Pippin

EXCAVATOR

model EX102 EX139

PIPPIN CONSTRUCTION EQUIPMENT WHITE RIVER JUNCTION, VT

Builders of the PIPPIN EXCAVATOR

CONE AUTOMATIC MACHINE COMPANY, INC.

Since the very early days of American history, the small pioneer town of Windsor, Vermont had been the home of invention and manufacture. An amazing diversity of early products and industries had sprung from the region. From father to son, from master to apprentice had been handed down the heritage of ingenuity, the skill of craftsmanship and the technique of manufacture.

It was in these surroundings, that the National Hydraulic Company was founded in 1829 to produce a patented hydraulic pump. This pump — the first known instance of the manufacture of interchangeable parts in the production of machinery — was basically the same in principle as the hydraulic pump used in the PIPPIN excavator today.

Of the long line of machine industries to originate in Windsor, Cone Automatic Machine Company alone remains. Internationally known as the world's largest line of multiple spindle bar automatics, the "Conomatics" are noted for their rugged construction, accurate performance and unequalled records in low cost production.

The same care in engineering, the same attention to quality of materials and workmanship that have made Conomatics famous, are applied to the manufacture of the PIPPIN Excavator. It is this background that makes the PIPPIN the leader in its field — the best in design, the best in quality, the best in operation.

OPERATION OF CONTROLS

Levers 1, 2, and 3 control motions of bucket, dipper stick and boom respectively. When controls are pulled back, the machine action is toward the operator. When controls are pushed forward, the machine action is also forward.

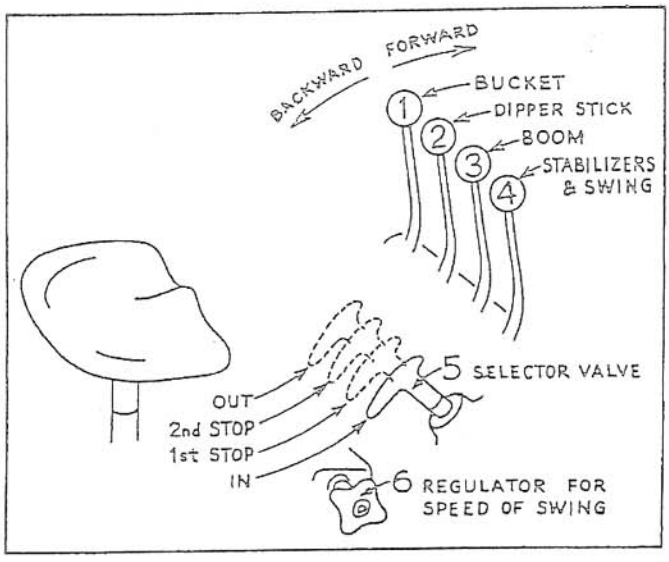
Lever 4 controls either the stabilizers or swing cylinders, depending on the position of selector lever 5.

With 5 way in, a forward movement of 4 swings boom left and a backward movement of 4 swings boom right.*

With 5 pulled out to the first stop, a forward movement of 4 extends L.H. stabilizer only, and a backward movement of 4 retracts it.

With 5 at the second stop, both stabilizers are extended or retracted by 4.

With 5 pulled way out, the R.H. stabilizer only is controlled by 4.



Combination valve 6 regulates the speed of swing — handle screwed in gives fastest swing; turned out gives slower, smoother operation. As the oil warms up, it may be necessary to adjust valve 6 to slow the swing.

*Right and left, and R.H. and L.H. refer to the right and left hand of the operator, seated in the operator's position.

BASIC DIGGING INSTRUCTIONS

Extend stabilizers enough to relieve weight on rear wheels of tractor. On uneven ground or on a slope, level tractor with stabilizers. In difficult digging, it will be advantageous to set tractor wheel brakes.

Push selector valve (5, above) way in to lock stabilizers.

With tractor engine operating at 1000 RPM, gently test the action of each control lever. As the operator becomes familiar with the operation of controls, engine RPM may be increased to 1500 RPM.

Smooth, light handling of controls will result in the most efficient machine operation.

With experience it will be possible to operate two or three controls simultaneously.

Lower boom and extend dipper stick to digging spot.

Actuate bucket so it is edged to a cutting angle. To fill bucket, pull dipper stick control lever back and relieve binding by intermittently pulling boom control lever until bucket is full.

Actuate bucket to bring into position for lifting out of hole and to prevent earth spillage.

Raise boom and extend dipper stick.

Swing machine to desired side and actuate bucket to release load.

TO AVOID SHOCK, ALWAYS CHECK SWING BEFORE HITTING STOP.

On extreme swing, care should be taken not to over-balance tractor, especially when using shovel bucket.

Moving tractor by using bucket is not recommended.

To transport, raise boom to vertical position and bring dipper stick in to boom.

Upon completion of the day's digging, INSPECT, TIGHTEN AND GREASE THOROUGHLY.

PREVENTATIVE MAINTENANCE

DAILY CHECK

Check and tighten all bolts.

Check pins for loss of hairpins, cotter pins or locks.

Check cylinders for oil leaks. If necessary, tighten packing nuts with spanner wrench provided. After tightening, relieve packing nut one quarter turn. A thin film of oil is always present on rods when extended. This is removed by wiper and should not be confused with a leak or undue wear on packings.

Check oil level and add proper oil if necessary. (See "Recommended Hydraulic Oils").

Grease thoroughly. If any oil fittings fail, determine cause and correct immediately.

Check cylinder rods for scratches or scoring. (See "Hydraulic Cylinder Service").

TROUBLE SHOOTING

FAILURE IN CONTROL VALVE, except leakage around plungers, must be corrected at the factory because the close tolerances require factory methods. Exchange service for this valve is available.

FAILURE OF PUMP, also requires factory rebuilding. Exchange service available.

CYLINDER TROUBLES, refer to "Hydraulic Cylinder Service."

FAILURE OF EXCAVATOR TO OPERATE AT ALL:
Check to see if tractor power take-off is engaged.
Check to see if over-under transmission is in step-up position, not in neutral position.
Check pump coupling.
Check pump inlet line for partial obstruction.
Check oil level.

If all above suggestions fail to correct trouble, a defective pump is indicated.

PUMP TROUBLE is very rare and extremely close check should be made of all other possible trouble sources. Put pressure gage on tee in valve block where ½" hose comes from pump. Run tractor for five minutes to bring oil to proper temperature. Push or pull any one of control levers to its extended position with engine turning at approximately 1800 RPM. With tractor in step-up position, gage should read 1000 PSI.

When levers are all in neutral position, with no obstructions in hoses, pressure gage should read zero.

IF UNIT LACKS POWER or slows down with operation, it is an indication that oil in tank is low or that improper type of oil is being used. (See "Recommended Hydraulic Oils").

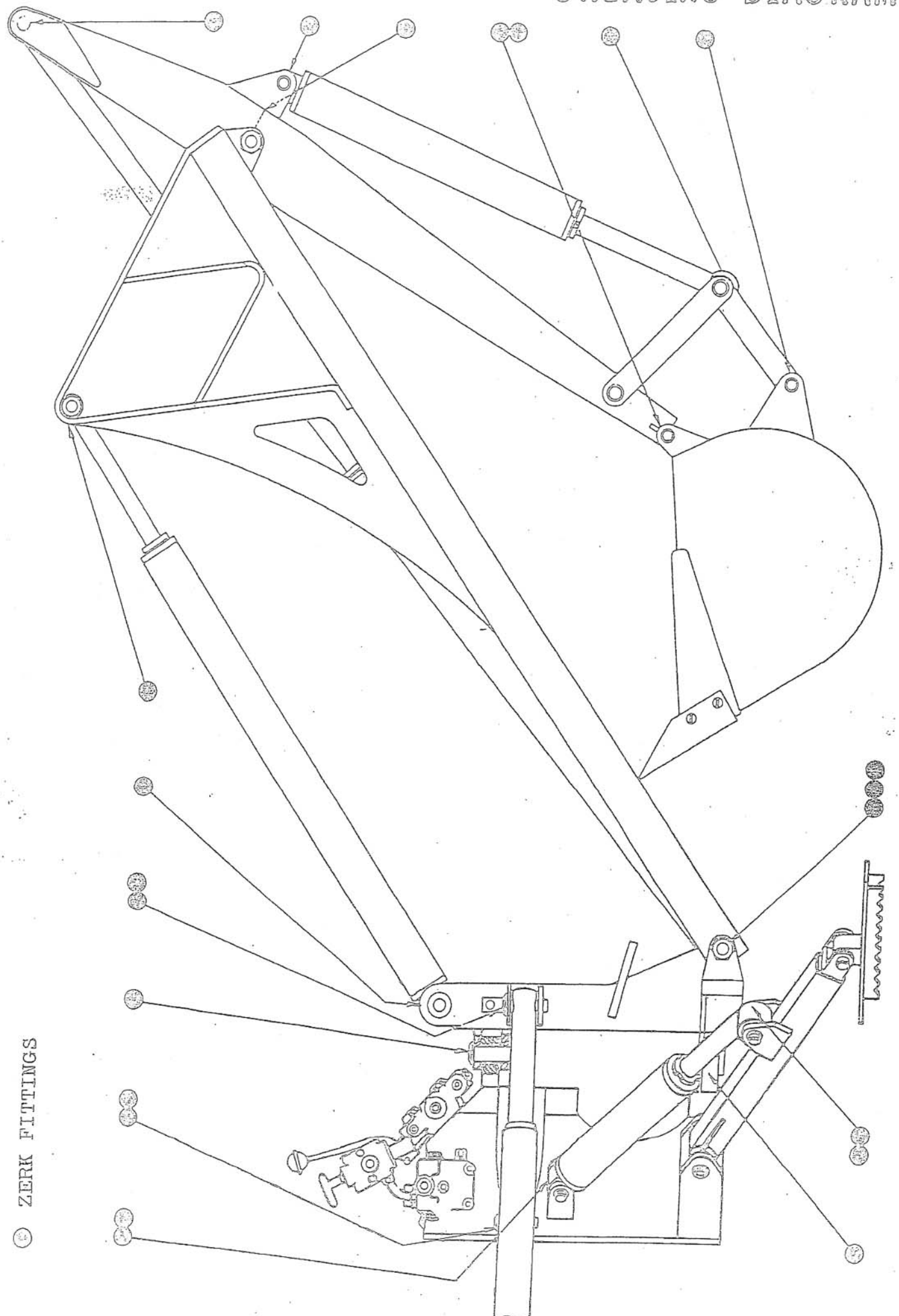
IF SIDE SWING IS SLOW OR FAILS TO SWING ENTIRELY, combination valve may need regulating.

SIMULTANEOUS ACTION OF STABILIZER AND SWING CYLINDERS indicates defective selector valve (P5801). Replace.

REPLACING CONTROL VALVE (P5092), or fittings in valve, care must be taken not to over-tighten bolts holding valve to tank, or to screw plumbing fittings too tightly, as this will distort the valve block and cause valve plungers to stick.

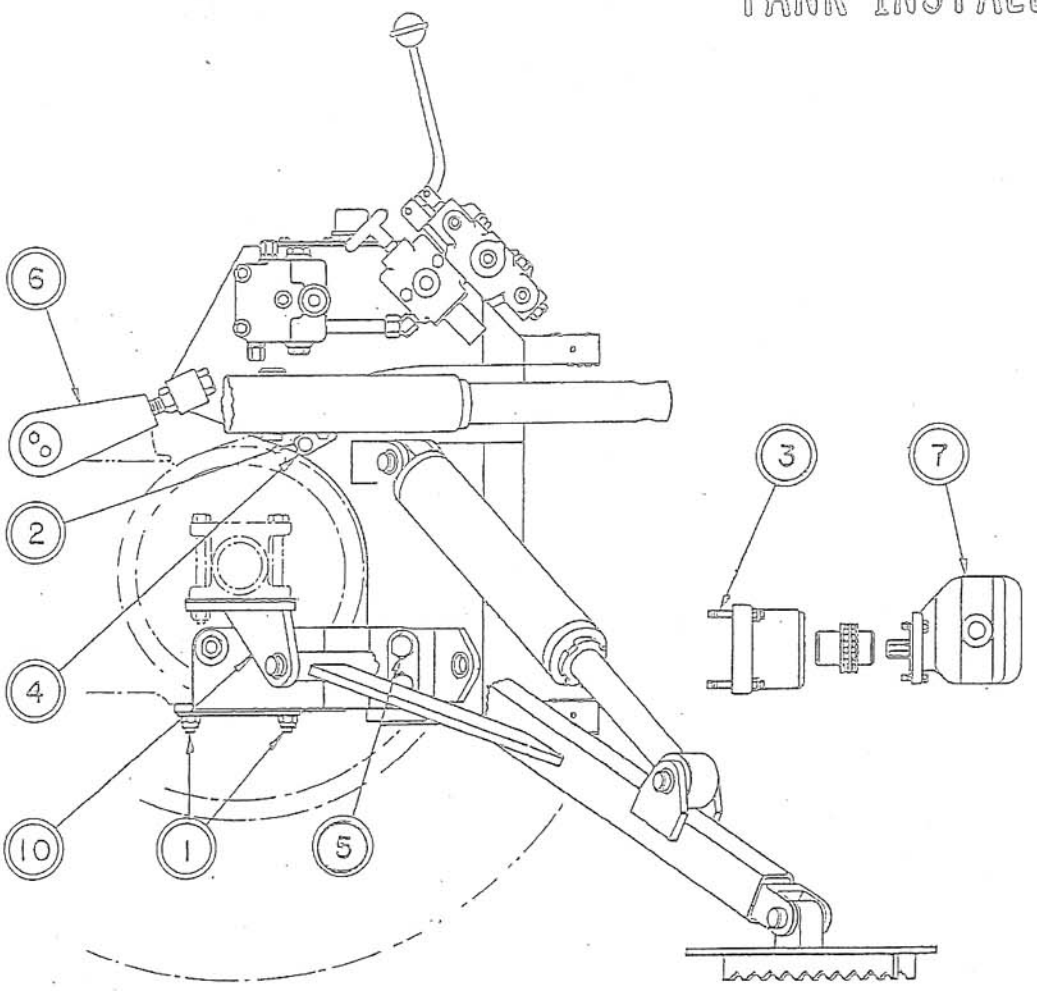
RELIEF VALVE on control valve is sealed at factory and if tampered with prior to expiration of 90 day warranty period, warranty on entire machine will be voided.

GREASING DIAGRAM



● ZERK FITTINGS

TANK INSTALLATION



1. Insert the four (4) 5/8" studs in draw bar screw holes on the bottom of the tractor. Attach the right and left hand tank to tractor brackets to these studs using the four (4) 5/8" locknuts provided.

2. Place the bushings provided in the ears of the tractor rear axle housing.

3. Insert the four (4) 7/16" studs in screw holes around P. T. O. shaft and tighten.

4. Secure chain to two eyebolts at top of tank and raise so that pin bracket can be passed through the holes in the sides of the tank and the bushed ears of the tractor. Fasten the pin bracket loosely to tank with a 3/8" bolt.

5. Fasten the tank to the tank-to-tractor brackets with four (4) 7/8" x 2 1/2" bolts and locknuts. Place bolts so that the locknuts are on the outside.

6. Place right and left anchor blocks over ends of rock shaft of tractor. Insert the two (2) 7/8" x 4 1/4" bolts through the ears of either side of the tractor, thread a 7/8" nut on each and then thread bolts into anchor blocks.

7. Slip chain coupling over splined shaft of pump and slide pump and bracket assembly over the four studs at the P. T. O. housing. Jog starter, if necessary, to engage the pump coupling. Fasten pump bracket to studs with four (4) 7/16" nuts.

8. Tighten all nuts and bolts.

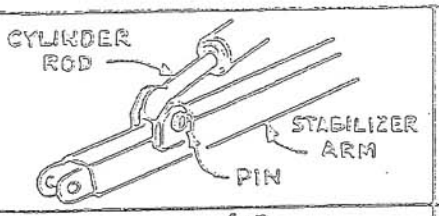
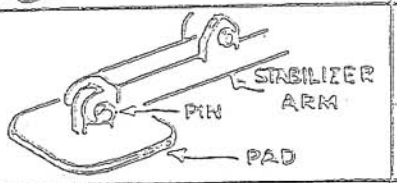
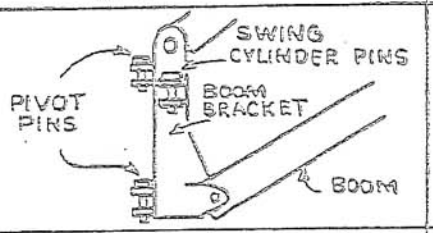
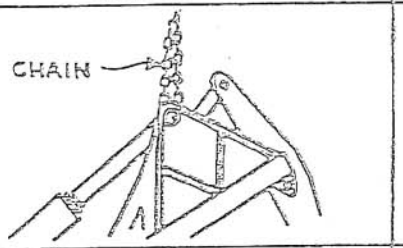
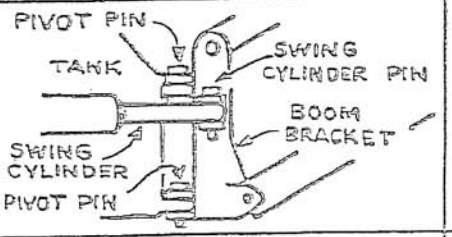
9. Remove seat spring and attach lower seat post to tractor. Fasten upper seat post to seat, and assemble.

10. Insert pivot at one end of stabilizer arm into the ear of the tank, and the other pivot end into the stabilizer bracket. Fasten the stabilizer bracket to the rear axle pad with the fender bolts. On the Series 8N insert the 1/8" shim provided between the rear axle pad and the stabilizer bracket. On the Series 600 and 800, place the fender base extension of the top axle pad and fasten with four (4) 5/8" x 7 1/2" bolts instead of the fender bolts, then position the stabilizer bracket and replace the fenders using the four (4) 5/8" x 1 1/4" bolts, lockwashers, and nuts.

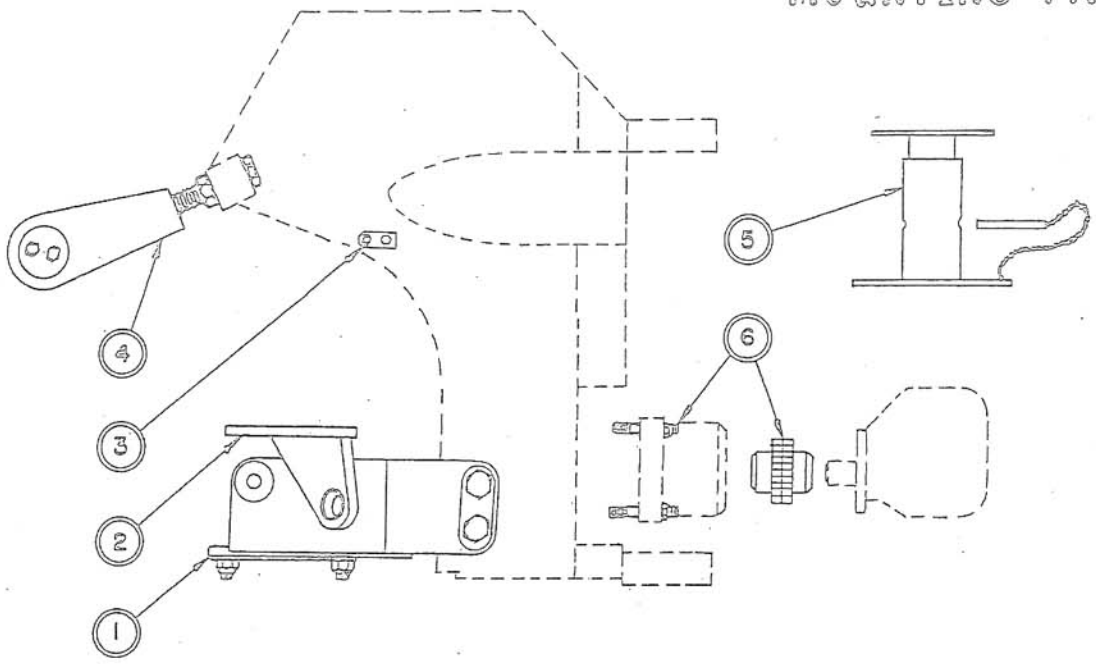
INSTALLATION CHANGE SUBSTITUTE FOR FIGURE ONE (1) PAGE OPPOSITE

1. Attach the right and left hand tank to tractor brackets to the two lower linkage studs on the tractor. (When support frame or dozer frame is used have left and right frame in position before inserting four (4) 5/8" studs so studs pass through support frame or dozer frame brackets.) First insert the four (4) 5/8" studs through the tank to tractor brackets and "bottom" in the tractor differential housing. Lock brackets in place with the four (4) 5/8" locknuts. Use double nuts on studs to thread them into tractor housing.

GENERAL INSTALLATION

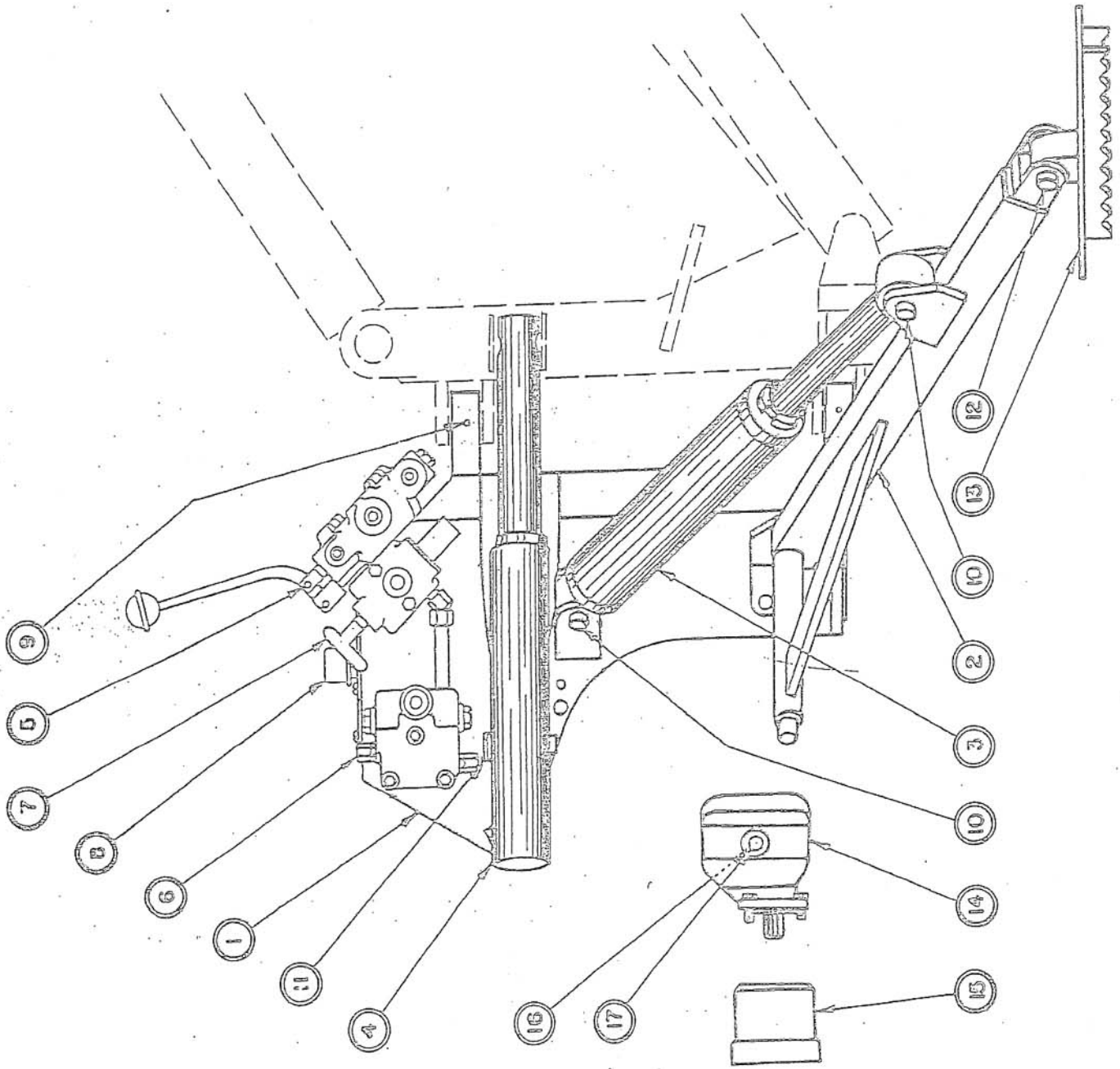
	Attach stabilizer cylinder rods to stabilizer arms with pins in ears on top of arms.
	Attach stabilizer pads to arms with pins.
	Remove Top and Bottom Pivot pins, and R.H. and L.H. swing cylinder pins from Boom Bracket.
	Secure chain to top of Boom Ram and with hoist raise boom assembly.
	Maneuver boom bracket into place and attach to ears on tank by replacing pivot pins. Attach swing cylinders to boom bracket with swing cylinder pins. Cotter all pins.
CONNECT HOSES The letters at end of sentences refer to hose terminals as shown in "Hose & Fitting" section.	Make 6 hose connections as follows: A. &B. Connect hose ends marked #1 & #2 with similarly marked fittings in junction box on L.H. side of boom cylinder.(F & E) C. Hose from upper port of boom control valve (third from Left) should be brought around the left side of boom cylinder and connected at lower end of cylinder.(N) D. Hose from lower port of boom control valve should be brought to right and connected to the lower end of pipe which connects with upper end of boom cylinder.(M) E. Hose from upper port of dipper stick control valve (second from left) connects to junction box on R.H. side of boom bracket.(L) F. Hose from lower port of dipper stick control valve connects to junction box on L.H. side of boom bracket.(K)
	INSPECT, TIGHTEN AND GREASE THOROUGHLY
FILL WITH HYDRAULIC OIL	FILL WITH HYDRAULIC OIL Fill tank with recommended oil (see "Recommended Oils") to full mark on dip stick. Operate machine for several minutes to completely fill system. Recheck oil level, and refill if necessary. Check carefully all connections for leaks.

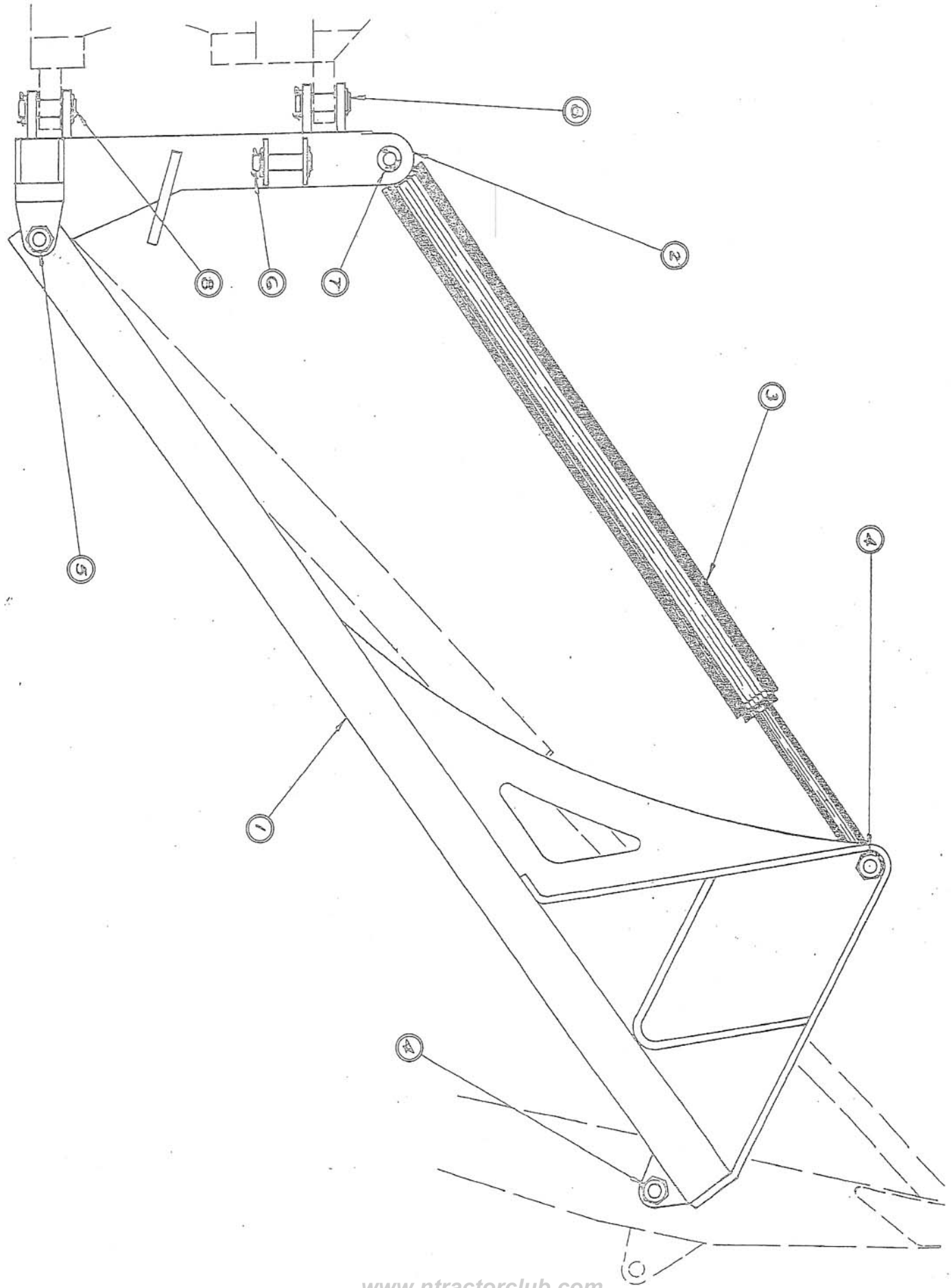
MOUNTING PARTS



NO.	TRACTOR SERIES / PART	8N REQ.	8N STOCK NO.	NAA REQ.	NAA STOCK NO.	600 REQ.	600 STOCK NO.	800 REQ.	800 STOCK NO.
1	TANK TO TRACTOR BRACKET, R.H.	1	WF1381	1	WF1379	1	WF13202	1	WF13213
	TANK TO TRACTOR BRACKET, L.H.	1	WF1380	1	WF1378	1	WF13201	1	WF13214
	BOLT 7/8" - 14 x 2 1/2"	4	WS1171	4	WS1171	4	WS1171	4	WS1171
	LOCKNUT	4	1316	4	1316	4	1316	4	1316
	STUD 5/8" - 18	4	W5527	4	W5527	4	W5527	4	W5527
	LOCKNUT	4	1326	4	1326	4	1326	4	1326
2	STABILIZER BRACKET, R.H.	1	WF1329	1	WF1329	1	WF13204	1	WF13204
	STABILIZER BRACKET, L.H.	1	WF1328	1	WF1328	1	WF13205	1	WF13205
	BUSHING	2	WF1345	2	WF1345	2	WF1345	2	WF1345
	SPACING SHIM	2	WF1377	—	—	—	—	—	—
	FENDER BASE EXTENSION	—	—	—	—	2	WF13210	2	WF13210
	BOLT 5/8" - 11 x 1 1/4"	—	—	—	—	4	202	4	202
	BOLT 5/8" - 11 x 7 1/2"	—	—	—	—	4	215	4	215
	LOCKWASHER	—	—	—	—	4	2353	4	2353
	NUT 5/8" - 11	—	—	—	—	4	1268	4	1268
3	PIN BRACKET	2	WF1340	2	WF1340	1	WF13209	1	WF13209
	BOLT 3/8" - 16 x 1"	2	308	2	308	1	308	1	308
	LOCKWASHER	2	2328	2	2328	1	2328	1	2328
	TRACTOR BUSHING 3/4" LONG	2	WF1347	2	WF1347	—	—	—	—
	TRACTOR BUSHING 1 3/4" LONG	1	WF1348	1	WF1348	1	WF1348	1	WF1348
4	ANCHOR BLOCK R.H.	1	WF1349	1	WF1349	1	WF13206	1	WF13206
	ANCHOR BLOCK L.H.	1	WF1349	1	WF1349	1	WF13207	1	WF13207
	BOLT 7/8" - 14 x 4 1/4"	2	WF1354	2	WF1354	2	WF1354	2	WF1354
	NUT 7/8" - 14	2	1294	2	1294	2	1294	2	1294
	BOLT 7/16" - 20 x 1"	4	105	4	105	4	105	4	105
5	UPPER SEAT POST	1	W5501	1	W5501	1	W5501	1	WF13212
	LOWER SEAT POST	1	W5500	1	W5500	1	W5500	1	WF13211
	PIN	1	W5542	1	W5542	1	W5542	—	—
	CHAIN	1	P5484	1	P5484	1	P5484	—	—
	BOLT 7/16" - 20 x 1"	—	—	—	—	—	—	6	105
	LOCKWASHER	—	—	—	—	—	—	2	2331
	NUT 7/16" - 20	—	—	—	—	—	—	2	1273
6	COUPLING HALF, DRIVING	1	WF1387	1	WF1387	1	WF1387	1	WF1387
	COUPLING HALF, DRIVEN	1	WF1388	1	WF1388	1	WF1388	1	WF1388
	CHAIN	1	P5913	1	P5913	1	P5913	1	P5913
	STUD 7/16" - 14	4	W5526	4	W5526	4	W5526	4	W5526
	LOCKNUT	4	1324	4	1324	4	1324	4	1324

TANK PARTS





NO.	PART	NO. REQ'D	STOCK NO.
1	TANK	1	WF1321
	EYEBOLT	2	P5057
	NUT 3/8" - 16	2	1221
2	STABILIZER ARM, R. H.	1	WF1326
	STABILIZER ARM, L. H.	1	WF1325
	BUSHING	2	WF1345
3	*STABILIZER CYLINDER	2	P5686
4	*SWING CYLINDER	2	P5689
5	†MAIN CONTROL VALVE	1	P5092
	GASKET	1	P5634
	GASKET	2	P5633
	SCREW 1/2" - 13 x 3 1/2"	4	164
	LOCKWASHER	4	2340
	NUT 1/2" - 13	4	1243
6	†COMBINATION VALVE	1	P5800
	GASKET	3	P5633
	SCREW 3/8" - 16 x 3"	3	59
	LOCKWASHER	3	2328
	NUT 3/8" - 16	3	1221
7	†SELECTOR VALVE	1	P5801
	SCREW 3/8" - 16 x 3"	1	59
	LOCKWASHER	1	2328
	NUT 3/8" - 16	1	1221
8	TANK COVER	1	WF1382
	GASKET	1	P5632
	OIL FILLER CAP	1	WF1339
	NAME PLATE	1	P6131
	SCREW 1/4" - 20 x 1/2"	8	810
9	BUSHING	2	WS1125
	ZERK	2	7759
10	PIN - INCLUDES	4	WF1350
	WASHER	4	W5537
	BUSHING	8	WF1345

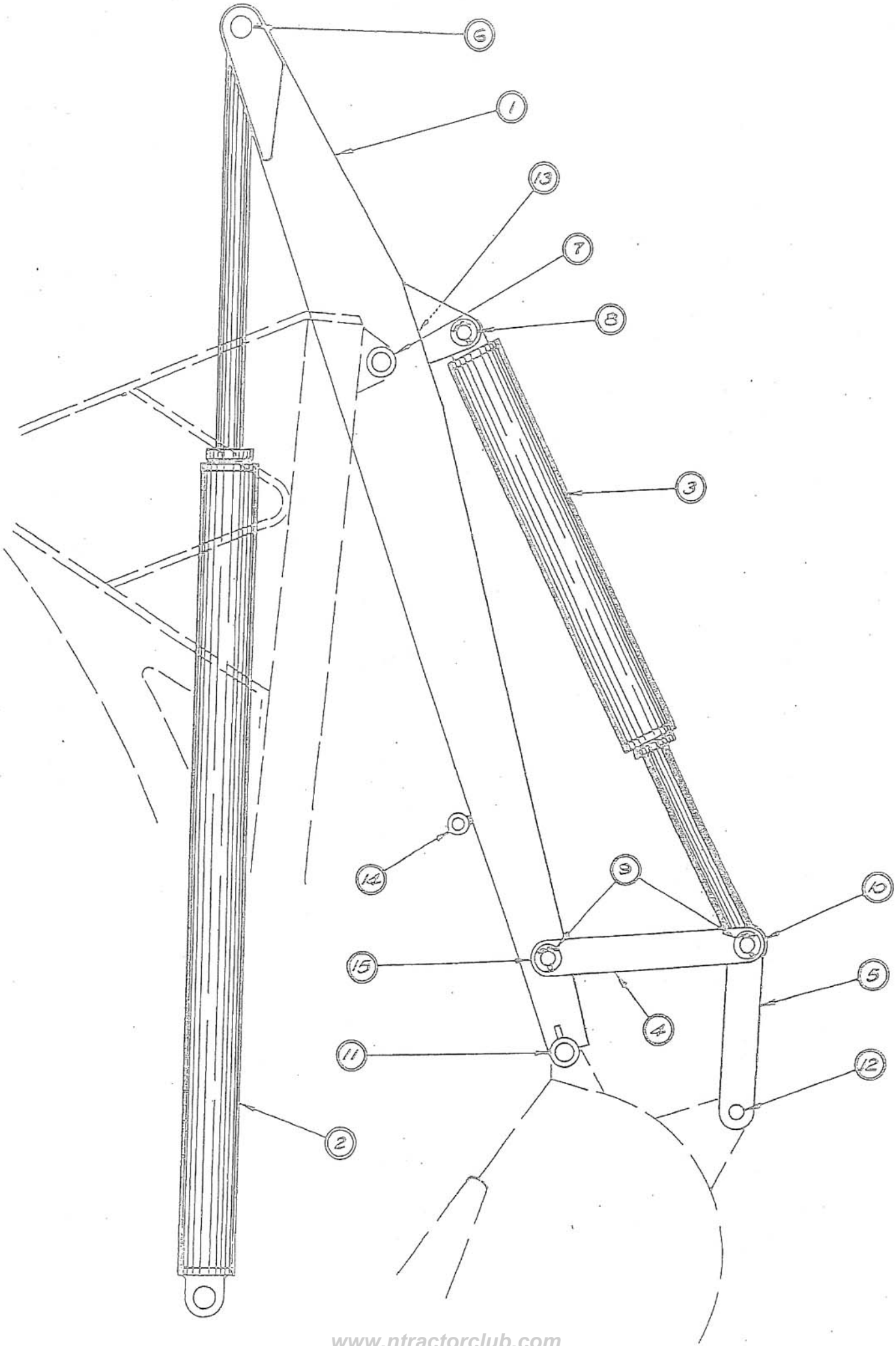
NO.	PART	NO. REQ'D	STOCK NO.
11	PIN - INCLUDES	2	WF1351
	WASHER - WELDED TYPE	2	WF1352
	PIN STOP	2	W3558
	PIN	2	WF13192
	PIN STOP - MACHINED TYPE	2	WF13194
	SCREW 1/4" - 20 x 5/8"	2	828
	LOCKWASHER	2	2307
12	CLEVIS - INCLUDES	2	WF13125
	WASHER	2	WF13163
	PIN - INCLUDES	2	WF1350
	WASHER	4	W5537
13	PAD (STANDARD EQUIPMENT)	2	WF1327
	DOG TEETH	4	W5218
	PIN - OPTIONAL EQUIPMENT	4	P5277
	WASHER	4	W5537
	CEMETERY PAD 24" x 24"	2	WF13167
	SPUDS - OPTIONAL EQUIPMENT	4	WF13168
	ROLL PIN	4	P5383
14	PUMP	1	P5274
	SCREW	3	312
	LOCKWASHER	3	2328
15	PUMP BRACKET	1	W5285
16	OUTLET FITTINGS:		
	REDUCING BUSHING 1" x 1/2"	1	2784
	NIPPLE 1/2" x 2"	1	2817
	ELBOW 1/2" x 90°	1	2742
	HOSE 1/2" x 25 1/2"	1	P5758
17	INLET FITTINGS:		
	STREET ELBOW 1" x 90°	1	2770
	NIPPLE 1" x 4 1/2"	1	WF1386
	THREADLESS ELBOW 1" x 90°	1	P5721
	NIPPLE 1" x 3 3/4"	1	WF1376

*See cylinder page for parts
†See valve pages for parts

BOOM & BOOM BRACKET PARTS

NO.	PART	NO. REQ'D	STOCK NO.
1	BOOM, R.H.	1	WF 1333
	BOOM, L.H.	1	WF 1332
2	BOOM BRACKET	1	WF 1341
3	*BOOM CYLINDER	1	P 5685
4	PIN } INCLUDES	2	WF 1336
	NUT 1 1/4" - 7 }	2	1321
	PIN STOP	3	W 5531
5	PIN } INCLUDES	1	WF 1335
	NUT 1 1/4" - 7 }	1	1321
	PIN STOP	1	W 5531
	BUSHING	2	WF 1331
	ZERK	2	P 5912
6	PIN } INCLUDES	2	WF 1351
	WASHER } WELDED TYPE	2	WF 1352
	PIN STOP	2	W 5558
	PIN	2	WF13192
	PIN STOP } MACHINED TYPE	2	WF13195
	SCREW 1/4" - 20 x 5/8"	4	828
	LOCKWASHER	4	2307
7	PIN } INCLUDES	1	W 5506
	WASHER }	2	W 5537
	WASHER	4	WS1124
	SETSCREW 5/16" - 18 x 5/16"	2	736
	SETSCREW 5/16" - 18 x 5/8"	2	836
8	PIN } INCLUDES	2	WF13193
	WASHER } WELDED TYPE	2	WS 1166
	PIN STOP	2	WF 1384
	SPACER WASHER	4	WS 1124
	PIN	2	WF13193
	SPACER WASHER } MACHINED TYPE	4	WS 1124
	PIN STOP	2	WF13195
	SCREW 1/4" - 20 x 5/8"	4	828
	LOCKWASHER	4	2307

* See cylinder page for parts.

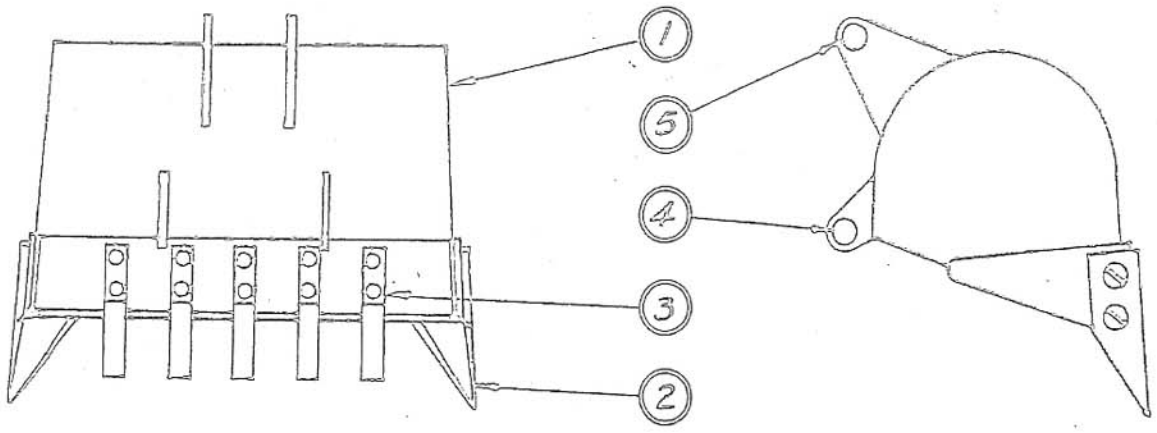


DIPPER STICK & ACTUATING PARTS

NO.	PARTS	NO. REQ'D	STOCK NO.
1	DIPPER STICK	1	WF 1334
2	*DIPPER CYLINDER	1	WF 1315
3	*ACTUATING CYLINDER	1	WF 1320
4	ACTUATING LEVER	1	WF 1330
5	ACTUATING LINK	1	WF 1343
6	PIN	1	WF 1338
	SETSCREW 5/16" - 18 x 5/16"	2	736
	SETSCREW 5/16" - 18 x 5/8"	2	836
7	BUSHING	2	WF 1331
	SPACER	1	WF 1342
8	PIN } INCLUDES	1	WF 1337
	WASHER }	2	W 5537
9	PIN } INCLUDES	2	W 5506
	WASHER }	4	W 5537
	BUSHING	4	WF 1345
10	SETSCREW 5/16" - 18 x 5/16"	2	736
	SETSCREW 5/16" - 18 x 5/8"	2	836
11	ZERK	2	7759
12	BUSHING	2	WF 1331
	ZERK	1	7759
13	NIPPLE 1/8" x 2"	1	2802
	COUPLING	1	2721
	ZERK	1	7760
14	EYEBOLT	1	P 5057
15	SETSCREW 5/16" - 18 x 5/16"	2	736
	SETSCREW 5/16" - 18 x 5/8"	2	836

* See cylinder page for parts.

A



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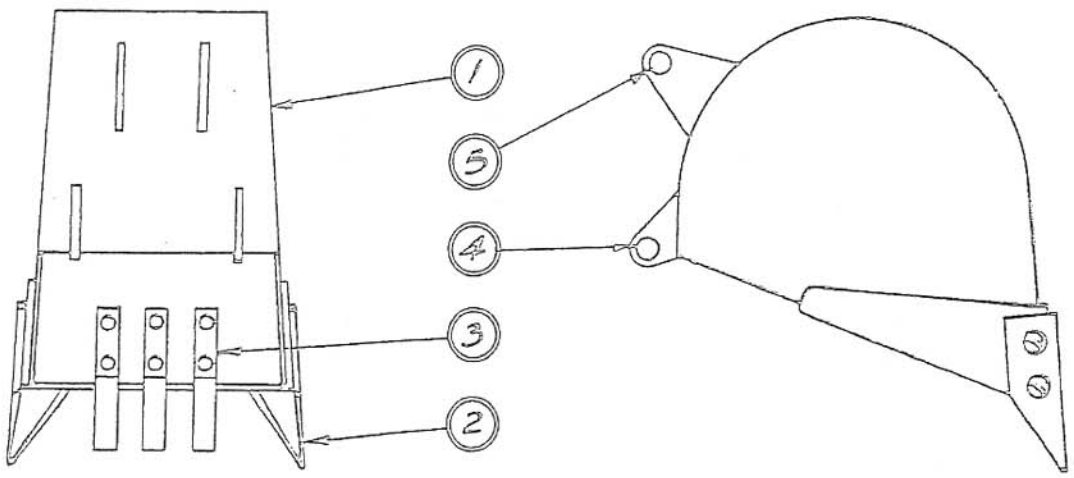
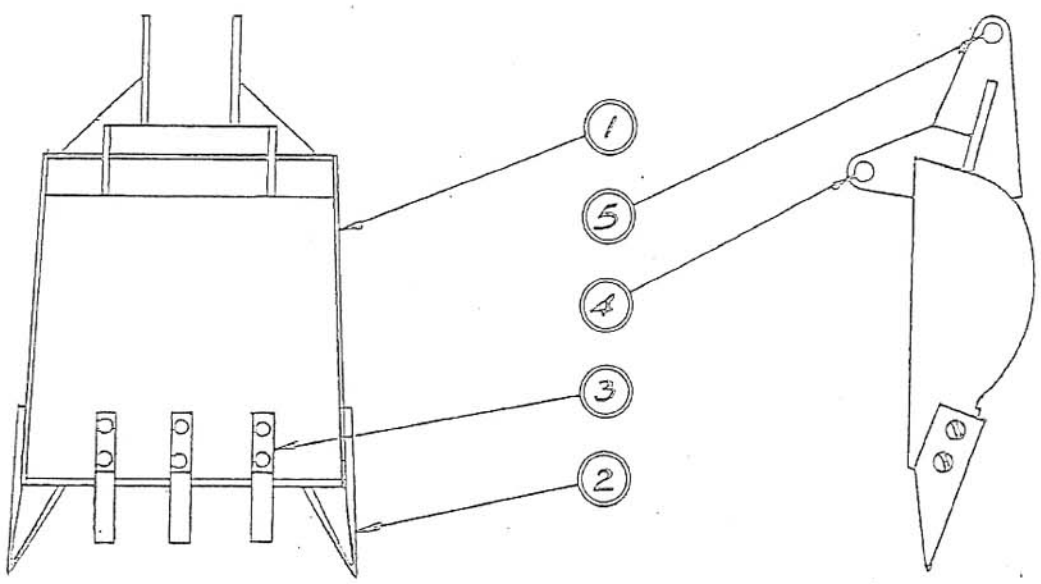
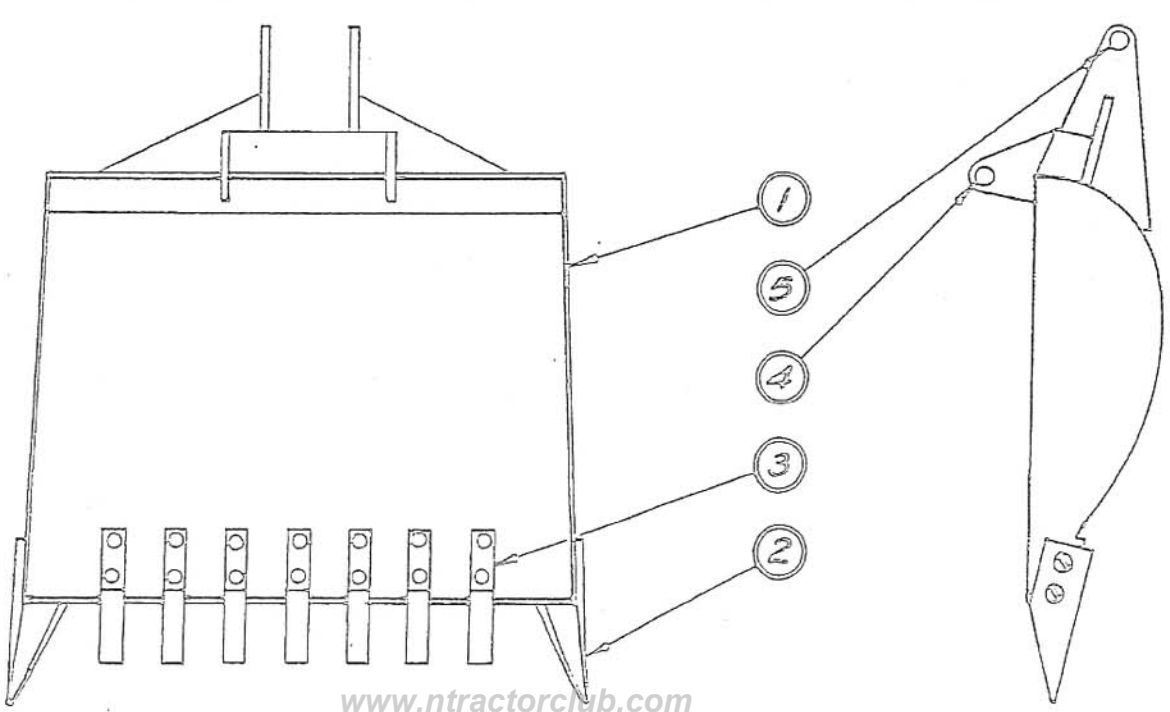


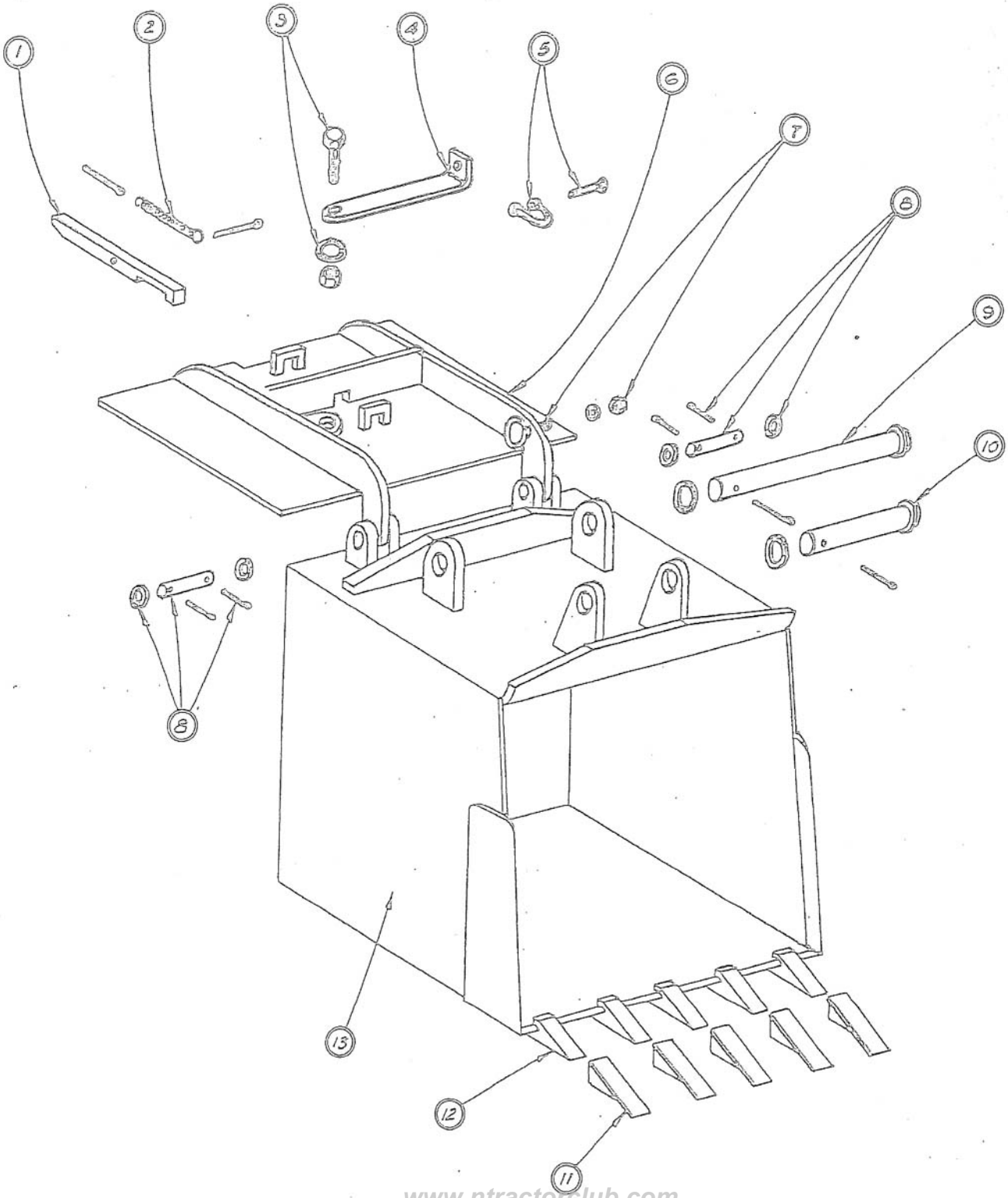
C



D



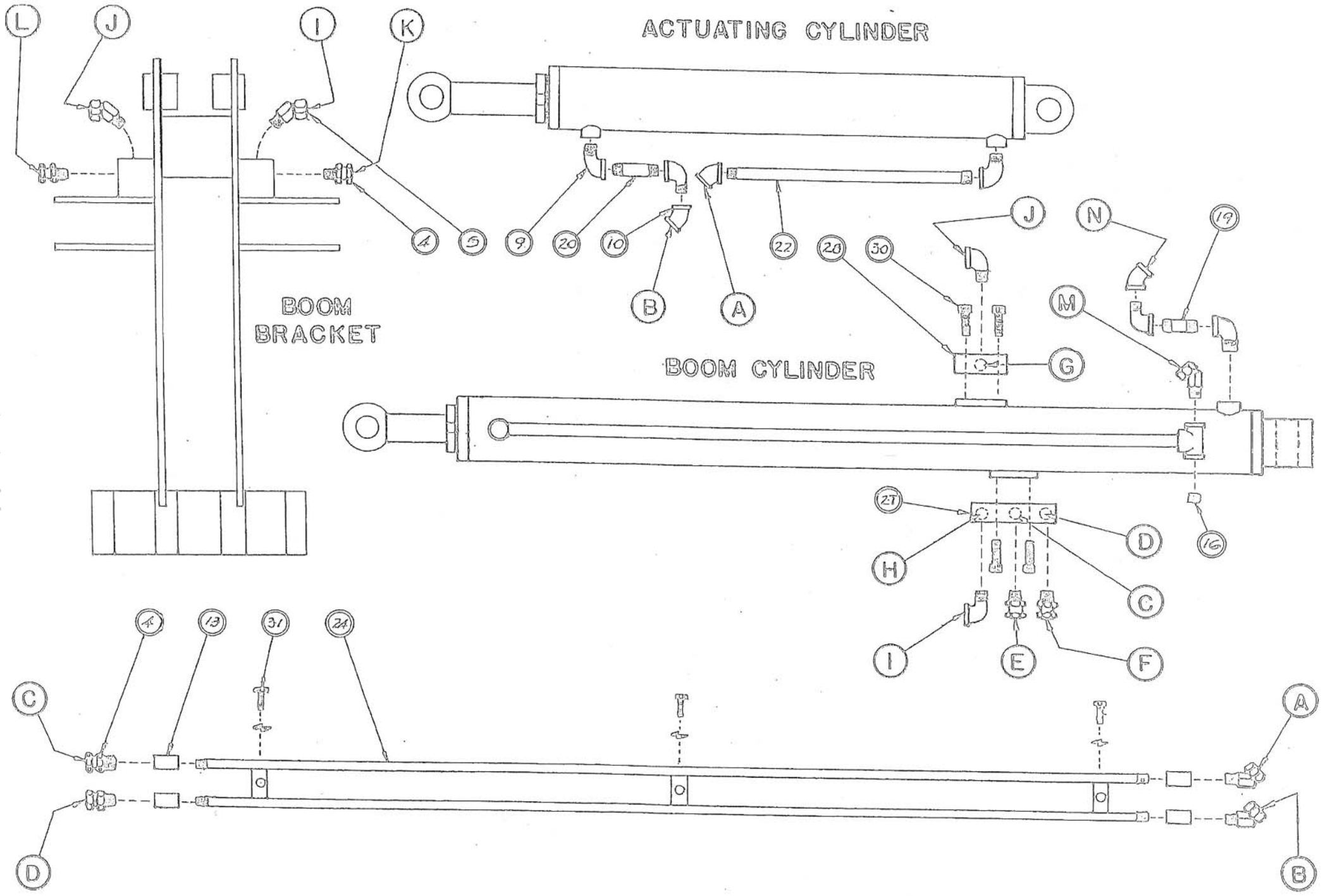
TYPE	Bucket Number	Nominal Size, In.	Trench Width, In.	Capacity, Cu. Ft.	1				2				3	4	5
					Corner Tooth W 5573	Screw	Screw	Nut	881	889	1243	P 6160	P 6161	WF 1357	W 5537	WF 1358	W 5537
									Point Shank	Point	Pin	Washer	Pin	Washer			
A	WF1363	29	31	3.5	2	8	-	8	5	5	1	1	1	1			
	WF1364	36	38	4.3	2	8	-	8	5	5	1	1	1	1			
B	WF1367	12	14	3.0	2	8	-	8	1	1	1	1	1	1			
	WF1368	15	17	3.9	2	8	-	8	3	3	1	1	1	1			
	WF1369	17	19	4.5	2	8	-	8	3	3	1	1	1	1			
	WF1370	22	24	5.8	2	8	-	8	3	3	1	1	1	1			
C	WF13108	12	14	0.8	2	4	4	8	1	1	1	1	1	1			
	WF13109	15	17	0.9	2	4	4	8	3	3	1	1	1	1			
	WF13110	17	19	1.1	2	4	4	8	3	3	1	1	1	1			
	WF13111	22	24	1.5	2	4	4	8	3	3	1	1	1	1			
	WF13112	32	34	2.4	2	4	4	8	5	5	1	1	1	1			
	WF13113	36	38	2.5	2	4	4	8	7	7	1	1	1	1			
D	WF1359	32	34	3.6	2	4	4	8	7	7	1	1	1	1			
	WF1360	36	38	4.1	2	4	4	8	7	7	1	1	1	1			
	WF1361	38	40	4.3	2	4	4	8	7	7	1	1	1	1			

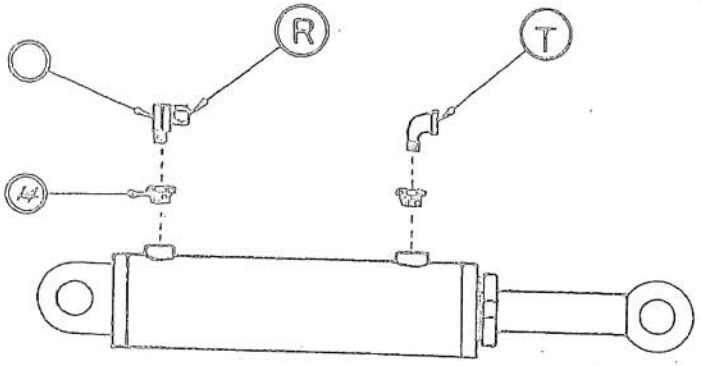


SHOVEL BUCKET PARTS

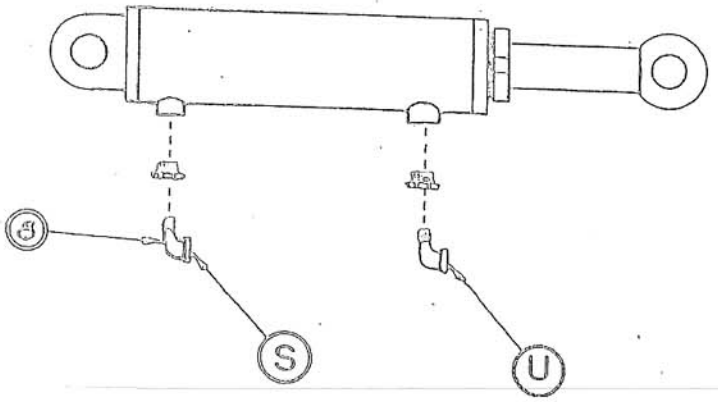
BUCKET NUMBER	WF-13123
NOMINAL SIZE, IN.	22
TRENCH WIDTH, IN.	24
CAPACITY, CU. FT.	5.1

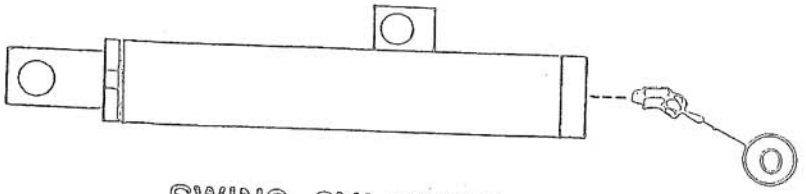
No.	PART	NO. REQ'D.	STOCK NO.
1	DOOR LATCH	1	W5550
2	SPRING	1	P1436
3	SCREW	1	207
	LOCKWASHER	1	2353
	NUT	1	1268
4	LATCH LEVER	1	W5549
5	SHACKLE	2	P5250
	CHAIN	1	P5714
6	BUCKET DOOR	1	W5546
7	RING STUD	1	P5057
	LOCKWASHER	1	2328
	NUT	1	1223
8	HINGE PIN	2	WF13124
9	PIVOT PIN	1	WF1357
10	LINK PIN	1	WF1358
11	POINT	5	P6161
12	POINT SHANK	5	P6160
13	SHOVEL BUCKET	1	WF13122



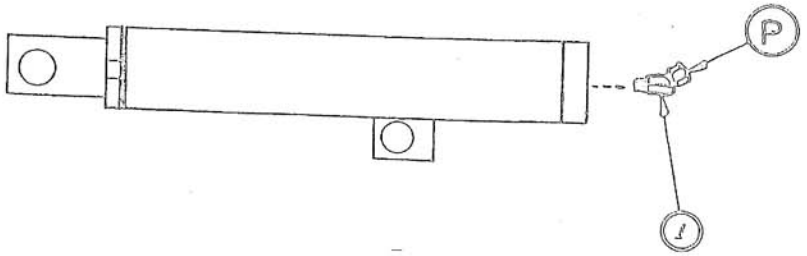


STABILIZER CYLINDER

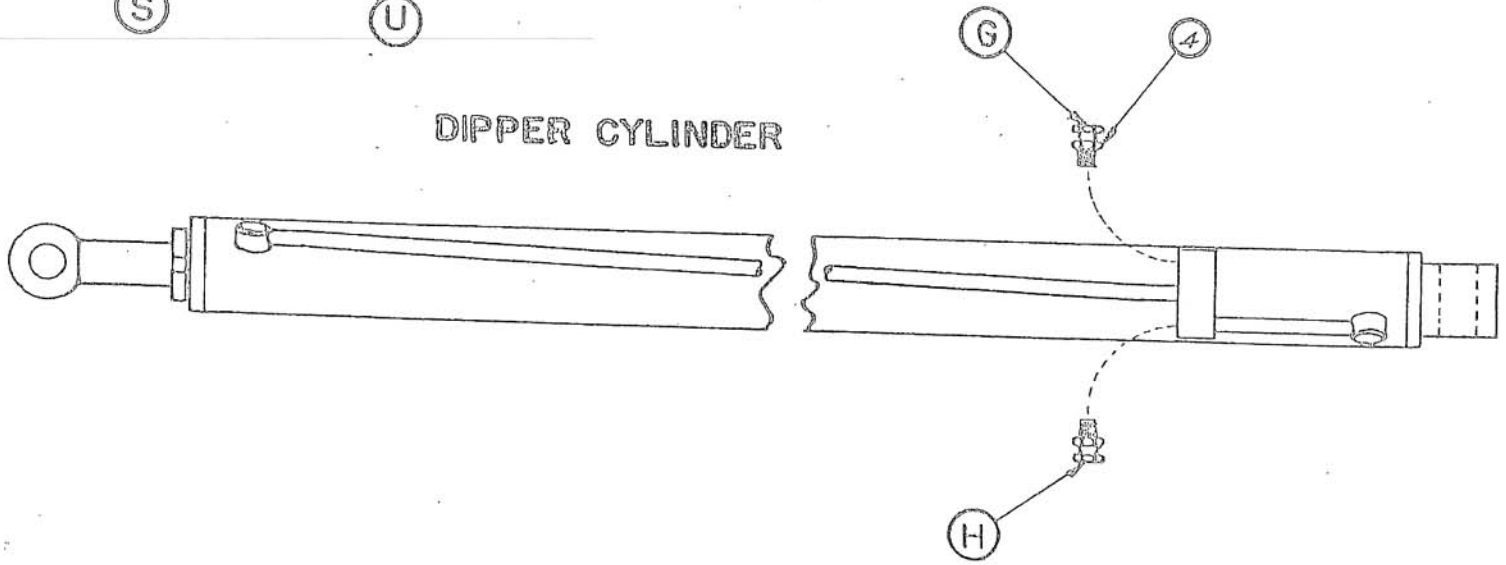


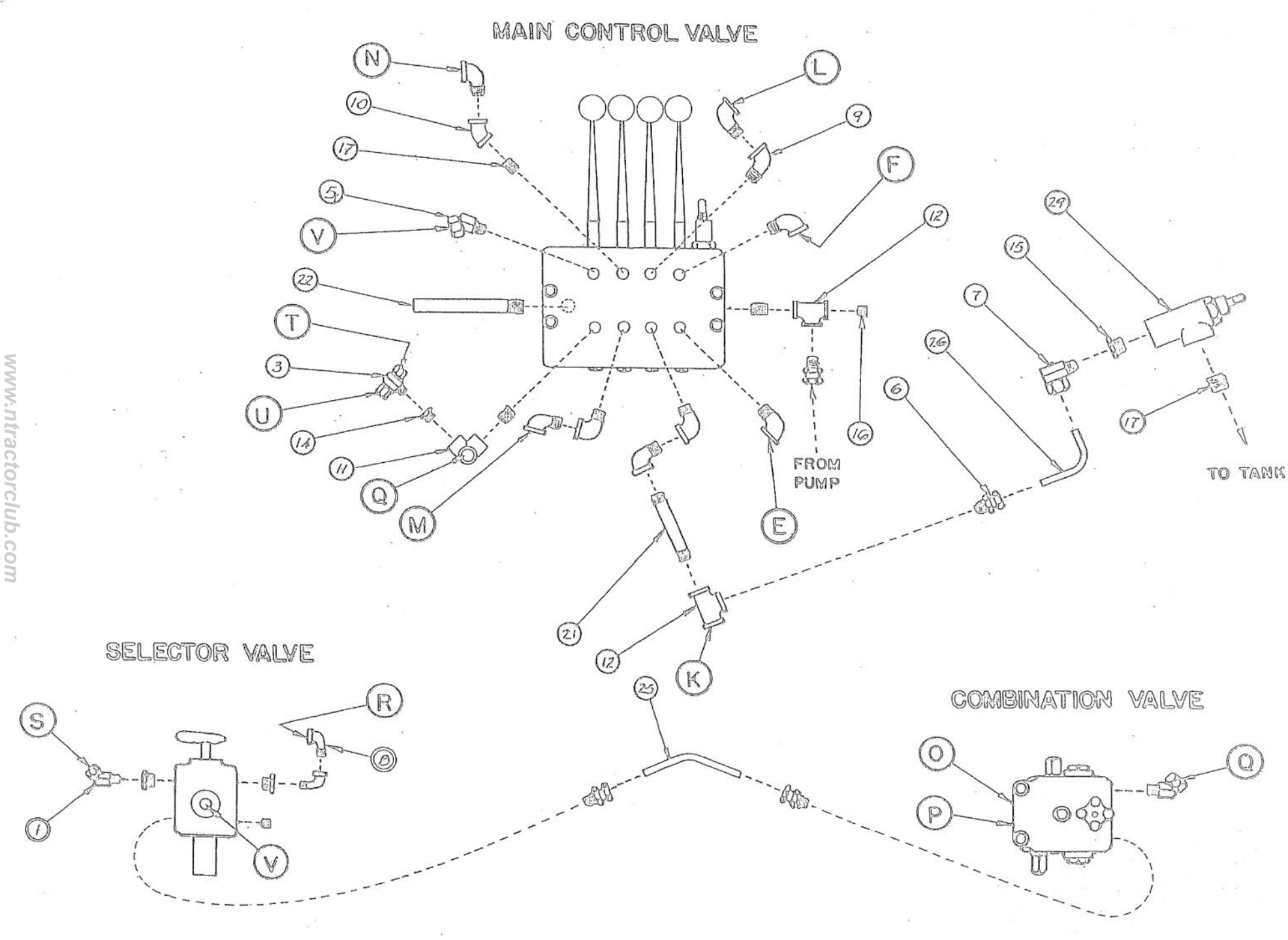


SWING CYLINDER



DIPPER CYLINDER





HOSE & FITTINGS

NO.	PARTS	STOCK NO.
1	HOSE UNION 1/4" x 45° Elbow	P5281
2	" " 1/4" x 90° Elbow	P5153
3	" " 1/4" x Tee	P5278
4	" " 1/2" x Straight	4650
5	" " 1/2" x 45° Elbow	P5078
6	TUBE UNION Straight	P5151
7	" " 90° Elbow	P5152
8	PIPE ELBOW 1/4" x 90° Street	2757
9	" " 1/2 " x 90° Street	2756
10	" " 1/2" x 45°	2761
11	" " 1/2" x 90° Side Outlet	P5833
12	PIPE TEE 1/2"	2859
13	PIPE COUPLING 1/2"	2727
14	REDUCER 1/4" x 1/2"	2776
15	" 1/2" x 3/4"	2781
16	PIPE PLUG 1/2"	2703
17	CLOSE NIPPLE 1/2"	2793
18	" " 3/4"	2794
19	PIPE 1/2" x 2"	2817
20	" 1/2" x 3"	2819
21	" 1/2" x 4"	4136
22	" 1/2" x 15 1/2"	4295
23	" 3/4" x 8"	WF1375
24	PIPE ASSEMBLY	W5534
25	STEEL TUBE	WF13121
26	STEEL TUBE	WB01109
27	JUNCTION BLOCK	WF1373
28	JUNCTION BLOCK	WF1374
29	RELIEF VALVE	P6044
30	SCREW 3/8"-16 x 1 1/2"	754
31	SCREW 3/8"-16 x 1 1/4"	312

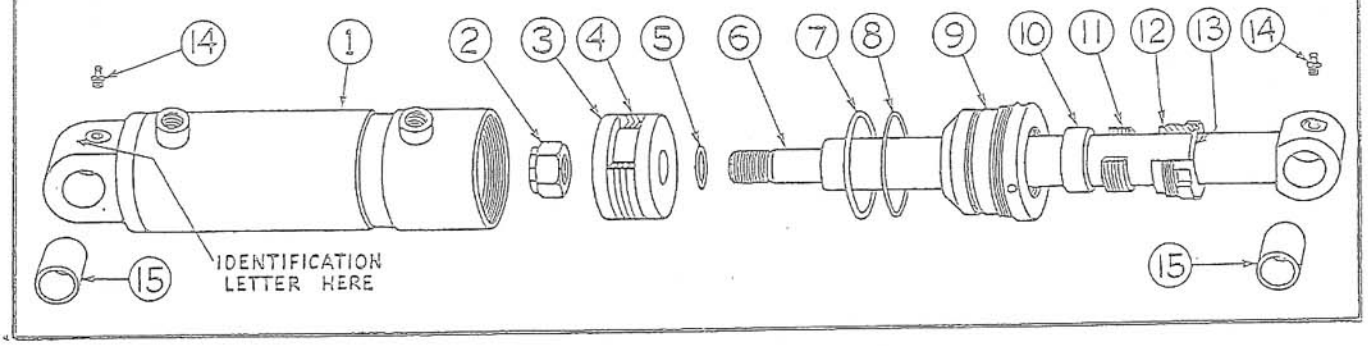
FROM POINTS	LENGTH	S. R. NO.
A-A	1/2" x 36"	P 5142
B-B	1/2" x 36"	P 5142
C-C	1/2" x 42"	P 5424
D-D	1/2" x 42"	P 5424
E-E	1/2" x 42"	P 5424
F-F	1/2" x 42"	P 5424
G-G	1/2" x 42"	P 5424
H-H	1/2" x 42"	P 5424
I-I	1/2" x 25 1/2"	P 5758
J-J	1/2" x 25 1/2"	P 5758
K-K	1/2" x 36"	P 5142
L-L	1/2" x 36"	P 5142
M-M	1/2" x 36"	P 5142
N-N	1/2" x 36"	P 5142
O-O	1/4" x 30"	P 5150
P-P	1/4" x 24"	P 5149
Q-Q	1/2" x 17"	P 5503
R-R	1/4" x 36"	P 5280
S-S	1/4" x 24"	P 5149
T-T	1/4" x 36	P 5280
U-U	1/4" x 33"	P 5279
V-V	1/2" x 17"	P 5503
From Pump	See Pump Mounting Parts Page	
To Pump		

To order replacement hose, locate points on drawings corresponding to those on machine. Then from the above table obtain the hose size and number necessary for ordering.

The arrangement and quantity of the fittings shown on the accompanying drawings will vary on different models and are shown for parts identification only.

CYLINDER PARTS

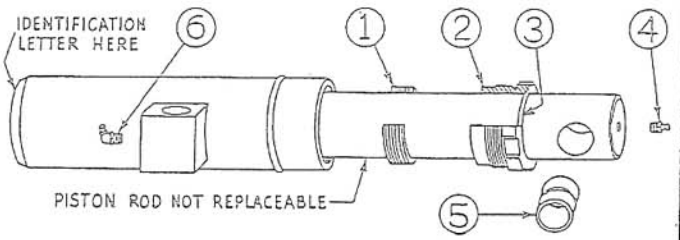
DOUBLE ACTING CYLINDERS



		CYLINDERS, IDENTIFICATION LETTERS & PART NUMBERS							
		BOOM		DIPPER		ACTUATING		STABILIZER	
KEY	PARTS DESCRIPTION	D	N	F	P	H	R	J	T
1	Cylinder Tube	P5842	P5872	P5843	P5874	P5840	P5873	P5841	P5871
		WF13157		WF1390		WF13149		WF13131	
2	Locknut	P5837	P5869	P5837	P5869	P5837	P5869	P5837	P5869
3	Piston	P5839	P5880	P5839	P5880	P5839	P5880	P5839	P5880
		WF13103	WF13182	WF13103	WF13182	WF13103	WF13182	WF13103	WF13182
4	Piston Packing	P5838	P5838	P5838	P5838	P5838	P5838	P5838	P5838
5	Piston Seal Ring	P5325	P5881	P5325	P5881	P5325	P5881	P5325	P5881
6	Piston Rod	P5844	P5876	P5847	P5879	P5846	P5875	P5845	P5877
		WF13156	WF13185	WF1399	WF13171	WF13151	WF13183	WF13134	WF13184
7	Stuffing Box Seal Ring	P5312	P5883	P5312	P5883	P5312	P5883	P5312	P5883
8	Back-up Ring	P5311	P5884	P5311	P5884	P5311	P5884	P5311	P5884
9	Stuffing Box	P5657	P5886	P5646	P5885	P5646	P5885	P5646	P5885
		WF13152	WF13173	WF13106	WF13187	WF13106	WF13187	WF13106	WF13187
10	Bushing	P5310	P5310	P5534	P5534	P5534	P5534	P5534	P5534
		WF13153	WF13176	WF13105	WF13105	WF13105	WF13105	WF13105	WF13105
11	Rod Packing	P5309	P5309	P5286	P5286	P5286	P5286	P5286	P5286
12	Packing Nut	P5307	P5889	P5326	P5888	P5386	P5888	P5326	P5888
		WF13154	WF13175	WF13107	WF13175	WF13107	WF13175	WF13107	WF13175
13	Wiper Ring	P5308	P5308	P5313	P5313	P5313	P5313	P5313	P5313
14	Zerk	7759	7759	7759	7759	7759	7759	7759	7759
15	Bushing	WF1331	WF1331	WF1331	WF1331	WF1331	WF1331	WF1331	WF1331

When ordering cylinder repair parts, always give Excavator Model and Serial Numbers, identification letter of cylinder, part name, and number. For those parts where two part numbers are given always order by the WF series number. (The WF numbers are new numbers for those parts)

SINGLE ACTING CYLINDERS



KEY	PARTS DESCRIPTION	CYLINDER AND IDENTIFICATION LETTERS Swing B	Swing L
1	Packing	P5836	P5836
2	Packing Nut	P5834	P5887
		WF13148	
3	Wiper Ring	P5835	P5835
4	Zerk	7759	7759
5	Bushing	WF1331	WF1331
6	Zerk	7760	7760

When ordering cylinder repair parts, always give Excavator Model and Serial numbers, identification letter of cylinder, part name, and number. For those parts where two part numbers are given always order by the WF series number. (The WF numbers are new numbers for those parts)

HYDRAULIC CYLINDER SERVICE

SEEPAGE AT PACKING NUT (beyond that normally expected) shows that packing has worn slightly and should be tightened with spanner wrench. When cylinder leaves the factory there is a 1/16" to 3/32" gap between nut and stuffing box for this purpose. If leak continues after nut has been tightened, run rod out and check surface of rod for deep scratches or nicks. If rod is smooth, unscrew and remove packing nut. Add one leather "V"ring washer. Replace nut and tighten.

EXCESSIVE LEAKING AT PACKING NUT shows that packing assembly is worn out and must be replaced. Remove nut and inspect rod for deep scratches or nicks. Check wiper ring in packing nut for damage by dirt to outer lip.

TO REMOVE PACKING ASSEMBLY, a long sharp pick or screw driver is needed. Rod should be pushed in cylinder as far as possible to get more working clearance. Force pick into first ring and pull out. Do not pry against stuffing box or rod. Repeat until all packing rings are removed.

SLIGHT SCRATCHES ON ROD SURFACE indicate grit wear. Check wiper ring for abrasives and replace ring if any are found. Use a strip of dry, medium emery cloth and polish rod with rotary motion. Do not polish lengthwise. After scratch is removed take a strip of fine emery, dip in clean oil and polish to a high finish with rotary motion.

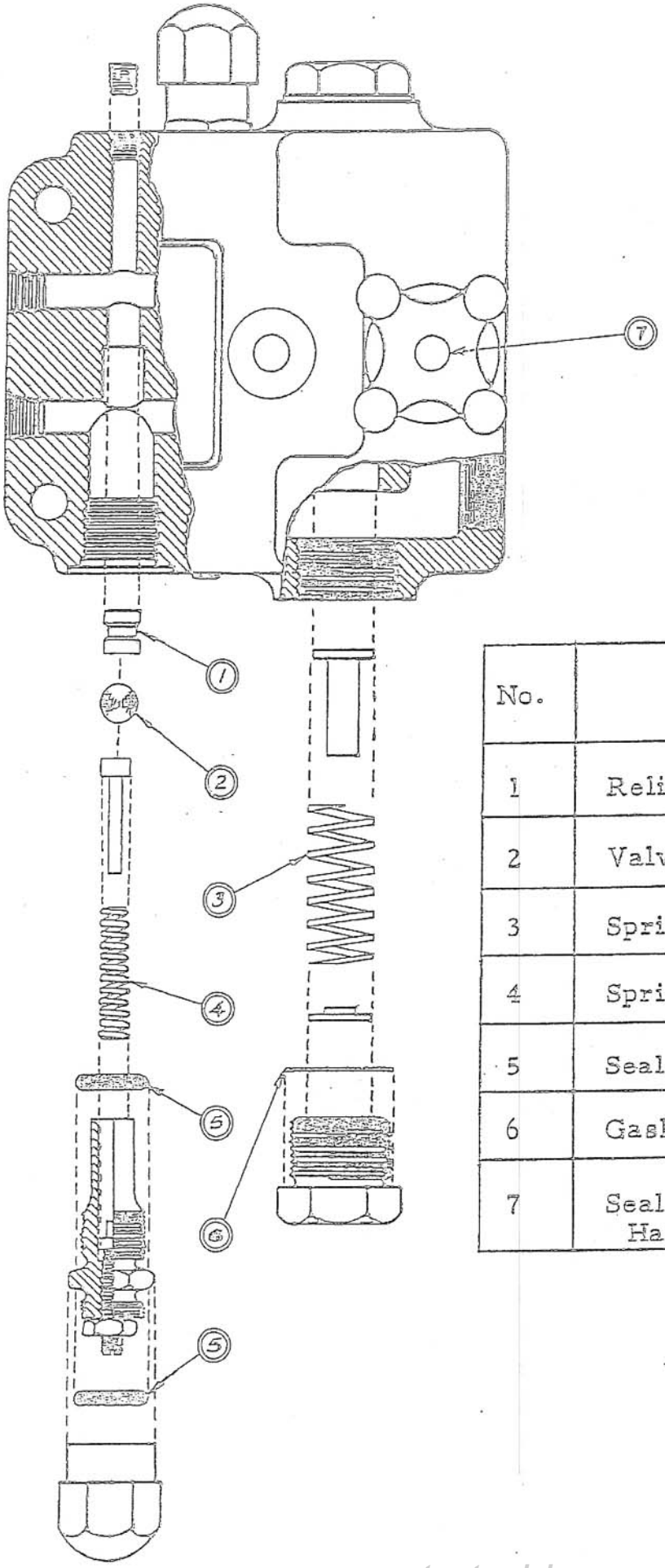
DEEP SCRATCHES ON ROD SURFACE show that either there is an excessive amount of dirt in wiper ring and packing or there is a slight misalignment on machine between cylinder end and rod end. If due to misalignment, this condition should be corrected before cylinder is repaired. Rod must be replaced.

IF ROD IS SCORED through accident or other cause STOP WORK IMMEDIATELY. This may eliminate further damage. Polish out scoring as indicated above. Rod may have to be replaced.

IF LOAD DROPS when valve is in neutral position or IF LOAD RAISES SLOWLY check cylinder by running it to either stop position, remove line on return or low pressure end of cylinder, hold valve open to opposite or connected end of cylinder and check for oil flow through disconnected end. If oil runs out, piston packing and wear rings are worn and must be replaced. If no oil comes out, the cause will be found in valve or pump.

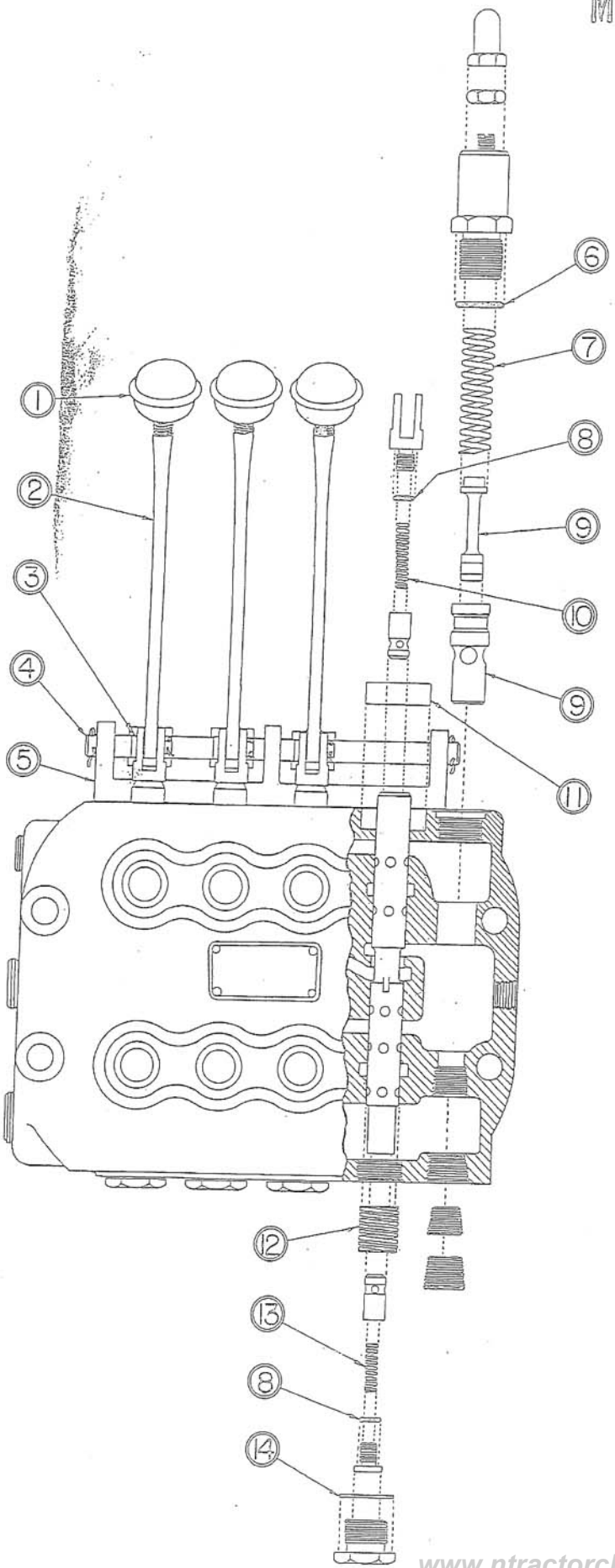
TO DISASSEMBLE CYLINDER secure whole assembly in a bench vise. Back off packing nut and unscrew stuffing box. The whole piston rod assembly can now be removed, allowing removal of piston packing rings and wear rings. When removing piston packing rings, note the way they are placed in relation to base ring so that new rings are assembled exactly the same way. Use of a ring compressor is recommended for re-inserting repacked piston into cylinder tube. Packing should be smeared with cup grease. Back-up ring should always be replaced whenever stuffing box is removed from cylinder.

COMBINATION VALVE PARTS



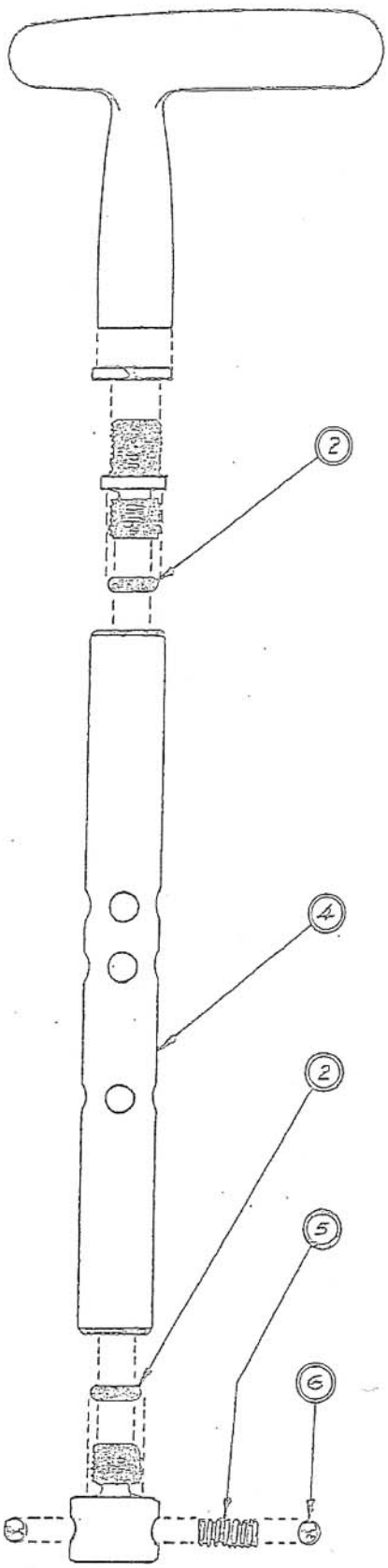
No.	Part	Stock No.
1	Relief Valve Seat	P 5982
2	Valve Ball	P 5981
3	Spring	P 5333
4	Spring	P 6000
5	Seal Ring	P 6003
6	Gasket	P 5332
7	Seal Ring Under Handle	P 6006

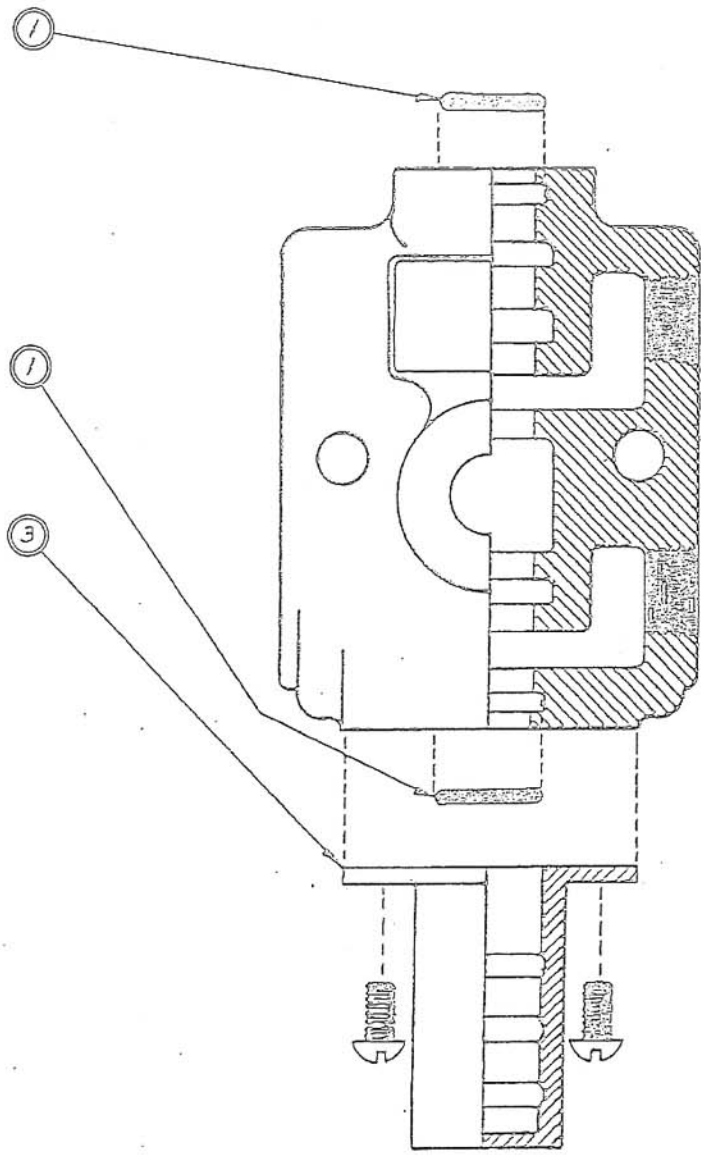
MAIN CONTROL VALVE PARTS



No.	Part	Stock No
1	Knob	P 5629
2	Lever	WF 1344
3	Stud	W 5119
4	Shaft	W 5116
5	Bracket	W 5094
	Allen Screw	709
6	Seal Ring	P 5329
7	Spring	P 5328
8	Seal Ring	P 6005
9	Plunger and Seat	P 5327
10	Spring	P 5998
11	Seal	P 5330
12	Spring	P 5994
13	Spring	P 5999
14	Gasket	P 5331
Not shown	Gasket under Set Screw	P 5977

SELECTOR VALVE PARTS





No.	PARTS	Stock No.
1	Seal Ring	P 6002
2	Seal Ring	P 6005
3	Detent Cap	P 6060
4	Plunger	P 6061
5	Detent Spring	P 5996
6	Detent Ball	P 6177

HYDRAULIC OILS

THE NEED of SPECIAL HYDRAULIC OILS

Pippin hydraulic units are finely machined precision mechanisms, fitted to extremely close tolerances. The "heart" of the system is the hydraulic pump which stores power by creating hydraulic pressure, just as an air compressor stores power by creating air pressure.

Regardless of the care used in the manufacture of hydraulic equipment, its satisfactory operation will be no better than the hydraulic fluid used in it.

One of the nation's largest manufacturers of hydraulic pumps and accessories used in hydraulic equipment (name on request) states **"APPROXIMATELY 70% OF ALL HYDRAULIC SYSTEM REPAIRS RESULT FROM IMPROPER CONDITION OF HYDRAULIC OIL.**

In spite of this, the selection of hydraulic oil is often relegated to a place of minor importance. The absolute necessity for care in selection of hydraulic oil can be better realized when the following important functions of hydraulic fluid are considered:

1. Protection against rust and corrosion.
2. Adequate lubrication of the hydraulic pump.
3. Retention of original characteristics over a long period of service.
4. Transmission of hydraulic power despite adverse operating conditions.

Approved Pippin Hydraulic Oil (in three viscosities) is specifically engineered to properly perform the above functions. On the other hand, motor oils, hydraulic brake fluids, aviation hydraulic oils and other similar type products do not possess these characteristics, and *should not be used for this purpose.*

PROPERTIES OF PIPPIN HYDRAULIC OIL

Although there are literally hundreds of different oil stocks from which hydraulic oil can be blended, the selection of base oils, manner of compounding, and the kind and percentage of chemicals used, spell the difference between a product of the highest quality and a poor or average grade hydraulic oil. The actual specifications of Pippin Hydraulic Oil are confidential in order to eliminate spurious imitation, but in general they are as follows:

PARAFFIN BASE

Paraffin oils are world-renowned for their purity, excellent quality, high heat resistance, and better lubricating properties. For these reasons only 100% paraffin base oils are used in the blending of Pippin Hydraulic Oil.

VISCOSITY

An oil must have the proper viscosity to flow through a system under pressure, or it cannot be considered for use. The viscosity is also important in effecting a seal against the escape of oil through the clearance between the gears, vanes, or plungers of hydraulic pumps. The three viscosities of Pippin Hydraulic Oil (Light, Medium, and Heavy) have been determined to give the best results at the temperature ranges indicated.

VISCOSITY INDEX

The higher the viscosity index, the more constant the body (viscosity) of an oil under changes in temperature. The viscosity index of poor grade oils can be raised through the use of artificial VI improvers; however, these are prone to dissipate during actual operation and the oil will readily revert to its lower natural viscosity index. When this occurs, it can impair the operation of the hydraulic system. Approved Pippin Hydraulic Oil has an extremely high *natural* viscosity index to assure smoother operation under all conditions.

OXIDATION RESISTANCE

Hydraulic oils are subjected to severe conditions of oxidation due to agitation, temperature, and pressure. When an oil oxidizes it forms by-products of gum, varnish, acid and sludge. EVEN THE MOST MINUTE AMOUNTS OF THESE BY-PRODUCTS CAN CAUSE CORROSION, OR STICKING OF THE CLOSELY FITTED PARTS OF THE PUMP. If this occurs it usually necessitates a shut-down of the equipment and expensive repairs. For protection of sensitive hydraulic mechanisms, naturally high oxidation-resistant oils are further treated with anti-oxidation additives. This assures a hydraulic oil possessing the highest oxidation resistance possible.

LUBRICITY

The rubbing surfaces of hydraulic pumps are machined and fitted in such a manner that fluid leakage and loss in efficiency are held to a minimum. To protect these expensive surfaces against damage due to inadequate lubrication, Approved Pippin Hydraulic Oil is blended from stocks rating extremely high in lubricity qualities.

FOAM RESISTANCE

Foam in hydraulic oil causes irregular action in the cylinders. Furthermore, the entrained air becomes very hot when compressed and the heat thus generated accelerates oxidation of the oil. To eliminate these undesirable characteristics, Approved Pippin Hydraulic Oil contains special anti-foam inhibitors.

RUST RESISTANCE

Moisture is present in every hydraulic unit and because of this the formation of rust is an ever-present threat. Even the smallest particles of rust passing through precision made pumps and valves can so scratch the surfaces that their efficiency is reduced. Anti-rust inhibitors are blended into Approved Pippin Hydraulic Oil to assure positive protection against this common hazard.

FOR THE BEST OPERATING EFFICIENCY OF PIPPIN EXCAVATORS, *USE ONLY PIPPIN APROVED HYDRAULIC OIL*, SUPPLIED EXCLUSIVELY BY LUBRICATION ENGINEERS, INC., FORT WORTH, TEXAS.

Pippin
HYDRAULIC OIL
LIGHT
For temperatures
from 0 to 32 degrees

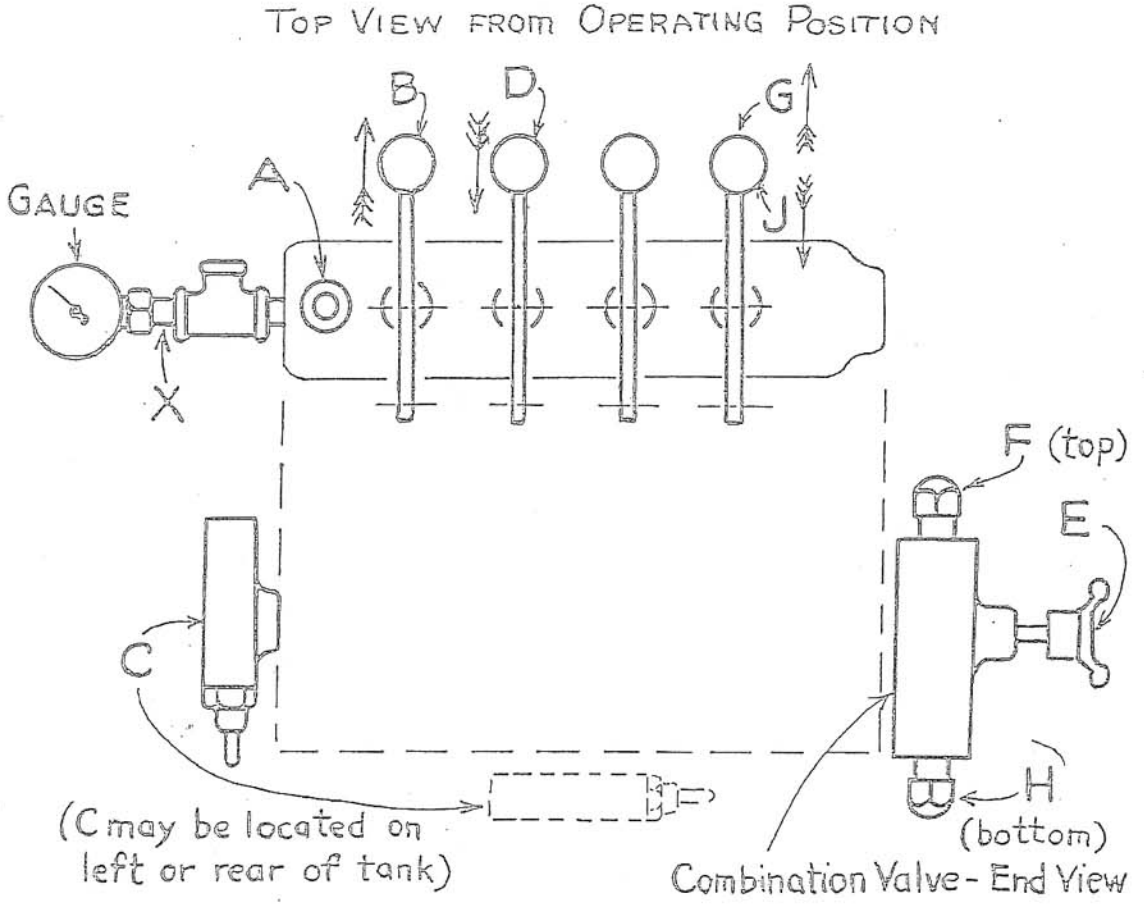
Pippin
HYDRAULIC OIL
MEDIUM
For temperatures
from 32 to 90 degrees

Pippin
HYDRAULIC OIL
HEAVY
For temperatures
above 90 degrees

Pippin Construction Equipment BULLETIN

(Supersedes SRB-

ADJUSTMENT OF MAIN VALVE BY-PASS DIPPER CYLINDER RELIEF VALVE AND COMBINATION SWING VALVE ON PIPPIN EXCAVATOR MODELS WF-104 AND LATER



Instructions:

Install guage at point (X) by removing 1/2" pipe plug in tee. (Left side of main control valve where 1/2" hose connects to pump) Leave and read guage at this location throughout valve adjustment. Follow in sequence below using diagram for location.

1. Set tractor throttle at approximately 1500 R.P.M. for steps 2, 3, and 4. Check guage to make sure there is no pressure reading with valves in neutral position.

2. At main valve by-pass (A), break seal, remove acorn nut and loosen locknut. Push control handle (B) in direction of arrow. Turn adjusting screw (A) (clockwise to increase, counter-clockwise to decrease) until guage reads 1500 lbs. P.S.I.

3. At dipper cylinder relief valve (C) remove acorn nut, loosen lock nut. Pull control handle (D) (in direction of arrow. Set adjusting screw (C) so guage reads 1400 lbs. P.S.I. (clockwise to increase, counter-clockwise to decrease.) Re-set lock nut and replace acorn nut at (C).

4. Drop R.P.M. of tractor to approximately 1200 R.P.M. for steps 6 and 7.

5. Turn speed control handle (E), on combination valve, clockwise until tight. At cushion valve (F) remove acorn nut and loosen lock nut. Push control handle (G) in direction of arrow. Swing boom full left to stop. Set adjusting screw (F) until guage reads 1350 P.S.I. (clockwise to increase, counter-clockwise to decrease.) Re-set lock nut and replace acorn nut at (F).

6. At cushion valve (H) remove acorn nut and loosen lock nut. Pull control handle (J) in direction of arrow. Swing boom full right to stop. Set adjusting screw (H) until guage reads 1350 P.S.I. (clockwise to increase, counter-clockwise to decrease). Re-set lock nut and replace acorn nut at (H).

7. Re-set throttle at 1500 R.P.M. for steps 9, 10, and 11.

8. Push control handle (B) in direction of arrow and turn adjusting screw (A) counter-clockwise until guage reads 1200 lbs. P.S.I. Re-set locknut and replace acorn nut. Re-seal valve (A). (Seals are available)

9. Double check on steps 6 and 7. The cushion valve adjustment at (F) and (H) should be re-checked by ear after completing pressure setting sequence. Swing full left to stop and listen for by-passing at point (F) on combination valve. If by-passing is apparent, tighten down cushion valve adjusting screw (F) until oil is by-passing at main valve by-pass (A) and not at cushion valve (F).

10. Swing full right to stop and listen for by-passing at point (H) on combination valve. If by-passing is apparent tighten down cushion valve adjusting screw (H) until oil is by passing at the main valve by-pass (A) and not at cushion valve (H).

If it is impossible to attain proper valve settings on any of the valves (A) (C) (F) (H) by following the above procedure, this indicates foreign matter under the valve seat or worn valve parts. Service parts are available for all valves.

WARRANTY

Pippin Construction Equipment, Inc., warrants each new excavator or part manufactured by it to be free from defects in material or workmanship under normal use and service.

We agree to replace at no charge except for transportation or give credit for any defects due to imperfect material or workmanship which may develop within ninety (90) days from date of delivery to owner provided defective parts are returned to the Pippin Construction Equipment, Inc., by prepaid transportation. Defective parts must be returned within sixty (60) days from time of breakage. Credit or replacement is contingent upon inspection of the imperfect parts by the factory service department of Pippin Construction Equipment, Inc.

Written notice on our "SERVICE ADJUSTMENT REQUEST" forms must be forwarded by the Owner, Dealer, or Distributor stating in what parts and wherein it fails to fulfill the warranty.

Failure on the part of the purchaser to forward the PIPPIN Excavator warranty card on date of purchase shall be conclusive evidence of fulfillment of the warranty and that the machine is satisfactory to the purchaser, and the seller shall be released from all liability under the warranty.

This warranty being expressly in lieu of all other warranties, expressed or implied, and all other obligations or liabilities on its part, and it neither assumes nor authorizes any other person to assume for it any other liability in connection with the sale of its excavators.

THE ABOVE WARRANTY IS NOT VALID UNLESS THE WARRANTY CARD IS SUBMITTED BY YOUR DEALER ON THE DATE OF PURCHASE

PIPPIN CONSTRUCTION EQUIPMENT, INC.

WHITE RIVER JUNCTION, VERMONT