

PARTS

4540

TABLE OF CONTENTS

SECTION ONE

SAFETY PRECAUTIONS	2
SAFETY DECALS	4
INTRODUCTION	5
General	5
Application	5
Model/Serial Information	5
SPECIFICATIONS	6
BACKHOE NOMENCLATURE	8
TORQUE TIGHTENING CHART	9

SECTION TWO

SERVICE PROCEDURES	10
Troubleshooting	10
Backhoe Controls	12
Control Valve Service	13
PTO Pump Overhaul	16
Cylinder Service	17
REMOVING & REINSTALLING THE BACKHOE	20
Removal Instructions	20
Reinstallation Instructions	20
LUBRICATION & MAINTENANCE	22
Backhoe Lubrication Fittings	22
Backhoe Hydraulic System Service	22
Backhoe Bucket Service	23
NOTES	24

SECTION THREE

PARTS LISTING	25
Mainframe, Stabilizers & Related Components	26
Swing Frame, Boom & Related Components	28
Dipper, Bucket & Related Components	29
Operator's Platform	30
Swing & Boom Locks	31
Control Valve	32
Control Valve Handles	33
Power Take Off Hydraulic Pump	34
Swing & Stabilizer Hydraulics	35
Boom & Dipper Hydraulics	36
Lift, Crowd, Curl & Stabilizer Cylinders	37
Swing Cylinder	38



SAFETY PRECAUTIONS



THIS SAFETY ALERT SYMBOL IDENTIFIES IMPORTANT SAFETY MESSAGES WITHIN THIS MANUAL. CAREFULLY READ THE MESSAGE THAT FOLLOWS THE SYMBOL. FAILURE TO UNDERSTAND AND OBEY A SAFETY WARNING, OR RECOGNIZE A SAFETY HAZARD, COULD RESULT IN AN INJURY TO YOU OR OTHERS AROUND YOU. THE OPERATOR IS ULTIMATELY RESPONSIBLE FOR THE SAFETY OF HIMSELF, AS WELL AS OTHERS, DIRECTLY RELATED TO HIS JOB IN THE WORK AREA.

KUBOTA BACKHOES ARE DESIGNED TO GIVE SAFE, DEPENDABLE SERVICE IF IT IS OPERATED ACCORDING TO INSTRUCTIONS. READ AND UNDERSTAND THIS MANUAL BEFORE OPERATING THE BACKHOE. FAILURE TO DO SO COULD RESULT IN PERSONAL INJURY OR EQUIPMENT DAMAGE.

IF YOU HAVE ANY QUESTIONS, CONSULT YOUR KUBOTA DEALER.

Kubota recommends the use of a ROPS (Roll Over Protective Structure) and seat belt when operating the tractor and in almost all applications. Never fasten the seat belt without a ROPS. Do not modify a ROPS in any way. Welding, bending, drilling or cutting any portion of the ROPS may weaken the structure. Do not repair a damaged ROPS. A damaged ROPS structure must be replaced, not repaired or revised. If any structural member of the ROPS is damaged, replace the entire structure at your local Kubota dealership. Check the seat belt daily and replace it if damaged or frayed.

Allow only trained personnel to operate or service this equipment. Know and understand all precautions **before** service or operation. Also read and understand all precautions found in the Tractor and Loader Manuals.

For safe operation, check the main attaching wedge bolts and nuts for tightness **before** each day's operation. Also observe all maintenance and lubrication procedures, and inspect all hoses, cylinders, and general fasteners, daily.

Do not allow passengers on the tractor at any time. The operator **MUST** sit in the seat.

Use the hand rail and mounting steps while getting on and off the backhoe. Keep the steps and operator's platform clean and free of mud, grease or oil, and other debris.

NEVER raise or lower a stabilizer, when mounting or dismounting, unless the **swing is locked**.

For all excavation work, operate the backhoe from the backhoe operator's seat only.

A complete front loader, including lift arms and bucket, is required for backhoe stability, **at all times**.

Make sure the stabilizers and loader bucket are on solid footing and the unit is level before backhoe operation.

When excavating on a uneven terrain, dig with the backhoe uphill.

When you must work on uneven terrain, one stabilizer will be lower than the other. Use extreme care during excavation, as risk of overturn will be increased.

Use care when operating on uneven terrain to avoid an overturn. Travel at speeds compatible with safe operation, especially when operating in uneven terrain, crossing ditches and while turning.

Keep all bystanders away from the swing arc, from under the boom and dipper, and well clear of the backhoe, **at all times**.

NEVER attempt to lift loads in excess of backhoe capacity. See the Specifications within this manual before lifting.

Be sure the lifting chain is correctly and securely fastened to the backhoe bucket before craning. Avoid sudden boom and swing movement.

NEVER allow anyone under the backhoe when lifting or craning.

Do not operate close to the edge of the excavation where the weight of the Tractor/Loader/Backhoe could cause a cave-in.

Do not dig under the stabilizers or tractor, especially in soft or sandy soil. Take extra precautions in wet or thawing ground. This soil can become unstable very quickly, and may collapse under the weight of the unit.

To reduce the risk of overturn on a uneven terrain, place the spoil on the high side of the excavation.

Keep the backhoe and loader **well clear** of electrical lines. If in doubt on safe distance, contact the local power company.

Be alert for buried electrical, telephone, gas and water lines. When in doubt, contact the local utility companies for the location of buried lines.

Before transporting the unit, raise and center the boom, close the bucket and dipper, engage the swing and boom locks and disengage the power takeoff.

Check local codes or regulations that may apply to tractor/loader/backhoe operation on public streets or highways, before transporting. Use slow moving vehicle (SMV) signs, lock brake pedals together and use the tractor flashing lights when traveling on public roads.

Park the unit on level ground whenever possible. Lower the backhoe bucket and both stabilizers to the ground, engage the swing lock, dismount and disengage the PTO. Lower the loader bucket, set the parking brake, shut off the engine, and **remove the key** before leaving the unit.

Before transporting, always securely fasten the tractor/loader/backhoe, with chains and chain binders, to the transport vehicle. Before transporting, determine and note the load height of the backhoe, for underpass clearance.

DO NOT change any backhoe control valve relief settings. They have been factory set for best backhoe performance and operator safety.

Never make any repairs, service, or adjustments, when the backhoe hydraulic system is under pressure, when the engine is running, or when any backhoe cylinder is under load.

After daily service, make sure handholds, control levers, steps, and your hands, are free of grease and oil.

Escaping hydraulic fluid under pressure has sufficient force to penetrate into skin, causing serious personal injury. Before applying pressure to the system, make sure all connections are tightened and that lines, pipes and hoses are not damaged.

Fluid escaping from pin holes may be invisible. Do not use hands to search for suspected leaks. Instead, use a piece of cardboard and wear protective eyewear such as safety goggles. If injured by escaping fluid, see a medical doctor at once. Serious infection or reaction may result if proper medical treatment is not administered immediately.

When installing or removing tight fitting pins or bolts, care should be taken to guard against injury from pieces that may chip off of pin, bolt, or object used in striking it. Always use a brass punch or lead hammer, and always **wear safety glasses**.

Replace any safety decal that becomes damaged, lost, or otherwise illegible. Replace all decals when repainting. If a part is replaced that has a decal on it, obtain a replacement from your Kubota dealer and install the decal in the same location.

SAFETY DECALS

Refer to the following representations of decals used on the backhoe, for positive identification, and also to the Parts List for individual numbers and usage location.

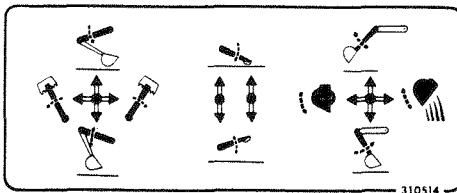
Decals are available individually (see Parts List) or in a complete kit, contained in Part Number 70050-02366.

CAUTION

1. READ AND UNDERSTAND ALL OF THE SAFETY PRECAUTIONS AND OPERATING INSTRUCTIONS FOUND IN THE TRACTOR, LOADER AND BACKHOE OPERATOR'S MANUALS.
2. FOR ALL EXCAVATION WORK, OPERATE THE BACKHOE FROM THE BACKHOE OPERATOR'S SEAT ONLY.
3. A COMPLETE FRONT LOADER, INCLUDING LIFT ARMS AND BUCKET, IS REQUIRED FOR BACKHOE STABILITY, AT ALL TIMES.

4. MAKE SURE THE STABILIZERS AND LOADER BUCKET ARE ON SOLID FOOTING AND THE UNIT IS AS LEVEL AS POSSIBLE, BEFORE BACKHOE OPERATION.
5. KEEP ALL BYSTANDERS AWAY FROM THE SWING ARC, AND WELL CLEAR OF THE BACKHOE, AT ALL TIMES.
6. DO NOT PLACE SPOIL CLOSE TO THE EDGE OF THE EXCAVATION WHERE ITS WEIGHT MAY CAUSE A CAVE-IN.
7. TO REDUCE RISK OF OVERTURN ON A SLOPE, PLACE THE SPOIL TO THE HIGH SIDE OF THE EXCAVATION.
8. KEEP THE BACKHOE AND LOADER WELL CLEAR OF HIGH VOLTAGE LINES. IF IN DOUBT ON SAFE DISTANCE, CALL THE LOCAL POWER COMPANY.
9. BE CONSTANTLY AWARE OF THE POTENTIAL FOR BURIED ELECTRICAL, TELEPHONE, GAS LINES, ETC. WHEN IN DOUBT, CONTACT THE LOCAL UTILITY COMPANIES.
10. USE EXTREME CARE WHEN WORKING ON SLOPES OR UNEVEN TERRAIN. KNOW THE LIMITATIONS OF THE BACKHOE AND DO NOT RUSH.
11. DISENGAGE THE TRACTOR POWER TAKE OFF AND ENGAGE THE BOOM AND SWING LOCKS BEFORE TRANSPORTING.
12. LOWER THE BUCKET, BOTH STABILIZERS, AND THE FRONT LOADER TO THE GROUND, SHUT OFF THE ENGINE AND REMOVE THE KEY BEFORE LEAVING THE UNIT.

310513



SWING LOCK
DISENGAGED ENGAGED
310511

OPERATE PUMP IN
540
POSITION ONLY
310510

4540

KUBOTA

INSTRUCTIONS FOR REMOVING & REINSTALLING
(Also See Backhoe Operator's Manual)

REMOVING THE BACKHOE

BEFORE REMOVAL, MAKE SURE THE BACKHOE SWING LOCK IS ENGAGED!

1. Locate the tractor/backhoe on a firm level surface. Place the hand throttle at low idle, the transmission in neutral, set the parking brake and engage the tractor PTO.

KEEPS HANDS/FEET OUT FROM UNDER THE BACKHOE WHILE REMOVING!

2. Fully extend the boom and dipper and set the bucket on the ground. Place the backhoe seat in the storage position, lower both stabilizers and raise the rear of the tractor and the backhoe off the ground.
3. Remove all 8 nuts and 4 wedge bolts from the mount brackets through the mainframe.
4. Return the boom and dipper to transport and slowly raise the stabilizers, lowering the mainframe from its brackets. The boom and stabilizers may have to be hydraulically adjusted so the backhoe sits flat for storage.
5. Slowly raise the tractor forward, 16 to 18 inches, for removal of the backhoe PTO pump.

DISENGAGE THE PTO AND SHUT OFF THE TRACTOR BEFORE CONTINUING!

6. Remove the harrow clip and the drawbar pin from the pump frame and slide the pump off of the tractor PTO shaft.
7. Drive the tractor/loader slowly away from the backhoe.

COVER THE HYDRAULIC TANK AND POWER TAKE OFF PUMP WITH A SUITABLE WEATHER PROTECTION DURING BACKHOE STORAGE!

REINSTALLING THE BACKHOE

THESE INSTRUCTIONS ARE NOT TO BE USED FOR INITIAL (NEW) BACKHOE INSTALLATION. FOLLOW PROCEDURES UNDER "B" IN THE INSTALLATION INSTRUCTIONS SECTION OF THE OPERATOR'S MANUAL.

1. Back the tractor/loader, centered, over the backhoe frame. Stop the tractor, 16 to 18 inches away from mount alignment for PTO pump installation.

MAKE SURE THE TRACTOR PTO IS DISENGAGED, THE PARKING BRAKE IS SET AND THE ENGINE IS SHUT OFF BEFORE CONTINUING!

2. Slide the PTO pump onto the tractor shaft; install the drawbar pin from the bottom and install the harrow clip.
3. Start the tractor, engage the PTO and position the tractor so the brackets are directly over the mainframe guides.
4. Place the hand throttle at low idle, the transmission in neutral and set the parking brake.

BEFORE ATTACHING, MAKE SURE THE SWING LOCK IS STILL ENGAGED!

5. Lower the stabilizers and raise the rear of the mainframe approximately 2 inches off of the storage surface.

KEEP HANDS/FEET OUT FROM UNDER BACKHOE WHILE REATTACHING!

6. Slowly extend the boom/dipper, keeping the bucket within 4 inches of ground level, until the front of the mainframe raises into its mount brackets. Install the wedge bolts and nuts and tighten.
7. Return the boom/dipper/backhoe to transport and engage the boom transport lock.
8. Lower the stabilizers and raise the rear of the mainframe into its brackets. Install the remaining wedge bolts and nuts and tighten.

AFTER 1/2 TO 1 HOUR OF OPERATION, CHECK ALL WEDGE BOLT NUTS AND MAKE SURE THEY ARE TIGHT. RECHECK NUT TIGHTNESS DAILY.

310515



CAUTION: REPLACE ANY SAFETY DECAL THAT BECOMES DAMAGED, LOST, OR OTHERWISE ILLEGIBLE. REPLACE ALL DECALS WHEN REPAINTING.

INTRODUCTION

GENERAL:

This Parts & Service Manual is organized into three basic sections. Section One covers such items as Safety Precautions, Decals, Application and Specifications. The 2nd section is on Service Procedures, and is divided into more specific subsections pertaining to troubleshooting, diagnosing and repair on the KUBOTA Model 4540 Backhoe. The 3rd Section contains the Backhoe Parts Lists, and includes necessary illustrations, part numbers and descriptions.

The Parts List can also be used as a guide for disassembly, repair, etc., on the backhoe or its individual components.

When referring to the BACKHOE ONLY, all references to right and left, forward or rearward, are as viewed from the backhoe operator's seat, facing the boom.

Continually striving for improvement, KUBOTA TRACTOR reserves the right to change design or specifications, without notice, and without obligation to modify or update previous units. Changes to the 4540 Backhoe may require revisions to this manual. Revised pages will contain the revision date and must be added to the manual as soon as they are received.

APPLICATION:

The KUBOTA 4540 BACKHOE has been designed to mount on KUBOTA Tractor Models L3350, L3750 and L4150 only. The tractor must be equipped with a complete Front Loader, Model BF800 on the L3350, and Model BF900 on the L3750 and L4150 tractors, before backhoe installation.

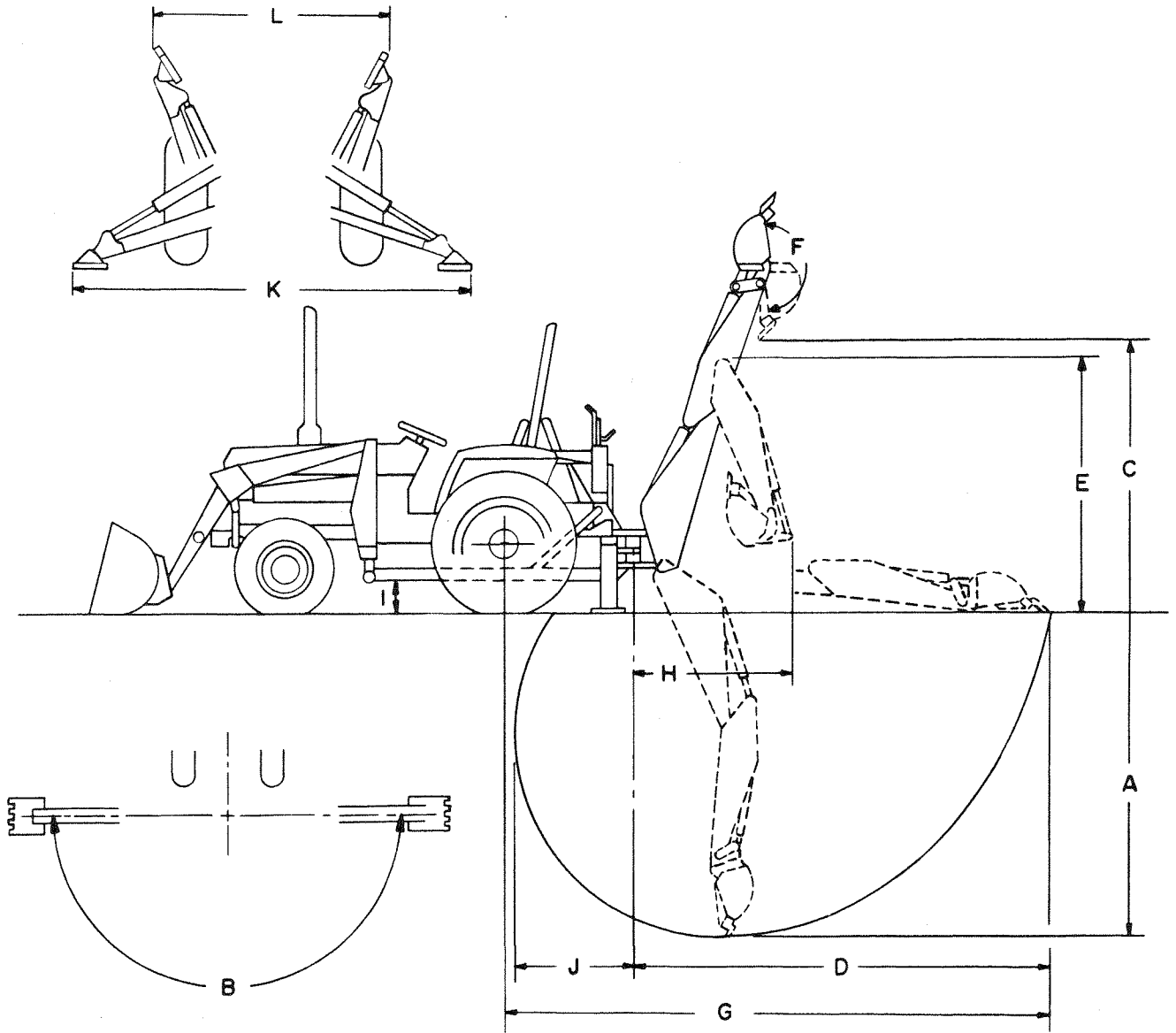
One of the following mount kits is also required to install the backhoe to the tractor/loader.

1. L4541 — Rear Bracket Kit, L3350 Only.
2. L4542 — Rear Bracket Kit, L3750 & L4150.

MODEL/SERIAL INFORMATION:

The Model/Serial plate is located on the right side of the backhoe mainframe, just below the tractor clutch pedal. In addition to serial number information, you will need to know what model tractor the backhoe is mounted on, to supply parts for the backhoe.

BACKHOE SPECIFICATIONS*



	L3350	L3750	L4150
A. DIGGING DEPTH.....	125" / 3175mm	123" / 3125mm	123" / 3125mm
B. SWING ARC.....	180°	180°	180°
C. LOADING HEIGHT.....	98" / 2490mm	100" / 2540mm	99" / 2515mm
@ Max. Stab. Lift.....	111" / 2820mm	113" / 2870mm	112" / 2845mm
D. REACH FROM ϕ SWING PIVOT.....	167" / 4242mm	167" / 4242mm	167" / 4242mm
E. TRANSPORT HEIGHT.....	104" / 2642mm	105" / 2667mm	105" / 2667mm
F. BUCKET ROTATION.....	190°	190°	190°
G. REACH FROM ϕ OF REAR AXLE.....	211" / 5360mm	211" / 5360mm	211" / 5360mm
H. OVERHANG FROM ϕ OF SWING PIVOT.....	60" / 1524mm	60" / 1524mm	60" / 1524mm
I. MINIMUM GROUND CLEARANCE.....	7" / 178mm	8" / 203mm	9" / 229mm
J. UNDERCUT FROM ϕ OF SWING PIVOT.....	32" / 813mm	32" / 813mm	32" / 813mm
K. STABILIZER SPREAD — FULL DOWN.....	103" / 2616mm	103" / 2616mm	103" / 2616mm
L. STABILIZER SPREAD — FULL UP.....	74" / 1880mm	74" / 1880mm	74" / 1880mm

DIGGING FORCE — CURL CYLINDER.....	3980 lbs. / 1805 kg.
DIGGING FORCE — CROWD CYLINDER.....	2045 lbs. / 928 kg.
DIPPERSTICK LIFT ABILITY.....	1675 lbs. / 760 kg.
BOOM LIFT ABILITY — CRANING.....	745 lbs. / 338 kg.
BOOM LIFT ABILITY — FULL REACH.....	690 lbs. / 313 kg.

SWING TIME — FULL ARC.....	5.0 seconds
LIFTING TIME — CROWD CYLINDER.....	1.7 seconds
LIFTING TIME — BOOM CYLINDER.....	2.4 seconds
ROTATION TIME — BUCKET CURL.....	2.5 seconds

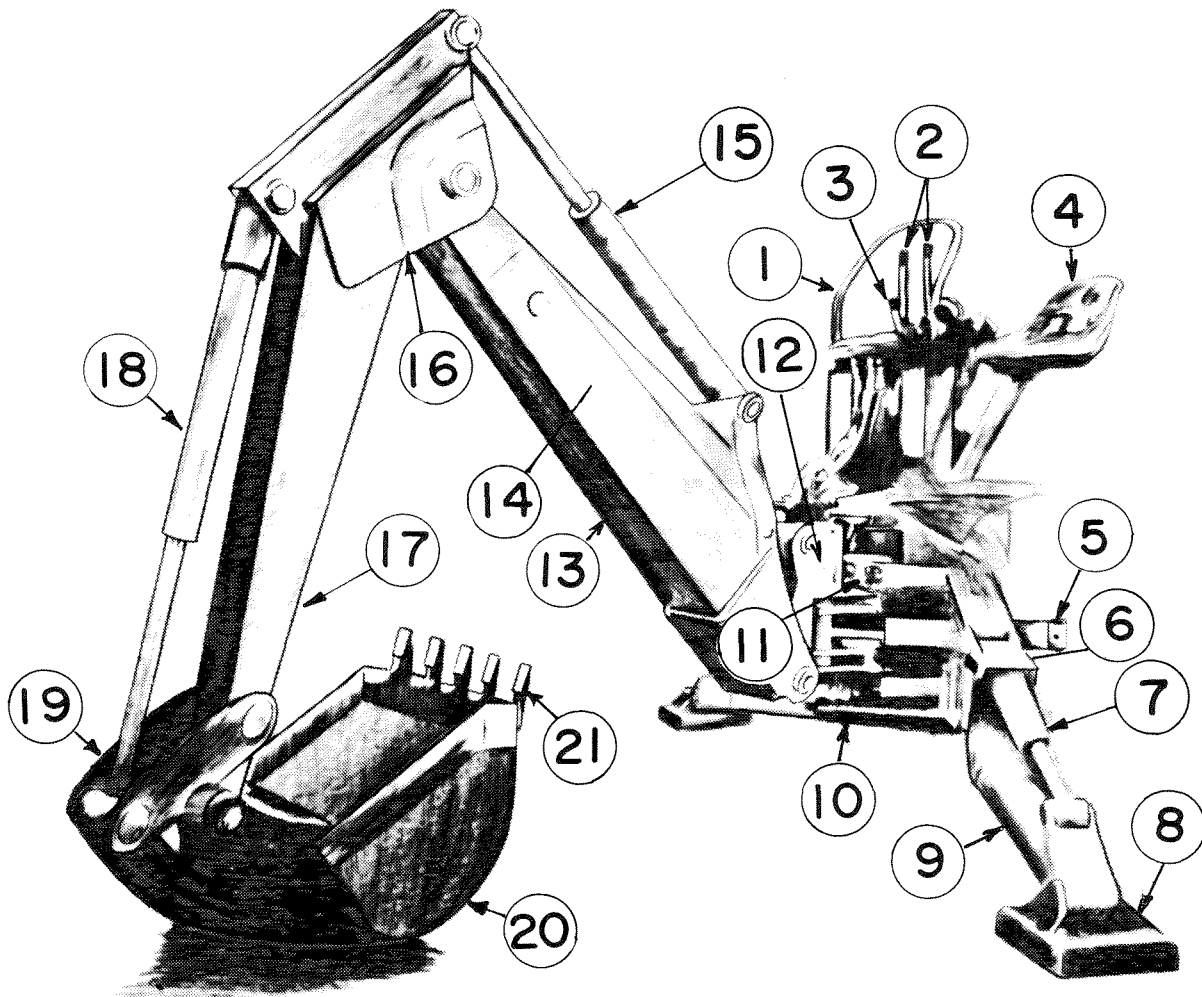
Lifting capacities and cycle times taken on an L4150 Tractor with the PTO in 540 RPM position, at rated engine RPM.

* Specifications based on the following tires sizes.

	TRACTOR	FRONT	REAR
*1	L3350	9.5 × 16	14.9 × 24
*2	L3750	9.5 × 16	13.6 × 28
*3	L4150	9.5 × 20	14.9 × 28

Kubota Tractor specifically reserves the right to change, modify, or eliminate from time to time, for technical or other reasons, certain or all data, specifications, or equipment of the product or the products themselves, without any liability or obligation.


BACKHOE NOMENCLATURE





- | | |
|------------------------|-----------------------------|
| 1. Hand Rail | 12. Swing Frame |
| 2. "Joystick" Controls | 13. Boom |
| 3. Stabilizer Controls | 14. Lift Cylinder (in boom) |
| 4. Operator Seat | 15. Crowd (dipper) Cylinder |
| 5. Swing Cylinder | 16. Dipper "Kneeplate" |
| 6. Mounting Step | 17. Dipperstick |
| 7. Stabilizer Cylinder | 18. Curl (bucket) Cylinder |
| 8. Stabilizer Pad | 19. Bucket Links |
| 9. Stabilizer Arm | 20. Backhoe Bucket |
| 10. Mainframe | 21. Bucket Teeth |
| 11. Swing Bumper Pad | |

TORQUE TIGHTENING CHART

Use the following charts for all backhoe applications. Special fastening torques are shown below.

U.S. Bolt Size	Torque	
	ft.-lb.	N-m
	 Grade 5	
1/4-20	7-9	9-12
5/16-18	10-15	15-20
3/8-16	20-25	25-35
7/16-14	30-40	40-55
1/2-13	50-60	70-80
9/16-12	70-90	95-120
5/8-11	100-120	135-160
3/4-10	180-220	245-300
1-8	600-625	815-850

Metric Bolt Size	Torque	
	ft.-lb.	N-m
	  Class 8.8	
M- 8	17-20	23-27
M-10	34-40	45-55
M-12	55-65	75-90
M-14	91-109	125-145

NOTE: All torque specifications apply to plated or oiled fasteners. When non-plated or dry fasteners are used, increase recommended torque by 20%.

SPECIAL TORQUE APPLICATIONS.

Oil Filter Head to Platform Mount Plate.

5/16-18 × 3/4" fasteners = 7-9 ft. lbs. (9-12 N•m)

Hydraulic Pump Bracket to Pump.

3/8-16 × 1-1/4" fasteners = 13-16 ft. lbs. (16-22 N•m)

Control Valve Tie Rod Fasteners.

3/8-24 UNF Nuts = 15 ft. lbs. (20 N•m)*

* Torque tie rod nuts in 3 steps, as follows. Torque all to 3 to 5 ft lbs., then to 10 ft. lbs., and finally 15 ft. lbs. **OVERTIGHTENING, or UNEVEN TIGHTENING MAY CAUSE VALVE BORE DISTORTION, WHICH WILL CAUSE SPOOL BINDING AND OIL LEAKAGE.**

SERVICE PROCEDURES

Before attempting to troubleshoot the 4540 Backhoe hydraulic circuit, insure the tractor power take-off is engaged in the 540 RPM position, is operating properly, and the engine is operating at a minimum of 2250 RPM. Consult the necessary KUBOTA Workshop Manual if the tractor PTO is not functioning properly.

IMPORTANT: THE 4540 BACKHOE HAS BEEN DESIGNED TO OPERATE IN THE 540 PTO/RPM POSITION ONLY! DO NOT OPERATE IN THE 750 POSITION, OR BACKHOE HYDRAULIC SYSTEM DAMAGE MAY RESULT.

The following troubleshooting guide is for backhoe hydraulics only, and assumes the tractor is operating at prescribed specifications.

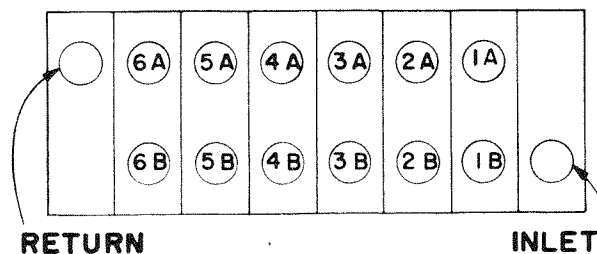
HYDRAULIC TROUBLESHOOTING

SYMPTOM	POSSIBLE CAUSE	SUGGESTED REMEDY
ALL BACKHOE FUNCTIONS TOO SLOW, OR LACK POWER.	<ol style="list-style-type: none"> 1. Oil too cold. 2. Engine RPM too slow. 3. Low oil level. 4. Improper system oil. 5. System contaminated. 6. Restricted pressure line. 7. Restricted suction line. 8. Oil Filter plugged. 9. Hydraulic Pump worn. 10. Main Relief set wrong or malfunctioning. 	<ol style="list-style-type: none"> 1. Allow oil to warm up. 2. Operate at recommended RPM. 3. Fill oil reservoir. 4. Use approved hydraulic oil. 5. Change oil & filter. 6. Repair or replace kinked or damaged line. 7. Repair or replace kinked or damaged line. 8. Replace filter cartridge. 9. Rebuild or replace pump. 10. Clean, repair, or replace main system cartridge.
NO POWER IN ONE CIRCUIT ONLY.	<ol style="list-style-type: none"> 1. Work Relief set wrong or malfunctioning. 2. Cylinder Seals worn or damaged. 3. Anti-Cavitation Restrictor plugged or damaged. 4. Centering Spring broken or fastener loose. 5. Valve Tie Bolts too tight. 6. Worn Valve Spool. 	<ol style="list-style-type: none"> 1. Clean, repair, or replace work relief valve. 2. Rebuild or replace necessary cylinder. 3. Clean or replace anti-cavitation fitting w/restrictor. 4. Repair or replace centering spring. 5. Torque tie bolts to correct specification. 6. Replace valve section.
SWING "DRIFTS" OR CYLINDER(S) SETTLE, WITH VALVE IN NEUTRAL	<ol style="list-style-type: none"> 1. Work Relief set wrong or malfunctioning. 2. Cylinder Seals worn or damaged. 3. Anti-Cavitation Restrictor plugged or damaged. 4. Valve spool not returning to neutral. 5. Worn Valve Spool(s). 6. Cylinder bypassing oil internally. 7. Cylinder Hose or Fitting leaking oil. 	<ol style="list-style-type: none"> 1. Clean, repair, or replace work relief valve. 2. Rebuild or replace necessary cylinder. 3. Clean or replace anti-cavitation fitting w/restrictor. 4. Repair or replace centering spring. 5. Replace valve section(s). 6. Rebuild or replace necessary cylinder. 7. Repair or replace hose or fitting.
BOOM "CHATTERS", LOWERING, OR STABILIZER(S) CHATTER WHEN RAISING.	<ol style="list-style-type: none"> 1. Oil too cold. 2. Engine RPM too slow. 3. Air in cylinder(s). 4. Cylinder bypassing oil internally. 	<ol style="list-style-type: none"> 1. Allow oil to warm up. 2. Operate at recommended RPM. 3. Bleed air by operating control, full stroke, several times. 4. Rebuild or replace necessary cylinder.

CYLINDER(S) CAVITATE (AIR BUILD-UP)	<ol style="list-style-type: none"> 1. Oil too cold. 2. Engine RPM too slow. 3. Low oil level. 4. Improper system oil. 5. System contaminated. 6. Restricted pressure line. 7. Restricted suction line. 8. Oil Filter plugged. 9. Hydraulic Pump worn or damaged. 10. Reservoir Vent plugged. 	<ol style="list-style-type: none"> 1. Allow oil to warm up. 2. Operate at recommended RPM. 3. Fill oil reservoir. 4. Use approved hydraulic oil. 5. Change oil & filter. 6. Repair or replace kinked or damaged line. 7. Repair or replace kinked or damaged line. 8. Replace filter cartridge. 9. Repair or replace pump. 10. Clean or replace vent.
VALVE SPOOL(S) DO NOT RETURN TO NEUTRAL	<ol style="list-style-type: none"> 1. Misaligned or binding handle linkage(s). 2. Centering Spring broken or loose. 3. Valve Tie Bolts too tight. 4. Contaminated Spool or Section Bore. 	<ol style="list-style-type: none"> 1. Repair or replace handle linkage(s). 2. Repair or replace centering spring. 3. Torque tie bolts to correct specification. 4. Flush, repair or replace necessary section.
CYLINDER(S) OPERATING INCORRECTLY	<ol style="list-style-type: none"> 1. Cylinder installed wrong. 2. Cylinder or Control Valve Hoses reversed. 	<ol style="list-style-type: none"> 1. Install cylinder correctly. 2. Install hoses to their correct port fitting.
EXCESSIVE HOSE FAILURES	<ol style="list-style-type: none"> 1. Hoses routed wrong. 2. Hoses twisted or kinked. 3. Main System Relief set too high. 	<ol style="list-style-type: none"> 1. Correctly route hoses. 2. Install hoses correctly. 3. Adjust main relief to correct specification.
EXTERNAL OIL LEAKAGE AT CONTROL VALVE	<ol style="list-style-type: none"> 1. Tie Bolts too tight, damaging seals. 2. Worn Valve Spool(s) or Spool Bore. 3. Valve Body Section cracked or damaged. 4. Damaged Seals in ports or fittings. 5. Loose or damaged hoses. 	<ol style="list-style-type: none"> 1. Reseal valve sections & torque to specifications. 2. Replace valve section. 3. Replace valve section. 4. Reseal necessary ports or fittings. 5. Tighten or replace leaking hoses.
EXTERNAL OIL LEAKAGE AT CYLINDER(S)	<ol style="list-style-type: none"> 1. Cylinder Packing(s) worn or damaged. 2. Damaged Seals in ports or fittings. 3. Loose or damaged hoses. 	<ol style="list-style-type: none"> 1. Rebuild cylinder(s). 2. Reseal necessary ports or fittings. 3. Tighten or replace leaking hose.

HYDRAULIC SPECIFICATIONS @ 540 PTO/RPM, 2250 ENG. RPM

SYSTEM FLOW = 12½ gpm, plus or minus 1 gpm
 MAIN SYSTEM RELIEF = 2000 psi
 SWING WORKPORT RELIEF = 1400 psi, both directions.
 LIFT WORKPORT RELIEF = 1600 psi, Boom full up.
 CROWD WORKPORT RELIEF = 2300 psi, Dipper full in.



**FIGURE # 1
CONTROL VALVE PORT
& HOSE CONNECTIONS**

ANTI-CAVITATION FITTINGS W/.094 RESTRICTORS ARE USED IN PORTS 1A & 1B, 2A, and 5B. Port 5A uses a "blank" workport fitting as a spacer.

IMPORTANT: MAKE SURE RESTRICTORS ARE USED IN THE CORRECT PORTS, OR CYLINDER DAMAGE WILL RESULT.

BACKHOE CONTROLS

- A. The backhoe is controlled by the use of a two lever "joystick" system. The left lever controls the boom and swing circuits, and the right lever controls the crowd (dipper) and bucket circuits. The further the levers are moved from neutral, the faster the components will move. Learn to "feather" the controls for smooth and precise component movement.

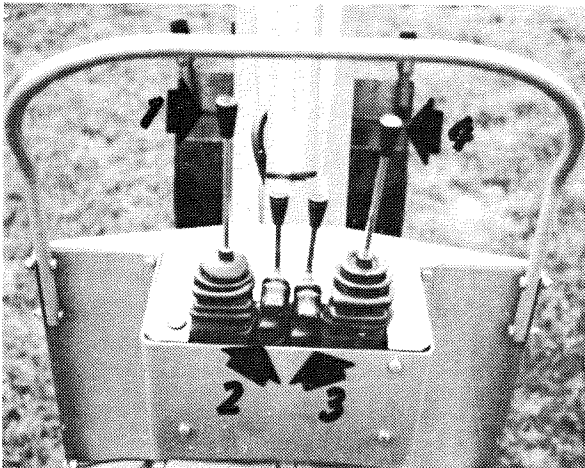


FIGURE #2

1. BOOM & SWING LEVER
2. LEFT STABILIZER LEVER
3. RIGHT STABILIZER LEVER
4. CROWD & CURL LEVER

The two smaller levers in the center of the control bank are for the left and right backhoe stabilizers.

1. BOOM & SWING LEVER. (Left hand operated). Pushing this lever forward will lower the boom, dipper and bucket. Pulling it back will raise them. Movement to the left will swing the backhoe left, and right lever movement will swing to the right.

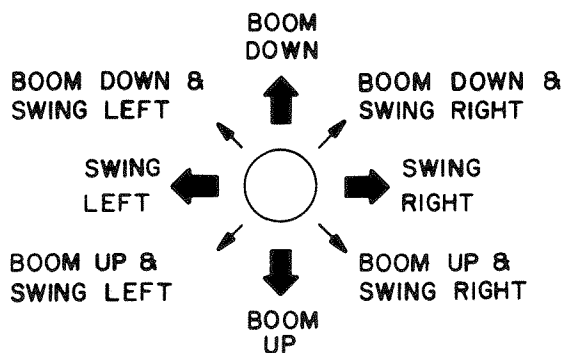


FIGURE #3

By moving the lever out of the plus (+) position, into an "X" relationship, it is possible to raise or lower and swing at the same time.

2. CROWD & CURL LEVER (Right hand operated). Pushing the lever forward will crowd the dipper and bucket out and pulling it back will crowd them in. Lever movement to the left will curl the bucket to fill it, and right lever movement will dump the bucket.

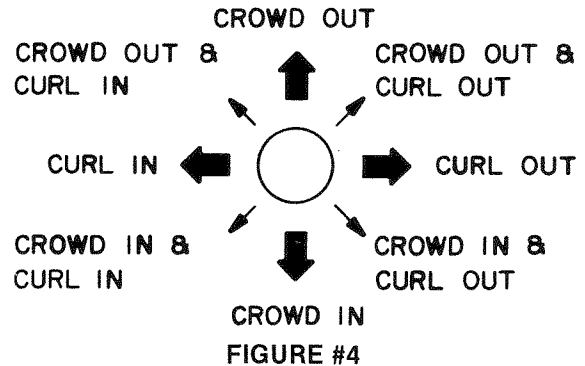


FIGURE #4

Again, movement into an "X" relationship will crowd in and fill the bucket, or crowd out and dump the bucket.

With experience, the combination of both "joystick" levers will allow lift, swing, crowd out and spoil dumping, all in one smooth movement, or swing, lowering, crowd in and bucket filling with reverse movement.

3. STABILIZER CONTROL LEVERS. The stabilizers are the only controls that should be operated when the operator is not in the backhoe operator's seat. The only stabilizer control lever that should be operated when the operator is not seated, in the operator's seat, is that lever which controls the stabilizer that the operator will use to mount or dismount the backhoe. This is necessary because the mounting step moves up and down in conjunction with the stabilizer cylinder.



CAUTION: NEVER RAISE OR LOWER A STABILIZER, WHEN MOUNTING OR DISMOUNTING, UNLESS THE SWING IS LOCKED.

Moving the levers forward will lower the stabilizers, and rear lever movement will raise them.

BACKHOE CONTROL VALVE

The Backhoe Control Valve is an open center sectioned type valve, consisting of six sections and two end covers. The inlet cover contains an adjustable system relief valve. Each section of the control valve contains applicable work port reliefs, flow restrictors and anti-cavitation valves where necessary. See the Parts List for specific applications. Each section of this control valve is serviced separately.

The spools are of high carbon, chrome plated, and polished steel. Each is selectively fitted to its section spool bore which means they are not interchangeable or serviced separately from the section. All spools use centering springs to return the spool to neutral on release of the control handle. No backhoe function is equipped with a hold or "float" position.

Oil flows through the control valve, when the PTO pump is operating in the 540 RPM position and the spools are in neutral, then back to the system reservoir. The oil in the cylinders is trapped, maintaining function control, because the passages are closed as long as the spools remain in neutral.

When a spool is activated, oil flows from the neutral path to the cylinder being activated. Speed of cylinder movement is controlled by lever movement. Because this backhoe is equipped with "joystick" controls, it is possible to move all backhoe functions, except stabilizers, at the same time. However, due to the series oil flow path, functions upstream will have priority. This should **not** stop down stream functions, but slow them slightly, under their normal speed.

DISASSEMBLY

1. Remove all hoses from the valve. Make sure the hoses and their 90° fittings are coded for correct reassembly. **DO NOT** remove the fittings or anti-cavitation fittings until this same code is marked on each valve section.
2. Remove the handles and the rubber boots. Thoroughly wash and dry the exterior of the control valve. Lay the valve face down on a **CLEAN** work surface. Use a straight edge to scribe a line across the valve stack, directly in line with the lower tie stud. This line will facilitate reassembly.
3. Disassemble both "joystick" controls and remove their double brackets from the top of the valve. Remove the nuts and washers from one end of the valve stack and remove the tie rods. Split the valve sections and end caps and place them, in correct order, off to the

side of the cleaned work area. All o-rings from between the sections should be discarded. New o-rings are available in a separate kit, specifically for sealing between the sections of this valve. See the Parts List for seal kit requirements.

4. Valve section disassembly and inspection are similar on each section. Procedures that follow are for one section only, insuring that its specific items are reused during section reassembly. Repeat the following general instructions on each section, as necessary.
 - a. Remove the neutral spring end cap, centering spring retaining screw, the spring, and both its retainers and small centering washer.
 - b. Remove the control lever and handle bracket, if they have not already been removed.
 - c. Gently remove the spool from the body by slowly rotating and pulling out from the handle end.
 - d. Remove the check valve from the center, between the section ports, by gently prying it out with a small screwdriver.
 - e. Remove workport reliefs and anti-cavitation fittings, noting which port they were removed from.
 - f. Remove and discard all seals and o-rings from the components removed from the section being inspected.
 - g. Wash all section parts in clean solvent and dry with low pressure air. Inspect all items for damage or excessive wear. Remove small nicks and burrs with extra fine crocus cloth. Rewash any deburred items. Replace damaged or worn items as necessary.

REASSEMBLY

NOTE: See the Parts List for assistance during reassembly.

1. ALWAYS use NEW SEALS and O-RINGS during reassembly. Old seals can leak if they are reused. Lubricate all parts, EXCEPT NEUTRAL SPRING ITEMS, with clean, lightweight hydraulic oil during reassembly.
 - a. Install the lower spool o-ring in the bottom of the section housing.

- b. Insert the spool, from the top, with the handle clevis up. Gently rotate it as it is installed, until it passes through the lower seal. Pull the spool far enough out of the bottom so the upper seal can be installed. Push and rotate the spool through the upper seal until it is in its approximate neutral position. Make sure the threaded hole in the bottom of the spool is cleansed of all oil, and is thoroughly dry.
- c. Install the "dry" neutral centering spring items as shown. Apply thread adhesive, such as Loctite 242[®] to the threads of the spool screw and tighten. Insert a phillips screwdriver through the handle clevis hole in spool, so it will not turn, and torque the spool screw to 24 to 36 in. lbs. (2½-4 N•m). Make sure the shoulder on the screw goes through the washer and lower spring retainer.



FIGURE #5

- d. Reinstall the check valve, with a new o-ring. Make sure the hole through the body of the check valve aligns with the tie rod hole.

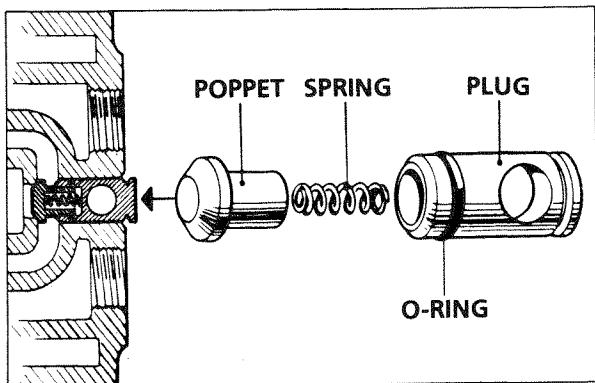


FIGURE #6

- e. Reinstall workport reliefs, restrictors and anti-cavitation fittings, with new o-rings, in the ports from which they were removed.

IMPORTANT: The upper outlet port on the crowd section uses a dummy anti-cavitation fitting that has no restrictor. DO NOT mix these fittings or crowd cylinder damage may result.

- f. Disassemble, clean, inspect and reassemble the other sections as necessary. See the Parts List illustrations for assistance while rebuilding the control valve.

SYSTEM RELIEF VALVES

Located in the top of the inlet cover, the Main Relief Valve protects the backhoe hydraulic components from damage by preventing excessive pressures in the system when the control valve spools are activated. When a spool is activated, and the cylinder reaches the end of its stroke, or is physically prevented from moving, the system relief valve opens and directs oil flow through the neutral passages and the return cover, to the backhoe reservoir.

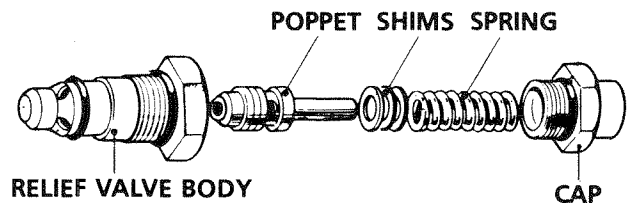


FIGURE #7

System relief pressure is maintained by a series of shims pre-selected to relieve at 2000 psi. Do not change or alter the preselected relief setting, or backhoe component damage could result. The main system relief valve is serviced only as an assembly and includes the o-ring seals. O-rings alone for the relief valve, are included in the control valve seal kit.

Workport Relief Valves, with and without oil flow restrictors, are used in this control valve. Service procedures are similar to those for the main relief valve, limited to cleaning and inspection only. Workport reliefs are serviced as assemblies and include their o-ring seals. O-rings alone are included in the control valve seal kit.

See the illustrated Parts List for specific workport relief valve locations.

The installation torque on all relief valves and anti-cavitation fittings is 10 to 15 ft. lbs. (13-20 N•m).

CONTROL VALVE REASSEMBLY & REINSTALLATION

1. Insert all three tie rods, with a nut and lock-washer on one end, through one of the end covers. Stand the end cover on its side so the tie rods are vertical.

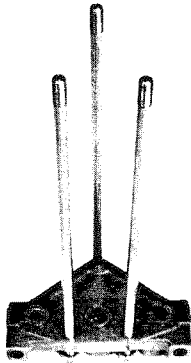


FIGURE #8

2. Place the correct o-ring seals, from the Section Seal Kit, in their respective recesses. A light coating of Vaseline® type grease will hold the o-rings in place as the control valve is reassembled.
3. Place the applicable section onto the rods, making sure the center rod passes through the housing hole in the section check valve. Also insure that the scribed line matches the one on the end cover.
4. Install the remaining valve sections, in correct order, adding section o-rings between each as each section is installed.
5. Install the opposite end cover, again making sure the scribed line matches those across the back of the valve sections.
6. Install the three removed lockwashers and nuts to the rods, finger tight only.

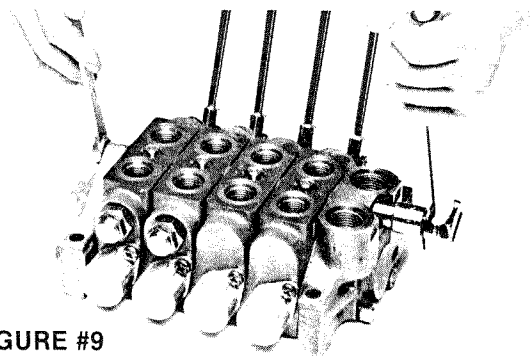


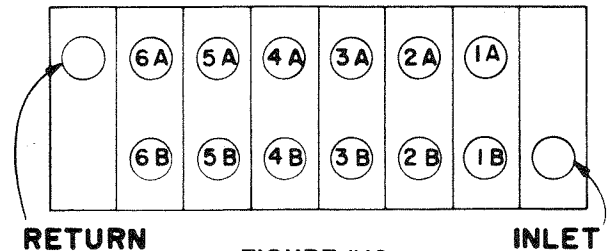
FIGURE #9

7. Torque tie rod nuts in 3 steps as follows. Torque all to 3 to 5 ft. lbs., then to 10 ft. lbs., and finally to 15 ft. lbs. (20 N•m). **OVER-TIGHTENING, OR UNEVEN TIGHTENING, MAY CAUSE VALVE BORE DISTORTION, WHICH WILL CAUSE SPOOL BINDING AND OIL LEAKAGE.**
8. Reinstall all control valve handles. See the Parts List for correct sequence of items for installation.

9. Reinstall the control valve to the backhoe. Torque the 3/8 inch fasteners to 20 to 25 ft. lbs. (25-35 N•m).

NOTE: All cylinder hose ends to the control valve are marked 1A & 1B through 6A & 6B. It is important these hoses and their 90° fittings be installed correctly. A description of each hose and hose code number follows:

- | | |
|-------------------------|--------------------------|
| 1A. Right Swing | 4A. Right Stab. Rod End |
| 1B. Left Swing | 4B. Right Stab. Base End |
| 2A. Lift-Rod End | 5A. Crowd-Base End |
| 2B. Lift-Base End | 5B. Crowd-Rod End |
| 3A. Left Stab. Rod End | 6A. Curl-Rod End |
| 3B. Left Stab. Base End | 6B. Curl-Base End |



**FIGURE #10
CONTROL VALVE PORT
& HOSE CONNECTIONS**

10. Install and tighten the inlet and return hoses.
11. Make all lower hose connections to the control valve, first. This will allow the most wrench room for tightening. Complete hose connections by attaching and tightening the top row of hoses to their 90° fittings.
12. Gather the hoses and clamp them in place in the sequence illustrated. Use four clamp plates, stacked as shown, on the crimped sleeves of the corresponding hoses. Fasten with 5/16-18 x 4-1/2 bolts and locknuts.

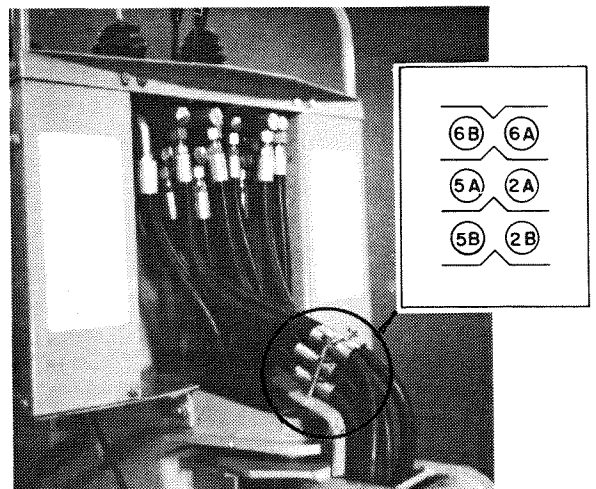


FIGURE #11

IMPORTANT: Because the hydraulic control valve and its hoses contain air, the backhoe hydraulic system is going to be very unstable, until all air is bled back and vented in the reservoir. These instructions should be closely followed, to avoid personal injury or damage to the backhoe. These procedures **MUST** be performed from the backhoe operator's seat.



CAUTION: DO NOT PERMIT ANYONE OTHER THAN THE OPERATOR ON THE UNIT WHILE IN OPERATION OR TRANSPORT.



CAUTION: KEEP ALL BYSTANDERS AWAY FROM THE SWING ARC, FROM UNDER THE BOOM AND DIPPER, AND WELL CLEAR OF THE BACKHOE, AT ALL TIMES.

13. Raise and lower the stabilizers, from floor contact to full up, several times. Place the stabilizers in floor contact before proceeding.
14. Raise and lower the boom, within limits of overhead clearance, until it responds with gentle movement of the control lever and does not lower by itself when the lever is released. Raise the boom to as close to full up as possible.
15. Cycle the dipper (crowd) in the same manner as the boom. However, when the air has been purged from the crowd circuit, leave the dipper partially extended, or the bucket will contact the stabilizers when the swing circuit is cycled for bleeding.
16. Cycle the bucket (curl circuit) several times to bleed trapped air.
17. With the boom up as high as possible, the dipper partially out, gently activate the swing. Continue to move it, from stop to stop, until movement is smooth and movement stops when the control lever is released.
18. After hydraulic circuit bleeding, the reservoir will need to be refilled. Add KUBOTA "UDT" oil, or other recommended KUBOTA hydraulic oil, to the full mark on the dipstick.
19. Check and **MAKE SURE** all hydraulic hose and fitting connections are tight.

PTO PUMP OVERHAUL

This Power Take-Off pump, even though repairable, contains some mated items that must be purchased and replaced in sets. Refer to the Parts List for part numbers and seal kit requirements.

DISASSEMBLY

IMPORTANT: Thoroughly clean the exterior of the pump. Before disassembly, prepare a **CLEAN** work area. Contamination introduced during repair can quickly damage the pump, control valve, or hydraulic cylinders.

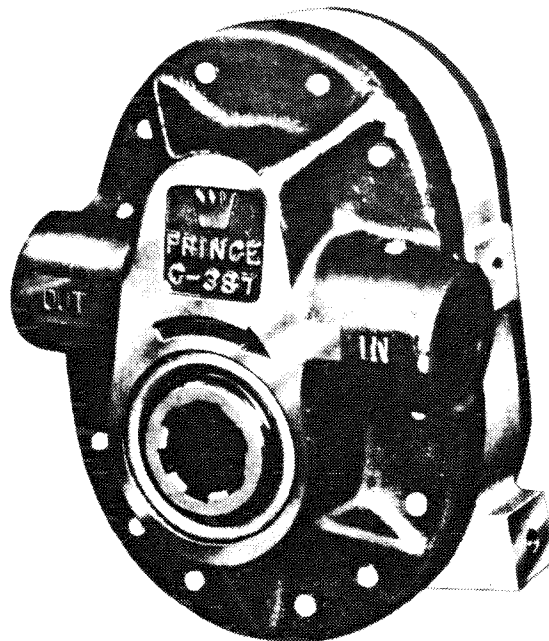


FIGURE #12

IMPORTANT: It is intended that the gears are to rub on the pump body during normal use. It is especially important that the body shows some gear contact wear on the inlet side, or the body and gear sets should be replaced. See figure #13.

1. Clamp the pump in a bench vise, lined with wood or copper facing, to avoid damage to the pump. Clamp across the port area with the cap screws facing upwards. Remove all cap screws.
2. Remove the pump from the vise and lay it on the cleaned work surface with the splined drive shaft horizontal. Use a plastic mallet and tap on the drive shaft that extends slightly above the body casting. At this point, the pump housings should separate allowing room for screwdrivers to be inserted so the housings can be lifted apart.

3. Remove the aluminum pressure plate, gears and gaskets.
4. Wash and clean all parts in solvent and dry with low pressure air.
5. Inspect shafts, gears, bearings and other items for wear. It is normal for the pressure plate and back plate to have some shiny areas where the gears have made contact. However, the gears should not have cut deeply into either part.
6. Inspect the body for excessive wear. It is intended that the gears are to contact the body during normal use. It is important that the body show some even gear contact wear on the inlet side as shown below. If this wear is excessive, gouged or deeply scratched, the body should be replaced.

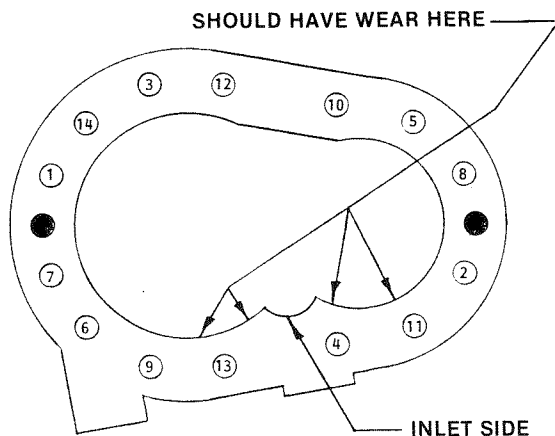


FIGURE #13

REASSEMBLY

IMPORTANT: If the PTO pump is disassembled, for whatever reason, **ALL** seals and gaskets must be replaced with **NEW** items.

1. The location of the o-ring strip and the flat white protector gasket strip, in the pressure plate, is extremely important. The white strip is to go inside the o-ring strip, as shown in figure #14. A light coat of clean grease on the o-ring and white strip will hold them in place during continued reassembly.

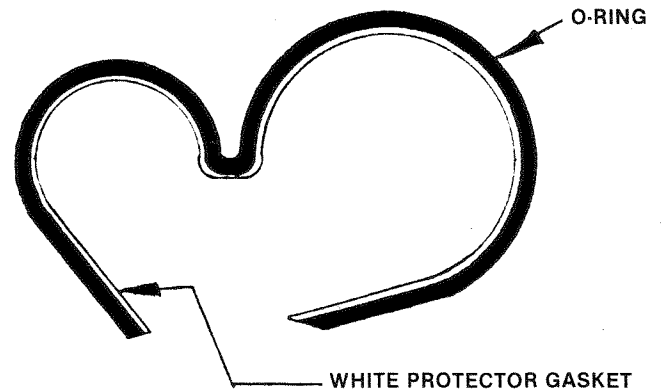


FIGURE #14

2. Insert the aligning dowels in the back plate, replace the pump body section, and reinstall the gear and shaft assemblies.
3. Replace the pressure plate. Care should be taken to insure that the o-ring and white strip are fully in their groove and that they do not get pinched when the front plate is installed.
4. Replace the front plate. It may have to be gently tapped with a plastic mallet, to fully seat against the body.
5. Insert and gently tighten all 14 - 3/8 inch cap screws. Torque to 30-35 ft. lbs. (40-48 N•m) in the sequence shown in figure #13.

CYLINDER SERVICE

TESTING CYLINDERS FOR INTERNAL LEAKAGE

SWING CYLINDERS: If piston seal damage or wear occurs in the single acting cylinders, oil will leak out of a special vent hole in the head gland. If oil leakage is excessive, the swing cylinder should be rebuilt.

LIFT, CROWD, CURL & STABILIZER CYLINDERS: These cylinders are all double-acting, and as such, it is possible for internal leakage to occur in one direction only. These cylinders may be checked for oil by passing the piston seals utilizing the following procedures.

NOTE: It is possible for backhoe cylinders, with good seals, to settle, if the control valve is damaged, or badly worn.

Complete Flow Meter test procedures for backhoes is covered in the KUBOTA Service Training Handbook. If you have a flow meter, the hydraulic system should be tested using the flow meter.

The following test procedures assume that no flow meter is available for diagnostic testing.

1. Before proceeding with this series of tests, lower the backhoe to full ground contact and shut off the engine. Relieve cylinder pressure by cycling all control functions several times in all directions.



CAUTION: MAKE SURE THE BACKHOE BOOM, DIPPER, OR BUCKET LINKAGES ARE SUPPORTED, **BEFORE REMOVING ANY CYLINDER.**

2. Remove the pivot pin from the **rod end** of the cylinder to be tested. Do not remove the hoses. Prop the cylinder in such a way to allow it to stroke without interference.

3. Check the EXTEND function as follows:

- a. Start the engine and extend the suspect cylinder to its full stroke. Shut off the engine.



CAUTION: BEFORE DISCONNECTING THE HYDRAULIC HOSE, RELIEVE PRESSURE USING ITS CONTROL LEVER.

- b. Disconnect the hose from the rod end of the suspect cylinder.



CAUTION: DO NOT MOVE THE CONTROL LEVER TO THE RETRACT POSITION WHILE THE ROD END IS DISCONNECTED.

- c. Start the engine and run at low idle in the 540 PTO position. Move the control to **EXTEND** the cylinder while observing the open cylinder port for oil flow. There should be **no oil flow**. Slowly raise the throttle to 2250 RPM, holding the control lever in extend. There still should be **no oil flow**.

NOTE: If **oil flows** out of the cylinder port, the piston seal is damaged and the cylinder should be rebuilt.

- d. Shut off the engine and reconnect the removed hose. Restart the engine and cycle the suspect cylinder several times to bleed out air.

4. Check the **RETRACT** position on the suspect cylinder, following steps 3a thru 3d, **BUT** with the cylinder fully retracted, and the hose removed from the base end of the suspect cylinder.



CAUTION: DO NOT MOVE THE CONTROL LEVER TO THE EXTEND POSITION WITH THE BASE END HOSE DISCONNECTED.

5. After testing, or rebuilding, reinstall the cylinder to its mount. Start the tractor engine and cycle all backhoe controls to bleed any injected air back to the oil reservoir vent.

6. Check and refill the backhoe hydraulic system reservoir and add necessary KUBOTA recommended oil to bring the level to full.

BACKHOE CYLINDER REBUILDING PROCEDURES:

The same general service instructions apply to all backhoe cylinders, even though they are different and require a specific cylinder seal kit. See the Parts List for the applicable seal kit part numbers, and different individual parts, for the cylinder being rebuilt.



CAUTION: MAKE SURE THE BACKHOE BOOM, DIPPER, OR BUCKET LINKAGES ARE SUPPORTED, **BEFORE REMOVING ANY CYLINDER.**

DISASSEMBLY:

IMPORTANT: **NEVER** clamp the cylinder barrel or rod directly into a bench vise! **NEVER** use pliers of any kind on the cylinder rod.

IMPORTANT: Thoroughly clean the exterior of the cylinder being rebuilt. Before disassembly, prepare a **CLEAN** work area. Contamination introduced during repair can quickly damage the cylinders, control valve, or PTO hydraulic pump.

1. Clamp a piece of pipe or steel rod, of the appropriate diameter for the cylinder being rebuilt, into a large bench vise. Slip the base end eye over the pipe or rod.

2. Stroke the cylinder rod in both directions to flush oil from the cylinder into a container. This oil should **NOT** be reused.
3. Remove the 1/4 inch set screw from the barrel at the rod end of the swing cylinder. All other backhoe cylinders have a retaining nut that is to be removed with a spanner wrench.
4. After the set screw, or spanner nut has been removed, depress the gland into the cylinder, far enough to remove the lock ring.

IMPORTANT: Any scratches or nicks in the groove, as a result of removing the lock ring, should be smoothed with fine emery cloth before removing the rod and piston. Nicks or scratches could damage the piston during removal, or the new seals during reinstallation, causing seal leakage.

5. Remove the rod and piston assembly from the barrel by pulling it out. Note the correct piston and gland positioning before disassembly of the rod.
6. Remove the barrel from the vise mount and place the pin eye of the rod on the vise mount. Remove, and discard the locknut that retains the piston. Always use the new locknut contained in the seal kit to insure correct torque retention.
7. Disassemble and discard all old seals and o-rings. Clean and inspect all cylinder components. Replace any component that is damaged or otherwise suspect. Use fine emery cloth to remove nicks or burrs, and also buff the threads for the locknut, on the rod, to remove sharp edges.

REASSEMBLY

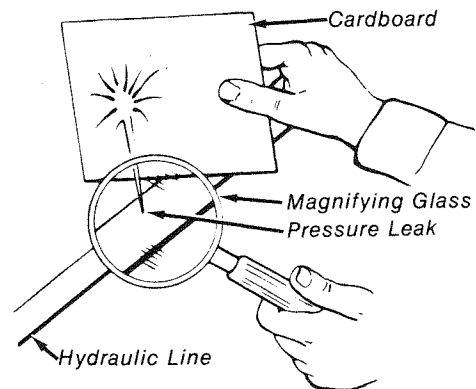
NOTE: Refer to the illustrations in the Parts List, pertaining to the cylinder being rebuilt, for the correct location of components in that cylinder.

1. All cylinder parts should be cleaned and thoroughly dried with low pressure air, before reassembly. All parts, including seals and o-rings, should be lightly coated with hydraulic oil, for ease of installation during cylinder reassembly.
2. Reassembly is a reverse order of disassembly, using **ALL NEW** seals and o-rings, for the cylinder being rebuilt.
3. Install and torque the new 1-14 locknut to 160-180 ft. lbs. (215-245 N•m).

4. Push the assembled rod, piston and gland into the cylinder barrel. Push the gland deep enough into the barrel so the lock ring can be installed.
5. Pull the rod and piston against the gland to fully seat it against the lock ring. Reinstall the 1/4 inch set screw in the swing cylinder, or the retainer nut into the gland, on the other cylinders. Torque the retainer nut to 160-180 ft. lbs. (215-245 N•m).
6. Reinstall the applicable cylinder, exactly as it was removed, to the backhoe. Make sure the hoses are correctly connected to the cylinder, and that hoses and fittings are tight.
7. Start the engine, engage the PTO into the 540 position and raise engine speed to 1700 RPM. Cycle all backhoe control functions, especially the function pertaining to the cylinder that was rebuilt, to bleed out air and to check operation.



CAUTION: ESCAPING HYDRAULIC FLUID UNDER PRESSURE HAS SUFFICIENT FORCE TO PENETRATE INTO SKIN, CAUSING SERIOUS PERSONAL INJURY. BEFORE APPLYING PRESSURE TO THE SYSTEM, MAKE SURE THAT ALL CONNECTIONS ARE TIGHTENED AND THAT LINES, PIPES AND HOSES ARE NOT DAMAGED.



FLUID ESCAPING FROM PIN HOLES MAY BE INVISIBLE. DO NOT USE HANDS TO SEARCH FOR SUSPECTED LEAKS. INSTEAD, USE A PIECE OF CARDBOARD AND WEAR PROTECTIVE EYEWEAR SUCH AS SAFETY GOGGLES. IF INJURED BY ESCAPING FLUID, SEE A MEDICAL DOCTOR AT ONCE. SERIOUS INFECTION OR REACTION MAY RESULT IF PROPER MEDICAL TREATMENT IS NOT ADMINISTERED IMMEDIATELY.

8. Double check for, and correct any, oil leaks. Check the hydraulic oil reservoir and add KUBOTA approved hydraulic oil as necessary.

REMOVING & REINSTALLING THE BACKHOE

REMOVING THE BACKHOE



CAUTION: BEFORE REMOVAL, MAKE SURE THE BACKHOE SWING LOCK IS ENGAGED!

1. Locate the tractor/loader/backhoe on a firm level surface. Place the hand throttle at 1400/1600 RPM, the tractor transmission in neutral, set the parking brake and engage the tractor PTO into the 540 PTO/RPM position.



CAUTION: KEEP HANDS AND FEET OUT FROM UNDER THE BACKHOE WHILE REMOVING.

2. Fully extend the boom and dipper and set the bucket on the ground. Place the backhoe seat in the tipped storage position, lower both stabilizers and raise the rear of the tractor off of the ground.
3. Remove all 8 nuts and 4 wedge bolts from the front and rear mount brackets that hold the mainframe in place on the tractor.
4. Return the boom and dipper to the locked transport position and SLOWLY raise the stabilizers, lowering the backhoe mainframe out of its brackets. After removal, the boom, only, should be unlocked, the bucket lowered to ground contact and the stabilizers adjusted so the backhoe sits flat for storage.
5. SLOWLY MOVE THE TRACTOR FORWARD, 16 to 18 inches. for removal of the backhoe PTO pump.



CAUTION: DISENGAGE THE PTO, SET THE PARKING BRAKE AND SHUT OFF THE ENGINE BEFORE CONTINUING.

6. Remove the hairpin clip and drawbar stop pin from the PTO pump frame and slide the pump off of the tractor PTO shaft.
7. Drive the tractor/loader slowly away from the backhoe.

8. If the backhoe is to remain off for an extended period of time, or is being stored outside, cover the hydraulic tank and PTO pump with a suitable weather cover. This will keep moisture, dirt and other airborne debris from getting into the system. Lubricate all grease fittings and coat all exposed cylinder rods with grease, to protect these areas from corrosion during storage.

NOTE: The entire three point system can now be reinstalled on the tractor for use with other rear mounted implements. The backhoe mount brackets do not have to be removed, unless absolutely necessary for ground clearance.

REINSTALLING THE BACKHOE

IMPORTANT: THESE INSTRUCTIONS ARE NOT TO BE USED FOR INITIAL (NEW) BACKHOE INSTALLATION. FOLLOW PROCEDURES UNDER "III." IN THE INSTALLATION INSTRUCTIONS SECTION OF THE OPERATORS MANUAL.

NOTE: If the three point system is on the tractor, follow instructions found in the Installation Section, Pre-assembly Notes, for its removal.

1. Back the tractor/loader, centered, over the backhoe mainframe. Stop the tractor 16 to 18 inches away from mount alignment for PTO pump installation.



CAUTION: MAKE SURE THE TRACTOR PTO IS DISENGAGED, THE PARKING BRAKE SET, THE ENGINE IS SHUT OFF AND IGNITION KEYS ARE REMOVED BEFORE CONTINUING.

2. Slide the backhoe pump onto the tractor PTO shaft, install the drawbar stop pin from the bottom and retain with the hairpin clip.

3. Start the tractor and position it so the mount brackets are directly over their guides on the mainframe.
4. Place the throttle at low engine RPM, engage the PTO in the 540 position, place the transmission in neutral and set the parking brake.



CAUTION: BEFORE ATTACHING THE BACKHOE, MAKE SURE THE SWING LOCK IS STILL ENGAGED.

5. Lower the stabilizers and raise the rear of the mainframe approximately 2 inches off of the storage surface.



CAUTION: KEEP HANDS AND FEET OUT FROM UNDER THE BACKHOE WHILE REINSTALLING.

6. Slowly EXTEND the boom and dipper, keeping the bucket within 4 inches of ground level, until the front of the mainframe raises into the front mount brackets. Install the 5/8 inch wedge bolts and double 5/8" nuts and tighten.

7. Return the boom, dipper and bucket to the transport position, engaging the boom lock. SLOWLY lower both stabilizers, raising the rear of the mainframe into its brackets. Install the one inch wedge bolts and double handle nuts and tighten.

NOTE: If the backhoe has been stored for an extended period of time, service the entire backhoe following instructions found in the Lubrication & Maintenance Section.

8. Move the tractor/loader/backhoe to an open area and cycle all backhoe functions. This will check their operation and flow oil back through the system, filtering it and refilling each circuit. Check the hydraulic oil level before putting the backhoe into full operation. See the Lubrication & Maintenance Section for oil type and correct level.

AFTER 1/4 TO 1/2 HOUR OF OPERATION, CHECK ALL WEDGE NUTS AND MAKE SURE THEY ARE TIGHT. RECHECK NUT TIGHTNESS DAILY!

LUBRICATION & MAINTENANCE

I. BACKHOE LUBRICATION FITTINGS

- A. GREASE FITTINGS are provided at all points (13) indicated in the following illustration. Not shown are four (4) on the right stabilizer, and one (1) on the base end of the right swing cylinder. If any grease fittings are missing, replace them immediately. Always clean fittings thoroughly with a rag before using a grease gun.

NOTE: All pivot pins that have a high degree of rotation do not require lubrication. These pivot pins are chrome plated and rotate in special "Garlock" bushings.

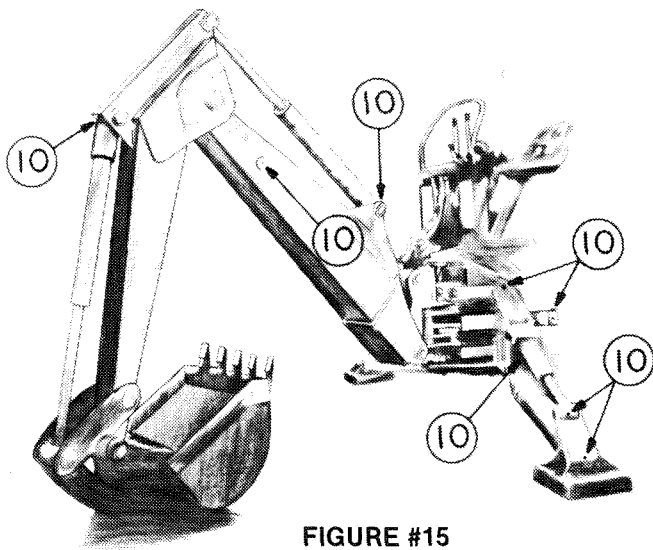


FIGURE #15

1. Using a high quality multi-purpose grease, lubricate all fittings on the backhoe every 10 hours of operation, or daily.

II. BACKHOE HYDRAULIC SYSTEM SERVICE



CAUTION: NEVER MAKE ANY REPAIRS, SERVICE, OR ADJUSTMENTS, WHEN THE HYDRAULIC SYSTEM IS UNDER PRESSURE, WHEN THE ENGINE IS RUNNING, OR WHEN ANY BACKHOE CYLINDER IS UNDER LOAD.

- A. CHECKING OIL LEVEL. The hydraulic system oil level should be checked every 10 hours of operation, or daily.

1. With the unit on a level surface, the backhoe in the transport position, the swing and boom locks engaged, and the tractor engine SHUT OFF, check the system oil level. Remove the filler cap/dipstick, located just under the tractor clutch pedal, and check the dipstick. The level should be at the full mark.
2. If the backhoe hydraulic oil reservoir is below the required level, add oil using a clean automatic transmission type flexible funnel. Use KUBOTA "UDT" oil, or other KUBOTA approved hydraulic oil.

- B. CLEANING THE BREATHER. Remove the breather, from the top center of the reservoir and clean it every 50 hours of backhoe operation, or anytime the system oil filter is replaced.

1. Wash it thoroughly in cleaning solvent. Using low pressure air, blow all excess solvent out of the breather. Reinstall it in the reservoir.

- C. CHANGE HYDRAULIC OIL AND FILTER after the first 50 hours of backhoe operation. The backhoe system capacity, not counting oil in the cylinders, is approximately 11-1/2 gallons.

1. After the initial 50 hour system oil change, the OIL FILTER should be changed every 250 hours.
2. The HYDRAULIC OIL should be changed every 500 hours of backhoe operation, or more regularly if the unit is being operated in very dusty conditions, or is removed and stored on a regular basis. The oil is drained by removing the hose from the center front of the backhoe hydraulic reservoir.



CAUTION: AFTER DAILY SERVICE, MAKE SURE HAND HOLDS, CONTROL LEVERS, STEPS, AND YOUR HANDS, ARE FREE OF GREASE AND OIL.

III. BACKHOE BUCKET SERVICE

A. CHANGING THE BACKHOE BUCKET becomes necessary as the type of job to be accomplished changes. In most backhoe operations, this is a common occurrence. By using the following instructions, this job will be quick and easy. Always select a smooth level area to change buckets.

1. Place the bucket to be installed on its bottom, near the backhoe dipper and bucket to be removed. Position the bucket to be removed, hydraulically, into this "natural" position, just touching the ground. See figure #16.



CAUTION: WHEN INSTALLING OR REMOVING TIGHT FITTING PINS OR BOLTS, CARE SHOULD BE TAKEN TO GUARD AGAINST INJURY FROM PIECES THAT MAY CHIP OFF OF PIN, BOLT, OR OBJECT USED IN STRIKING IT. ALWAYS USE A BRASS PUNCH OR LEAD HAMMER, AND ALWAYS WEAR SAFETY GLASSES.

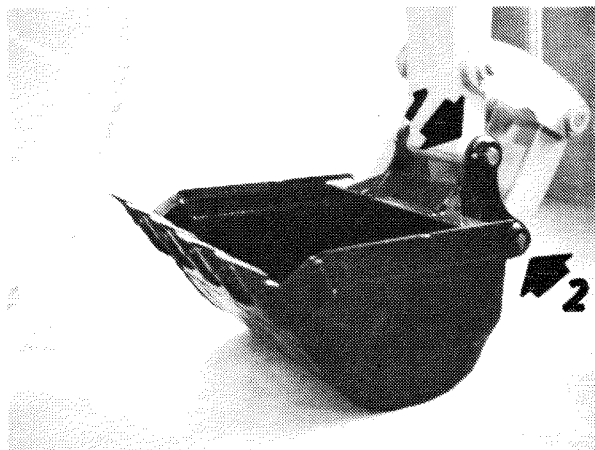


FIGURE #16

1. TAPERED BUCKET/DIPPER PIN
2. BUCKET/LINK PIN

2. Remove the 3/8 inch hardware retainers and remove the bucket/dipper and bucket/link pins. As the pins wear in, and with the holes correctly aligned, the pins should be able to be removed with ease.

3. Align the boom/dipper with the bucket to be installed and install the pins. The tapered end of the bucket/dipper pin must go through its aligned holes first. That way the pin will not damage the seal lips in the end of the dipper.

4. Reinstall the 3/8 inch retaining hardware. If the locknut threads on unusually easy, its locking position is no good. It should be replaced with a new 3/8-16 grade five locknut.

B. CHANGING THE BUCKET TEETH. Even though the teeth are self-sharpening, they will eventually need replacement. As the teeth become worn, digging resistance will increase. As they continue to wear they will get thin and eventually fall off. NEVER dig with teeth missing from the bucket, or the shank will be worn enough to where it will not hold a new tooth. Use one of the following two methods for replacing bucket teeth. ALWAYS WEAR SAFETY GLASSES when replacing bucket teeth.

1. METHOD ONE (For thin or well worn teeth). Remove the tooth point from the welded shank by driving it off with a hammer at point "A".

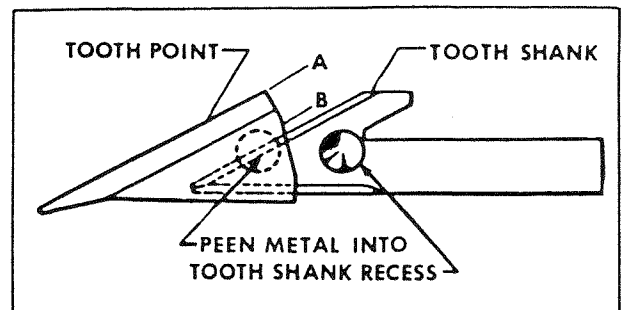


FIGURE #17

2. METHOD TWO (For newer broken teeth). Drive a chisel between the tooth point and the shank at point "B" to open the peened lock. Drive the tooth off using method one after removing the chisel.

3. Install the new tooth point over the welded shank. Peen the rear edge of the tooth into the recess in the shank to lock the tooth in place.

NOTES

PARTS LIST

ILLUSTRATIONS: All parts are shown in their normal relationship to each other, whenever possible. Reference numbers used on each illustration closely correspond with those numbers found in the 4540 Operator's Manual.

PARTS CHANGES: Changes to the backhoe may make it necessary to revise the Parts List. All revised pages must be added to this parts list as soon as they are received.

CONTENTS:

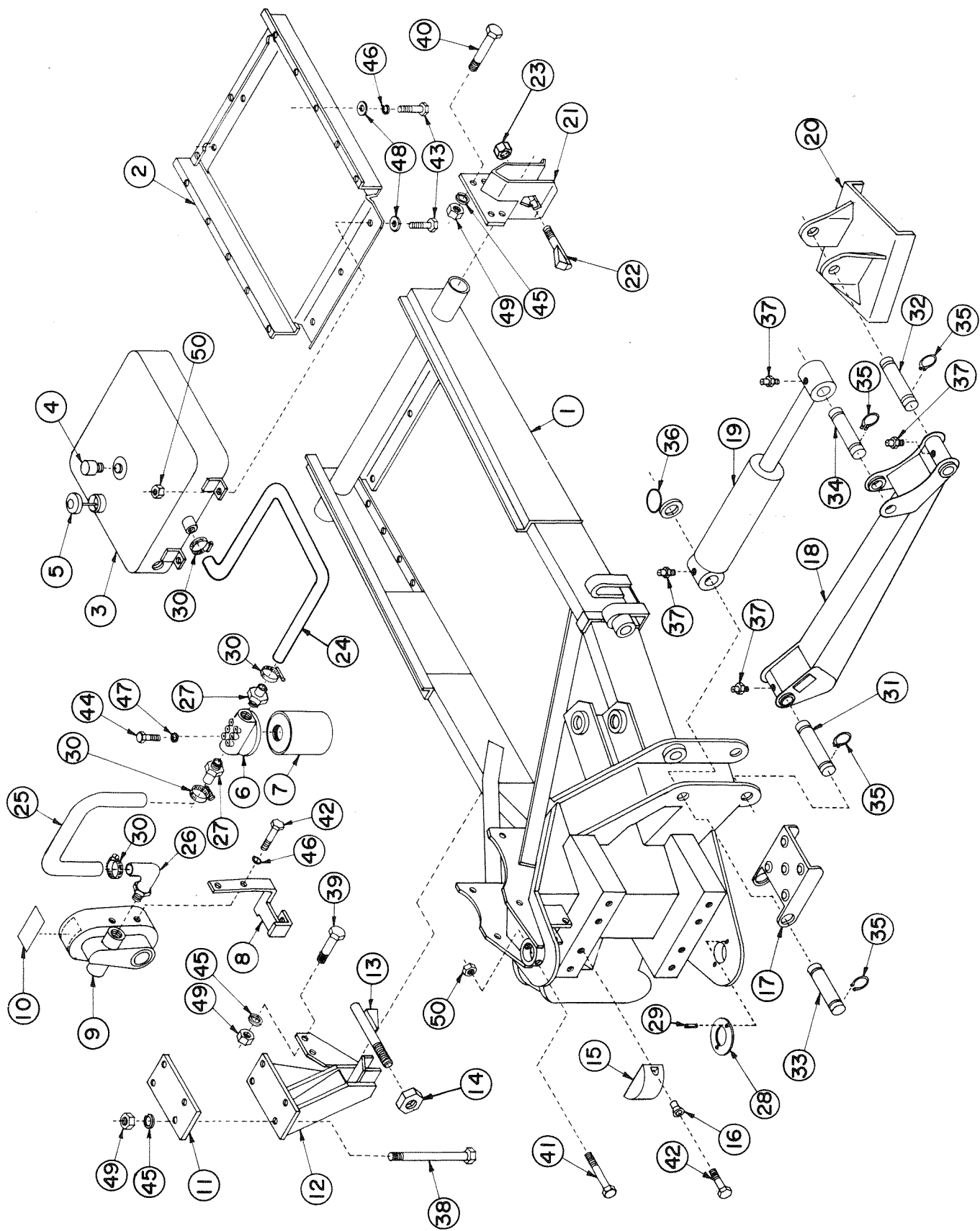
Mainframe, Stabilizers & Related Components	26
Swing Frame, Boom & Related Components	28
Dipper, Bucket & Related Components	29
Operator's Platform	30
Swing & Boom Locks	31
Control Valve	32
Control Valve Handles	33
PTO Hydraulic Pump	34
Swing & Stabilizer Hydraulics	35
Boom & Dipper Hydraulics	36
Lift, Crowd, Curl & Stabilizer Cylinders	37
Swing Cylinder	38

PARTS ORDERS: All orders must have a complete part number, description, quantity needed, method of shipment, your dealer number, or a shipping address.

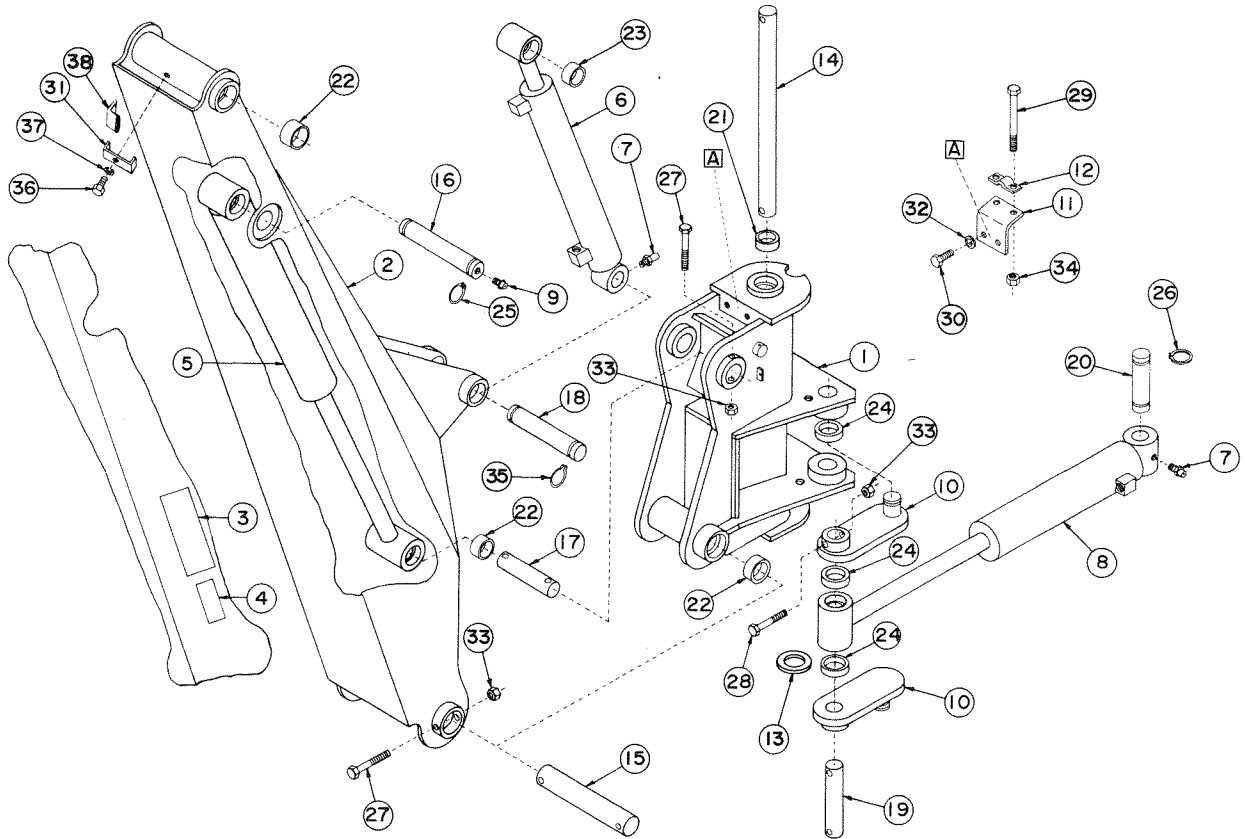
MAINFRAME, STABILIZERS & RELATED COMPONENTS

REF. PART NUMBER	DESCRIPTION	QTY.	REF. PART NUMBER	DESCRIPTION	QTY.
1. 70050-02444	Mainframe.....	1	24. 70050-02410	Line, to Oil Filter.....	1
2. 70050-02458	Belly Pan.....	1	25. 70050-02411	Line, to PTO Pump.....	1
3. 70050-02445	Hydraulic Tank.....	1	26. 70050-02315	Fitting, Special 90°.....	1
4. 70050-02446	Breather Vent.....	1	27. 70050-02311	Fitting, Straight.....	2
5. 70050-02447	Fillcap/Dipstick.....	1	28. 70050-02417	Thrust Washer, Special.....	1
6. 70050-02327	Filter Head.....	1	29. O/L	Roll Pin, 3/16 x 1/2.....	2
7. 70050-02326	Filter Cartridge.....	1	30. O/L	Hose Clamp.....	6
8. 70050-02457	Pump Mount Bracket.....	1	31. 70050-02426	Pivot Pin, 1-1/4 x 7-1/8.....	2
9. 70050-02374	540 RPM/PTO Pump.....	1	32. 70050-02425	Pivot Pin, 1-1/4 x 7-3/8.....	2
10. 70050-02373	Decal, PUMP, Speed.....	1	33. 70050-02428	Pivot Pin, 1-1/4 x 6-15/16.....	2
11. 70050-02454	PLate, All Models.....	2	34. 70050-02429	Pivot Pin, 1-1/4 x 5-1/8.....	2
12. 70050-02452	Rear Mount, LH (3950 & 4150).....	1	35. 70050-02328	Snap Ring, 1-1/4.....	16
70050-02481	Rear Mount, LH (3750).....	1	36. 70050-02470	Hose Loop.....	2
70050-02453	Rear Mount, RH (3950 & 4150).....	1	37. O/L	Lube Fitting, 3/16 Drive In.....	8
70050-02482	Rear Mount, RH (3750).....	1	38. O/L	Bolt, 5/8-11 x 8.....	8
13. 70050-02450	Wedge Bolt, Special.....	2	39. O/L	Bolt, 5/8-11 x 2-1/2.....	4
14. O/L	Nut, 1-8.....	4	40. O/L	Bolt, 5/8-11 x 2.....	8
15. 70050-02464	Bumper Pad, Swing.....	4	41. O/L	Bolt, 3/8-16 x 3-1/2.....	1
16. 70050-02467	Sleeve, Bumper Pad.....	8	42. O/L	Bolt, 3/8-16 x 1-1/4.....	10
17. 70050-02469	Mount Step.....	2	43. O/L	Bolt, 3/8-16 x 1.....	17
18. 70050-02439	Stabilizer Arm.....	2	44. O/L	Bolt, 5/16-18 x 3/4.....	4
19. 70050-02397	Cylinder, Stabilizer.....	2	45. O/L	Lockwasher, 5/8.....	20
20. 70050-02440	Pad, LH Stabilizer.....	1	46. O/L	Lockwasher, 3/8.....	15
70050-02441	Pad, RH Stabilizer.....	1	47. O/L	Lockwasher, 5/16.....	17
21. 70050-02455	Front Mount, LH.....	1	48. O/L	Flat Washer, 5/16.....	4
70050-02456	Front Mount, RH.....	1	49. O/L	Nut, 5/8-11.....	20
22. 70050-02451	Wedge Bolt, Special.....	2	50. O/L	Locknut, 3/8-16.....	5
23. O/L	Nut, 5/8-11.....	4			

O/L = Obtain locally. When replacing fasteners, always use Grade 5 or equivalent.



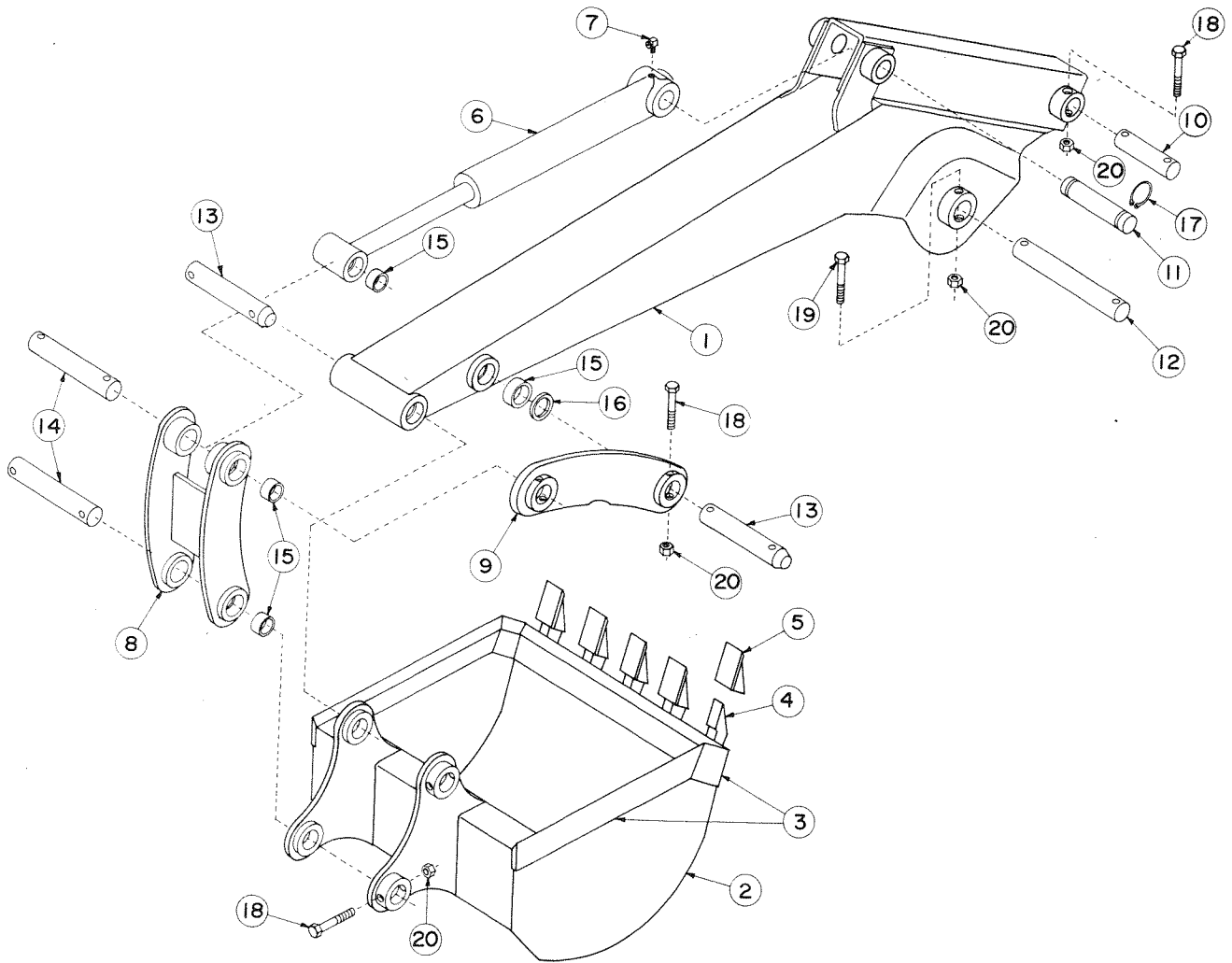
SWING FRAME, BOOM & RELATED COMPONENT



REF.	PART NUMBER	DESCRIPTION	QTY.	REF.	PART NUMBER	DESCRIPTION	QTY.
1.	70050-02413	Swing Frame.....	1	20.	70050-02430	Pivot Pin, 1-1/2 x 7-1/4.....	1
2.	70050-02418	Boom.....	1	21.	70050-02322	Bushing, 2 ID x 2.....	2
3.	70050-02370	Decal, KUBOTA, Trademark....	2	22.	70050-02306	Bushing, 2 ID x 1-1/2.....	6
4.	70050-02371	Decal, 4540, Model.....	2	23.	70050-02308	Bushing, 1-3/4 ID x 1-1/2.....	2
5.	70050-02387	Cylinder, Lift.....	1	24.	70050-02309	Bushing, 1-1/2 ID x 1-1/2.....	8
6.	70050-02394	Cylinder, Crowd.....	1	25.	70050-02331	Snap Ring, 2" External.....	2
7.	O/L	Lube Fitting, 3/16 Drive In.....	2	26.	70050-02329	Snap Ring, 1-1/2" External.....	4
8.	70050-02400	Cylinder, Swing.....	2	27.	O/L	Bolt, 3/8-16 x 3-3/4.....	4
9.	O/L	Lube Fitting, 1/8 NPT.....	1	28.	O/L	Bolt, 3/8-16 x 3.....	4
10.	70050-02442	Swing Link.....	4	29.	O/L	Bolt, 5/16-18 x 4-1/2.....	2
11.	70050-02433	Bracket, Hose Guide.....	1	30.	O/L	Bolt, 5/16-18 x 3/4.....	2
12.	70050-02432	Clamp, Hose Guide.....	4	31.	70050-02434	Hose Clamp.....	2
13.	70050-02414	Thrust Washer.....	1	32.	O/L	Lockwasher, 5/16.....	2
14.	70050-02415	Pivot Pin, 2 x 27-1/4.....	1	33.	O/L	Locknut, 3/8-16.....	12
15.	70050-02416	Pivot Pin, 2 x 11-7/8.....	1	34.	O/L	Locknut, 5/16-18.....	2
16.	70050-02427	Pivot Pin, 2 x 9-1/2.....	1	35.	70050-02230	Snap Ring, 1-3/4 External.....	2
17.	70050-02424	Pivot Pin, 2 x 7-3/4.....	1	36.	O/L	Bolt, 1/4-20 x 1-1/4.....	1
18.	70050-02423	Pivot Pin, 1-3/4 x 7-13/16.....	1	37.	O/L	Lockwasher, 1/4.....	1
19.	70050-02431	Pivot Pin, 1-1/2 x 7-3/4.....	1	38.	70050-02412	Web Sleeve.....	2

O/L = Obtain locally. When replacing fasteners, always use Grade 5 or equivalent.

DIPPER, BUCKET & RELATED COMPONENTS

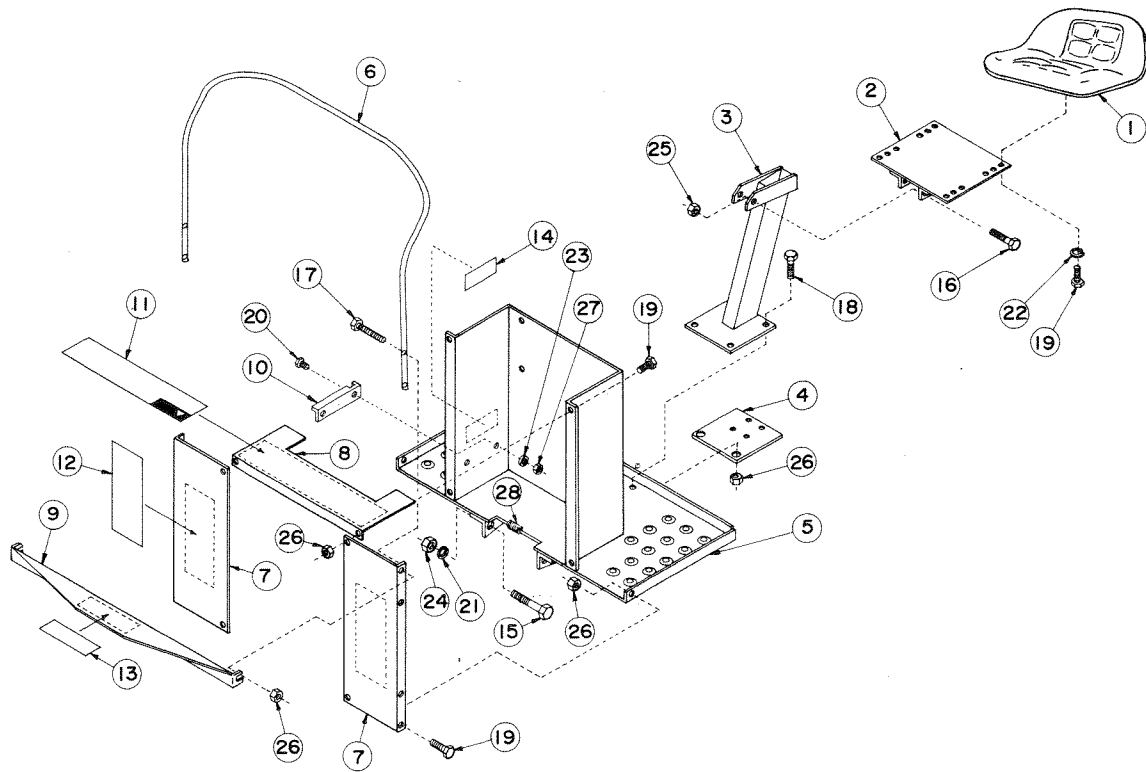


REF.	PART NUMBER	DESCRIPTION	QTY.	REF.	PART NUMBER	DESCRIPTION	QTY.
1.	70050-02479	Dipperstick	1	4.	70050-02323	Tooth Shank	A/R
2.	003105	Bucket, 13" Std.	1	5.	70050-02324	Tooth Point	A/R
	003106	Bucket, 18" Std.	1	6.	70050-02394	Cylinder, Curl	1
	003107	Bucket, 24" Std.	1	7.	O/L	Lube Fitting, 3/16 Drive In.	1
	003108	Bucket, 30" Std.	1	8.	70050-02421	Bucket Link	1
	003109	Bucket, 36" Std.	1	9.	70050-02420	Guide Link, LH.	1
					70050-02419	Guide Link, RH.	1
	003115	Bucket, 13" HD.	1	10.	70050-02437	Pivot Pin, 1-3/4 x 7-1/8.	1
	003116	Bucket, 18" HD.	1	11.	70050-02423	Pivot Pin, 1-3/4 x 7-13/16.	1
	003117	Bucket, 24" HD.	1	12.	70050-02443	Pivot Pin, 2 x 13-3/8.	1
3.	70050-02471	Edge & Side, 13" Std.	A/R	13.	70050-02435	Pivot Pin, 1-3/4 x 12-7/8.	2
	70050-02472	Edge & Side, 18" Std.	A/R	14.	70050-02422	Pivot Pin, 1-3/4 x 12-7/16.	2
	70050-02473	Edge & Side, 24" Std.	A/R	15.	70050-02308	Bushing, 1-3/4 ID x 1-1/2.	10
	70050-02474	Edge & Side, 30" Std.	A/R	16.	70050-02307	Dipper Seal	4
	70050-02488	Edge & Side, 36" Std.	A/R	17.	70050-02330	Snap Ring, 1-3/4 External	2
	70050-02475	Edge & Side, 13" HD.	A/R	18.	O/L	Bolt, 3/8-16 x 3-1/2.	10
	70050-02476	Edge & Side, 18" HD.	A/R	19.	O/L	bolt, 3/8-16 x 3-3/4.	2
	70050-02477	Edge & Side, 24" HD.	A/R	20.	O/L	Locknut, 3/8-16.	12

A/R = As Required.

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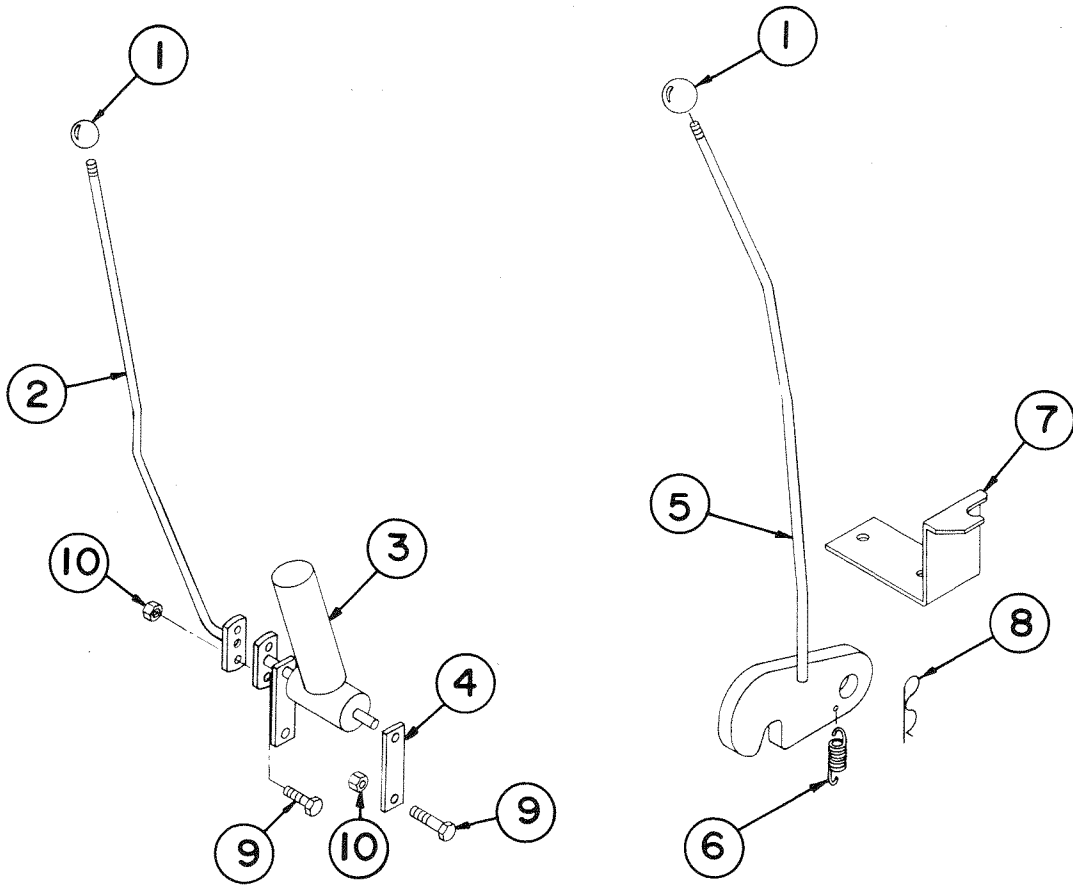
OPERATOR'S PLATFORM



REF.	PART NUMBER	DESCRIPTION	QTY.	REF.	PART NUMBER	DESCRIPTION	QTY.
1.	70050-02325	Operator Seat.....	1	15.	O/L	Bolt, 5/8 - 11 x 1-1/2.....	4
2.	70050-02459	Seat Bracket.....	1	16.	O/L	Bolt, 1/2-13 x 1-1/4.....	2
3.	70050-02465	Seat Stand.....	1	17.	O/L	Bolt, 3/8-16 x 1-1/2.....	4
4.	70050-02466	Bracket, Filter Mount.....	1	18.	O/L	Bolt, 3/8-16 x 1.....	4
5.	70050-02468	Platform/Valve Stand.....	1	19.	O/L	Bolt, 3/8-16 x 3/4.....	6
6.	70050-02463	Hand Rail.....	1	20.	O/L	Bolt, 1/4-20 x 1.....	2
7.	70050-02460	Kick Plate.....	2	21.	O/L	Lockwasher, 5/8.....	4
8.	70050-02461	Console.....	1	22.	O/L	Lockwasher, 3/8.....	4
9.	70050-02462	Brace, Console.....	1	23.	O/L	Lockwasher, 1/4.....	2
10.	70050-02484	Swing Lock Plate.....	1	24.	O/L	Nut, 5/8-11.....	4
11.	70050-02367	Decal, CAUTION, Operating..	1	25.	O/L	Locknut, 1/2-13.....	2
12.	70050-02369	Decal, BACKHOE, Instruction.	2	26.	O/L	Locknut, 3/8-16.....	16
13.	70050-02368	Decal, CONTROL, Instruction.	1	27.	O/L	Nut, 1/4-20.....	2
14.	70050-02372	Decal, SWING LOCK, Inst. ...	1	28.	70080-00345	Isolator.....	1
	N/I	70050-02366	Decal Kit.....				1

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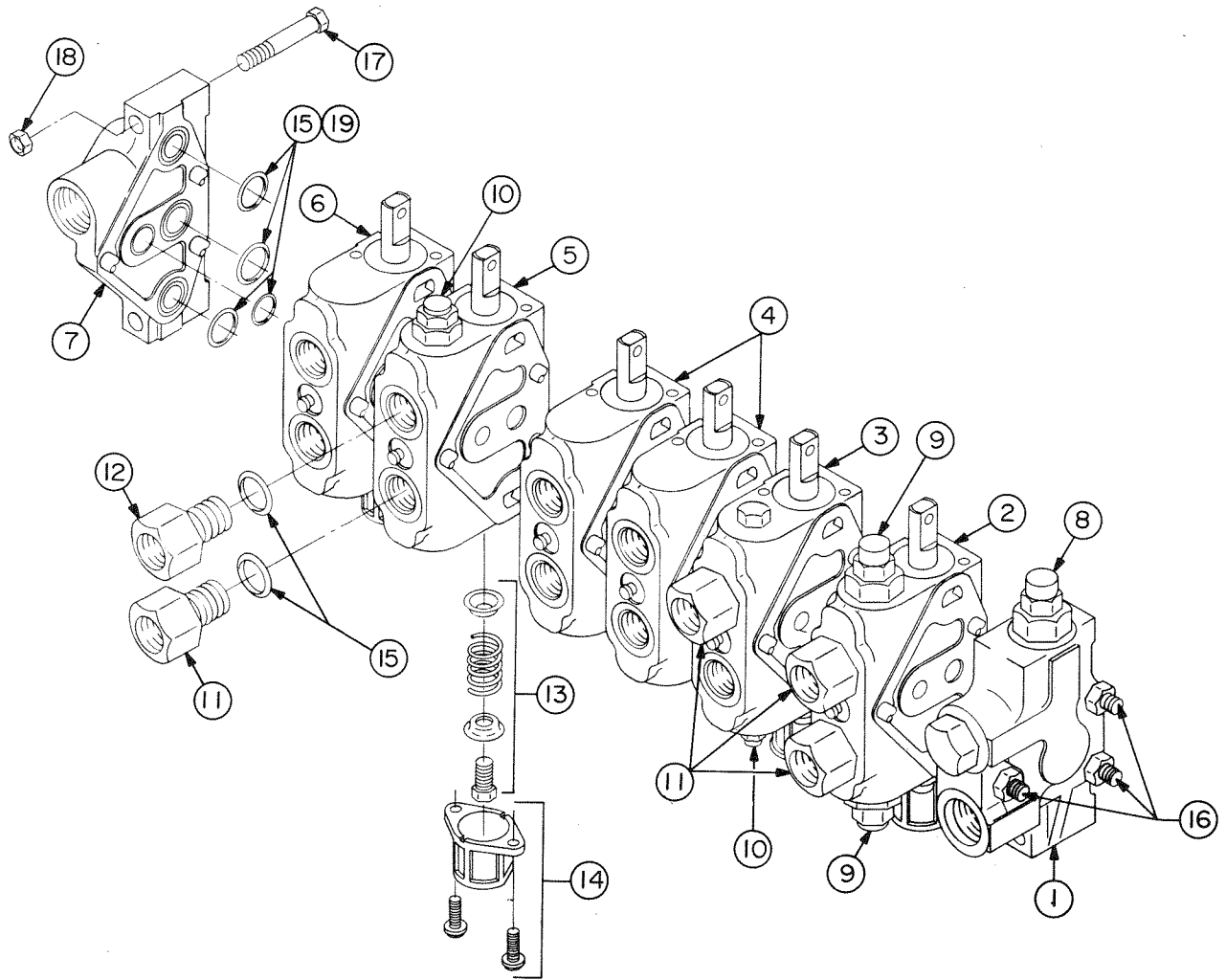
SWING & BOOM LOCKS



REF.	PART NUMBER	DESCRIPTION	QTY.	REF.	PART NUMBER	DESCRIPTION	QTY.
1.	70050-02485	Knob, Control Lock.....	2	6.	70050-02487	Spring, Boom Latch.....	1
2.	70050-02486	Lever, Swing Lock.....	1	7.	70050-02510	Lock, Boom Lever.....	1
3.	70050-02483	Swing Lock & Shaft.....	1	8.	70050-02306	Hairpin Clip.....	1
4.	70050-02511	Retainer, Swing Lock.....	1	9.	O/L	Bolt, 5/16-18 x 1.....	2
5.	70050-02480	Boom Latch & Lever.....	1	10.	O/L	Locknut, 5/16-18.....	2

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BACKHOE CONTROL VALVE

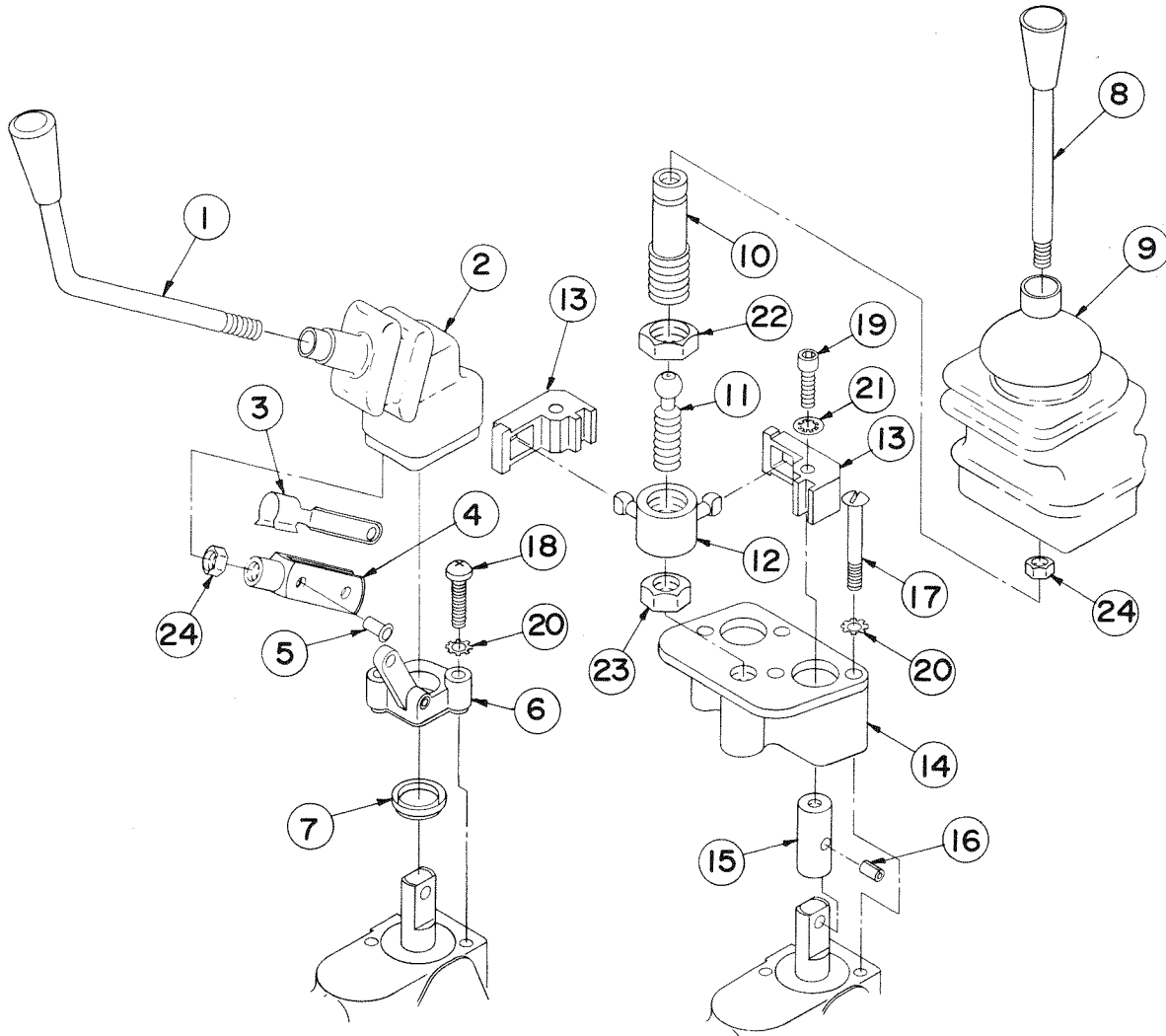


REF.	PART NUMBER	DESCRIPTION	QTY.	REF.	PART NUMBER	DESCRIPTION	QTY.
+	70050-02332	Control Valve, Complete, less Handles.....	1	9.	70050-02341	Work Relief, w/res.	2
1.	70050-02333	Inlet Section*.....	1	10.	70050-02342	Work Relief Only.....	2
2.	70050-02334	Swing Section*.....	1	11.	70050-02343	Anti-Cav., w/res.	4
3.	70050-02335	Boom Section*.....	1	12.	70050-02344	Spacer Fitting.....	1
4.	70050-02336	Stabilizer Section*.....	2	13.	70050-02345	Spool Centering Kit.....	6
5.	70050-02337	Crowd Section*.....	1	14.	70050-02346	End Cap, w/screws.....	6
6.	70050-02338	Curl Section*.....	1	15.	70050-02347	Seal Kit, Control Valve.....	1
7.	70050-02339	Return Section.....	1	16.	70050-02348	Tie Rod Kit, w/nuts.....	1
8.	70050-02340	System Relief Cartridge.....	1	17.	O/L	Bolt, 3/8-16 x 2-1/2.....	3
				18.	O/L	Locknut, 3/8-16.....	3
				19.	70050-02589	Seal Kit, Between Section....	1

* SECTIONS NOT SERVICE SEPARATELY! However, each section comes with its respective relief, anti-cavation valves, centering kit, end caps, etc.

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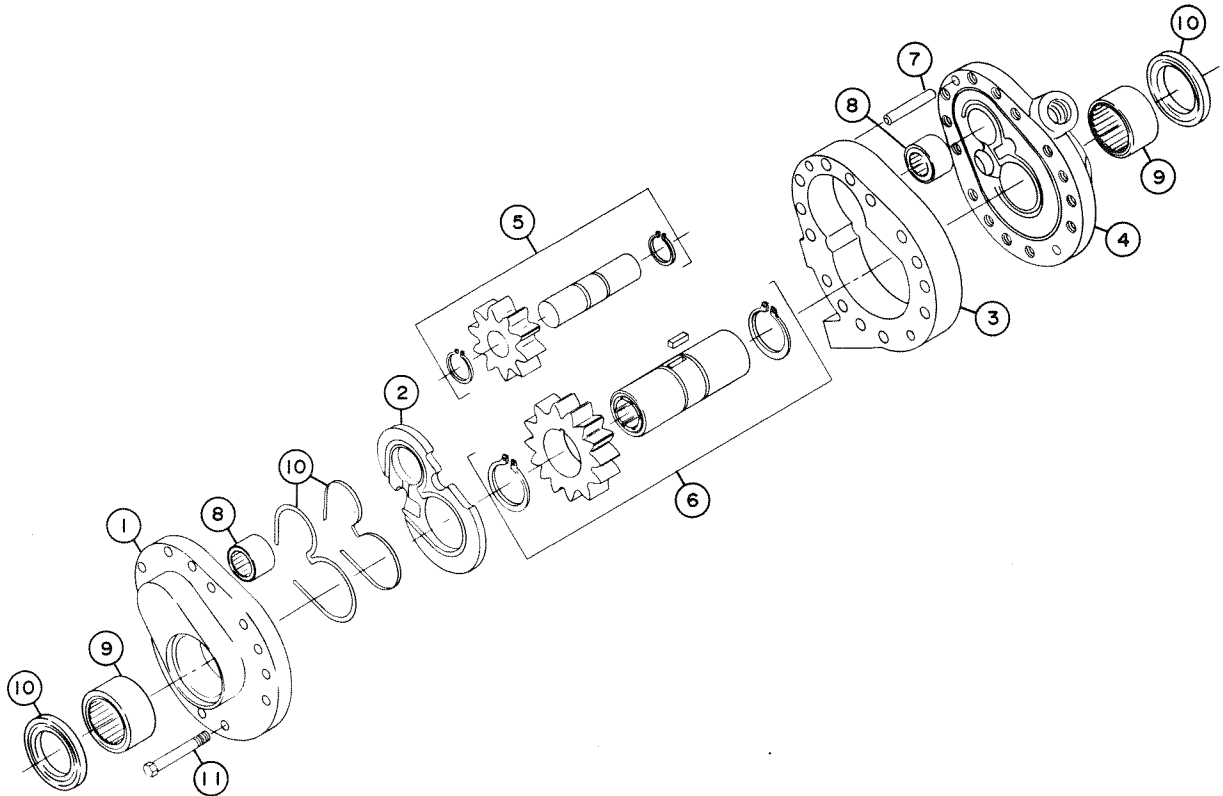
CONTROL VALVE HANDLES



REF.	PART NUMBER	DESCRIPTION	QTY.	REF.	PART NUMBER	DESCRIPTION	QTY.
+	70050-02349	Stabilizer Handle, Complete..	2	11.	70050-2361	Ball Stud.....	2
1.	70050-02350	Lever, w/knob.....	2	12.	70050-02362	Spool Lever.....	2
2.	70050-02351	Boot.....	2	13.	70050-02363	Linkage.....	4
3.	70050-02352	Clip.....	2	14.	70050-02364	Double Bracket.....	2
4.	70050-02353	Clevis.....	2	15.	70050-02365	Spool Adapter.....	4
5.	70050-02354	Link Pin.....	2	16.	O/L	Roll Pin, 1/4 x 3/4.....	4
6.	70050-02355	Bracket & Link.....	2	17.	O/L	Screw, 1/4-20 x 2.....	8
7.	70050-02356	Spacer Sleeve.....	2	18.	O/L	Phillips Screw, 1/4-20 x 1-1/4..	4
+	70050-02357	Control Handle, Complete....	2	19.	O/L	Socket Screw, 1/4-20 x 1.....	4
8.	70050-02358	Lever, w/knob.....	2	20.	O/L	Washer, 1/4-Outside Lock....	12
9.	70050-02359	Boot.....	2	21.	O/L	Washer, 1/4-Inside Lock.....	4
10.	70050-02360	Adapter Sleeve.....	2	22.	O/L	Nut, 3/4-16 Jam.....	2
				23.	O/L	Nut, 1/2-20 Jam.....	2
				24.	O/L	Nut, 3/8-16.....	4

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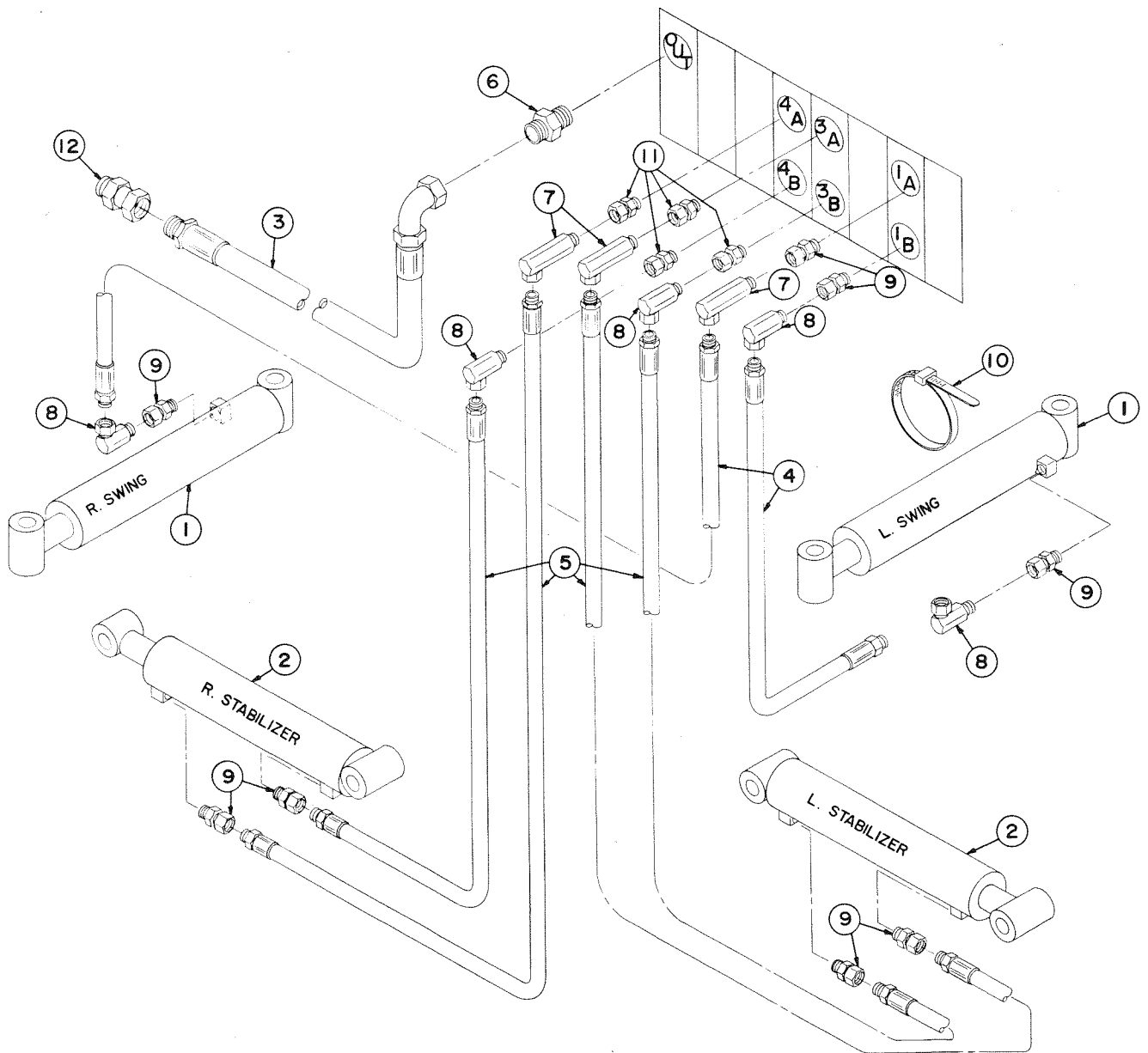
540 RPM / PTO PUMP



REF.	PART NUMBER	DESCRIPTION	QTY.	REF.	PART NUMBER	DESCRIPTION	QTY.
+	70050-02374	PTO Pump, Complete.....	1	6.	70050-02380	Drive Gear & Shaft.....	1
1.	70050-02375	Front Plate Assy.	1	7.	70050-02383	Bearing, Idler.....	2
2.	70050-02376	Wear Plate.....	1	8.	70050-02384	Bearing, Driver.....	2
3.	70050-2377	Pump Body.....	1	9.	70050-02381	Pin, 3/8-16 x 2-1/4.....	2
4.	70050-02378	Back Plate Assy.	1	10.	70050-02386	Seal Kit, PTO Pump.....	1
5.	70050-02379	Idler Gear & Shaft.....	1	11.	O/L	Bolt, 3/8-16 x 2-1/4.....	14

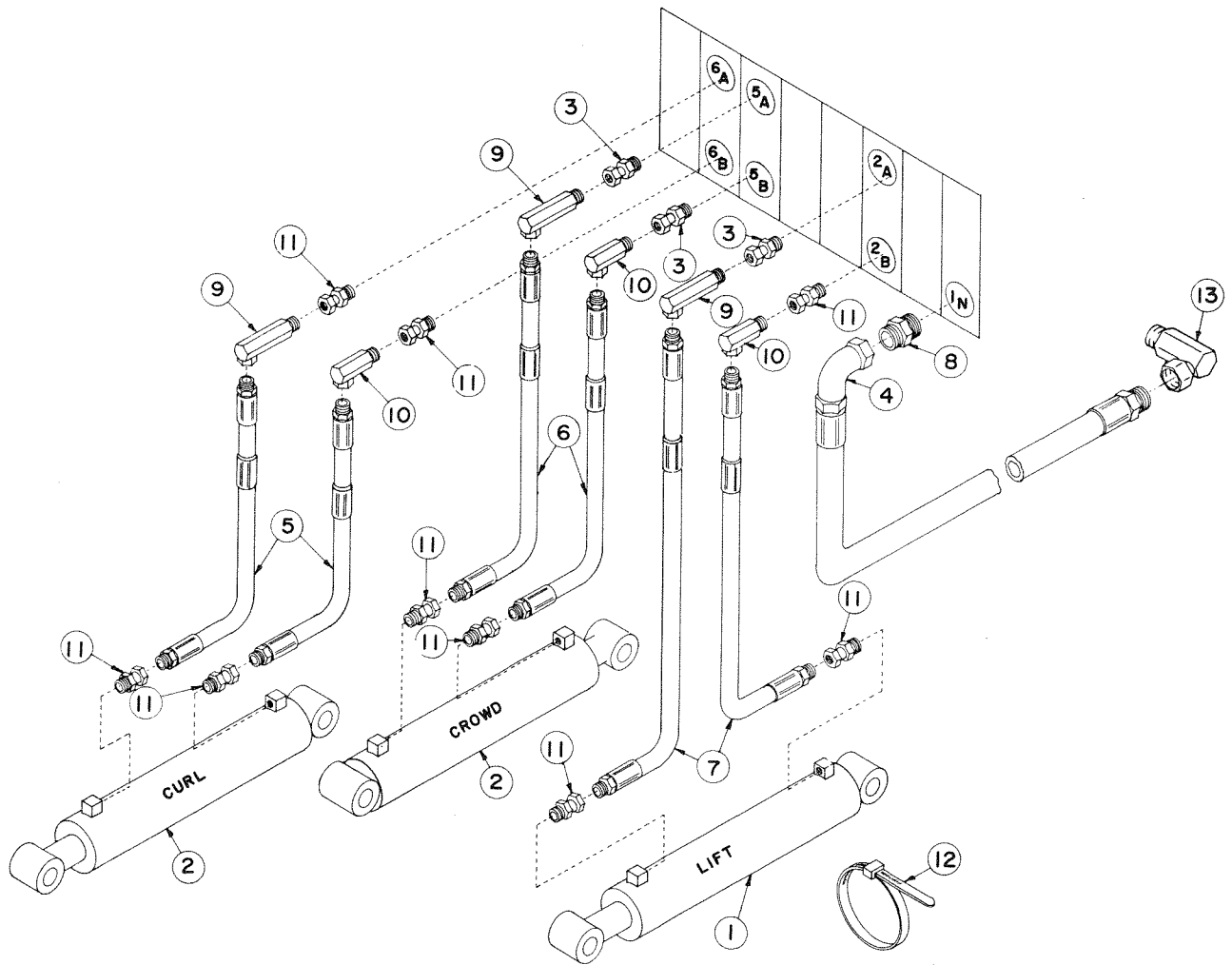
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SWING & STABILIZER HYDRAULICS



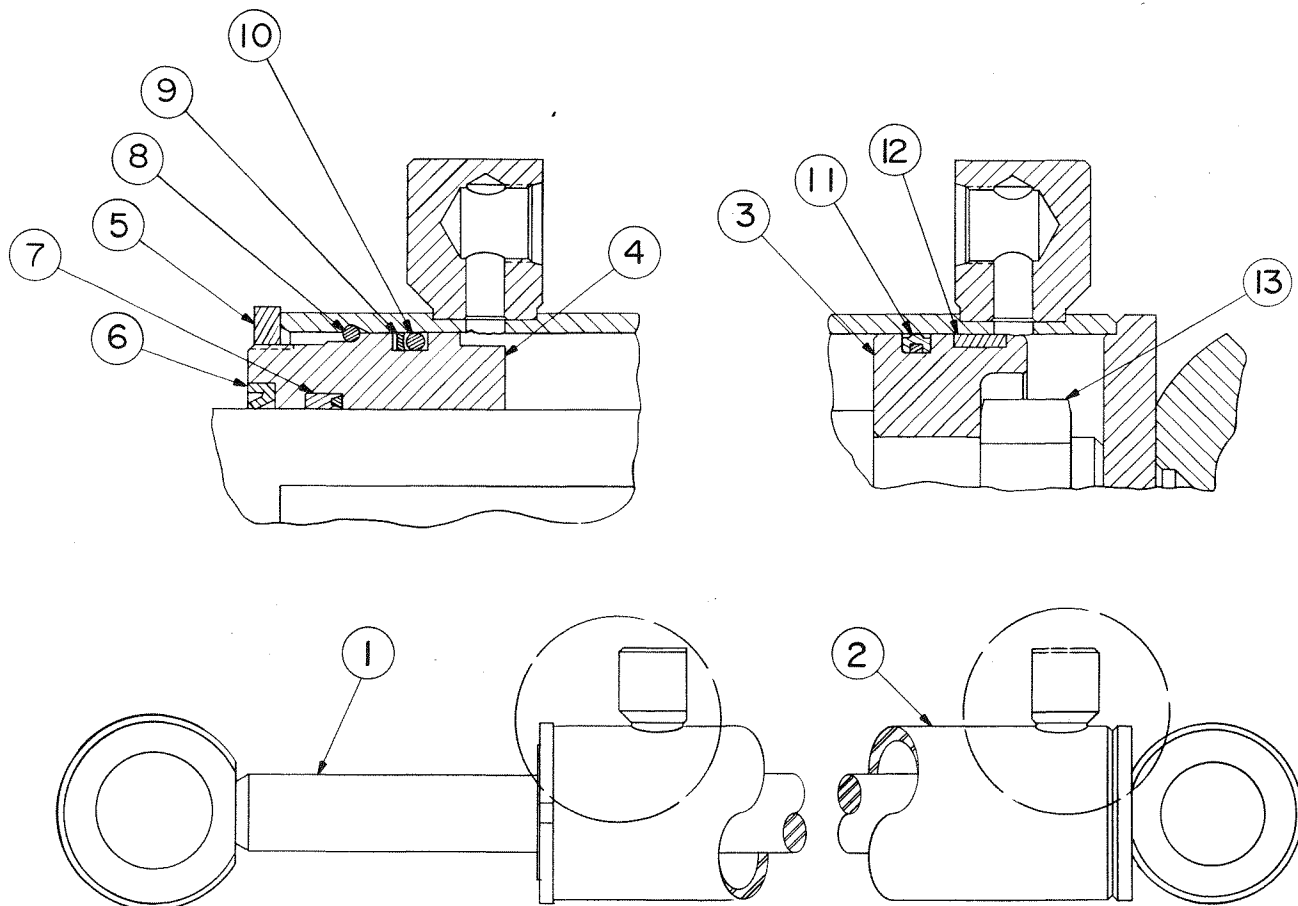
REF.	PART NUMBER	DESCRIPTION	QTY.	REF.	PART NUMBER	DESCRIPTION	QTY.
1.	70050-02400	Cylinder, Swing.....	2	7.	70050-01657	Fitting, long, 90°.....	3
2.	70050-02397	Cylinder, Stabilizer.....	2	8.	70050-01619	Fitting, short, 90°.....	5
3.	70050-02408	Return Hose.....	1	9.	70050-01618	Adapter Swivel.....	8
4.	70050-02320	Swing Hose, 45".....	2	10.	70050-01663	Hose Tie.....	4
5.	70050-02321	Stabilizer Hose, 69".....	4	11.	70050-02310	Fitting, Special.....	4
6.	70050-02317	Adapter Fitting.....	1	12.	70050-02406	Adapter Swivel.....	1

BOOM & DIPPER HYDRAULICS



REF.	PART NUMBER	DESCRIPTION	QTY.	REF.	PART NUMBER	DESCRIPTION	QTY.
1.	70050-02387	Cylinder, Lift.....	1	7.	70050-02409	Lift Hose, 98".....	2
2.	70050-02394	Cylinder, Crowd.....	1	8.	70050-02317	Adapter.....	1
	70050-02394	Cylinder, Curl.....	1	9.	70050-01649	Fitting, 90° - long.....	3
3.	70050-02314	Fitting, Special.....	3	10.	70050-02312	Fitting, 90° - short.....	3
4.	70050-02407	Inlet Hose.....	1	11.	70050-02313	Adapter Swivel.....	9
5.	70050-02319	Curl Hose, 167".....	2	12.	70050-01663	Hose Tie.....	3
6.	70050-02318	Crowd Hose, 109".....	2	13.	70050-02316	Fitting, 1" x 90°.....	1

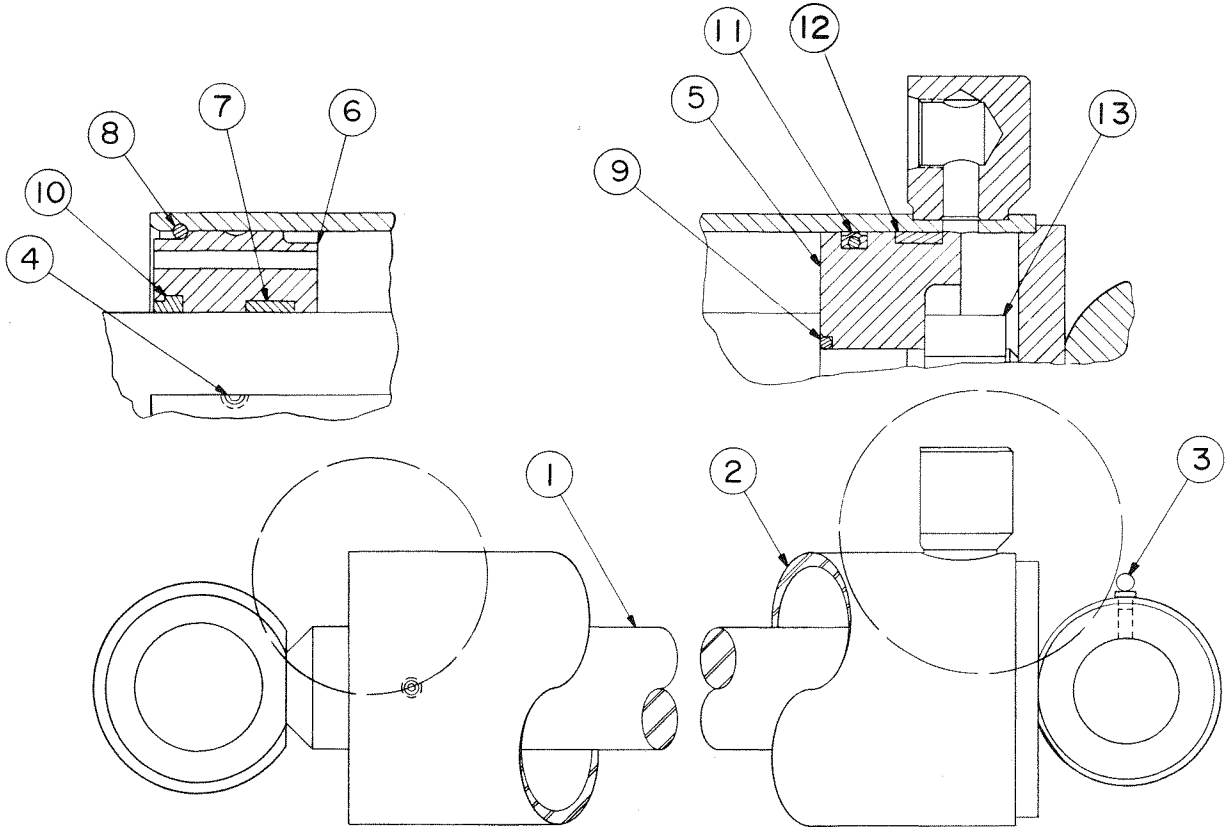
LIFT, CROWD, CURL & STABILIZER CYLINDERS



REF.	PART NUMBER	DESCRIPTION	QTY.	REF.	PART NUMBER	DESCRIPTION	QTY.
+	70050-02387	Cylinder, Lift	1	S/K	70050-02393	Seal Kit, Lift, Crowd, Curl & Stab. Cyl's.	A/R
+	70050-02394	Cylinder, Crowd & Curl	2	6.	S/K	Wiper Seal	1
+	70050-02397	Cylinder, Stabilizer	2	7.	S/K	Gland Seal	1
1.	70050-02388	Rod, Lift Cyl.	1	8.	S/K	Retaining Ring	1
	70050-02395	Rod, Crowd & Curl	1	9.	S/K	Back-up Ring	1
	70050-02398	Rod, Stabilizer Cyl.	1	10.	S/K	O-Ring	1
2.	70050-02389	Barrel, Lift Cyl.	1	11.	S/K	Piston Seal	1
	70050-02396	Barrel, Crowd & Curl	1	12.	S/K	Wear Ring	1
	70050-02399	Barrel, Stabilizer Cyl.	1	13.	S/K	Locknut, 1-14, Special	1
3.	70050-02391	Piston	1				
4.	70050-02392	Gland	1				
5.	70050-02390	Retainer Nut	1				

A/R = As Required.

SWING CYLINDER



REF.	PART NUMBER	DESCRIPTION	QTY.	REF.	PART NUMBER	DESCRIPTION	QTY.
+	70050-02400	Cylinder, Swing.....	2	+	70050-02405	Seal Kit.....	A/R
1.	70050-02401	Rod	1	7.	S/K	Gland Wear Ring.....	1
2.	70050-02402	Barrel.....	2	8.	S/K	Retaining Ring.....	1
3.	O/L	Lube Fitting, 3/16 Drive In....	1	9.	S/K	O-Ring	1
4.	O/L	Set Screw, 1/4-20.....	1	10.	S/K	Gland Seal.....	1
5.	70050-02403	Piston	1	11.	S/K	Piston Seal.....	1
6.	70050-02404	Gland.....	1	12.	S/K	Piston Wear Ring.....	1
				13.	S/K	Locknut, 1-14, Special.....	1

A/R = As Required.

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