GASKET.....	59006
(3) (2) 7	1	ELEMENT.....	59007
(2) 8	1	SEAL, housing, O-ring.....	65343
9	1	CASTING, head.....	59022
(1) 10	1	VALVE, by-pass.....	(59014)
(1) 11	1	LOCKNUT, by-pass.....	(59019)
12	1	INDICATOR, vacuum.....	59010
13	1	PLUG, pipe, 1/8" NPTF.....	59021
(1) 14	1	GUIDE, by-pass.....	(59013)
(1) 15	1	SPACER, valve, by-pass.....	(59011)
(1) 16	1	SPRING, by-pass.....	(59012)
(1) 17	1	CAP, stem, by-pass.....	(59015)
(1) 18	1	SCREW, H.D., by-pass filter.....	(59018)
19	1	DECAL, instruction.....	59020

NOTE: Numbers in () indicate superceded numbers. Serviced only in appropriate kits.

- (1) Included in Relief Kit #52021
- (2) Included in Filter Element & Seal Kit #52019
- (3) Included in Filter Element Kit #52022

Change Notice No. 1
 Effective: 11/24/75

SINGLE PUMP



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MODEL 40
SUCTION, PRESSURE AND RETURN CIRCUIT
SINGLE PUMP (MID-MOUNT)

PARTS LIST

ITEM NO.	QTY.	DESCRIPTION	PART NUMBER
	1	RESERVOIR.....	642109
	2	NIPPLE, pipe, 2 1/2"	21076
	3	NIPPLE, king, 2 1/2"	67666
(1)	4	HOSE, suction, 2 1/2"	-
	1	HOSE, 2 1/2"	94009
	5	ELBOW, 90°, 2 1/2"F-1 1/2"F.....	22172
	6	NIPPLE, close, 1 1/2"	19816
	7	ADAPTER, flange, 1 1/2"	67024
	8	PUMP, single, vickers	60603
		PUMP, single, commercial.....	60617
	9	ADAPTER, flange, 1"	67202
	10	ADAPTER, 90° union, 1"M-3/4"F.....	66066
(1)(2)	11	HOSE, assembly 3/4"-2W	-
	12	ADAPTER, 90°, 3/4"M-3/4"F	66063
(2)	13	HOSE, assembly, 3/4"-2W	70413
	14	SWIVEL, 90° barco, 3/4"	66659
(2)	15	HOSE, assembly, 3/4"-2W	70484
	16	ADAPTER, 45°, 1"M-3/4"F	66110
	17	ADAPTER, 45°, 1"M-1"F	66111
(3)	18	HOSE, assembly, 1"-2W.....	70583
	19	SWIVEL, 90° barco, 1"F-1"F.....	66662
	20	ADAPTER, straight, 1"m-1"M	66620
	21	ELBOW, 90° street, 1"	21922
	22	BUSHING, pipe, 1 1/4",-1"F	22215
	23	FILTER, assembly.....	65000
	24	VALVE, stabilizer control.....	58563
	25	ADAPTER, 90°, 3/4"M-1/2"F	66062
(4)	26	HOSE, assembly, 1/2"-2W.....	70223
	27	SWIVEL, straight, 1/2"Mx1/2"F.....	66008
	28	CLAMP, hose.....	69510
	29	VALVE, main control.....	58564

- (1) Hose lengths vary with pump location.
- (2) Hose assembly consists of the following:
- | | | |
|---|--------------------------------|-------|
| 1 | HOSE, 3/4"-2W | 94003 |
| 2 | FITTING, male hose, 3/4" | 65964 |
- (3) Hose assembly consists of the following:
- | | | |
|---|------------------------------|-------|
| 1 | HOSE, 1"-2W | 94012 |
| 2 | FITTING, male hose, 1" | 65966 |
- (4) Hose assembly consists of the following:
- | | | |
|---|--------------------------------|-------|
| 1 | HOSE, 1/2"-2W | 94002 |
| 2 | FITTING, male hose, 1/2" | 65962 |

Effective: 1/1/75
 Supercedes Page Dated: 3/15/74

SUCTION, PRESSURE AND RETURN CIRCUIT

TANDEM PUMP

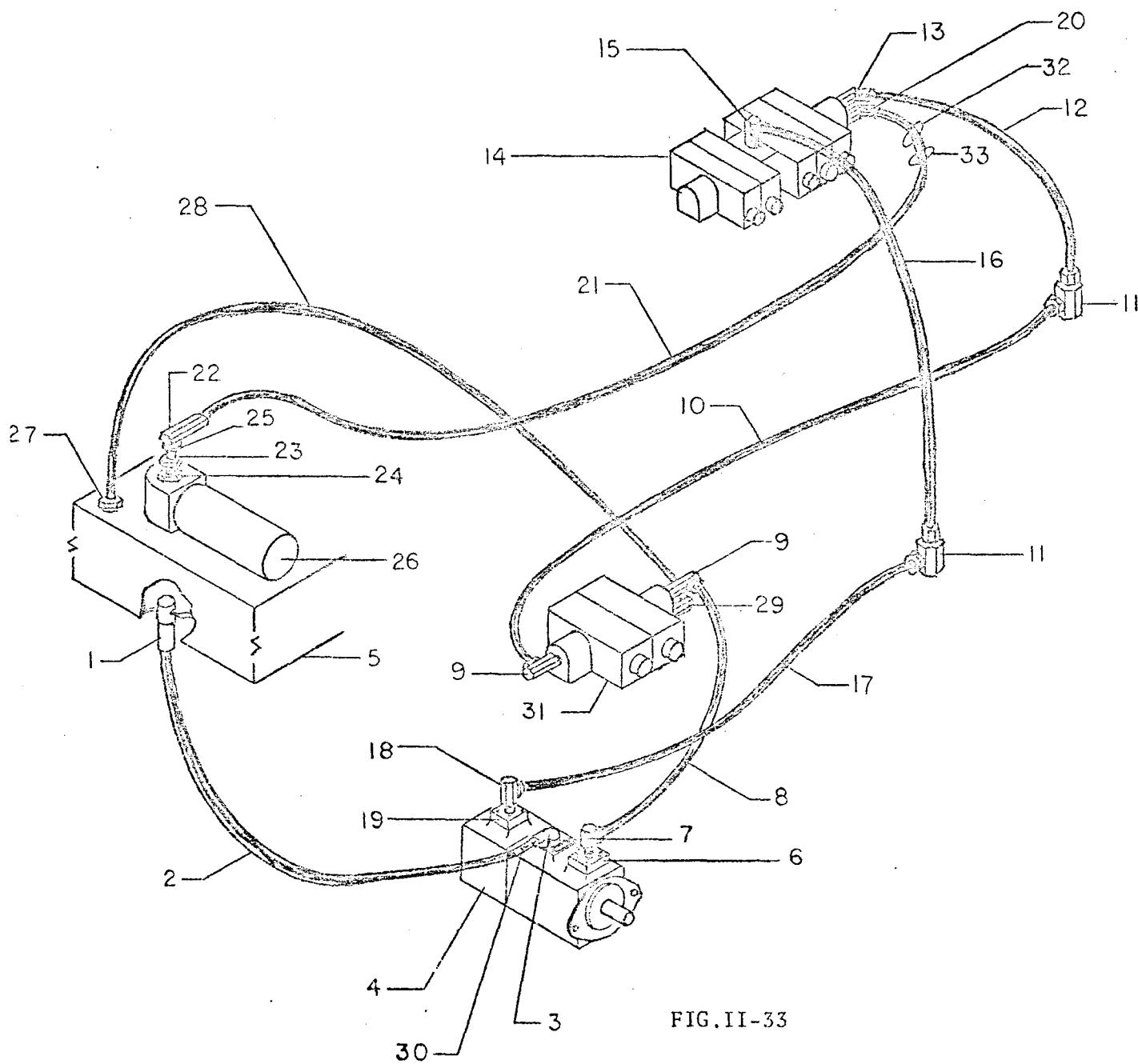


FIG. II-33

Effective: 1/1/75
 Supersedes Page Dated: 3/15/74

TANDEM PUMP

PARTS LIST

			PUMP TYPES	
ITEM NO.	QTY.	DESCRIPTION	VICKERS	COMMERCIAL
(1)	1	NIPPLE, king.....	67666	67664
	2	HOSE, suction.....	94009	94011
	3	HOSE STEM, 90° beaded.....	67550	67546
	4	FLANGE, split.....	67606	67604
	1	PUMP, tandem.....	60601	60618
The following items are for the Mid-Mount and Rear-Mount:			MID-MOUNT	REAR-MOUNT
	5	RESERVOIR.....	642109	642107
	6	ADAPTER, flange, 1".....	67202	67202
	7	ADAPTER, 90° union, 1"M-3/4"F.....	66066	66066
(1)(2)	8	HOSE, assembly, 3/4"-2W.....	-	-
	9	ADAPTER, 90°, 3/4"M-3/4"F.....	66063	66063
(2)	10	HOSE, assembly, 3/4"-2W.....	70413	70427
	11	SWIVEL, 90° barco, 3/4".....	66659	66659
(2)	12	HOSE, assembly, 3/4"-2W (model 60)..	70484	70437
	13	HOSE, assembly, 3/4"-2W (model 80)..	70484	70438
	14	ADAPTER, 45°, 1"M-3/4"F.....	66110	66110
	15	VALVE, main control.....	58556	58556
	16	ADAPTER, 90°, 1"M-3/4"F.....	66066	66066
(2)	17	HOSE, assembly, 3/4"-2W.....	70480	70454
(1)(2)	18	HOSE, assembly, 3/4"-2W.....	-	-
	19	ADAPTER, 90°, 3/4"M-3/4"F.....	66063	66063
	20	ADAPTER, flange, 3/4".....	67201	67201
	21	ADAPTER, 45°, 1"M-1"F.....	66111	66111
(3)	22	HOSE, assembly, 1"-2W (model 60)....	70539	70541
	23	HOSE, assembly, 1"-2W (model 80)....	70539	70544
	24	SWIVEL, 90° barco, 1"F-1"F.....	66662	66662
(3)	25	SWIVEL, straight, 1"M-1"M.....	66620	-
	26	HOSE, assembly, 1"-2W.....	-	70582
	27	BUSHING, pipe, 1 1/4"M-1"F.....	22215	22215
	28	ELBOW, 90° street, 1".....	21922	21922
	29	FILTER, assembly.....	65000	65000
(4)	30	SWIVEL, straight, 1/2"M-1/2"F.....	66008	66008
	31	HOSE, assembly, 1/2"-2W.....	70223	70227
	32	ADAPTER, 90°, 3/4"M-1/2"F.....	66062	66062
	33	CLAMP, hose.....	69510	69510
	34	VALVE, stabilizer control.....	58563	58563
The following items are used on the stationary platform:				
	10	HOSE, assembly, 3/4"-2W.....	70418	
	13	ADAPTER, 90°, 1"M-3/4"F.....	66066	
	20	BUSHING, pipe, 1"M-3/4"F.....	22210	
	21	HOSE, low pressure, 3/4" x 48".....	71330	
	22	CLAMP, hose (order separately).....	69503	
	23	ELBOW, 45° street, 3/4".....	21904	
	24	BUSHING, pipe, 1 1/4"M-3/4"F.....	22215	
	25	NIPPLE, king, 3/4".....	67661	
(4)	28	HOSE, assembly, 1/2"-2W.....	70225	
	32	ELBOW, 45° street, 3/4".....	21904	
	33	NIPPLE, king, 3/4".....	67661	

- (1) Length varies with pump location
- (2) Hose assembly consists of the following:
- 1 HOSE, 3/4"-2W..... 94003
- 2 FITTING, male hose, 3/4"..... 65964
- (3) Hose assembly consists of the following:
- 1 HOSE, 1"-2W..... 94012
- 2 FITTING, male hose, 1"..... 65966
- (4) Hose assembly consists of the following:
- 1 HOSE, 1/2"-2W..... 94002
- 2 FITTING, male hose, 1/2"..... 65962

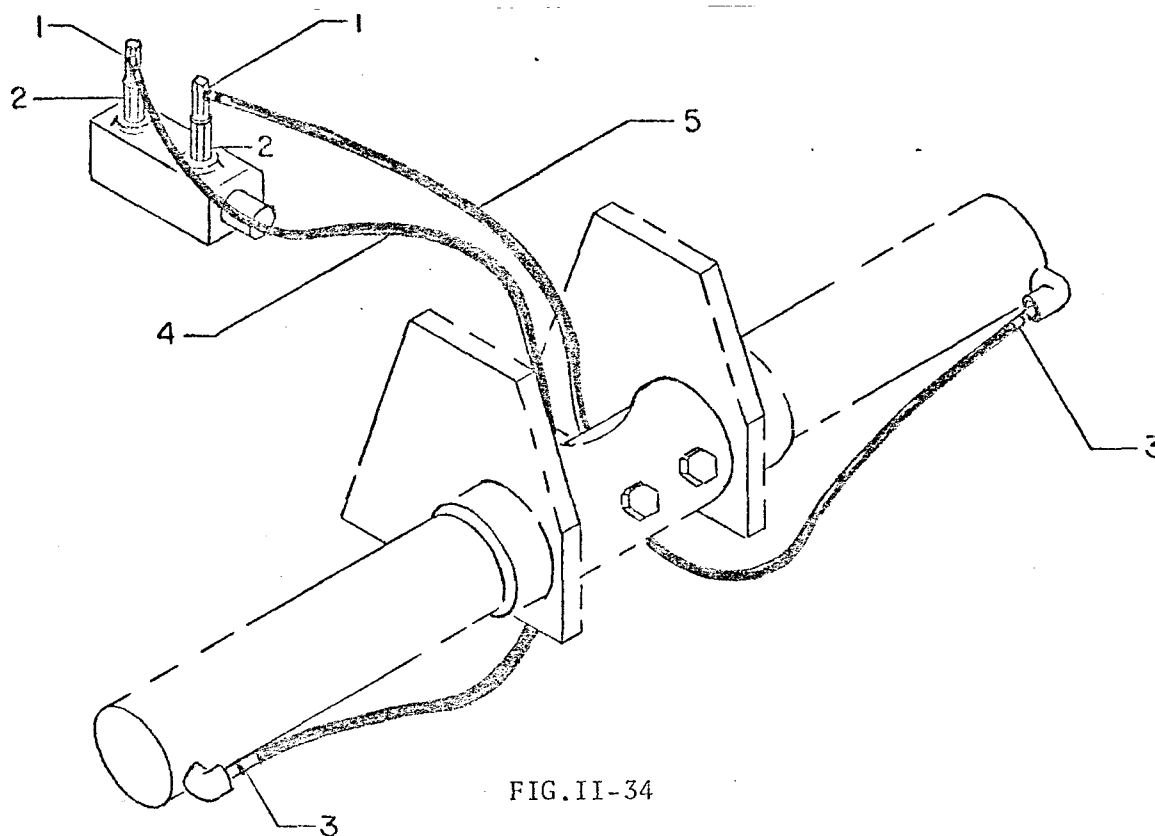


FIG. II-34

MODEL 40-60-80

MID-MOUNT GEAR & RACK CIRCUIT

PARTS LIST

ITEM NO.		QTY.	DESCRIPTION	PART NUMBER
	1	2	ADAPTER, 90°, 1/2"M-1/2"F.....	66059
	2	2	THROTTLE, line, 1/2".....	66675
	3	2	SWIVEL, barco, 1/2".....	66667
(1)	4	1	HOSE, assembly, 1/2"-2W x 102".....	70278
(1)	5	1	HOSE, assembly, 1/2"-2W x 102".....	70278
			The following items are used on the Stationary Platform Application:	
	3	2	SWIVEL, straight, 1/2"M-1/2"F.....	66008
(1)	4	1	HOSE, assembly, 1/2"-2W x 52".....	70232
(1)	5	1	HOSE, assembly, 1/2"-2W x 80".....	70244

- (1) Hose assemblies consist of the following:
- | | |
|--|-------|
| HOSE, 1/2"-2W..... | 94002 |
| FITTING, male hose, 1/2" (2 per hose)..... | 65962 |

Effective: 1/1/75
 Supercedes Page Dated: 3/15/74

GRAPPLE OPEN AND CLOSE CIRCUIT

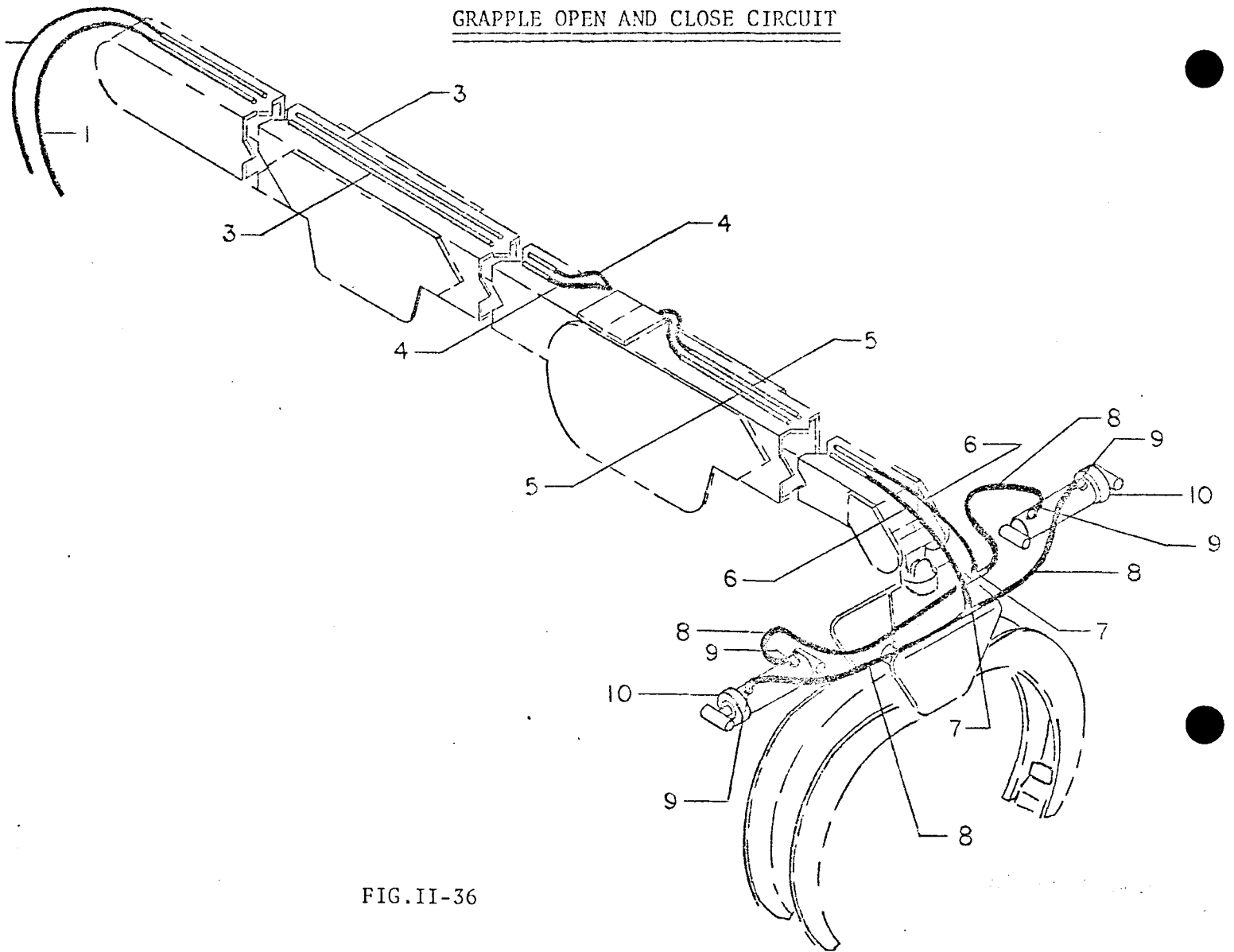


FIG. II-36

Effective: 1/1/75

MODEL 40-60-80

GRAPPLE OPEN AND CLOSE CIRCUIT

PARTS LIST

ITEM NO.	QTY.	DESCRIPTION	MODEL 40	MODEL 60	MODEL 80
(1) 1	1	HOSE, assembly, 1/2"-2W x 42".....	70227	70227	70227
(1) 2	1	HOSE, assembly, 1/2"-2W x 42".....	70227	70227	70227
(3) 3	1	TUBE, assembly.....	93482	93448	93484
(2) 4	2	HOSE, assembly, 1/2"-2W x 48"	70230	70230	70230
(3) 5	2	TUBE, assembly.....	93437	93485	93482
(1) 6	2	HOSE, assembly, 1/2"-2W x 52"	71600	71600	71600
7	2	ADAPTER, tee, 1/2"-1/2"-1/2"	66218	66218	66218
(1) 8	4	HOSE, assembly, 1/2"-2W x 24"	70212	70212	70212
9	4	ADAPTER, straight, 1/2"M-1/2"F	66008	66008	66008
10	2	CYLINDER, 3 1/2" x 8"	812001	812001	812001
	2	CYLINDER, 3 1/2" x 10"	812002	812002	812002
The following fittings are located on the control valve section (not shown)					
	1	ADAPTER, 90°, 1/2"M-1/2"F	66059	66059	66059
	2	ADAPTER, straight, 1/2"M-1/2"F	66008	66008	66008
The following items are used on the Stationary Platform Application:					
(1) 1	1	HOSE, assembly, 1/2"-2W x 60"	70236	70236	70236
(1) 2	1	HOSE, assembly, 1/2"-2W x 58".....	70235	70235	70235

- (1) Items 1,2,6,8, consists of the following:
- | | |
|--|-------|
| HOSE, 1/2"-2W..... | 94002 |
| FITTING, male hose, 1/2" (1 per hose)..... | 65962 |
| SOCKET, hose, 1/2" (1 per hose) | 66339 |
| NIPPLE, ferrule-fix (1 per hose)..... | 66316 |
- (2) Item 4 consists of the following:
- | | |
|--------------------------------|-------|
| HOSE, 1/2"-2W..... | 94002 |
| FITTING, male hose, 1/2" | 65962 |
- (3) Items 3 and 5 are tube lengths for the standard boom. Boom extensions require longer hydraulic boom tubing.

Change Notice No. 1
 Supersedes Page Dated: 1/1/75
 Effective: 11/24/75

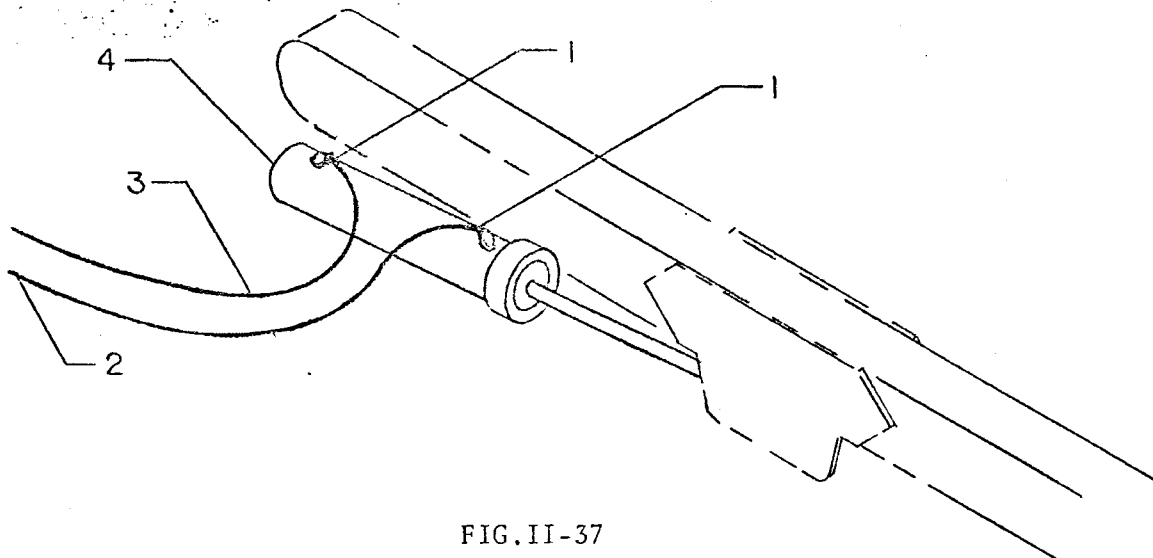


FIG. II-37

MODEL 40-60-80

MAIN LIFT HYDRAULIC CIRCUIT

PARTS LIST

ITEM NO		QTY.	DESCRIPTION	MODEL 40	MODEL 60	MODEL 80
(1)	1	2	ADAPTER, straight, 1/2"M-1/2:F.....	66008	66008	66008
	2	1	HOSE, assembly, 1/2"-2W x 66".....	70239	70239	70239
(1)	3	1	HOSE, assembly, 1/2"-2W x 76".....	70243	70243	70243
	4	1	CYLINDER, main.....	812406	812421	812414
			The following items are located on the control valve section (not shown)			
		1	ADAPTER, 90°, 1/2"M-1/2"F.....	66059	66059	66059
		2	ADAPTER, straight, 1/2"M-1/2"F.....	66008	66008	66008
			The following items are used on the Stationary Platform Application.			
(1)	2	1	HOSE, assembly, 1/2"-2W x 84".....	70245	70245	70245
(1)	3	1	HOSE, assembly, 1/2"-2W x 88".....	70246	70246	70246

- (1) Items 2 and 3 consists of the following:
- | | |
|---|-------|
| HOSE, 1/2"-2W..... | 94002 |
| FITTING, male hose, 1/2" (2 per hose).... | 65962 |

Effective: 1/1/75
 Supersedes Page Dated: 3/15/74

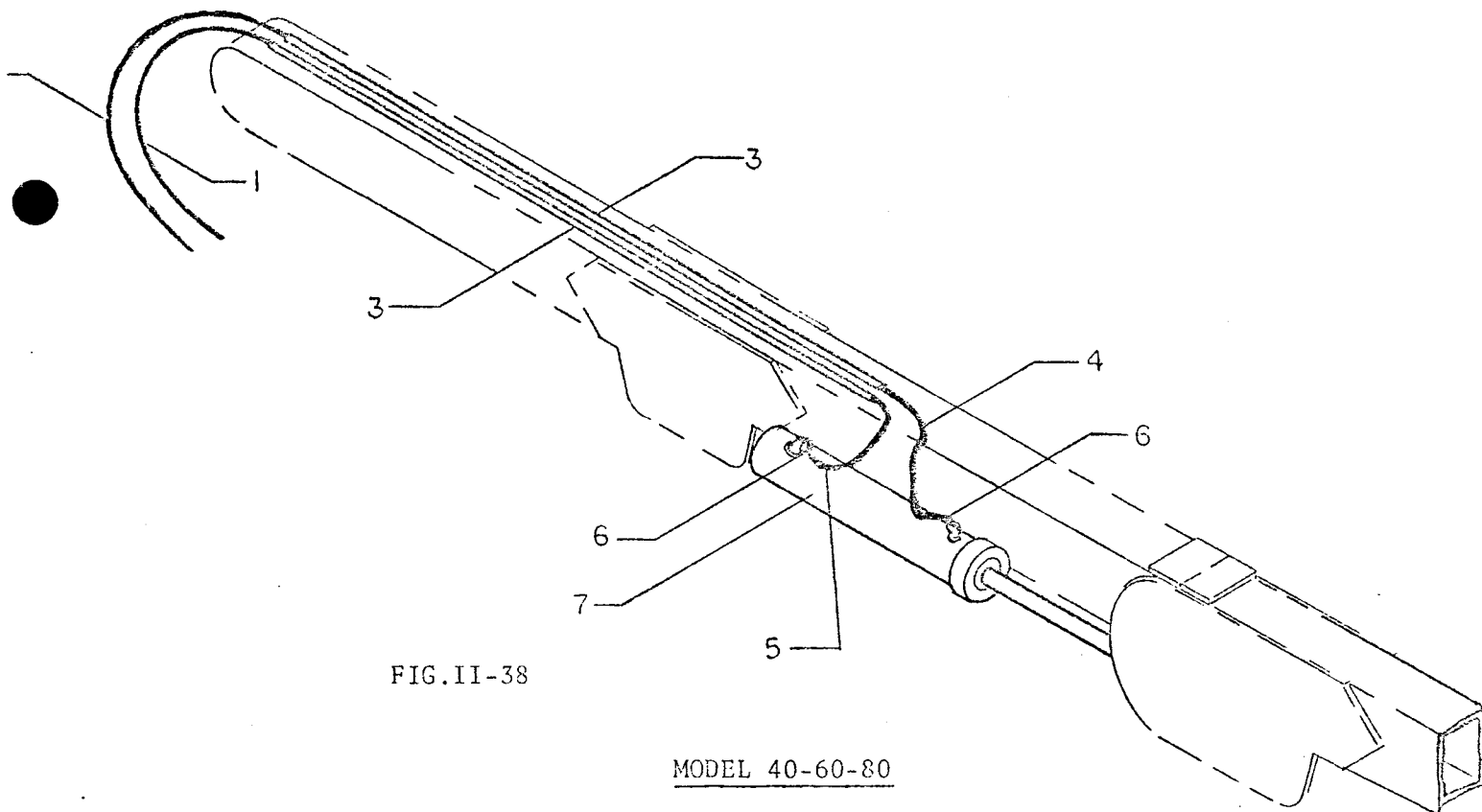


FIG. II-38

MODEL 40-60-80

SECONDARY ROOM CIRCUIT

PARTS LIST

ITEM NO		QTY	DESCRIPTION	MODEL 40	MODEL 60	MODEL 80
(1)	1	1	HOSE, assembly, 1/2"-2W x 42".....	70227	70227	70227
(1)	2	1	HOSE, assembly, 1/2"-2W x 42".....	70227	70227	70227
	3	2	TUBE, assembly.....	93477	93438	93477
(1)	4	1	HOSE, assembly, 1/2"-2W x 45".....	70284	70284	70284
(1)	5	1	HOSE, assembly, 1/2"-2W x 35".....	70223	70223	70223
	6	2	ADAPTER, straight, 1/2"M-1/2"F.....	66008	66008	66008
	7	1	CYLINDER, secondary.....	812407	812407	812421
			The following fittings are located on the control valve section (not shown)			
		1	ADAPTER, 90°, 1/2"M-1/2"F.....	66059	66059	66059
		2	ADAPTER, straight, 1/2"M-1/2"F.....	66008	66008	66008
			The following items are used on the Stationary Platform Application:			
(1)	1	1	HOSE, assembly, 1/2"-2W x 58".....	70235	70235	70235
(1)	2	1	HOSE, assembly, 1/2"-2W x 60".....	70236	70236	70236

- (1) Items 1,2,4 and 5 consist of the following:
- HOSE, 1/2"-2W..... 94002
- FITTINGS, male hose, 1/2" (1 per hose) 65962
- SOCKET, hose, 1/2" (1 per hose)..... 66339
- NIPPLE, ferrule-fix (1 per hose)... 66316

Effective: 1/1/75
 Supercedes Page Dated: 3/15/74

GRAPPLE ROTATE CIRCUIT

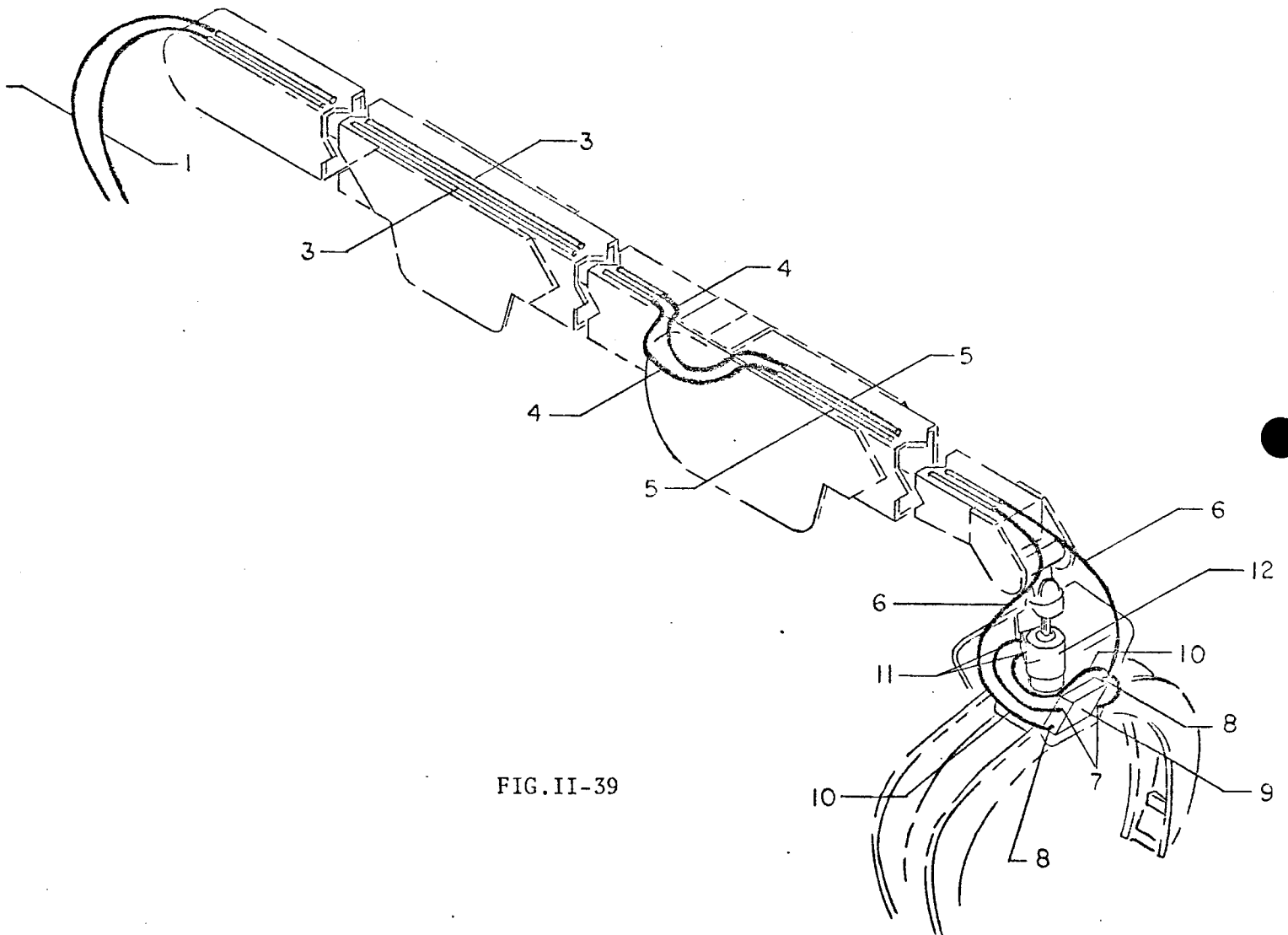


FIG. II-39

Effective: 1/1/75

MODEL 40-60-80

GRAPPLE ROTATE CIRCUIT

PARTS LIST

ITEM NO		QTY	DESCRIPTION	MODEL 40	MODEL 60	MODEL 80
(1)	1	1	HOSE, assembly, 1/2"-2W x 42".....	70227	70227	70227
(1)	2	1	HOSE, assembly, 1/2"-2W x 42".....	70227	70227	70227
(4)	3	1	TUBE, assembly.....	93482	93448	93484
(2)	4	2	HOSE, assembly, 1/2"-2W x 48".....	70230	70230	70230
(4)	5	2	TUBE, assembly.....	93437	93485	93482
(1)	6	2	HOSE, assembly, 1/2"-2W x 52".....	71600	71600	71600
	7	2	BUSHING, reducer, 1/2"M-1/4"F.....	22204	22204	22204
	8	2	ADAPTER, 90°, 1/2"M-1/2"F.....	66059	66059	66059
	9	1	VALVE, cushion.....	63014	63014	63014
(3)	10	2	HOSE, assembly, 1/4"-2W x 17".....	70005	70005	70005
	11	2	ADAPTER, 90°, 1/2"M-1/4"F.....	66057	66057	66057
	12	1	MOTOR, orbit.....	60000	60000	60000
			The following fittings are located on the Control Valve Section:			
		1	ADAPTER, 90°, 1/2"M-1/2"F.....	66059	66059	66059
		2	ADAPTER, straight, 1/2"M-1/2"F.....	66008	66008	66008
			The following items are used on the Stationary Platform Application:			
(1)	2	1	HOSE, assembly, 1/2"-2W x 60".....	70236	70236	70236
(1)	3	1	HOSE, assembly, 1/2"-2W x 58".....	70235	70235	70235

- (1) Items 1, 2 and 6 consist of the following:
- HOSE, 1/2"-2W..... 94002
- FITTING, male hose, 1/2" (1 per hose)..... 65962
- SOCKET, hose, 1/2" (1 per hose)..... 66339
- NIPPLE, ferrule-fix (1 per hose), 1/2"..... 66316
- (2) Item 4 consists of the following:
- HOSE, 1/2"-2W..... 94002
- SOCKET, hose, 1/2" (2 per hose)..... 66339
- NIPPLE, ferrule-fix, 1/2" (2 per hose)..... 66316
- (3) Item 10 consists of the following:
- HOSE, 1/2"-2W..... 94000
- FITTING, male hose, 1/4" (2 per hose)..... 65958
- (4) Items 3 and 5 are tube lengths for standard boom. Boom extensions require longer hydraulic boom tubing.

Change Notice No. 1
 Supersedes Page Dated: 1/1/75
 Effective: 11/24/75

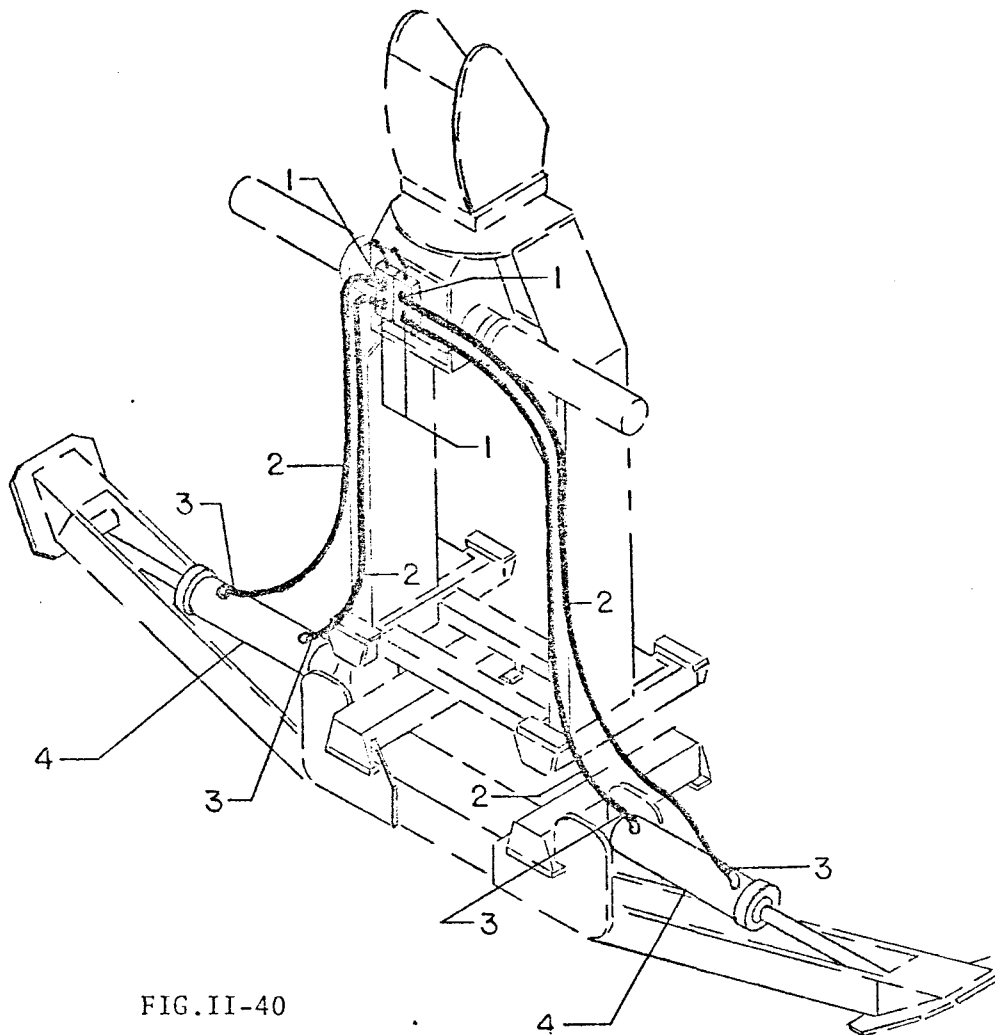


FIG. II-40

MODEL 40-60-80

MID MOUNT STATILIZER CIRCUIT

PARTS LIST

ITEM NO		QTY	DESCRIPTION	PAGE NUMBER
(1)	1	4	ADAPTER, 90°, 1/2"M-1/2"F.....	66059
	2	4	HOSE, assembly, 1/2"-2W x 120".....	70254
	3	4	ADAPTER, straight, 1/2"M-1/2"F.....	66008
	4	2	CYLINDER, stabilizer, 5" x 17".....	812404

- (1) Item 2 consists of the following:
- | | |
|--|-------|
| HOSE, 1/2"-2W..... | 94002 |
| FITTING, male hose, 1/2" (2 per hose)..... | 65962 |

Effective: 1/1/75
 Supersedes Page Dated: 3/15/74

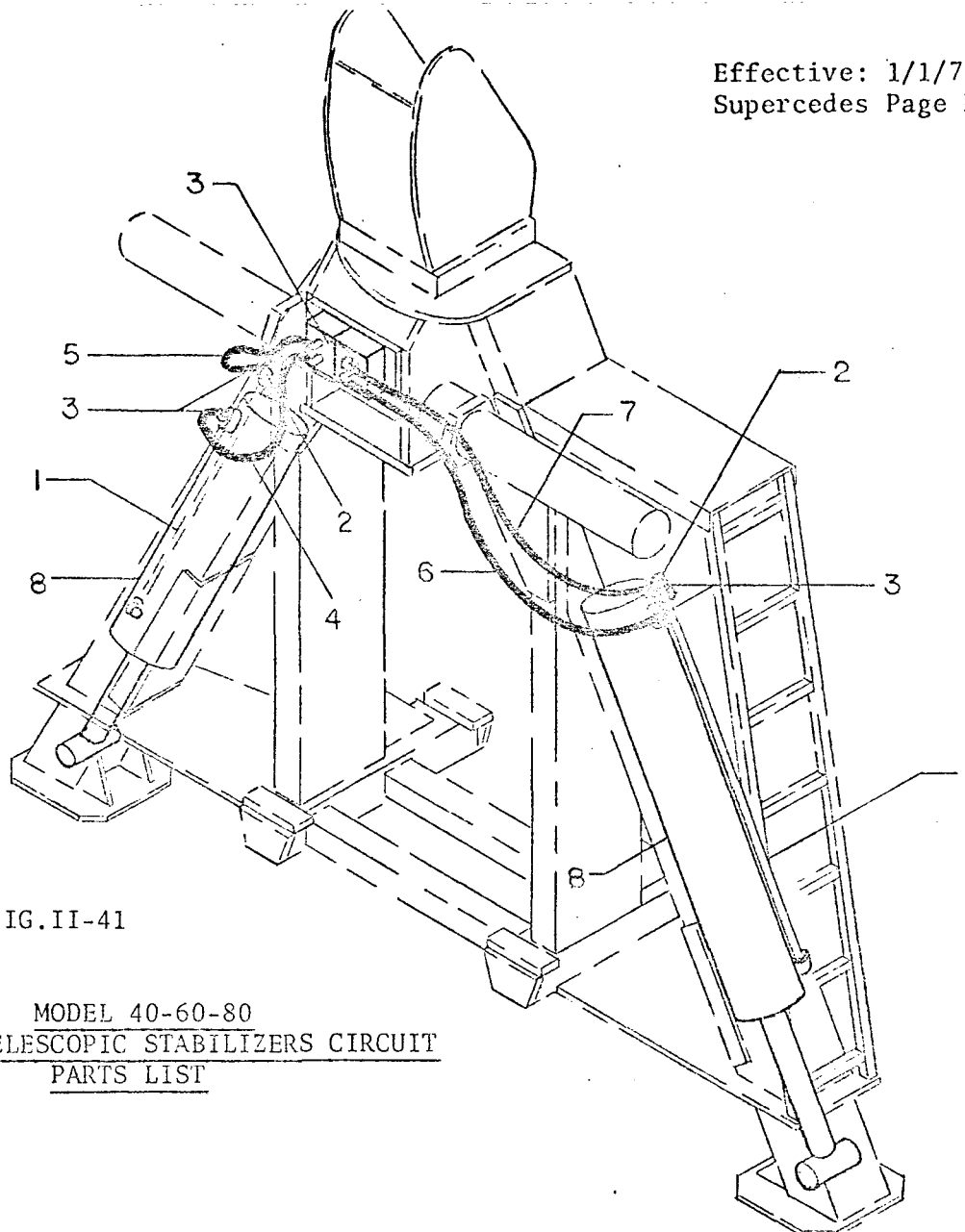


FIG. II-41

MODEL 40-60-80
 MID-MOUNT TELESCOPIC STABILIZERS CIRCUIT
 PARTS LIST

ITEM NO		QTY	DESCRIPTION	PART NUMBER
(1) (1)	1	2	PIPE, 3/8" x 47 1/2" long.....	20102
	2	2	PIPE, elbow, 3/8"F-1/2" F.....	21853
	3	8	ADAPTER, 90°, 1/2"M-1/2"F.....	66059
	4	1	HOSE, assembly, 1/2"-2W x 42".....	70227
	5	3	HOSE, assembly, 1/2"-2W x 42".....	70227
	6	1	CYLINDER, 3 1/2" x 43", right.....	812004
		1	CYLINDER, 3 1/2" x 43", left.....	812010
The following items are used on the Stationary Platform Application:				
(1)	4	1	HOSE, assembly, 1/2"-2W x 50".....	70231
(1)	5	3	HOSE, assembly, 1/2"-2W x 52".....	80232

- (1) Item 4 and 5 consists of the following:
- | | |
|---|-------|
| HOSE, 1/2"-2W..... | 94002 |
| FITTING, male hose, 1/2" (2 per hose).... | 65962 |

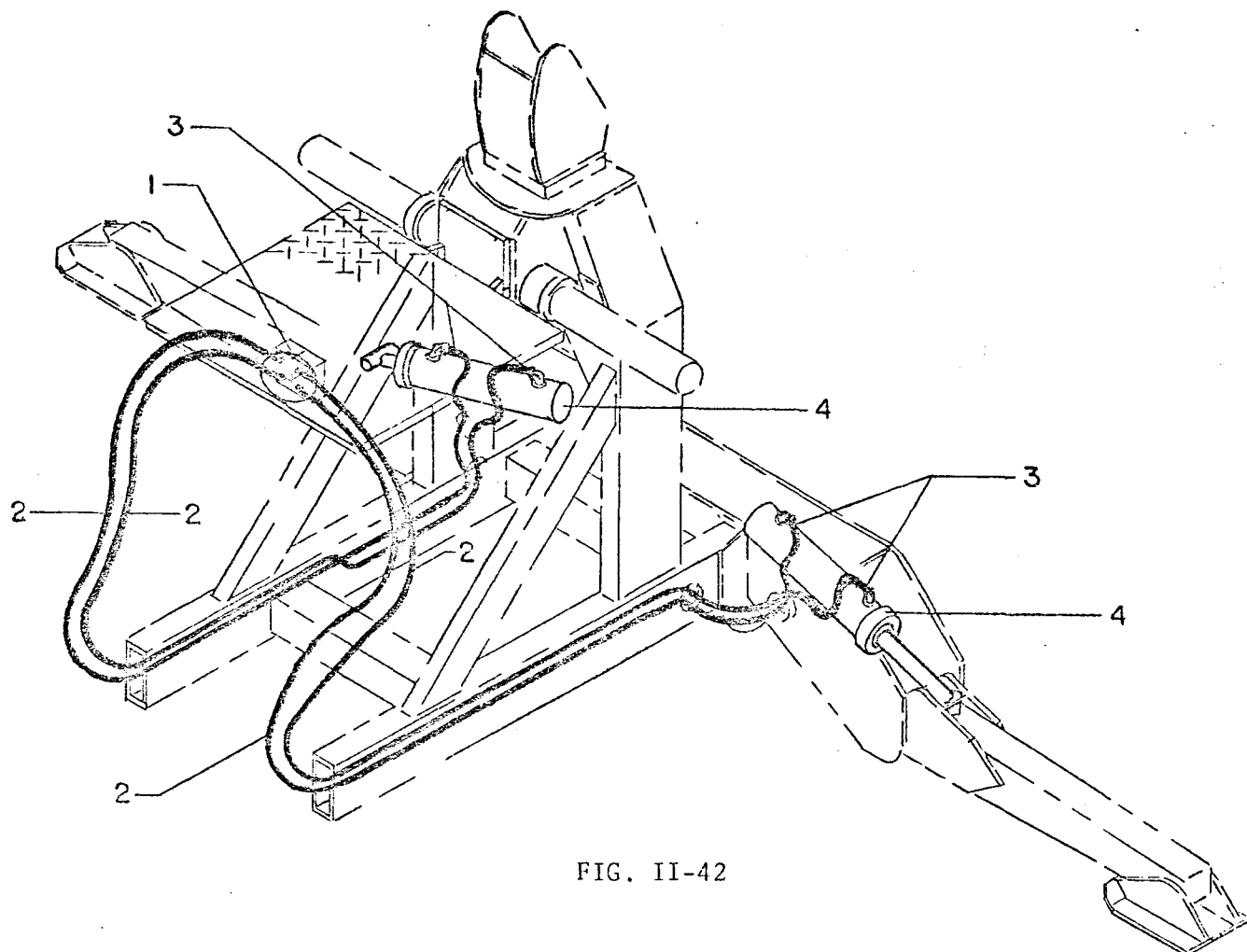


FIG. II-42

MODEL 40 60-80

REAR MOUNT STABILIZER CIRCUIT

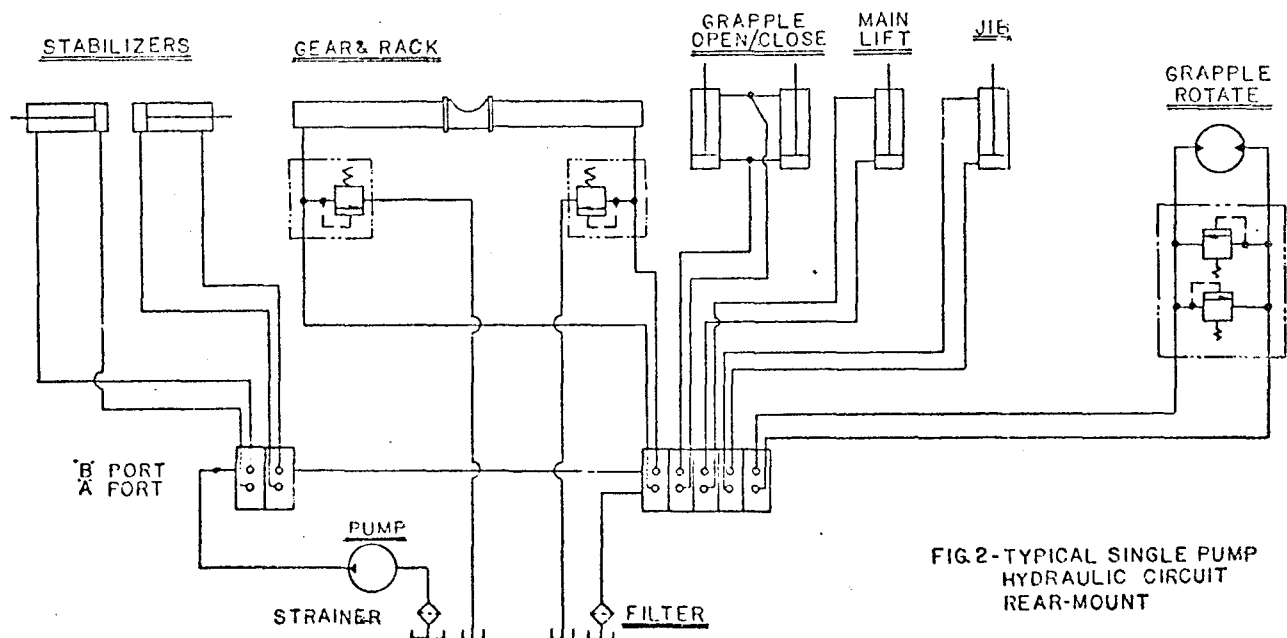
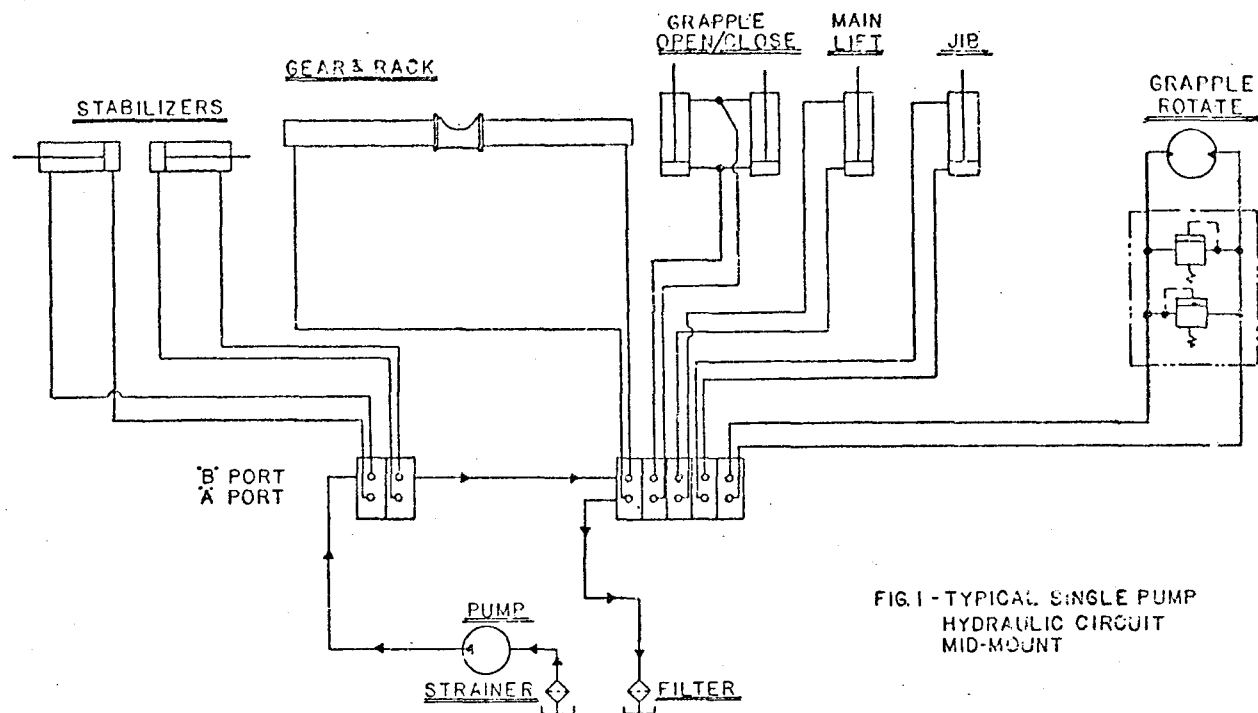
PARTS LIST

ITEM NO	QTY	DESCRIPTION	PART NUMBER
(1)	1	4 ADAPTER, 90 ⁰ , 1/2" M-1/2" F.....	66059
	2	4 HOSE, assembly, 1/2"-2W x 156".....	70262
	3	4 ADAPTER, straight, 1/2" M-1/2" F.....	66008
	4	1 CYLINDER, 5" x 17", right.....	812405
		1 CYLINDER, 5" x 17", left.....	812418

(1) Item 2 consists of the following:

HOSE, 1/2"-2W.....	94002
FITTING, male hose, 1/2" (2 per hose).....	65962

Effective: 1/1/75
 Supercedes Page Dated: 3/15/74



Effective: 1/1/75

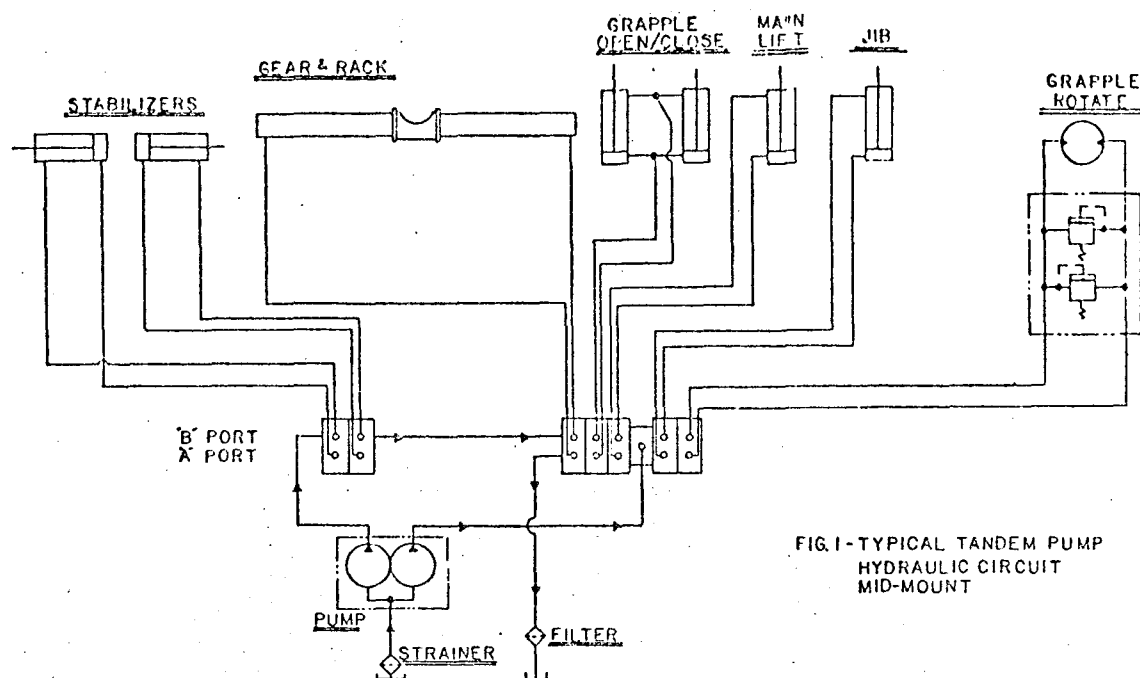


FIG. 1-TYPICAL TANDEM PUMP
HYDRAULIC CIRCUIT
MID-MOUNT

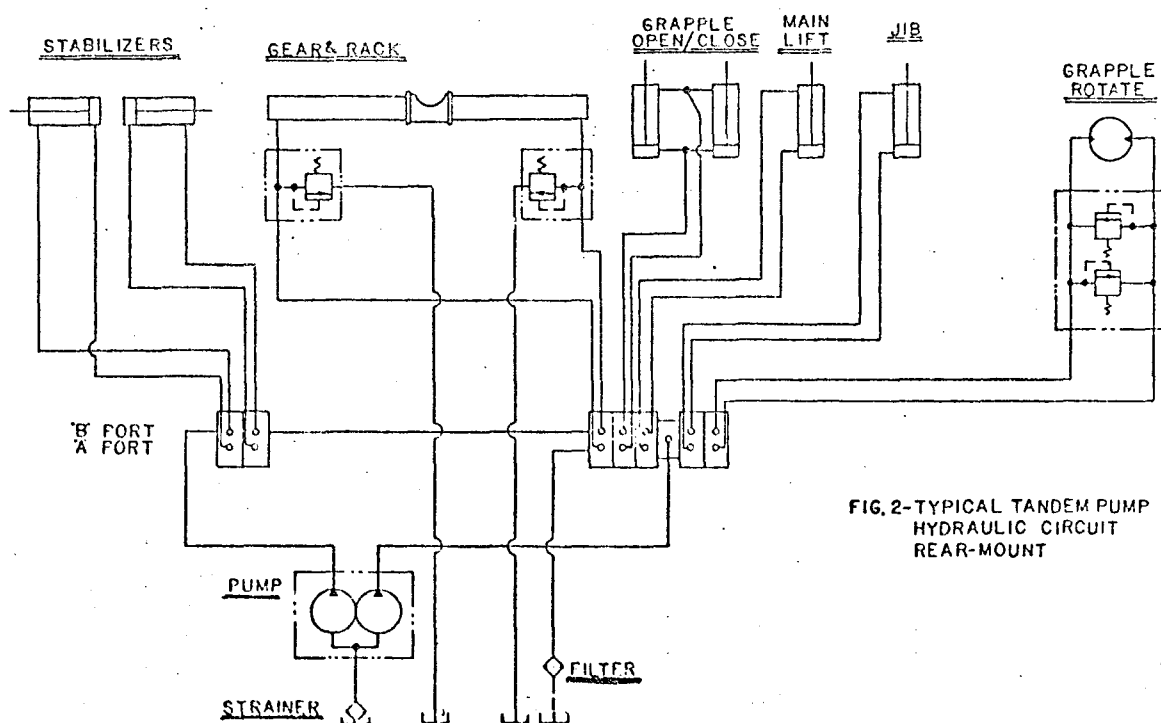


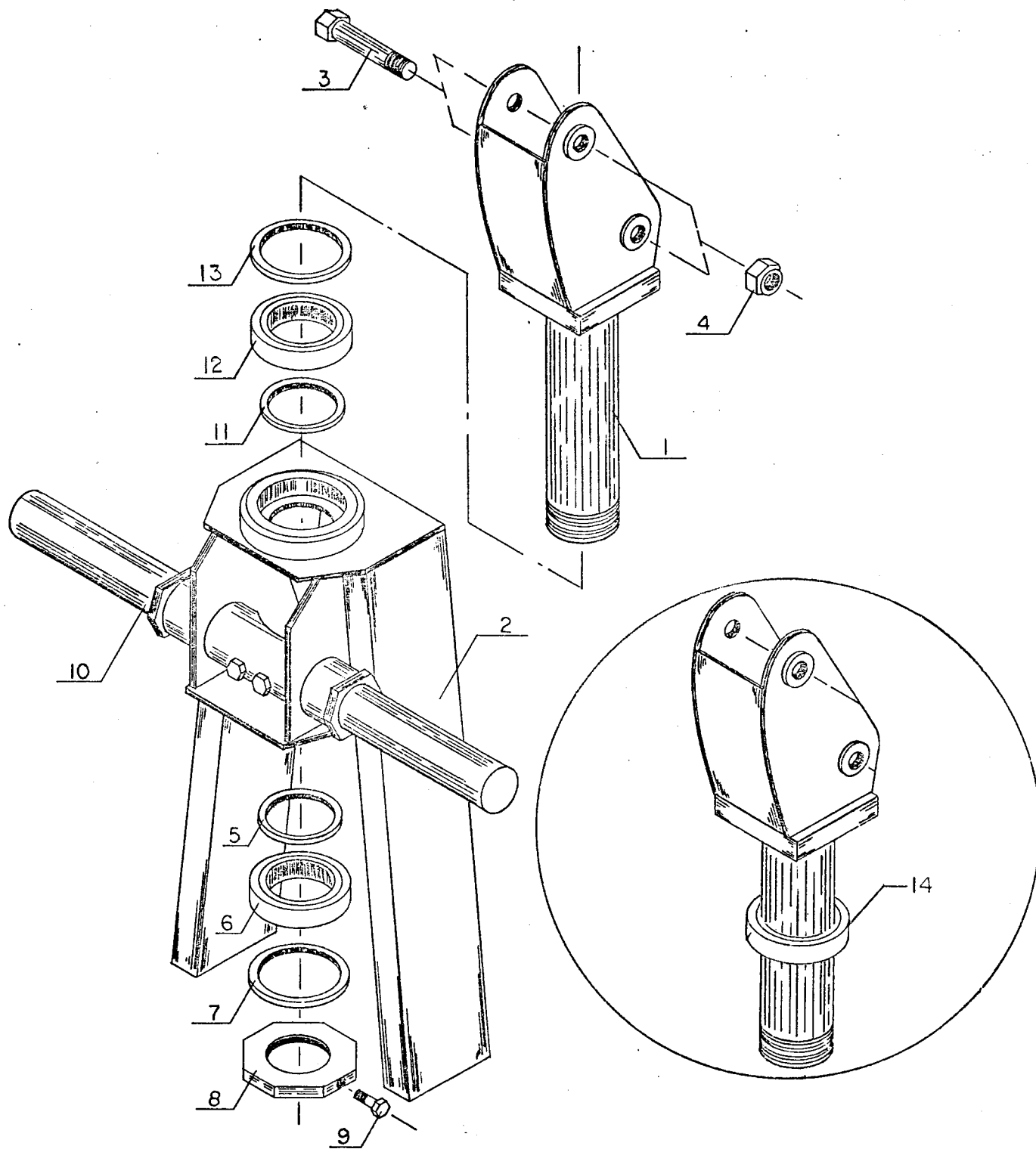
FIG. 2-TYPICAL TANDEM PUMP
HYDRAULIC CIRCUIT
REAR-MOUNT

Effective: 1/1/75

OPTIONS & ACCESSORIES

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EFFECTIVE: MAY 1, 1975

MODEL 40/60 TRACTOR MOUNT

GEAR & RACK SWING

HEAD AND FRAME ASSEMBLY
PARTS LIST

ITEM NO	QTY	DESCRIPTION	MODEL 40	MODEL 60
-	-	FRAME & HEAD, assembly.....	144018	144034
1	1	HEAD, weldment.....	122102	122115
2	1	FRAME, weldment.....	132113	132161
3	2	BOLT, body fit.....	482205	482200
4	2	NUT, nylock.....	13413	13413
(1) 5	1	SEAL, o-ring.....	(65437)	(65437)
6	1	BEARING, tapered roller.....	41079	41079
	1	cone.....	41726	41726
	1	cup.....	41727	41727
(1) 7	2	SEAL, dust.....	(44534)	(44534)
8	1	NUT, hex.....	481707	481707
9	1	SCREW, hex head, cap.....	10051	10051
10	1	GEAR & RACK, assembly, 300°.....	674207	674207
	1	GEAR & RACK, assembly, 400°.....	674208	674208
		For breakdown of GEAR & RACK see Page 30.		
(1) 11	1	SEAL, o-ring.....	(65437)	(65368)
12	1	BEARING, tapered roller.....	41079	41090
	1	cone.....	41726	41730
	1	cup.....	41727	41731
(1) 13	1	SEAL, dust.....	(44534)	(44538)
14	1	SLEEVE, head stem (see accompanying Picture)		
15	1	GEAR, pinion (not shown)	402904	402904

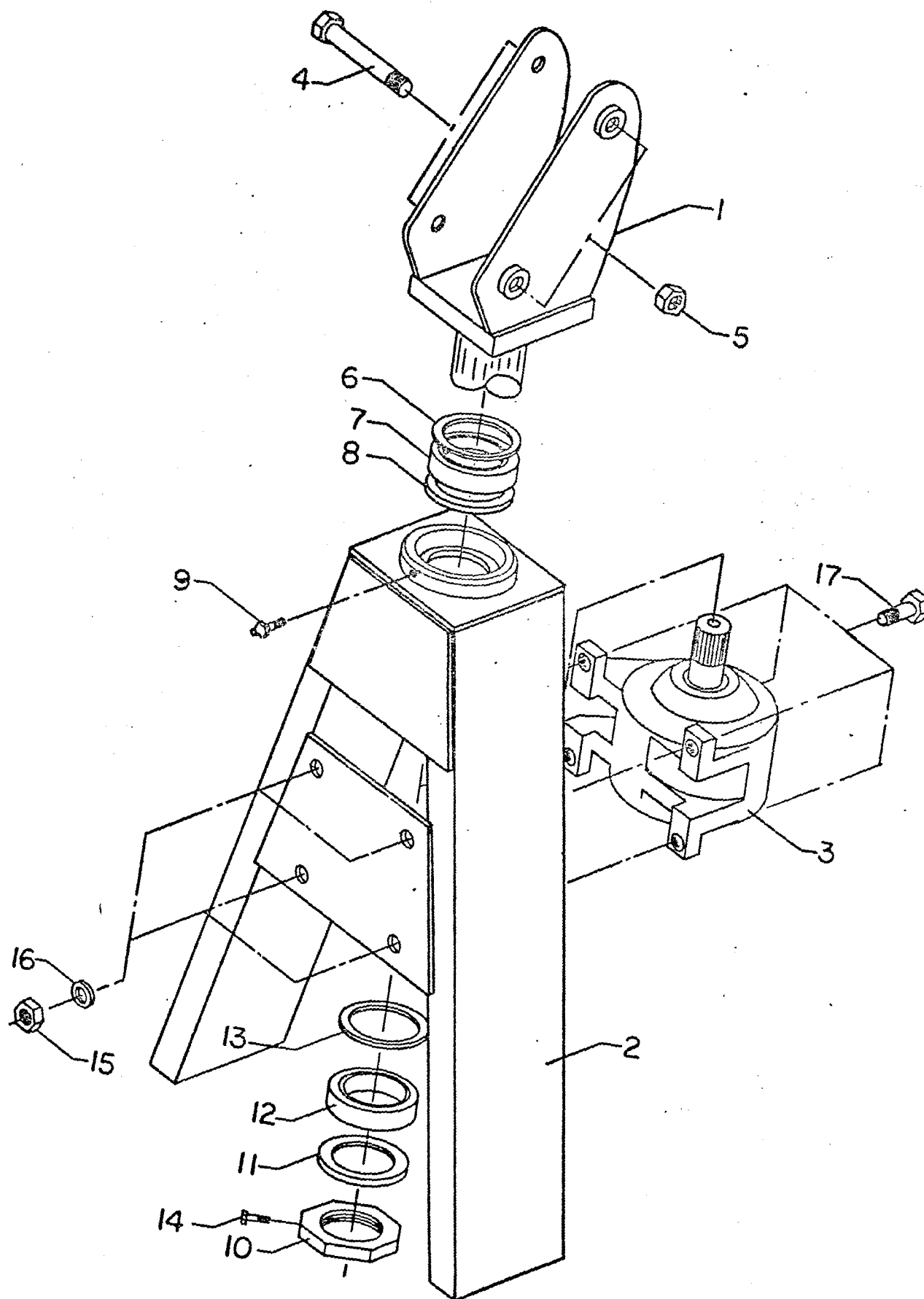
NOTES: THOSE PART NUMBERS IN BRACKETS () HAVE BEEN SUPERCEDED,
CHECK ACCOMPANYING FOOT NOTE IN 1st COLUMN.

(1) Serviced in Head Stem Seal Kit..... 65499 65289

Reference Model 60 only

The following items pertain to earlier model machines with 1½" bolts.				
1	1	HEAD, weldment.....		
3	1	BOLT, body fit, 1½" x 13".....	482200	482200
4	1	BOLTS, body fit, 1½" x 13".....	482200	482200

EFFECTIVE: MAY 1, 1975



MODEL 40/60 TRACTOR MOUNT

ROTARY ACTUATOR

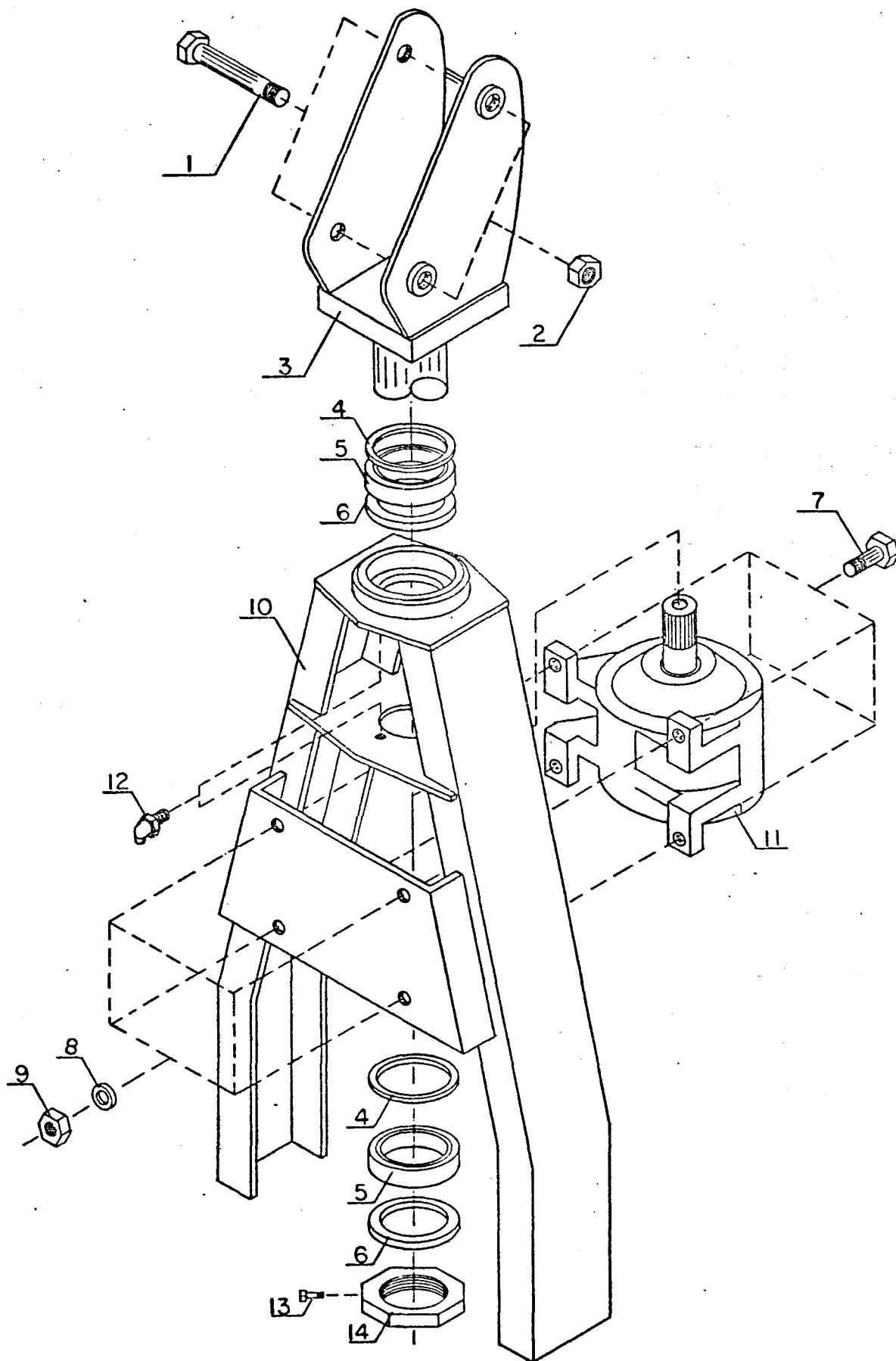
HEAD & FRAME ASSEMBLY
PARTS LIST

ITEM NO		QTY	DESCRIPTION	MODEL 40	MODEL 60
	-	1	FRAME & HEAD, assembly.....	143001	144009
	1	1	HEAD, weldment.....	121116	121119
	2	1	FRAME, weldment.....	132124	132125
	3	1	ACTUATOR, rotary.....	60005	60005
	4	2	BOLT, body-fit.....	482205	482205
	5	2	NUT, nylock.....	13413	13413
(1)	6	1	SEAL, dust.....	(44534)	(44538)
	7	1	BEARING.....	41079	41090
(1)	8	1	O-RING.....	(65437)	(65368)
	9	1	FITTING, grease.....	17300	17300
	10	1	NUT, stem lock.....	481707	481707
(1)	11	1	SEAL, dust.....	(44534)	(44534)
	12	1	BEARING, lower.....	41079	41079
(1)	13	1	O-RING.....	(65437)	(65437)
	14	1	SCREW, hex cap.....	10056	10056
	15	4	NUT, hex.....	13015	13015
	16	4	WASHER, lock.....	14018	14018
	17	4	SCREW, hex cap.....	10233	10233

NOTE: THOSE PART NUMBERS IN BRACKETS () HAVE BEEN SUPERCEDED,
CHECK ACCOMPANYING FOOT NOTE IN 1st COLUMN.

(1) Serviced in Head Stem Seal Kit..... 65499 65289

EFFECTIVE: MAY 1, 1975



EFFECTIVE: MAY 1, 1975

MODEL 40 TRACTOR MOUNT

ROTARY ACTUATOR

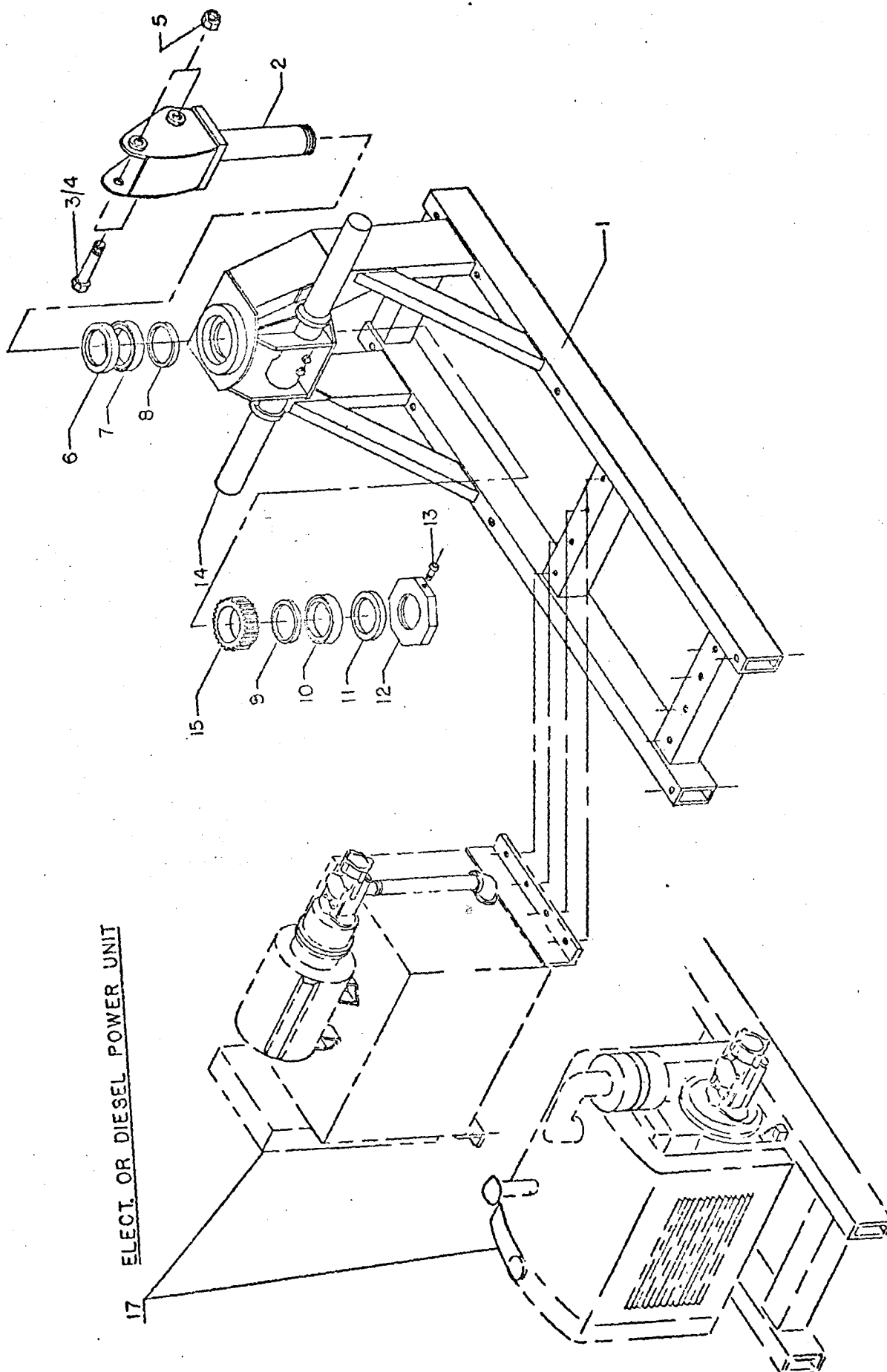
HEAD & FRAME ASSEMBLY
PARTS LIST

ITEM NO		QTY	DESCRIPTION	PART NUMBER
		1	HEAD & FRAME, assembly.....	144014
	1	2	BOLT, body-fit.....	482205
	2	2	NUT, nylock.....	13413
	3	1	HEAD, weldment.....	122116
(1)	4	2	SEAL, dust.....	(44534)
	5	2	BEARING.....	41079
(1)	6	2	O-RING.....	(65437)
	7	4	SCREW, cap, hex.....	10233
	8	4	WASHER, lock.....	14018
	9	4	NUT, hex.....	13015
	10	1	FRAME, weldment.....	13117
	11	1	ACTUATOR, rotary.....	60005
	12	2	FITTING, grease.....	17300
	13	1	SCREW, cap, hex.....	10056
	14	1	NUT, lock.....	481707

NOTE: THOSE PART NUMBERS IN BRACKETS ()
HAVE BEEN SUPERCEDED, CHECK ACCOMPANYING
FOOT NOTE IN 1st COLUMN

(1) Serviced in Head Stem Seal Kit. 65499

EFFECTIVE: MAY 1, 1975



EFFECTIVE: MAY 1, 1975

MODELS 40-60-80 STATIONARY-MOUNT

GEAR & RACK

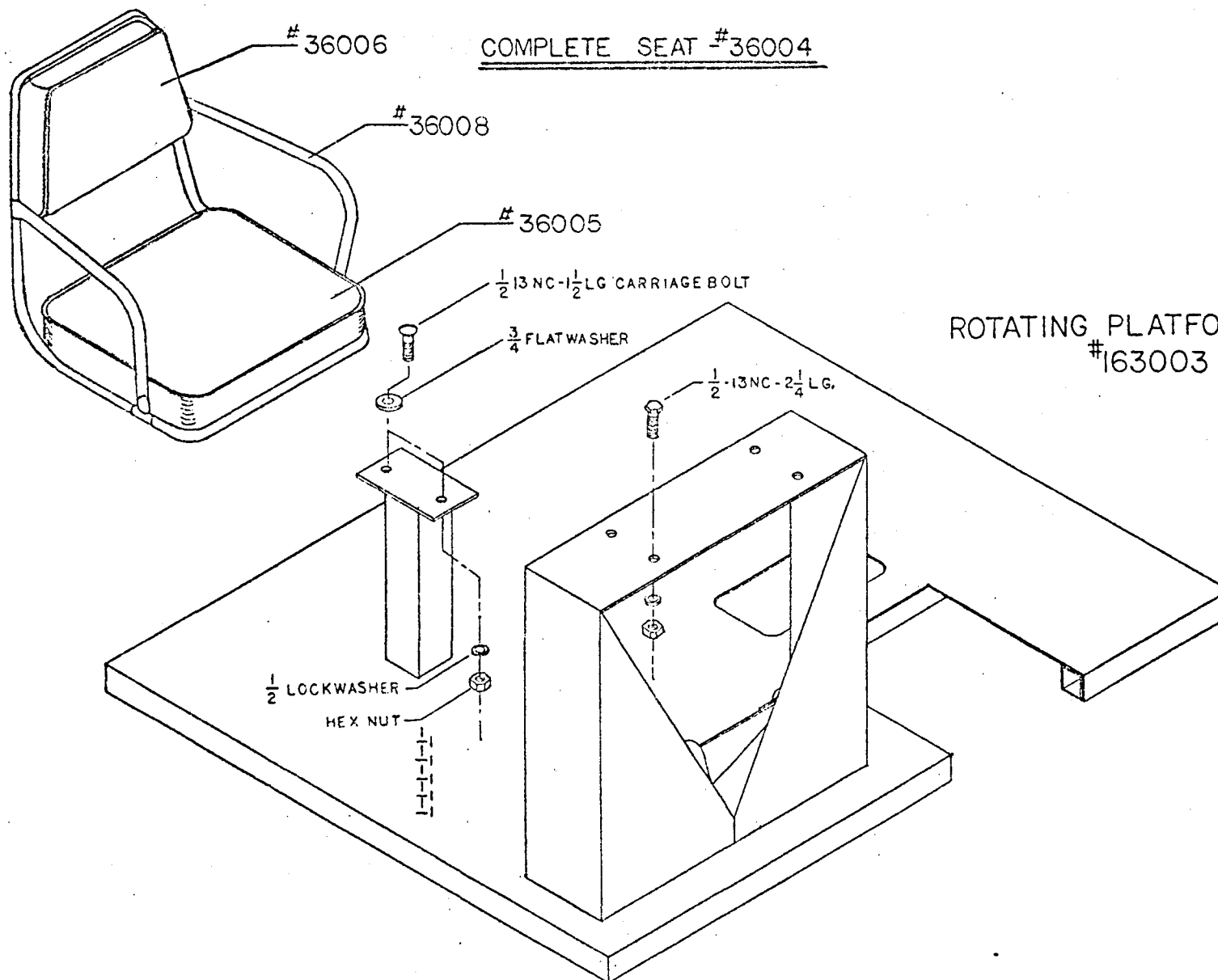
PARTS LIST

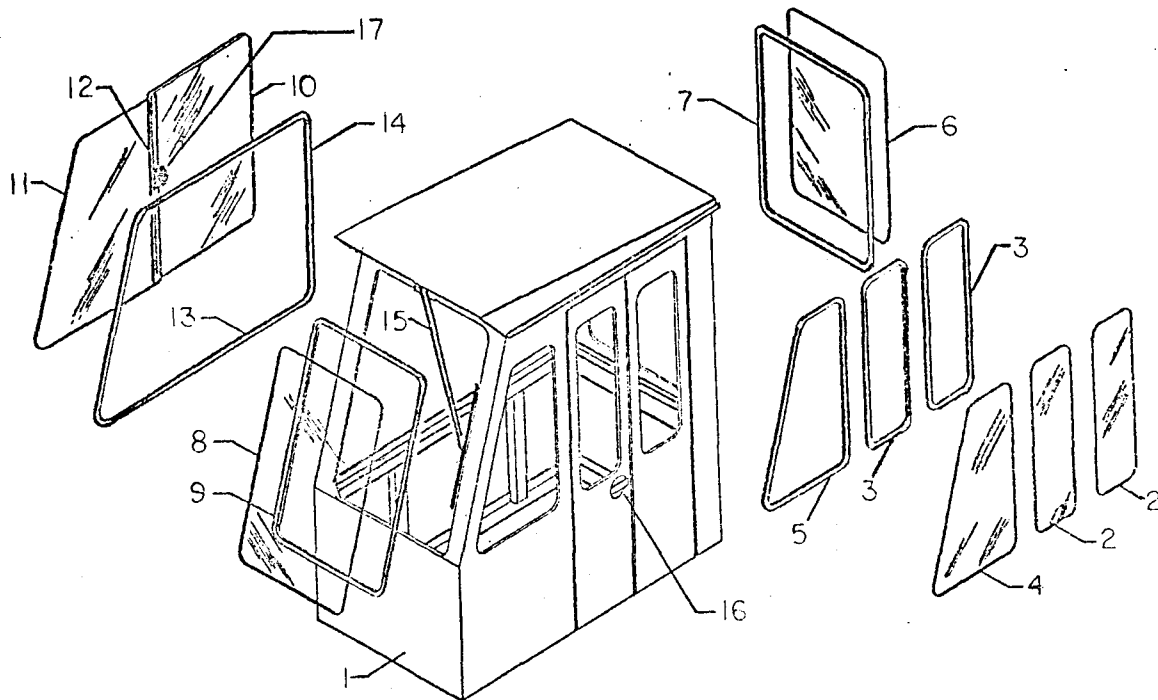
ITEM NO.	QTY.	DESCRIPTION	MODEL 40	MODEL 60	MODEL 80
1	1	FRAME & SUB-FRAME, weldment, short.....	133183	133184	133185
	1	FRAME & SUB-FRAME, weldment, standard.....	133178	133179	133180
2	1	HEAD, weldment	122102	122115	122118
3	1	BOLT, body-fit	482205	482272	482272
4	1	BOLT, body-fit	482205	482304	482304
5	2	NUT, hex, nylock.....	13413	13417	13417
(1) 6	1	SEAL, dust.....	(44534)	(44538)	(44538)
7	1	BEARING, tapered roller.....	41079	41090	41090
	1	cone	41726	41730	41730
	1	cup	41724	41731	41731
(1) 8	1	SEAL, o-ring.....	(65437)	(65468)	(65468)
(1) 9	1	SEAL, o-ring	(65437)	(65437)	(65437)
10	1	BEARING, tapered roller.....	41079	41079	41079
	1	cone	41726	41730	41730
	1	cup.....	41724	41731	41731
(1) 11	1	SEAL, dust.....	(44534)	(44534)	(44534)
12	1	NUT, hex, stem.....	481707	481707	48707
13	1	SCREW, cap.....	10056	10056	10056
14	1	GEAR & RACK, assembly, 300 ⁰ ...	674207	674207	674204
	1	GEAR & RACK, assembly, 400 ⁰ ...	674208	674208	674208
15	1	GEAR, pinion.....	402901	402901	402901
16	1	SLEEVE, head stem	122102-2	-	-
17		POWER UNIT			
	1	electric, 30 or 50 hp			
	1	diesel.....			

NOTE: THOSE PART NUMBERS IN BRACKETS () HAVE BEEN SUPERCEDED,
CHECK ACCOMPANYING FOOT NOTE IN 1st COLUMN.

(1) Serviced in Head Stem Seal Kit. 65499 65289 65289

EFFECTIVE: MAY 1, 1975





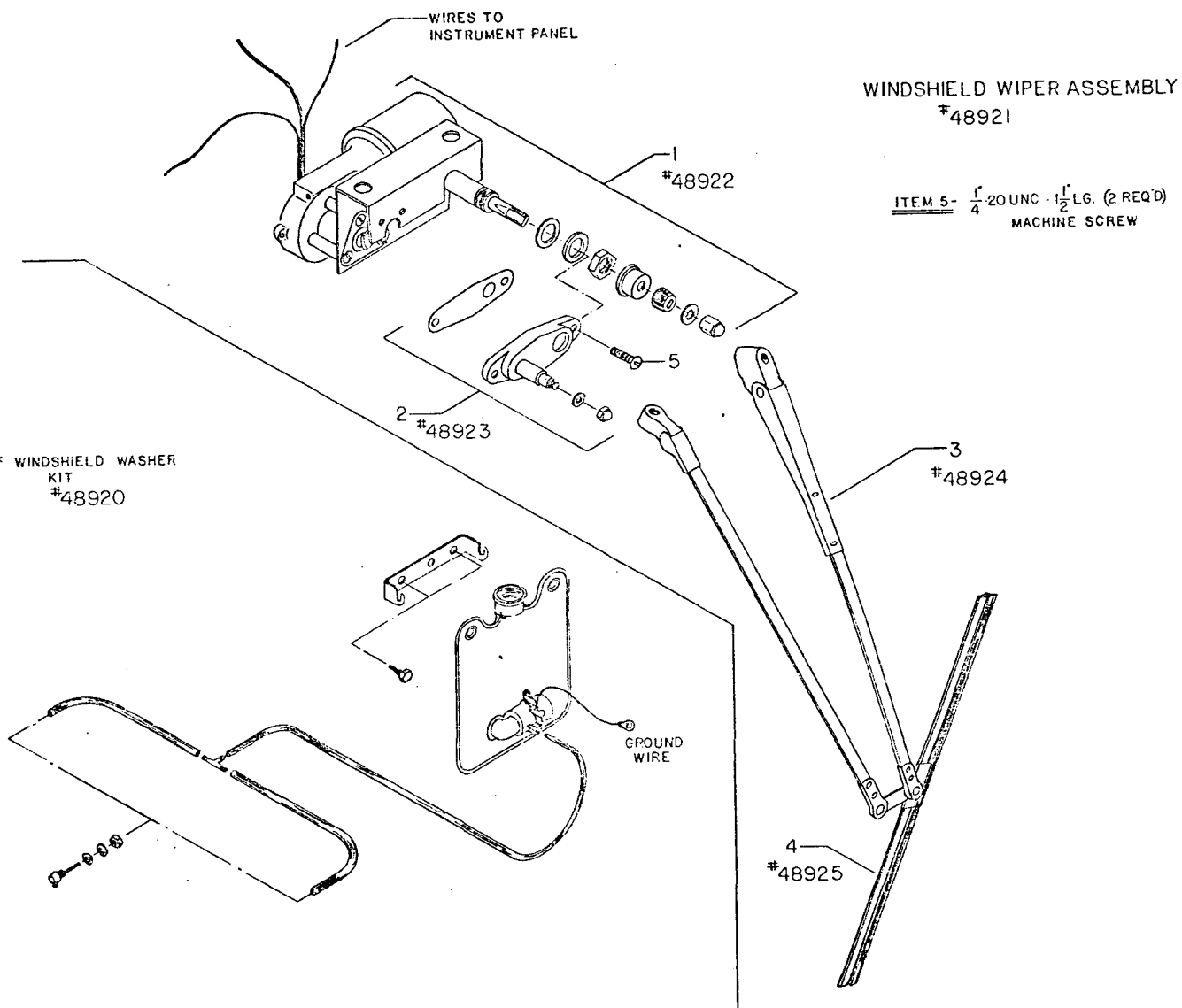
CAB ASSEMBLY
MODELS 40-60-80
PARTS LIST

ITEM NO	QTY	DESCRIPTION	PART NUMBER
-	-	CAB, complete, w/glass.....	164003
1	1	CAB, shell.....	16414
* 2	2	GLASS, door.....	36101
(1) 3	2	CASING, door, 69 1/2".....	
* 4	1	GLASS, front panel.....	36106
(1) 5	1	CASING, front panel, 67 1/2" long.....	
* 6	1	GLASS, rear.....	36104
(1) 7	1	CASING, rear window, 105".....	
* 8	1	GLASS, windshield.....	36105
(1) 9	1	CASING, windshield, 111 1/2" long.....	
* 10	1	GLASS, right side, rear section.....	36102
* 11	1	GLASS, right side, sliding section.....	36103
12	1	CHANNEL, edge, sliding glass.....	36251
(2) 13	1	CHANNEL, sliding, 120" long.....	
(1) 14	1	CASING, right side, glass, 120" long.....	
15	1	WIPER, assembly.....	48921
16	1	HANDLE, door.....	36300
17	1	GRIP, finger.....	36301

- (1) All window casing is sold by the foot. Approximate lengths are given in Parts List above. When ordering, order by part No. #36200 and proper length in feet, except on Sliding Window use #36250.

Ex: Ref. no. 3 above shows 60 1/2" long. Order 6 feet.

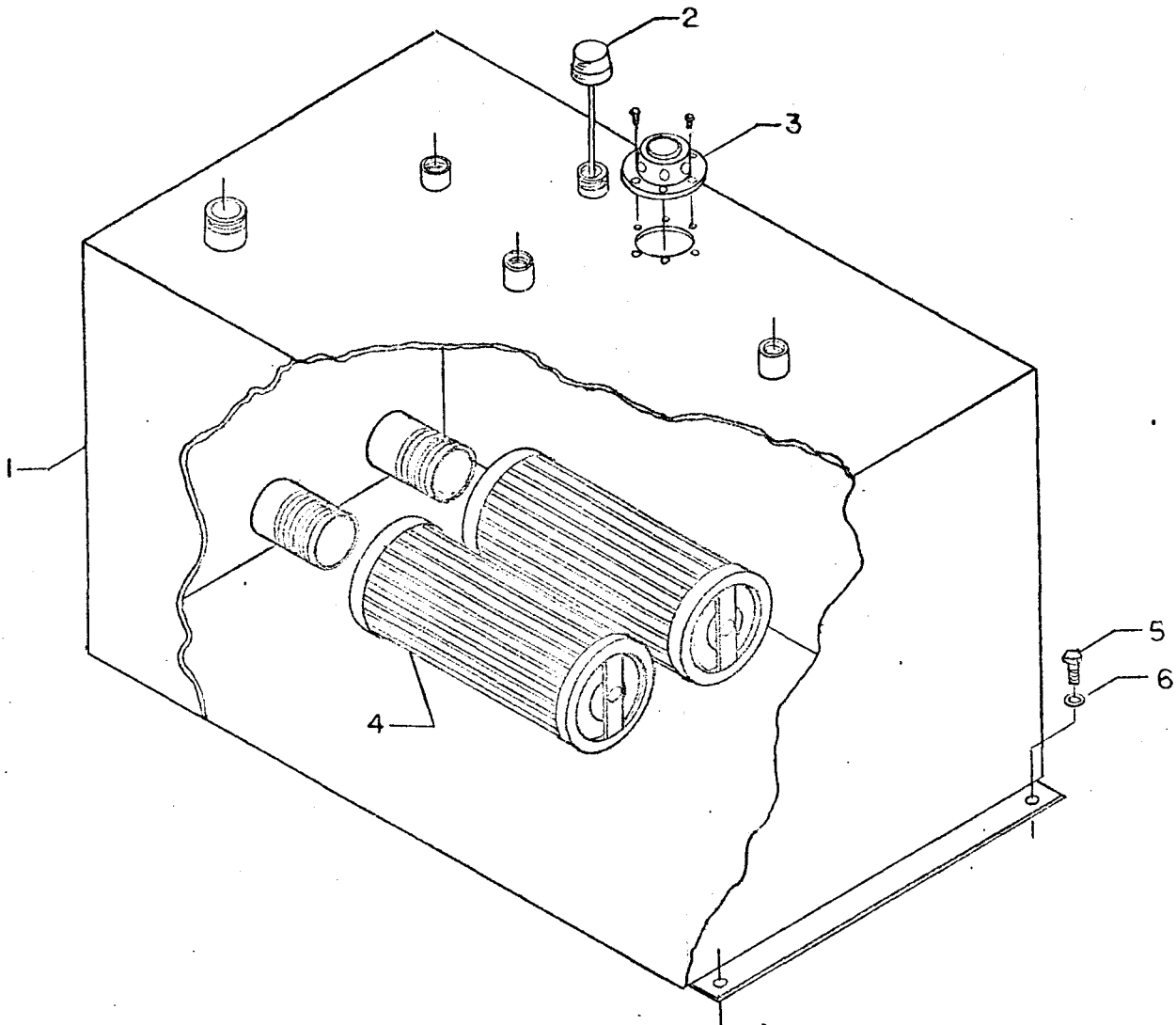
- (2) Channel for sliding window, #36201, is sold in 5-foot lengths. When ordering, order 10 feet of sliding channel for complete window.
- * Part numbers are for glass patterns only. #36205 casing #36250.



* NOTE: Windshield Washer Kit Optional On All Cabs.

EFFECTIVE: MAY 1, 1975

100 GALLON RESERVOIR



100 GALLON RESERVOIR

PARTS LIST

ITEM NO.	QTY.	DESCRIPTION	PART NUMBER
1	1	RESERVOIR, hydraulic	643122
2	1	DIPSTICK.....	641101
3	1	CAP, filler	39500
4	2	STRAINER.....	65019
5	4	BOLT, 3/8-16 UNC, hex head, 3/4" long...	
6	4	LOCKWASHER, 3/8"	
*7	-	VALVE, shut-off.....	63089

* OPTIONAL

EFFECTIVE: MAY 1, 1975

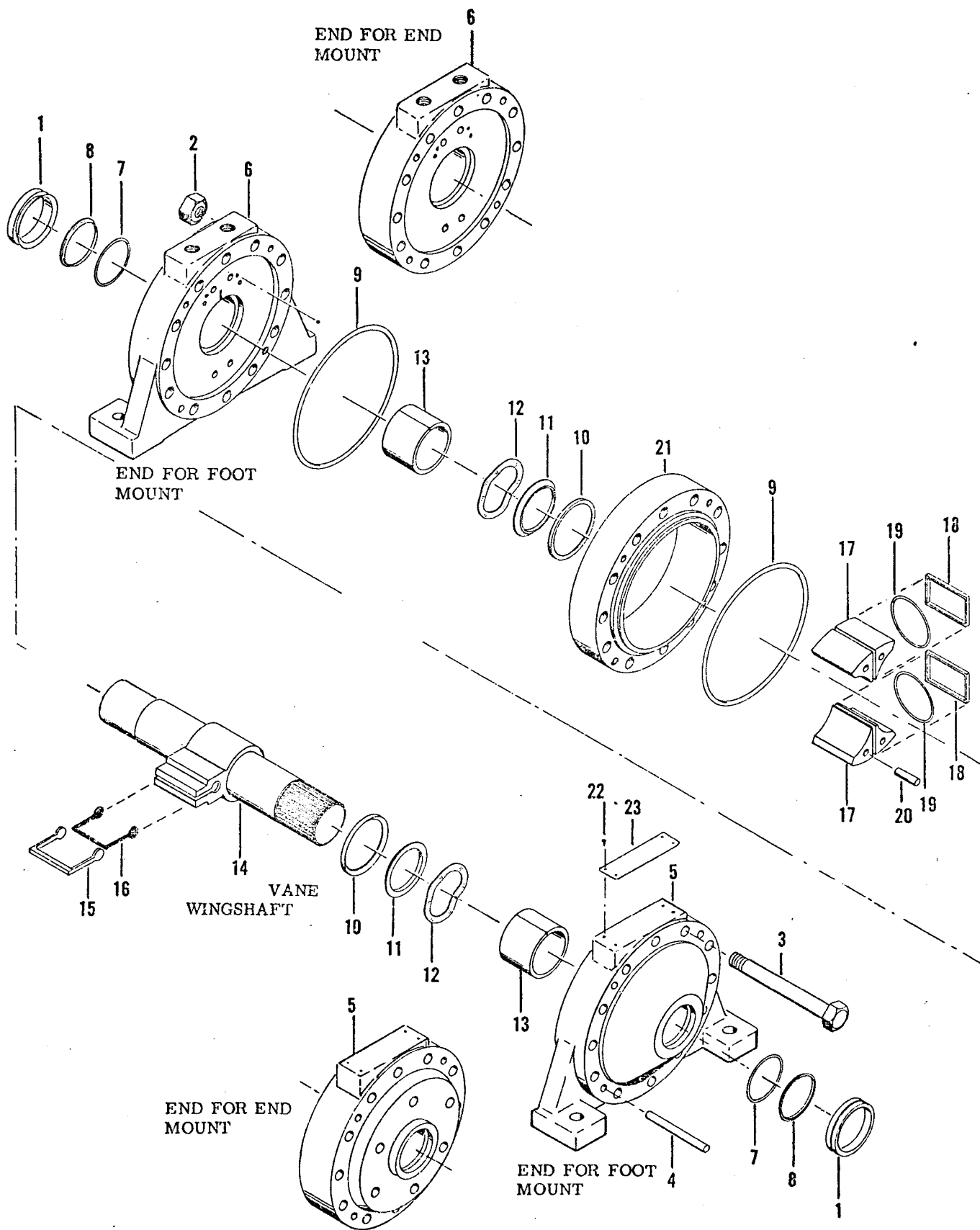
MODELS 60-80

MAIN BOOM & SECONDARY BOOM ASSEMBLY

OVERHEAD SECONDARY CYLINDER
PARTS LIST

ITEM NO.	QTY	DESCRIPTION	MODEL 60	MODEL 80
-	-	MAIN BOOM & SECONDARY BOOM, assembly..	104034	104034
1	1	MAIN BOOM, weldment.....	103217	103026
2	1	SECONDARY BOOM, weldment.....	112231	112232
3	2	ARM, connecting.....	101550	101550
4	1	LINK, connecting.....	101207	101207
5	2	BOLT, body fit.....	482256	482256
6	2	BOLT, body fit.....	482250	482250
7	2	BOLT, body fit.....	482256	482256
8	1	BOLT, body fit.....	482228	482228
9	7	NUT, hex, nylock.....	481718	481718
10	6	BUSHING, bronze.....	42020	42020
11	2	BEARING, tapered roller.....	42032	42032
12	2	BEARING, tapered roller.....	41015	41015
13	6	GREASE FITTING, straight, (not shown)..	17300	17300

EFFECTIVE: MAY 1, 1975



ROTARY ACTUATOR

HOUDAILLE LARGE

PARTS LIST

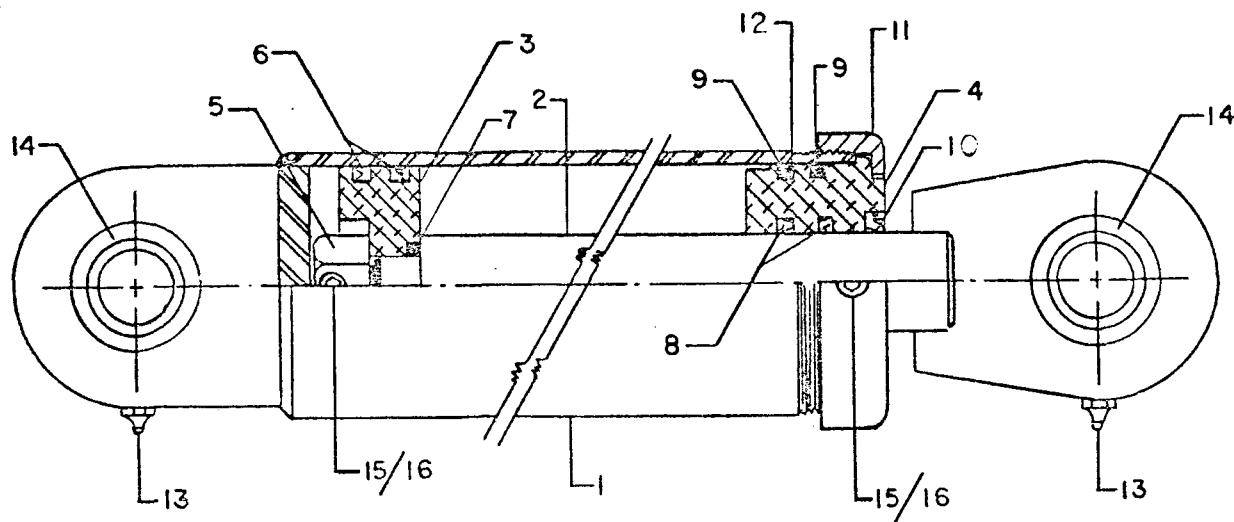
ITEM NO.	QTY.	DESCRIPTION	PART NUMBER
-	1	ROTARY ACTUATOR, end mount.....	60002
		single vane, roller bearing	
(1) 1	2	V-RING.....	(-)
2	12	NUT, hex, 3/4-16 Grade 5.....	59801
3	12	SCREW, end cap, 3/4-16 x 8 1/2, Gr. 8.....	59800
4	8	DOWEL, end.....	59802
5	1	ASSEMBLY, end and bushing (unported).....	59803
6	1	ASSEMBLY, end and bushing (ported).....	59804
(1) 7	2	O-RING, shaft seal,.....	(59805)
(1) 8	2	SEAL, shaft.....	(59806)
(1) 9	2	O-RING, end seal.....	(59807)
(1) 10	2	SEAL, hub.....	(59808)
11	2	SEAL RING, hub.....	59809
12	2	SPRING, hub seal.....	59810
13	2	BUSHING, part of item 5 or 6.....	59811
14	1	WINGSHAFT.....	59812
(1) 15	1	SEAL, vane.....	(59814)
(1) 16	1	GASKET, vane seal.....	(-)
17	1	ABUTMENT.....	59818
(1) 18	1	SEAL, abutment.....	(-)
(1) 19	1	O-RING, abutment.....	(-)
20	4	DOWEL.....	59802
21	1	BODY.....	59820
22	2	SCREW, drive.....	59821
23	1	PLATE, name.....	451044

NOTE: THOSE PART NUMBERS IN BRACKETS () HAVE BEEN SUPERCEDED,
CHECK ACCOMPANYING FOOT NOTE IN 1st COLUMN.

(1) Items included in Seal Kit..... 65286

EFFECTIVE: MAY 1, 1975

Supercedes Page Dated: 3/15/74



OVERHEAD SECONDARY BOOM CYLINDER (6x36)

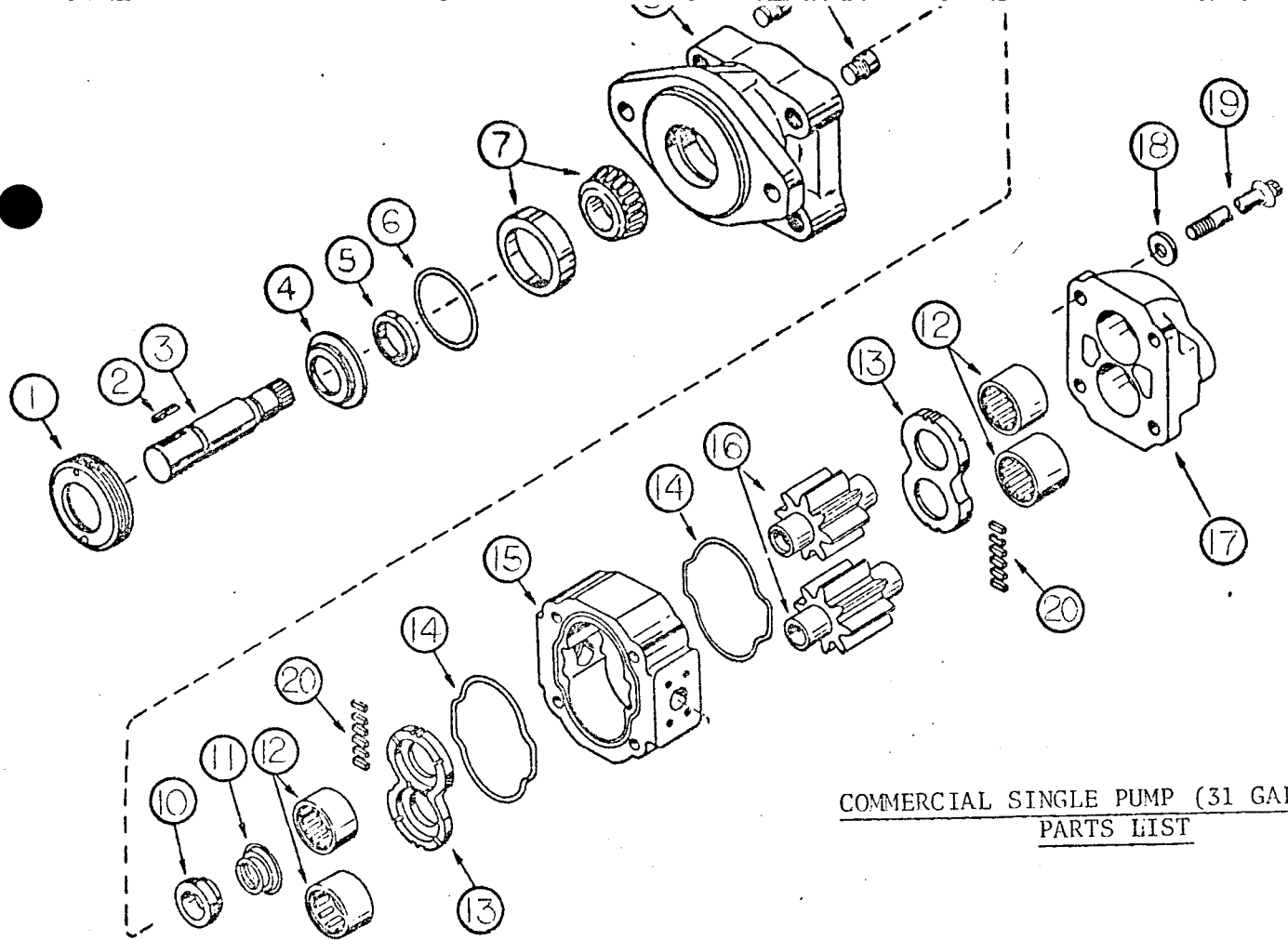
PARTS LIST

ITEM NO	QTY	DESCRIPTION	80 (6x36)	
-	1	CYLINDER, assembly.....	812414	(672165)
1	1	BUTT & TUBE, weldment.....	832023	(672974)
2	1	ROD, weldment.....	842018	(671370)
3	1	PISTON.....	852003	(682329)
4	1	GLAND.....	852304	(682325)
5	1	NUT, hex.....	13019	
(1)(3)6	2	SEAL, piston.....		(56856)
(1)(3)7	1	O-RING.....		(56318)
(2)(3)8	2	SEAL, rod.....		(56806)
(2)(3)9	2	O-RING.....		(65355)
(2)(3)10	1	SEAL, wiper.....		(65655)
11	1	CAP, gland.....	852802	(682250)
(2)(3)12	1	WASHER, back-up.....		(56902)
13	2	FITTING, grease.....	17300	
14	2	BUSHING, bronze.....	-	
	2	BUSHING, ball.....	41515	
15	2	SCREW, set.....	12616	
(3)16	1	PLUG, teflon.....		(50000)

NOTE: NUMBERS IN BRACKETS () INDICATE SUPERCEDED PART NUMBERS.

(1) Piston Seal Kit..... 65489
 (2) Gland Seal Kit..... 65490
 (3) Seal Kit..... 65524

EFFECTIVE: MAY 1, 1975



COMMERCIAL SINGLE PUMP (31 GALLON)
PARTS LIST

ITEM NO	QTY	DESCRIPTION	PART NUMBER
-	-	PUMP, 31 GPM.....	60514
1	1	RING, retainer.....	60625
2	1	KEY.....	60631
3	1	SHAFT, splined.....	60630
	1	SHAFT, keyed.....	60676
4	1	SEAL, retainer.....	60626
(1) 5	1	SEAL, double lip.....	()
(1) 6	1	O-RING.....	(60628)
7	1	BEARING, assembly.....	60629
8	1	END COVER, shaft.....	60634
(1) 9	1	CHECK, assembly.....	(60635)
(1) 10	1	BUSHING, brorze shaft.....	(60636)
11	1	SPRING, conical.....	60637
12	4	BEARING.....	60638
13	2	PLATES, thrust.....	60639
14	2	GASKET, o-ring.....	60662
15	1	HOUSING, gear.....	60671
16	2	GEARS, matched.....	60672
17	1	END COVER, port.....	60653
18	4	WASHERS.....	60654
19	4	FASTENERS.....	60665
20	2	SEALS, pocket.....	(65581)

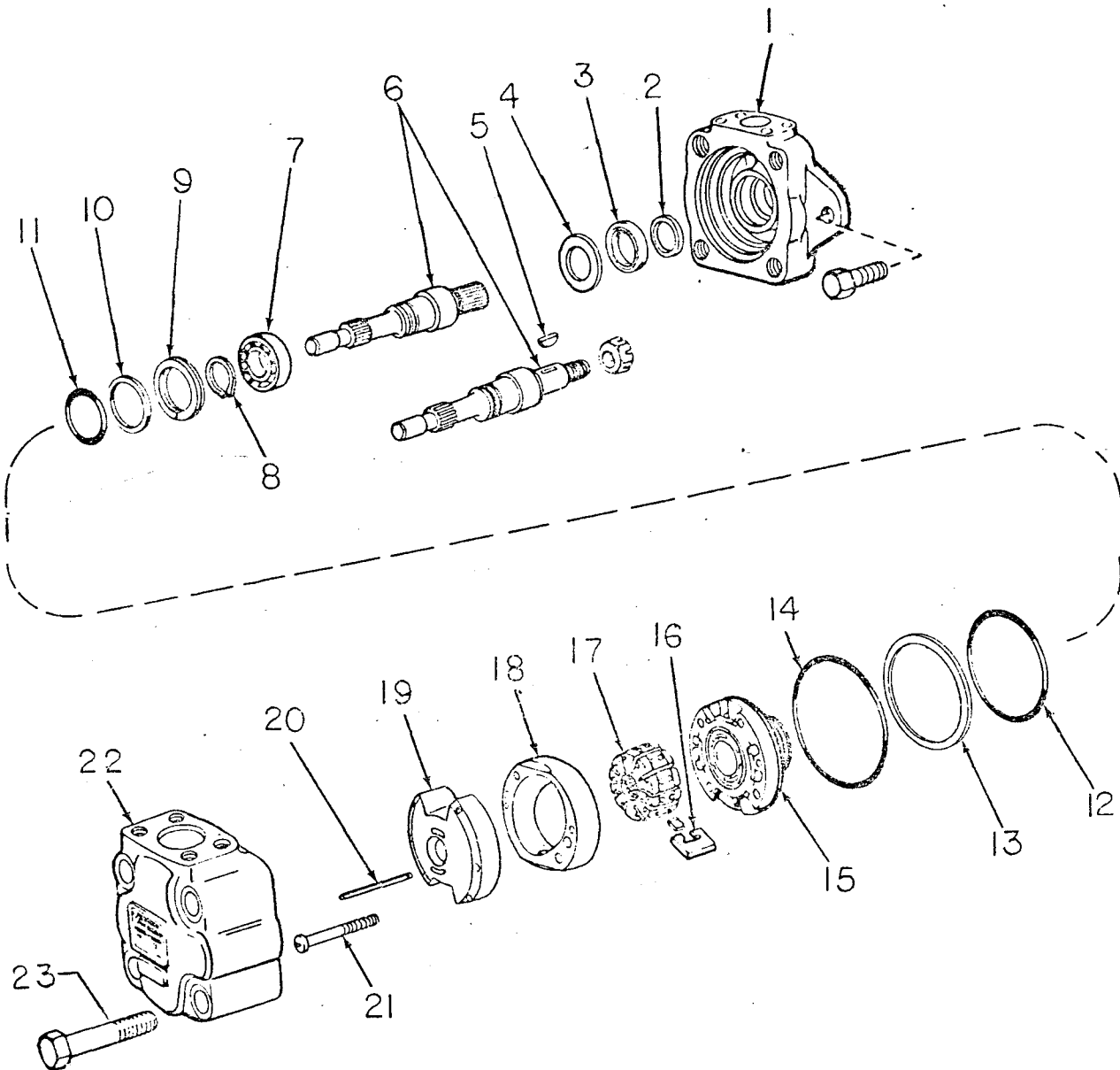
NOTE: NUMBERS IN () INDICATE SUPERCEDED NUMBERS. SERVICED
ONLY IN APPROPRIATE KITS.

(1) Included in Seal Kit #65580

EFFECTIVE: MAY 1, 1975

Supercedes page dated; 7/1/73

VICKERS SINGLE PUMP (28 GALLON)



EFFECTIVE: MAY 1, 1975

VICKERS SINGLE PUMP

SERIES 30V (28 GPM)

PARTS LIST

ITEM NO	QTY	DESCRIPTION	PART NUMBER
-	-	PUMP, complete assembly R.H..	60604
-	-	PUMP, complete assembly L.H..	60605
1	1	BODY.....	59578
(1) 2	1	SEAL, wiper.....	(44512)
(1) 3	1	SEAL.....	(59569)
4	1	WASHER.....	59568
5	1	KEY.....	59566
6	1	SHAFT, (keyed).....	59567
	1	SHAFT, (splined).....	59584
7	1	BEARING.....	59565
8	1	RING, snap.....	59564
9	1	RING, lock.....	59563
The following items 10-21 below are serviced only in Cartridge Kit, Part No. 65253:			
(1) 10	1	RING, back up.....	(59562)
(1) 11	1	SEAL, o-ring.....	(65414)
(1) 12	1	SEAL, o-ring.....	(65417)
(1) 13	1	RING, back-up.....	(59559)
(1) 14	1	SEAL, o-ring.....	(65418)
15	1	PLATE, pressure.....	(-)
16	1	VANE, assembly.....	(59576)
17	1	ROTOR.....	(-)
18	1	RING.....	(-)
19	1	PLATE, wea , sub-assembly....	(-)
20	2	PIN.....	(59558)
21	2	SCREW.....	(-)
22	1	COVER.....	59577
23	4	BOLT.....	59579

NOTES: PART NUMBERS IN BRACKETS () ARE SUPERCEDED
NUMBERS AND ARE SERVICED ONLY IN APPROPRIATE
KITS.

(1) Seal Kit..... 65507

EFFECTIVE: MAY 1, 1975

BARKO MODEL 40-60-80 LOADERS

SECTION III - SERVICE INFORMATION

CONTENTS:

PUMP SERVICE MANUAL (VICKERS, COMMERCIAL)

GRAPPLE ROTATE MOTOR SERVICE MANUAL (CHAR-LYNN)

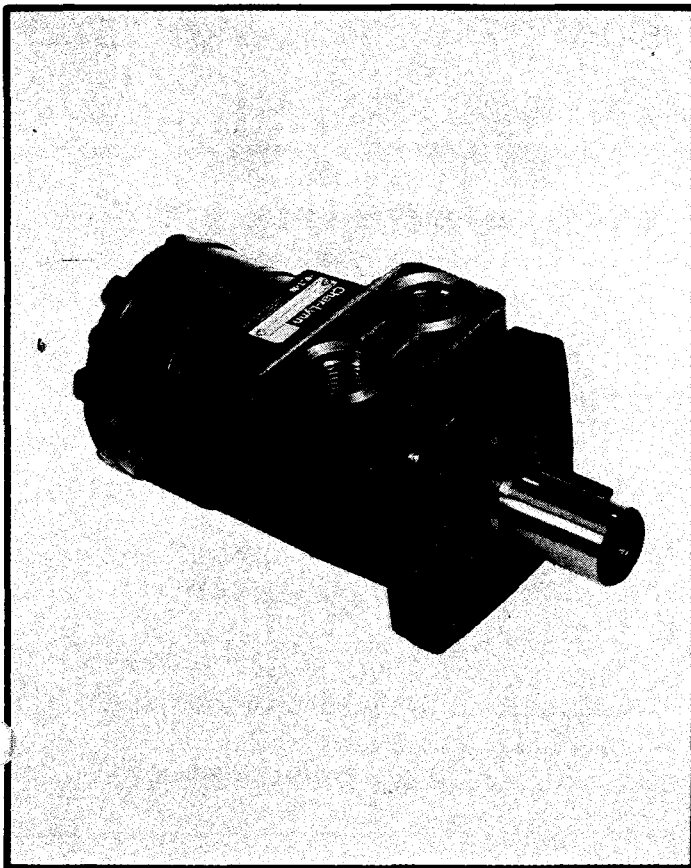
INSTRUCTIONS FOR REPLACING SEALS IN VALVES

INSTRUCTIONS FOR CENTER SECTION ASSEMBLIES

FILTER ELEMENT REPLACEMENT INSTRUCTIONS

INSTRUCTIONS FOR REPLACING BY-PASS SPRING IN FILTER

HYDRAULIC HINTS



Char-Lynn

"H" Series (101-0000-007)

Operator's Manual

Char-Lynn®
"H" Series
Hydraulic Motor
Operator's Manual
No. 8-114



Motor Record

RECORDING THIS INFORMATION
NOW MAY SAVE TROUBLE LATER.

MOTOR PRODUCT NO. _____

MOTOR DATE CODE NO. _____

DATE OF PURCHASE _____

DEALER'S NAME _____

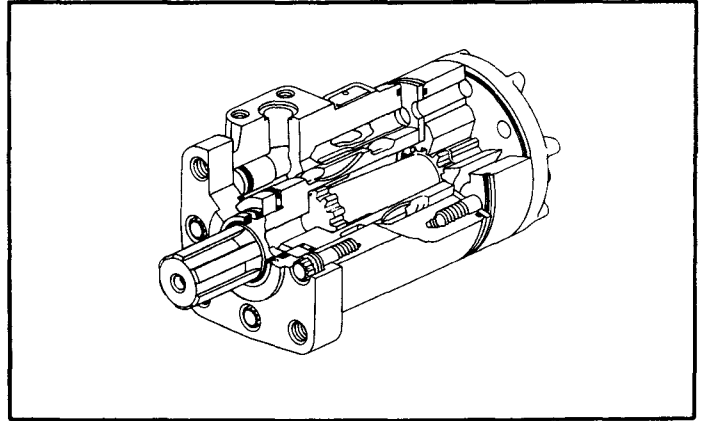
TABLE OF CONTENTS

MOTOR RECORD	1
INTRODUCTION	2
MOTOR IDENTIFICATION	3-4
SPECIFICATIONS	5
MOUNTING	6-10
POWER TRANSMISSION	11-12
HYDRAULIC SYSTEM	13
RESERVOIR & FILTER	14
MOTOR MAINTENANCE	15
FLUID	16-17

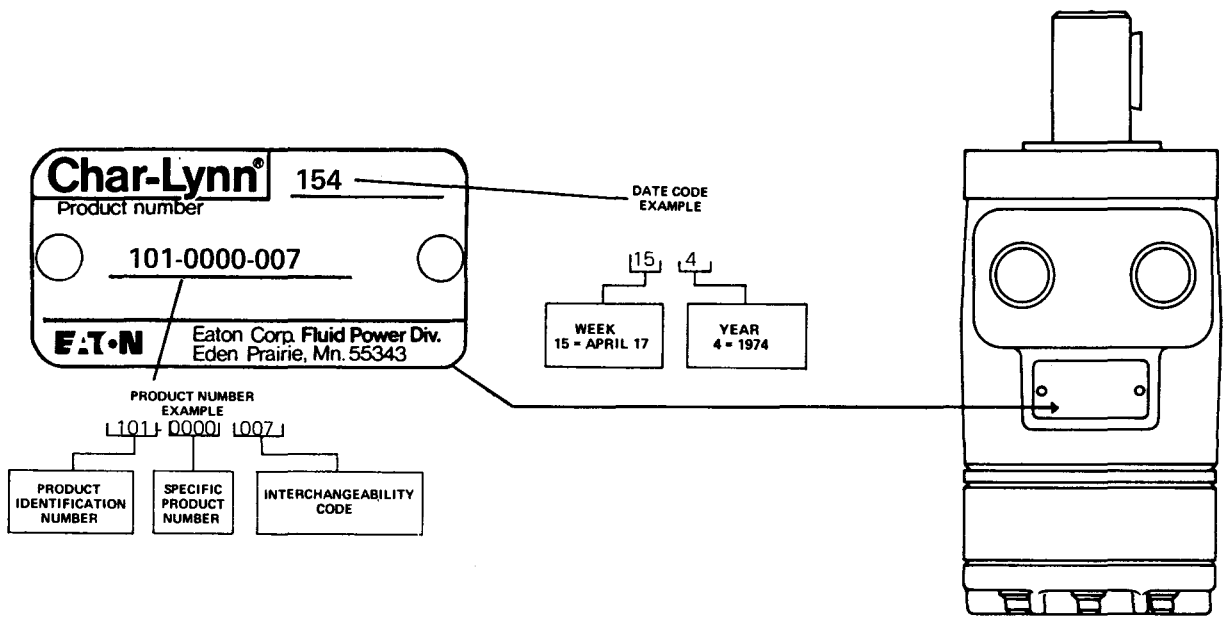
INTRODUCTION

The Char-Lynn® "H" Series Hydraulic Motor is manufactured under very closely controlled conditions and completely tested to insure the highest quality possible. This manual has been prepared to help install and maintain the motor in a manner that will allow you to obtain all the power and utility built into it. For more information concerning the servicing of the motor, a Service Manual is available which gives complete disassembly and reassembly instructions plus other pertinent information about the repair of the motor.

If you have any questions which are not answered in these manuals contact your local representative or Eaton Corp., Char-Lynn Plant.



The "H" Series Motor is a relatively simple mechanism utilizing a unique hydraulic principle to develop rotary hydraulic power. It has only three moving parts, the commutator valve, the drive and the gerotor star, yet it develops more **usable** power per ounce than many units do per pound. This is possible because its power output is at slow speeds which can be matched to the application without belts, chains, or gear reductions.



MOTOR IDENTIFICATION

"H" Series

Mtg. Prov.	Shaft	Hydraulic Connections		Displacement (Cu. In./Rev.)							
				3.0	4.5	6.2	10.3	11.9	14.9	17.9	23.8
4 Bolt Flange	Straight Keyed	1/2 NPTF	Product Number	101-1001-007	101-1002-007	101-1003-007	101-1004-007	101-1005-007	101-1006-007	101-1007-007	101-1008-007
		3/8 x 14	Product Number	101-1009-007	101-1010-007	101-1011-007	101-1012-007	101-1013-007	101-1014-007	101-1015-007	101-1016-007
		O-ring Port	Product Number	101-1017-007	101-1018-007	101-1019-007	101-1020-007	101-1021-007	101-1022-007	101-1023-007	101-1024-007
	Splined	1/2 NPTF	Product Number	★	★	101-1051-007	101-1052-007	★	101-1054-007	101-1055-007	101-1056-007
		3/8 x 14	Product Number	★	★	★	101-1060-007	★	★	★	101-1064-007
		O-ring Port	Product Number	★	★	★	★	★	★	★	101-1072-007
2 Bolt Flange	Straight Keyed	1/2 NPTF	Product Number	101-1025-007	101-1026-007	101-1027-007	101-1028-007	101-1029-007	101-1030-007	101-1031-007	101-1032-007
		3/8 x 14	Product Number	101-1033-007	101-1034-007	101-1035-007	101-1036-007	101-1037-007	101-1038-007	101-1039-007	101-1040-007
		O-ring Port	Product Number	101-1041-007	101-1042-007	101-1043-007	101-1044-007	101-1045-007	101-1046-007	101-1047-007	101-1048-007
	Splined	1/2 NPTF	Product Number	★	★	★	101-1076-007	101-1077-007	101-1078-007	101-1079-007	101-1080-007
		3/8 x 14	Product Number	★	101-1082-007	101-1083-007	★	★	101-1086-007	101-1087-007	101-1088-007
		O-ring Port	Product Number	★	★	★	★	★	★	★	★

End cap part number 7611 can be ordered separately for field replacement with a 7/16-20 case drain port.

* — Available on special orders only, consult factory.

Gerotor Width		1/4	3/8	1/2	7/8	1	1-1/4	1-1/2	2
Displacement (Cu. In./Rev.)		3.0	4.5	6.2	10.3	11.9	14.9	17.9	23.8
Speed (RPM)	Per GPM (theo.)	78	52	37	22	19	15	13	10
	@ Max Flow and @ Continuous PSI	885	748	537	320	276	219	182	137
Flow (GPM) Max.		12	15	15	15	15	15	15	15
Torque (lb. in.)	Per 100 Δ PSI (theo.)	47	71	98	163	189	236	283	377
	Cont. @ 15 GPM	473	682	867	1327	1371	1562	1696	1930
	Peak @ 15 GPM	735	1059	1350	2180	2145	2450	2650	3050
Pressure	Continuous Δ PSI	1500	1400	1300	1200	1100	1000	900	800
	Peak Δ PSI	2250	2100	1950	1800	1650	1500	1350	1200
	Back Press.	1000	1000	1000	1000	1000	1000	1000	1000

Continuous Rating – Motor may be run continuously at these ratings.

Peak Rating – Motor may be run maximum of 10% of duty cycle at these ratings.

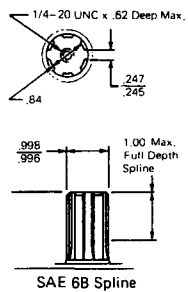
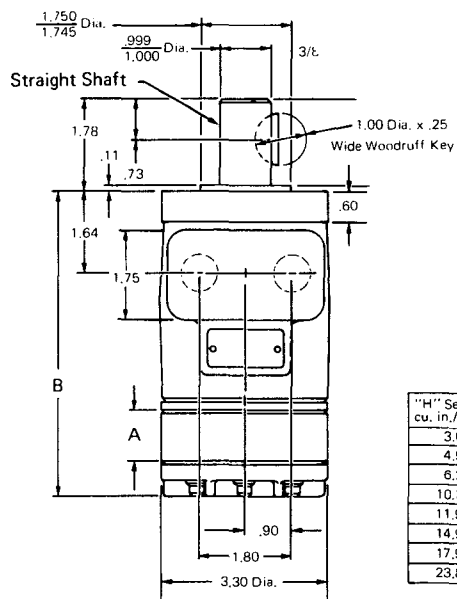
Recommended Viscosity Range – 100 – 200 SSU See page 3

Recommended Maximum System Operating Temperature – 180°F

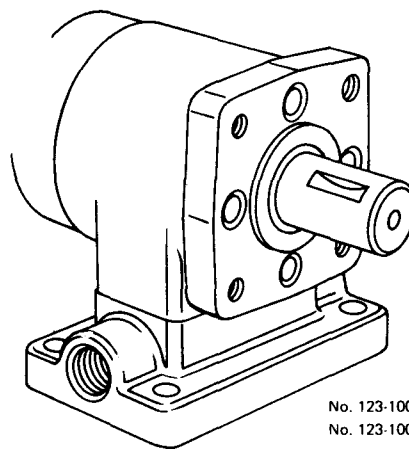
Recommended Filtration – 10 micron or finer

MOUNTING

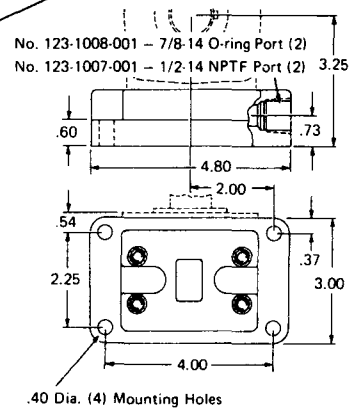
SPLINED SHAFT

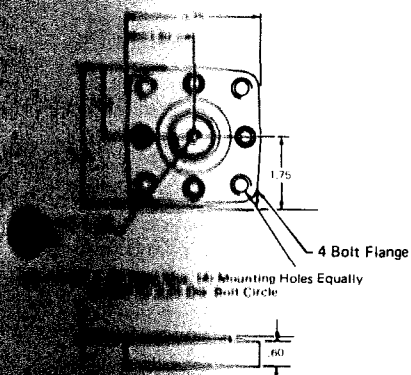
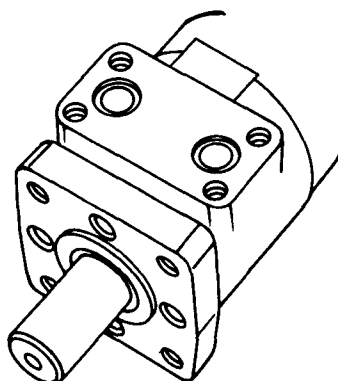


"H" Series cu. in./rev. Disp.	A	B
3.0	.250	5.16
4.5	.375	5.28
6.2	.520	5.43
10.3	.863	5.77
11.9	1.000	5.91
14.9	1.250	6.16
17.9	1.500	6.41
23.8	2.000	6.91



BASE BLOCK

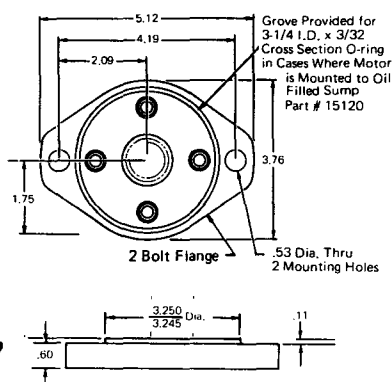
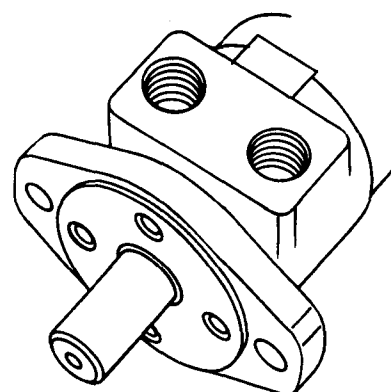




FOUR HOLE FLANGE

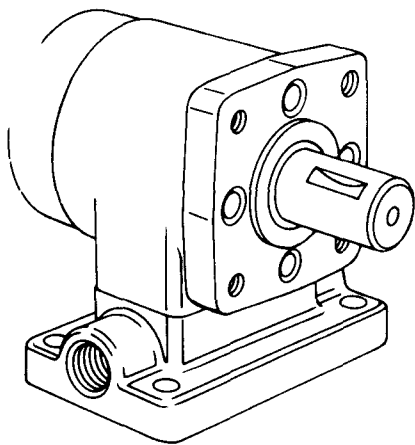
Mounting holes on this flange are tapped to accept a 3/8-16 UNC with 9/16 of an inch of threads in the flange.

(Caution—Do not bottom mounting bolts against housing. This will separate flange and housing and may cause leakage.)



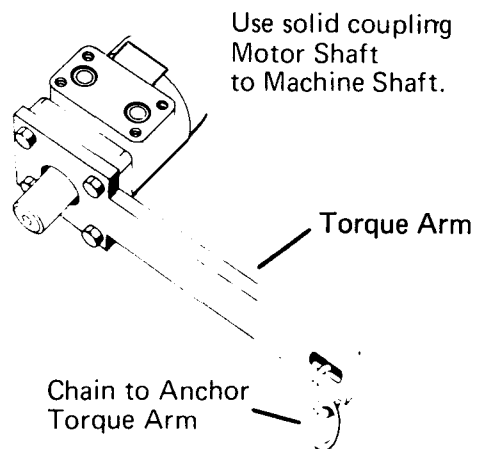
TWO HOLE FLANGE

The bolt holes on this flange are not tapped and will accept a 1/2 inch bolt. It can be mounted on either side of a structural member.



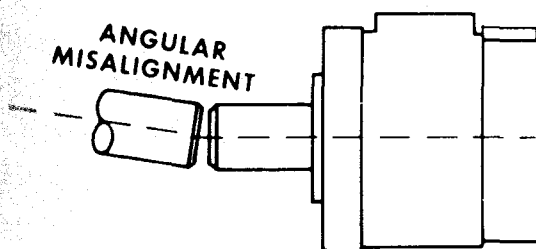
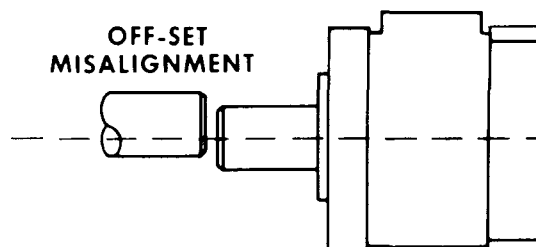
BASE BLOCK with Four Hole Flange

In some applications base block mounting may be more convenient than flange mounting. Motors with o-ring ports and mounting holes in the port face are required.



TORQUE ARM MOUNTING

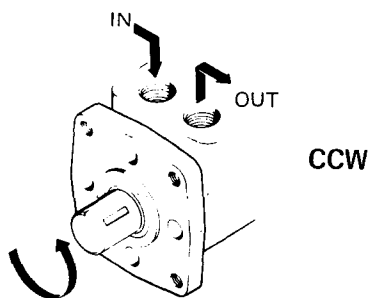
This is a simple, easily made mount and when properly designed and installed, it will compensate for shaft misalignment. The torque arm should be at least 8 inches long to prevent excessive side load, and the hole should be in line with the motor's bearing. Install on the machine as shown in the inset. This allows for both lateral and longitudinal play and still holds the motor steady with minimum side load.

**ANGULAR
MISALIGNMENT****OFF-SET
MISALIGNMENT****MISALIGNMENT**

Misalignment must be avoided as it causes excessive motor wear and unsatisfactory performance. A minor amount of angular and offset misalignment can be compensated for with a flexible coupling.

Standard Rotation Shown

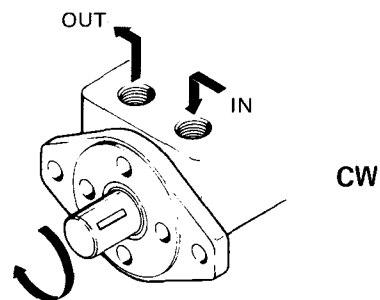
Figure A

**CONNECTING THE ORBIT[®] MOTOR**

The motor will operate in either direction equally well depending on which port is connected to pressure.

When connected as shown in Figure A above, the shaft will rotate in the direction indicated by the arrow. When the connections are reversed, as shown in Figure B, shaft rotation will be in the opposite direction.

Figure B

**CHANGING THE ROTATION OF THE MOTOR**

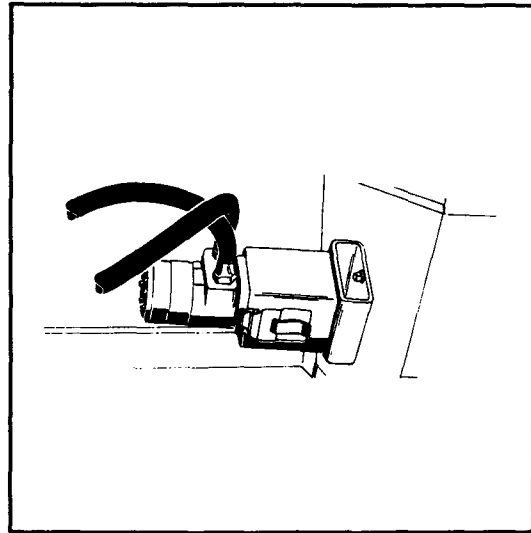
Char-Lynn[®] "H" Series Motors are set at the factory to rotate in a clockwise direction when pressurized as shown. The motor can be reversed simply by reversing the oil lines.

If for some reason this is impossible, the position of the gerotor star must be changed to effect a reversal. The procedure for this is outlined in Service Bulletin 1007.

UNIVERSAL MOUNTING KIT

The universal mounting kit has been developed by Char-Lynn as a means of positively eliminating misalignment. This kit consists of a motor mounting plate, a torque tube, a coupling device and a machine mounting plate. Complete instructions are included with the kit.

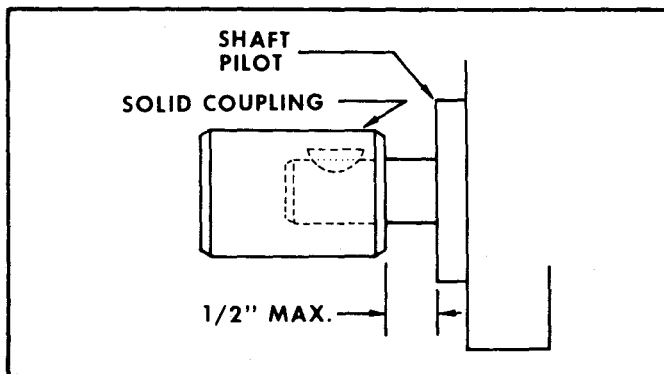
See Char-Lynn Agricultural Products Catalog (#11—819) for more information.



POWER TRANSMISSION

RIGID OR SOLID COUPLING

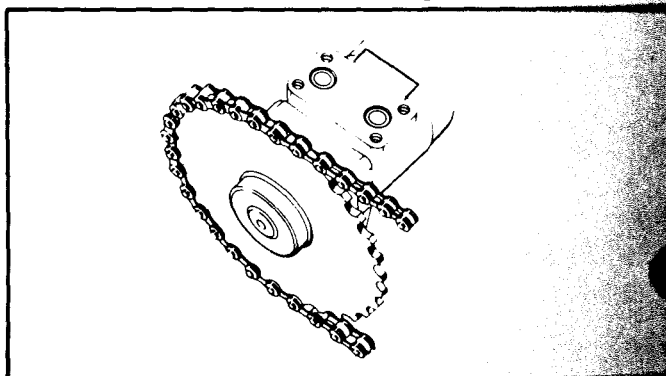
A direct drive, motor to shaft, is the simplest method of transmitting the power. This can be accomplished by using a solid coupling, but care must be taken to avoid misalignment. In using this method it is important to have the end of the coupling as close to the motor bearing as possible. Maximum spacing is 1/2 inch. If it is more than 1/2 inch, excessive bending stress occurs in the shaft keyway area.



SPROCKETS OR PULLEYS

Either one of these two driving elements can be attached directly to the motor shaft. They should be positioned as close to the shaft pilot as possible, leaving clearance for the chain or belt. The hub should always be on the out-board side.

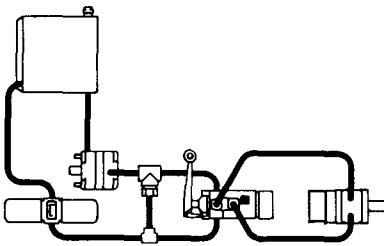
The maximum chain tension (motor torque - pound inches) divided by 1/2 socket or pulley pitch diameter (inches) should not exceed the maximum side load capacity of the motor. See chart in motor catalog.



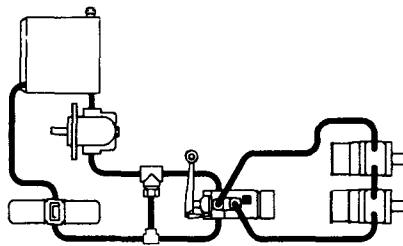
Single Motor

The simplest system for using one motor is shown below. The motor can be located in a remote spot simply by lengthening the hoses, while the valve can be located close to the motor, close to the rest of the system or anywhere between.

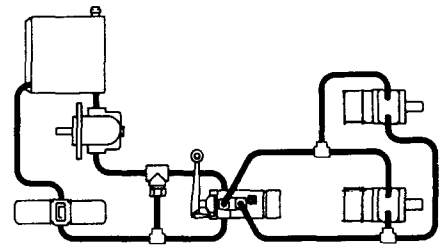
BE SURE TO INCLUDE A FILTER IN THE CIRCUITS. THE CHAR-LYNN FILTER WITH A 10 MICRON ELEMENT IS RECOMMENDED.

**Two Motors in a Series Circuit**

Two motors can be connected together in series and controlled by a single valve as shown below. In a series circuit, all of the system fluid passes through each motor. The motor with the highest pressure drop should be located first in the circuit, if possible. Its shaft seal is then subjected to the least amount of back pressure.

**Two Motors in a Parallel Circuit**

In a parallel circuit only a part of the total oil in the system passes through each motor. The amount is controlled by the flow divider valve. This valve can be either the fixed or variable type depending on the requirements of the application. In a parallel circuit the pump must be capable of delivering the total volume of oil needed by both motors.



RESERVOIR & FILTER

THE RESERVOIR

Reservoir size varies with the type of circuit and the application. A ratio of 1:1* is adequate to supply most systems and maintain the proper temperature. This temperature should be around 120° with 180° considered the absolute maximum!

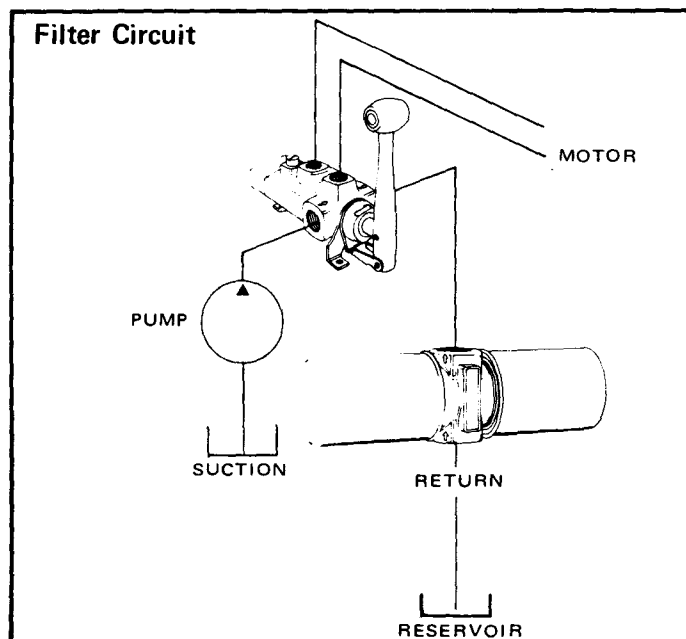
If oil temperatures go beyond this range, a larger reservoir or heat exchanger should be added to the circuit. Black iron pipes can be used to replace hoses in some instances. These help keep the temperatures down and also give a more economical installation. The pipe should be in accordance with recognized pressure maximums i.e. STD., XH or XXH.

*1 GALLON OF RESERVOIR CAPACITY FOR EACH GPM PUMPED.

THE FILTER

It is very important that adequate filtration is included in the design of the system because of the high volume of oil that is being circulated through the motor. A Char-Lynn Filter should be used.

This filter has a 10 micron rating and should be installed in the low pressure return line. It has a built-in visual indicator which tells the operator the condition of the filter elements.



MOTOR MAINTENANCE

A Char-Lynn® hydraulic motor is built to extremely high standards and should be treated as such.

It should be returned to your nearest service center or to the factory if in need of repair.

Trained personnel repair and test returned motors so that they meet the highest quality repair and test standards.

Upon request, before repairs are made, the owner will be notified of the cost and probable cause of the failure.

The only exception to the above is the replacement of the high-pressure shaft seal.

INSURE TROUBLE—FREE SERVICE

The Char-Lynn® hydraulic motor was designed and is manufactured to very strict tolerances and assembled under closely controlled conditions. If properly installed and with a minimum of attention it will give long trouble-free service.

**** Avoid nuisance fluid-leaks. Typical causes are: dirty, scratched, bowed or inadequately bolted joints; vibrating, unsupported lengths of flexible and rigid piping. The cure: careful assembly, proper seals, periodic inspection. Only compatible materials (resistant to fluid and temperatures involved) should be used.

**** Eliminate vacuum leaks in suction lines to pumps. Suction leaks lead to noisy pump operation, cavitation, and early pump failure.

**** Avoid shock—limit the rate of pressure buildup. Adjust relief valves, avoid chatter, sudden pressure surges, and higher-than-needed working pressures. Pressure and flow are energy—use them efficiently.

**** Be aware of temperatures. Use oils that will not be too heavy when cold or too light when hot. Either may affect operation and lubrication. (See page 17).

**** Include adequate filtration in the system (10 micron or finer).

FLUID

THE FLUID IN AN ORBIT MOTOR SYSTEM

The following are the recommended procedures for selecting the proper hydraulic fluid for use in Char-Lynn Motors. Select a major brand industrial PREMIUM QUALITY (anti-wear type) hydraulic oil to provide viscosity between 100–200 SSU at operating temperature. Premium hydraulic oils with viscosity indexes of 95 or above will provide the following temperature ranges:

INDUSTRY IDENTIFICATION VISCOSITY GRADE	OPERATING TEMPERATURE	VISCOSITY
150 SSU	122° F	100 SSU
	84° F	200 SSU
225 SSU	140° F	100 SSU
	107° F	200 SSU
300 SSU	150° F	100 SSU
	116° F	200 SSU
450 SSU	165° F	100 SSU
	130° F	200 SSU
600 SSU	182° F	100 SSU
	145° F	200 SSU

If, because of necessity or convenience it is desirable to use an automotive engine oil, multi-viscosity oils of SC rating (formerly MS Quality) which will provide viscosity between 100 and 200 SSU at operating temperature can be used. These will provide proper viscosity over a wide range. For example:

SAE VISCOSITY GRADE	OPERATING TEMPERATURE	VISCOSITY
10W-30	130° F	100 SSU
	100° F	200 SSU
10W-40	190° F	100 SSU
	140° F	200 SSU

The above recommendations cover the normal system operating temperatures. For system temperatures above or below those shown in the charts above, contact Char-Lynn.

If in doubt as to proper grade and types of oils to use, Char-Lynn distributors or representatives can supply pertinent information or contact EATON Corporation, Fluid Power Division, 15151 Highway 5, Eden Prairie, Minnesota, 55343, for a copy of the Technical Bulletin on Petroleum Base Hydraulic Fluids.

Synthetic fluids or other non-petroleum based fluids can be used. However, where such fluids are required because of fire hazard or other specifications, the motor performance may have to be de-rated, the operating temperature and pressure limited and seals may require changing because of incompatibility with the fluid. Consult Char-Lynn distributors, representatives or write direct for Technical Bulletin on Fire Resistant Fluids.

Do not use proprietary additives such as viscosity increasers or friction eliminators.

CHAR-LYNN FACTORY TRAINED SERVICE CENTERS

Activation Inc.
P.O. Box 58067
West Valley Ave.
Homewood, Alabama 35209
205/871-0353

Air Draulics Company
3135 North 29th Ave.
Phoenix, Arizona 85017
602/254-8414

Airoyal Company
43 Newark Way
Maplewood, New Jersey 07040
201/761-4150

Engineered Sales Assoc.
18 Progress Parkway
Maryland Heights, Missouri 63043
314/878-4500

Fornaciari Co.
5350 E. Washington Blvd.
Los Angeles, Calif. 90040
213/268-1271

Hydraulic Supply
680 Montgomery St.
Orlando, Florida 32808
305/295-4617

Hydraulic Supply
4301 NW 36th St.
Miami Springs, Florida 33166
305/888-2414

Industrial Air & Hydraulics Inc.
7400 Townsend Place
New Orleans, Louisiana 70126
504/241-7050

Livingston & Haven Inc.
P.O. Box 5564
3103 Cullman Avenue
Charlotte, North Carolina 28205
704/376-8475

Lucas-Keelavite Div.
280 Yorkland Blvd.
Willowdale, Ontario, Canada
416/491-5446

Lucas-Keelavite Div.
517 Airport Road So.
Vancouver, British Columbia
604/278-5104

M & I Supply
P.O. Box 10856
5326 Lynch St. Ext.
Jackson, Mississippi 39209
601/922-5005

MacMillin Hydraulics
7355 N. Lawndale Ave.
Skokie, Illinois 60078
312/676-2910

Price Engineering
285 North Janacek Rd.
Waukesha, Wisconsin 53186
414/784-1260

P. T. E. Corp.
3305 Kifer Road
Santa Clara, California 95051
408/735-8900

Roberts Engineered Products
26045 W. 7 Mile Rd.
Detroit, Michigan 48240
313/538-1933

Scott Equipment Co.
P. O. Box 1387
272 Leo Street
Dayton, Ohio 45401
513/223-8141

Scott Industrial Equipment
2655 Tobey Drive
Indianapolis, Indiana 46219
317/897-1222

Stewart-Hunt Inc.
8 Garfield Circle
Burlington, Massachusetts 01803
617/272-4411

Sweetland Co.
870 Doolittle Drive
P. O. Box 2449
San Leandro, Calif. 94577
415/635-0500

Wild Company
4675 Joliet Street
Denver, Colorado 80239
303/373-4840

NOTE: These Service Centers are listed for your convenience and close proximity. Motors may also be returned directly to the Char-Lynn factory. All motors for warranty handling consideration must be sent directly to: Char-Lynn Plant
ATTN: Warranty and Repair Dept.

EATON Corporation, Fluid Power Division
15151 Highway 5, Eden Prairie, Minn. 55343

EAT•N Fluid Power
Products

MARCH, 1975
FORM NO. 8-114

INSTRUCTIONS FOR REPLACING SPOOL SEALS IN 25P CONTROL VALVE

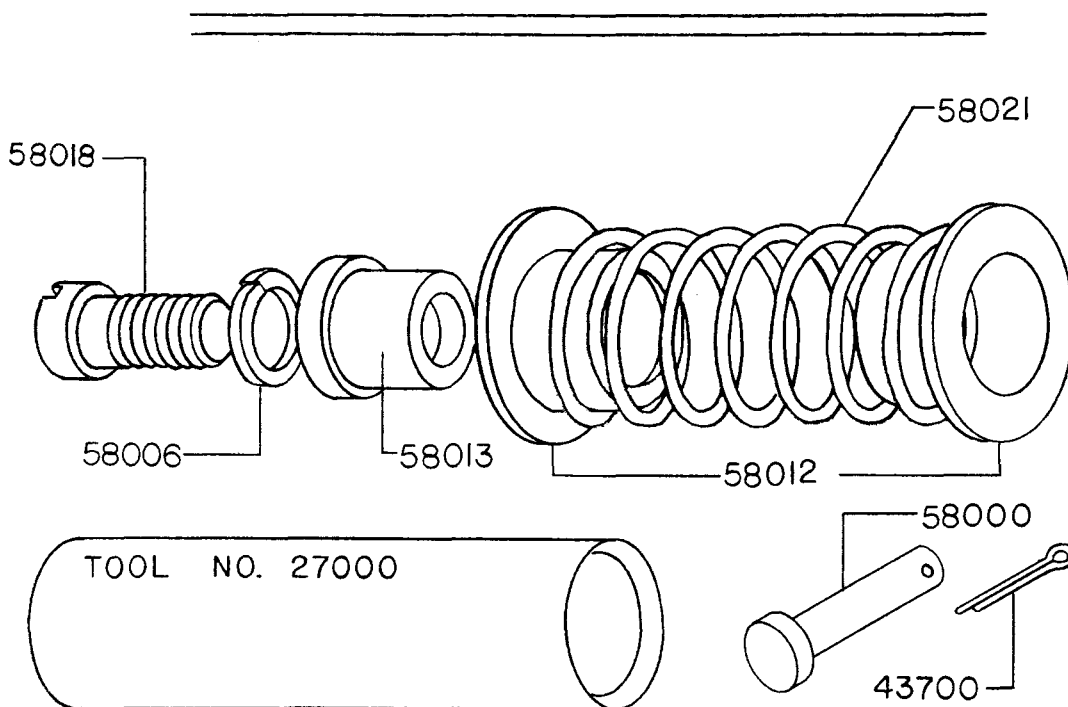
REQUIREMENT: One Special #27000 Tool.

NOTE: For the purpose of these instructions, we shall consider the control handle side of the valve as the front end, and the opposite end as the back end.

-
1. At the back of the valve, remove the #58014 die cast Bonnet Assy. This assembly is fastened to the valve housing by four (4) #58027 Bonnet Screws with four (4) #58002 Lockwashers.
 2. Remove #58018 Spool Assembly Screw, #58013 Spool Collar, #58006 Spool Assembly Lockwasher, #58012 Stop Collar, and #58021 Centering Spring. Be sure to observe the order in which these parts are removed to insure proper reinstallation.
 3. Disconnect handle from spool by removing #58000 Handle Pin. Let handle swing free of spool.
 4. Pull spool towards front end of valve just far enough to expose the back seal in housing.
 5. Remove back seal (#58017).
 6. Push spool in opposite direction (towards back end) until **front** seal is fully exposed.
 7. Remove front seal (#58017) from housing
 8. BE SURE THAT BODY SEAL GROOVES ARE THOROUGHLY AND CAREFULLY CLEANED.
 9. Insert new #58017 Seal in front groove, being very careful that the open end (end with wiping edges) of the seal is placed towards the center of the valve body. It will be very helpful to pinch one side of the seal, causing the seal to bend into a shape slightly smaller than the seal groove in the valve. When the seal has been properly placed in seal groove, straighten the seal by running a smooth rod around the exposed surface of the seal until you have it well seated. To check this, run your finger around the exposed edge of the seal. You should have a smooth perfect ridge with no kinks.
 10. Apply a small amount of grease or heavy oil on the #58017 Seal to prevent it from tearing during assembly.

(Continued)

11. Insert the internal-chamfered end of the #27000 Special Tool into the spool bore of the valve housing from the front side of the valve and through the new seal. Push spool forward until the spool and tool make contact. Push spool further forward against tool until rear seal groove is completely exposed, but no further.
12. Install new #58017 Seal in back groove and apply grease or heavy oil. Insert #27000 Special Tool (internal-chamfered end first) carefully into back bore through seal until it makes contact with spool. From front side, push spool back approximately 3/4".
13. Reinstall complete handle assembly, installing the #58000 Handle Pin and #43700 Cotter Pin.
14. Reinstall the complete spring assembly on back of spool. Be sure the #58018 Spool Assembly Screw is securely tightened. (20Ft. Lbs. Torque)
15. Reinstall #58014 Bonnet Assembly.



BARKO HYDRAULICS, INC.
 Office: Superior, Wisconsin Phone: (715) 392-5641
 Mailing address: P.O. Box 6227 Duluth, Minnesota 55806

INSTRUCTIONS FOR REPLACING, ADDING OR REMOVING CENTER SECTION ASSEMBLIES IN THE 25P STACK VALVE

NOTE: For the purpose of these instructions, we shall consider the section containing the main relief valve the left side of the valve.

1. If the valve is to be reassembled in the same order, it is suggested that before disassembling, each section be marked numerically so that they may be returned to the same sequence when reassembled.
2. If valve has been removed from equipment, it is adviseable to mount valve vertically in a vise to facilitate disassembly and assembly.
3. On the right end of the valve there may be a power beyond sleeve, conversion plug or closed center plug installed. These must be removed before the valve can be disassembled.
4. Remove the four assembly stud nuts or bolts from right end section.
5. Next, valve sections may be disassembled by sliding the sections along the assembly studs.
6. Thoroughly clean the o-ring counterbores and the ground surface of each section. Place new o-ring seals, two Part #65301 and one (1) Part #65303 in proper counterbores. For better sealing, it is suggested that all o-rings used in the counterbores be replaced with new parts.
7. Replace the sections on assembly studs with the o-ring counterbores facing right end of valve. Use care in replacing sections so the section o-rings are not dislodged from the counterbores.
8. When all sections are assembled on assembly studs, tighten the assembly stud nuts or bolts evenly to 20 ft. lbs. torque, NO MORE, NO LESS, otherwise spools may bind or stick.

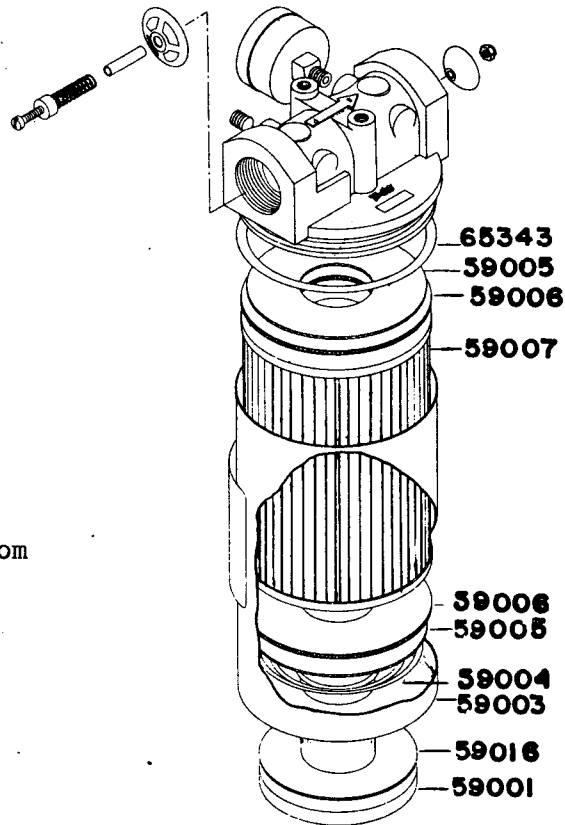


BARKO HYDRAULICS, INC.
Office Superior, Wisconsin Phone (715) 392-5641
Mailing address P.O. Box 6227 Duluth, Minnesota 55806

I N S T R U C T I O N S
F I L T E R E L E M E N T R E P L A C E M E N T

To remove the filter element, the following steps must be taken

1. Unscrew and drop #59001 Center Post (1" clearance for drop is all that is necessary to remove element container.)
2. Remove #59003 Filter Housing, #59005 Back-Up Washer, #59006 Gasket, #59007 Element, etc.
3. Clean all parts and filter housing. (CAUTION: Do NOT use solutions such as perchlorethylene or trichlorethylene to clean the Cork Gasket as these solutions will tend to cause swelling of the Gaskets which could result in malfunction of the filter when reassembled.)
4. Reassemble in the following order:
 - A. Put #59001 Post in Filter Housing. (Be sure Post has Gasket Seal, #59016, and that Gasket, Bottom of Filter Housing, and flange of Center Post are absolutely free of all oil and grease when tightening in order to prevent extrusion of Gasket.)
 - B. Insert #59004 Conical Spring, with small coil end down.
 - C. Insert #59005 - 4¼" Back-Up Washer (Bottom).
 - D. Insert #59006 Bottom Gasket.
 - E. Insert Filter Element.
 - F. Insert #59006 Top Gasket.
 - G. Insert Top #59005 Back-up Washer.
 - H. Position #59016 Filter Housing and tighten #59001 Center Post to MAXIMUM OF 20 FT. LBS. TORQUE.



CAUTION: When tightening Center Post, Hold Can From Turning, otherwise #65343 O-Ring may stretch out of shape and a leak may occur.

NOTE: Be sure Indicator reads "0" when system is not in operation

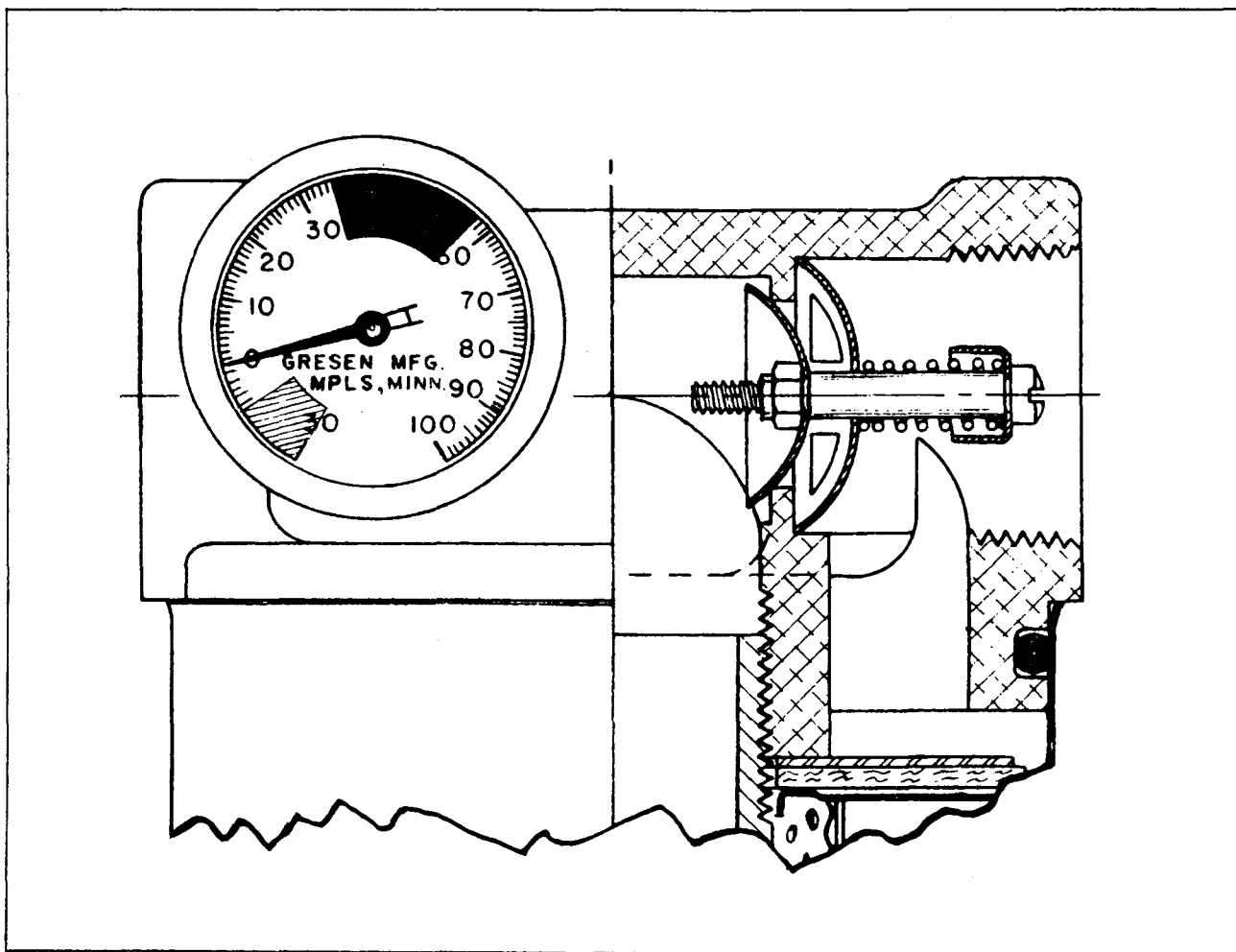
FILTER

INSTRUCTIONS TO REPLACE BY-PASS SPRING

TOOLS REQUIRED: One (1) Screwdriver
One (1) Socket Wrench - #11-11/32" Hex.

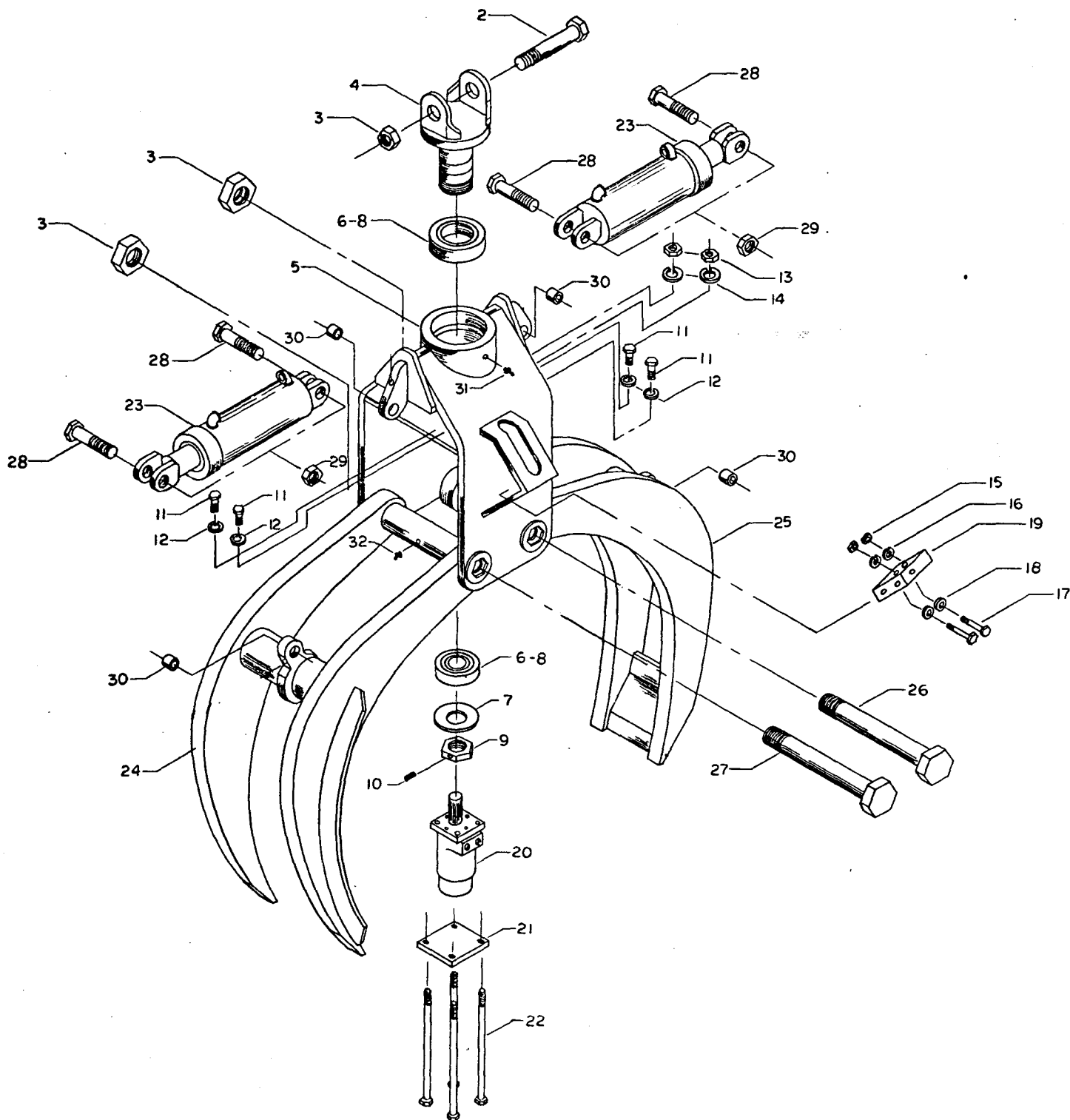
1. Disassemble Filter (See Filter Element Replacement Instructions)
2. For convenience, put #59022 Head Casting in Vise. (Upside-Down)
3. With screwdriver and socket wrench, remove By-Pass valve assembly. Observe carefully position of these parts.

Reinstall new spring.



BARKO HYDRAULICS, INC.

Office: Superior, Wisconsin Phone: (715) 392-5641
Mailing address: P.O. Box 6227 Duluth, Minnesota 55806



1/4 CORD BYPASS360° ROTATIONPARTS LIST

<u>ITEM</u>	<u>QTY</u>	<u>DESCRIPTION</u>	<u>PART NO</u>
-	1	ASSEMBLY, grapple 1/4 cord-----	154002
1 *	1	WELDMENT, hanger-----	
2	1	BOLT, body fit 1-1/2 X 7-5/8 long-----	482347
3	3	NUT, nylock 1-1/2 unf-----	13413
4	1	WELDMENT, yoke-----	151141
5	1	WELDMENT, head-----	152106
6	2	BEARING, tapered roller-----	41034
7	1	WASHER, flat-----	14096
8	2	SEAL, dust-----	44520
9	1	NUT, yoke 2" unf-----	481711
10	1	SCREW, cap head 3/8 - unc X 3/4 long-----	12002
11	4	BOLT, hex 3/8 - unc X 1 long-----	10654
12	4	WASHER, lock 3/8"-----	14011
13	4	NUT, hex 1/2 unc-----	13010
14	4	WASHER, lock 1/2-----	14013
15	2	NUT, hex 5/16" unc-----	13207
16	2	WASHER, lock 5/16"-----	14010
17	2	BOLT, hex 5/16 - unc X 2-1/2 long-----	10637
18	2	WASHER, flat 5/16"-----	14081
19	1	CUSHION, block-----	63010
20	1	MOTOR, hydraulic-----	60035
21	1	PLATE, back up 1/2" X 4" X 4"-----	151502
22	4	BOLT, hex 1/2 - unc X 8 long-----	10721
23	2	ASSEMBLY, cylinder 3-1/2 X 10-----	812002
24	1	WELDMENT, outer arm-----	153134
25	1	WELDMENT, inner arm-----	153133
26	1	BOLT, body fit 1-1/2 X 19-1/2 long-----	482250
27	1	BOLT, boyd fit 1-1/2" X 21" long-----	482314
28	4	BOLT, hex 1 X unc - 3-1/2 long-----	14426
29	4	NUT, nylock 1" unc -----	13409
30	4	BUSHING-----	42205
31	1	FITTING, grease straight 1/8"-----	17300
32	2	FITTING, grease 90° 1/8"-----	17304

* NOT SHOWN

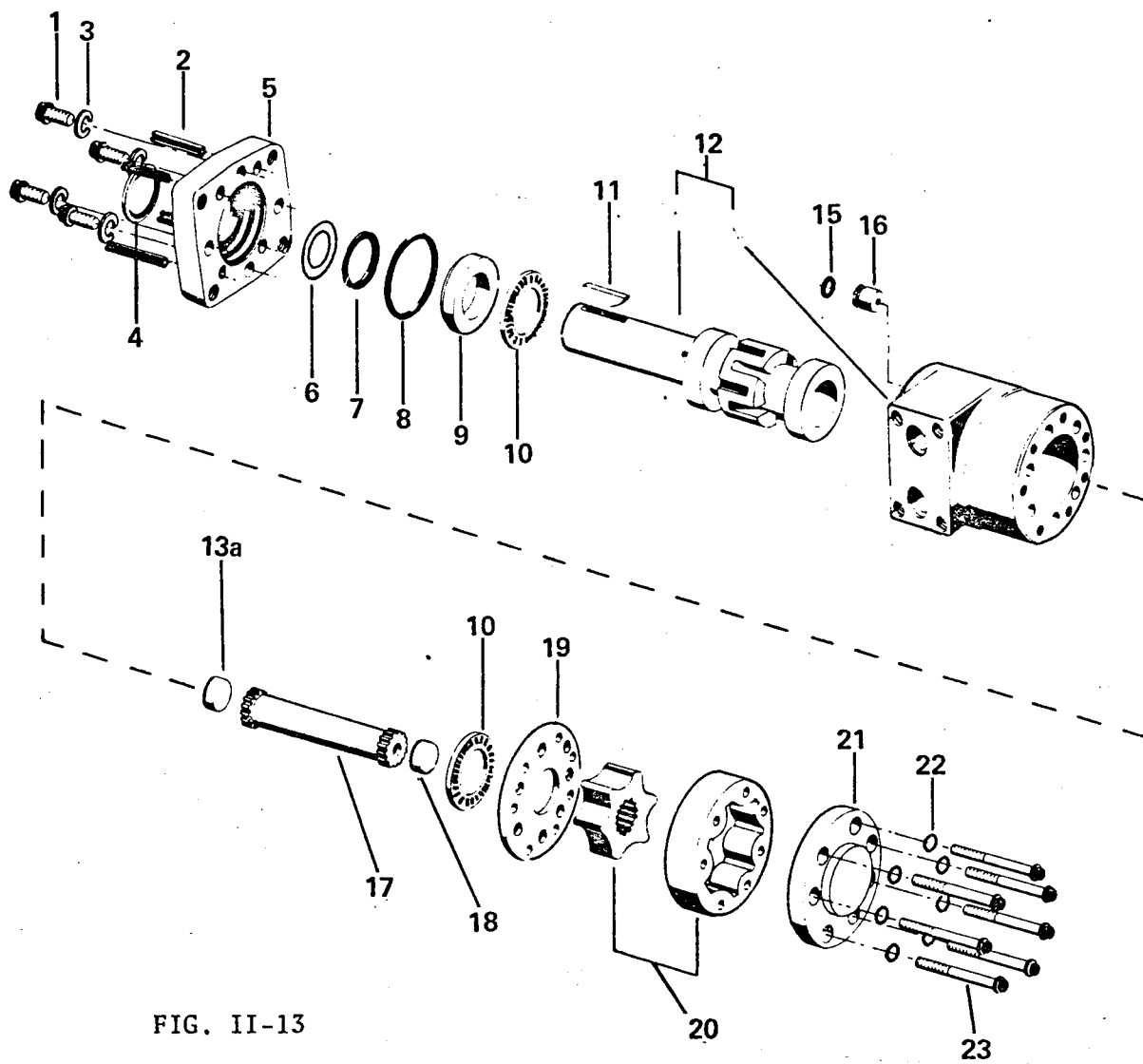


FIG. II-13

Effective: 1/1/75

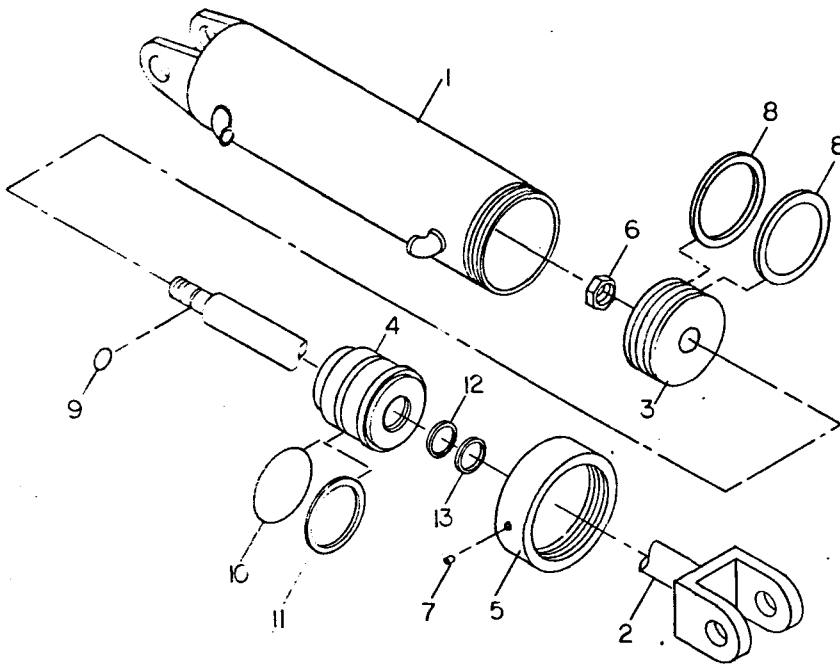
CHAR-LYNN
GRAPPLE ROTATE MOTOR
PARTS LIST

ITEM NO	QTY	DESCRIPTION	PART NUMBER
-	1	Complete Motor Assembly.....	60000
1	4	SCREW, cap.....	59601
2	4	PIN, roll.....	59602
3	4	WASHER.....	14036
(1) 4	1	SEAL.....	(59604)
5	1	PLATE, mounting.....	59605
(1) 6	1	WASHER, back-up.....	(-)
(1) 7	1	SEAL, quad.....	(59606)
(1) 8	1	SEAL, O-ring.....	(65375)
9	1	BEARING, race.....	59608
10	2	BEARING, thrust.....	59609
11	-	KEY, Woodruff (not used).....	-
12	1	HOUSING & SHAFT ASSEMBLY.....	59611
		(Includes Spacer 13A).....	-
(1) 15	1	SEAL, o-ring.....	(65385)
16	1	PLUG, housing.....	59614
17	1	DRIVE.....	59616
18	1	SPACER.....	59617
19	1	PLATE, spacer.....	59618
20	1	GEROTOR SET.....	59619
21	1	CAP, end.....	59620
(1) 22	7	WASHER, seal.....	(-)
23	7	SCREW, seal.....	59621

NOTE: PART NUMBERS IN BRACKETS () ARE SUPERCEDED NUMBERS
AND ARE SERVICED ONLY IN APPROPRIATE KITS.

(1) Seal Kit..... 65511

Effective: 1/1/75
Supercedes Page Dated: 3/15/74



GRAPPLE CYLINDER
(3 1/2 X 10 WITH 2" ROD)

<u>ITEM NO.</u>		<u>QTY.</u>	<u>DESCRIPTION</u>	<u>PART NO.</u>
	0	1	ASSEMBLY, complete-----	812002
	1	1	WELDMENT, butt and tube-----	832002
	2	1	WELDMENT, rod-----	842001
	3	1	PISTON-----	852000
	4	1	GLAND-----	852300
	5	1	CAP, gland-----	852812
	6	1	NUT, hex-----	13413
	7	1	SCREW, set-----	12616
(1) (3)	8	2	SEAL, piston-----	
(1) (3)	9	1	O-RING-----	
(2) (3)	10	1	O-RING-----	
(2) (3)	11	1	WASHER, back-up-----	
(2) (3)	12	1	SEAL, rod-----	
(2) (3)	13	1	SEAL, wiper-----	
<u>SEAL KITS AVAILABLE</u>				
	(1)		PISTON SEAL KIT-----	65482
	(2)		GLAND SEAL KIT-----	65483
	(3)		COMPLETE SEAL KIT-----	65533