ARPS

OWNER'S MANUAL

model 70 backhoe

THIS MANUAL INCLUDES:

W250 BASIC BACKHOE

W209 - BUCKET, 9"
W210 - BUCKET, 13"
W211 - BUCKET, 16"
W213 - BUCKET, 19"
W214 - BUCKET, 24"

SERIAL NO. 1001 AND LATER

This Safety Alert Symbol identifies important safety messages in this manual.

ARPS

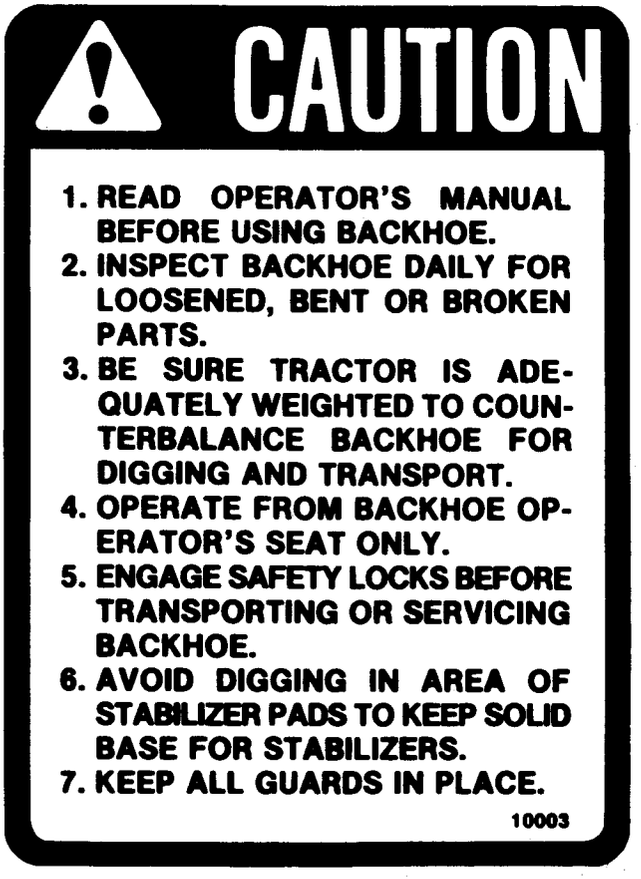
FORM W250 885
NO. 9991

CONTENTS

SAFETY PRECAUTIONS

The safety of the operator was a prime consideration in the design of this backhoe. Proper shielding convenient controls, simple adjustments, and other safety features have been built into this backhoe.

The following decals are located on the top of the seat bracket:



Accidents can be avoided if the following safety rules are observed:

Preparation:

DO NOT operate the backhoe unless it is rigidly attached to the tractor.

KNOW YOUR controls. Read this operator's manual and the manual provided with your tractor. Learn how to stop the tractor, the engine, and the backhoe quickly in an emergency.

PROVIDE adequate front end weight to counter-balance the backhoe at all times.

BE SURE the area is clear of underground utilities or other hazards.

POSITION a barricade around the work area.

KEEP ALL bystanders a safe distance away.

Operation:

DO NOT attempt to enter operators platform of backhoe by using stabilizers as a step.

OPERATE from the backhoe operator's seat only.

ALLOW only one person to operate the backhoe at any time.

DISENGAGE safety locks before attempting to operate the backhoe.

NEVER dig with the backhoe unless the stabilizers are properly set.

DO NOT dig under stabilizers or tractor-backhoe. Soft ground or sandy soil can cause cave-ins.

KEEP BUCKET away from stabilizer area to avoid possible stabilizer damage.

ALWAYS swing bucket uphill to dump when on a hillside and keep loaded bucket low.

SET BRAKES and block wheels when operating on hills and banks to avoid dangerous run-away.

WATCH for overhead wires. DO NOT touch wires with any part of the backhoe.

NEVER allow a person to work under a raised bucket.

NEVER lift a person with the backhoe.

DO NOT use the backhoe bucket as a battering ram.

ALWAYS lower the bucket to the ground when not digging.

NEVER leave the tractor unattended with the engine running.

Transportation:

ALWAYS engage safety locks before transporting backhoe.

DO NOT drive the tractor near the edge of a ditch or excavation.

ALWAYS use accessory lights and devices, when transporting on a road or highway, to warn operators of other vehicles. Check your local government regulations.

BE SURE that the SMV emblem is visible to the rear.

Adjustments and Inspection:

CHECK pins that attach backhoe to tractor and all pivot pins for tightness several times daily. Replace any parts which are bent, broken, or missing.

ALWAYS engage safety locks before servicing backhoe.

DO NOT oil, grease, or adjust the backhoe while it is in motion.

DO NOT change any backhoe relief valve settings. They are factory set for best backhoe performance and safety.

ESCAPING FLUID under pressure can have sufficient force to penetrate the skin and cause serious injury. Be sure to relieve all pressure before disconnecting lines. Be sure all connections are tight and that lines, pipes, and hoses are not damaged before applying pressure to the system.

FLUID ESCAPING from a very small hole can be almost invisible. Use a piece of cardboard or wood - not your hands - to search for suspected leaks.

SEE A DOCTOR AT ONCE if injured by escaping fluid. Serious infection or reaction can develop if proper medical treatment is not administered immediately.

PROTECT YOUR EYES - WEAR SAFETY GLASSES.

GUARD AGAINST INJURY when driving connecting pins or performing any repair in which particles can chip from work piece or striking tool.

DO NOT REMOVE ANY GUARDS on backhoe or tractor.

BASIC ASSEMBLY INSTRUCTIONS

General:

The backhoe has been partially disassembled and strapped to a skid for shipping purposes. Initial installation on the tractor will require a hoist or other device capable of safely lifting the entire backhoe from the skid. Once the initial installation is complete the backhoe can serve as its own erecting hoist, by lowering stabilizers and bucket to the ground, and additional lifting devices will not be required for normal removal and reattaching.

Assembly Procedure:

NOTE - The terms RIGHT and LEFT for all backhoe components are determined from the position of the operator when seated in the operating position on the backhoe.

1. Remove top and sides from crate base, being careful not to disturb support which is fastened to boom and dipperstick.

⚠ *CAUTION - DO NOT cut any strapping that fastens the backhoe mainframe to the crate base or fastens the boom and dipperstick to the boom support at this time.*

2. Remove the stabilizer assemblies, box of parts, and any other miscellaneous items which have been fastened to the crate and conveniently arrange these items.

IMPORTANT - Tighten all hardware to torque requirements specified in Torque Chart, Page 8, of this manual.

3. Assemble seat bracket (A) to rear of control console (B) in any of the three possible positions using four 1/2 NF x 1" bolts and lockwashers.

4. Attach seat plate assembly (C) to backhoe using one 5/8 NC x 5" bolt and locknut.

5. Assemble seat (D) to backhoe in any of the three sets of holes, using four 5/16 NC x 3/4 bolts and lockwashers.

6. Attach stabilizers (E) to mainframe using pins and hardware assembled to mainframe.

7. Attach stabilizer cylinders (F) to stabilizers using pins and hardware provided.

8. Support boom (G) with hoist and remove wood support from boom and dipperstick (H). Install dipperstick on boom, as shown in Fig 1 & 8 being careful not to stretch or pinch hydraulic hoses. Attach dipperstick cylinder to dipperstick at point (I) using one 1" diameter x 5-1/2 inch pin, two 5/16 NF x 3/4 bolts, two 5/16 x 1-1/2 cotter pins, locknuts, and necessary washers. Note that the hydraulic hoses are routed under cylinder rod bushing.

⚠ *CAUTION - Be sure hoist being used is suitable, has sufficient capacity, and is in the proper position. Do not allow anyone under a backhoe member that is supported by the hoist.*

9. Lower boom and dipperstick to the ground using hoist. Move control handle to "BOOM DOWN" position as required to aid movement.

10. Attach bucket (J) to dipperstick using a 1" diameter x 7-3/8 inch pin, two 5/16 NF x 1" bolts, two 5/16 x 1-1/2 cotter pins, locknuts, and necessary washers.

11. Attach bucket link (K) to bucket using same hardware as listed for #10.

12. Remove remaining strapping and use hoist to raise mainframe. Remove crate base using caution to prevent tipping of backhoe. Raise backhoe mainframe approximately 8 inches and block securely.

13. Follow the Attaching Kit Assembly Instructions to mount the backhoe to the tractor. Check the installation carefully making sure that all members are correctly installed and securely fastened.

14. Continue with the "GENERAL OPERATION" Section to familiarize yourself with the backhoe controls and with safe operating practices.

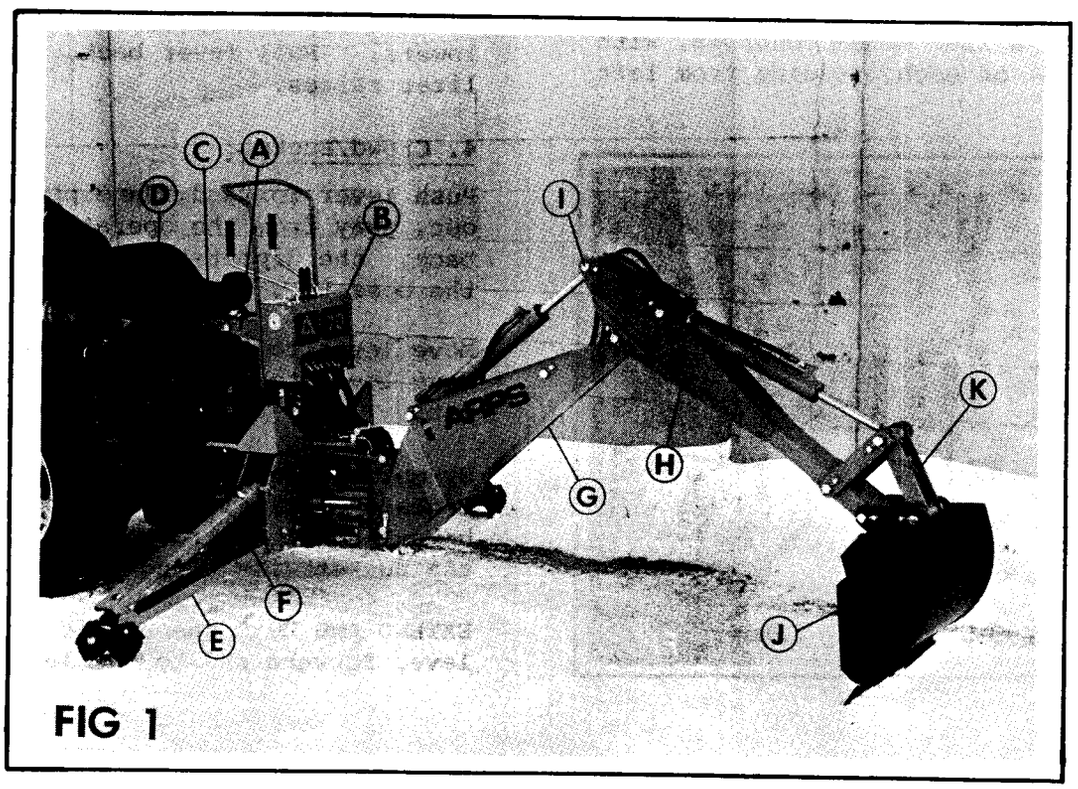


FIG 1

GENERAL OPERATION

CAUTION - To avoid possible injury, observe the following safety rules BEFORE OPERATING the backhoe:

1. BE SURE area is clear of underground utilities or other hazards.
2. POSITION a barricade around work area.
3. PROVIDE adequate front end weight to counter-balance backhoe at all times.
4. KEEP bystanders a safe distance away.

Directions:

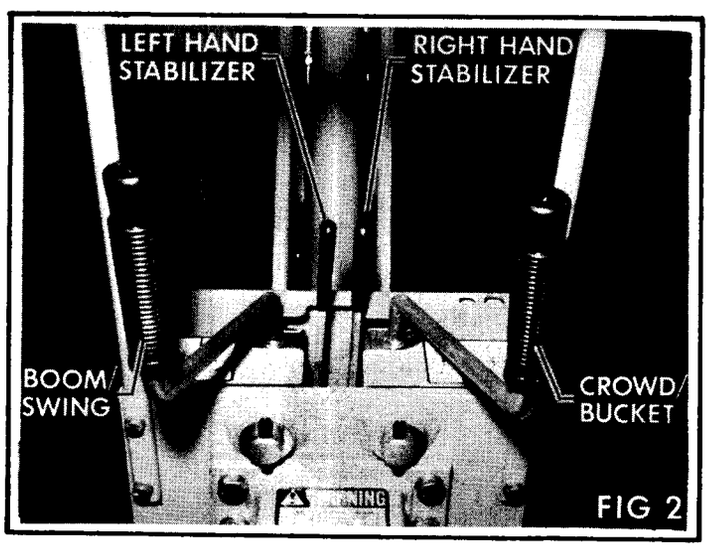
The terms right, left, front, and back shall be determined from the position of the operator when seated in the operating position on the backhoe.

Engine Speed:

The speed at which the backhoe operates is partially dependent on engine RPM. Use a moderate engine speed to start and increase it as your experience permits. Refer to "SPECIFICATIONS" for hydraulic flow volume requirements. When powering from tractor systems with higher output, reduce engine RPM to obtain acceptable backhoe operating speed.

Controls:

The backhoe has two major control levers plus the stabilizer control levers. These controls are located on the control panel directly ahead of the operator, see Fig 2. Following is a list of the controls, with the function of each, reading from left to right.



1. Boom/Swing:

Push lever forward, the boom moves down, away from the operator. Pull lever back, the boom moves up, toward the operator.

Move lever to left, the backhoe swings to the left. Move lever to right, the backhoe swings to the right.

By moving the lever tc one of the intermediate positions, the boom can be swung left or right at the same time it is being raised or lowered, performing the two operations simultaneously.

SWING LEFT AND LOWER the boom by moving the control lever forward and to the left.

SWING LEFT AND RAISE the boom by moving the control lever back and to the left.

SWING RIGHT AND LOWER the boom by moving the lever forward and to the right.

SWING RIGHT AND RAISE the boom by moving the lever back and to the right.

2. Left Hand Stabilizer:

Push lever forward, the LH stabilizer lowers. Pull lever back, the LH stabilizer raises.

3. Right Hand Stabilizer:

Push lever forward, the RH stabilizer lowers. Pull lever back, the RH stabilizer raises.

4. Crowd/Bucket:

Push lever forward, the dipperstick moves out, away from the operator. Pull lever back, the dipperstick moves in, toward the operator.

Move lever to left, the bucket curls in. Move lever to right, the bucket extends out.

By moving the lever to one of the intermediate positions, the dipperstick can be extended or retracted at the same time the bucket is being loaded or dumped.

EXTEND AND LOAD the bucket by moving the lever forward and to the left.

RETRACT AND LOAD the bucket by moving the lever back and to the left.

EXTEND AND DUMP the bucket by moving the lever forward and to the right.

RETRACT AND DUMP the bucket by moving the lever back and to the right.

The two operations of the boom lever, combined with the two operations performed by the bucket and dipperstick control lever provide four simultaneous operations from the two levers, keeping cycle time at a minimum.

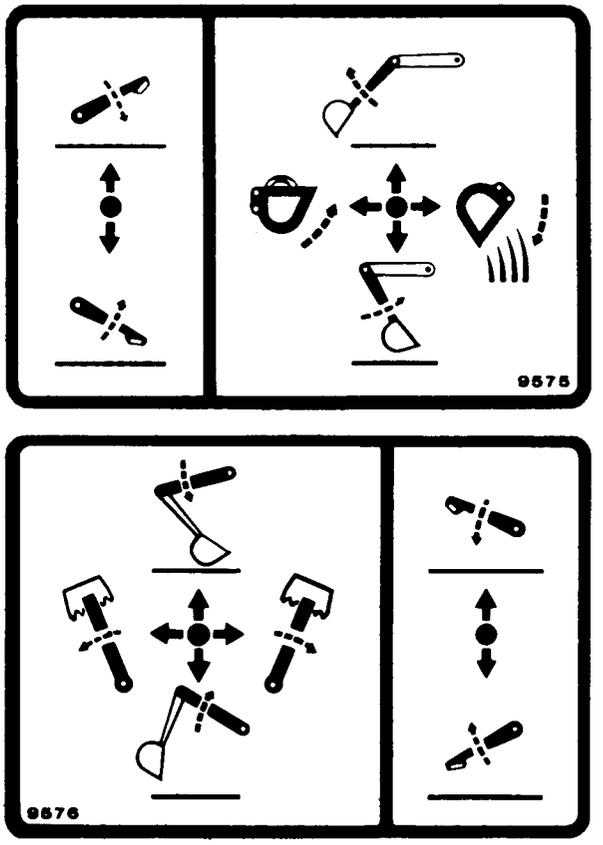
In general, the direction of movement of a control lever corresponds to the movement of the operating member.

Operating The Backhoe:

CAUTION - To avoid possible injury, observe the following safety rules WHEN OPERATING the backhoe:

1. DISENGAGE safety locks before attempting to operate the backhoe.
2. OPERATE from the backhoe operator's seat only.
3. LOWER the stabilizers until the rear of the tractor is totally supported by them.
4. DO NOT dig near the stabilizers.
5. DO NOT touch overhead wires with any part of the backhoe.
6. DO NOT attempt to raise the tractor off the ground or move the tractor forward or backward using the backhoe dipperstick or bucket.
7. DO NOT lose stability by swinging the bucket downhill when positioned on a slope.

It is not difficult to become an efficient operator. Control lever operating decals are located in front of the control levers. Study these decals; they will assist you in becoming familiar with the controls.



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

Operate the backhoe control levers to become familiar with their speed and movements. The engine speed and the size of the hydraulic system will determine the speed of cylinder operation. When powering from tractor systems with higher output than required, reduce engine RPM to obtain acceptable backhoe operating speed.

Swing the boom several times to practice controlling the speed of swing. Do not operate the swing more than 45 degrees each way for the first few times, then gradually increase the arc.

IMPORTANT - To avoid damage to the backhoe, do not slam swing unit into the rubber bumper pads.

Best results are obtained by digging near the center of the swing arc so material can be dumped on either side.

As the operator becomes more familiar with the operation of the backhoe, it will be common practice to operate two controls at one time. For example; with the bucket extended and the dipperstick

extended, the lift control and crowd control can be operated together to bring the bucket toward the operator with down pressure on it. As the dipperstick approaches the operator, the crowd and bucket controls can be operated to close the bucket and trap the material. At the end of the stroke, the lift and crowd controls are operated to move the load up and away from the operator to save time in clearing the excavation.

This dual operation of controls will speed and simplify the digging operation. Normally the two or more movements will not be equal or even simultaneous but as pressure within the cylinders change, and the resistance on an operating member of the hoe lessens, it will begin to move. It is balancing the force of one member against the other.

NOTE - Actuating the bucket is the key to powerful digging. Operating the crowd and bucket controls simultaneously will insure a full bucket and prevent waste motion and time.

Transporting The Backhoe:

CAUTION - To avoid possible injury, observe the following safety rules WHEN TRANSPORTING the backhoe:

1. ALWAYS engage safety locks when transporting backhoe.

2. TRAVEL SLOWLY over rough terrain, on hillsides, and around curves to prevent tipping.

3. DO NOT drive the tractor near the edge of a ditch or excavation.

4. USE accessory lights and SMV emblem when traveling on highways.

Before leaving backhoe operator's seat, position the backhoe for transport by raising boom, crowding dipperstick in, curling bucket in, swinging to center, and raising the stabilizers.

When transporting for long distances, periodically examine the backhoe and raise stabilizers and bucket back up to full transport height. It is normal for the hoe to slowly settle while being transported.

SERVICE

CAUTION - To avoid possible injury, observe the following safety rules WHEN SERVICING the backhoe:

1. ENGAGE safety locks before servicing the backhoe.

2. DO NOT oil, grease, or adjust the backhoe while it is in motion.

3. DO NOT change any backhoe relief valve settings. They are factory set for best backhoe performance and safety.

4. ESCAPING FLUID under pressure can have sufficient force to penetrate the skin and cause serious injury. Be sure to relieve all pressure before disconnecting lines. Be sure all connections are tight and that lines, pipes, and hoses are not damaged before applying pressure to the system.

5. FLUID ESCAPING from a very small hole can be almost invisible. Use a piece of cardboard or wood - not your hands - to search for suspected leaks.

6. SEE A DOCTOR AT ONCE if injured by escaping fluid. Serious infection or reaction can develop if proper medical treatment is not administered immediately.

7. PROTECT YOUR EYES - WEAR SAFETY GLASSES. Guard against injury when driving connecting pins or performing any repair in which particles can chip from work piece or striking tool.

Beginning Of Season:

Remove all protective covering.

Check hydraulic hoses for deterioration and, if necessary, replace.

Lubricate all grease fittings and oil handle linkage.

Check hydraulic system for loss of fluid and, if necessary, fill to proper level.

Tighten all loose bolts, nuts, and setscrews.

Inspect bucket teeth and, if necessary, sharpen or replace them.

Operate the backhoe slowly for a short time before placing the unit under full load.

Bleeding Backhoe-Hydraulic System:

If the hydraulic hoses have been disconnected from the backhoe or tractor, all trapped air must be removed after the hoses are connected. Start tractor engine and operate backhoe through all movements fully, several times, to purge the system of air.

Hydraulic System Hoses:

Oil leaks in the pressure side of the system can be located by carefully inspecting the external area of the hoses and fittings.

Check the return side of the system for leaks by examining the oil in the reservoir. If air is being drawn into the system, the oil will contain air bubbles and appear to foam.

When tightening connections always use two wrenches.

IMPORTANT - Do not over-tighten fittings. Make them just tight enough to eliminate leaks.

NEVER use teflon tape on pipe thread fittings. Always use a paste type sealer.

Hoses on any backhoe are very severely worked and will fail in time. Examine them regularly and replace any that show signs of failure. Pay careful attention to the routing of hoses so they can move fully and freely, without kinking, and can not be pinched or cut by any part of the backhoe.

Hydraulic System Reservoir:

On PTO pump self-contained systems, maintain the reservoir fluid level at 1 inch below the tank top when the bucket is extended to full reach, bucket rolled back for loading and resting on the ground, and stabilizers fully raised. Do not over-fill, fluid may be forced out of the breather filler cap.

Fill with:

SAE 10W40 engine oil with API "SD" classification in northern climates.

SAE 40W engine oil with API "SD" classification in southern climates.

Change oil every 200 hours or more often if necessary.

If the tractor system supplies the hydraulic power, service according to the tractor instruction manual.

Bucket Tooth Points:

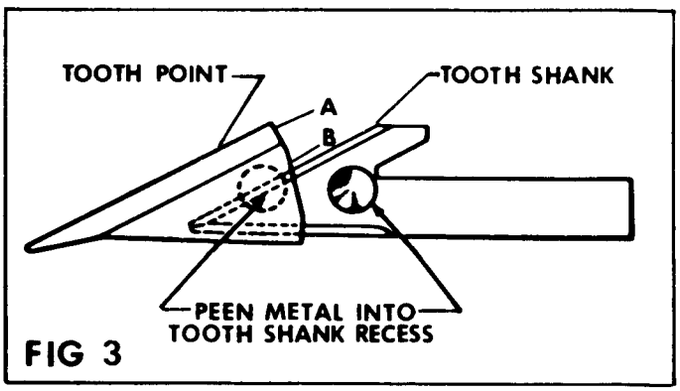


FIG 3

The bucket tooth points are self-sharpening and will require little attention; however, these points on the bucket shanks can be replaced when they become badly worn or broken.

A tooth point can be removed from the welded tooth shank by hammering at "A" on the tooth point or by driving a chisel at "B", just between the tooth point box section and the tooth shank. Install the new point and anchor it to the shank by peening at the location shown.

If a tooth shank breaks off, becoming lost or damaged so that it can not hold a tooth point, a new shank should be welded to the bucket in its place.

Tightening Nuts And Bolts:

Periodically, check to be sure all bolts and nuts are tight, see Torque Chart, Page 8.

Check all pivot pins for cotter pins, washers, and retainers; if missing - replace.

Lubrication:

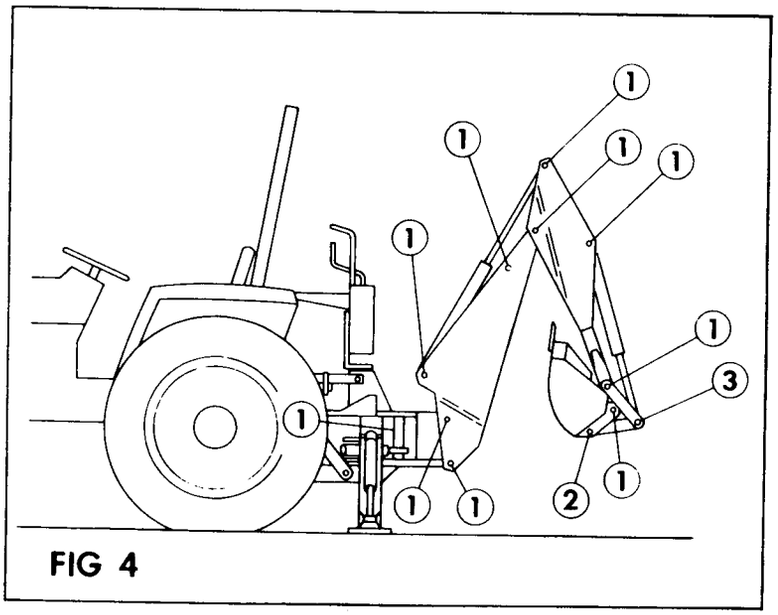


FIG 4

Economical and efficient operation of any machine is dependent upon regular and proper lubrication of all moving parts with a quality lubricant.

All parts provided with grease fittings should be lubricated with a good quality chassis lube type grease. If any grease fittings are missing, replace them immediately. Clean all fittings thoroughly before using grease gun.

Lubricate all grease fittings at least twice daily, once at the beginning of operation and again approximately halfway through the work day.

See Fig 4, for the location of most grease fittings. In addition to those fittings shown, the following must also be greased twice daily:

A. Stabilizer cylinder pivot pins (2 each cylinder).
B. Swing cylinder pivot pins (2 each cylinder).
C. Swing linkage (2 each side).

The following locations should be oiled with SAE 30 oil:

A. Control valve handle linkage.
B. Seat bracket pivot.

IMPORTANT - Avoid excessive greasing. Dirt collects on exposed grease and increases wear greatly. After greasing wipe off excessive grease from fittings.

TORQUE VALUES

Common bolts and nuts. Tightening Torque ± 20%

SIZE	GRADE 2	GRADE 5	GRADE 8
1/4-20 NC	70 in lb	115 in lb	165 in lb
1/4-28 NF	85 in lb	140 in lb	200 in lb
5/16-18 NC	150 in lb	250 in lb	350 in lb
5/16-24 NF	165 in lb	270 in lb	30 ft lb
3/8-16 NC	260 in lb	35 ft lb	50 ft lb
3/8-24 NF	300 in lb	40 ft lb	60 ft lb
7/16-14 NC	35 ft lb	55 ft lb	80 ft lb
7/16-20 NF	45 ft lb	75 ft lb	105 ft lb
1/2-13 NC	50 ft lb	80 ft lb	115 ft lb
1/2-20 NF	70 ft lb	105 ft lb	165 ft lb
9/16-12 NC	75 ft lb	125 ft lb	175 ft lb
9/16-18 NF	100 ft lb	165 ft lb	230 ft lb
5/8-11 NC	110 ft lb	180 ft lb	260 ft lb
5/8-18 NF	140 ft lb	230 ft lb	330 ft lb
3/4-10 NC	150 ft lb	245 ft lb	350 ft lb
3/4-16 NF	200 ft lb	325 ft lb	470 ft lb

NOTE - See tractor instruction manual or your tractor dealer for tightening of metric bolts.

REMOVAL FROM TRACTOR - STORAGE

The backhoe is self-assisting during the installation and removal procedures. For removal and storage follow these steps:

1. Put the stabilizers down and lift the hoe slightly.

2. Stretch out the boom, dipper arm, and bucket, as shown in Fig 5 and 6. Lower the bucket to the ground so that it rests there solidly.

3. Place suitable blocking under the backhoe frame to support it adequately, as shown in Fig 5 and 6.

4. Detach the backhoe from the tractor mechanically only, not hydraulically at this point, and move the tractor a few inches away from the backhoe.

NOTE - To facilitate this procedure, the backhoe can still be hydraulically moved, raised or lowered, to release the connection points of the carrying forces.

5. Gently lower the backhoe onto the blocking as shown in Fig 5 and 6. Leave the stabilizers outstretched and firmly in contact with the ground for added stability.

6. The hydraulic system can now be deactuated.

a. On PTO pump self-contained systems, the pump should be removed from the PTO shaft. The hydraulic system should always remain complete. No hoses or oil lines should be disconnected during correct removal and storage procedure.

b. On systems that tap into the tractor for hydraulic power, these lines can be disconnected now.

IMPORTANT - Be sure to mark the lines to prevent mix up, during hook-up, when the hoe is again attached to the tractor.

Be sure to cap the ends of the lines to keep clean while in storage.

7. Now slowly drive the tractor forward and away from the backhoe. Be careful that all parts clear each other during separation.

8. Refer to the installation instructions for the attaching kit, this will help with the removal and reattaching.

9. For long term storage, coat exposed lift, swing, and stabilizer cylinder rods with grease.

10. Lubricate all grease fittings and oil swing chains, stabilizer pivot pins, and complete handle linkage.

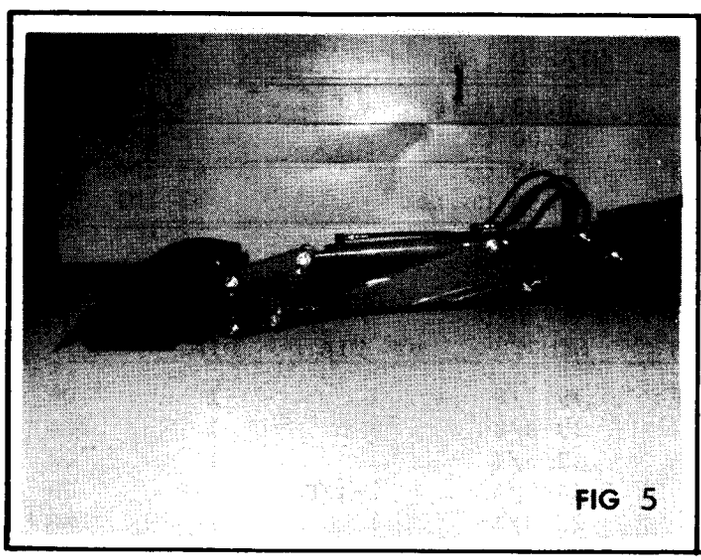


FIG 5

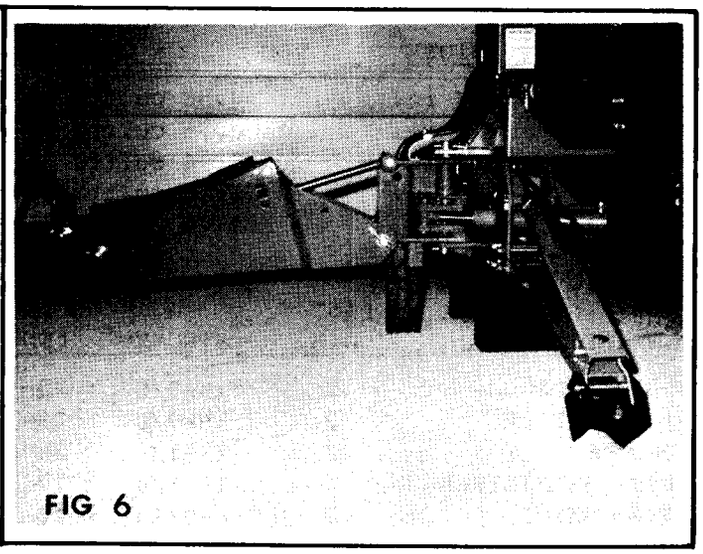
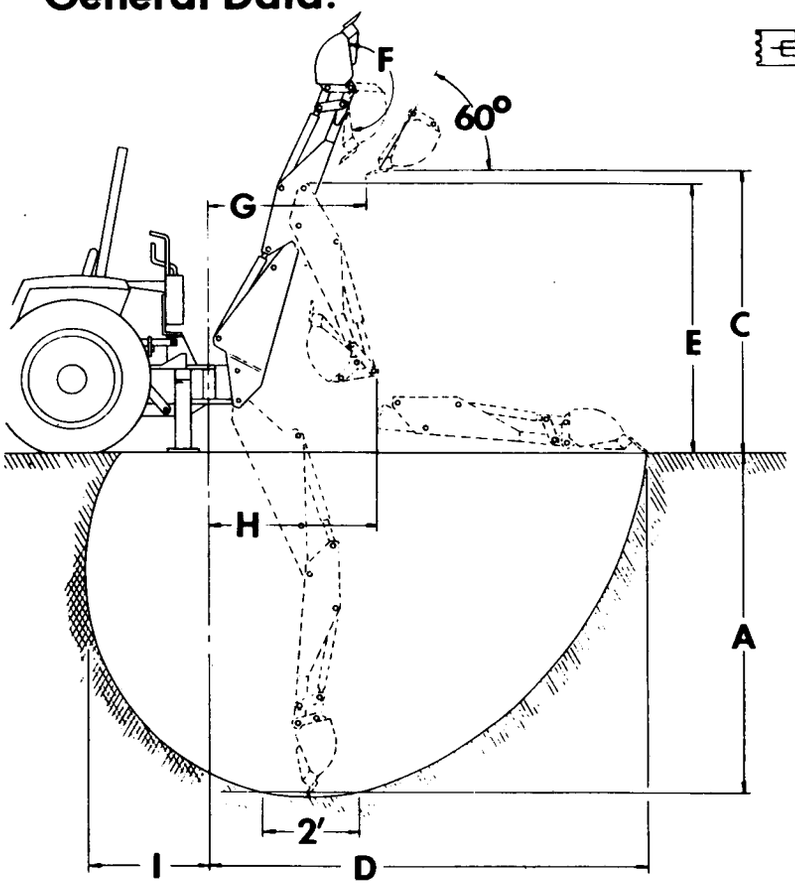
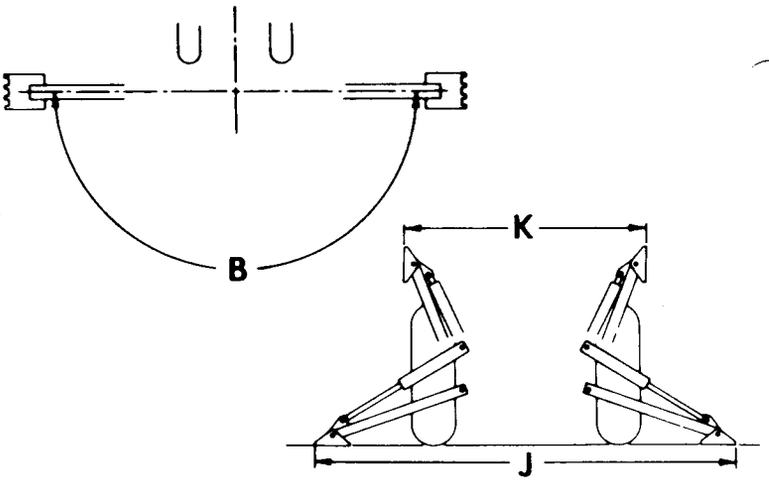


FIG 6

SPECIFICATIONS

General Data:





A. Digging Depth.....6' 6"
(two foot flat bottom)
B. Swing Arc.....180°
C. Loading Height.....5' 0"
(bucket at 60°)
D. Reach from Center Line of
Swing Pivot.....8' 6"

E. Transport Height (maximum).....4' 11"
F. Bucket Rotation.....180°
G. Loading Reach.....3' 2"
(bucket at 60°)
H. Transport Overhang.....3' 5"
I. Undercut.....2' 4"
J. Stabilizer Spread,
down position.....6' 6"
K. Stabilizer Spread,
up position.....3' 11"
Maximum Lift Capacity -
full reach.....200 lbs.
Bucket Roll Force.....2400 lbs.
Bucket Pry-Out Force.....
.....in excess of 4000 lbs.
Shipping Weight
(less bucket).....650 lbs.
Hydraulic Volume
Requirements.....3-1/2 to 5 GPM
Hydraulic Pressure
Requirements.....1600 psi

Bucket Data:

BUCKET	WIDTH	SAE STRUCK CAPACITY	HEAPED CAPACITY	SHIPPING WEIGHT
W209	9 in.	0.50 cu.ft.	0.63 cu.ft.	33 lbs.
W210	13 in.	0.75 cu.ft.	1.00 cu.ft.	39 lbs.
W211	16 in.	0.94 cu.ft.	1.25 cu.ft.	44 lbs.
W213	19 in.	1.13 cu.ft.	1.50 cu.ft.	53 lbs.
W214	24 in.	1.44 cu.ft.	2.00 cu.ft.	62 lbs.

Cylinder Data:

CYLINDER	PISTON DIA.	STROKE	RETRACTED LENGTH	EXTENDED LENGTH	ROD DIA.	PIVOT PIN DIA.	TYPE OF ACTION
*124 - BOOM	2	15-7/8	23-1/2	39-3/8	1	1	DA
*124 - DIPPER	2	15-7/8	23-1/2	39-3/8	1	1	DA
083 - BUCKET	2	13-1/8	20-5/8	33-3/4	1	1	DA
073 - STABILIZER	2	11-1/4	17	28-1/4	1-1/8	5/8	DA
082 - SWING	2	8-9/16	15	23-9/16	1	1	SA

* Identical cylinders used for both functions.

HYDRAULIC TROUBLE SHOOTING

The trouble shooting material presented in this section is offered as a guide to diagnosing probable causes and remedies for general operational problems. Match your problem with the typical problem examples given, and note the numbers given in the possible cause column. These numbers correspond with the possible cause and correction paragraphs that follow.

NOTE - When using the following chart if it is decided that overhaul of components or pressure adjustments are necessary, to correct malfunctioning, it is recommended that your dealer make these repairs. He is equipped to do this work.

PROBLEM	POSSIBLE CAUSE
A. Machine fails to operate when started initially	1, 2, 5, 7, 16, 24
B. Machine loses power after operating satisfactorily initially	1, 8, 10, 14, 16, 24
C. Loss of power in lift or crowd cylinder, but other cylinders function properly	23, 25, 30
D. Loss of power in any one cylinder including lift and crowd	8, 9, 10, 11, 12, 13, 23, 25, 26
E. Loss of power or loss of cushioning action in swing cylinders, but other cylinders function properly	8, 9, 10, 11, 12, 13, 23, 24, 26, 27
F. Maximum swing action can not be obtained	12, 15
G. Slow operation of machine (lack of power) all cylinders	1, 4, 6, 14, 16, 24
H. Spongy or jerking action of cylinders and/or noisy operation	1, 3, 4, 5
I. Lift, crowd, or bucket cylinders drop under load when control spools are shifted from neutral	28, 30
J. Load drops or settles	8, 10, 13, 26, 28
K. Leaky cylinders	10, 11, 12, 13
L. Leaky valve	8, 16, 17, 29
M. Sticky valve spool	17, 20, 21, 22
N. Unable to push valve spool in	17, 18, 20, 21, 22
O. Spring centered spools do not return to neutral	17, 18, 19, 20, 21, 22

POSSIBLE CAUSE:	AND CORRECTION -
1. Low oil level in reservoir	fill reservoir to proper level.
2. No oil supply to machine	oil is not being diverted from the prime mover hydraulic system. Be sure that the proper controls are actuated on the prime mover.
3. Air in system	bleed all circuits of air by operating machine at maximum oil flow and through full movements.
4. Oil viscosity too heavy, or oil is not at operating temperature.	use recommended hydraulic fluid. Run machine until oil reaches operating temperature.
5. Pump not running	check pump drive to be sure it is engaged.
6. Insufficient pumping	advance engine throttle.
7. Improper hose connection	*IMPORTANT - Be sure inlet and return hoses are hooked up correctly. Improper hook-up will result in damage to the backhoe valve.*
8. Loose oil line connections, leaks in lines, or broken lines.	tighten all hose connections and replace any damaged O-rings at leaking O-ring fittings. Check and replace any damaged hoses and lines.
9. Restrictions in oil lines	check and replace any damaged hoses and lines. Check for pinched hoses.
10. Oil is bypassing cylinder piston, scored piston, worn piston packing, or defective piston assembly.	replace or rebuild the cylinder; replace damaged parts.
11. Scored piston rods and worn rod guides in cylinder.	replace or rebuild the cylinder; replace damaged parts.
12. Bent piston rod in cylinder	replace or rebuild the cylinder; replace damaged parts.
13. Worn or damaged rod seals on cylinder; external leaks.	repack cylinder. Rebuild cylinder, replacing damaged parts as necessary.
14. Diverter valve on prime mover leaking externally or bypassing oil internally through valve to reservoir.	diverter valve may need rebuilding or replacing.
15. Something jamming the swing linkage	remove interference.
16. Excessive back pressure	relieve condition. May be restriction from outlet to reservoir.

POSSIBLE CAUSE:	AND CORRECTION -
17. Paint on valve spool, sticking valve spool, or scored valve spool.	clean valve spool. Binding is usually caused from an over tightened plug, mounting bolt, fitting in valve body, or tie rod bolt. If a plug or fitting in valve body is leaking do not over tighten in an effort to stop leak. This will distort body casting and cause spools to bind. Instead, the plug or fitting should be removed from valve body and be reconnected, using a new O-ring. Do not apply excessive pressure on mounting bolts. The rods should be torqued to 150 in-lb. Never force spool, if binding occurs, see item 31 at the end.
18. Oil leakage past spool seal into spool cap.	remove cap, if it contains oil, replace spool seal O-rings, 31 at the end and Fig 7.
19. Broken return springs	replace springs, see item 31 at the end and Fig 7.
20. Bent spool	return for factory repair, or replace with new spool section. See item 31 at the end and Fig 7.
21. Foreign particles	clean system and valve.
22. Misalignment of control handle linkage.	check linkage for binding condition.
23. Spool not moved to full stroke	check travel, should be 1/4 inch either way or a total of 1/2 inch. See item 31 at the end.
24. Relief valve setting in backhoe control valve too low or defective.	relief pressure will have to be checked and corrections made. Backhoe system pressure is 1600 PSI. Relief valve may need cleaning or replace inlet section with relief. See item 31 at the end and Fig 7.
25. Overload relief valve stuck open or malfunctioning.	clean relief carefully but do not disturb its pressure setting as it can not be field calibrated, or replace relief valve. See Fig 12.
26. Worn control valve	replace the control valve.

POSSIBLE CAUSE:	AND CORRECTION -
27. A cross over relief in swing circuit is leaking or malfunctioning. Raise the machine on one side by fully extending the left or right stabilizer cylinder. Raise the bucket clear of the ground with the boom and dipperstick in transport position. If the boom swings toward the low side of the machine, oil is bypassing the cross over relief valve.	clean reliefs carefully but do not disturb their pressure setting as they can not be field calibrated, or replace the entire cross over relief assembly.
28. Load check in the control valve not holding.	clean check ball(s) carefully, being sure that it moves freely and seats properly or replace. See item 31 at the end and Fig 7.
29. Damaged or worn spool seals	replace spool end seals, see item 31 at the end and Fig 7.
30. Check ball in shuttle valve is stuck or not seating properly.	clean shuttle valve carefully, being sure that ball moves freely and seats properly, or replace shuttle valve. See Fig 12.

31. Problems involving the control valve proper.....

This valve is a precision device and is not intended for any extensive field adjustment or repair. Field replacement parts are limited to Seal Kits, Valve Sections, and Tie Rods. Anything beyond the replacement of these parts, the opening of check cavities and certain relief valve cavities to examine for trapped dirt, or the resetting of the main relief valve with the use of a good pressure gauge, should be referred back to the factory for an exchange. The malfunctioning valve must then be returned to its manufacturer for service.

Dirt and shreds of packing material are the usual causes of valve malfunction. Be sure that the reservoir oil supply is kept clean and only factory supplied packings are used in cylinder repair. Everything must be clean and free of dirt during the oil line removal and replacement and during any cylinder work.

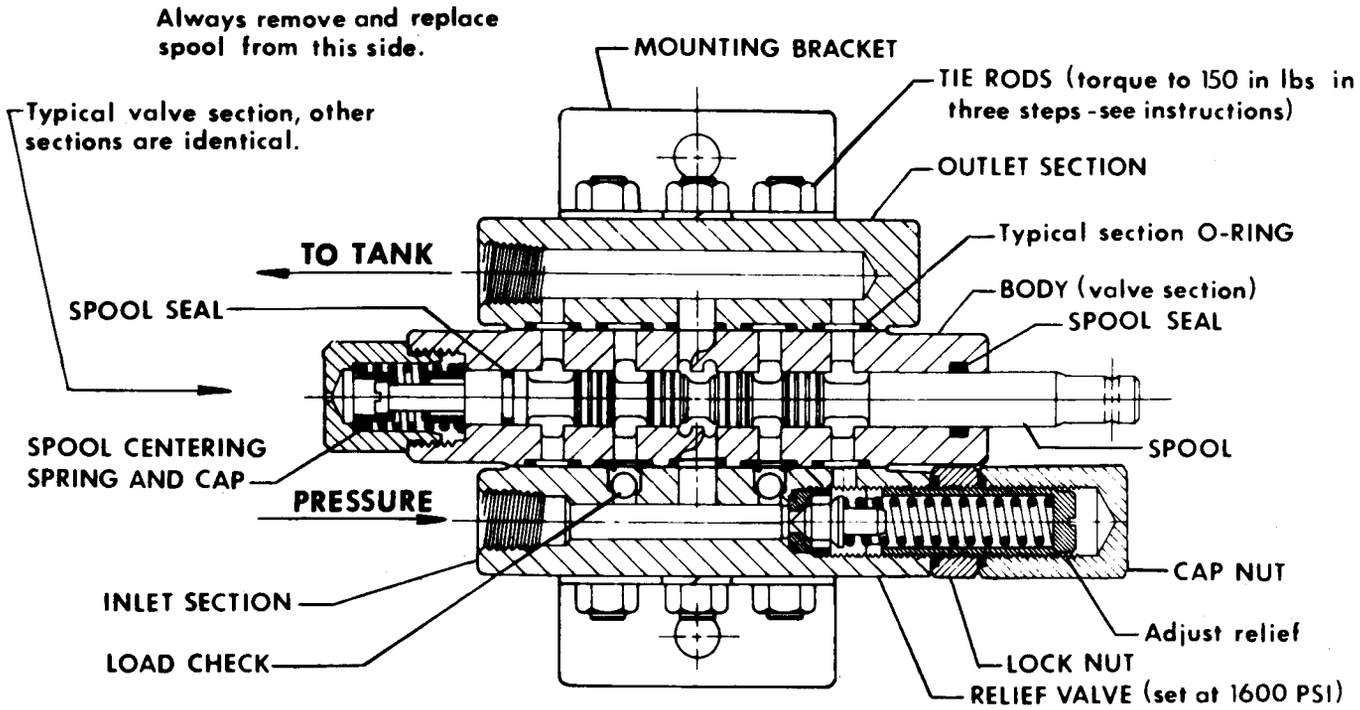
Pages 15, 16, and 17, Hydraulic Valve, explain the procedure to follow for valve repair, illustrate various portions of the valve, and list the part numbers.

PAY CLOSE ATTENTION TO ALL CAUTION AND WARNING NOTES SO THE VALVE WILL NOT HAVE TO BE RETURNED TO THE FACTORY AND THEN TO THE MANUFACTURER FOR RECONDITIONING.

Careful use of this information, after the warranty period, by qualified individuals with valve service training and experience, can correct minor problems which may develop.

THE INCLUSION OF THIS INFORMATION AND ITS USE DOES NOT IMPLY THAT THE WARRANTY WILL REMAIN EFFECTIVE ON THE VALVE IF IT IS TAMPERED WITH DURING THE WARRANTY PERIOD.

CONTROL VALVE



DISASSEMBLY -

1. Remove the valve from the backhoe and clean the exterior thoroughly.

2. Before progressing further, be sure the work area is very clean.

3. Remove nuts, mounting bracket, and washer from inlet end of valve.

NOTE - When removing the inlet section which will have load checks, watch for the check balls. They will fall free from the inlet section when removed. Remove ball retainers from the inlet side of the first valve section too.

4. Remove the inlet section. Between the inlet, each center section and the outlet, are three (3) mylar shims, one over each tie rod. Keep these shims, they will be needed during assembly.

5. Remove valve sections, one at a time, removing O-rings and mylar shims between each section.

6. After all valve sections are removed, detach stabilizer handle assemblies from sections three and four.

7. Remove the spring cap from the valve section.

8. Remove the spool from the body. Push spool on handle end, remove from spring cap end. Keep body and spool together, they are a matched set. DO NOT interchange.

9. Remove O-ring from inside bore on handle end of body.

10. To remove the O-ring on the spool, remove the spring centering assembly, then remove the O-ring.

11. Wash all parts in clean solvent, then dry with a low pressure air hose.

ASSEMBLY -

1. Inspect all parts before assembly. Remove any nicks or burrs from body and spool. Remove pipe sealant from ports. Replace any parts or components that are worn or damaged.

2. Lubricate all O-rings with clean hydraulic system oil. Note, it is wise to use all new O-rings.

3. Replace O-ring on handle end of body. Be sure O-ring is not twisted in groove.

4. Replace O-ring on spool making sure it is not twisted.

5. Replace spring centering assembly on end of spool. Torque to 30 in lbs.

6. Lubricate spool with clean hydraulic system oil. Place spool in its bore with a slight twisting action, this will prevent the possibility of O-ring shearing.

NOTE - No O-ring is used on the centering spring cap.

7. Replace the centering spring cap.

8. Replace the handle assemblies on sections three and four for stabilizers.

9. Install one nut on each tie rod. Place two tie rods through the mounting bracket. Place one flat washer on the third tie rod. Push the tie rods through the outlet section. An aid in assembling sections is to place the mounting bracket in a vice or on the edge of a flat surface with the tie rods in a vertical position. Replace O-rings on outlet section. Place one mylar shim over each tie rod and push them down onto the outlet sections. Install a valve section over the tie rods. Place the O-rings and mylar shims on this section. Replace remaining sections as above.

10. Installation of load checks; before installing O-rings in the section next to the inlet place the ball retainers, with center prongs up, in the flow passages on both sides of the center flow passage. Do not place retainers in the two outside passages. Place O-rings in the counter-bores. Place the mylar shims, one over each tie rod, on the section. Then stand the ball on the retainers.

11. Install the inlet section. Place the mounting bracket over the lower tie rods and install the two nuts. Place the flat washer over the top tie rod and install the nut.

12. Torque the tie rods in three steps of; 75 in lbs, 100 in lbs, and finally 150 in lbs each.

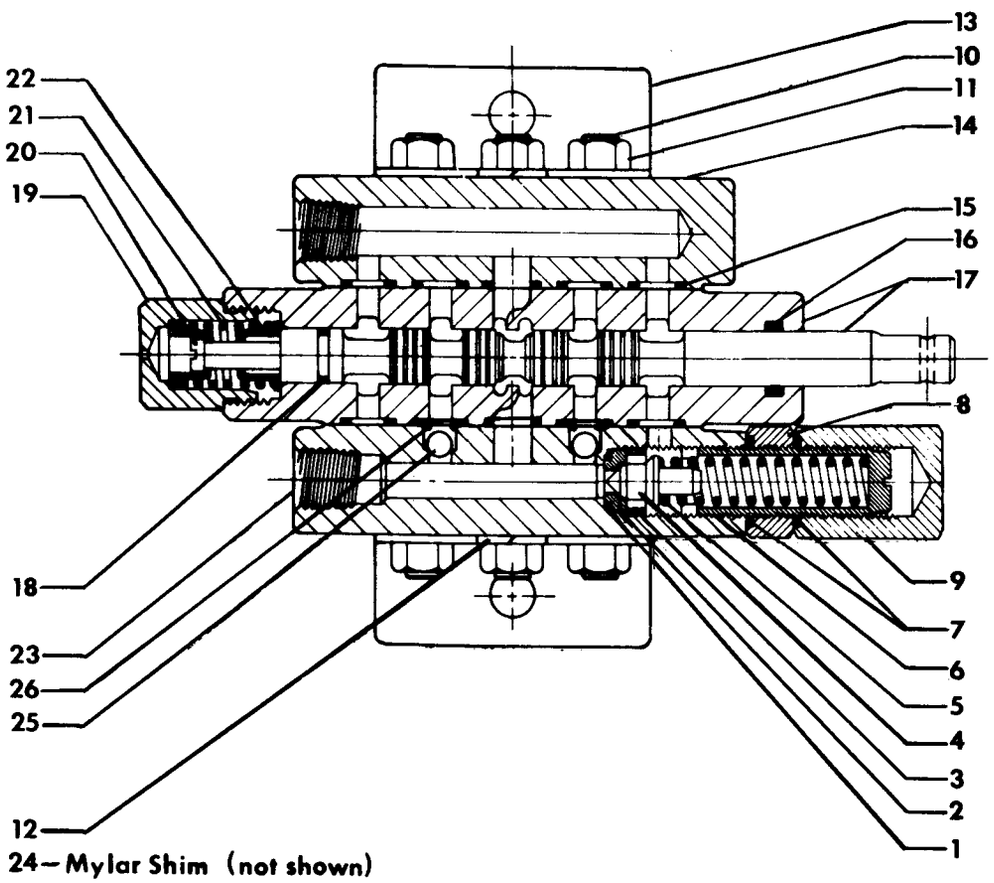


FIG 7

Parts List - Fig. 7

Index	Quantity	Description	Part No.
1	1 per valve	O-Ring	*
2	1 per valve	Seat	*
3	1 per valve	Retainer	*
4	1 per valve	Poppet	*
5	1 per valve	Spring	*
6	1 per valve	Adjusting Screw	*
7	2 per valve	O-Ring	*
8	1 per valve	Lock Nut	*
9	1 per valve	Cap Nut	*
10	3 per valve	Tie Rod, Six-Spool	10237
11	6 per valve	Nut, 5/16 NC	7431
12	2 per valve	Washer, 5/16 SAE	8152
13	2 per valve	Bracket	10238
14	1 per valve	Outlet	10239
15	5 per section	O-Ring	**
16	1 per section	O-Ring	**
17	6 per valve	Body and Spool (matched)	*
18	1 per section	O-Ring	**
19	1 per section	Spring Cap	10240
20	1 per section	Spring Shaft	10241
21	1 per section	Spring	10242
22	2 per section	Spring Guide	10243
23	1 per valve	Inlet with Relief, set at 1600 PSI	10130
24	3 per section	Mylar Shim	**
25	2 per valve	Load Check Ball	**
26	2 per valve	Load Check Retainer	**
	1 per section	Section Seal Kit, consisting of: parts 15, 16, 18, 24	10370
	1 per valve	Load Check Kit, consisting of: parts 25, 26	10371
	6 per valve	Valve Section Complete	10246
	1	Six-Spool Valve Complete	10138

* Not available as a separate repair part, order complete section.
** Not available as a separate repair part, order kit.

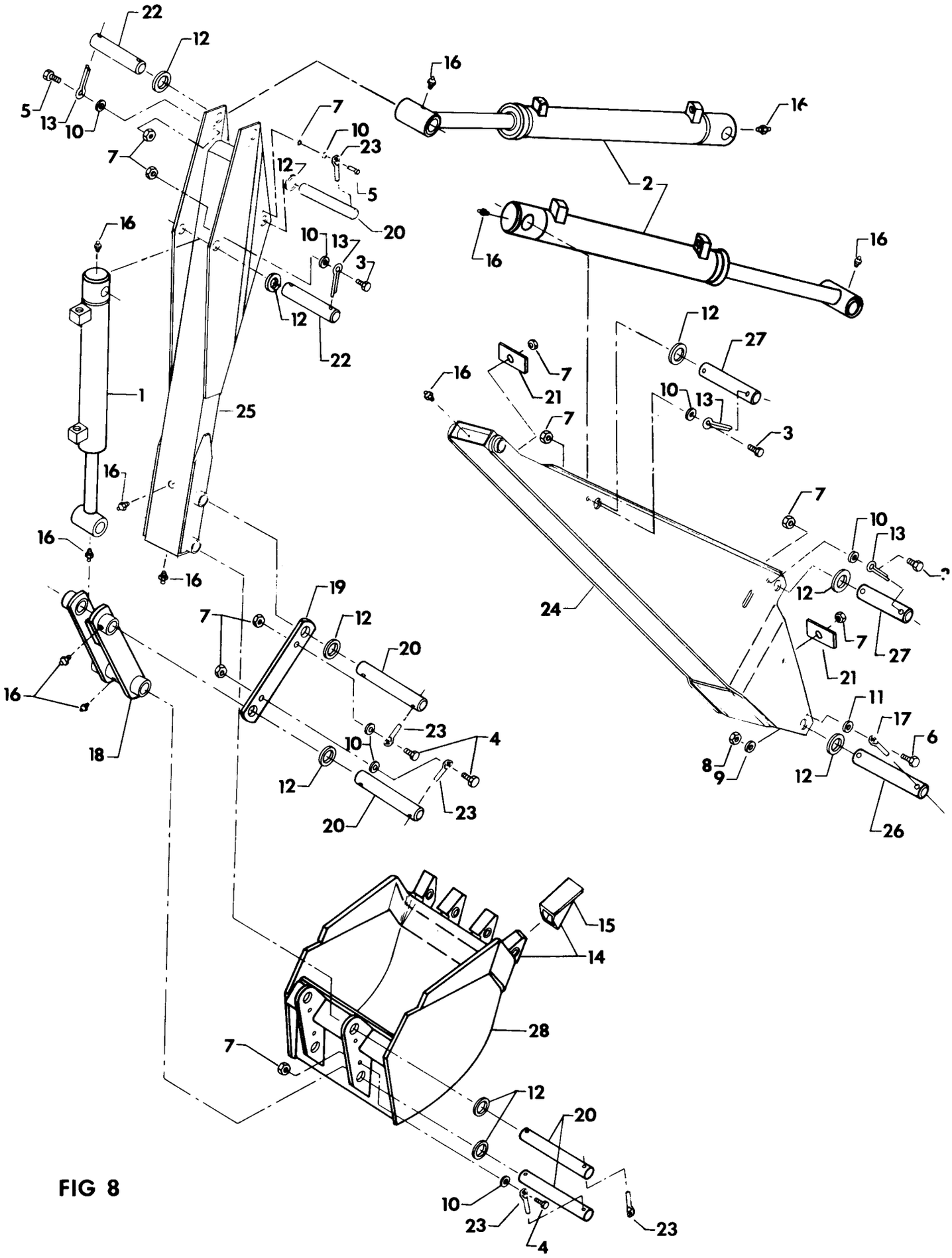


FIG 8

PARTS LIST - FIG 8

Index	Description	Part No.
1	Hydraulic Cylinder - Bucket	083
2	Hydraulic Cylinder - Boom/Dipperstick	124
3	Bolt, 5/16 NF x 3/4	6789
4	Bolt, 5/16 NF x 7/8	6790
5	Bolt, 5/16 NF x 1"	6795
6	Bolt, 3/8 NF x 1"	6851
7	Locknut, 5/16 NF	7437
8	Nut, 3/8 NF	7461
9	Lockwasher, 3/8	8079
10	Flat Washer, 5/16 SAE	8152
11	Flat Washer, 3/8 SAE	8158
12	Machine Bushing, 1-1/2 OD x 1" ID x 18 GA	8283
13	Cotter Pin, 5/16 x 1-1/2	8615
14	Bucket Tooth and Shank	13622
15	Bucket Tooth Only	13623
16	Grease Fitting	14505
17	Pin Retainer - Small	851122
18	Bucket Link Weldment	855120
19	Bucket Guide Link	855142
20	Pin, 1" Dia. x 7-3/8	855151
21	Hose Retainer	856233
22	Pin, 1" Dia. x 5-5/8	856243
23	Pin Retainer	856249
24	Boom Weldment	859060
25	Dipperstick Weldment	859080
26	Pin, 1" Dia. x 8-1/16	859179
27	Pin, 1" Dia. x 5-1/2	859181
28	Bucket Complete - 9 inch	W209
28	Bucket Complete - 13 inch	W210
28	Bucket Complete - 16 inch	W211
28	Bucket Complete - 19 inch	W213
28	Bucket Complete - 24 inch	W214

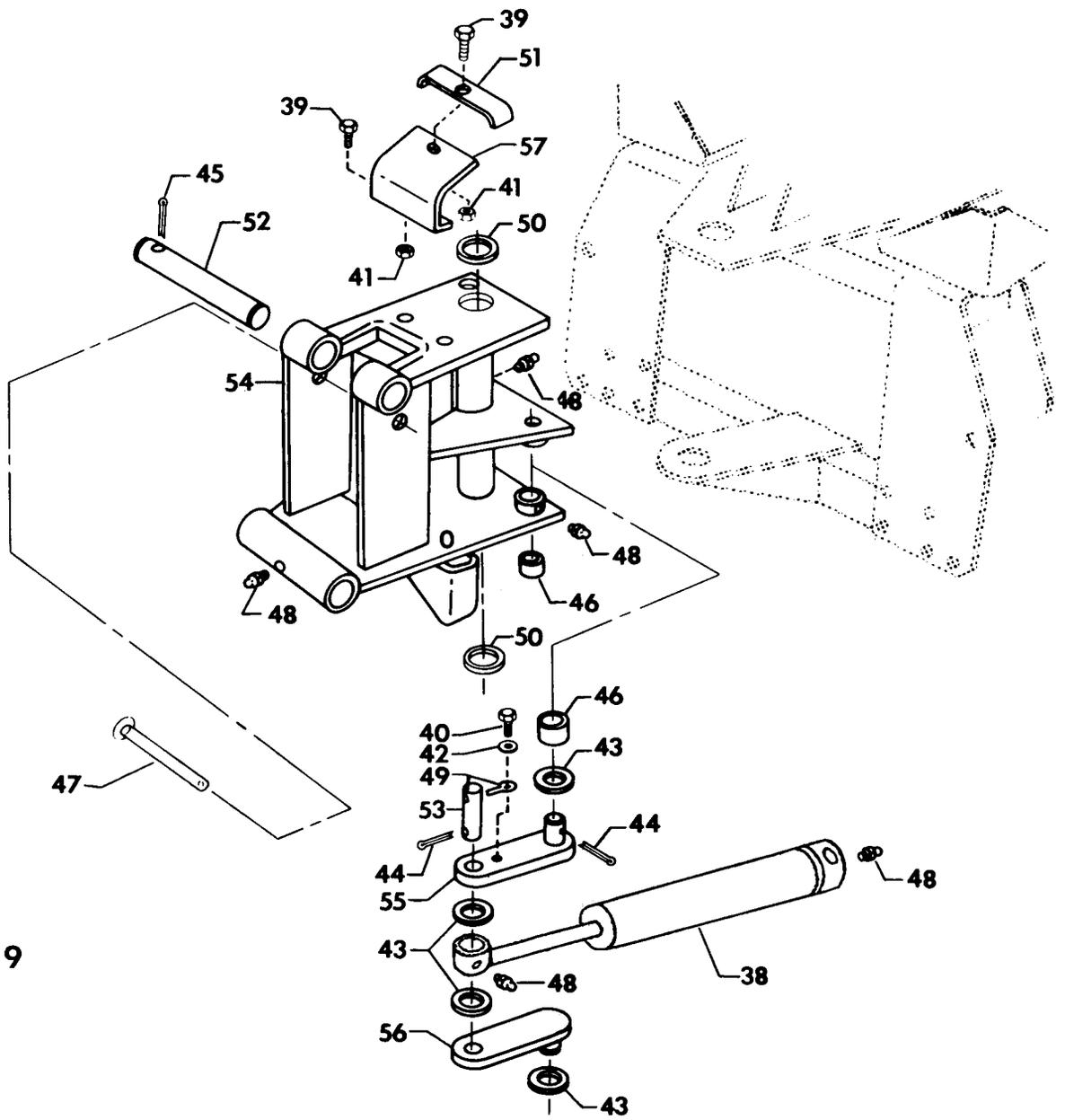


FIG 9

PARTS LIST - FIG 9

Index	Description	Part No.
38	Hydraulic Cylinder - Swing	082
39	Bolt, 5/16 NF x 1"	6795
40	Bolt, 3/8 NF x 1"	6851
41	Locknut, 5/16 NF	7437
42	Lockwasher, 3/8	8079
43	Machine Busing, 1-1/2 OD x 1" ID x 18 GA	8283
44	Cotter Pin, 1/4 x 1-1/2	8602
45	Cotter Pin, 5/16 x 2-1/2	8614
46	Bronze Bearing, 1-1/4 OD x 1" ID x 1"	11993
47	Quick Release Pin - Long	13495
48	Grease Fitting	14505
49	Pin Retainer - Small	851122
50	Thrust Washer	855171
51	Hose Strap	856237
52	Pin, 1" Diameter x 5-1/2	856244
53	Pin, 1" Diameter x 4-1/8	856248
54	Swing Frame Weldment	859030
55	Upper Swing Link Weldment	859105
56	Lower Swing Link Weldment	859110
57	Hose Bracket	859177

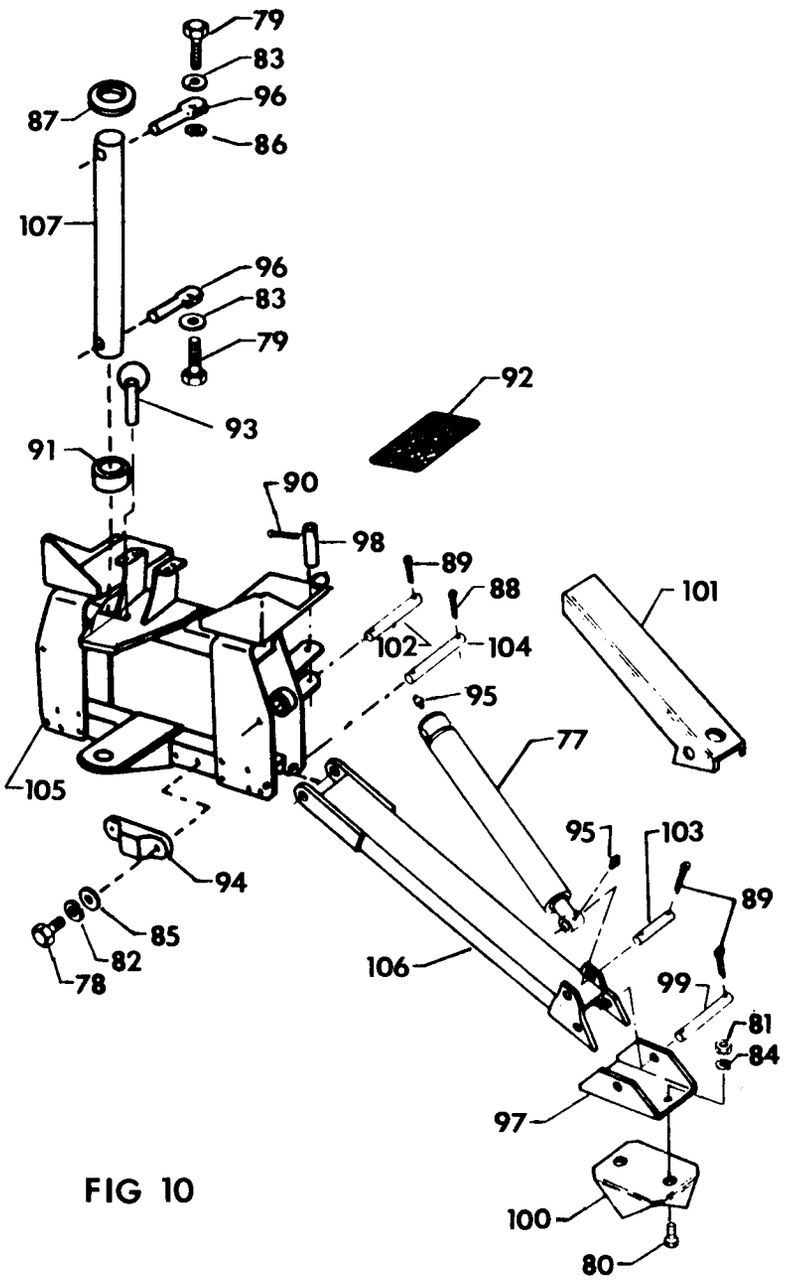


FIG 10

PARTS LIST - FIG 10

Index	Description	Part No.
77	Hydraulic Cylinder - Stabilizer	073
78	Bolt, 5/16 NF x 1"	6795
79	Bolt, 1/2 NF x 1"	7012
80	Bolt, 5/8 NC x 1-1/4 Gr 5	7118
81	Nut, 5/8 NC	7531
82	Lockwasher, 5/16	8071
83	Lockwasher, 1/2 Shakeproof	8103
84	Lockwasher, 5/8	8111
85	Flat Washer, 5/16	8151
86	Flat Washer, 1/2 SAE	8173
87	Machine Bushing, 2-1/4 OD x 1-1/2 ID x 16 GA	8232
88	Cotter Pin, 1/8 x 1-1/4	8563
89	Cotter Pin, 3/16 x 1-1/4	8582
90	Cotter Pin, 1/4 x 1-1/2	8602
91	Bronze Bearing, 1-3/4 OD x 1-1/2 ID x 1"	11994
92	Foot Pad - Large	12906
93	Quick Release Pin - Short	13492
94	Bumper	13681
95	Grease Fitting	14505
96	Pin Retainer - Large	851123
97	Stabilizer Pad	855141
98	Pin, 1" Diameter x 4-1/4	855147
99	Pin, 5/8 Dia. x 4-15/16	855174
100	Stabilizer Shoe	856231
101	Stabilizer Shield	856232
102	Pin, 5/8 Dia. x 5-5/8	856246
103	Pin, 5/8 Dia. x 3-7/8	856247
104	Pin, 5/8 Dia. x 5-3/16	856548
105	Mainframe Weldment	859000
106	Stabilizer Weldment	859100
107	Main Pivot Shaft	859178

VALVE MOUNT, CONTROLS, AND SEAT

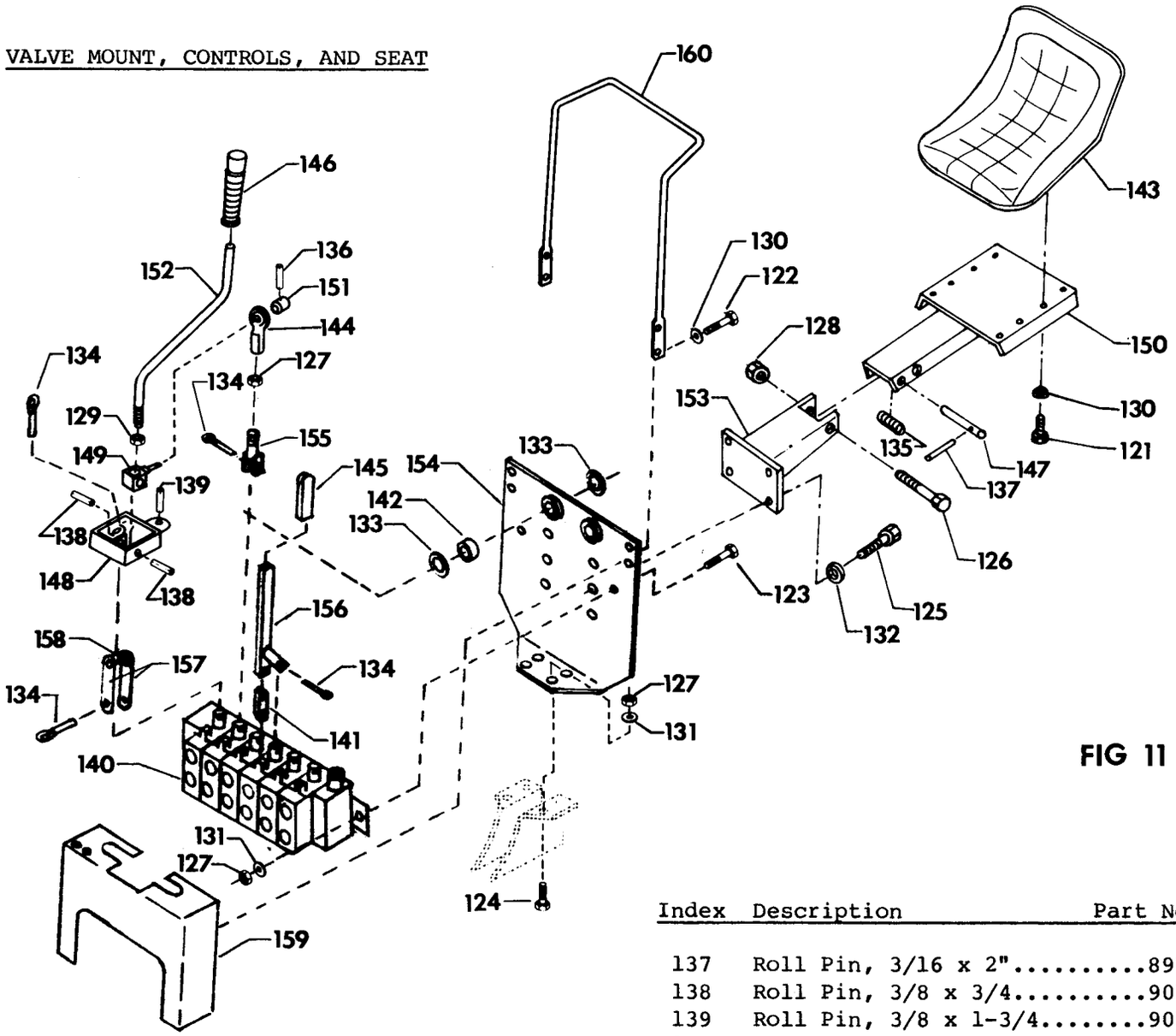


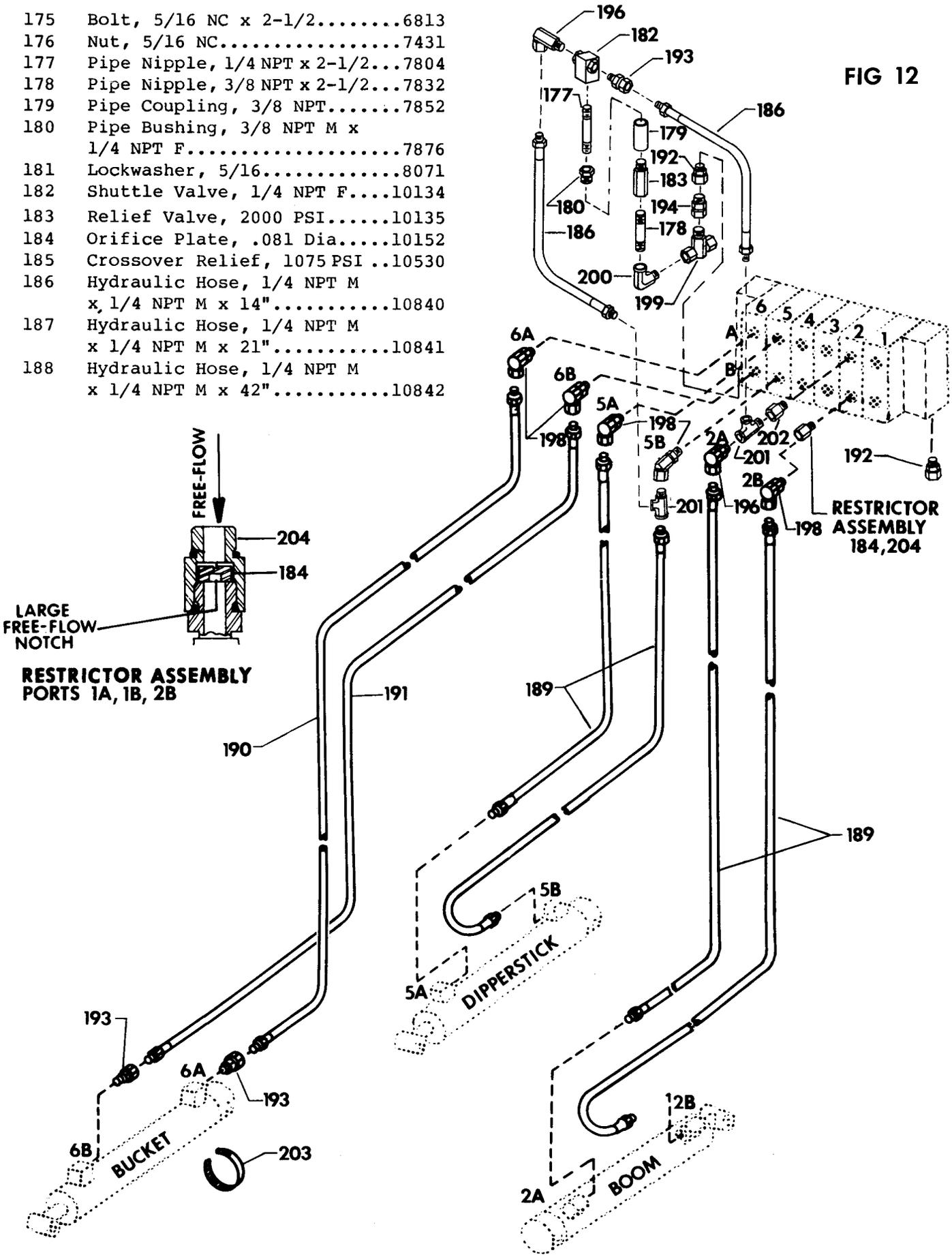
FIG 11

PARTS LIST - FIG 11

Index	Description	Part No.
121	Bolt, 5/16 NC x 3/4	6787
122	Bolt, 5/16 NF x 1-1/4	6799
123	Bolt, 3/8 NF x 1"	6851
124	Bolt, 3/8 NF x 1-1/4 Gr. 8	6860
125	Bolt, 1/2 NF x 1"	7012
126	Bolt, 5/8 NC x 5"	7184
127	Nut, 3/8 NF Gr. 5	7461
128	Locknut, 5/8 NC	7532
129	Jam Nut, 1/2 NC	7666
130	Lockwasher, 5/16	8071
131	Lockwasher, 3/8	8079
132	Lockwasher, 1/2	8101
133	Machine Bushing, 1-1/2 OD x 1" ID x 18 GA	8283
134	Cotter Pin, 5/32 x 1-1/4	8574
135	Spring	8711
136	Roll Pin, 5/32 x 3/4	8953
137	Roll Pin, 3/16 x 2"	8978
138	Roll Pin, 3/8 x 3/4	9017
139	Roll Pin, 3/8 x 1-3/4	9018
140	Control Valve, Complete	10138
141	Connector Link, ASA 2040	11465
142	Bronze Bushing, 1-1/4 OD x 1" ID x 1"	11993
143	Seat	13918
144	Ball Joint, 3/8 NF Female	14029
145	Handle Grip	14070
146	Handle Grip, 1/2 Dia	14071
147	Slide Pin	851988
148	Linkage Pivot Weldment	856160
149	Pivot Block Weldment	856165
150	Seat Plate with pins and spring	856180
151	Retainer Bushing	856227
152	Control Handle	856228
153	Seat Extension with decals	856655
154	Valve Plate, less bearings	859125
155	Link Weldment	859130
156	Control Handle Weldment	859135
157	Link	859141
158	Spacer	859142
159	Shroud Weldment	859150
160	Handle Loop	859176

PARTS LIST - FIG 12 and FIG 13

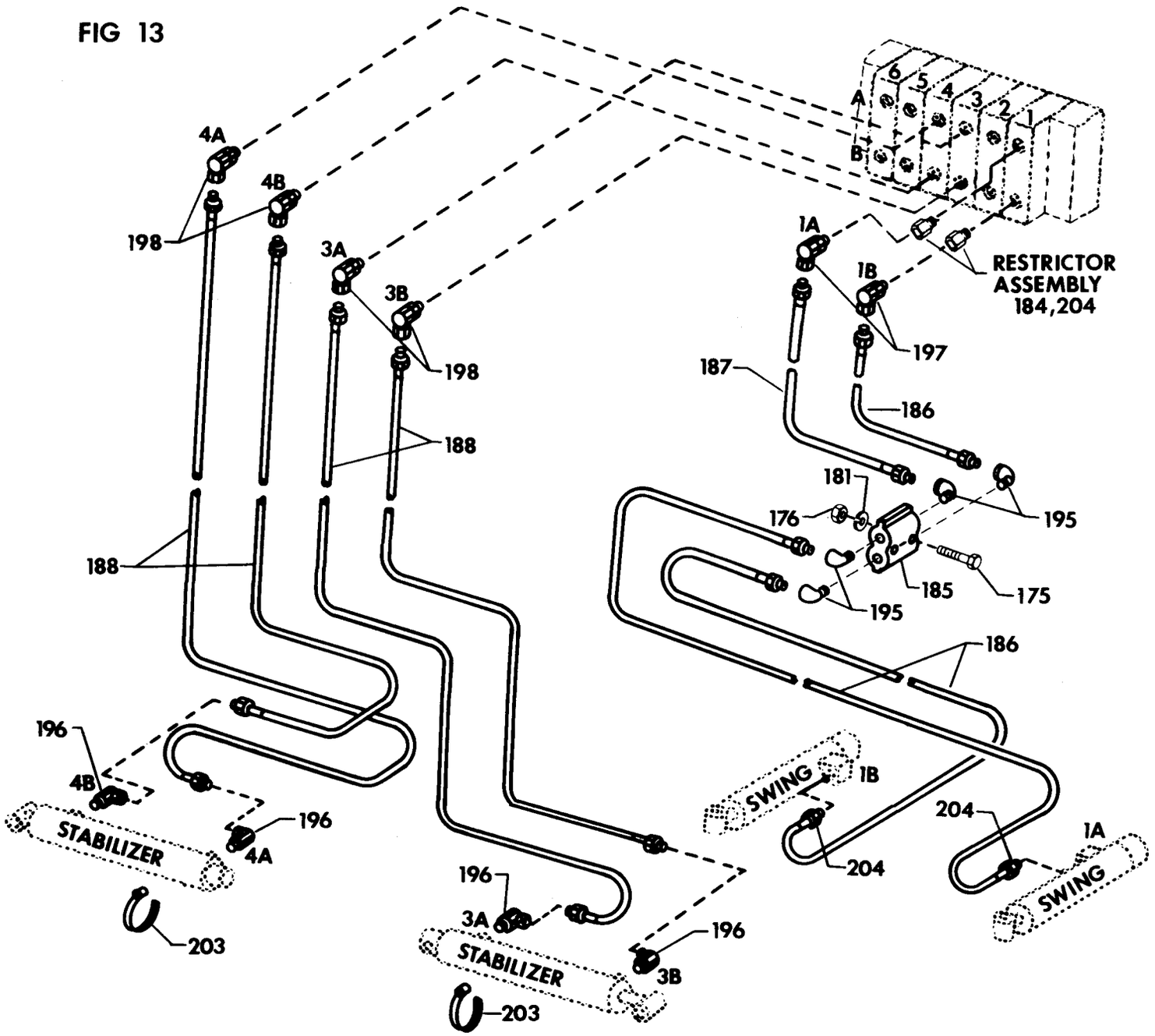
Index	Description	Part No.
175	Bolt, 5/16 NC x 2-1/2	6813
176	Nut, 5/16 NC	7431
177	Pipe Nipple, 1/4 NPT x 2-1/2	7804
178	Pipe Nipple, 3/8 NPT x 2-1/2	7832
179	Pipe Coupling, 3/8 NPT	7852
180	Pipe Bushing, 3/8 NPT M x 1/4 NPT F	7876
181	Lockwasher, 5/16	8071
182	Shuttle Valve, 1/4 NPT F	10134
183	Relief Valve, 2000 PSI	10135
184	Orifice Plate, .081 Dia	10152
185	Crossover Relief, 1075 PSI	10530
186	Hydraulic Hose, 1/4 NPT M x 1/4 NPT M x 14"	10840
187	Hydraulic Hose, 1/4 NPT M x 1/4 NPT M x 21"	10841
188	Hydraulic Hose, 1/4 NPT M x 1/4 NPT M x 42"	10842



PARTS LIST - FIG 12 and FIG 13

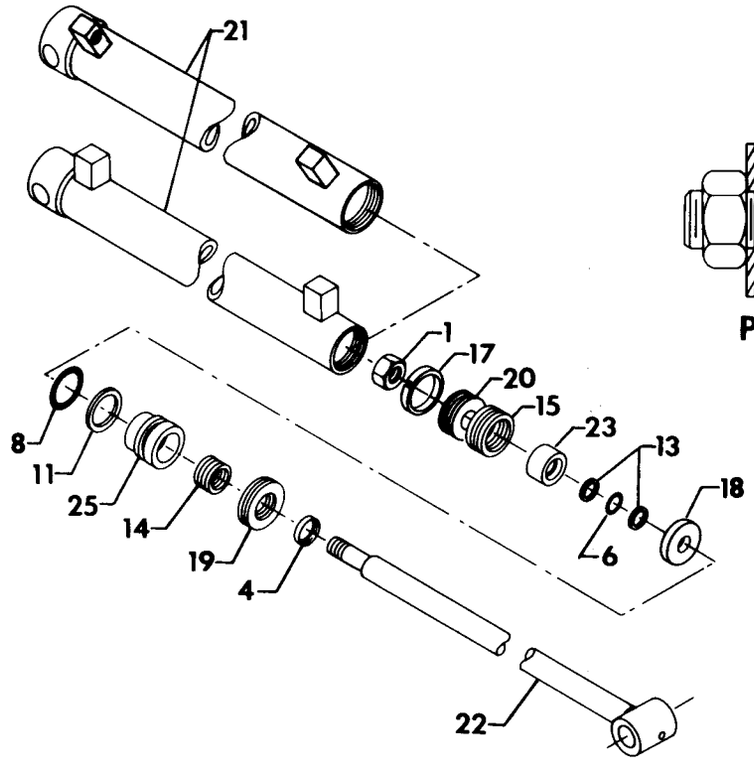
Index	Description	Part No.
189	Hydraulic Hose, 1/4 NPT M x 1/4 NPT M x 58"	10843
190	Hydraulic Hose, 1/4 NPT M x 1/4 NPT M x 85"	10844
191	Hydraulic Hose, 1/4 NPT M x 1/4 NPT M x 98"	10847
192	Adapter Union, 9/16-18 M x 3/8 NPT F	11091
193	Adapter Union, 1/4 NPT M-F	11103
194	Adapter Union, 3/8 NPT M-F	11109
195	Adapter Union, 3/8 NPT M x 1/4 NPT F x 90°	11124
196	Adapter Union, 1/4 NPT M-F x 90°	11125
197	Adapter Union, 9/16-18 M x 1/4 NPT F x 90°	11138
198	Adapter Union, 9/16-18 M x 1/4 NPT F x 45°	11156
199	Adapter Tee, 3/8 NPT M x (2) 3/8 NPT F	11158
200	Hydraulic Street Elbow, 3/8 NPT x 90°	11179
201	Run Tee, 1/4 NPT Hydraulic	11184
202	Pipe Adapter, 9/16-18 M x 1/4 NPT F	11186
203	Hose Clamp, 1-13/16 to 2-3/4	14140
204	Restrictor Housing	855168

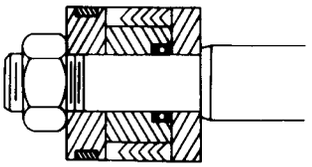
FIG 13



124 Cylinder
Lift and Crowd

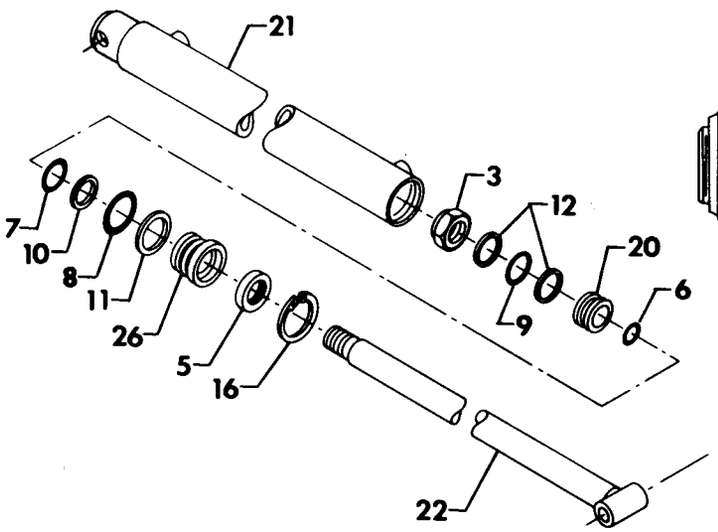
083 Cylinder
Bucket

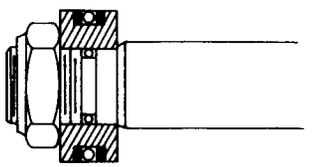




Proper Piston Assembly

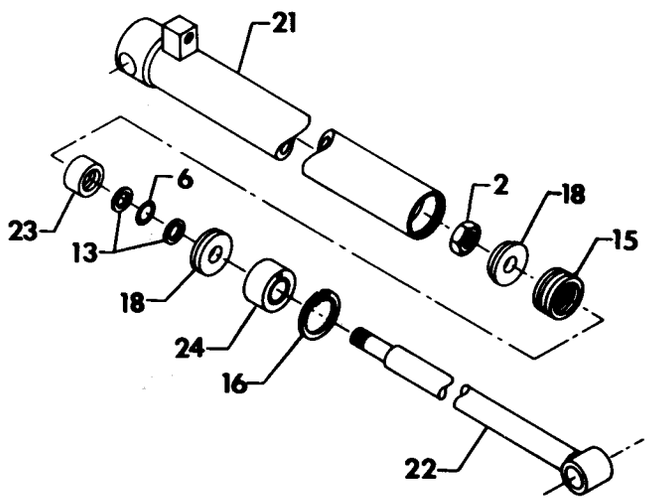
073 Cylinder
Stabilizer

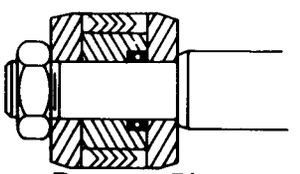




Proper Piston Assembly

082 Cylinder
Swing





Proper Piston Assembly

HYDRAULIC CYLINDERS - PARTS LISTS

Index	Description	124:	083:	073:	082:
1	Lock Nut, 3/4 NF Nyloc.....	7574	7574		
2	Jam Nut, 3/4 NF Nyloc.....				7679
3	Jam Nut, 1" NF Nyloc.....			7712	
4	Oil Seal, 1-1/4 OD x 1" ID.....	*	*		
5	Oil Seal, 1-5/8 OD x 1-1/8 ID.....			*	
6	O-Ring, 1" OD x 3/4 ID.....	*	*	*	*
7	O-Ring, 1-3/8 OD x 1-1/8 ID.....			*	
8	O-Ring, 2" OD x 1-3/4 ID.....	*	*	*	
9	O-Ring, 2" OD x 1-5/8 ID.....			*	
10	Back-Up Ring, 1-3/8 OD x 1-1/8 ID.....			*	
11	Back-Up Ring, 2" OD x 1-3/4 ID.....	*	*	*	
12	Back-Up Ring, 2" OD x 1-5/8 ID.....			*	
13	Back-Up Ring, 1" OD x 3/4 ID.....	*	*		*
14	Packing Assembly, 1-3/8 OD x 1" ID.....	*	*		
15	Packing Assembly, 2" OD x 1-1/2 ID.....	*	*		*
16	Retaining Ring, Internal.....			*	13406
17	Wear Ring, 2" OD x 1-3/4 ID x 3/8.....	*	*		
18	Piston Washer.....	904467	904467		904052
19	Gland Nut.....	904053	904053		
20	Piston.....	904466	904466	904231	
21	Cylinder Tube Weldment.....	904620	904450	904365	904435
22	Piston Rod Weldment.....	904630	904460	904375	904440
23	Piston Spacer, with O-Ring and Back-Ups.....	904430	904430		904430
24	Rod Guide Assembly.....				904445
25	Gland, with O-Ring, Back-Up, and Packing.....	904540	904540		
26	Gland.....			904232	
	For Complete Cylinder, order.....	124	083	073	082
	Seal Repair Kit (includes all Packings, Wear Rings, O-Rings, Back-Up Rings, and Wipers for one cylinder).....	904485	904485	904260	904480

* Not available as a separate repair part - order seal repair kit.

ARPS MANUFACTURING, INC.
NEW HOLSTEIN, WISCONSIN 53061 U.S.A.
PHONE 414/898-4291