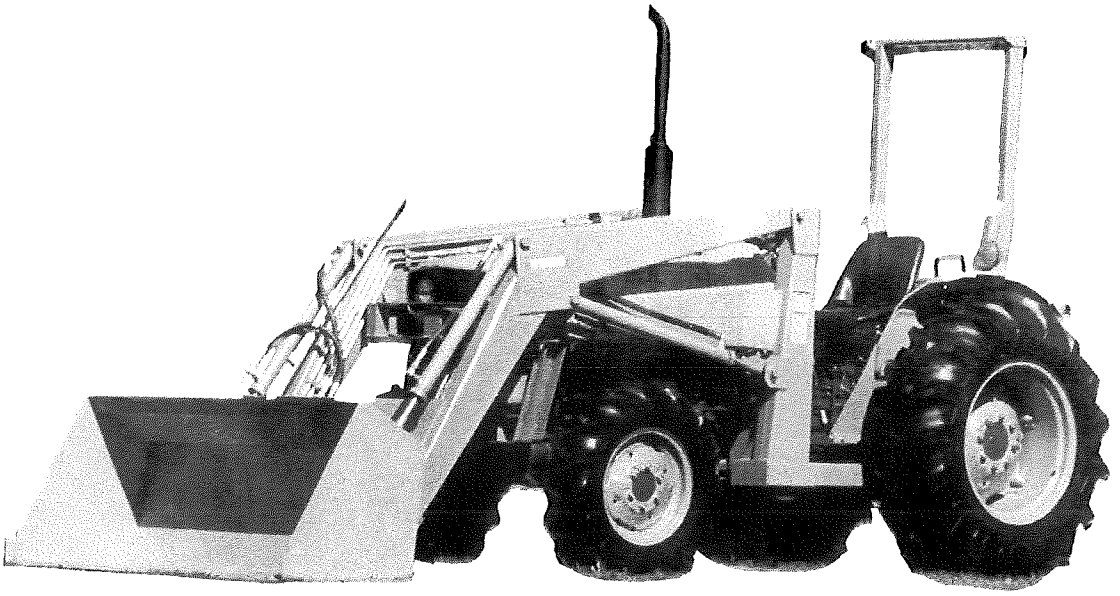
PARTS AND SERVICE MANUAL

KUBOTA

MODEL L1720 LOADER

FOR TRACTOR MODELS: L305, L305DT L345, L345DT, L355SS



EFFECTIVE BEGINNING WITH SERIAL NO. 50000

THIS SAFETY ALERT SYMBOL IDENTIFIES IMPORTANT SAFETY MESSAGES IN THIS MANUAL.

FORM 70000-70024 REV. B 5-1-82

TABLE OF CONTENTS

WATCH FOR THIS ALERT SYMBOL. IT INDICATES IMPORTANT SAFETY MESSAGES. WHEN YOU SEE THIS SYMBOL, CAREFULLY READ THE MESSAGE THAT FOLLOWS AND BECOME ALERT THAT YOUR SAFETY IS INVOLVED.

INTRODUCTION

This manual is organized into four (4) basic sections. The first two are General Specifications and Safety. The third is Service Instructions. Service is divided into more specific sections pertaining to Trouble Shooting, Diagnosing, and Repairing the Kubota L1720 Loader and its systems. The fourth basic section of this manual is a Parts Catalog. The Parts Section includes necessary illustrations, description, and part numbers required to identify and order service parts for the Kubota L1720 Loader.

DIRECTIONAL REFERENCE

Reference in this manual to the right and left-hand side of the loader is determined by standing at the rear of the unit and facing the direction of forward travel.

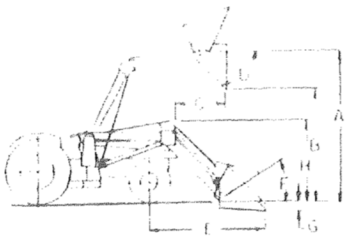
SERIAL NUMBER PLATE

The serial number plate is located on the left central portion of your loader subframe. Be sure to check all information pertaining to changes in the loader before diagnosing or repairing parts.

SECTION 1

GENERAL SPECIFICATIONS
MODEL L1720 LOADER

These specifications apply to:



	Kubota L345DT Tractor and loader equipped with external (open center-2000 PSI) hydraulic pump system; front tire size 9.5-16; rear tire size 13.6-28; and 66" material bucket less tines. Specifications will vary for tractors and loader equipped differently.	Kubota L305DT Tractor and loader equipped with external (open center-1800 PSI) hydraulic pump system; front tire size 8-16; rear tire size 13.6-24; and 66" material bucket less tines. Specifications will vary for tractors and loader equipped differently.	Kubota L355SS Tractor and loader equipped with external (open center-2000 PSI) hydraulic pump system; front tire size 8.3-16; rear tire size 13.6-24; and 66" material bucket less tines. Specifications will vary for tractors and loader equipped differently.
(A) MAXIMUM LIFT HEIGHT	113.5" (2883mm)	111.5" (2832mm)	112" (2845mm)
(B) CLEARNACE WITH ATTACHMENT DUMPED	89.75" (2280mm)	89.5" (2273mm)	91" (2320mm)
(C) REACH AT MAXIMUM HEIGHT	39" (991mm)	36" (914mm)	38"(965mm)
(D) MAXIMUM DUMP ANGLE	45°	45°	42°
(E) REACH WITH ATTACHMENT ON GROUND	72.25" (1835mm)	76.8" (1951mm)	73" (1845mm)
(F) ATTACHMENT ROLLBACK ANGLE	17°	20°	21°
(G) DIGGING DEPTH	7.5" (191mm)	8" (203mm)	5" (120mm)
(H) OVERALL HEIGHT TO CARRY POSITION	60.25" (1530mm)	57.3" (1455mm)	63.5" (1615mm)
BREAK-AWAY CAPACITY	2550 lbs. (1150Kg)	2220 lbs. (1010Kg)	2360 lbs. (1070Kg)
LIFT CAPACITY AT FULL HEIGHT	1495 lbs. (680Kg)	1300 lbs. (590Kg)	1470 lbs. (669Kg)
RAISING TIME	4.3 sec.*	4.5 sec.*	4.8 sec.*
LOWERING TIME	3.3 sec.*	3.4 sec.*	2.1 sec.*
ATTACHMENT DUMPING TIME	3.0 sec.*	4.3 sec.*	3.7 sec.*
ATTACHMENT ROLL BACK TIME	2.5 sec.*	2.3 sec.*	2.5 sec.*
APPROX. SHIPPING WEIGHT (WITH ATTACHMENT)	1433 lbs. (651Kg)	1433 lbs. (615Kg)	1433 lbs. (651Kg)

*Using External Hydraulic System @ 2800 RPM. Tractor system will be slower.

CYLINDERS:
Number - Type Lift Cylinders . . . . . 2 - 2" dia. Bore with 1.50" dia. Rod, 27.25" Stroke
Number - Type Bucket Cylinders . . . . . 2 - 2" dia. Bore with 1.25" dia. Rod, 22.25" Stroke
Port Thread Spec's . . . . . ¾"-16 SAE O-Ring Boss

VALVE:
External hydraulic control valve made by Cross.
Rated Capacity . . . . . Up to 30 GPM
Rated Pressure . . . . . Up to 2500 PSI
Port Thread Spec's . . . . . ¾"-16 SAE O-Ring Boss

RELIEF VALVE SETTING
L305 & L305DT External Hydraulic System . . . . . 1800 PSI (12411 KPa)
L345, L345DT, & L355SS External Hydraulic System . . . . . 2000 PSI (13790 KPa)

PUMP:
External hydraulic pump made by Webster (077YC)
Direction of Rotation . . . . . Left Hand
Rated Flow: (L305 Tractor) 9.3 GPM (35 liters/m) at 1800 PSI (12441 KPa) @ 2800 Engine RPM
(L345 Tractor) 9.0 GPM (34 liters/m) at 2000 PSI (13790 KPa) @ 2800 Engine RPM
(L355SS Tractor) 9.0 GPM (34 liters/m) at 2000 PSI (13790 KPa) @ 2800 Engine RPM
Suction (in) Port Thread Spec's . . . . . 1-1/16"-12 SAE O-Ring Boss
Pressure (out) Port Thread Spec's . . . . . 7/8"-14 SAE O-Ring Boss
Input Shaft . . . . . ¾" dia. with .19 x 1.12 LG AM STD SQ KEY

SECTION 2

SAFETY

SAFETY RULES

Your safety and the safety of those around you is dependent upon the care and good judgement you exercise in the use of this equipment.

READ THIS MANUAL THOROUGHLY and make sure you understand its contents. All equipment has limitations.

The safety information presented in this manual is not intended to replace safety codes, insurance requirements, federal, state and local laws, rules and regulations. Know the regulations and laws that apply to your area and be sure that your loader is properly equipped to meet such laws and regulations.

We at Kubota are continuing to contribute to your safety by building loaders with an extra measure of protection, and passing on these suggestions for safer operation.

IMPORTANT: Always replace any safety decals whenever the old decals are destroyed, lost, painted over or illegible. Replace all safety decals when repainting.

OPERATION

WARNING Before starting tractor engine study Operator's Manual safety messages. Read all safety signs. Clear the area of other persons. Learn and practice safe use of controls before operating. It is your responsibility to understand and follow manufacturer's instructions on machine operation, service, and to observe pertinent laws and regulations. Operator Manuals may be obtained from your equipment dealer.

CAUTION Improper use of a loader can cause serious injury or death.

CAUTION Operate the loader from the tractor seat only.

CAUTION Move wheels to widest recommended settings to increase stability.

CAUTION Move, turn and operate tractor at slow ground speeds, especially on irregular ground to avoid tipping.

CAUTION Add recommended rear tire liquid weight, rear wheel weight or rear ballast for increased stability and traction.

CAUTION Do not stand, walk or work under a raised loader or attachment unless it is securely blocked or held in position. Accidental movement of control lever or leak in hydraulic system could cause mainframe to drop, causing severe injury.

CAUTION Do not lift or carry personnel on a loader or attachment; a slip or fall could cause bodily injury.

CAUTION For better stability, use a tractor with wide front axle rather than one with narrow front wheels.

CAUTION Visually check for hydraulic leaks and broken, missing or malfunctioning parts and make necessary repairs.

OPERATION

CAUTION Do not operate the loader if the fittings are leaking or if the hoses are damaged. A sudden line burst would cause the mainframe to drop suddenly, causing damage to the tractor or loader or injury to personnel.

CAUTION If the tractor is equipped with a Rollover-Protective Structure (ROPS), fasten seat belt prior to starting engine.

CAUTION Avoid loose fill, rocks and holes; they can be dangerous for loader operation or movement.

CAUTION It is the loader owner's responsibility to be certain anyone operating the loader is aware of safe operating practices and potential hazards.

CAUTION Stop the tractor engine before checking oil level in tractor oil reservoir.

CAUTION Operating sideways on a hill tends to tip the unit.

CAUTION Be extra careful when working on inclines.

CAUTION If tractor is ROPS equipped, do not exceed the manufacturers rating for maximum gross vehicle weight. When adding counter weight to the rear refer to ROPS serial number plate.

CAUTION Stop the loader arms gradually when lowering or lifting.

CAUTION Use caution when handling loose or shiftable loads.

WARNING: Load on raised bucket or fork can roll back onto operator area, causing serious injury or death. Use recommended clamping attachments for handling large objects such as bales, posts, etc. Carry fork as low as possible.

TRANSPORT

CAUTION A loaded bucket should be transported in a low position at slow ground speeds, especially if the ground is irregular. Make turns slowly and use the tractor brakes cautiously. A full bucket in the raised position significantly alters the center of gravity location of the unit and increases the possibility of mishaps.

CAUTION Avoid overhead wires or obstacles when loader is raised, to avoid damage or possible shock.

CAUTION Allow for the loader length when making turns.

STORAGE

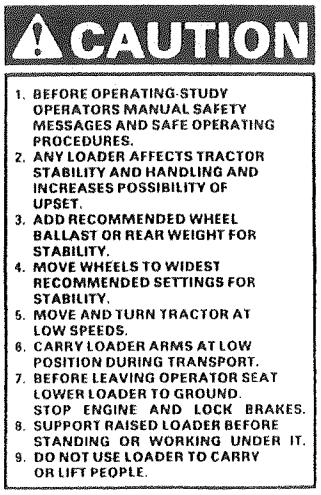
CAUTION Lower mainframe when parking or servicing. Accidental movement of control lever or leak in hydraulic system could cause mainframe to drop, causing damage to loader or tractor or injury to personnel.

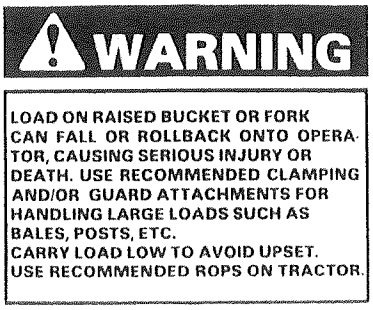
CAUTION Before disconnecting hydraulic lines, relieve all hydraulic pressure. Escaping hydraulic oil under pressure can have sufficient force to penetrate the skin, causing serious personal injury.

CAUTION If injured by escaping fluid, obtain medical treatment immediately.

CAUTION Make sure all parked loaders on stands are on a hard level surface with all safety devices engaged to prevent loader from falling and being damaged or injuring someone.

WARNING Lower or block elevated components before servicing or when leaving the machine. Elevated components can fall and cause serious injury.





NOTE: These decals are conspicuously placed on your loader and serve as a constant safety reminder. Replace safety decals if they become worn or difficult to read, especially when re-painting.

SECTION 3

TOOLS AND TEST EQUIPMENT

SUGGESTED TOOL LIST

The following tool list is recommended to perform routine loader maintenance.

1. Common hand tools including metric sockets and wrenches
2. Air compressor
3. Vise
4. Torque wrench
5. Portable hoist or overhead crane
6. Spanner wrench
7. Oil pressure gauges (low pressure 0 to 100 PSI and high pressure 0 to 4000 PSI)
8. Hydraulic flow meter (series flow through)
9. Steam cleaner or high pressure washer

GENERAL TORQUE SPECIFICATION TABLE

GENERAL TORQUE SPECIFICATION TABLE (Revised 2-74)

USE THE FOLLOWING TORQUES WHEN SPECIAL TORQUES ARE NOT GIVEN

NOTE: These values apply to fasteners as received from supplier, dry, or when lubricated with normal engine oil. They do not apply if special graphited or moly disulphide greases or other extreme pressure lubricants are used. This applies to both UNF and UNC threads.

SAE Grade No		2				5				8 *			
Bolt head identification marks as per grade NOTE: Manufacturing Marks Will Vary													
		Torque				Torque				Torque			
Bolt Size		Foot Pounds		Newton-Meters		Foot Pounds		Newton-Meters		Foot Pounds		Newton-Meters	
Inches	Millimeters	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
1/4	6.35	5	6	6.8	8.13	9	11	12.2	14.9	12	15	16.3	20.3
5/16	7.94	10	12	13.6	16.3	17	20.5	23.1	27.8	24	29	32.5	39.3
3/8	9.53	20	23	27.1	31.2	35	42	47.5	57.0	45	54	61.0	73.2
7/16	11.11	30	35	40.7	47.4	54	64	73.2	86.8	70	84	94.9	113.9
1/2	12.70	45	52	61.0	70.5	80	96	108.5	130.2	110	132	149.2	179.0
9/16	14.29	65	75	88.1	101.6	110	132	149.2	179.0	160	192	217.0	260.4
5/8	15.88	95	105	128.7	142.3	150	180	203.4	244.1	220	264	298.3	358.0
3/4	19.05	160	185	203.3	250.7	270	324	366.1	439.3	380	456	515.3	618.3
7/8	22.23	160	200	216.8	271.0	400	480	542.4	650.9	600	720	813.6	976.3
1	25.40	250	300	338.8	406.5	580	696	786.5	943.8	900	1080	1220.4	1464.5
1 1/8	25.58					800	880	1084.8	1193.3	1280	1440	1735.7	1952.6
1 1/4	31.75					1120	1240	1518.7	1681.4	1820	2000	2467.9	2712.0
1 3/8	34.93					1460	1680	1979.8	2278.1	2380	2720	3227.3	3688.3
1 1/2	38.10					1940	2200	2630.6	2983.2	3160	3560	4285.0	4827.4

* Thick nuts must be used with Grade 8 bolts

NOTE: When hardware is plated, reduce torque values by 25%.

LOGICAL STEPS TO TROUBLE SHOOTING

1. **QUESTION THE CUSTOMER AND OPERATOR.**
   Identify the exact symptoms of the problem, what is happening and under what conditions does it occur? Determine what appears to be working correctly.

2. **MAKE A COMPLETE PHYSICAL EXAMINATION.**
   Use your eyes, ears, nose and hands to closely examine the unit. Make sure that proper conditions exist for correct operation. (External defects, fluid levels, filters, linkages, connectors, fuel, condition of maintenance, etc.).

3. **HAVE OPERATOR SIMULATE PROBLEM, THEN TRY IT YOURSELF.**
   Determine and classify all the actual symptoms while running the unit. See which circuits may be working correctly.

4. **VERIFY THE PERFORMANCE OF MAJOR SYSTEMS.**
   Do preliminary running tests, stall checks and cycle times to begin eliminating systems and individual circuits which meet specifications, (engine, hydraulics, converter, etc.). Record results.
5. **NOW PERFORM SPECIFIC TESTS.**
   Use pressure gauge, flowmeter or hand-pump to determine which components work correctly. Record results. Eliminate components that meet specs.

6. **MAKE REPAIR, THEN RE-TEST TO VERIFY FIX.**

TROUBLE SHOOTING

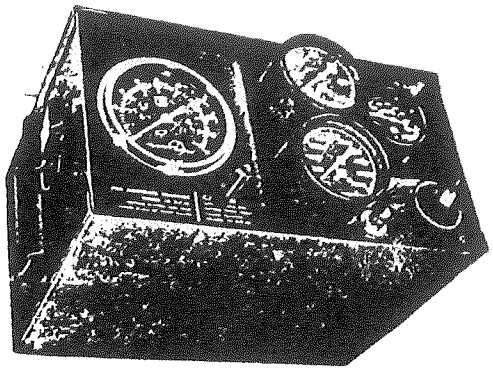
SYMPTOM	POSSIBLE CAUSE	REMEDY
Loader fails to raise	Obstructed or kinked hose	Repair as necessary
	Pump not operating	Check flow. Repair or replace as necessary.
	Main relief valve malfunction	Check relief valve. Replace if not up to specification.
	Control valve worn and/or damaged, or contaminated.	Repair or replace as necessary.
Slow or erratic lift	Engine RPM too low	Increase engine RPM
	Dirty filter	Clean or replace element.
	Low oil level	Maintain proper oil level in reservoir.
	Air in system	Check for loose suction line connections. Tighten fittings and/or replace "O" Ring seals on fitting as necessary.
	Wrong type of oil in system	Drain system and refill with recommended type oil.
	Main relief valve malfunction	Check relief valve. Replace if not up to specification.
	Pump worn or damaged	Check flow. Repair or replace as necessary.
	Misaligned or binding control linkage	Repair as necessary.
	Control valve worn and/or damaged, or contaminated	Repair or replace as necessary.

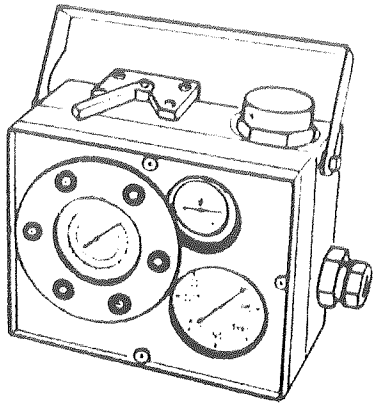
SYMPTOM	POSSIBLE CAUSE	REMEDY
Lift arms not lifting equally	Air in mainframe (lift) cylinders	Operate lift cylinders several times through their travel (while maintaining correct reservoir level) to expel air from cylinders.
	Restriction in the line to one cylinder	Repair as necessary.
	Damage to structural members	Repair as necessary.
Loader does not have adequate lift, or break out capacity.	Pump efficiency low	Check flow. Repair or replace as necessary.
	Main relief valve malfunction	Check relief valve. Replace if not up to specification.
	Engine RPM too low	Increase engine RPM.
Lift arms "drop" with mainframe spool in neutral	Damaged or worn cylinder packing	Test the cylinders. Repair or replace as necessary.
	Excessive wear between valve spool and spool bore	Repair or replace valve as necessary.
Cylinder movement with control valve spools in "neutral"	Damaged or worn cylinder packing	Test the cylinders. Repair or replace as necessary
	Excessive wear between valve spool and spool bore	Repair or replace valve as necessary.
Bucket movement with valve in "neutral"	Excessive wear between valve spool and spool bore	Repair or replace valve as necessary.
External leakage of control valve	Defective seals around valve spools	Replace seals as necessary.
	Valve port fittings loose (or damaged seals)	Replace seals and tighten fittings as necessary.

SYMPTOM	POSSIBLE CAUSE	REMEDY
"Sticky valve spools"	Misaligned or binding control linkage	Realign and free control valve handles and linkage.
	Mounting bolts unevenly tightened.	Loosen bolts and retighten equally.
	Control valve worn and/or damaged or contaminated	Repair or replace control valve as necessary
Spool does not return to "neutral"	Misaligned or binding control linkage	Realign and free control valve handles and linkage.
	Control valve worn and/or damaged, or contaminated	Repair or replace control valve as necessary.
	Defective seals around valve spools	Replace seals.
	Broken centering springs or bent spool.	Repair or replace as necessary.
Mainframe spool does not stay in float position	Spool detents damaged or worn	Repair as necessary.
	Control valve worn and/or damaged, or contaminated	Repair or replace control valve as necessary.
Hydraulic pump "noisy" and/or overheating	Low oil level	Maintain correct oil level in reservoir.
	Wrong type of oil in system	Drain system and refill with recommended type oil.
	Air in system	Check for loose suction line connections. Tighten fittings and/or replace "O" Ring seals on fittings as necessary.
	Obstruction or kinked hose	Repair as necessary.
	Pump worn or damaged	Check flow. Repair or replace as necessary
	Contaminated oil and/or dirty oil filters	Drain and flush system. Change oil filters.
	Pump drive shaft improperly installed causing excessive pressure on thrust plates	Correct as necessary.
Pump shaft seal leaking	Defective seal	Replace as necessary.
Leak down of cylinders	Excessive wear between valve spool and bore	Repair or replace valve as necessary.
	Damaged or worn cylinder packing	Test the cylinders. Repair or replace as necessary.

FLOW METER TESTING

Far too often hydraulic components are replaced in a trial and error fashion while troubleshooting a specific problem. While this can often produce satisfactory results, a quicker and more positive diagnosis can be made by using a flow meter.





WHAT IS A FLOW METER

A flow meter will simulate load conditions that exist during the operation of the tractor or implement. It measures temperatures of the hydraulic fluid, volume in gallons per minute (GPM) flow and pressure of the oil in pounds per square inch (PSI). By using these measurements, you can effectively troubleshoot problems related to pumps, valves and cylinders.

PRELIMINARY CHECKS

1. Before you begin connecting the flow meter, check the following:

   A. Oil level

   B. Check the oil filter and replace as necessary

C. Operate the equipment being careful to observe for yourself the problem described by the customer.

D. Define the problem in your mind but don't jump to a hasty conclusion.

E. Eliminate the possibility that the tractor engine is not running properly by performing a stall check. Run the engine at 2000 RPM, move the bucket cylinder all the way up to activate the relief valve. If the tractor engine stalls, your problem could be engine related.

F. If you have determined the problem is in the hydraulic system, then connect the flow meter as per the following directions and test the system. Use the spec chart to find specific GPM, relief valve setting and engine RPM.

CONNECTING THE FLOW METER - TEST 1

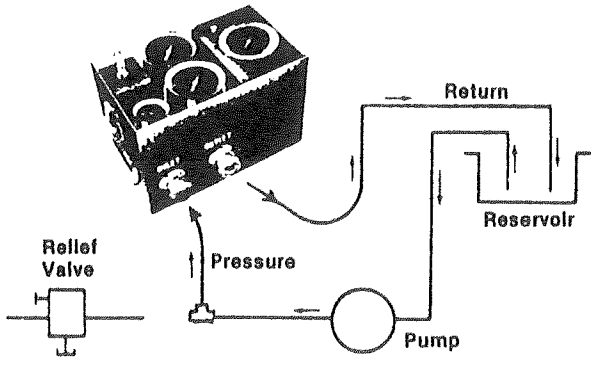
1. Rest the loader bucket on the ground. Shut the engine off.
2. Connect the flow meter into the system as follows:

   A. Move the bucket control lever to the float position.

   B. Disconnect the pressure hose from the loader hydraulic pump and install a tee fitting.

⚠ CAUTION: Be sure this tee will withstand 3000 PSI, a water pipe fitting will not work.

C. Cap off one end of the tee and install a hose to the other end. This hose will be secured to the inlet of the flow meter. Secure a hose from the outlet of the flow meter into the reservoir filler hole.



3. Select the proper GPM scale on the flow meter volume control handle. Open the load valve. Now return the bucket lever to neutral.

IMPORTANT: In this hookup, there is no relief valve. Therefore, the load valve must be at least partially open at all times. When testing, close the load valve slowly and gradually.

4. Bring the oil temperature up to 125 degrees F. (operating temperature) by partially closing the load valve until the pressure reaches 1000 PSI. Hold this pressure until the temperature reaches the desired level (hoses will be warm to the touch).

TEST 1 - PUMP FLOW (GPM)

1. Open the load valve completely. Run the engine at rated RPM. Take the GPM reading and record.

2. With the engine running at its rated RPM, gradually close the flow meter load valve. As the load is increased, the engine speed must be corrected as it will drop under load. Take a GPM reading when pressure reaches ½ rated PSI. Record.

3. Continue to close the load valve. Take a GPM reading when pressure reaches ¾ rated PSI. Record.

4. Close the load valve further and take a GPM reading at the full PSI rating. Record.

5. Open the flow meter load valve. Shut off the engine.

CONCLUSION

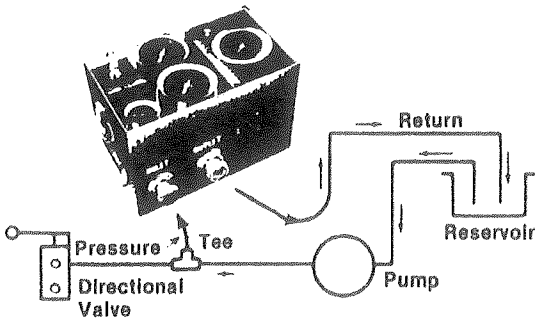
1. Loss of out-put with the load valve open (free flow) is an indication of a possible restriction in the pump suction line or a clogged filter. If the out-put meets the specifications it does not prove the pump is okay. It only eliminates the possibilty of a restriction between the reservoir and the inlet side of the pump.

NOTE: With the load valve wide open, it is possible for the pump out-put to exceed the rated GPM given in the specifications.

2. Loss of out-put under rated PSI load indicates pump wear or damage. If the out-put at rated PSI is less than 75 percent of out-put at zero PSI, you should re-build or replace the pump.

CONNECTING THE FLOW METER - TEST 2 AND 3

Flow meter connections are the same as Test 1 with the following addition.
Move the bucket lever to the float position. Unplug the capped end of the tee and connect a hose from there to the inlet port of the loader valve.



TEST 2 - RELIEF VALVE (PSI)

1. Return bucket lever to neutral, open the flow meter load valve and start the engine.

2. With the engine running at rated RPM, move the bucket control lever to load the bucket and hold the lever in this position. Gradually close the flow meter load valve to allow the bucket to roll back completely. Continue to hold the lever in the power position and slowly close the load valve. Watch the flow gauge. When the volume (GPM) starts to drop, the "crack point" for the relief valve has been reached. Record this reading.

3. Continue to close the load valve. When the volume drops to zero, read the pressure gauge and record this reading. This is the setting of the main relief valve.

4. Open the flow meter load valve. Shut off the engine.

CONCLUSION

Relief valves not meeting specifications must be replaced. The "crack point" of the relief valve should be within 10% of the full flow setting.

TEST 3 - LOADER CIRCUITS

1. Flow meter connections are the same as Test 2.

2. Test the bucket circuit:

   A. With the engine running at specified RPM, move the control lever to dump the bucket and hold. Partially close the flow meter load valve to permit cylinder movement. Adjust the flow meter load valve to attain rated PSI and record the reading.

   B. Repeat this test with the bucket rolled back and record.

3. Test the lift circuit in the same manner and record.

CONCLUSION

1. The recorded GPM readings for each cylinder tested at rated PSI should compare closely with the results you obtained at rated PSI in the pump test.

2. If the GPM readings for one pair of cylinders are below pump GPM readings in both the extended and retracted positions, it indicates leakage past the cylinder packing in either or both the cylinders. If the GPM reading is low in just one position, spool leakage is indicated.

3. If all cylinder GPM readings are low, it indicates that oil is leaking before it reaches the cylinders. Check the main relief valve.

HYDRAULIC TESTING WITHOUT FLOW METER

TEST 1 - RELIEF VALVE (PSI)

1. Rest loader on the ground. Be sure the engine is shut off.
2. Select a suitable gauge assembly that will record at least 3000 PSI.
   A. Move bucket control lever to the float position. This is to prevent reservoir drainage when the gauge is installed.
   B. Install the gauge in a tee connection between the pump pressure side and the inlet connection of the loader valve.

⚠ CAUTION: Make sure this tee will withstand 3000 PSI. A water pipe fitting will not work.

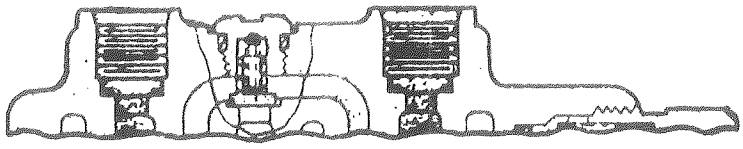
3. Start the engine and run it at full RPM. Allow the hydraulic oil temperature to raise to 125 F (46 C), normal operating temperature, by working the bucket circuit back and forth and then hold the lever in the work position for 30 seconds. Then return to neutral. Repeat this until the tubing is warm to the touch.
4. Run the engine at 2000 RPM. Then roll the bucket back as far as it will go.
5. Hold the lever in this position and increase the engine speed to full throttle. Allow the gauge to stabilize and record the pressure.

CONCLUSION

Relief valve not meeting specifications must be replaced.

LOAD CHECK VALVE

The purpose of the load check is to prevent the oil in the work port from returning to the pressure inlet passage in the control valve.



The load check is primarily useful when the operator is trying to "slow raise" a heavy load. When the spool is cracked the pressurized oil in the cylinder will try to backflow into the inlet passsage of the control valve and drop the load.

With a load check in the system, the oil is prevented from returning to the inlet passage of the control valve.

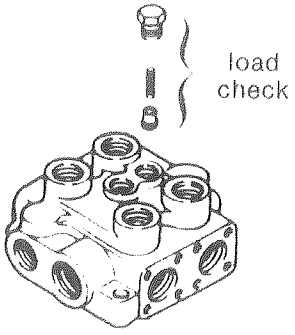
When the valve spool is in neutral, the oil from the pump enters the control valve and passes on to the reservoir. As the spool is moved "in" or "out", the oil return passage is gradually cut off. As it is cut off, the inlet oil from the pump is pressurized. The pressurized oil unseats the lift check plunger and causes the load to raise.

If a load check was not used in the system, the oil from the work port would have flowed backwards, out the "cracked" spool, into the valve inlet passage and on to the reservoir. This would have happened before the return passage was cut off and before the pump flow was pressurized enough to equalize the back flow pressure and lift the load.

The load check also prevents interaction between actuated spools. For example, if there were no lift checks and two loads were being raised simultaneously, the heavier of the two loads would fall and the oil from that cylinder would flow into the cylinder with the least load and increase its lifting speed. With a lift check in the system, the oil is prevented from back flowing into the other circuit.

TEST 2 - LOAD CHECK VALVE

There are 2 load check valves, one for the lift circuit and one for the bucket circuit. They are tested as follows:



LIFT CIRCUIT

Load the bucket as heavily as possible and raise a few inches off the floor. Stop the engine. Move the lift control lever to the "raise" position. Slight movement may be detected, however, if movement is excessive, it indicates the check valve at the lower work port of the lift spool is leaking. Replace parts as required.

IMPORTANT: Under no conditions should you attempt to shim up the check valve to make it work.

BUCKET CIRCUIT

Load the bucket as heavily as possible and raise a few inches off the floor. With the enging running at half throttle, slowly move the tilt control lever into the "rollback" position. The bucket should roll back without any indication of dropping first. If the bucket drops first and then rolls back, the load check valve at the lower work port of the tilt spool is leaking. Replace parts as required.

TEST 3 - INTERNAL CYLINDER LEAKAGE

The double-acting hydraulic cylinders may be checked for internal leakage (past the seals) through the following procedures:

1. Operate the cylinder and observe its rod for either settling into, or coming out of, the barrel. (It is possible for internal leakage to be in one direction only. Therefore, operate cylinder in both directions and allow enough time for evaluation at each extreme of travel.)

2. If it is determined that the cylinder may be faulty, actuate the suspected cylinder until it is **fully extended**.

⚠ CAUTION: If operation of cylinder has raised any attached equipment, support it adequately.

3. Shut off engine then **carefully** disconnect the hose from the rod end port of the suspected cylinder.

⚠ CAUTION: Use care when disconnecting the hose. . . Make sure that the correct one is being disconnected. Take all necessary precautions to avoid possible injury.

4. Operate engine and continue to actuate cylinder in same direction (extend) while observing the rod-end port of the cylinder. . . from which the hose was disconnected.

CONCLUSION

If oil comes out the disconnected port, the cylinder packing is faulty. If no oil comes out the port, but the rod enters the cylinder barrel due to the applied external load of boom, etc., the trouble may be due to a faulty circuit relief, or a leaking valve spool.

5. Shut off engine and reconnect the hose to the cylinder's rod-end port.

6. Run engine and actuate cylinder until it is **fully retracted**.

⚠ CAUTION: If operation of cylinder has raised any attached equipment, support it adequately.

7. Shut off engine then **carefully** disconnect the hose from the piston end port of the suspected cylinder.

⚠ CAUTION: Use care when disconnecting the hose. . . Make sure that the correct one is being disconnected. Take all necessary precautions to avoid possible injury.

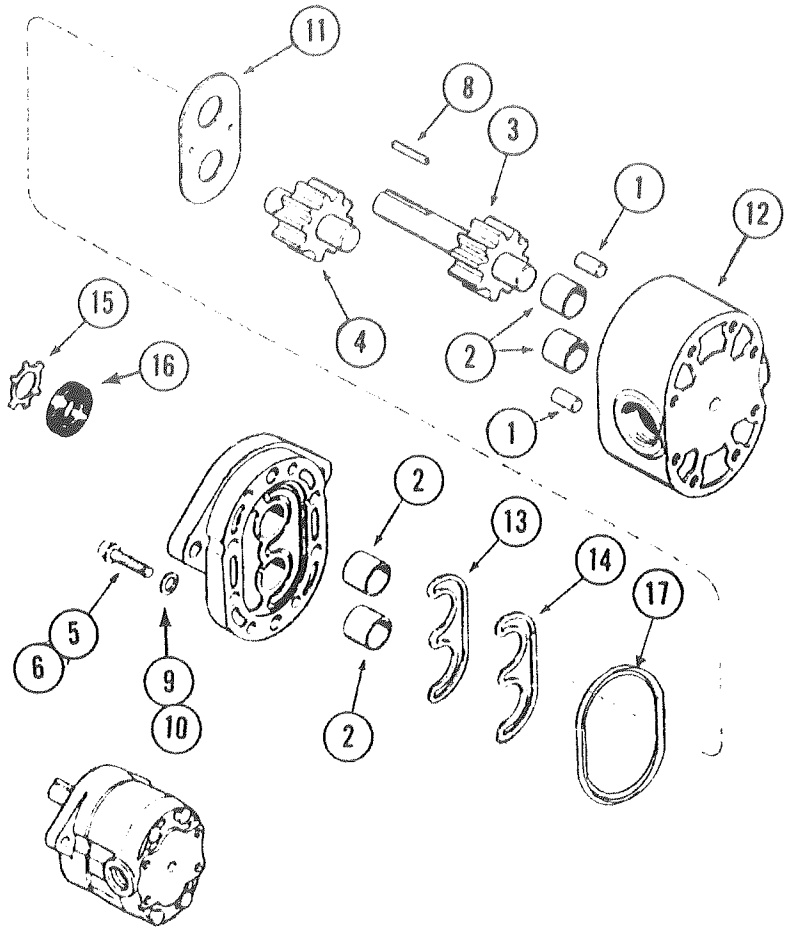
8. Operate engine and continue to actuate cylinder in same direction (i.e., retract cylinder rod) while observing the piston-end port of the cylinder. . . from which the hose was disconnected.

CONCLUSION

If oil comes out the disconnected port, the cylinder packing is faulty. If no oil comes out of the port, but the rod comes out of the cylinder barrel (due to the applied external load of attached equipment) the trouble may be due to a faulty circuit relief, or a leaking valve spool.

EXTERNAL HYDRAULIC PUMP

DISASSEMBLY



1. Clean pump exterior thoroughly with cleaning solvent.
2. Remove key (8) from drive gear shaft (3).
3. Scribe a line across the two housing sections of the pump to act as a guide to properly position sections during reassembly.
4. Remove screws (5,6) and washers (9,10) which hold the two housing sections together. Caution must be used when using a vise to avoid distorting any parts.

5. Separate the two housing sections. Do not pry between sections to avoid damaging machine surfaces. Disassemble by holding on to front cover and tapping back cover with a soft mallet.

6. Remove driven gear (4), drive gear (3) and dowel pins (1).

7. Remove wear plate (11), load seal (13) and rubber pre-load seal (14) from front cover (12) by lightly tapping with soft mallet. Remove wear plate seal (17).

8. Remove retaining ring (15), then remove rotary seal (16). It is recommended to use an expandable hook type tool to engage steel retainer portion of seal. The seal should be pulled out of its bore without "cocking" to avoid damaging seal bore.

   NOTE: It is advisable not to remove rotary seal (16) if it is in good condition and did not leak.

9. Clean all parts, including pump housing, in a suitable solvent. After cleaning parts with solvent, use air pressure to blow any dirt or excess solvent from all parts.

INSPECTION

Inspect all parts for abnormal wear and damage. Replace as necessary.

REASSEMBLY

Reassemble in reverse of disassembly. Lubricate all moving parts during reassembly.

CONTROL VALVE

Service required will consist of 3 potential spool valve problems:

1. External leakage

   This is usually due to seal failure and can be corrected by replacing seal. Leakage due to cracked valve body requires complete valve replacement.

2. Excessive internal leakage

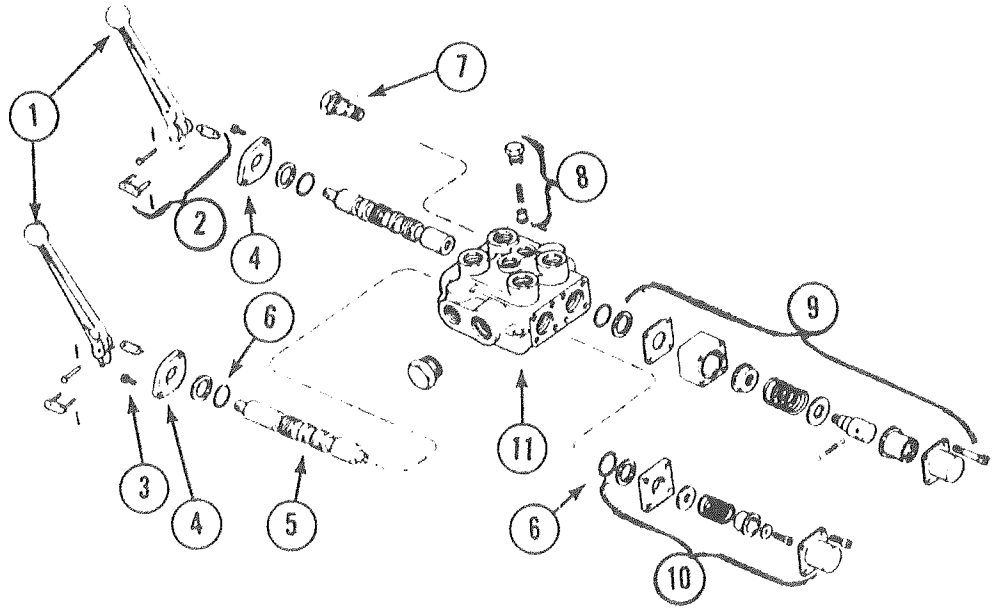
   This is usually caused by worn spools due to contaminates in the oil. Flush the system, replace valve if excessively worn and change oil and filter.

3. Spool binding

   This is usually caused by contamination, excessive heat, misalignment of valve linkage and uneven or excessive bolt torque on the mounting bolts.

DISASSEMBLY

1. Thoroughly clean the exterior of the valve.



2. Remove all hoses from valve assembly.
   NOTE: It is advisable to tag all hoses and parts to facilitate reassembly.
3. Remove the valve assembly from mounting and place on a clean surface.
4. Remove pin kits (2), valve handles (1) and handle brackets (4).
5. Remove relief valve assembly (7) and load check assembly (8).
6. Remove the detent assembly (9) and the end cap assembly (10).

INSPECTION

Inspect the spools (5), seals (6), valve body (11) and all other parts for excessive wear. Replace as necessary.

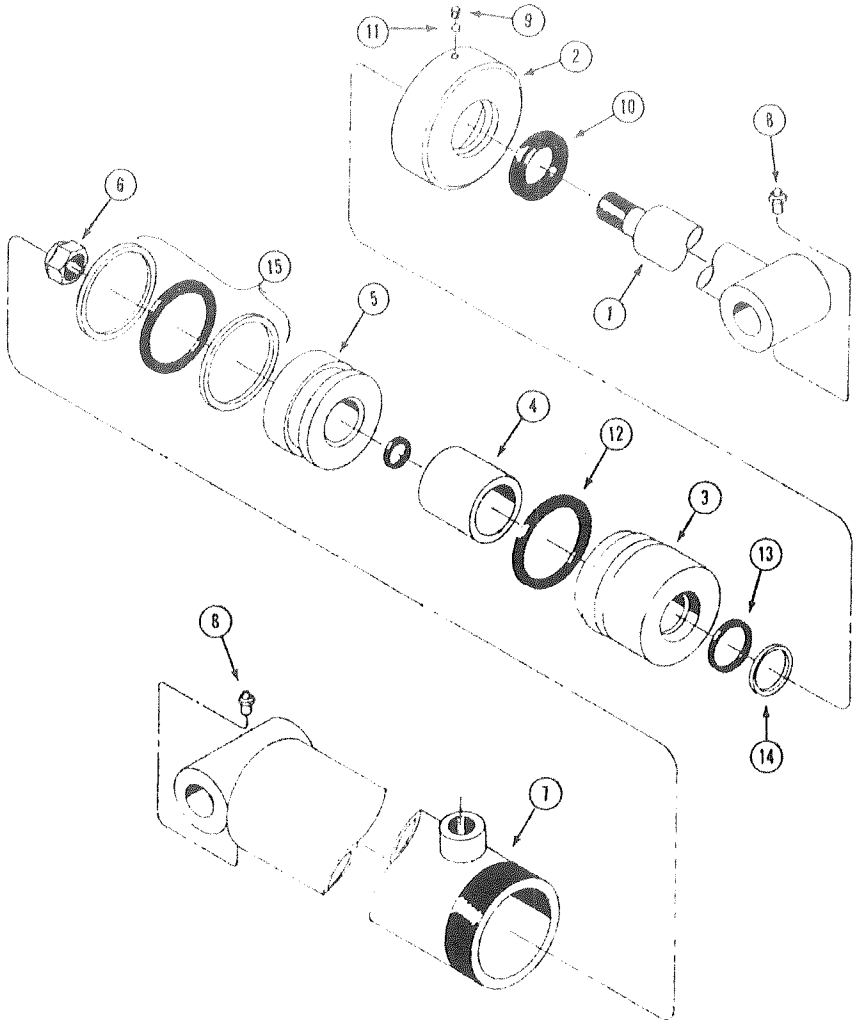
REASSEMBLY

1. Reassemble in the reverse of disassembly.
2. Lubricate moving parts with oil during reassembly.
3. Apply loctite to the handle bracket bolts (3) and torque evenly.
4. Check control valve handles for binding.

CYLINDERS

DISASSEMBLY

1. Remove the cylinder from the loader and clean with solvent.



2. Hold cylinder tube (7) stationary (be careful not to damage tube wall) and loosen set screw (9). Using spanner or pipe wrench, loosen headcap (2).
3. Pull rod (1) with headcap and internal components from tube.
4. Holding rod pineye, loosen and remove the piston nut (6).

NOTE: Hereafter keep parts in order of removal and note their position for ease of reassembly.

5. Remove the piston(s) and replace worn seals (15) with the proper size O-Ring and one flat back-up ring positioned on each side of the O-Ring.

6. Remove the spacer (4) from the rod and clean.

7. Remove the head (3) and clean. Replace the outer O-Ring (12) and replace O-Ring (13) and flat back-up ring (14) located on the inside of the head. Note that the flat back-up ring is located on the side nearest the large end flange of the head.

8. Remove the headcap and clean. Drive the worn wiper seal (10) out of its recessed seat and replace with the new wiper seal.

INSPECTION

With a bright light, inspect all parts, including the bore of the tube, for other damages. Any scored marks, nicks, or rust that cannot be removed by light buffing will require that the part be replaced to prevent damage to the new seals.

REASSEMBLY

1. Lubricate all parts, including O-Rings, with clean hydraulic oil and reinstall headcap, head (with large end flange nearest rod pineye), spacer, piston (positioned so nut will set in recessed side), and the nut on the rod.

2. Torque piston nut to 165 ft-lbs (22.8Kg-m).

3. Carefully install these parts into tube to prevent seal damage. Use rubber mallet or wood block if tapping becomes necessary.

4. Tighten headcap to 25 ft-lbs (3.5Kg-m), install new nylon seat (11), and tighten the set screw (9).

5. Reinstall the cylinder on the loader and cycle until cylinder is recharged.

6. Check reservoir oil level.

SECTION 4

PARTS CATALOG
KUBOTA L1720 LOADER

ILLUSTRATION

All parts are illustrated in "Exploded Views" which show the individual parts in their normal relationship to each other. Reference numbers are used in the illustrations. These numbers correspond to those in the "Reference Number" column and are followed by the part number, quantity required and description.

O/L

O/L "Obtain Locally" in the part number column indicates common hardware that is available at your local hardware supply.

NSS

NSS "Not Serviced Separately" in the part number column is an indication this part is not available for repairs.

TERMS, RIGHT & LEFT HAND

"Right Hand" and "Left Hand" sides of the machine is determined by standing at the rear of the unit and facing in the direction of foward travel.

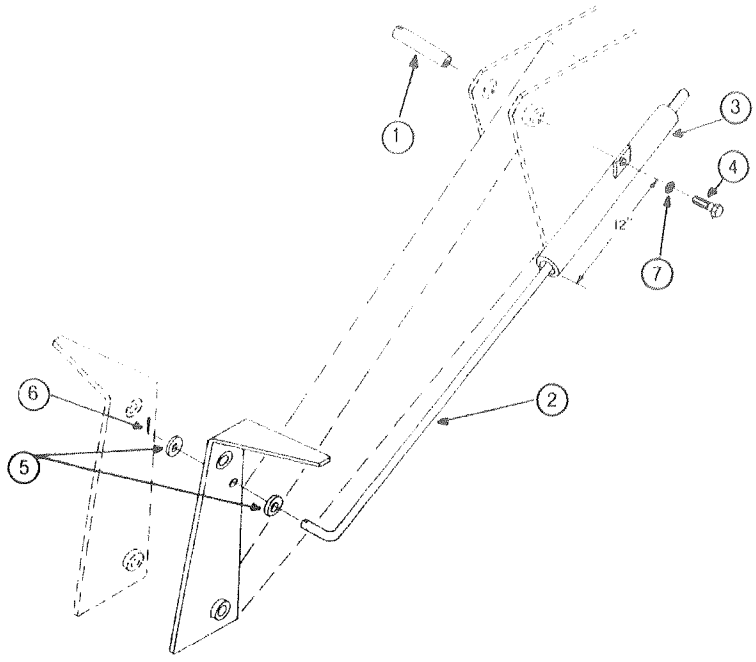
CATALOG CHANGES

Changes to the product will make it necessary to revise or add pages to this catalog. Each new or revised page will have a new issue date. A cover sheet will be attached to each revision. The cover sheet will list all pages released for each revision. All revised and new pages must be put into the parts book as soon as they are received.

PARTS ORDER

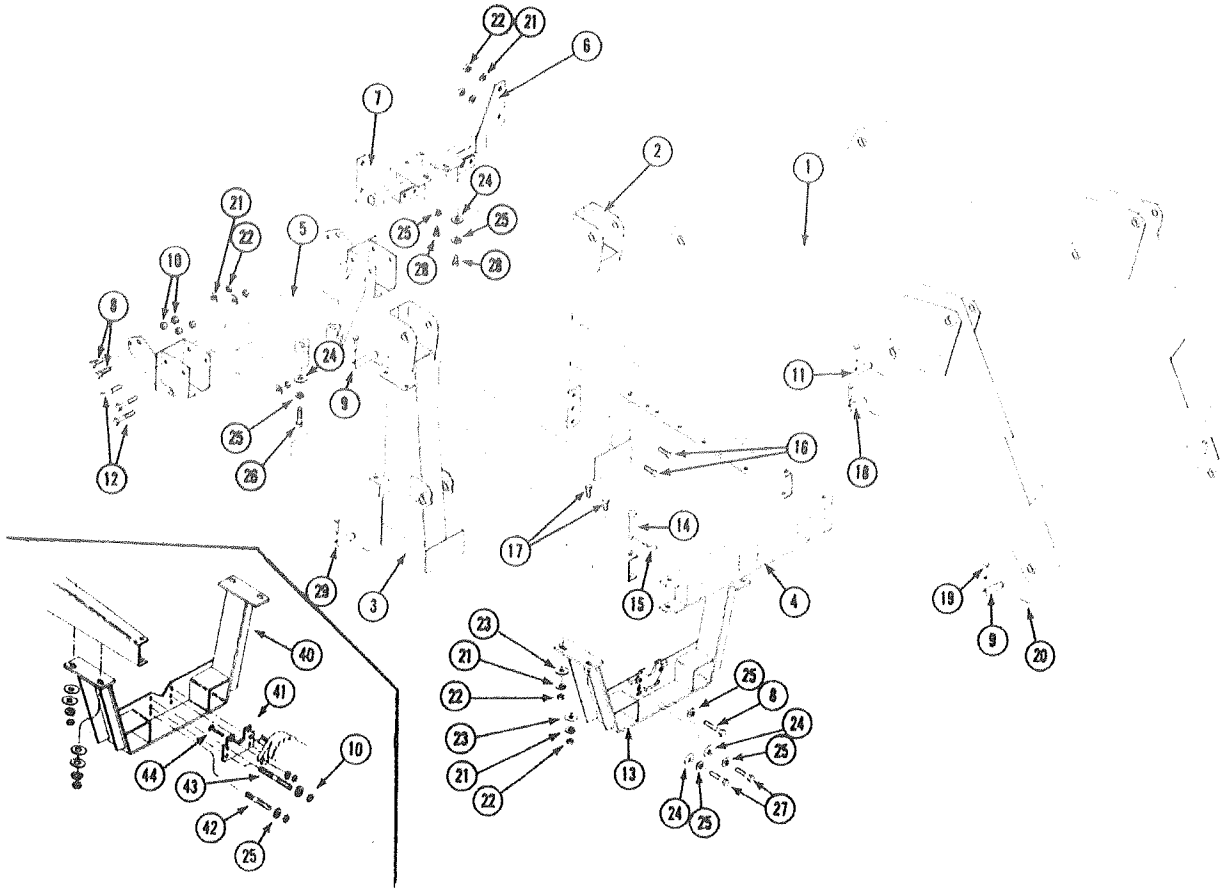
Orders must give the complete description, correct part number, the total amount required, the product model, all the necessary serial numbers, the method of shipment and the shipping address.

BUCKET LEVEL INDICATOR



REF. NO.	PART NO.	QTY.	DESCRIPTION
1	70050-01142	1	Mounting Pin
2	70050-01143	1	Rod
3	70050-01144	1	Rod Guide Tube
4	O/L	1	Bolt 3/8"-16NC x 1"
5	O/L	2	Flatwasher ½"
6	O/L	1	Cotter, 1/8" x 1"
7	O/L	1	3/8" Lockwasher

MAIN FRAME / SUB-FRAMES / MOUNTING BRACKETS



KUBOTA

30

⚠ CAUTION

1. BEFORE OPERATING STUDY OPERATORS MANUAL SAFETY MESSAGES AND SAFE OPERATING PROCEDURES.
2. ANY LOADER AFFECTS TRACTOR STABILITY AND HANDLING AND INCREASES POSSIBILITY OF UPSET.
3. ADD RECOMMENDED WHEEL BALLAST OR REAR WEIGHT FOR STABILITY.
4. MOVE WHEELS TO WIDEST RECOMMENDED SETTINGS FOR STABILITY.
5. MOVE AND TURN TRACTOR AT LOW SPEEDS.
6. CARRY LOADER ARMS AT LOW POSITION DURING TRANSPORT.
7. BEFORE LEAVING OPERATOR SEAT LOWER LOADER TO GROUND STOP ENGINE AND LOCK BRAKES.
8. SUPPORT RAISED LOADER BEFORE STANDING OR WORKING UNDER IT.
9. DO NOT USE LOADER TO CARRY OR LIFT PEOPLE.

31

32

⚠ WARNING

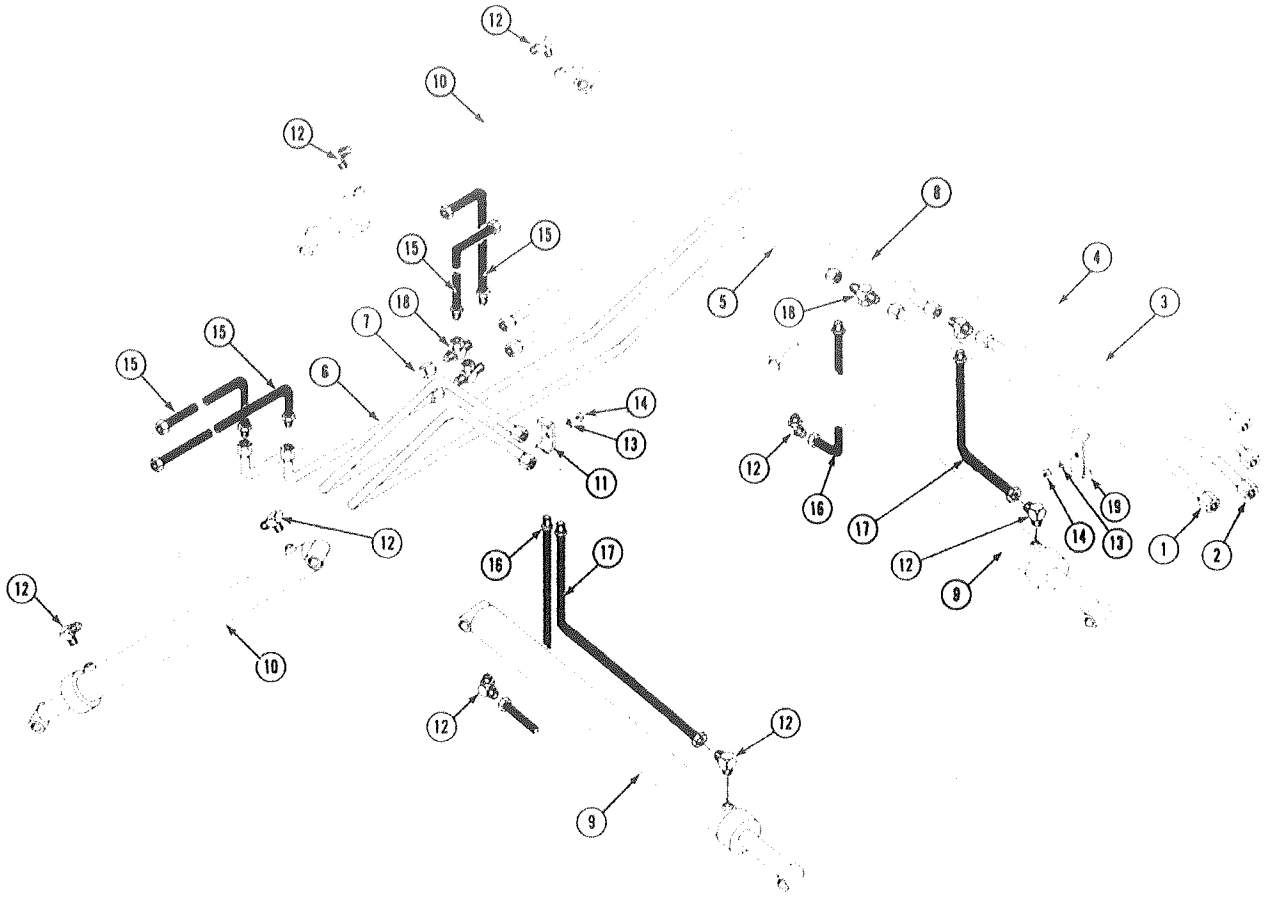
LOAD ON RAISED BUCKET OR FORK CAN FALL OR ROLLBACK ONTO OPERATOR, CAUSING SERIOUS INJURY OR DEATH. USE RECOMMENDED CLAMPING AND/OR GUARD ATTACHMENTS FOR HANDLING LARGE LOADS SUCH AS BALES, POSTS, ETC.
CARRY LOAD LOW TO AVOID UPSET.
USE RECOMMENDED ROPS ON TRACTOR

MAINFRAME / SUBFRAMES / MOUNTING BRACKETS

REF. NO.	PART NO.	QTY.	DESCRIPTION
1	70050-01000	1	Mainframe Assembly
2	70050-01019	1	Subframe, L.H. Assembly
3	70050-01020	1	Subframe, R.H. Assembly
4	70050-01021	1	Bumper Assembly
5	70050-01050	1	Bracket, Rear Assembly
6	70050-01047	1	Crossbrace Assembly L.H.
7	70050-01051	1	Crossbrace Assembly R.H.
8	01173-51250	6	Bolt, 12mm x 1.25Pitch x 50mm
9	70050-01003	6	Pin - Also used to attach bucket
10	02174-50120	14	Nut, 12mm x 1.25Pitch
11	70050-01001	2	Pin
12	O/L	6	Bolt, Hex 5/8"-11NC x 5-½" (Grade 5)
13	70050-01049	1	Bracket, Front Assembly
14	70050-01022	2	Pin, Clevis
15	70050-01023	2	Hairpin, Cotter
16	O/L	4	Bolt, Hex 5/8"-11NC x 1-½" (Grade 5)
17	O/L	4	Bolt, Hex 5/8"-11NC x 2" (Grade 5)
18	70050-01142	1	Pin
19	70050-01004	12	Pin, Clevis
20	O/L	12	Pin, Cotter 1/8" x 1"
21	O/L	14	Lockwasher, 5/8"
22	O/L	14	Nut, Hex 5/8"-11NC
23	O/L	4	Flatwasher, 5/8"
24	O/L	8	Flatwasher, ½"
25	O/L	12	Lockwasher, ½"
26	01173-51260	2	Bolt, 12mm x 1.25Pitch x 60mm
27	01173-51235	4	Bolt, 12mm x 1.25Pitch x 35mm
28	01173-51230	4	Bolt, 12mm x 1.25Pitch x 30mm
29	70050-01002	3	Pin
30	70050-01046	3	Kubota Decal
31	70050-01045	1	Decal, Caution
32	70050-01044	1	Decal, Warning
	After Loader S/N 51604		
33	70050-00814	1	Bracket, Front Assembly
34*	70050-00815	1	Pump Mount Assembly
35	70050-00816	6	Stud, 12mm x 60.8mm
35*	70050-00816	2	Stud, 12mm x 60.8mm
36*	70050-00817	4	Stud, 12mm x 79.5mm
37*	O/L	2	Bolt, Hex 3/8"-16NC x 1-¼" (Grade 5)
38*	O/L	2	Lockwasher, 3/8"
39*	O/L	2	Nut, Hex 5/8"-16NC

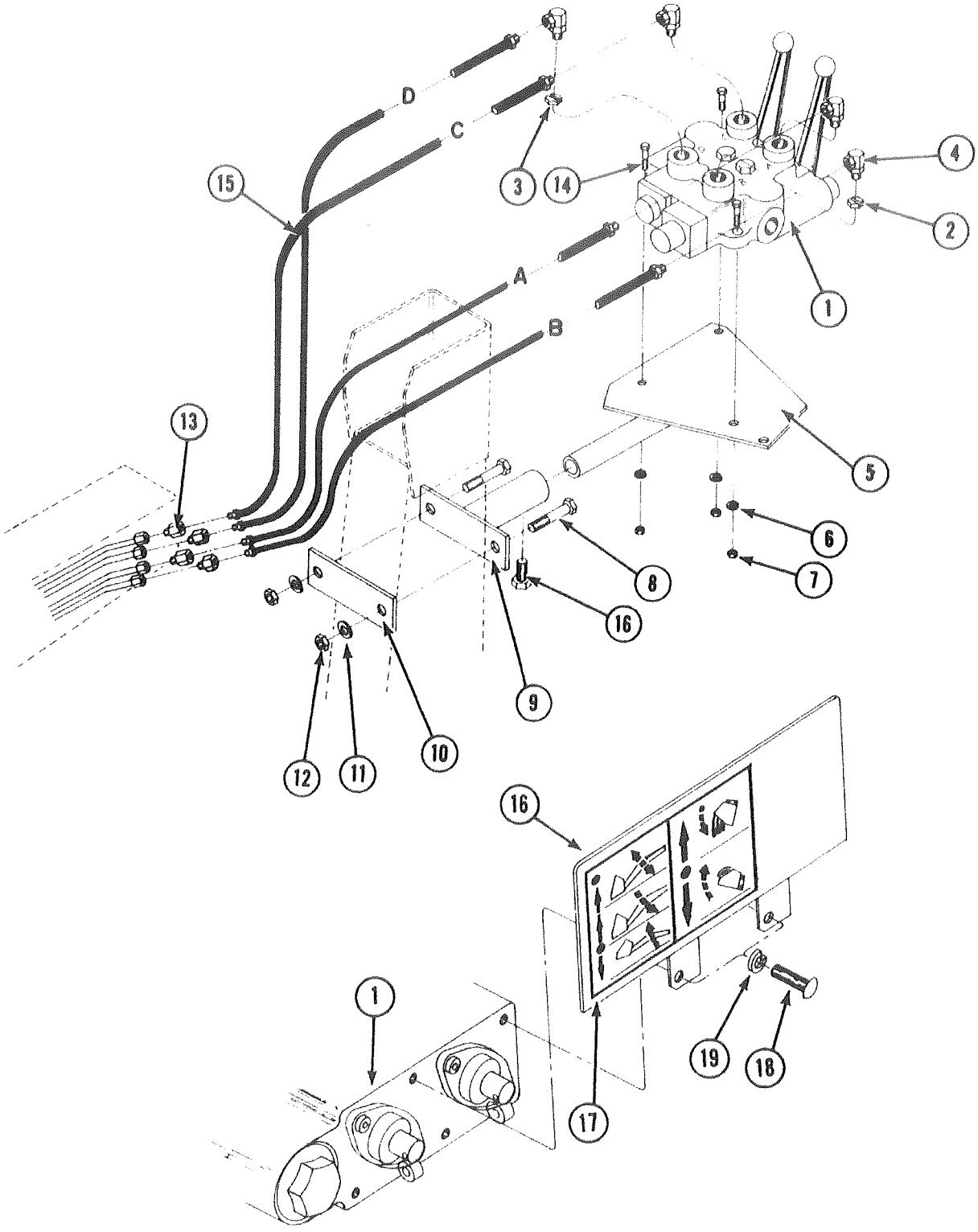
*External Hydraulic Kit

HYDRAULIC TUBES AND HOSE ASSEMBLIES



REF. NO.	PART NO.	QTY.	DESCRIPTION
1	70050-01009	1	Tube, Hydraulic
2	70050-01013	1	Tube, Hydraulic
3	70050-01008	1	Tube, Hydraulic
4	70050-01006	1	Tube, Hydraulic
5	70050-01012	1	Tube, Hydraulic
6	70050-01007	1	Tube, Hydraulic
7	70050-01010	1	Tube, Hydraulic
8	70050-01011	1	Tube, Hydraulic
9	70050-01035	2	Cylinder, Lift (See Page 40-41)
10	70050-01026	2	Cylinder, Attachment (See Page 42-43)
11	70050-01014	1	Clamp, Tube
12	70050-01025	8	Fitting, 90°
13	O/L	5	Lockwasher 3/8"
14	O/L	5	Nut, Hex 3/8"-16NC
15	70050-01017	4	Hose, ½" x 26"
16	70050-01016	2	Hose, ½" x 18"
17	70050-01018	2	Hose, ½" x 27"
18	70050-01005	4	Fitting, T
19	70050-01015	4	Clamp, Tube

2 SPOOL CONTROL VALVE, VALVE DECAL AND HOSES

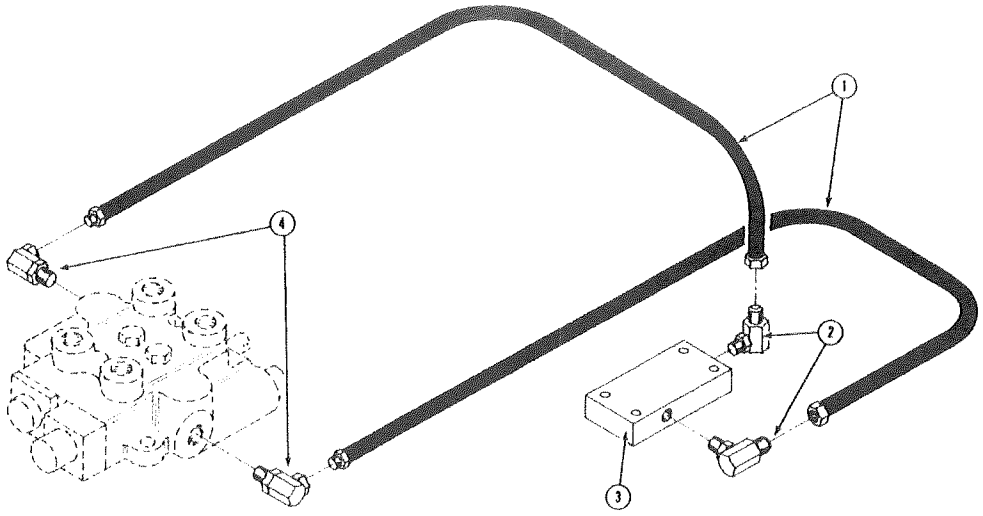


2 SPOOL CONTROL VALVE, VALVE DECAL, AND HOSES

REF. NO.	PART NO.	QTY.	DESCRIPTION
1	70050-01063	1	Valve, 2 Spool (Refer Page 44-45)
2	70050-01266	1	Orifice, Lift Circuit
3	70050-01267	1	Orifice, Attachment Circuit
4	70050-01092	4	Fitting, 90° 7/8" O-Ring to ½" Pipe
5	70050-01059	1	Valve, Mount Upper Assembly
6	O/L	3	Lockwasher, 3/8"
7	O/L	3	Nut, Hex 3/8"-16NC
8	O/L	2	Bolt, Hex 5/8"-11NC x 7" (Grade 5)
9	70050-01060	1	Valve, Mount Lower Assembly
10	70050-01061	1	Clamp, Plate
11	O/L	2	Lockwasher, 5/8"
12	O/L	2	Nut, Hex 5/8"-11NC
13	70050-01057	4	Fitting, Straight Adaptor
14	O/L	3	Bolt, Hex 3/8"-16NC x 2" (Grade 5)
15	70050-01093	4	Hose, 3/8" x 28"
16	70050-00820	1	Decal, Plate Mounting
17	70050-00819	1	Decal, Operation
18	O/L	2	Capscrew, ¼"-20NC x ½"
19	O/L	2	Lockwasher, ¼"

TRACTOR HYDRAULIC KIT

REF. NO.	PART NO.	QTY.	DESCRIPTION
1	70050-01135	2	Hose, 72"
2	70050-01134	2	Fitting, 90°
3	70050-01133	1	Hydraulic Block
4	70050-01092	2	Fitting, 90°



MUFFLER RELOCATOR

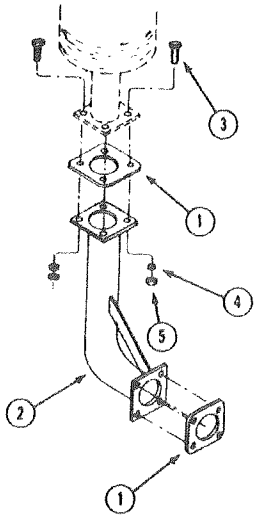
L345 - L345DT - L355SS

REF. NO.	PART NO.	QTY.	DESCRIPTION
1	70050-01055	2	Gasket
2	70050-01094	1	Muffler Relocator
3	O/L	4	Hex Bolt 5/16"-18NC x 1" (Grade 5)
4	O/L	4	Lockwasher, 5/16"
5	O/L	4	Hex Nut 5/16"-18NC

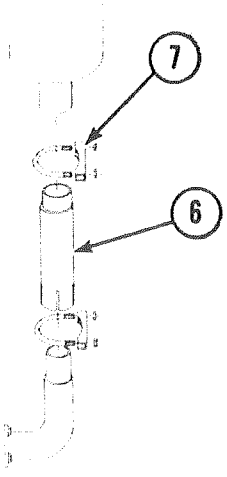
L305 - L305DT

REF. NO.	PART NO.	QTY.	DESCRIPTION
6	70050-01268	1	Muffler Relocator
7	70050-01212	2	Muffler Clamp

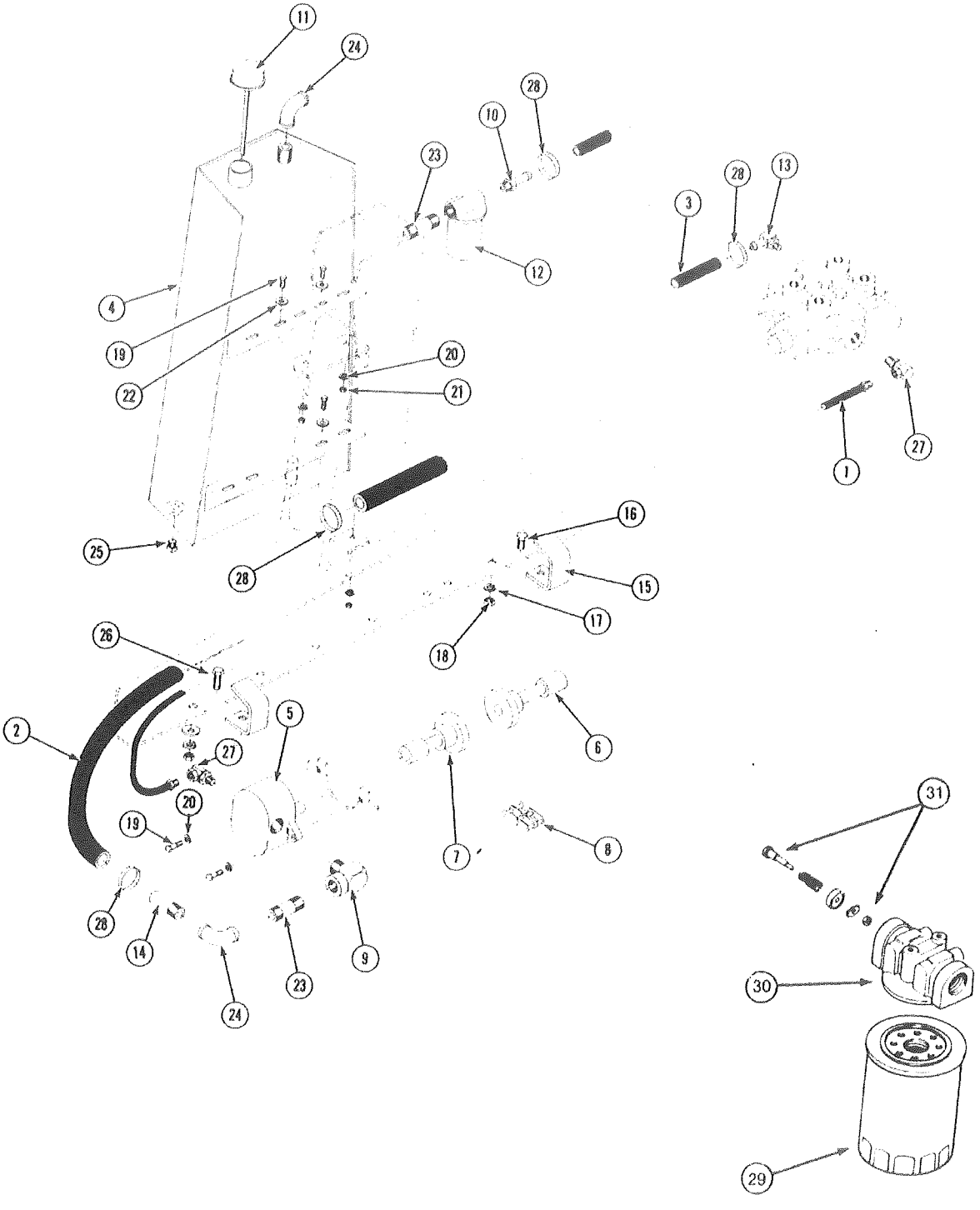
L345-L345DT-L355SS



L305-L305DT



EXTERNAL HYDRAULIC KIT
FRONT MOUNTED PUMP
OIL FILTER



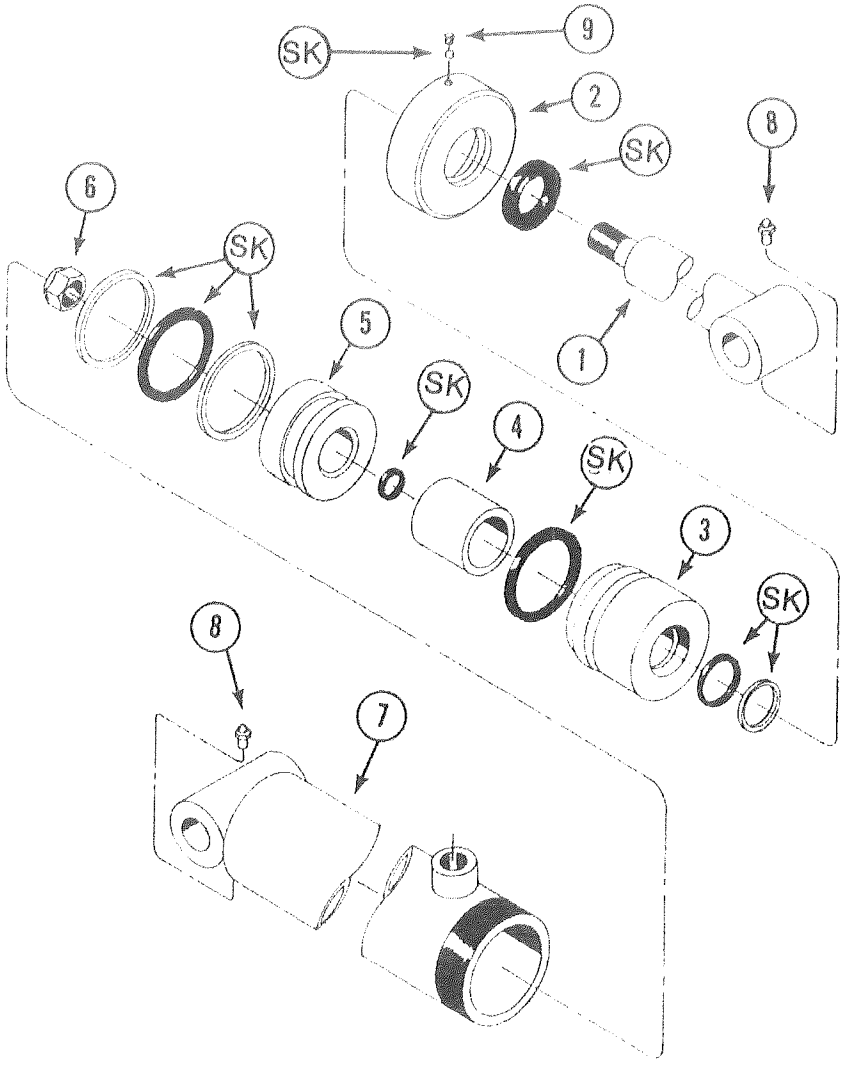
EXTERNAL HYDRAULIC, FRONT MOUNTED PUMP OIL FILTER

REF. NO.	PART NO.	QTY.	DESCRIPTION
1	70050-01116	1	Hose, 3/8" x 96" (Pressure)
2	70050-01127	1	Hose, 1" x 103" (Suction)
3	70050-01115	1	Hose, ¾" x 12" (Return)
4	70050-01101	1	Reservoir Assembly
5	70050-01117	1	Pump, Front (See Page 46-47)
6	70050-01113	1	Shaft Assembly
6*	70050-00818	1	Shaft Assembly
7	70050-01112	1	Shaft Assembly
8	70050-01114	1	Chain, Double
9	70050-01104	1	Fitting, 1-1/16" O-Ring to ¾" Pipe
10	70050-01108	1	Hose Barb, ¾" Pipe to ¾" Stem
11	70050-01102	1	Cap, Reservoir
12	70050-01110	1	Filter Assembly
13	70050-01109	1	Hose Barb 7/8" O-Ring to ½" Pipe
14	70050-01107	1	Nipple ¾" x 2-½" Special
15	70050-01111	2	Bar, Hose Clamp
16	O/L	1	Bolt Hex 5/8"-11NC x 1-½" (Grade 5)
17	O/L	1	Lockwasher, 5/8"
18	O/L	1	Nut, Hex 5/8"-11NC
19	O/L	5	Bolt Hex 3/8"-16NC x 1-¼" (Grade 5)
20	O/L	5	Lockwasher, 3/8"
21	O/L	5	Nut, Hex 3/8"-16NC
22	O/L	3	Flatwasher, 3/8"
23	70050-01105	2	Nipple, ¾" x 3"
24	70050-01106	2	Elbow, ¾" x 90°
25	O/L	1	Plug, ½"
26	-	-	Bracket Bolt (See Page 30)
27	70050-01092	2	Fitting, 7/8" O-Ring to ½" Pipe
28	70050-01126	4	Clamp, Hose
29	70050-01132	1	Filter Element
30	70050-01130	1	Head, Body
31	70050-01131	1	Poppet, Assembly

*This shaft assembly fits Model L355SS tractors.

NOTE: **After loader S/N 51604 the pump mount assembly is separate from the front bracket. See pages 30-31.**

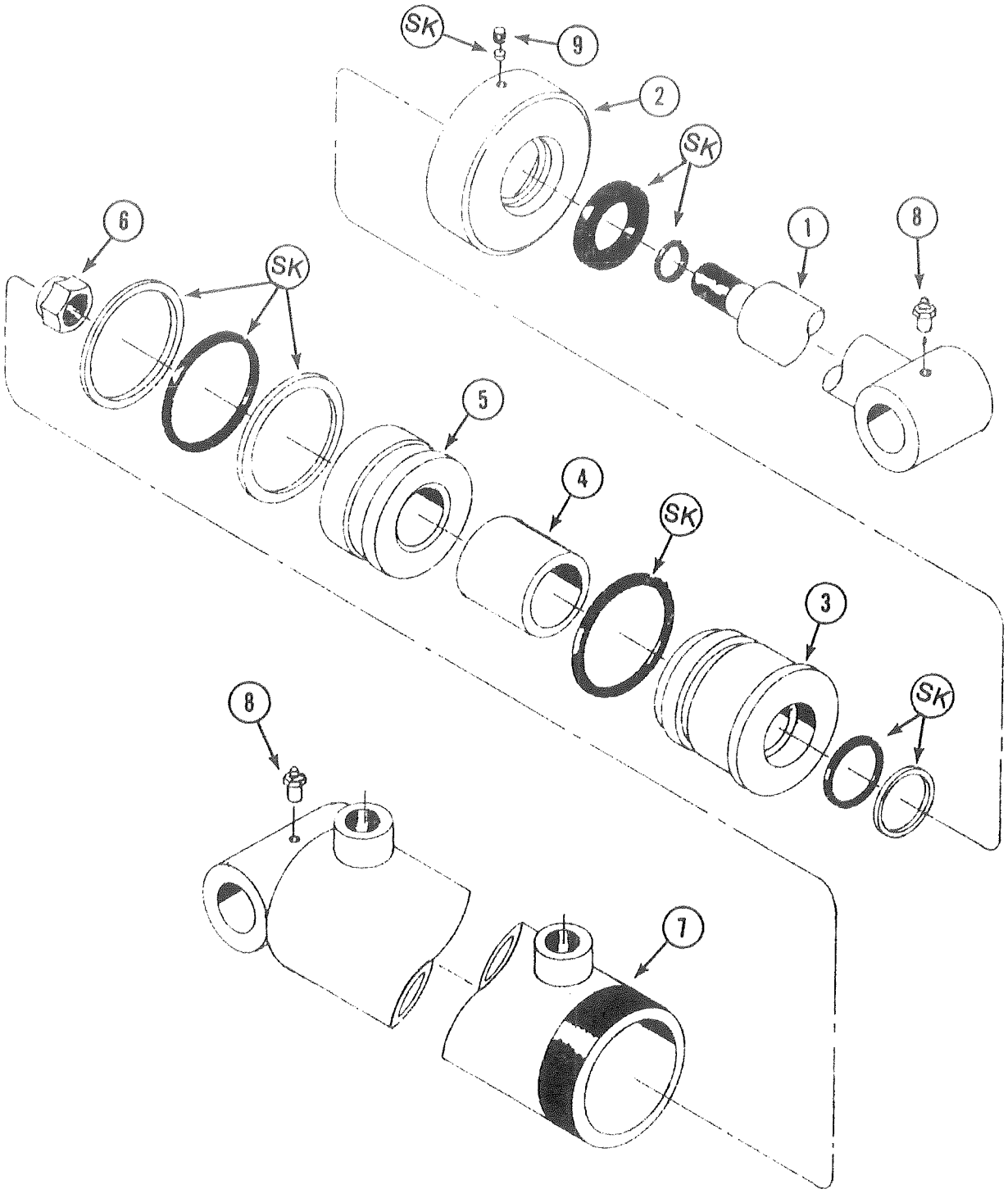
LIFT CYLINDER



LIFT CYLINDER

REF. NO.	PART NO.	QTY.	DESCRIPTION
	70050-01035	2	Cylinder, Lift Assembly
1	70050-01036	1	Rod Assembly
2	70050-01040	1	Head Cap
3	70050-01039	1	Head
4	70050-01038	1	Spacer
5	70050-01043	1	Piston
6	70050-01041	1	Nut
7	70050-01037	1	Tube Assembly
8	O/L	2	Zerk, Grease (Drive)
9	70050-01042	1	Set Screw
SK	70050-01138	1	Seal Kit (Included parts are identified by SK)

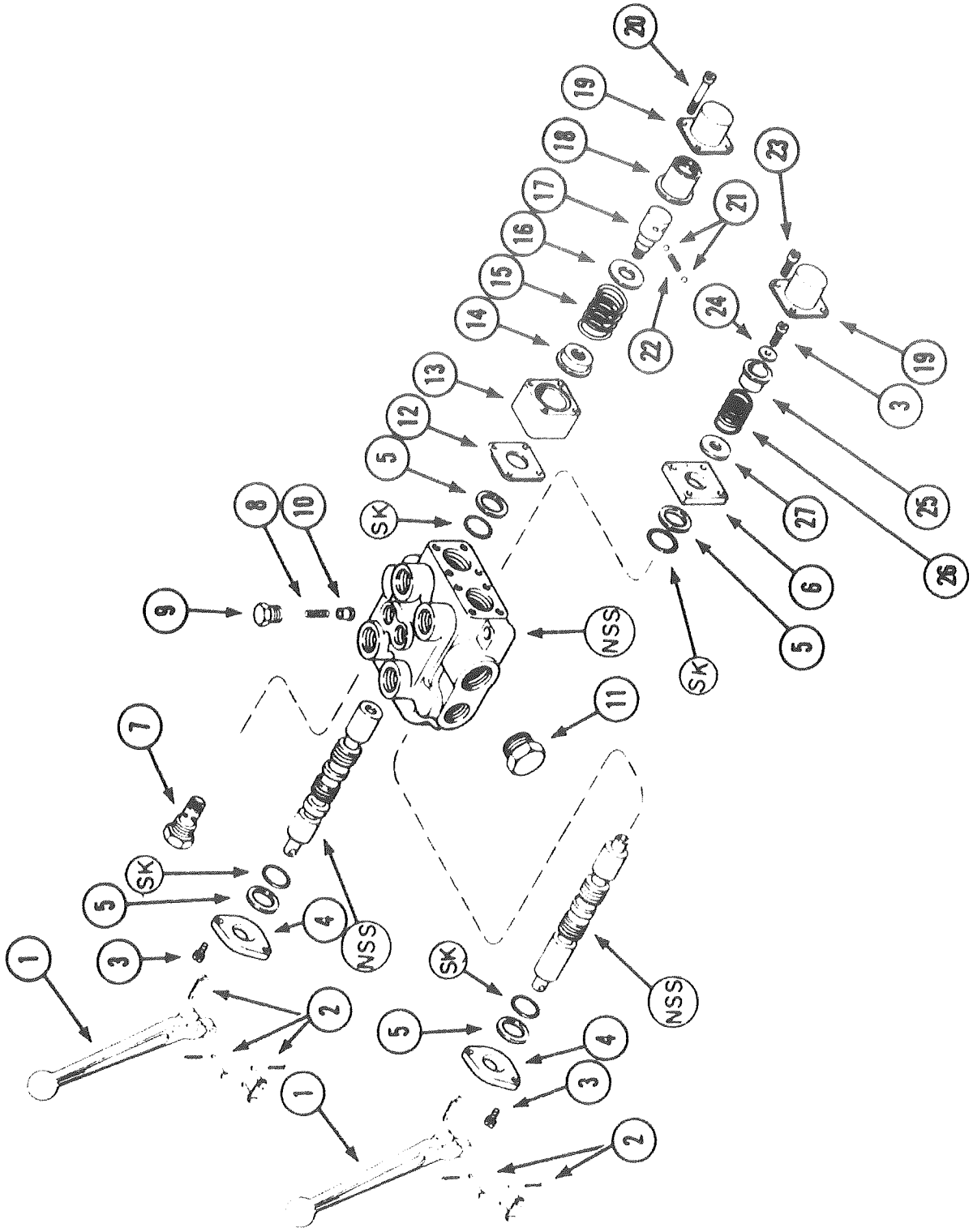
ATTACHMENT CYLINDER



ATTACHMENT CYLINDER

REF. NO.	PART NO.	QTY.	DESCRIPTION
	70050-01026	2	Cylinder, Attachment Assembly
1	70050-01027	1	Rod Assembly
2	70050-01031	1	Head Cap
3	70050-01030	1	Head
4	70050-01029	1	Spacer
5	70050-01032	1	Piston
6	70050-01033	1	Nut
7	70050-01028	1	Tube Assembly
8	O/L	2	Zerk, Grease (Drive)
9	70050-01042	1	Set Screw
SK	70050-01139	1	Seal Kit (Included parts are identified by SK)

2 SPOOL CONTROL VALVE

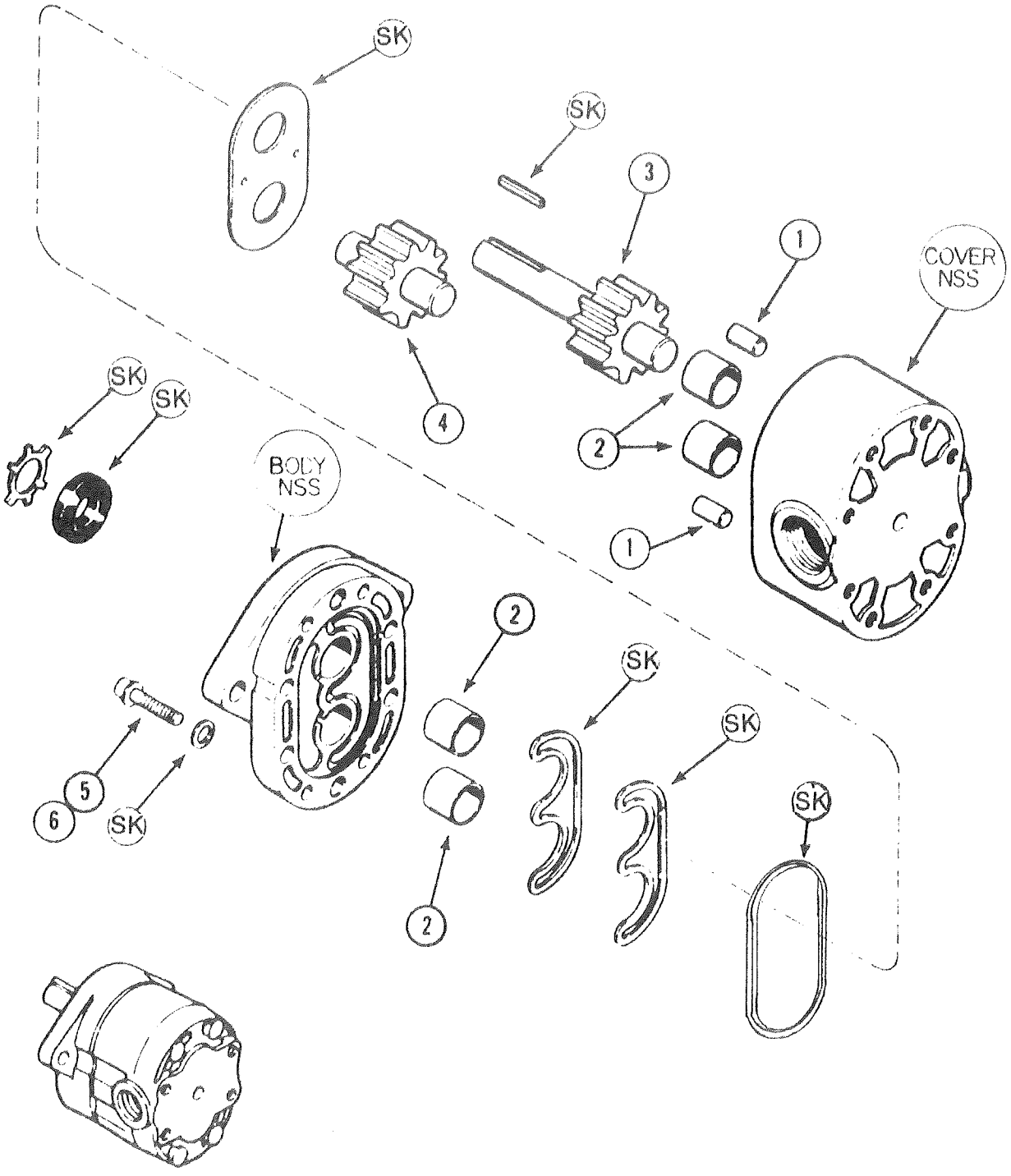


2 SPOOL CONTROL VALVE

REF. NO.	PART NO.	QTY.	DESCRIPTION
	70050-01063	1	Valve, 2 Spool Assembly
1	70050-01085	2	Handle Assembly
2	70050-01088	2	Pin Kit
3	70050-01069	4	Screw, Machine
4	70050-01084	2	Handle, Bracket
5	70050-01077	4	Washer
6	70050-01078	1	Spacer
7*	70050-01089	1	Relief Valve Assembly, Non-Adjustable, 2000 PSI
7**	70050-01248	1	Relief Valve Assembly, Non-Adjustable, 1800 PSI
8	70050-01070	2	Spring, Load Check
9	70050-01086	2	Plug, Load Check
10	70050-01087	2	Plug, Check
11	70050-01090	1	Plug, Conversion Assembly
12	70050-01068	1	Plate, End Stop
13	70050-01065	1	Spacer, Float
14	70050-01066	1	Collar, Spool
15	70050-01064	1	Spring, Float
16	70050-01079	1	Spacer
17	70050-01082	1	Retainer
18	70050-01083	1	Sleeve
19	70050-01073	2	Cap, End
20	70050-01067	4	Screw
21	70050-01080	4	Ball
22	70050-01081	2	Spring
23	70050-01076	4	Screw
24	70050-01074	1	Washer
25	70050-01072	1	Collar, Spool
26	70050-01071	1	Spring
27	70050-01075	1	Washer
NSS	NSS	1	Valve Body
NSS	NSS	2	Spools
SK	70050-01140	1	Seal Kit (Included parts are identified by SK)

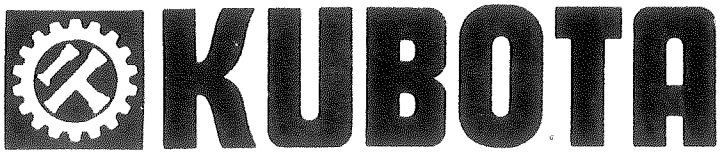
* Model L345, L345DT & L355SS
** Model L305 & L305DT Tractors

HYDRAULIC PUMP



HYDRAULIC PUMP

REF. NO.	PART NO.	QTY.	DESCRIPTION
	70050-01117	1	Pump, Front Assembly
1	70050-01120	2	Dowel Pin
2	70050-01095	4	Bearing Sleeves
3	70050-01123	1	Shaft, Drive Assembly
4	70050-01124	1	Shaft, Idler Assembly
5	70050-01118	4	Screw, 3/8" x 1-½"
6	70050-01119	4	Screw, 5/16" x 1-¼"
NSS	NSS	1	Body, Assembly
NSS	NSS	1	Cover, Assembly
SK	70050-01125	1	Seal Kit (Included parts are identified by SK)



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