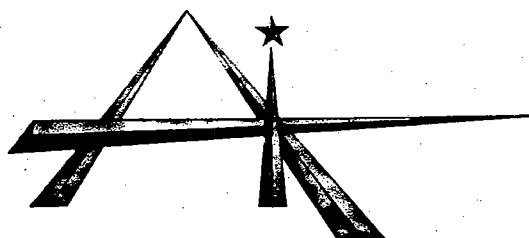


PM 331
REV. 3

3429

7-21-93-3

SERVICE PARTS MANUAL



BRADCO 9HD BACKHOE

American Trencher Inc.

Box-266
Delhi, Iowa 52223

(319) 922-2981

APPLIES TO SERIAL NO. 89HEZ1280 AND UP

*New Style
Watch
Serial #*

LIMITED WARRANTY

EFFECTIVE MARCH 1, 1986

All new unused American Trencher products are warranted to be free from defects in materials or workmanship which may cause failure under normal usage and service when used for the purpose intended.

In the event of failure within 12 months from initial retail sale, lease or rental date (excluding cable, ground engaging parts such as sprockets, digging chain, bearings, teeth, tamping and demolition heads, and blade cutting edges), if after examination, American Trencher determines failure was due to defective material and/or workmanship, parts will be repaired or replaced by American Trencher. American Trencher may request defective part or parts be returned prepaid to them for inspection at their place of business at Delhi, Iowa, or to a location specified by American Trencher.

Any claims under this warranty must be made within fifteen (15) days after the Buyer learns of the facts upon which such claim is based. All claims not made in writing and received by American Trencher within the time period specified above shall be deemed waived.

THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES EXPRESSED OR IMPLIED AND THERE ARE NO WARRANTIES OF MERCHANTABILITY OR OF FITNESS FOR A PARTICULAR PURPOSE. IN NO EVENT SHALL AMERICAN TRENCHER BE LIABLE FOR CONSEQUENTIAL OR SPECIAL DAMAGE.

AMERICAN TRENCHER'S LIABILITY FOR ANY AND ALL LOSSES AND DAMAGES TO BUYER, RESULTING FROM ANY CAUSE WHATSOEVER, INCLUDING AMERICAN TRENCHER'S NEGLIGENCE, IRRESPECTIVE OF WHETHER SUCH DEFECTS ARE DISCOVERABLE OR LATENT, SHALL IN NO EVENT EXCEED THE PURCHASE PRICE OF THE PARTICULAR PRODUCTS WITH RESPECT TO WHICH LOSSES OR DAMAGES ARE CLAIMED, OR, AT THE ELECTION OF AMERICAN TRENCHER, THE REPAIR OR REPLACEMENT OF DEFECTIVE OR DAMAGED PRODUCTS.

4374
10-25-88

CONTENTS

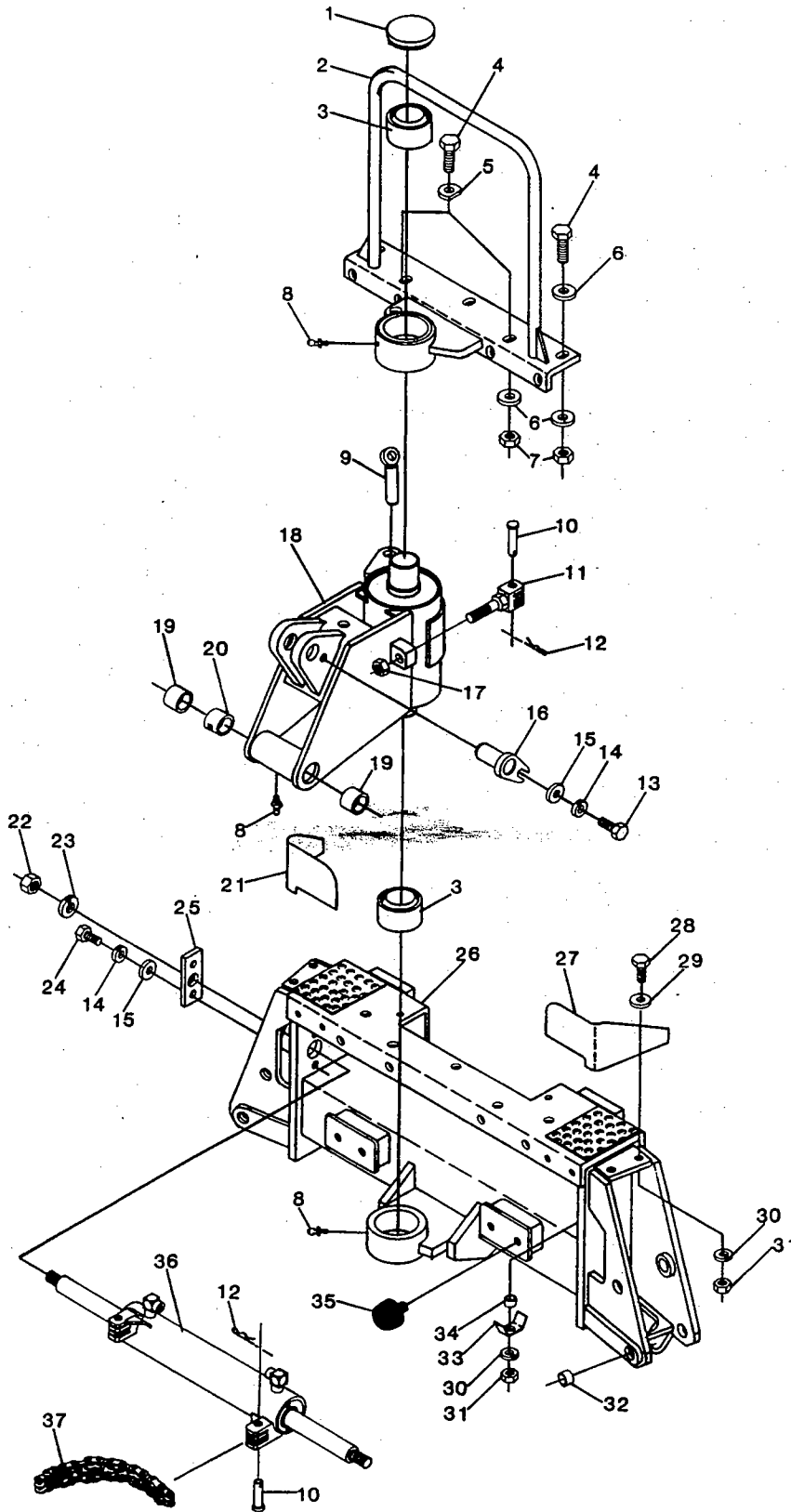
CONTENTS
MAINFRAME ASSEMBLY
STABILIZER ASSEMBLY
SEAT ASSEMBLY
BOOM ASSEMBLY
DIPPER ASSEMBLY
CONSOLE ASSEMBLY
VALVE ASSEMBLY
CYLINDER ASSEMBLIES
SUB HYDRAULIC KIT
HOSE SETS
SWING SPEED CONTROL OPTION
STABILIZER PAD OPTIONS
BUCKET ASSEMBLIES
DECALS

5259 6-13-90

MAINFRAME ASSEMBLY

ASSEMBLY #70258

5138 4-19-90



MAINFRAME ASSEMBLY

ASSEMBLY #70258

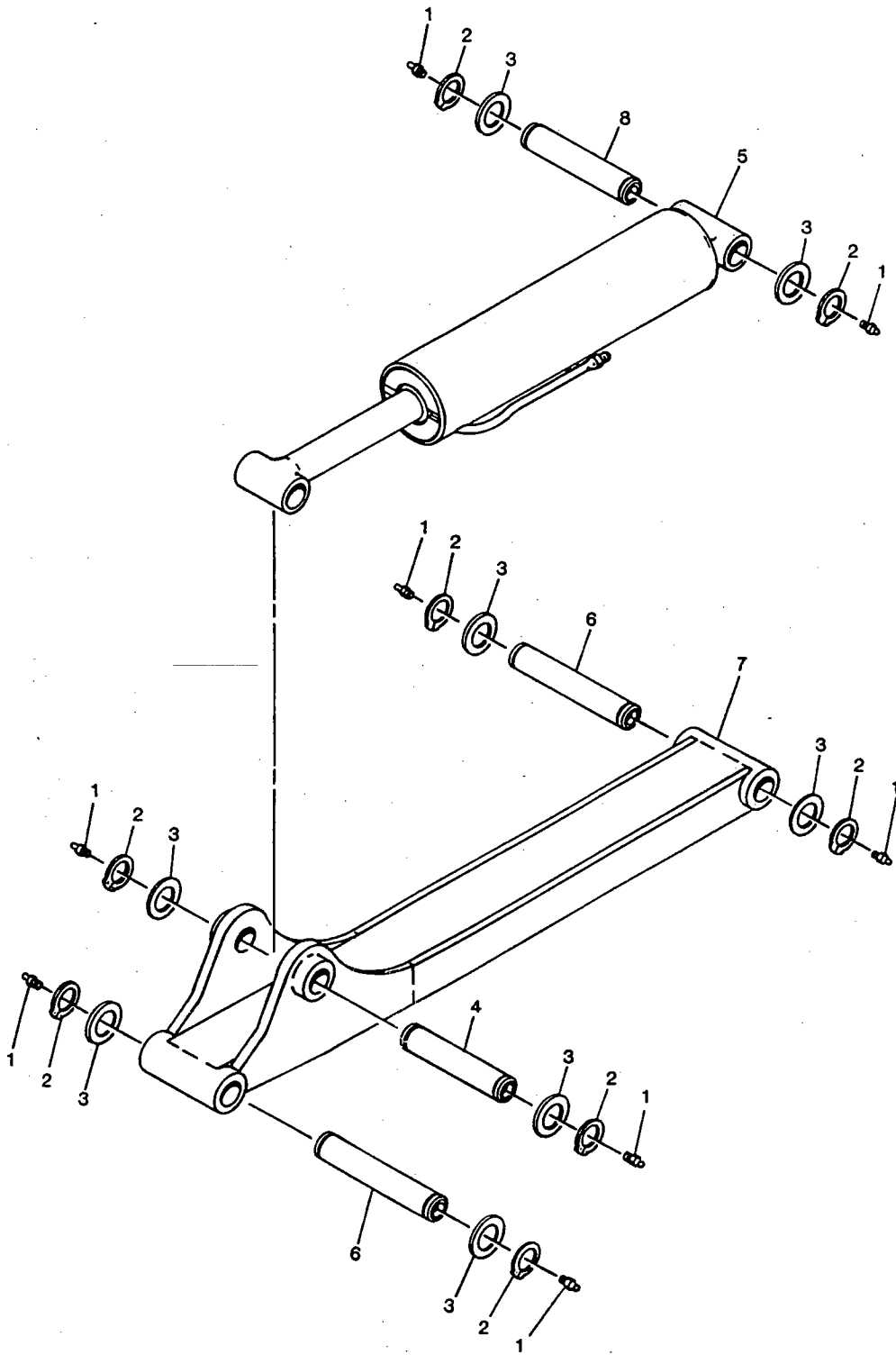
<u>NO</u>	<u>REQ'D</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>
1	1	9917	Bearing Cartridge Cap
2	1	53260	Top Bearing Mounting
3	2	9950	Bearing
4	9	1115	.62" UNC X 1.75" Hex Capscrew
5	2	54517	Special Washer
6	16	1627	.62" Hard Flat Washer
7	9	1230	.62" UNC Hex Nut
8	3	6616	Grease Zerk
9	1	6965	Anti-Swing Pin
10	4	6960	Swing Chain Pin
11	2	61114	Bolt
12	4	1611	Cotter Pin
13	1	1089	.50" UNC X 1.25" Hex Capscrew
14	3	1505	.50" Lock Washer
15	3	1527	.50" SAE Flat Washer
16	1	9757	Pin
17	2	1739	.88" UNC Nylock Nut
18	1	61113	Swing Post (Includes Two #6356 Bushings And One #69479 Bushing)
19	2	6356	Bushing
20	1	69479	Bushing
21	1	80565	Right Toe Guard
22	2	1904	1.00" Hex Nut
23	2	1509	1.00" Lock Washer
24	2	1090	.50" UNC X 1.50" Hex Capscrew
25	1	6252	Plate
26	1	69127	Mainframe (Includes Eight #56814 Bushings)
27	1	80566	Left Toe Guard
28	4	1044	.38" UNC X 1.25" Hex Capscrew
29	4	1514	.38" Flat Washer
30	6	1503	.38" Lock Washer
31	6	1226	.38" UNC Hex Nut
32	8	56814	Bushing
33	2	6186	Clamp
34	2	6799	Spacer
35	4	6886	Rubber Bumper
36	1	64892	Swing Cylinder
37	2	6959	Swing Chain

5139

1-2-96-4

STABILIZER ASSEMBLY

FOLD DOWN STABILIZER - SHORT
ASSEMBLY #70338



5262 6-15-90

STABILIZER ASSEMBLY

FOLD DOWN STABILIZER - SHORT
ASSEMBLY #70338

<u>NO.</u>	<u>REQ'D</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>
1	16	6616	Grease Zerk
2	16	1652	Snap Ring
3	VARIES	64728	Thrust Washer 1.25" X .031"
	VARIES	57693	Thrust Washer 1.25" X .078"
	VARIES	64727	Thrust Washer 1.25" X .125"
4	2	60784(1)	Pivot Pin 1.25" Dia. X 6.09"
5	2	61863	Stabilizer Cylinder Assembly
6	4	64549(2)	Pivot Pin 1.25" Dia. X 6.89"
7	2	71666	Stabilizer Arm, 32.50" Effective Length
8	2	57689(3)	Pivot Pin 1.25" Dia. X 6.34"

5263
7-3-90-2

NOTES:

Quantities listed are sufficient to make two stabilizers, enough for one complete backhoe.

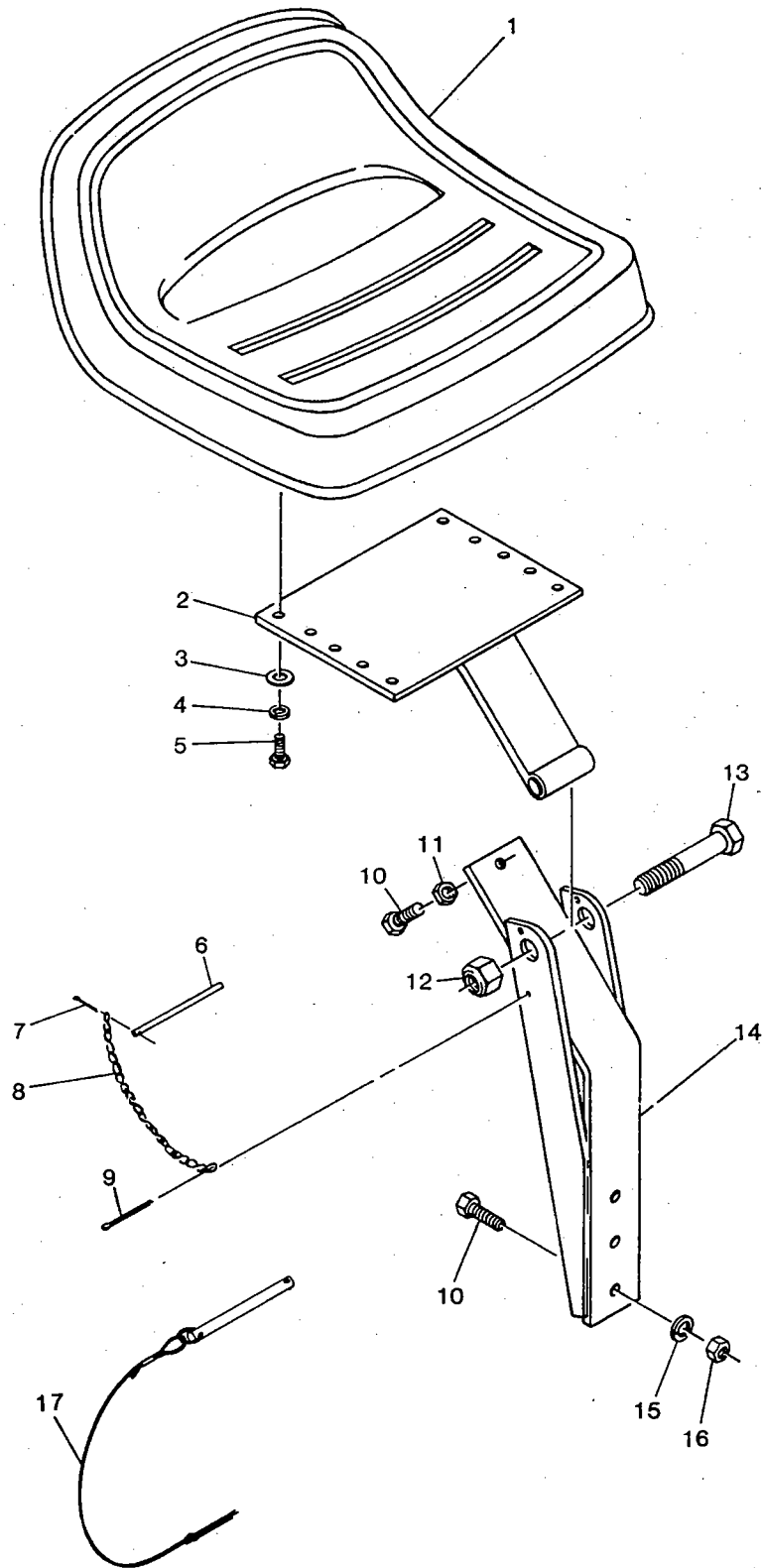
(1) Pivot pin #60784 is sold only in pin kit #74031. Kit includes one pin #60784, two thrust washers #64728, two snap rings #1652, and two grease zerks #6616.

(2) Pivot pin #64549 is sold only in pin kit #74032. Kit includes one pin #64549, two thrust washers #64728, two snap rings #1652, and two grease zerks #6616.

(3) Pivot pin #57689 is sold only in pin kit #74033. Kit includes one pin #57689, two thrust washers #64728, two snap rings #1652, and two grease zerks #6616.

SEAT ASSEMBLY

ASSEMBLY #54990



SEAT ASSEMBLY

ASSEMBLY #54990

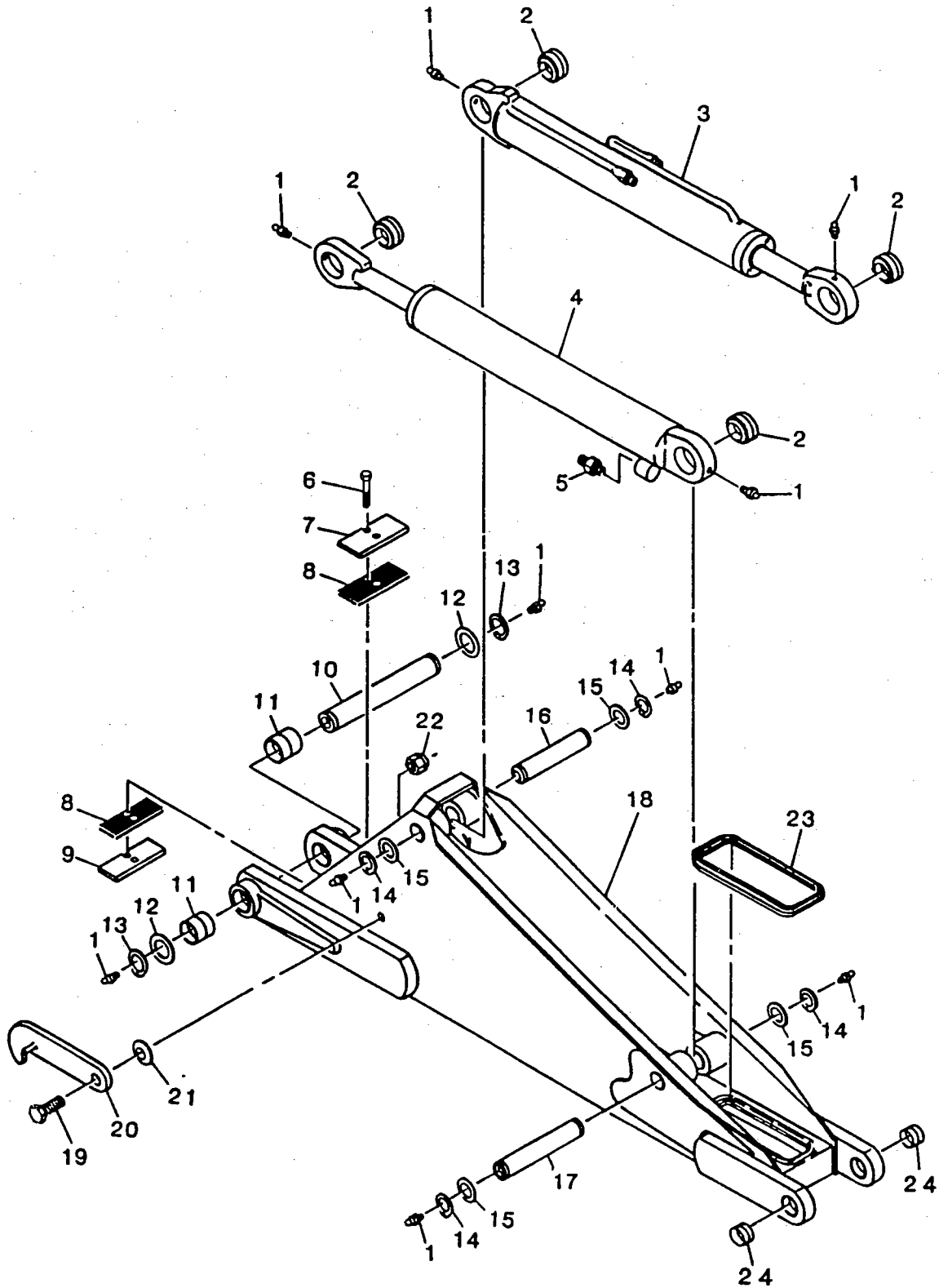
<u>NO</u>	<u>REQ'D</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>
1	1	6980	Seat
2	1	6979	Seat Pivot
3	4	1513	.31" Flat Washer
4	4	1502	.31" Lock Washer
5	4	1021	.31" UNC X .75" Hex Capscrew
6	1	52713 (1)	Seat Lock Pin
7	1	1659 (1)	.08" X .75" Cotter Pin
8	1	52712 (1)	Chain
9	1	1611 (1)	.12" X 1.00" Cotter Pin
10	3	1090 (1)	.50" UNC X 1.50" Hex Capscrew
11	1	1242	.50" UNC Jam Nut
12	1	1534	.75" UNC Nylock Nut
13	1	1147	.75" UNC X 4.00" Hex Capscrew
14	1	9977	Seat Mounting
15	2	1505	.50" Lock Washer
16	2	1228	.50" UNC Hex Nut
17	1	79280 (1)	.25" Detent Ring Pin
		80727 (2)	.38" Detent Ring Pin

NOTES:

- (1) .25" Detent Ring Pin #79280 replaces Seat Lock Pin #52713, Cotter Pins #1659 & 1611, Chain #52712, and Capscrews #1090 effective 3-4-92.
- (2) .38" Detent Ring Pin #80727 replaces .25" Detent Ring Pin #79280 on production units effective 6-15-93.

BOOM ASSEMBLY

ASSEMBLY #71712



BOOM ASSEMBLY

ASSEMBLY #71712

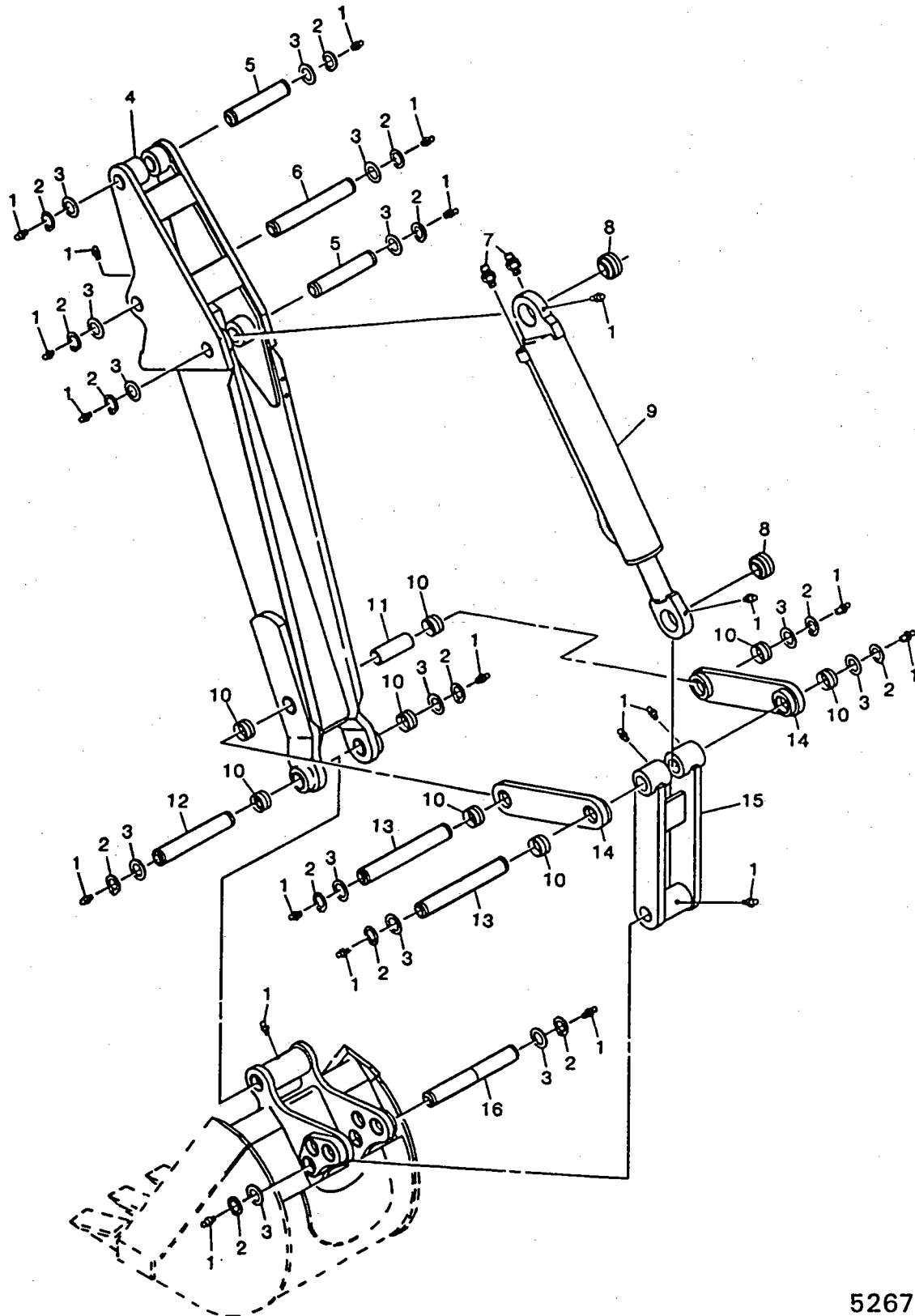
<u>NO</u>	<u>REQ'D</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>
1	10	6616	Grease Zerk
2	4	6615	Self-Aligning Bushing
3	1	71500	Dipper Cylinder Assembly
4	1	71716	Boom Cylinder Assembly
5	2	3103	Straight Adapter 8MBo-8Mj
6	2	1013	.25" UNC X 3.50" Hex Capscrew
7	1	69168	Upper Hose Clamp Plate
8	2	69167	Rubber Spacer
9	1	69166	Lower Hose Clamp Plate
10	1	6900 (1)	Pivot Pin 1.75" X 11.12"
11	2	6356	Bushing
12	VARIES	6622	Thrust Washer 1.75" X .078"
13	2	1651	Snap Ring 1.75" I.D.
14	4	1650	Snap Ring 1.38" I.D.
15	VARIES	6623	Thrust Washer 1.38" X .031"
	VARIES	64724	Thrust Washer 1.38" X .090"
	VARIES	64725	Thrust Washer 1.38" X .125"
16	1	58053 (2)	Pivot Pin 1.38" X 7.00"
17	1	69131 (3)	Pivot Pin 1.38" X 7.72"
18	1	69130	Boom (Includes 2 6356 Bushings and 2 #6355 Bushings)
19	1	1139	.75" UNC X 2.00" Hex Capscrew
20	1	6938	Boom Hook
21	1	6562	Spring Washer
22	1	1534	.75" UNC Lock Nut
23	1	34109	23" Rubber Edging
24	2	6355	Bushing

NOTES:

- (1) Pivot pin #6900 is sold only in pin kit #52611. Kit includes one pin #6900, two thrust washer #6622, two snap rings #1650, and two grease zerks #6616.
- (2) Pivot pin #58053 is sold only in pin kit #74014. Kit includes one pin #58053, two thrust washer #6623, two snap rings #1650, and two grease zerks #6616.
- (3) Pivot pin #69131 is sold only in pin kit #74015. Kit includes one pin #69131, two thrust washer #6623, two snap rings #1650, and two grease zerks #6616.

DIPPER ASSEMBLY

ASSEMBLY #71713



DIPPER ASSEMBLY

ASSEMBLY #71713

<u>NO</u>	<u>REQ'D</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>
1	21	6616	Grease Zerk
2	14	1650	Snap Ring 1.38" I.D.
3	VARIES	6623	Thrust Washer 1.38" X .031"
	VARIES	64724	Thrust Washer 1.38" X .090"
	VARIES	64725	Thrust Washer 1.38" X .125"
4	1	67104	Dipper (Includes 4 #6355 Bushings)
5	2	61234 (1)	Pivot Pin 1.38" Dia. X 6.81"
6	1	6899 (2)	Pivot Pin 1.38" Dia. X 9.50"
7	2	3103	Straight Adapter 8MBo-8MJ
8	2	6615	Self-Aligning Bushing
9	1	71496	Bucket Cylinder Assembly
10	8	6355	Bushing 1.38" I.D.
11	1	58059	Spacer Tube
12	1	6897 (5)	Pivot Pin 1.38" Dia. X 10.25"
13	2	6896 (4)	Pivot Pin 1.38" Dia. X 10.00"
14	2	6912	Dipper Link (Includes 2 #6355 Bushings)
15	1	6930	Bucket Link
16	1	6375 (3)	Pivot Pin 1.38" Dia. X 8.38"

NOTES:

- (1) Pivot pin #61234 is sold only in pin kit #69875. Kit includes one pin #61234, two thrust washers #6623, two snap rings #1650, and two grease zerks #6616.
- (2) Pivot pin #6899 is sold only in pin kit #52612. Kit includes one pin #6899, two thrust washers #6623, two snap rings #1650, and two grease zerks #6616.
- (3) Pivot pin #6375 is sold only in pin kit #52610. Kit includes one pin #6375, two thrust washers #6623, two snap rings #1650, and two grease zerks #6616.
- (4) Pivot pin #6896 is sold only in pin kit #52613. Kit includes one pin #6896, two thrust washers #6623, two snap rings #1650, and two grease zerks #6616.
- (5) Pivot pin #6897 is sold only in pin kit #52614. Kit includes one pin #6897, two thrust washers #6623, two snap rings #1650, and two grease zerks #6616.

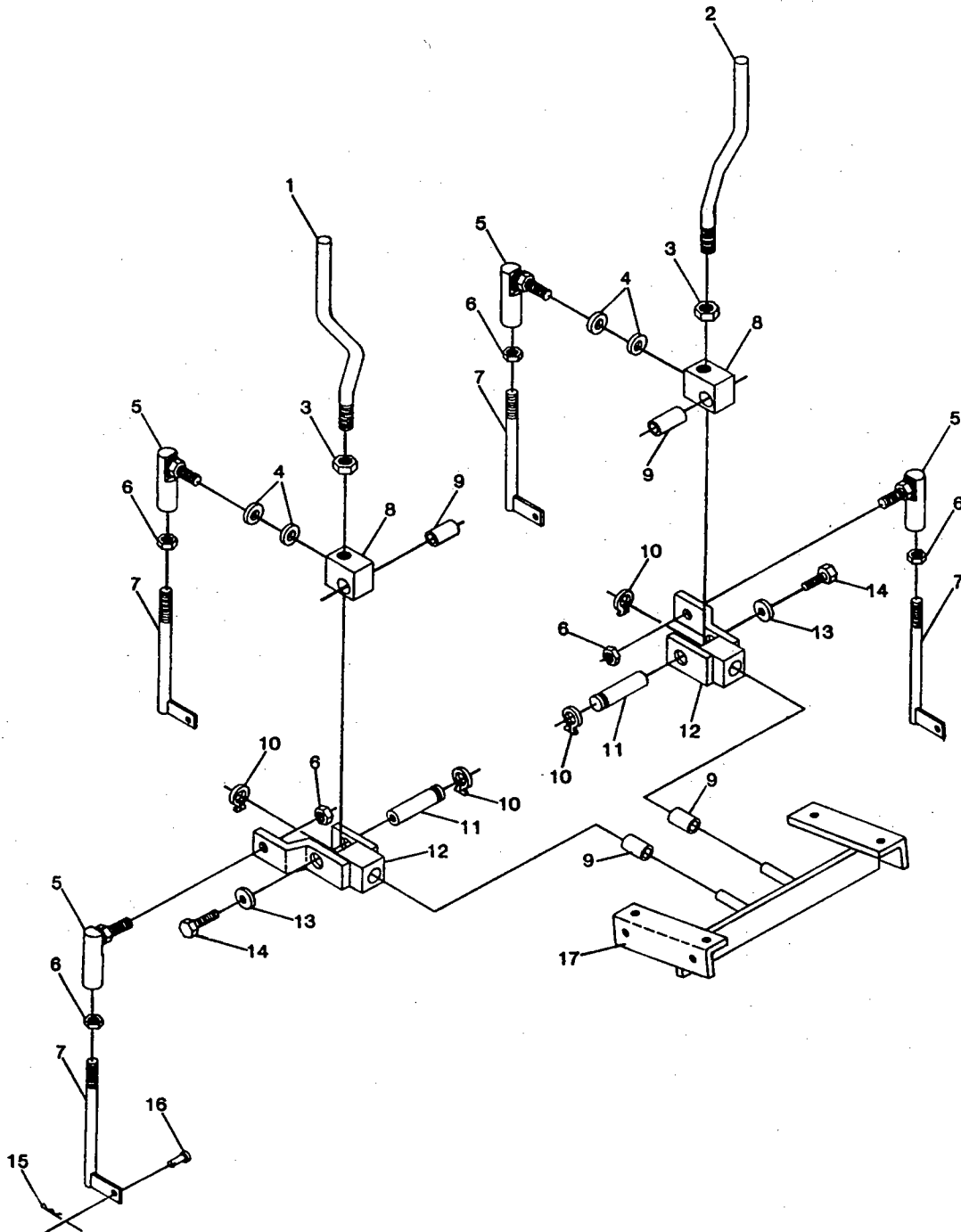
5268

11-7-94-3

CONSOLE ASSEMBLY

ASSEMBLY #63620

DIA. 1 OF 2



5235 6-6-90

CONSOLE ASSEMBLY

ASSEMBLY #63620

LIST 1 OF 2

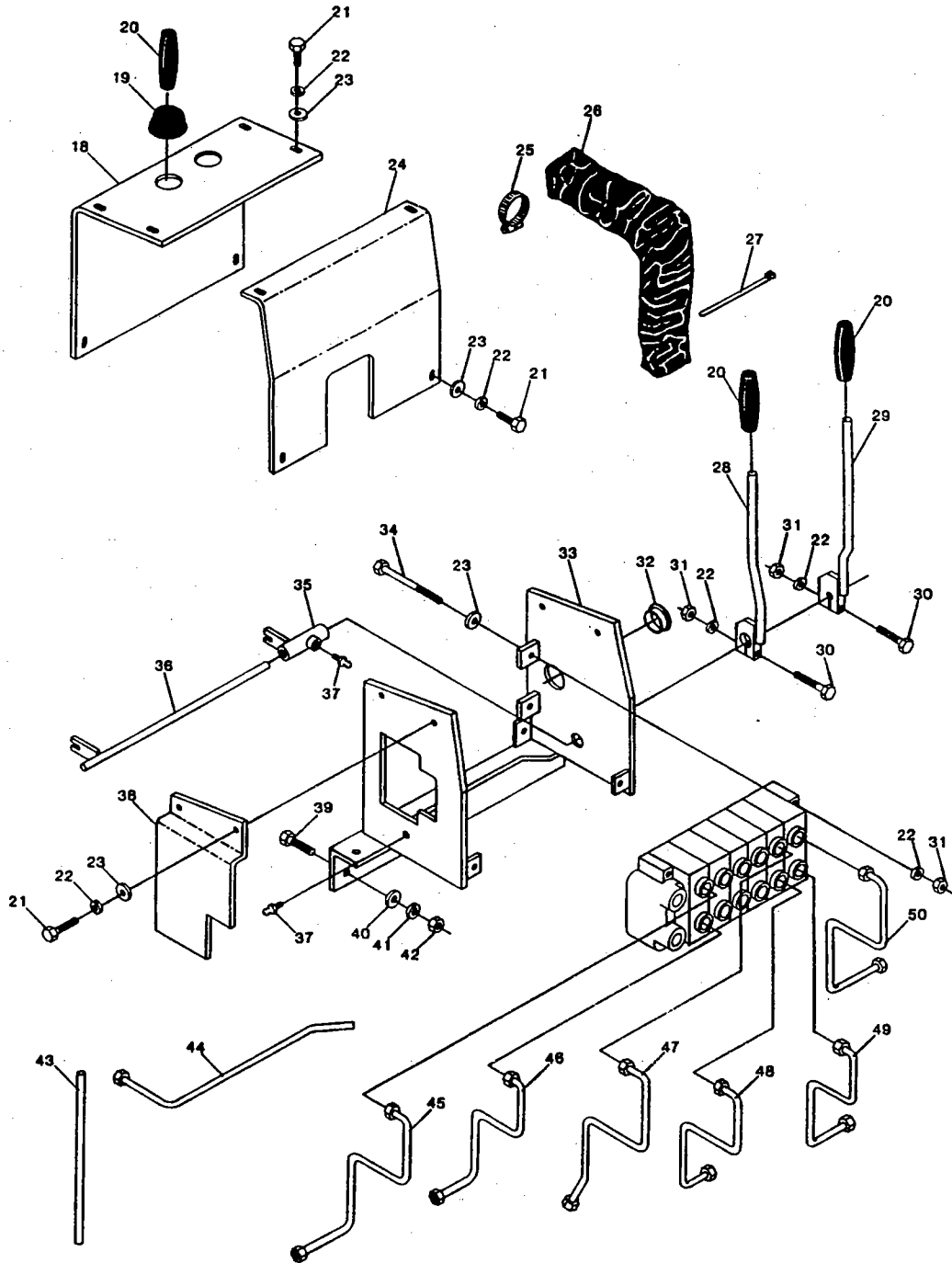
<u>NO.</u>	<u>REQ'D</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>
1	1	61162	Dipper & Bucket Control Lever
2	1	61161	Boom & Swing Control Lever
3	2	1244	.62" UNC Hex Nut
4	4	1527	.50" SAE Flat Washer
5	4	54099	Ball Joint
6	6	1492	.50" UNF Jam Nut
7	4	54314	Push Rod
8	2	54310	Pivot Block (Includes one #6961 Bushing)
9	4	6961	Bushing
10	4	6274	Snap Ring
11	2	6271	Pivot Pin .62" Dia. X 2.12"
12	2	54311	Pivot Yoke (Includes one #6961 Bushing)
13	2	1525	.38" SAE Flat Washer
14	2	1292	.38" UNF X .75" Hex Capscrew
15	6	1659	Cotter Pin
16	6	6776	Clevis Pin
17	1	54313	Control Bracket

5236 10-10-90-2

CONSOLE ASSEMBLY

ASSEMBLY #63620

DIA. 2 OF 2



5237 6-6-90

CONSOLE ASSEMBLY

ASSEMBLY #63620

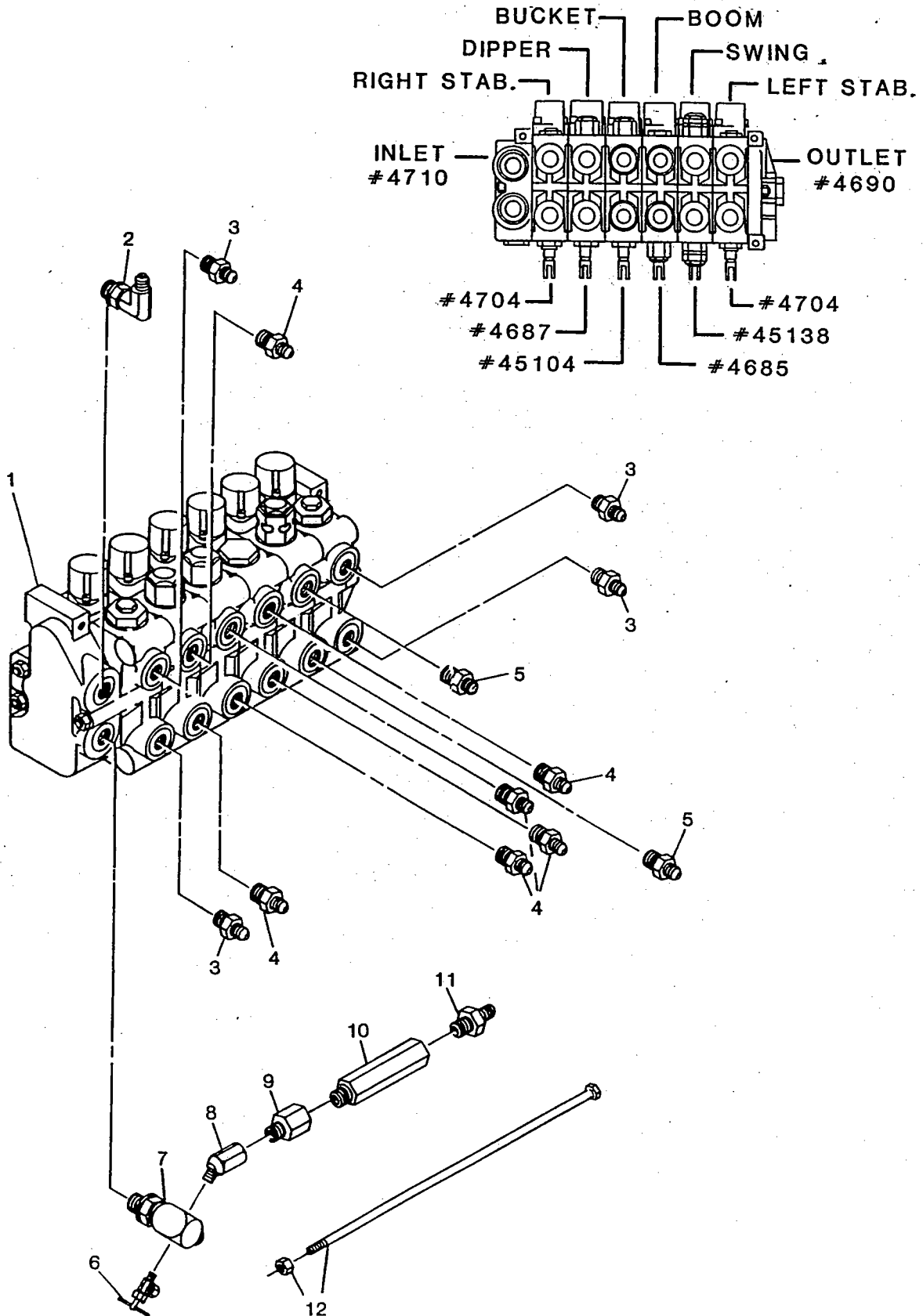
LIST 2 OF 2

<u>NO</u>	<u>REQ'D</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>
18	1	54519	Back Console Cover
19	2	9010	Rubber Boot
20	4	5655	Handle Grip
21	12	1021	.31" UNC X .75" Hex Capscrew
22	17	1502	.31" Lock Washer
23	15	1513	.31" Flat Washer
24	1	54518	Front Console Cover
25	2	53167	Hose Clamp
26	1	34101	Hose Sock 4" X 52"
27	1	7104	HOse Tie
28	1	54305	Left Stabilizer Control Lever
29	1	54304	Right Stabilizer Control Lever
30	2	1025	.31" UNC X 1.75" Hex Capscrew
31	5	1225	.31" UNC Hex Nut
32	1	7096	Button Plug
33	1	54500	Console
34	3	1030	.31" UNC X 3.00" Hex Capscrew
35	1	54317	Linkage
36	1	54320	Pivot Linkage
37	2	6616	Grease Zerk
38	1	57501	Valve End Cover
39	4	1045	.38" UNC X 1.50" Hex Capscrew
40	4	1514	.38" Flat Washer
41	4	1503	.38" Lock Washer
42	4	1226	.38" UNC Hex Nut
43	1	35110	.25" X 20" Plastic Drain Tube
44	1	57515	Hudraulic Relief Tube
45	1	54527	Hydraulic Tube Stabilizer - Right Top
46	1	54528	Hydraulic Tube Stabilizer - Right Bottom
47	1	54868	Hydraulic Tube Swing - Top
48	1	54526	Hydraulic Tube Swing - Bottom
49	1	54529	Hydraulic Tube Stabilizer - Left Bottom
50	1	54530	Hydraulic Tube Stabilizer - Left Top

5238
3-18-97-3

VALVE ASSEMBLY

GRESEN VALVE
ASSEMBLY #2190



5264 6-18-90

VALVE ASSEMBLY

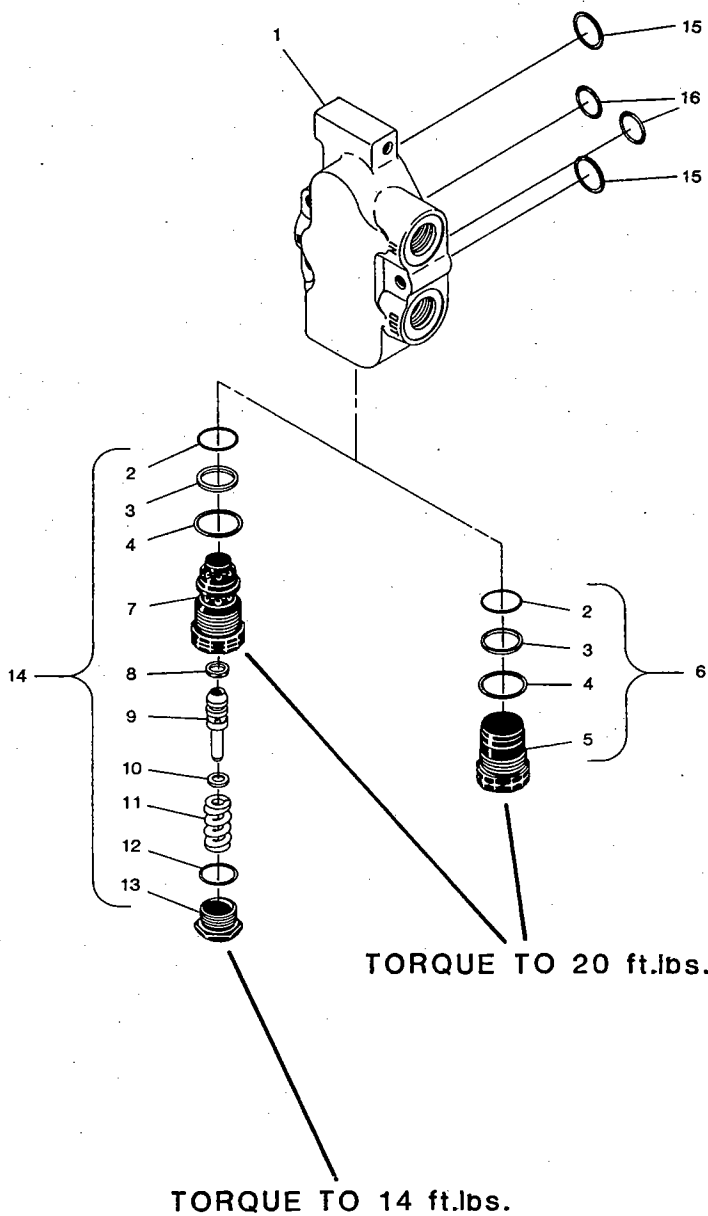
GRESEN VALVE
ASSEMBLY #2190

<u>NO.</u>	<u>REQ'D</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>
1	1	54332	6 Spool Gresen V20 Valve
2	1	30068	90° Male Connector (Long) 10MBo-8MJ
3	4	3269	O-Ring Boss Adapter 8MBo-6MJ
4	6	3270	O-Ring Boss Adapter 10MBo-8MJ
5	2	3362	O-Ring Boss Adapter 10MBo-6MJ
6	1	3360	Needle Valve
7	1	79575	90° Custom Fitting
8	1	3393	45° Street Elbow 4MP-6FP
9	1	3394	Pipe Expander 4MP-6FP
10	1	57547	.38" NPT Relief Valve
11	1	3138	Male Connector
12	3	4726	Replacement Tie Rod Assembly

5265 7-20-93-2

VALVE ASSEMBLY

GRESEN INLET COVER



4629 8-29-90-2

VALVE ASSEMBLY

GRESEN INLET COVER

<u>NO</u>	<u>REQ'D</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>
1	1	4710	Inlet Cover (#10 Ports)
2	1		Inner O-Ring Seal
3	1		Inner Back-Up Washer
4	1		Main O-Ring Seal
5	1		Main Relief Plug
6		45141	Main Relief Plug Assembly (Includes One Each Of Items 2 - 5.)
7	1		WH Main Relief Body
8	1		Relief Poppet Piston Ring
9	1		Relief Poppet
10	VARIES		Shim(s)
11	1		Relief Spring
12	1		Relief Cap O-Ring Seal
13	1		Relief Cap
14		45148*	Optional WH Main Relief Valve Assembly (Includes One Each Of Items 2, 3, 4, and 7 - 13.)
15	2		Exhaust Passage O-Ring Seal
16	2		Pressure Passage O-Ring Seal

* PLEASE STATE BACKHOE MODEL NUMBER WHEN ORDERING MAIN RELIEF VALVE ASSEMBLY.

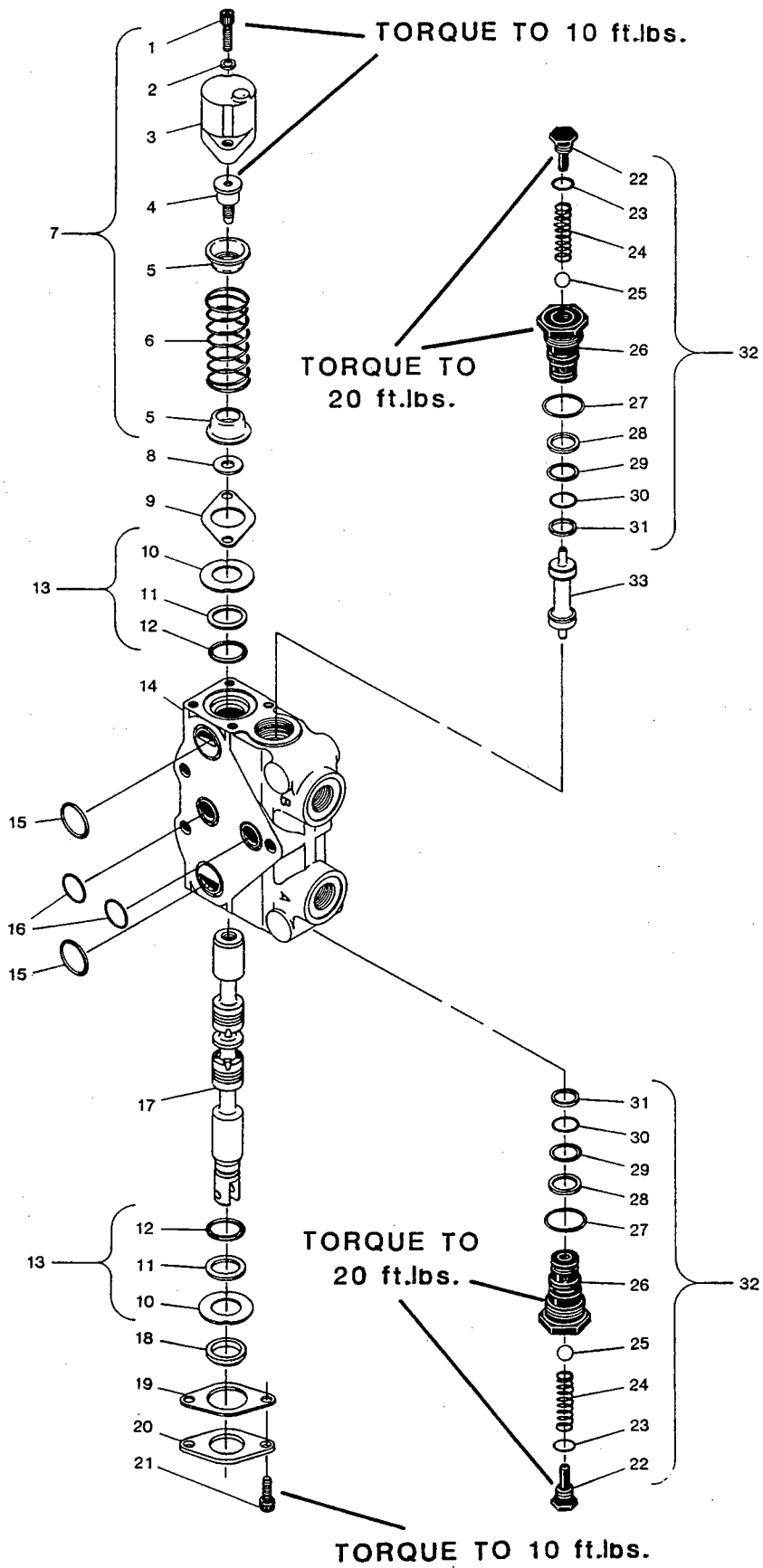
NOTE: Items without part numbers are not sold separately. These parts are only available in the various subassemblies shown on the diagram, or in the seal kits listed below.

Valve Section Seal Kit #4653 contains two each of items 15 & 16.

Main Relief Assembly Seal Kit #45142 contains one each of items 2, 3, 4, & 12.

VALVE ASSEMBLY

GRESEN STABILIZER SECTION
ASSEMBLY #4704



4631 8-29-90-2

VALVE ASSEMBLY

GRESEN STABILIZER SECTION ASSEMBLY #4704

<u>NO.</u>	<u>REQ'D</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>
1	2		.25" X .88" Screw
2	2		.25" Lock Washer
3	1		Bonnet
4	1		Collar Spool
5	2		Collar Stop
6	1		Collar Spring
7		4717	Spool Positioner Assembly (Includes Items 1 - 6)
8	1		Washer
9	1	45287	Upper Retainer Plate
10	2		Retainer Plate Washer
11	2		Back-Up Washer
12	2		Spool O-Ring Seal
13		4688	Spool Seal Kit (Includes One Each Of Items 10, 11 & 12)
14	1		Lockout Valve Section Casting
15	2		Exhaust Passage O-Ring Seal
16	2		Pressure Passage O-Ring Seal
17	1		Spool
18	1	4793	Spool Wiper
19	1	45288	Seal Plate
20	1	54631	Lower Retainer Plate
21	2	4658	.25" X .75" Screw
22	2		Check Cap
23	2		Check Cap O-Ring Seal
24	2		Spring
25	2		Steel Ball
26	2		Lockout Check Body
27	2		Main O-Ring Seal
28	2		Outer Back-Up Ring
29	2		Outer O-Ring Seal
30	2		Inner O-Ring Seal
31	2		Inner Back-Up Ring
32		4819	Lockout Check Assembly (In- cludes One Of Items 22 - 31)
33	1		Unlocking Piston

NOTE: Items without part numbers are not sold separately.

Spool Seal Kit #4688 contains one of items 10, 11, & 12.

Valve Section Seal Kit #4653 contains two of items 15 & 16.

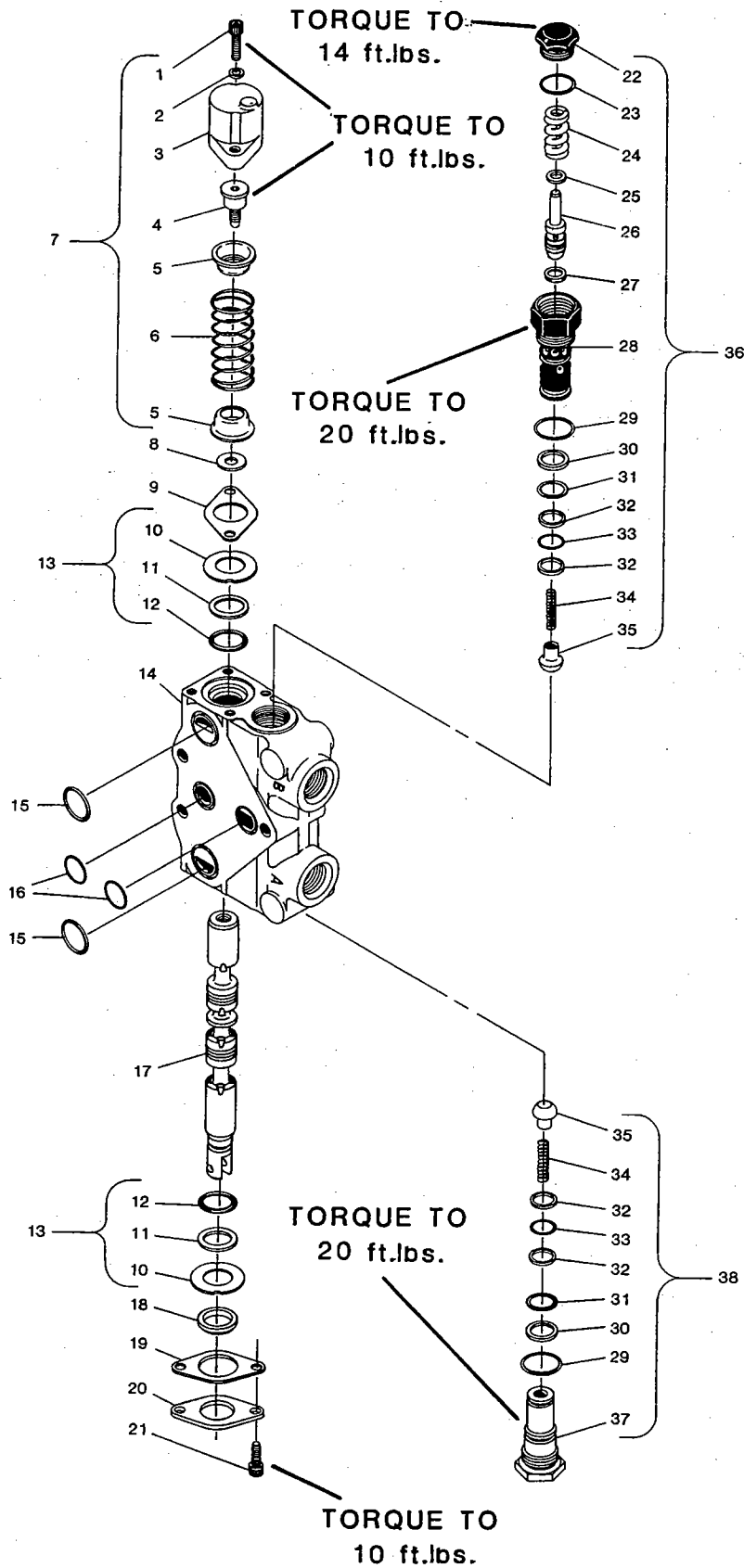
Lockout Check Assembly Seal Kit #4829 contains one of items 23, and 27 - 31.

Complete Stabilizer Section Seal Kit #45102 contains two of seal kits #4688 & #4829, and one seal kit #4653 & item 18.

4632 2-22-89

VALVE ASSEMBLY

GRESEN VALVE SECTION
ASSEMBLY #4687



4635 8-29-90-3

VALVE ASSEMBLY

GRESEN VALVE SECTION
ASSEMBLY #4687

<u>NO.</u>	<u>REQ'D</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>
1	2		.25" X .88" Screw
2	2		.25" Lock Washer
3	1		Bonnet
4	1		Collar Spool
5	2		Collar Stop
6	1		Collar Spring
7		4717	Spool Positioner Assembly (Includes Items 1 - 6)
8	1		Washer
9	1	45287	Upper Retainer Plate
10	2		Retainer Plate Washer
11	2		Back-Up Washer
12	2		Spool O-Ring Seal
13		4688	Spool Seal Kit (Includes One Each Of Items 10,11, & 12)
14	1		Valve Section Casting
15	2		Exhaust Passage O-Ring Seal
16	2		Pressure Passage O-Ring Seal
17	1		Spool
18	1	4793	Spool Wiper
19	1	45288	Seal Plate
20	1	54631	Lower Retainer Plate
21	2	4658	.25" X .75" Screw
22	1		Relief Cap
23	1		Relief Cap O-Ring Seal
24	1		Relief Spring
25	VARIES		Shim(s)
26	1		Relief Poppet
27	1		Relief Poppet Piston Ring
28	1		Relief Body
29	2		Main O-Ring Seal
30	2		Outer Back-Up Washer
31	2		Outer O-Ring Seal
32	4		Inner Back-Up Washer
33	2		Inner O-Ring Seal
34	2		Check Spring
35	2		Check Poppet
36		4665	Cylinder Port Relief Assembly (Includes Items 22 - 35)
37	1		Load Check Plug
38		4673	Load Check Plug Assembly (Includes Items 29 - 35, & 37)

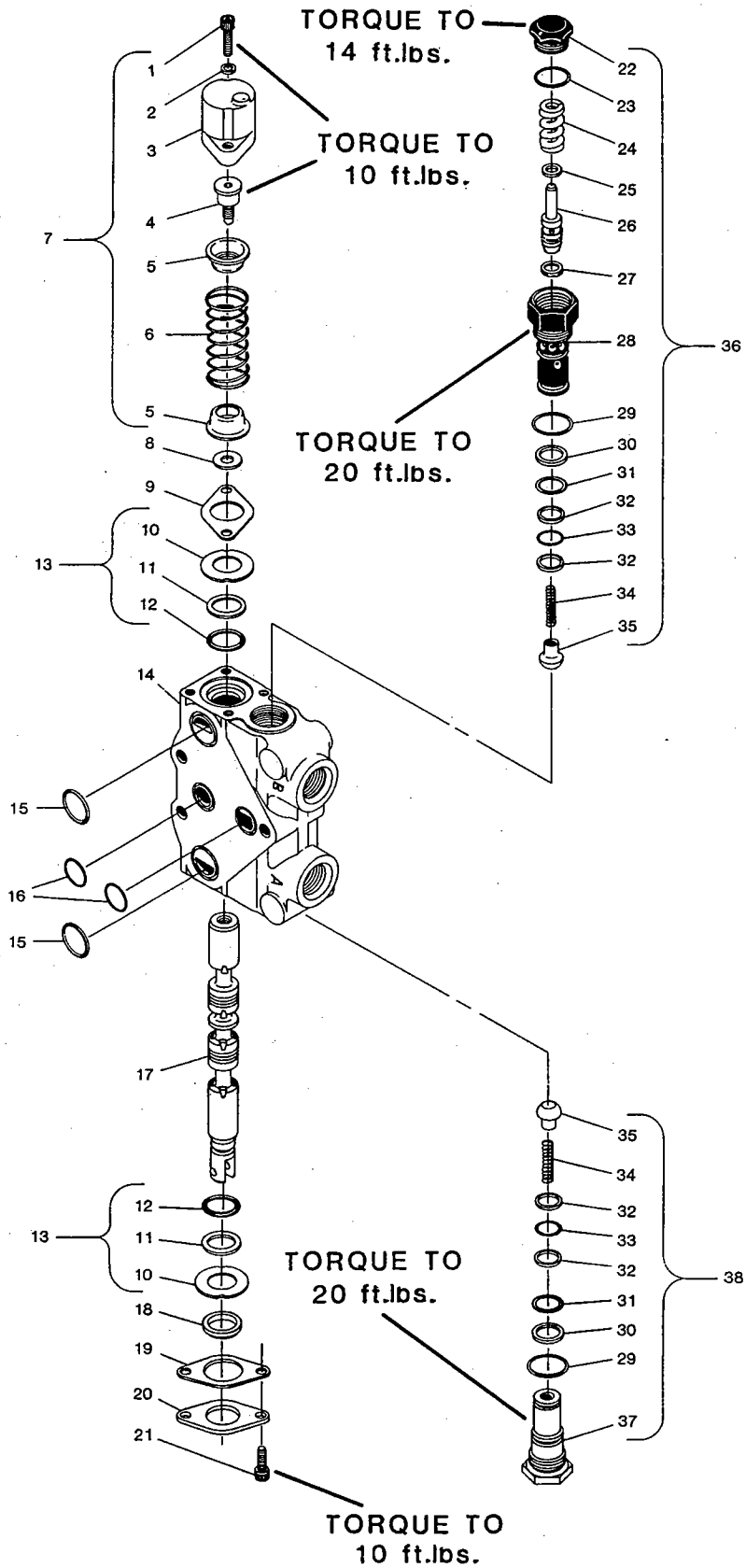
NOTE: Items without part numbers are not sold separately.
Valve Section Seal Kit #4653 contains two of items 15 & 16.
Port Relief/Load Check Assembly Seal Kit #4666 includes one
each of items 23, 27, 29, 30, 31, 33 and two of item 32.
Complete Dipper Section Seal Kit #45103 includes two of seal
kits #4666, #4688, and one of seal kit #4653 and item 18.

4636 7-3-89-2

VALVE ASSEMBLY

GRESEN BUCKET SECTION

ASSEMBLY #45104



4633 8-29-90-2

VALVE ASSEMBLY

GRESEN BUCKET SECTION

ASSEMBLY #45104

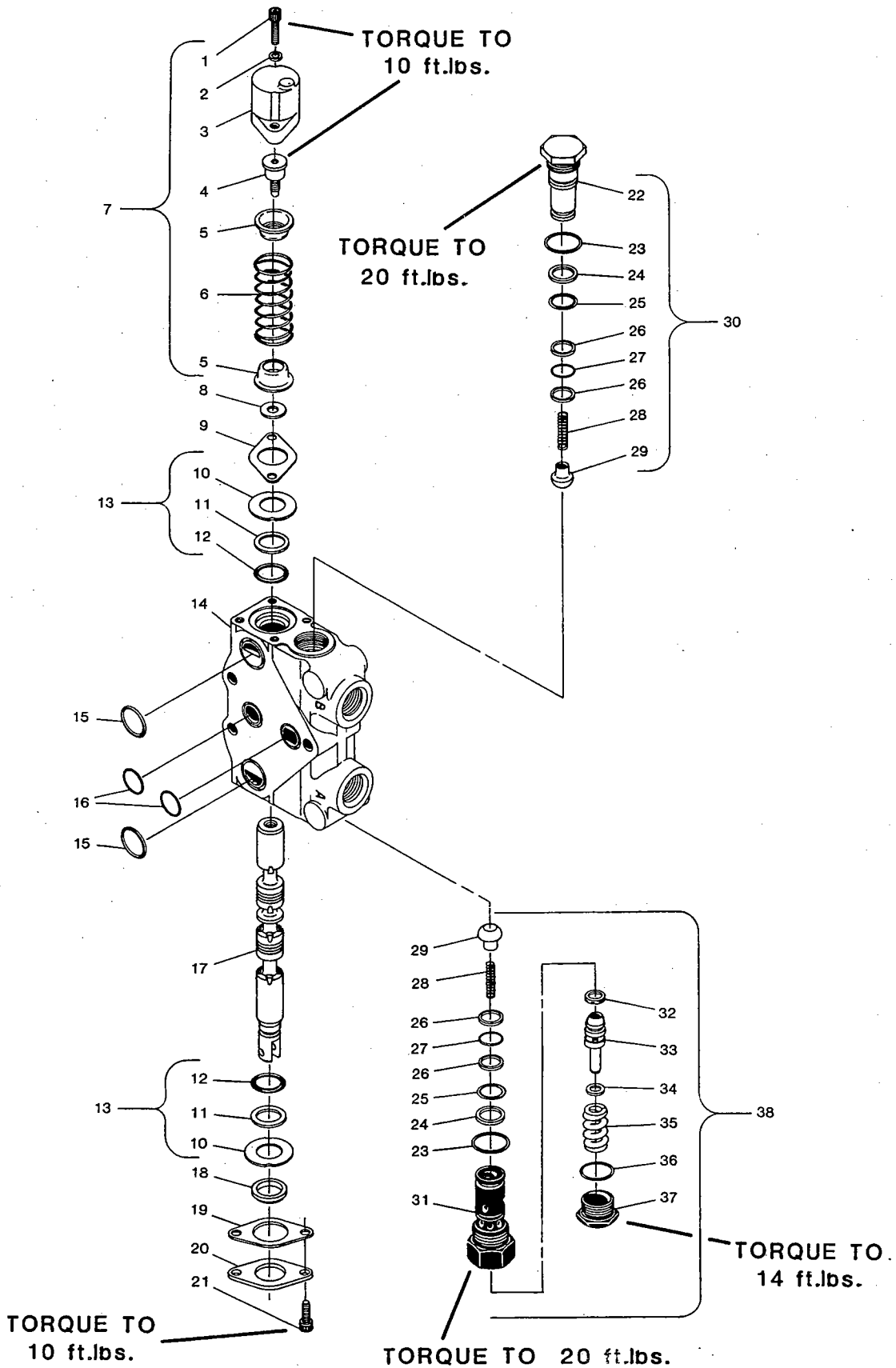
<u>NO.</u>	<u>REQ'D</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>
1	2		.25" X .88" Screw
2	2		.25" Lock Washer
3	1		Bonnet
4	1		Collar Spool
5	2		Collar Stop
6	1		Collar Spring
7		4717	Spool Positioner Assembly (Includes Items 1 - 6)
8	1		Washer
9	1	45287	Upper Retainer Plate
10	2		Retainer Plate Washer
11	2		Back-Up Washer
12	2		Spool O-Ring Seal
13		4688	Spool Seal Kit (Includes One Each Of Items 10,11, & 12)
14	1		Valve Section Casting
15	2		Exhaust Passage O-Ring Seal
16	2		Pressure Passage O-Ring Seal
17	1		Spool
18	1	4793	Spool Wiper
19	1	45288	Seal Plate
20	1	54631	Lower Retainer Plate
21	2	4658	.25" X .75" Screw
22	1		Relief Cap
23	1		Relief Cap O-Ring Seal
24	1		Relief Spring
25	VARIABLES		Shim(s)
26	1		Relief Poppet
27	1		Relief Poppet Piston Ring
28	1		Relief Body
29	2		Main O-Ring Seal
30	2		Outer Back-Up Washer
31	2		Outer O-Ring Seal
32	4		Inner Back-Up Washer
33	2		Inner O-Ring Seal
34	2		Check Spring
35	2		Check Poppet
36		45100	Cylinder Port Relief Assembly (Includes Items 22 - 35)
37	1		Load Check Plug
38		4673	Load Check Plug Assembly (Includes Items 29 - 35, & 37)

NOTE: Items without part numbers are not sold separately.
Valve Section Seal Kit #4653 contains two of items 15 & 16.
Port Relief/Load Check Assembly Seal Kit #4666 includes one
each of items 23, 27, 29, 30, 31, 33 and two of item 32.
Complete Bucket Section Seal Kit #45103 includes two of seal
kits #4666, #4688, and one of seal kit #4653 and item 18.

4634 2-22-89

VALVE ASSEMBLY

GRESEN VALVE SECTION
ASSEMBLY #4685



4637 8-29-90-3

VALVE ASSEMBLY

GRESEN VALVE SECTION

ASSEMBLY #4685

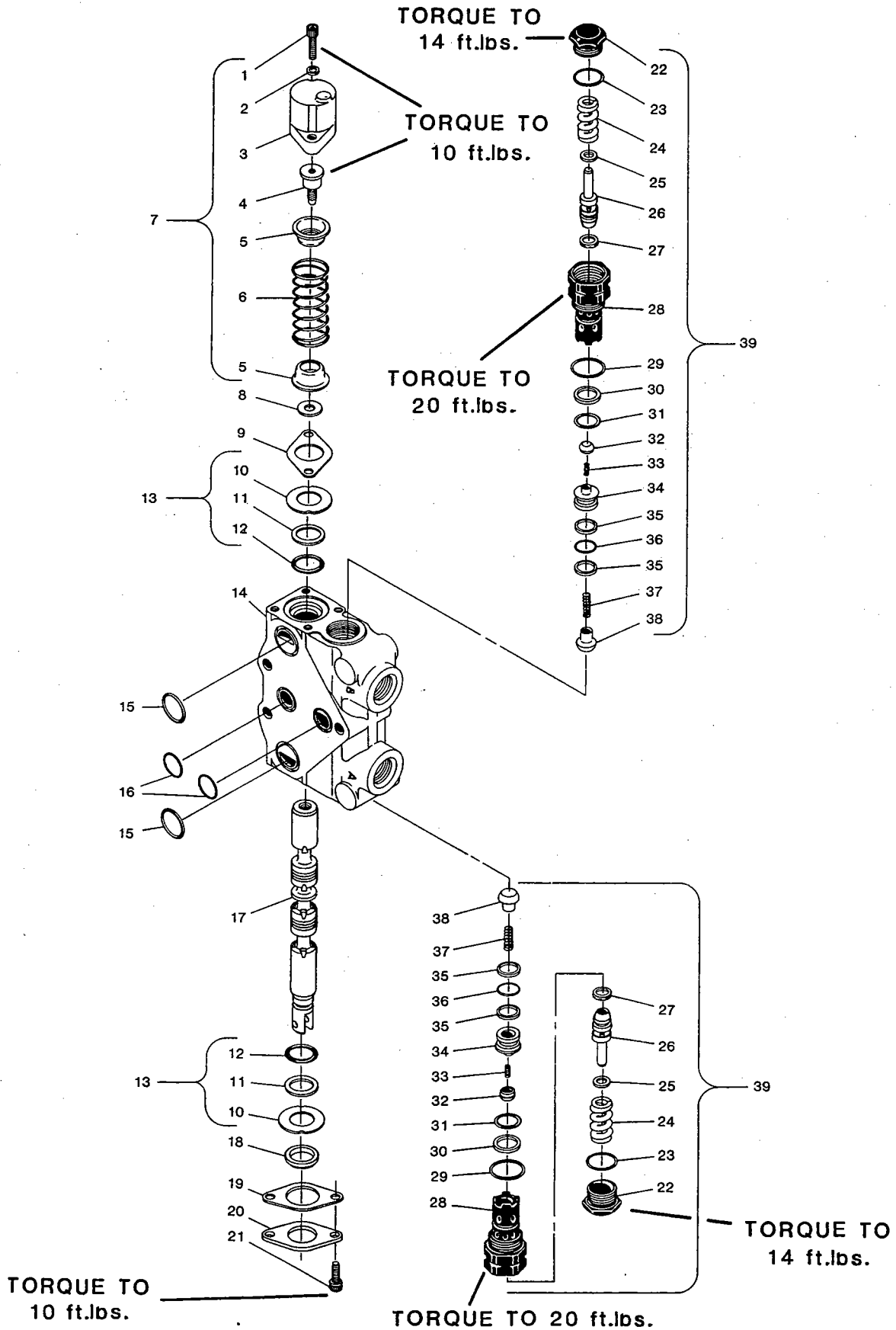
<u>NO.</u>	<u>REQ'D</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>
1	2		.25" X .88" Screw
2	2		.25" Lock Washer
3	1		Bonnet
4	1		Collar Spool
5	2		Collar Stop
6	1		Collar Spring
7		4717	Spool Positioner Assembly (Includes Items 1 - 6)
8	1		Washer
9	1	45287	Upper Retainer Plate
10	2		Retainer Plate Washer
11	2		Back-Up Washer
12	2		Spool O-Ring Seal
13		4688	Spool Seal Kit (Includes One Each Of Items 10, 11, & 12)
14	1		Valve Section Casting
15	2		Exhaust Passage O-Ring Seal
16	2		Pressure Passage O-Ring Seal
17	1		Spool
18	1	4793	Spool Wiper
19	1	45288	Seal Plate
20	1	54631	Lower Retainer Plate
21	2	4658	.25" X .75" Screw
22	1		Load Check Plug
23	2		Main O-Ring Seal
24	2		Outer Back-Up Washer
25	2		Outer O-Ring Seal
26	4		Inner Back-Up Washer
27	2		Inner O-Ring Seal
28	2		Check Spring
29	2		Check Poppet
30		4673	Load Check Plug Assembly (Includes Items 22 - 29)
31	1		Relief Body
32	1		Relief Poppet Piston Ring
33	1		Relief Poppet
34	VARIES		Shim(s)
35	1		Relief Spring
36	1		Relief Cap O-Ring Seal
37	1		Relief Cap
38	1	4665	Cylinder Port Relief Assembly (Includes Items 23-29, & 31-33)

NOTE: Items without part numbers are not sold separately.
 Valve Section Seal Kit #4653 contains two of items 15 & 16.
 Cylinder Port Relief/Load Check Assembly Seal Kit #4666 includes one of items 23 - 25, 27, 32, 36, and two of item 26.
 Complete Boom Section Seal Kit #45103 includes two of seal kits #4666, #4688, and one of seal kit #4653 and item 18.

4638 7-3-89-2

VALVE ASSEMBLY

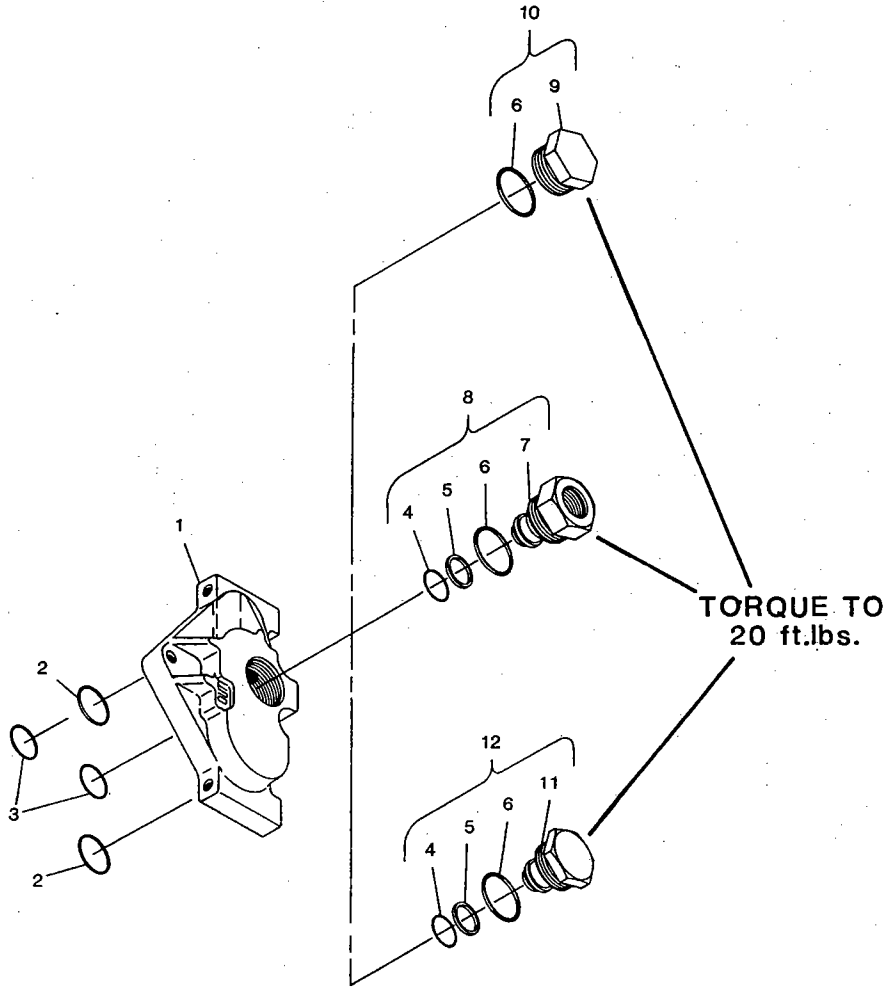
GRESEN SWING SECTION
ASSEMBLY #45138



4639 8-29-90-2

VALVE ASSEMBLY

GRESEN OUTLET COVER



4641 8-29-90-2

VALVE ASSEMBLY

GRESEN SWING SECTION
ASSEMBLY #45138

<u>NO.</u>	<u>REQ'D</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>
1	2		.25" X .88" Screw
2	2		.25" Lock Washer
3	1		Bonnet
4	1		Collar Spool
5	2		Collar Stop
6	1		Collar Spring
7		4717	Spool Positioner Assembly (Includes Items 1 - 6)
8	1		Washer
9	1	45287	Upper Retainer Plate
10	2		Retainer Plate Washer
11	2		Back-Up Washer
12	2		Spool O-Ring Seal
13		4688	Spool Seal Kit (Includes One Each Of Items 10,11, & 12)
14	1		Valve Section Casting
15	2		Exhaust Passage O-Ring Seal
16	2		Pressure Passage O-Ring Seal
17	1		Spool
18	1	4793	Spool Wiper
19	1	45288	Seal Plate
20	1	54631	Lower Retainer Plate
21	2	4658	.25" X .75" Screw
22	2		Relief Cap
23	2		Relief Cap O-Ring Seal
24	2		Relief Spring
25	VARIES		Shim(s)
26	2		Relief Poppet
27	2		Relief Poppet Piston Ring
28	2		Relief/Anti-Cav. Check Body
29	2		Main O-Ring Seal
30	2		Outer Back-Up Washer
31	2		Outer O-Ring Seal
32	2		Anti-Cavitation Poppet
33	2		Anti-Cavitation Spring
34	2		Poppet Retainer
35	4		Inner Back-Up Washer
36	2		Inner O-Ring Seal
37	2		Check Spring
38	2		Check Poppet
39		45139	Relief/Anti-Cav. Check Assy. (Includes One Of Items 22-38)

NOTE: Items without part numbers are not sold separately.
Valve Section Seal Kit #4653 contains two of items 15, & 16.
Relief/Anti-Cavitation Check Assembly Seal Kit #4666 contains
one of items 23, 27, 29, 30, 31, 36, and two of item 35.
Complete Swing Section Seal Kit #45103 contains two of seal
kits #4666, and #4688, and one of seal kit #4653 and item 18.

4640 2-22-89

VALVE ASSEMBLY

GRESEN OUTLET COVER

<u>NO.</u>	<u>REQ'D</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>
1	1	4690	Outlet Cover Casting
2	2		Exhaust Passage O-Ring Seal
3	2		Pressure Passage O-Ring Seal
4	1		Inner O-Ring Seal
5	1		Inner Back-Up Washer
6	1	4693	Main O-Ring Seal
7	1		Power Beyond Sleeve
8		4698	Power Beyond Sleeve Assembly (Includes Items 4,5,6, & 7)
9	1		Open-Center Plug
10		4691	Open-Center Plug Assembly (Includes Items 9 & 10)
11	1		Close-Center Plug
12		6977	Close-Center Plug Assembly (Includes Items 4,5,6, & 11)

4642 2-22-89

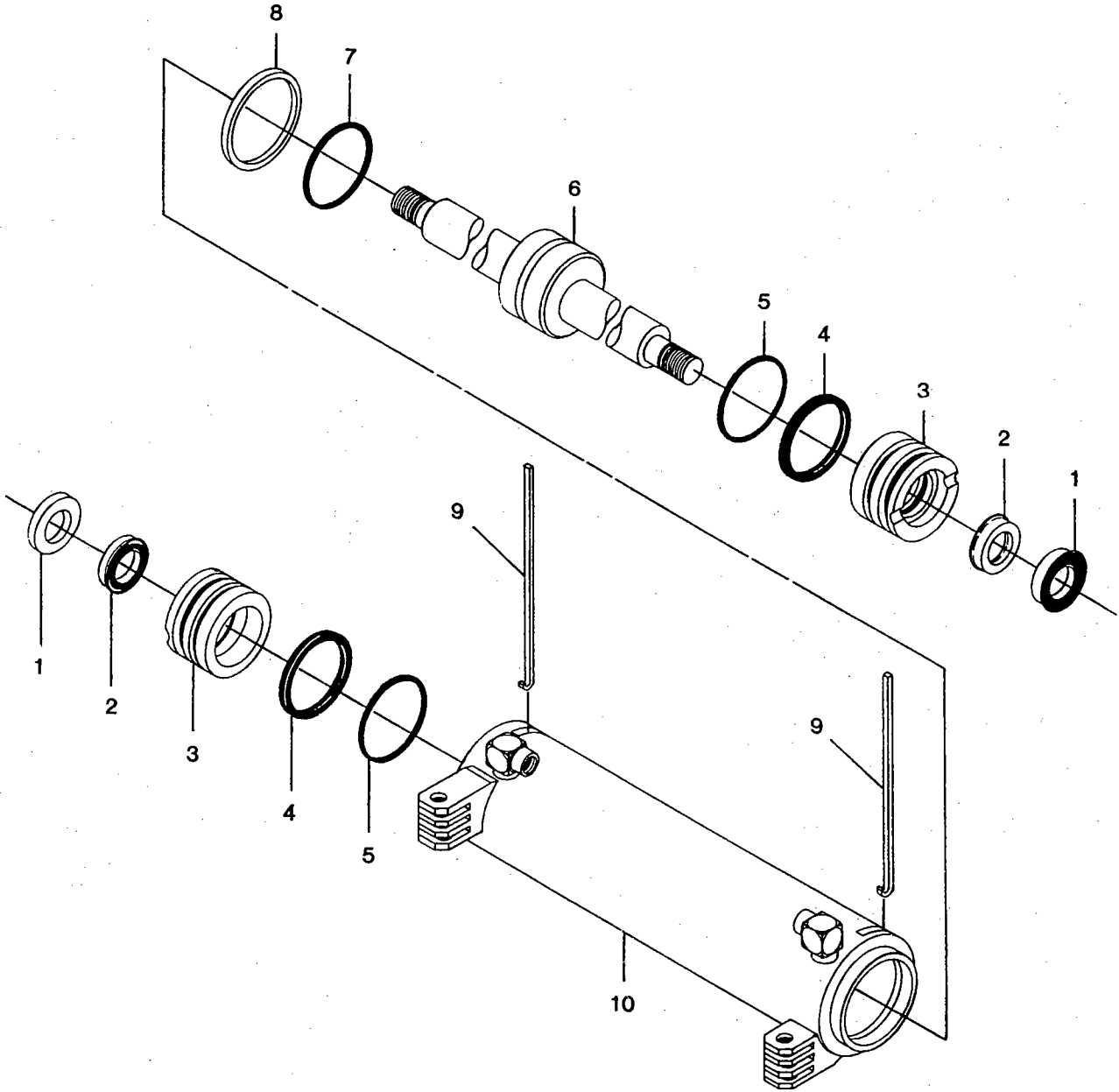
NOTE: Items without part numbers are not sold separately. These parts are only available in the various subassemblies noted on the diagram, or in the seal kits listed below.

Valve Section Seal Kit #4653 contains two each of items 2 & 3.

Outlet Cover Port Seal Kit #4966 contains one each of items 4, 5, & 6.

CYLINDER ASSEMBLY

ASSEMBLY #64892



4919 9-5-90-2

CYLINDER ASSEMBLY

ASSEMBLY #64892

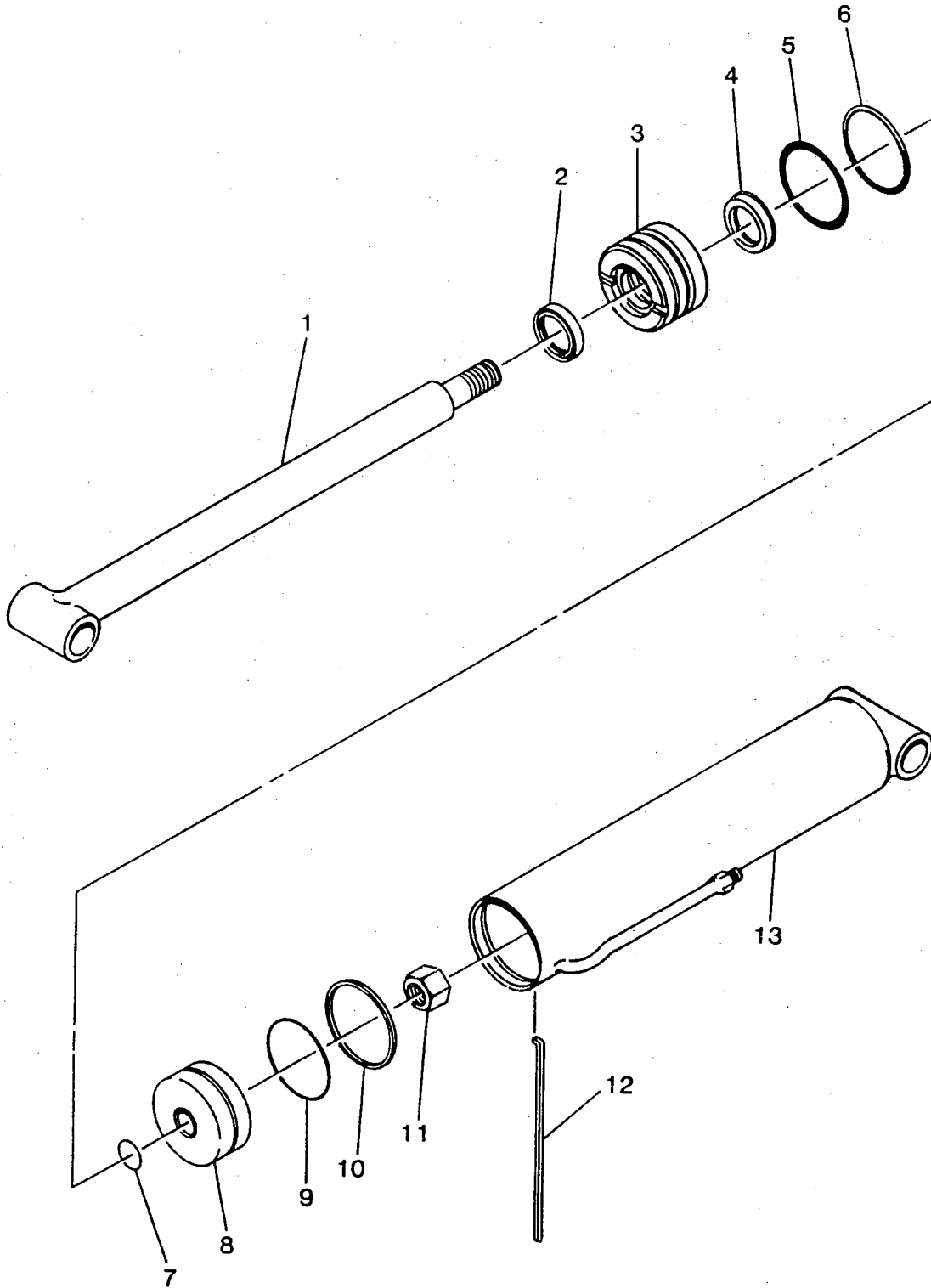
<u>NO.</u>	<u>REQ'D</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>
1	2	4914*	Rod Wiper
2	2	45225*	Cylinder Rod Seal
3	2	63108	Cylinder Gland
4	2	4631*	Back-Up Washer
5	2	4507*	O-Ring
6	1	6725	Cylinder Rod
7	1	4570*	O-Ring
8	1	4569*	Teflon Piston Ring
9	2	7166*	Gland Retainer Rod/Ring
10	1	6724	Cylinder Tube

4920 9-11-89

NOTE: Seal kit #45265 includes all parts marked with an asterisk (*). Parts are not sold separately.

CYLINDER ASSEMBLY

ASSEMBLY #61863



5136 4-19-90

CYLINDER ASSEMBLY

ASSEMBLY #61863

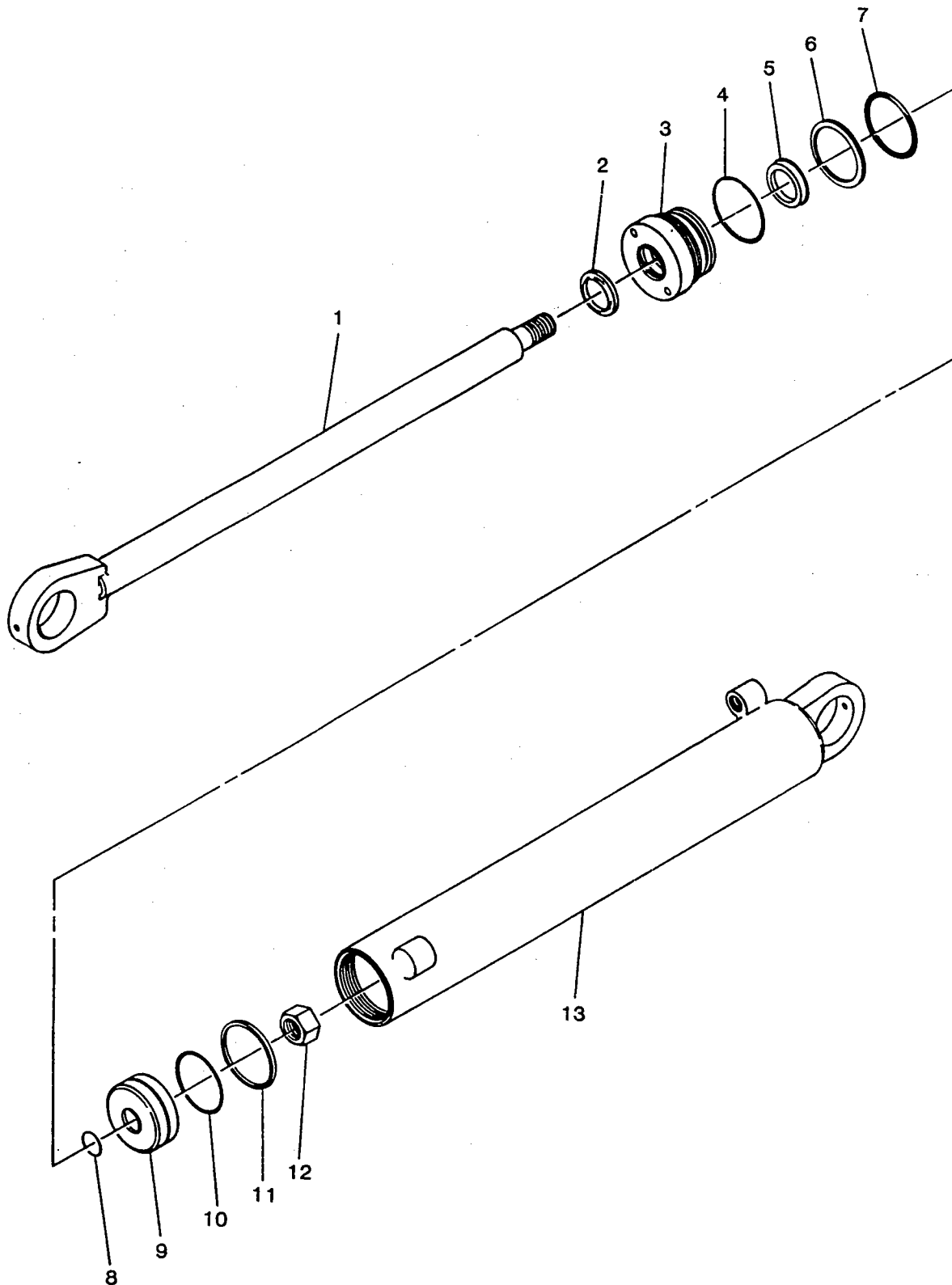
<u>NO.</u>	<u>REQ'D</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>
1	1	61864	Cylinder rod
2	1	4914*	Rod Wiper
3	1	63367	Cylinder Gland
4	1	45225*	Cylinder Rod Seal
5	1	4790*	Back-Up Washer
6	1	4791*	O-Ring
7	1	4641*	O-Ring
8	1	9677	Piston
9	1	4908*	O-Ring
10	1	4909*	Teflon Piston Ring
11	1	1483	Hex Nut
12	1	9679*	Gland Retainer Rod/Ring
13	1	61865	Cylinder Tube

5137 1-25-91-2

NOTE: Seal Kit #45540 includes all parts marked with an asterisk (*). Parts are not sold separately.

CYLINDER ASSEMBLY

ASSEMBLY #71716



5273 7-2-90

CYLINDER ASSEMBLY

ASSEMBLY #71716

<u>NO</u>	<u>REQ'D</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>
1	1	69069	Cylinder Rod
2	1	45372*	Rod Wiper
3	1	77445 (1)	Cylinder Gland
4	1	4908*	O-Ring
5	1	45225*	Cylinder Rod Seal
6	1	4631* (2)	Back-Up Washer
7	1	45555* (2)	O-Ring
8	1	4641*	O-Ring
9	1	6731	Piston
10	1	4570*	O-Ring
11	1	4569*	Teflon Piston Ring
12	1	1483	Hex Nut
13	1	71728	Cylinder Tube

NOTE:

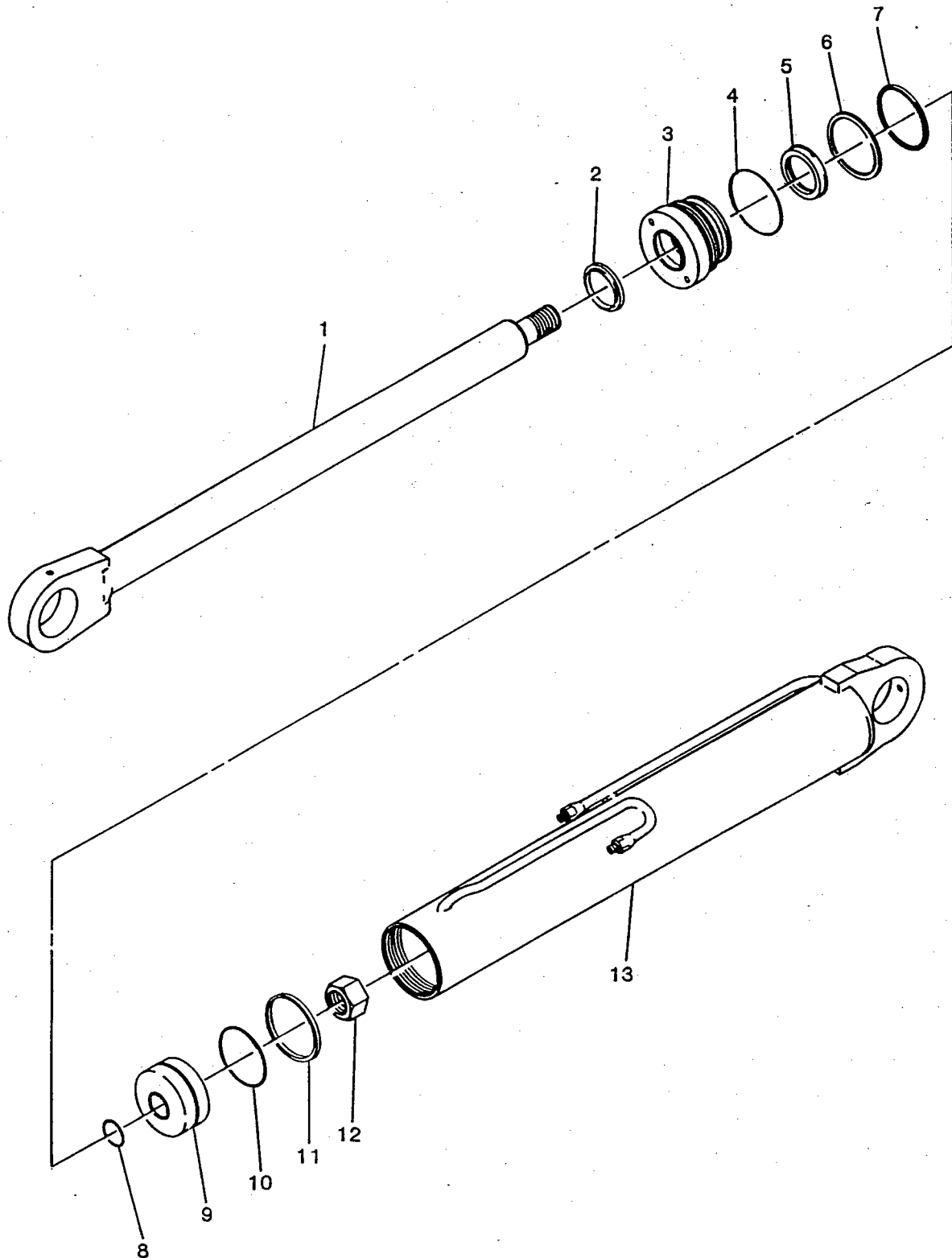
(1) Cylinder gland #77445 replaced cylinder gland #67771 effective 1-11-91. The part number is stamped on cylinder gland #77445.

(2) O-Ring #45555 and back-up washer #4631 replaced poly pack seal #45534 to coincide with new cylinder gland #77445 effective 1-11-91.

(3) Seal Kit #45539 includes all parts marked with an asterisk (*). Parts are not sold separately.

CYLINDER ASSEMBLY

ASSEMBLY #71500



5271 7-2-90

CYLINDER ASSEMBLY

ASSEMBLY #71500

<u>NO</u>	<u>REQ'D</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>
1	1	71308	Cylinder Rod
2	1	45370*	Rod Wiper
3	1	77443 (1)	Cylinder Gland
4	1	4908*	O-Ring
5	1	45119*	Cylinder Rod Seal
6	1	4631* (2)	Back-Up Washer
7	1	45555* (2)	O-Ring
8	1	4865*	O-Ring
9	1	55904	Piston
10	1	4570*	O-Ring
11	1	4569*	Teflon Piston Ring
12	1	1484	Hex Nut
13	1	71501	Cylinder Tube

NOTE:

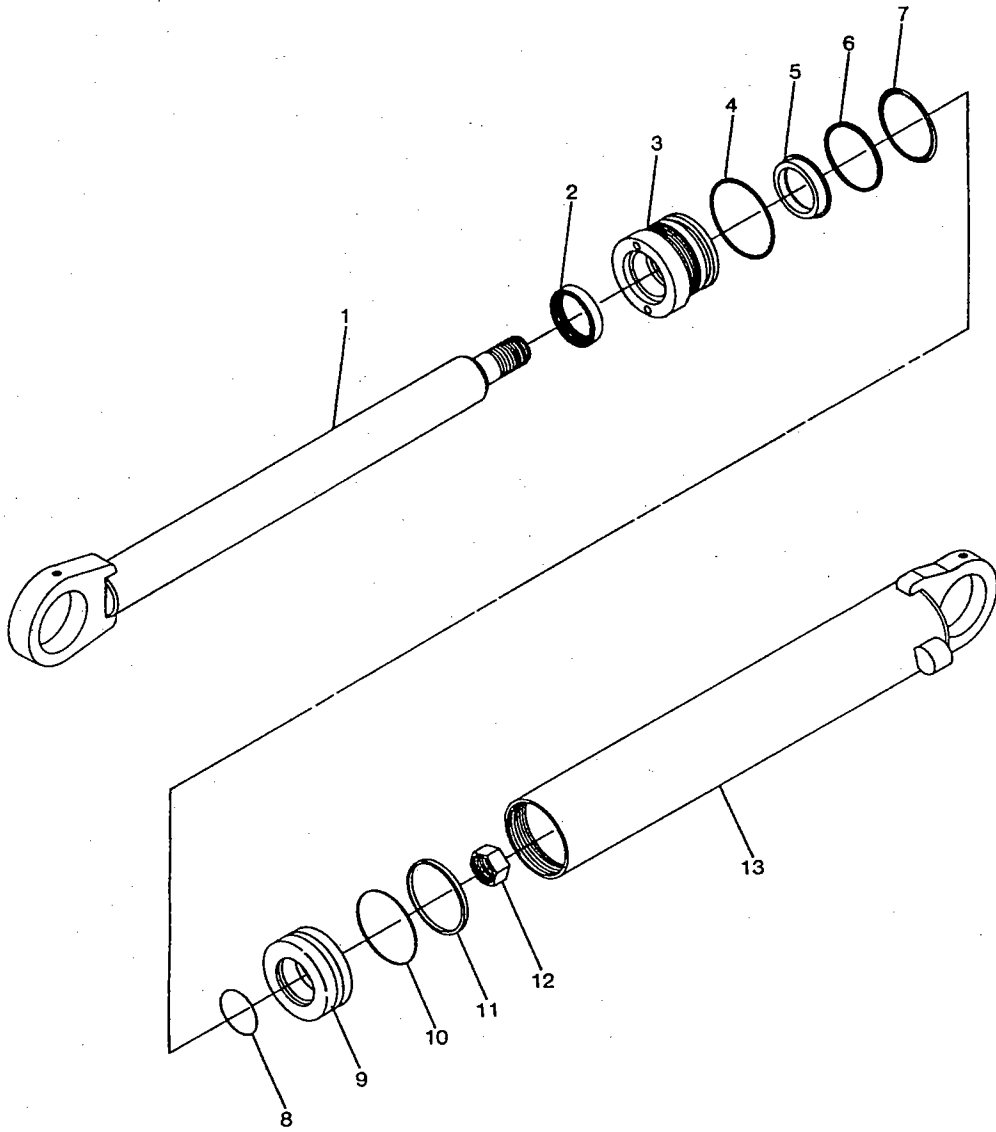
(1) Cylinder gland #77443 replaced cylinder gland #67958 effective 1-11-91. The part number is stamped on cylinder gland #77443.

(2) O-Ring #45555 and back-up washer #4631 replaced poly pack seal #45534 to coincide with new cylinder gland #77443 effective 1-11-91.

(3) Seal Kit #45541 includes all parts marked with an asterisk (*). Parts are not sold separately.

CYLINDER ASSEMBLY

ASSEMBLY #71496



5244 6-6-90

CYLINDER ASSEMBLY

ASSEMBLY #71496

<u>NO</u>	<u>REQ'D</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>
1	1	68929	Cylinder Rod
2	1	45364*	Rod Wiper
3	1	77444 (1)	Cylinder Gland
4	1	4908*	O-Ring
5	1	45117*	Cylinder Rod Seal
6	1	4631* (2)	Back-Up Washer
7	1	45555* (2)	O-Ring
8	1	4865*	O-Ring
9	1	55904	Piston
10	1	4570*	O-Ring
11	1	4569*	Teflon Piston Ring
12	1	1484	Hex Nut
13	1	71497	Cylinder Tube

NOTE:

(1) Cylinder gland #77444 replaced cylinder gland #67959 effective 1-11-91. The part number is stamped on cylinder gland #77444.

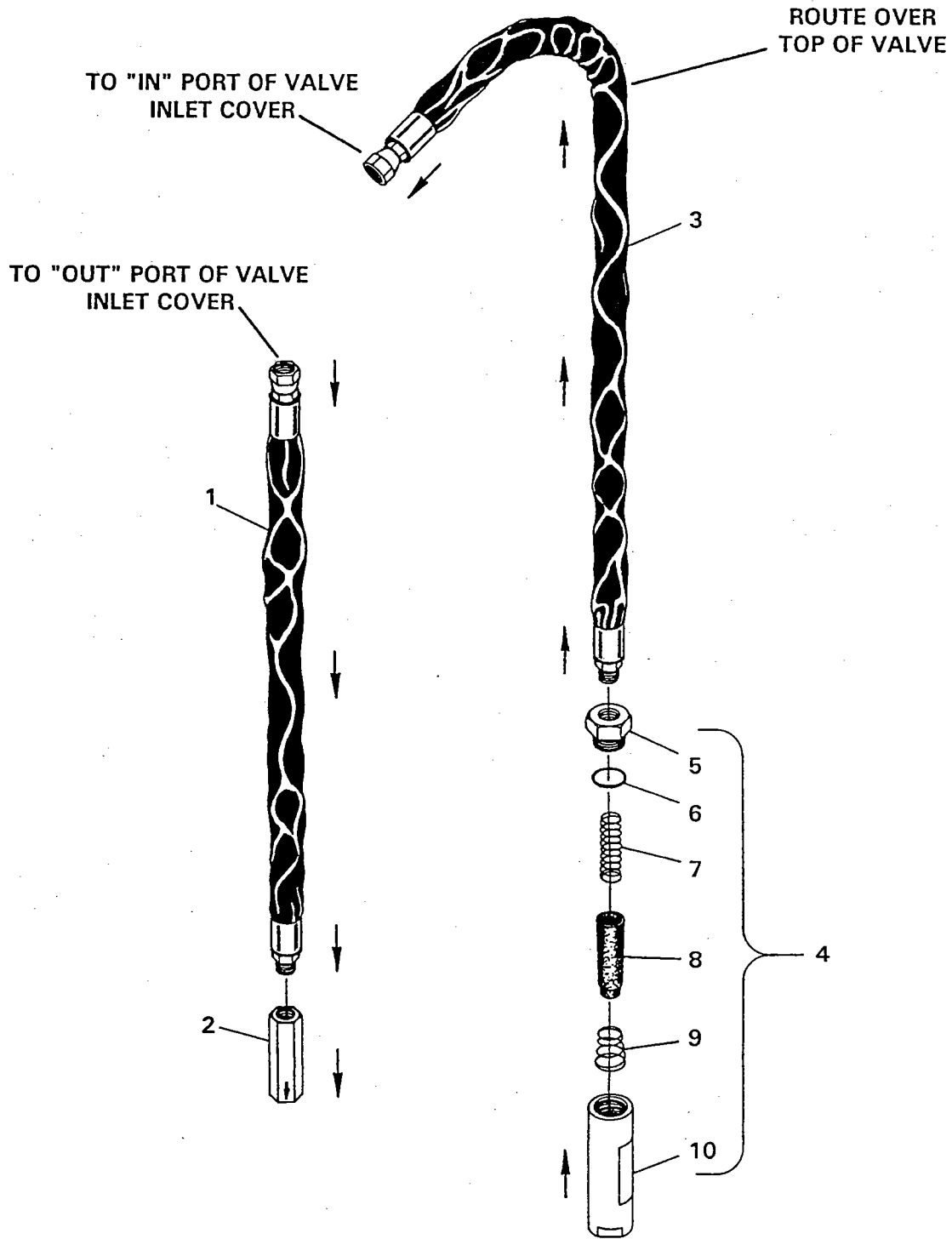
(2) O-Ring #45555 and back-up washer #4631 replaced poly pack seal #45534 to coincide with new cylinder gland #77444 effective 1-11-91.

(3) Seal Kit #45542 includes all parts marked with an asterisk (*). Parts are not sold separately.

5245
3-18-97-3

SUB HYDRAULIC KIT

ASSEMBLY #64420



SUB HYDRAULIC KIT

ASSEMBLY #64420

<u>NO.</u>	<u>REQ'D</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>
1	1	35281	Hose Assembly .50" X 28" (SAE 100R2-2Wire) 8FJX-8MP-HS
2	1	45137	Check Valve
3	1	35287	Hose Assembly .50" X 36" (SAE 100R2-2Wire) 8FJX-8MP-HS
4	1	45132	Inline Filter (Includes Items 5 Through 10)
5	1		End Plug
6	1	45405	O-Ring Seal
7	1	45135	Support Spring
8	1	45133	Filter Element (25 Micron)
9	1	45094	Spring
10	1		Filter Housing

4644 2-22-89

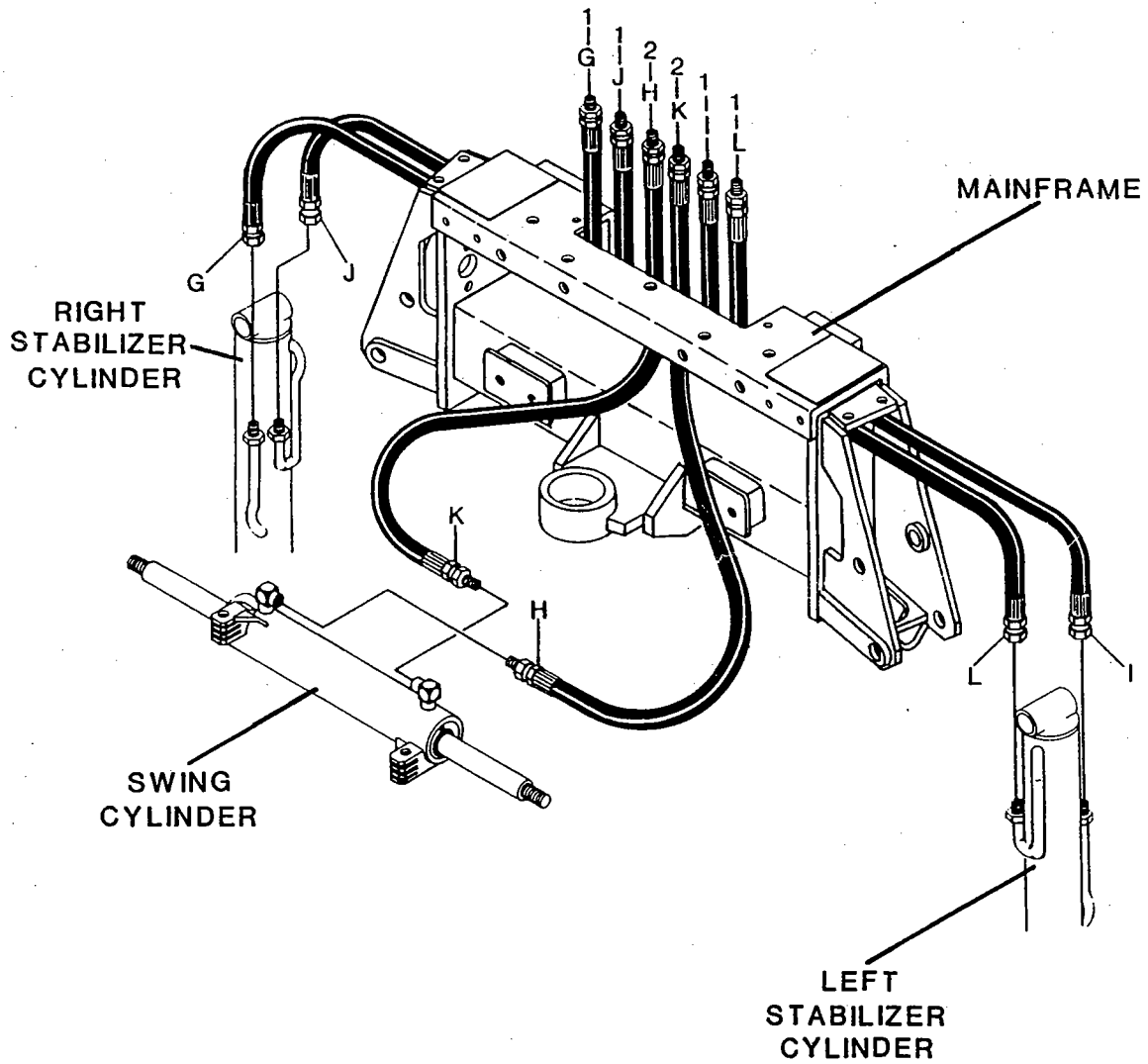
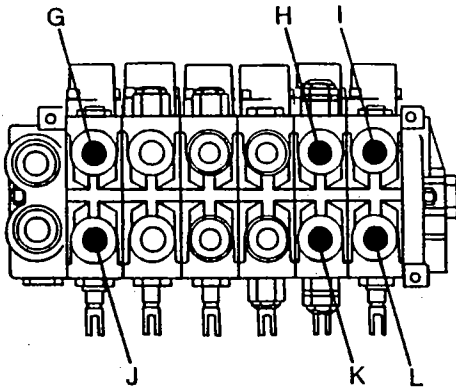
IMPORTANT: The arrows used on this diagram show the direction of hydraulic flow through the hydraulic kit. This flow pattern must be maintained for proper operation of the backhoe. Improper hose routing could result in possible damage to the backhoe or vehicle.

NOTE: Items without part numbers are not sold separately. These parts are only available in the complete inline filter assembly #45132.

HOSE ASSEMBLY

MAINFRAME HOSES
ASSEMBLY #72459

GRESEN VALVE



5150 4-19-90

HOSE ASSEMBLY

MAINFRAME HOSES
ASSEMBLY #72459

<u>NO.</u>	<u>REQ'D</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>
1	4	37059	Hose .25" X 28" (SAE 100R2-2Wire) 6FJX-6MJ
2	2	35121	Hose .25" X 24" (SAE 100R2-2Wire) 4MP-6MJ

5151 9-4-92-2

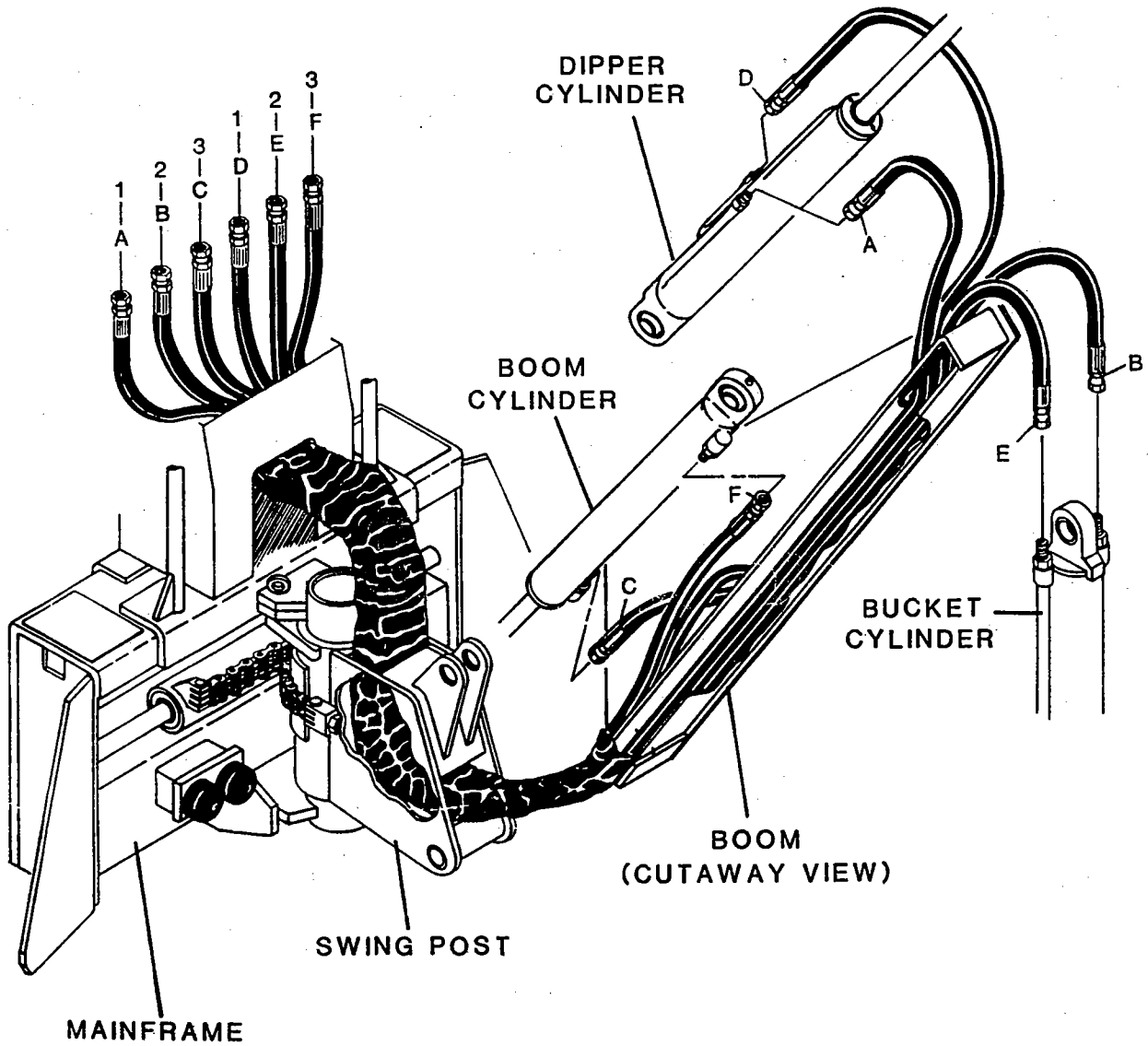
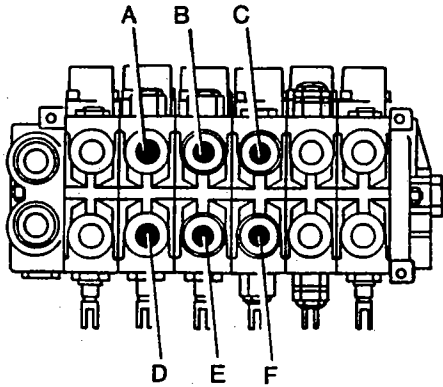
NOTE: Letters on the hose set diagram show the hydraulic hose routing between the backhoe control valve and the various hydraulic cylinders. Simply match the letter on the control valve port to the same letter on the hydraulic hose ends. Example: Hose assembly labeled "K" runs from the lower swing port "K" on the hydraulic valve, through the mainframe, and to the left side fitting of the swing cylinder.

HOSE ASSEMBLY

BOOM & DIPPER HOSES

ASSEMBLY #70257

GRESEN VALVE



5275 7-3-90

HOSE ASSEMBLY

BOOM & DIPPER HOSES

ASSEMBLY #70257

<u>NO.</u>	<u>REQ'D</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>
1	2	37149	Hose .38" X 100" (SAE 100R2-2Wire) 8FJX-8FJX
2	2	37150	Hose .38" X 103" (SAE 100R2-2Wire) 8FJX-8FJX
3	2	37148	Hose .38" X 71" (SAE 100R2-2Wire) 8FJX-8FJX

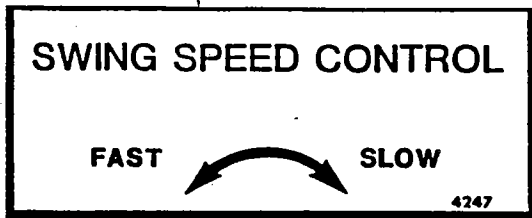
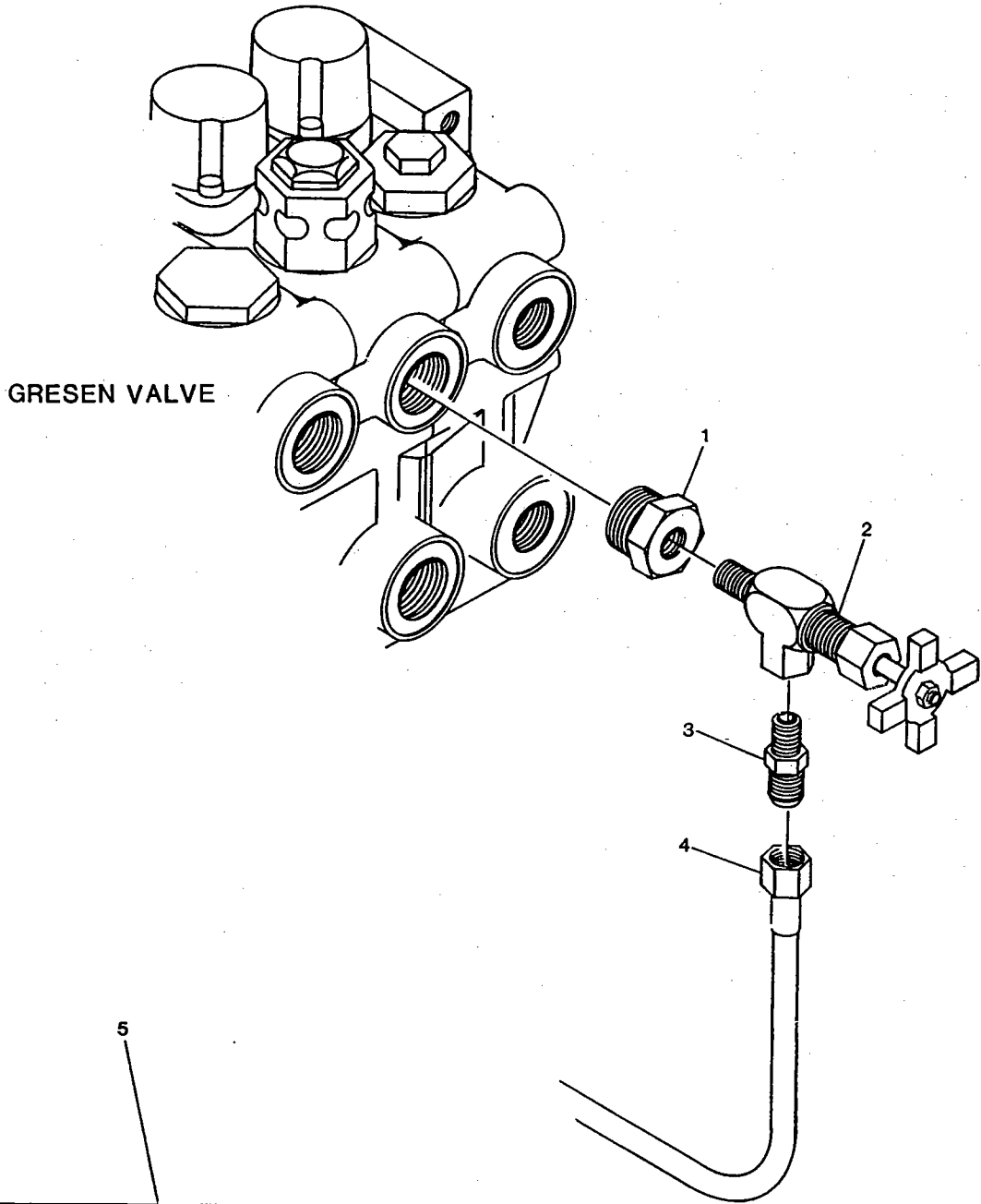
5276-2 12-5-91

NOTE: Letters on the hose set diagram show the hydraulic hose routing between the backhoe control valve and the various hydraulic cylinders. Simply match the letter on the control valve port to the same letter on the hydraulic hose ends. Example: Hose assembly labeled "A" runs from the upper dipper port "A" on the hydraulic valve, through the mainframe and swing post, and to the tube end fitting of the dipper cylinder.

SWING SPEED CONTROL

GRESEN VALVE
ASSEMBLY #58219

5212 5-21-90



SWING SPEED CONTROL

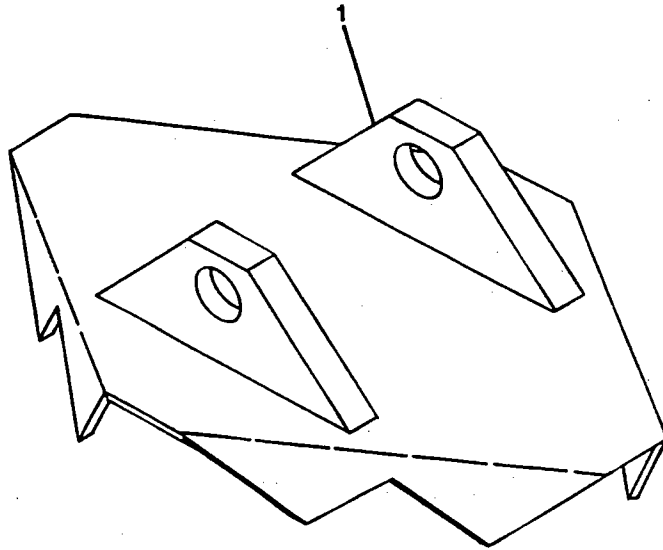
GRESEN VALVE
ASSEMBLY #58219

<u>NO.</u>	<u>REQ'D</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>
1	1	3336	SAE O-Ring Boss 10MP-4FP
2	1	3185	Needle Valve
3	1	3137	Male Connector 4MP-6MJ
4	1	58220	Hydraulic Tube
5	1	4247	Decal

5213 5-21-90

STABILIZER PAD OPTIONS

GROUSER STABILIZER PAD
ASSEMBLY #64912



5122 3-29-90

STABILIZER PAD OPTIONS

GROUSER STABILIZER PAD

ASSEMBLY #64912

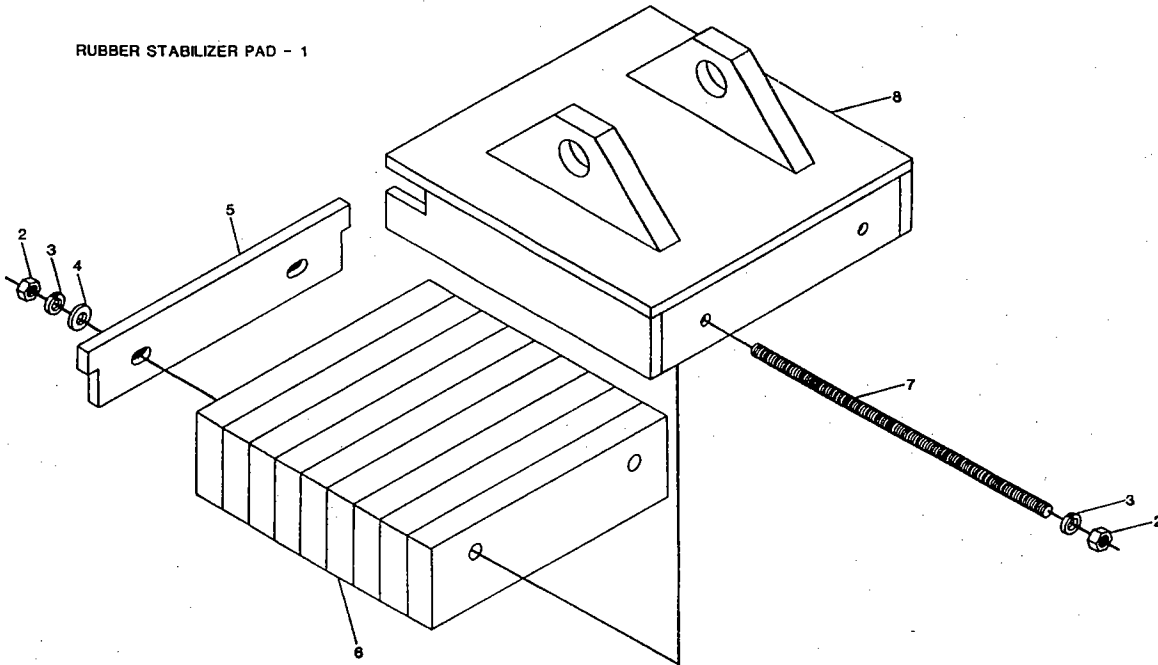
<u>NO.</u>	<u>REQ'D</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>
1	2	64590	Grouser Stabilizer Pad

5123 3-29-90

STABILIZER PAD OPTIONS

RUBBER STABILIZER PAD
ASSEMBLY #64913

RUBBER STABILIZER PAD - 1



5126 3-29-90

STABILIZER PAD OPTIONS

RUBBER STABILIZER PAD

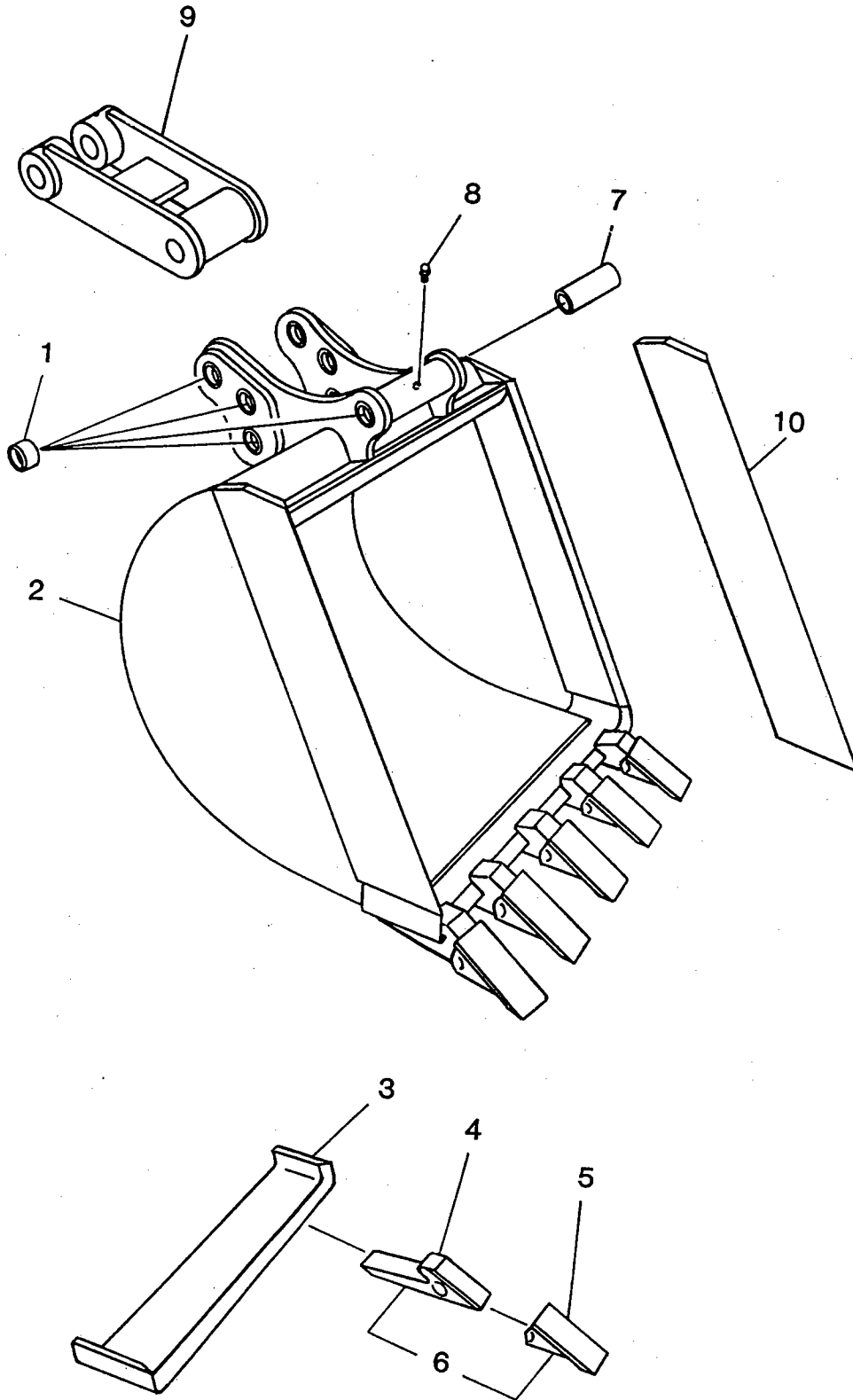
ASSEMBLY #64913

<u>NO.</u>	<u>REQ'D</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>
1	2	64917	Rubber Stabilizer Pad (Includes Items 2 through 8)
2	4	1226	.38" UNC Hex Nut
3	4	1503	.38" Lock Washer
4	2	1514	.38" Flat Washer
5	1	51190	Slide Plate
6	1	64412	Rubber Strip Bundle
7	1	1661	Readi Rod
8	1	64918	Stabilizer Pad

5127 3-29-90

BUCKET ASSEMBLIES

POWER DIG BUCKETS



5253 6-12-90

BUCKET ASSEMBLIES

POWER DIG BUCKETS

<u>NO.</u>	<u>REQ'D</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>
1	8	6355	Bushing
2	1	67412	12" Bucket Weldment
		67416	16" Bucket Weldment
		67418	18" Bucket Weldment
		67420	20" Bucket Weldment
		67424	24" Bucket Weldment
3	1	67399	12" Replacement Front Cutter Edge
		67393	16" Replacement Front Cutter Edge
		67387	18" Replacement Front Cutter Edge
		67338	20" Replacement Front Cutter Edge
		66387	24" Replacement Front Cutter Edge
4	Varies	55090	Replacement Tooth Shank
5	Varies	55088	Replacement Tooth Point
6	Varies	56073	Replacement Tooth Point and Shank Assembly
7	1	68482	Spacer
8	1	6616	Grease Zerk
9	Optional	51540	8.5" Bell Hole Bucket Link (Requires 3 Grease Zerks Part #6616)
10	1	67151	Left Replacement Side Cutter
	1	67152	Right Replacement Side Cutter

5255 6-12-90

NOTE:

Power dig buckets have three different bucket link positions for different digging needs.

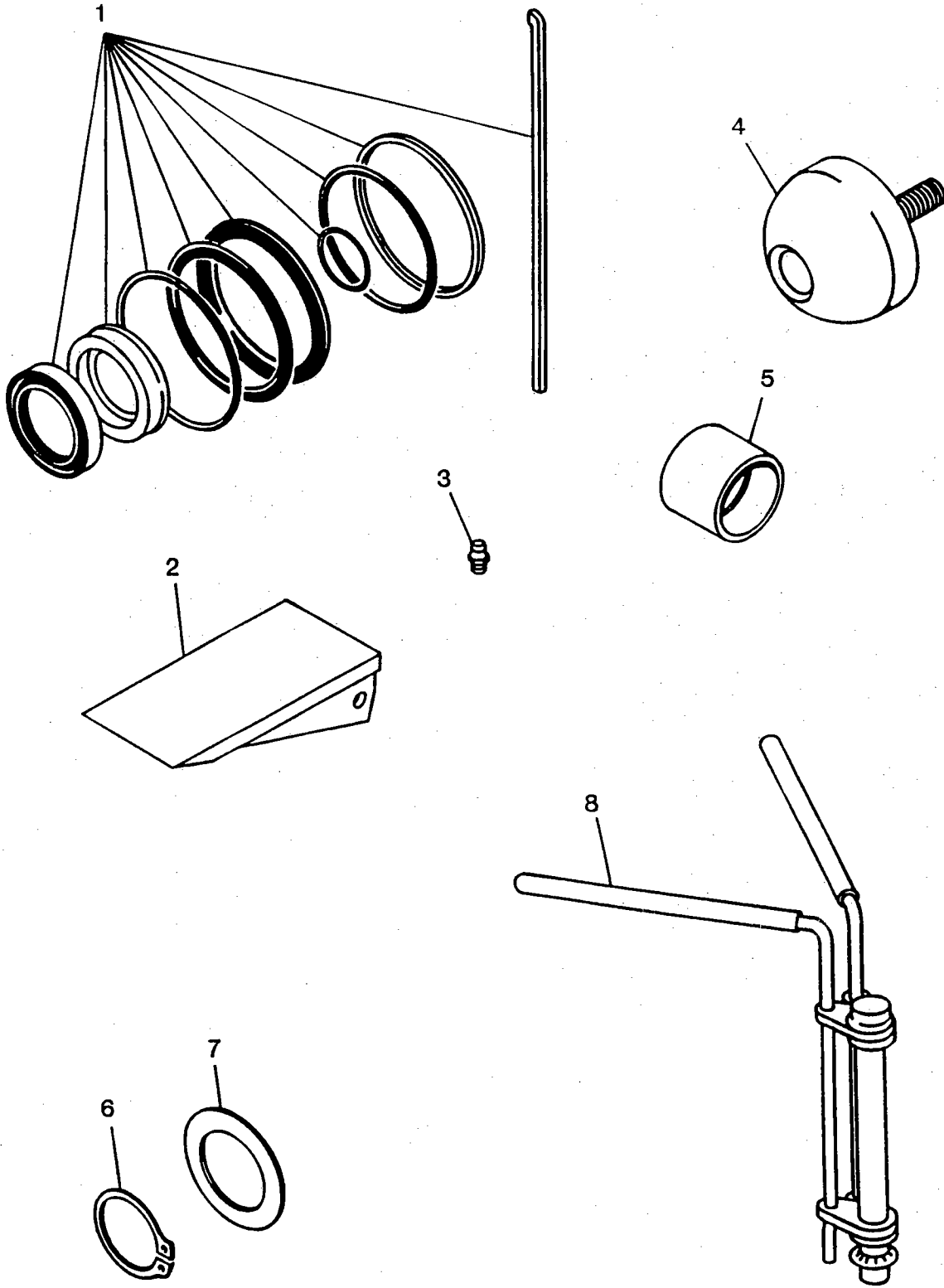
Position "A" power digging position for added digging force in hard ground.

Position "B" truck loading position for greater ease of spoil removal and higher dump height.

Position "C" Standard digging position with a good balance of digging force and bucket rotation for general digging use.

FIRST LINE REPAIR KIT

ASSEMBLY #64410



5277 7-9-90

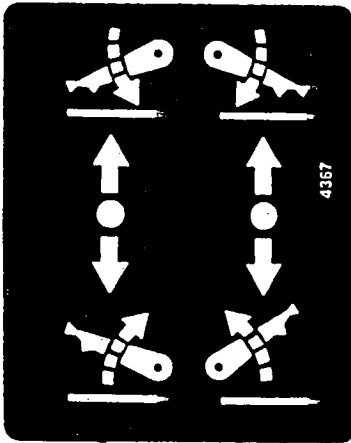
FIRST LINE REPAIR KIT

ASSEMBLY #64410

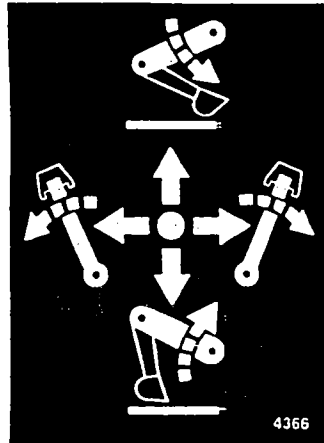
<u>NO.</u>	<u>REQ'D</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>
1	1	45265	Swing Cylinder Seal Kit
	1	45540	Stabilizer Cylinder Seal Kit
	1	45539	Boom Cylinder Seal Kit
	1	45541	Dipper Cylinder Seal Kit
	1	45542	Bucket Cylinder Seal Kit
2	4	55088	Bucket Tooth
3	4	6616	Grease Zerk
4	1	6886	Rubber Bumper
5	2	6355	Bushing 1.38" I.D.
6	4	1650	Snap Ring 1.38" I.D.
7	4	6623	Thrust Washer 1.38" X .031"
8	1	65349	Cylinder Seal Install-Tool

5278 1-30-91-2

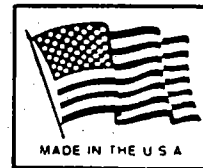
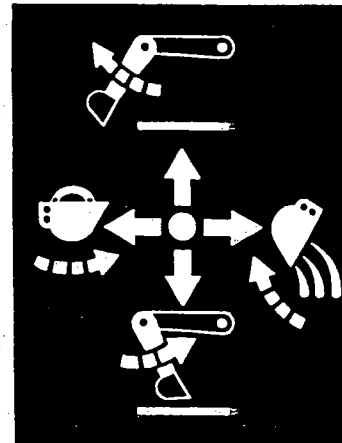
DECALS



STABILIZER CONTROLS
PART #4367



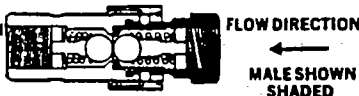
OPERATING CONTROLS
PART #4366



MADE IN USA
PART #4338

HYDRAULIC QUICK COUPLER HOOK-UP
RECOMMENDED PRACTICE AND DEFINITIONS.

- Always install quick couplers so the oil flows out of the male tip and into the female coupler.

FEMALE SHOWN CLEAR  **FLOW DIRECTION**
MALE SHOWN SHADED

- Quick couplers must be fully engaged to provide full freeflow. There are several reasons that may cause the coupler not to fully engage.
 - Dirt may block the male tip from engaging.
 - The coupler or male tip may be damaged or worn.
 - The coupler halves may not be matched to fully open the valve when the coupler is engaged. (The dimension from the face of a male tip to the locking groove must match the corresponding coupler.)
 - Some couplers with poppet style valve may not connect with ball type.
- Coupler lock-up--Some quick couplers which may not have a "positive valve stop" or "Valve shield" feature may have a problem called "Lock Up" or "Flow Checking." This occurs when a valve closes during flow conditions, usually in return lines subjected to high surge flows, such as when quickly lowering a backhoe boom.

Surge flows -- A dramatic, almost instantaneous increase in fluid flow.

NOTE: All couplers or halves supplied with our units have positive valve stop feature. Both coupler and male tip must have the feature or lock up may occur.

SUGGESTED PRACTICE

 - If possible, always use quick couplers, pairs or identical make (brand) and model or style numbers when coupling hoses.
 - Be sure the brand or model used does not include the design feature to prevent "flow checking", or "lock up" during surge flow conditions.
 - Always be scrupulously clean when coupling quick couplers.
 - After coupling, perform first backhoe operations at engine idle to ascertain proper flow exists. **NOTE:** Many of our models of backhoes include a relief valve vented to atmosphere (small tube down the back) which will vent excessive return flow oil pressure to the air. If you see oil squirting out of the vent, check for a restricted return flow coupling.

What if: 4291
In the event the coupler is blocked, even for just a instant, causing excessive back pressure build up in the valve assembly, you may experience valve failure. This will usually show up as stretched tie bolts, leaking spool seals or a ruptured casting.

QUICK-COUPLER
PART #4291

! WARNING

NEVER USE A BACKHOE AS A MANLIFT

Bradco backhoe geometry and valving are not suitable for manlifting purposes. Do not under any circumstances use your backhoe for manlifting purposes. Serious injury or death may result.

#4493

MANLIFT WARNING
PART #4493

5252 9-5-90-2

DECALS

5251 9-5-90-2

! WARNING

To avoid bodily injury:
Read Operator's Manual and follow instructions.
Operate backhoe control levers only from operator's seat.
Lower stabilizers and bucket to ground before leaving operator's seat.
Prevent instability or tipover of backhoe during attaching or detaching by first extending boom and dipperstick and lowering bucket to the ground.
Prevent accidental backhoe movement during transport by first engaging boom latch and swing pin lock.

#4497

BODILY INJURY WARNING
PART #4497

IMPORTANT

DO NOT ATTACH TOW CHAIN TO DIPPER OR BUCKET. DAMAGE TO BACKHOE MAY OCCUR.

4075

TOW CHAIN CAUT.
PART #4075

PREPARATION FOR STORAGE

LUBRICATE ALL GREASE POINTS.
LEAVE AS MANY CYLINDERS IN CLOSED POSITION AS POSSIBLE.
COVER ALL EXPOSED CYLINDER RODS WITH A LIGHT COAT OF GREASE.

4150

PREP. FOR STORAGE
PART #4150

NOTICE!

REPEATED SLAMMING OF SWING POST INTO STOPS WILL DAMAGE THE RUBBER BUMPERS WHICH ARE PROVIDED FOR INADVERTENT CONTACT ONLY.

#4496

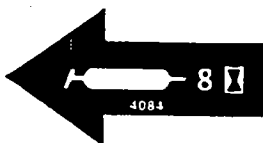
SWING POST CAUTION
PART #4496

IMPORTANT

The backhoe bucket is capable of contacting this stabilizer and/or cylinder. Carefull operation will avoid backhoe damage.

4140

BUCKET CONTACT CAUTION
PART #4140 (2 REQ.)



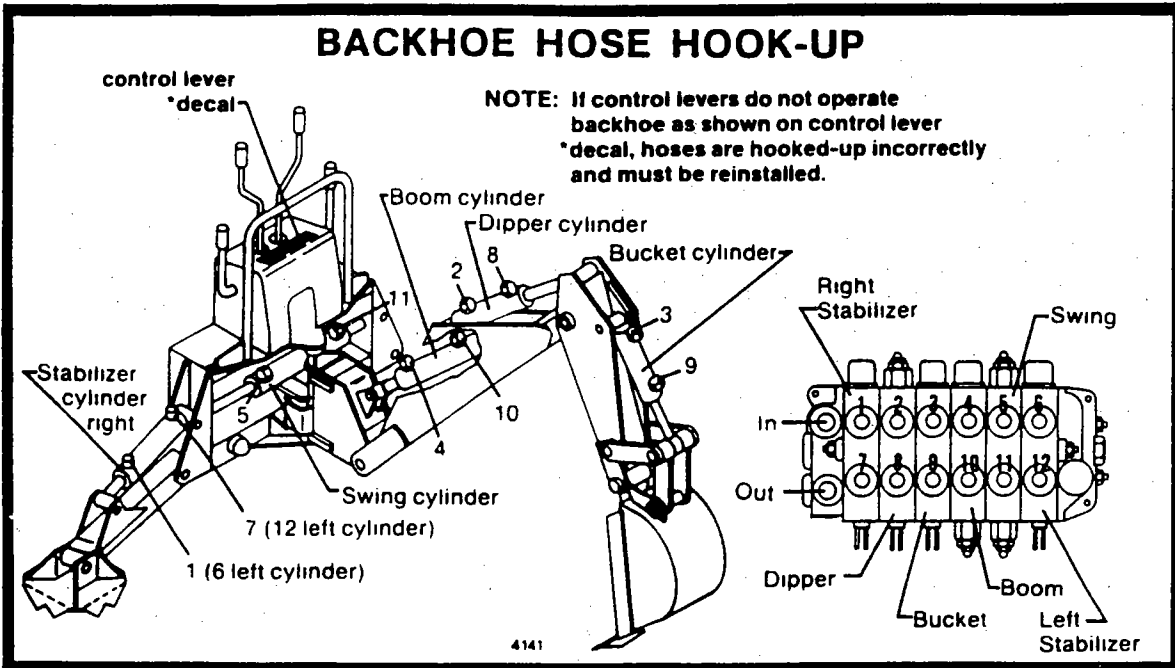
GREASE 8 HOURS
PART #4084
(2 REQ.)

! WARNING

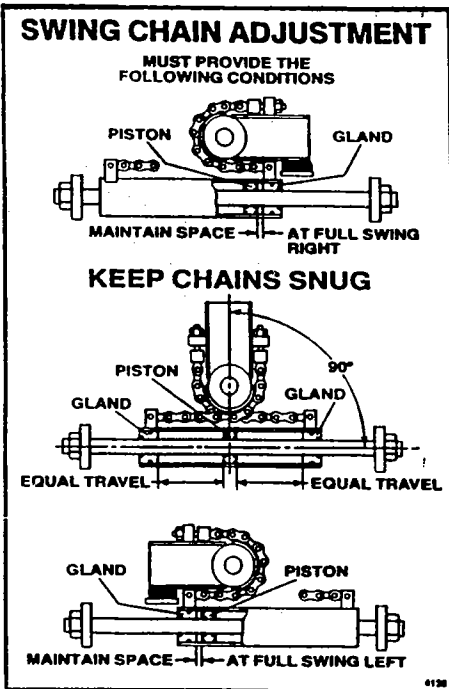
- THIS MACHINE IS DESIGNED TO BE OPERATED BY ONE OPERATOR. DO NOT CARRY PASSENGERS ON THIS UNIT.
- DO NOT OPERATE THIS MACHINE WITH GUARDS AND COVERS REMOVED.
- ALL OPERATORS SHOULD READ OPERATORS INSTRUCTION MANUAL OR BE THOROUGHLY TRAINED BEFORE OPERATING MACHINE.

#4494

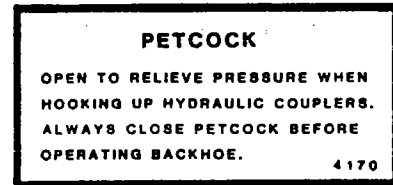
OPERATOR'S WARNING
PART #4494



**BACKHOE HOSE HOOK-UP
PART #4141**



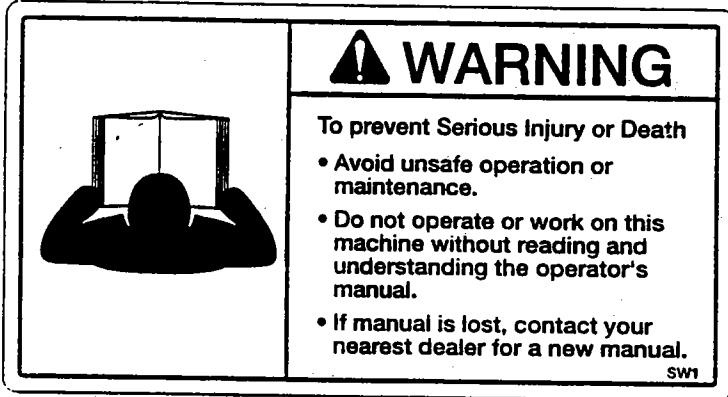
**SWING CHAIN ADJUSTMENT
PART #4136**



**PETCOCK OPERATION
PART #4170 (OPTIONAL)**



**SWING SPEED CONTROL
PART #4247 (OPTIONAL)**



WARNING! READ MANUAL
PART #40150



WARNING! HIGH PRESSURE FLUID
PART #40151

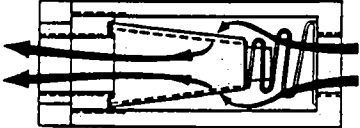


DANGER! PINCH POINTS
PART #40149 (2 req'd)

DECALS

SERVICE INFORMATION 4271

THIS IS AN INLINE 25 MICRON SINTERED BRONZE FILTER. IF PLUGGED OR PARTIALLY FILLED IT WILL REDUCE BACKHOE PERFORMANCE. REMOVE AND WASH OUT REGULARLY. REPLACE ELEMENT #45133 IF DIFFICULT TO BLOW THROUGH AFTER WASHING. SEE FULL INSTRUCTIONS IN THE OWNERS MANUAL.



The diagram shows a cross-section of an inline filter. It consists of a cylindrical housing with a sintered bronze filter element inside. Two arrows on the left indicate the flow direction from left to right. The filter element is shown as a porous, cylindrical structure.

**INLINE FILTER SERVICE
PART #4271**

5260 6-13-90