

Kelley



B850

BACKHOE

OWNER'S MANUAL

Kelley Manufacturing Corporation
PO BOX 276, 131 PROGRESSIVE DRIVE
OTTOVILLE, OHIO 45876
Telephone 419-453-5539
Fax 419-453-2278

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PARTS

Model: _____

**Serial
Number:** _____

Provide this information to your dealer to obtain correct repair parts.

READ THIS PAGE BEFORE OPERATING YOUR BACKHOE

DO NOT OPERATE YOUR BACKHOE UNTIL YOU DO THE FOLLOWING:

- 1. READ THIS OPERATOR'S MANUAL THOROUGHLY.***
- 2. HAVE YOUR DEALER COMPLETE AND RETURN THE WARRANTY REGISTRATION CARD THAT ACCOMPANIES THIS MANUAL.***

If you did not receive a Warranty Registration Form, contact your dealer. He will be able to obtain one for you. It is important that you return your Warranty Registration Card. Your warranty is valid only if the Warranty Registration Card is returned to us within ten days after the delivery of your backhoe.

The warranty period is one year from the original date of purchase for parts and 6 months for labor. To verify the warranty period, you should keep the sales slip or other proof of purchase date.

This warranty does not cover damage caused by accident, misuse, or tampering with the product. A charge will be made for such repairs.

Additional warranty information may be found in the back of this manual.

Attach your CUSTOMER COPY of the Warranty Registration Card or fill in the information below. This information will help you in ordering repair parts for your KELLEY B850 BACKHOE.

MODEL NUMBER	
SERIAL NUMBER	
DATE OF SALE	
DEALER	
ADDRESS	
CITY	
STATE	ZIP
KELLEY MANUFACTURING CORPORATION OTTOVILLE, OHIO	

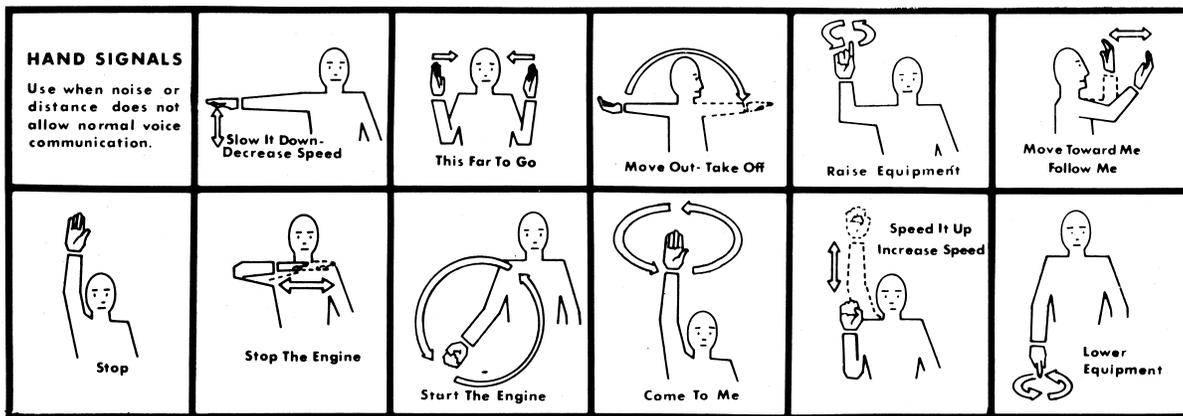
INTRODUCTION

CAUTION

This manual is provided for you the operator to familiarize yourself with the operation, safety precautions and maintenance of this unit. This safety alert symbol (as shown above) is used throughout this manual to bring to your attention to safety precautions and potentially dangerous situations that can cause injury or machine malfunction. Read the warnings below carefully before operating the backhoe. It is extremely important that you the operator understand fully the mounting, hydraulic connections, and the operation of the backhoe. Understand thoroughly the proper method of trenching or digging. Do not use this backhoe for anything other than for what it is designed. Otherwise, injury and/or machine failure may result. Follow directions and methods carefully and instruct others that may operate this machine as to its proper use. Insist that they read this manual carefully. *LET NO ONE OPERATE THIS UNIT UNTIL THEY HAVE READ THIS MANUAL AND UNDERSTAND IT FULLY.*

1. Your backhoe must be mounted only on a tractor equipped with a Category 1 hitch for B600 and B750, and larger Category I, Category II and Category III for the B-851. Failure to do so may result in serious injury.
2. When servicing backhoe, make sure all moving parts are on the ground
3. To avoid injury from escaping pressurized hydraulic oil, move the control levers in all directions before disconnecting any hoses, steel lines, or couplers.
4. Keep footpads clean to prevent foot slipping when the operator mounts the backhoe.
5. Do not transport your backhoe with the bucket fully raised.
6. Be sure your tractor has sufficient front end weight to operate and transport the backhoe
7. When traveling on highways and roads, be sure the boom and stabilizers are in the fully raised position and transport lock is in the transport lock position.
8. When traveling on the road with your backhoe, use proper safety lights and warning signs. Check local regulations.
9. When traveling with your backhoe, do not make sudden starts, stops or turn at high speeds. Do not exceed safe speed limits on rough ground. Do not make sudden starts when climbing grades.
10. Always wear protective headgear while operating the backhoe.
11. Be sure to lower the stabilizers to the ground before operating the backhoe.
12. Watch overhead low hanging wires. Do not touch wires with any part of the backhoe.
13. Do not operate from any other position than the operator's seat.
14. Before swinging the backhoe for any reason, make sure you have room to swing and that all persons are clear of the backhoe
15. Be extra careful when working on hillsides and close to ditches or any place where danger of tipping or sliding is possible.
16. Do not dig under the stabilizers or backhoe, as a cave-in could occur.
17. Be sure you are not digging over underground wiring or other underground obstructions.
18. When digging to either side and close to the tractor, be extremely careful that the backhoe does not contact the stabilizers as serious damage could occur.
19. Do not attempt to raise the tractor off the ground or move the tractor forward or backward using the boom or stabilizers.
20. When leaving the backhoe for any reason, lower the bucket to the ground for safety.
21. Never leave unit unattended with engine running
22. To prevent injury during assembly, installation, operation, adjustment, or removal of the backhoe, it is recommended that gloves, safety glasses or face shield, and safety toe shoes be worn.

23. Do not wear loose clothing while operating or working near the backhoe. Keep hair and clothing away from all moving parts of the backhoe.
24. Only the operator should be near the backhoe during operation. Keep all others a minimum of fifty feet away from your work area.
25. Keep your work areas clear of obstacles at all times.
26. Children should never be permitted to operate the backhoe.
27. Do not attempt any repairs, maintenance, or adjustments of your backhoe while it is in operation. Always turn off your tractor before making repairs or adjustments or performing maintenance procedures.
28. When the use of hand tools is required to perform any part of assembly, installation, removal or adjustment of the backhoe, be sure that the tools, which are used, are designed and recommended by the tool manufacturer for the specific task in which they are being used.
29. Keep all bolts and nuts tight. Replace any damaged or worn parts such as hydraulic hoses and fittings immediately. Always use replacement parts of equivalent strength and quality.
30. Perform all maintenance procedures as recommended.
31. Anytime hoses are disconnected from your backhoe, cover all open ports with protective caps or plugs in order to prevent contamination of the oil supply.
32. Use the hand signals show below for safety during operation



Throughout this manual, the term **IMPORTANT** is used to indicate that failure to observe can cause damage to equipment. The terms **CAUTION**, **WARNING** and **DANGER** are used in conjunction with the Safety-Alert Symbol, (a triangle with an exclamation mark), to indicate the degree of hazard for items of personal safety



The Safety Alert Symbol means **ATTENTION BECOME ALERT! YOUR SAFETY IS INVOLVED**

CAUTION

Denotes a reminder of safety practices or directs attention to unsafe practices which could result in personal injury if proper precautions are not taken.

WARNING

Denotes a hazard exists which can result in injury or death if proper precautions are not taken.



DANGER

Denotes an extreme intrinsic hazard exists which would result in high probability of death or irreparable injury if proper precautions are not taken.

GENERAL SPECIFICATIONS

CAUTION

Your backhoe must be mounted only on a tractor equipped with a Category I hitch for B600 & B750. The Category I tractors may use the B851 Category II and III hitches are required for the B851, B60 and B70 backhoes. Failure to do so voids all warranties associated with this equipment. The B600 and B750 are not safe to operate unless it is mounted on a Category I hitch. The B851 may be used on a category I hitch usually in conjunction with a frame kit, and category II and III hitches. Failure to do so may result in serious injury.

CAUTION

The backhoe valve must be compatible with the hydraulic system that will power it. Make sure that if you are powering the backhoe with an open center hydraulic system, the backhoe is set for open center operation. If you are using a closed center hydraulic system, the valve must be set for closed center operation. If you are using a power beyond setup, the valve must be converted for this use. See the appropriate section of this manual on how to convert your valve. If you do not know how your valve is currently setup, check with your dealer.

Your backhoe unit has been filled with oil at the factory. The oil in the unit is compatible with most tractor manufacturers' oil. Do not move any control levers on the unit until after hydraulic connections to the tractor or the independent hydraulic system have been made.

HYDRAULIC SYSTEM REQUIREMENTS The *KELLEY BACKHOE* has been designed to be operated at a flow rate of 4-6 GPM for B600 and B750 and 6-8 GPM for the B851, B60, and B70 at a preferable 2000lb –2200 PSI and a minimum of 1500lb PSI.

Since many tractor systems exceed a flow rate specified for your backhoe, the flow may have to be adjusted by throttling the engine RPM down to obtain an acceptable flow rate. By adjusting the flow rate correctly, you will prevent sudden shock loads on the cylinders, pins, hoses, seals, etc. This results in a smooth operation and reduced maintenance costs and down time.

MOUNTING THE BACKHOE

1. If you are **NOT** using a KELLEY independent hydraulic system, proceed to Step 2.

Install the independent hydraulic system onto the backhoe according to the following procedures. Refer to Figure 1 and page 35 of this manual for the identification of the ports. During assembly, use pipe compound on all pipe fittings. None is required on the O-ring fittings

- A Insert the filter into the **SUCTION PORT** of the reservoir. This is the port that is located on the left side of the reservoir.
- B Attach the 1/2" street ell to the **RETURN PORT ON THE RESERVOIR**. This is the port located on the right side of the reservoir
- C Attach the reservoir to the backhoe by bolting it through the two holes in the swing cylinder pivot pads. Use the 1/2" capscrews, lockwashers, and nuts.
- D Bolt the torque bar to the flange mounting of the pump. Use the 7/16" capscrews lockwashers, and nuts.
- E Attach the O'Ring pressure fitting and the 1/2" street ell to the outlet port of the pump per the illustration on page 35.
- F Attach the O'Ring suction fitting and the 3/4" street ell to the suction port of the pump per illustration in Figure 1.

G Place the PTO adapter on the pump shaft and secure it with the two set screws. After tightening set screws take a small punch and place into set screw, set them and then retighten.

H Attach the pump assembly to the PTO shaft of the tractor.

ASSEMBLY

I Attach one end of the torque chain to the hole in the torque bar. Use 3/8" hardware in this order: 3/8" x 2-1/4" capscrew, flatwasher, chain, flatwasher, torque bar, lockwasher and nut.

J Attach the free end of the torque chain to either the chain tab on the backhoe frame (Figure1) or a fixture of the tractor. Use the remaining 3/8" hardware in the same manner as above. Imagine a plane perpendicular to the ground that passes through torque bar and separates the tractor from the backhoe. It is very important that the chain is attached to a point located **ON** this plane **OR** on the **TRACTOR** side of this plane. By attaching to such a point, the chain applies pressure on the pump so that it is not pulled off of the PTO adapter during operation.

2. Remove the seat from the seat and safety chain carton and install with the hardware supplied. The use of the safety chains is explained in Step 25.

3. Remove the cap from the 1/2" pressure hose. This is the hose connected to the right hand inlet port of the valve.

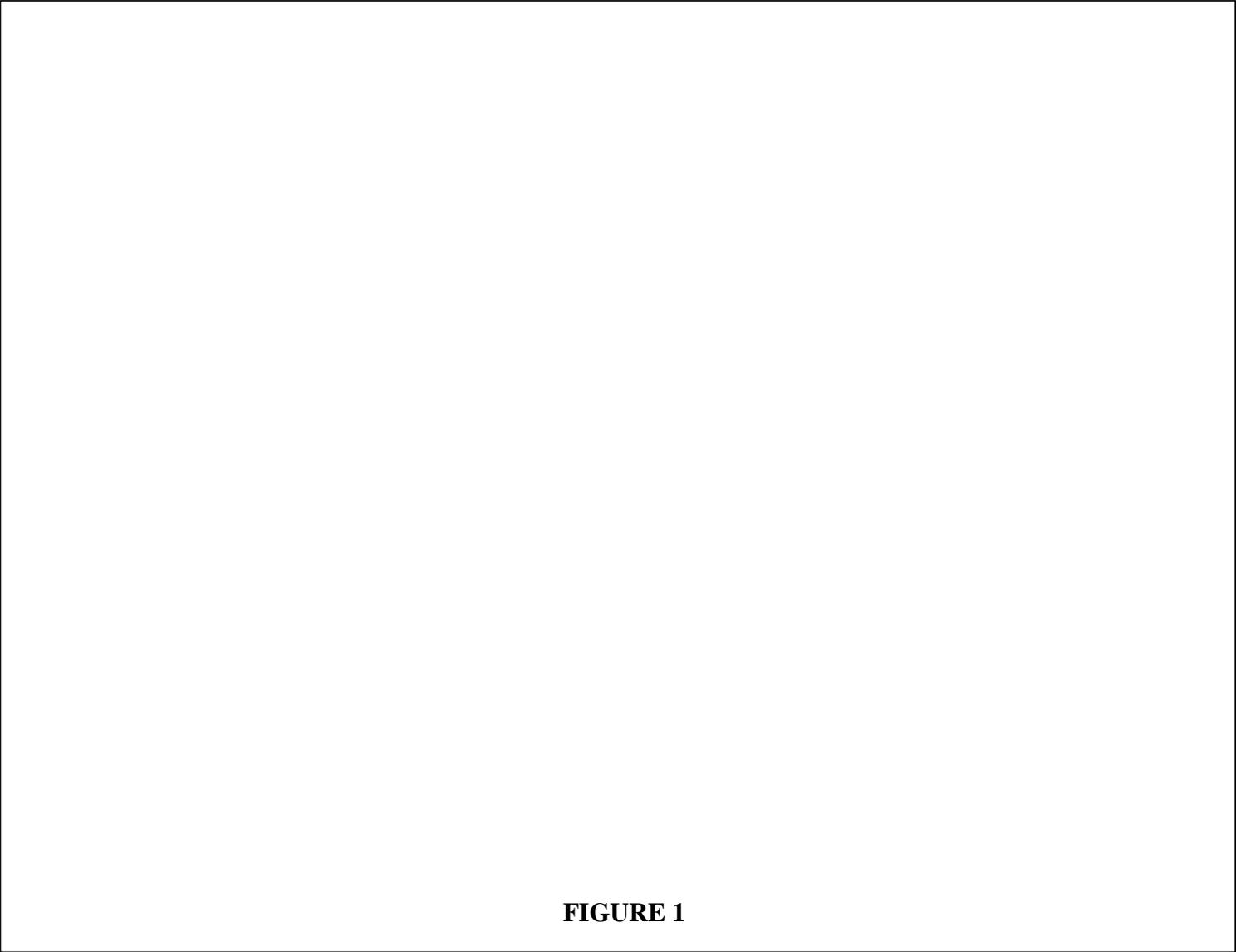


FIGURE 1

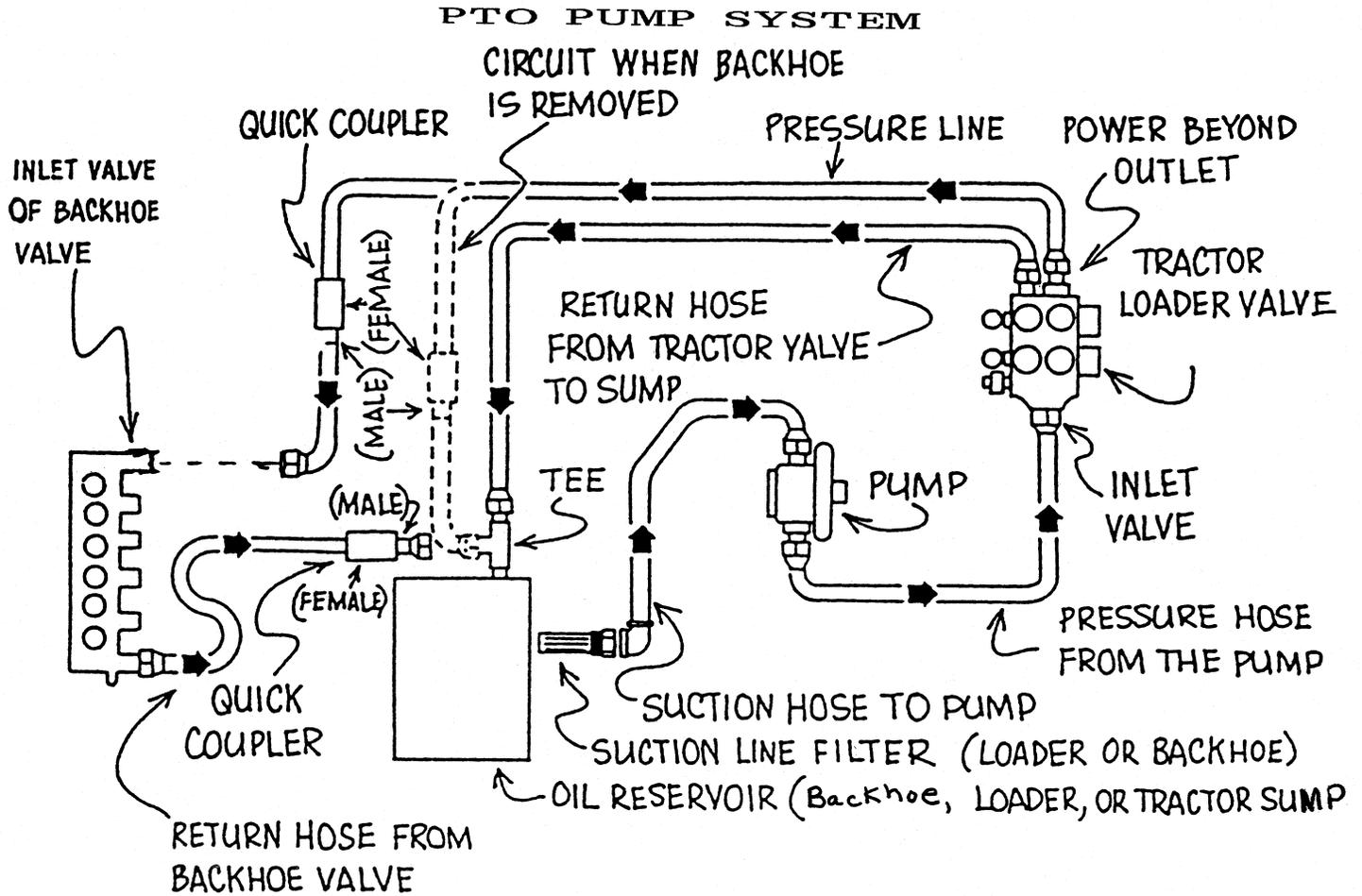


Figure 1

Figure 2- Power Beyond Hosing

- A. If an open center tractor hydraulic system is being utilized, attach the hose to the tractor pressure hydraulic outlet.
- B. If the KELLEY independent hydraulic system is being utilized, attach the hose to the 1/2" street ell that is connected to the independent hydraulic system's pump.
- C. If a closed center tractor hydraulic system is being utilized, refer to the section of this manual entitled **Closed Center Hydraulic Systems**-Figure 11
- D. If you wish to run both a loader and a backhoe off of the same hydraulic system, make your connection as illustrated in Figure 2—Power Beyond Hosing. Also, refer to the section of this manual entitled **Power Beyond Hydraulic Systems** Figure 10. Since there are so many variations for this type of setup, we are showing only a generalized hosing scheme. If you have any questions concerning the specifics for your situation, please contact the factory before attempting operation.

- 4. Locate the return hose, which is already connected, to the left-hand outlet port of the valve.
- 5. Remove the cap from the free end of the hose.

6. Attach the 3/8" return hose via its 1/2" male fitting to the oil reservoir inlet fitting or directly to the oil sump of the tractor according to the instructions below.

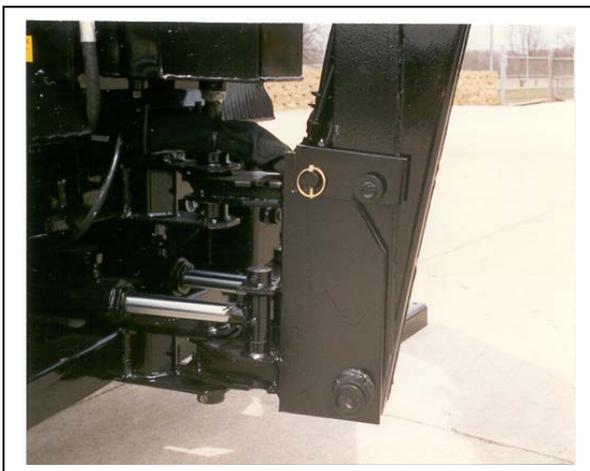
⚠ CAUTION Do not remove or discard the special return hose. This hose is designed to burst at 800 PSI. The hydraulic valve can be damaged by reverse flow of oil through the valve, disconnecting the return hose while the tractor is running, or by using more than 12 GPM while operating. **THE VALVE MANUFACTURER WILL NOT WARRANT THE VALVE WHEN DAMAGED IN THIS MANNER.**

- A. If an open center tractor hydraulic system is being utilized, attach the hose to the oil sump of the tractor.
- B. If the KELLEY independent hydraulic system is being utilized, attach the hose to the 1/2" 90° ell on the **RETURN PORT** of reservoir in lower right corner.
- C. If a closed center tractor hydraulic system is being utilized, refer to the section of this manual entitled **Closed Center Hydraulic Systems**-Figure 11
- D. If you wish to run both a loader and a backhoe off the same hydraulic system, make your connection as illustrated in Figure 2-Power Beyond Hosing.

Since there are so many variations for this type of setup, we are showing only a generalized hosing scheme. If you have any questions concerning the specifics for your situation, please contact the factory before attempting operation.

7. If you are not familiar with the operation of the KELLEY BACKHOE, **DO NOT PROCEED** until you have studied the operating instructions contained within this manual.

Figure 3 – Description of Major Backhoe Parts



8. Familiarize yourself with all of the terms that will be employed in the following instructions by studying Figure 3 – Description of Major Backhoe Parts.
9. Apply power to the backhoe.
10. Raise the boom to take the tension off of the transport chains. Remove and place chains in chain carrier on front of the control panel as shown in Figure 4.
11. Lower the boom to the ground.
12. Remove the pin from Point A of Figure 4.
13. Disconnect the strapping and padding that attaches the dipper stick cylinder to the boom.

Figure 4

ASSEMBLY

FIGURE 5

14. Extend the dipper stick cylinder until it is possible to align the rod bushing of the dipper stick cylinder with the bushings at Point A on the dipper stick.
15. Install the pin at Point A to secure the cylinder to the dipper stick. Use the 5/16" roll pin to lock the pin in place.

⚠ CAUTION Keep all people clear of your work area during the next steps. Until the backhoe is securely mounted, the operator should make sure that no portion of his body is beneath any part of the backhoe.

16. Extend boom and dipper stick until they make contact with the ground
17. Remove the two lower link pins.
18. By manipulating the cylinders and placing down pressure on the boom and stabilizers, lift the backhoe vertically for approximately 8" to 11" of ground clearance.
19. Attach the backhoe to the lower lift arms of the tractor using the pins removed from the pallet and secure the lower link.

For Power Beyond Hydraulic Systems

Power Beyond and Closed Center Kit Part # BCV10107

For power beyond applications, a Power Beyond and Closed Center Kit (Part #BCV10107) must be purchased from your *KELLEY BACKHOE* Dealer, then perform the following steps:



- A. Remove return hose and elbow, only if it was installed at point B Figure 2, on model B851 only. Models B600 & B750 return hose need not be removed.
- B. Install Power beyond sleeve at Point B—Figure 2
- C. Install a #8 O-Ring ell (Part #SFT272) into closed center sleeve opening C. This converts it to a power beyond sleeve.
- D. Install a high pressure hose going to the inlet of another valve. This hose is not furnished.
- E. If the return hose was installed at Point B (model 851 only) it must be installed at point A of the outlet section. Remove the O'Ring plug and install one C5315 8x10 adapter and one C5506 swivel nut ell. Connect the return hose to the ell and the other end to the oil sump of the tractor. For models B600 & B 750 the return hose must also be connected to the tractor oil sump.
- F. Refer to Figure 1 for hosing.

CLOSED CENTER HYDRAULIC SYSTEMS

Power Beyond and Closed Center Kit Part #BVV10107



CAUTION If you are going to use a closed center tractor hydraulic system to power your *KELLEY BACKHOE*, A Power Beyond and Closed Center Kit (Part #BVV10107) must be purchased from your *KELLEY BACKHOE* Dealer, then you must follow carefully the directions below. Failure to do so may cause extensive damage to your tractor and/or *KELLEY BACKHOE*.

1. Adjust the Valve Bypass

- A. Remove the cover nut, Point A of Figure 3, from the valve bypass. This exposes a socket head screw.
- B. Loosen locknut and turn socket head screw *IN* approximately four complete turns, then tighten locknut.
- C. Replace cover nut. Be sure to replace the washer with the cover nut as it acts as a gasket.

2. Installing the Closed Center Sleeve

- A. Return return hose and O'ring ell at outlet end of valve. Point B of Figure 13.



B. Replace with closed center sleeve (Part #785022- Figure 12) as shown in Point B of Figure 13.

ASSEMBLY

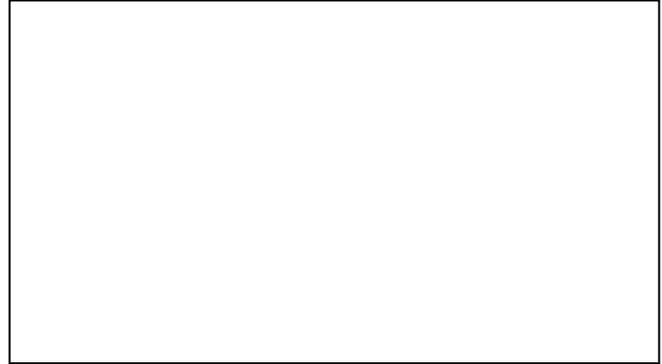
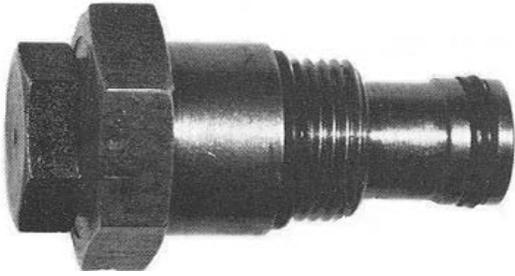


FIGURE 12

FIGURE 13

C. Remove the O-Ring plug from the front of outlet section of the valve Point C of Figure 3 (for model B851 only) and replace with a C-5315X8X10 adapter (Part #SFT10079). Connect return line to the adapter and return to oil sump of the tractor.

This procedure converts the valve to a closed center operation. If the valve is set for closed center operation, it may be converted back to open center by reversing the above procedure.

3. Choose the Appropriate Hosing

CAUTION

1. Reversing the flow of oil through the valve.
2. Hydraulic lines disconnected during transport.
3. Disconnecting the return line while the tractor is running.
4. A faulty quick coupler.
5. More than 12 GPM of oil flow while operating the backhoe.
6. By connecting the backhoe to a tractor valve and actuating the valve in the wrong direction causing a reverse flow through the backhoe valve.

The return hose will burst under these conditions. **THE VALVE MANUFACTURER WILL NOT WARRANT THE VALVE WHEN DAMAGED UNDER THESE CIRCUMSTANCES.**

FOR ALL TRACTORS

We highly suggest that you purchase a KELLEY INDEPENDENT HYDRAULIC SYSTEM for you backhoe.

However, if you wish to use the tractor hydraulic system, consult the dealer of your tractor for a safe and proper method of connecting the KELLEY BACKHOE to your tractor.

FOR JOHN DEERE TRACTORS

The return hose supplied with your KELLEY BACKHOE will not be long enough. You will have to purchase a 1/2" return hose with a length suitable for the following procedure.

Purchase a Port Filter Cover (JOHN DEERE Part Number AT301970) from your dealer. Install it on your tractor.

Attach the backhoe's pressure hose to the tractor quick coupler. Attach the backhoe's return hose to the port filter cover that you installed. Move the control lever on the tractor so that it starts a flow to the backhoe valve, and secure it in full open position.

The above procedure results in a direct connection to the JOHN DEERE master pump, and eliminates a return into the rear transfer pump chamber. The problem with returning oil into the rear transfer pump chamber is that if the tractor engine RPM is throttled down to a point at which the oil transfer pump cannot supply sufficient oil to the main system

TRANSPORTING THE BACKHOE



CAUTION While traveling with the backhoe, the tractor must have at least 20% of the combined tractor and backhoe weight on its front wheels. Add additional front-end weight, if necessary, to meet this requirement. This is necessary in order to maintain complete control of the tractor during travel.

Your backhoe comes equipped with transport chains for the older backhoes, prior to Jan 1, 2000. These should be put into proper position anytime you are transporting your backhoe. To ready your backhoe for transport, perform the following:

Raise both stabilizers completely. Raise the boom as high as possible. Curl the bucket completely in. Close the dipper stick in towards the boom assembly as far as possible. Your backhoe should now appear similar to Figure 1.

Locate the end of the transport chain, which is not bolted to the stabilizer. Thread this end through the hole on the plate that is welded to the boom A of Figure 1. Pull the chain taut and lock it in place by slipping it into the slot in the plate. Repeat this procedure with the transport chain on the other side of the backhoe.

Observe the following precautions while transporting the backhoe:

1. When traveling on roads, use the proper safety lights and warning signs. (Check your local regulations.)
2. When traveling over rough ground, do not exceed safe speed limits.
3. Do not make sudden starts or stops.
4. Do not make turns at high speeds.
5. When climbing grades, be particularly careful not to make sudden starts.



Raise the boom to take the tension off of the transport safety locking bar shown in Figure 14

FIGURE 14

PREPARING FOR OPERATION

PREPARING THE BACKHOE

You must first place the transport lock in their operating position. To do this, disconnect the transport lock from the boom. You may have to raise the boom in order to relax the tension on the lock.

PREPARING THE TRACTOR

Move the tractor's gearshift lever to a neutral position. Set the engine throttle to the correct RPM. For added stability, lower the front-end loader or blade to the ground (if so equipped). Move the draft control lever to the bottom-most position. If you are using an independent hydraulic system, engage the PTO.

FIGURE 15

OPERATING THE BACKHOE

▲ CAUTION Operate the backhoe only from the operator's seat. Be sure to place your feet on the footpads during operation. This protects them from injury that could result from moving parts.

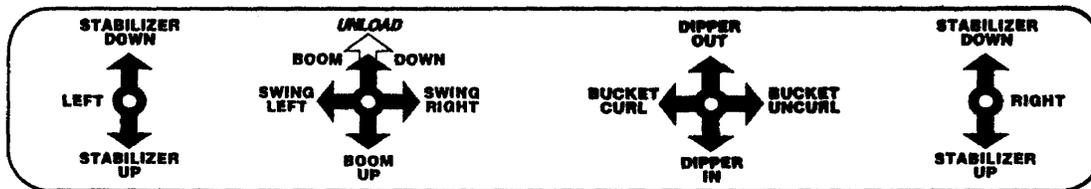


FIGURE 16

To operate your backhoe, mount yourself on the operator's seat. In front of you there are four control levers. Beneath the control levers is a decal that instructs you on the proper operation of the levers. Shows this control diagram as it appears on your backhoe. Refer to it for interpreting the following instructions. All directions such as **Right** and **Left** are determined from a seated position in the operator's seat.

STABILIZERS The levers on the extreme right and extreme left of the operator's console control the stabilizers. The left lever is for the left stabilizer, and the right lever is for the right stabilizer. To raise the stabilizers, pull the levers towards yourself. To lower the stabilizers, push the levers forward (i.e. away from you). The two levers in the center of the console control the operation of the backhoe. The left-hand lever controls the boom and the swing. The right-hand lever controls the dipper stick and the bucket.

BOOM

The second lever from the left controls the boom. Pulling the lever towards you raises the boom; pushing the lever forward lowers the boom.

Moving the lever to the left swings the boom to the left; moving the lever to the right swings the boom to the right.

DIPPER STICK AND BUCKET

The second lever from the right controls the dipper stick and the bucket. Pulling the lever towards you moves the dipper stick in; pushing the lever forward moves the dipper stick out.

Moving the lever to the left curls the bucket; moving the lever to the right uncurls the bucket.

Familiarize yourself with these controls before beginning to operate the backhoe. After a little experience, you will be able to operate the unit with a smooth, steady motion.

DIGGING SUGGESTIONS

 **CAUTION** Always be sure that the stabilizers maintain contact with the ground during digging operations. Take the time to readjust the stabilizers when necessary during digging.

Before you begin digging, extend the stabilizers so that they make a firm contact with the ground. This is essential in order to gain the necessary stability and weight transfer to insure safe digging.

Observe the following cautions while digging:

 **CAUTION** Before swinging the backhoe, make sure you have room to swing and that all people are clear of the backhoe. For added protection, place a barricade around the swing area before commencing operation.

 **CAUTION** Be sure that you are not digging over any underground wiring, pipes, or other obstructions. If there is any doubt, call your public service agency.

 **CAUTION** When digging to either side and/or close to the tractor, be extremely careful that the bucket does not contact the stabilizers, as serious damage may occur.

 **CAUTION** When swinging the backhoe to either side, do not slam the swing mast into the stops.

 **CAUTION** Be extra careful when working on hillsides and/or close to ditches. It is always extremely dangerous to work in a position where the danger of tipping or sliding exists.

 **CAUTION** Digging on a slope should be done from the top down. When digging across a slope, use the stabilizers to keep the backhoe level and *ALWAYS* dump uphill. Use caution when digging under these conditions. Move the unit carefully and at a safe ground speed.

The following suggestions should aid you in gaining maximum efficiency with your backhoe.

OPERATION

Digging at the correct angle is essential. To obtain the best penetration, the dipper stick should be at an angle. Do not extend the boom and the dipper stick out into a straight line. See Figure 4.

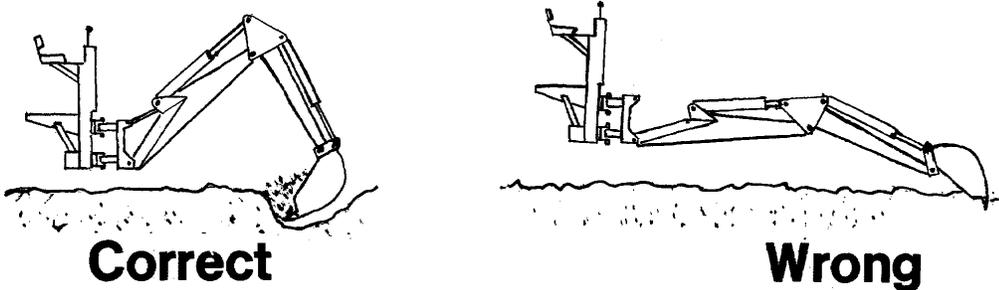


FIGURE 17

Figure 18 shows the correct angle of the bucket for digging. After you have filled the bucket, do not pull the dipper stick any closer to the boom than is necessary in order to clear the hole. When the bucket is clear, swing it to the side to dump. Always start dumping far enough to the side so as not to run out of dumping room. It is desirable while swinging to the side to make contact with the already removed material in order to lessen shock on the machine. This also aids the operator in pushing the material away from the working area.

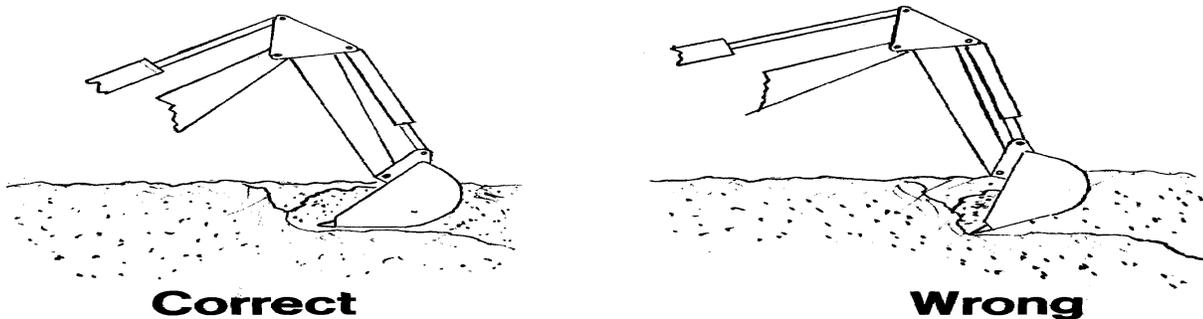


FIGURE 18

The length of the pass should be just long enough so that the bucket will be full at the end of the pass. The depth of the pass will depend upon the type of soil. Do not drag a full bucket of dirt. After making a pass you will be able to determine how deep you will be able to dig. To control the depth of the pass, work the bucket and dipper stick controls alternately. In this way you can take an even bite each time you make a pass and obtain a full bucket. See Figure 19.

When loading trucks, curling the bucket close to the dipper stick will prevent undue spillage when the bucket is raised so that it can be dumped in the truck bed.

To obtain a level bottom, set the bucket teeth at a slight angle. Keep this angle as you drag the bucket with the dipper stick by gradually uncurling the bucket. Intermittently pull the boom lever at the same time to maintain a level bottom.

When digging for pipe leaks or underground cables, dig parallel to the pipe or cable run—never across it.

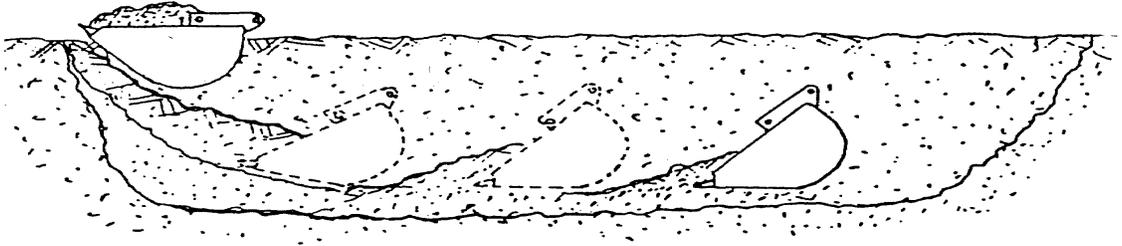


FIGURE 19

MAINTENANCE AND LUBRICATION

⚠ CAUTION Failure to perform the routine maintenance procedures outlined below may cause your backhoe to operate improperly. Such operation could lead to personal injury. Your *KELLEY BACKHOE* requires only a few minutes of maintenance before each use. For your own safety, follow the procedures suggested below.

⚠ CAUTION When servicing the backhoe, make sure all moving parts are resting on the ground.

⚠ CAUTION Do not service, adjust, or work on the backhoe while it is operating. Remove all power from both the backhoe and the tractor while servicing the backhoe.

⚠ CAUTION To avoid injury from escaping pressurized hydraulic oil, move the control levers in all directions before disconnecting any hoses, steel lines, or couplers.

INITIAL BREAK-IN PERIOD

1. If your backhoe is equipped with an optional high pressure in line filter, Replace the high-pressure filter element after the first 25 hours of operation. See OIL FILTER REPLACEMENT in this section of the manual.
2. If you are using a *KELLEY INDEPENDENT HYDRAULIC SYSTEM*, clean the suction line filter after the first 10 hours of operation. See the section entitled SUCTION LINE FILTER CLEANING.

DAILY

1. Check all hardware and hoses in order to be sure that they are secure. Check particularly the 3-point bolts, the lower link pins and locking pins, and the snap lock pins in the 3-point mounting top link. Check all retaining bolts in pins.
2. Check the hoses for cracks, cuts, or leaks. If a hose is defective, replace it.

OPERATION-MAINTENANCE

 **CAUTION** Under no circumstances should you attempt to repair a defective hose. Always *REPLACE* defective hoses.

3. Check for defective parts. If any are found, repair and replace them before operating the backhoe.

 **CAUTION** Whenever you replace a part, make sure it is replaced with a part having strength rating equivalent to or greater than that of the original part.

4. If you are using the *KELLEY INDEPENDENT HYDRAULIC SYSTEM*, make sure that the oil level is at the proper height. Add a Type A non-foaming hydraulic fluid if necessary.

5. Remove dirt from the machine. Particularly remove any dirt on the swing mast or on the topside of the stabilizers around the stabilizer cylinders. Clogged dirt can damage cylinders and hoses.

6. Check for any hoses that may be rubbing against sharp edges. If you find any such hoses, try to reposition them to a safer place.

7. Lubricate all zerks as indicated by the arrows on the drawing "Lubrication Points".

FIGURE 20 - LUBRICATION POINTS

EVERY 50 HOURS OF OPERATION

1. If you are using a *KELLEY INDEPENDENT HYDRAULIC SYSTEM*, clean the suction line filter as outlined in the section entitled SUCTION LINE FILTER CLEANING.

SUCTION LINE FILTER CLEANING

Remove suction line from tank outlet. Screw the filter out of the tank. Clean or replace filter screen. Reinstall filter.

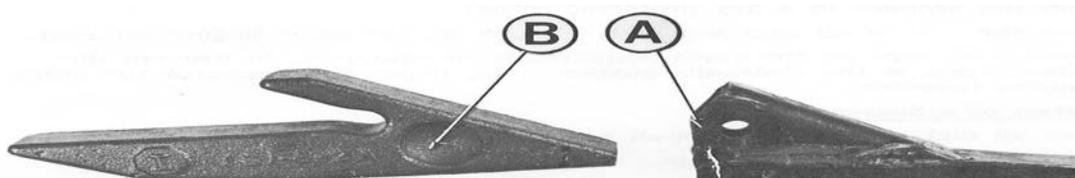
BUCKET TOOTH REPLACEMENT



Figure 21 – BBK 192 Tooth Assembly

To remove a tooth point, heat the point with a torch at A in (the peened section that overlaps B). Then hammer at the top of the point until the point comes free from the shank.

To replace a tooth point, hammer the point onto the shank. Heat at A and hammer the heated section into recess B.



STORING THE BACKHOE

⚠ CAUTION To avoid injury while disconnecting the backhoe from a tractor, slow the tractor RPM down to avoid sudden and quick reactions from the hydraulic cylinders.

⚠ CAUTION To avoid injury from escaping pressurized hydraulic oil, move the control levers in all directions before disconnecting any hoses, steel lines, or couplers.

The first step in removing your *KELLEY BACKHOE* from your tractor is to lower the hydraulic stabilizers to the ground. Then lower the bucket to the ground. This will provide a third position point for stability.

MAINTENANCE

Now by maneuvering the stabilizers and the boom cylinder, position the backhoe so that the weight load is removed from the pins connecting the backhoe to the 3-Point of the tractor. Be sure that the backhoe maintains a stable position that will not shift once the pins are removed.

Remove the lower hitch pins. Then remove the top link pin (you may have to reposition the backhoe to do so). While removing pins, make sure you keep your body above the frame of the backhoe in case it shifts its position.

At this point the backhoe can be removed from its hydraulic source. It is advisable to block the base of the backhoe if you wish to prevent the stabilizer cylinders from settling down and letting the backhoe sit directly on the ground.

Once the backhoe is removed, perform the recommended procedures below.

STORING FOR SHORT PERIODS

Coat all exposed cylinder shafts with grease or corrosion preventive. (Remove before operating again.)

Install dust caps on the quick couplers, if so equipped, to prevent dirt contamination of the hydraulic system. Or, if possible, connect the quick couplers together.

STORING AT THE END OF THE SEASON

Coat all exposed cylinder shafts with grease or corrosion preventive.

Store the backhoe in a dry protected place.

Clean the unit of all mud and dirt. Touch up the paint to prevent rust.

Install dust caps on the quick couplers, if so equipped, to prevent dirt contamination of the hydraulic system. Or, if possible, connect the quick couplers together.

AT THE START OF A SEASON

1. Clear all dirt and debris from all quick couplers, if so equipped.
2. Remove the protective coatings.
3. Check all hydraulic hoses and replace if necessary.
4. Tighten loose bolts and nuts.
5. Lubricate the unit.
6. Check bucket teeth. Sharpen or replace if required.
7. Run the unit slowly and check the operating controls before starting to dig.

BACKHOE VALVE RELIEF

To measure the setting of the relief valve, perform the following steps:

1. Remove O'ring plug (Point A – Figure 22) and install a hydraulic gauge and adapter at this point. A gauge and adapter kit can be ordered from the factory – Part #BVV10076.
2. Start tractor engine and set RPM at operating speed.
3. Raise stabilizer to top position, continue to hold lever until a reading can be taken. The pressure should be 2000 P.S.I.

Adjusting the main relief pressure

To adjust the main relief (Point B – Figure 22) remove cap, loosen locknut, hold stabilizer in top position as described in item number 3 above. Screw clockwise to increase pressure or counter clockwise to decrease pressure. When the correct pressure is reached (2200 P.S.I.), locknut and replace cap.

HYDRAULIC VALVE TROUBLESHOOTING

In the disassembly and servicing of the valve it should be noted that plungers if removed must be replaced in the same bore.

PROBLEM	POSSIBLE CAUSE	POSSIBLE REMEDY
Sticking Plungers	<ol style="list-style-type: none"> 1. Excessively high oil temperature. 2. Dirt in oil. 3. Pipe fittings too tight. 4. Valve warped from mounting. 5. Excessively high pressure in valve. 6. Handle or linkage binding. 7. Plunger bent. 8. Return spring damaged. 9. Spring or detent cap binding. 10. Valve not at thermal equilibrium. 	<ol style="list-style-type: none"> 1. Eliminate restrictions in pipe lines and filtering system. 2. Change oil—clean system. 3. Check torque. 4. Loosen valve and check. 5. Check with gauge on inlet and cylinder lines. 6. Free up linkage. 7. Replace valve or section. 8. Replace faulty parts. 9. Loosen cap, re-center and re-tighten. 10. Let system warm up.
Leaking Seals	<ol style="list-style-type: none"> 1. Paint on or under seal. 2. Excessive back pressure. 3. Dirt under seal. 4. Scored plunger. 5. Loose seal plates. 6. Cut or scored seal. 	<ol style="list-style-type: none"> 1. Remove and clean. 2. Open or enlarge line to reservoir. 3. Remove and clean. 4. Replace valve or section. 5. Clean and tighten. 6. Replace faulty parts.

TROUBLESHOOTING

PROBLEM	POSSIBLE CAUSE	POSSIBLE REMEDY
Unable to move plunger	<ol style="list-style-type: none"> 1. Dirt in valve 2. Plunger cap full of oil. 3. Bind in linkage. 	<ol style="list-style-type: none"> 1. Clean and flush out. 2. Replace seals. 3. Free up linkage.
Blown or Leaking O-ring Seals Between Valve sections	<ol style="list-style-type: none"> 1. Improper connected 2. Return line was replaced with high pressure hose. 3. Valve used in power beyond application without installation of power beyond sleeve. 	<ol style="list-style-type: none"> 1. Replace O-ring seals. Make sure all connections are as shown in the assembly section of this manual 2. Replace O-ring seals. Remove highpressure hose and replace with correct low pressure hose. 3. Replace O-ring seals. Install power beyond sleeve as shown in assembly section of this manual.
Blown Hydraulic Valve section	<ol style="list-style-type: none"> 1. Improper connected 2. Return line was replaced with high pressure hose. 3. Valve used in power beyond application without installation of power beyond sleeve. 	<ol style="list-style-type: none"> 1. Replace O-ring seals. Make sure all connections are as shown in the assembly section of this manual 2. Replace O-ring seals. Remove highpressure hose and replace with correct low pressure hose. 3. Replace O-ring seals. Install power beyond sleeve as shown in assembly section of this manual.

RELIEF VALVE

PROBLEM	POSSIBLE CAUSE	POSSIBLE REMEDY
Can't Get Pressure	Poppet D, E, or K stuck open or dirt under seat.	Check for foreign matter between poppets D, E, or K and their mating members. Members must slide freely.
Erratic Pressure	Pilot poppet seat damaged. Poppet C sticking in D.	Clean dirt. If parts are damaged, replace complete relief valve.
Pressure Setting Not Correct	Wear due to dirt. Locknut and adjustment screw loose.	<ol style="list-style-type: none"> 1. See "How to Set Pressure". 2. Check seats for scratches, nicks or other marks. Replace relief valves if damaged.
Leaks	Damaged seats, worn O-Rings, parts sticking due to dirt.	Replace worn or damaged O-Rings and back up rings. Inspect for free movement of components. Replace complete relief if metal parts are damaged.

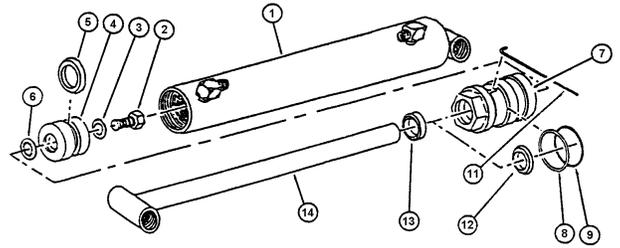
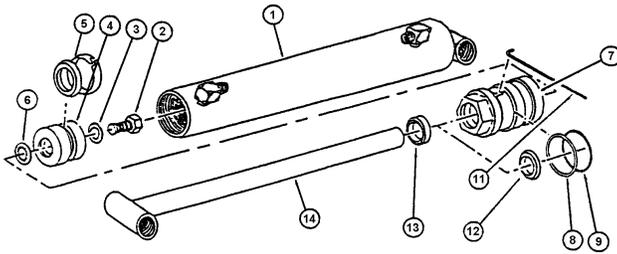
General Troubleshooting

 **CAUTION** Do not attempt any repairs on the backhoe until you have studied all the Cautions in the *Maintenance* section of this manual.

PROBLEM	POSSIBLE CAUSE	POSSIBLE REMEDY
Backhoe Does Not Operate	<ol style="list-style-type: none"> 1. Low oil supply. 2. Hoses not properly connected. 3. Worn or damaged pump. 4. Broken oil line. 	<ol style="list-style-type: none"> 1. Add oil. 2. Check hose connections. 3. Replace or repair pump. 4. Check for leaks. Replace line.

PROBLEM	POSSIBLE CAUSE	POSSIBLE REMEDY
Slow Operation and Poor Hydraulic System Performance	<ol style="list-style-type: none"> 1. Engine speed too low. 2. Defective pump. 3. Dirty oil filter. 4. Circuit relief not holding. 5. Load too heavy. 6. Faulty main relief valve. 7. Internal valve crack. 8. Suction line filter plugged. 9. Oil too heavy for cold weather use. 10. Power supply may not be pumping enough oil. 11. Low oil level. 12. Pressure line restricted. 13. Collapsed suction line. 14. Valve spool not at full stroke. 	<ol style="list-style-type: none"> 1. Adjust RPM's. 2. Check pressure or replace. 3. Replace. 4. Remove and clean. See maintenance topic "Circuit Relief Cleaning". 5. Check line pressure. 6. Clean or replace. 7. Replace valve section. 8. Clean. 9. Replace with lighter oil. 10. Use a flow meter to check out whether a 8-12 GPM flow rate is being achieved. 11. Add oil. 12. Check for obstruction. 13. Check for damage. 14. Check movement and linkage.
Backhoe Does Not Hold Up Load	<ol style="list-style-type: none"> 1. Cylinder seals leaking. 2. Valve spool leaking. 3. Oil bypassing valve spool. 4. Faulty circuit relief. 	<ol style="list-style-type: none"> 1. Replace seals. 2. Replace seals. 3. Replace valve bank. 4. Replace circuit relief.
Load Drops When Valve Spool Moved From Neutral	<ol style="list-style-type: none"> 1. Dirt in check valve. 2. Scored circuit relief valve poppet not seating properly. 	<ol style="list-style-type: none"> 1. Disassemble and clean. 2. Replace poppet or lap poppet.
Excess Oil Heat	<ol style="list-style-type: none"> 1. Damaged or worn pump. 2. Too fast of an engine speed. 3. Main relief bypass valve improperly set. 4. Draft control lever not all the way down. 	<ol style="list-style-type: none"> 1. Repair or replace. 2. Reduce throttle. 3. Check relief setting. 4. Position correctly.
Oil Leakage	<ol style="list-style-type: none"> 1. Valve spool seals. 2. Loose hose fittings. 3. Broken oil line. 	<ol style="list-style-type: none"> 1. Replace seals. 2. Tighten just enough to stop leakage. 3. Replace hose or line.
Independent Hydraulic System Pump Failure	Improperly set relief valve.	Set relief at 2200 PSI.
Independent Hydraulic System Pump Noisy	<ol style="list-style-type: none"> 1. Suction line filter plugged. 2. Oil too heavy. 	<ol style="list-style-type: none"> 1. Clean filter. 2. Use a lighter oil.
Jerky or Erratic Action	<ol style="list-style-type: none"> 1. Air in system. 2. Wrong type of oil. 3. Foamy oil. 	<ol style="list-style-type: none"> 1. Check for loose connections and/or cycle all valves to remove air. 2. Check tractor manual. For Independent Hydraulic System use Type A non-foaming hydraulic oil. 3. Check tractor manual. For Independent Hydraulic System, use a Type A non-foaming hydraulic oil.
Blown Return Line	Improperly connected.	Make sure all connections are as shown in the assembly section of this manual.

Field Service Information for Kelley Cylinders



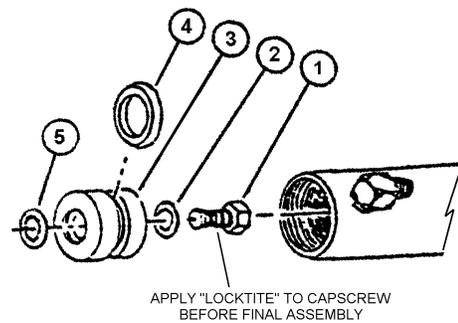
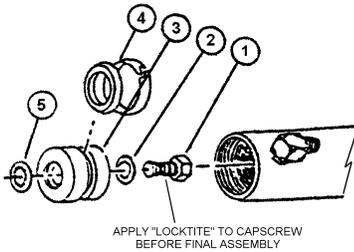
ILL No	Description
1	Barrel Assembly
2	Capscrew, 7/8"
3	Dyna Seal, 7/8"
4	Piston
5	Seal (2 piece Hercules)
6	Internal Lockwasher 7/8"
7	Cylinder Head

ILL No	Description
8	Back up Ring
9	O'Ring
11	Lockwire
12	Rod Seal
13	Rod Wiper
14	Rod Assembly Seal Kit

ILL No	Description
1	Barrel Assembly
2	Capscrew, 7/8"
3	Dyna Seal, 7/8"
4	Piston
5	Piston Seal Polypack
6	Internal Lockwasher 7/8"
7	Cylinder Head

ILL No	Description
8	Back up Ring
9	O'Ring
11	Lockwire
12	Rod Seal
13	Rod Wiper
14	Rod Assembly Seal Kit polypack

1. You will find enclosed in the current Kelley Cylinder Service Seal Kits a backup ring for the cylinder head not found in previously manufactured Kelley cylinders prior to January 1, 1980.
2. Simply by rotating the cast cylinder head clockwise, the lockwire will easily roll out of its slot and groove in the barrel. Cylinder head and piston bearing may easily be removed from the barrel assembly with lockwire removed.
3. Check the direction of the original piston seal for "polypac" cylinders so replacement of piston seal is positioned correctly for its best sealing abilities. The rod seal is always positioned with the larger "lip-o-ring" side facing the piston end of the rod shaft. Piston and rod seals should be heated in water or oil for easiest installation.
4. Shown above is a general schematic of a Kelley cylinder. Notice on the cast cylinder head the location of the new "backup" ring surfacing and protecting the cylinder head o'ring from movement in the groove provided for it. (III. #8,9) For the newer manufactured cylinders since to January 1, 1980, the groove only has enough room for one backup ring, place it against the o'ring toward the lockwire groove side.
5. One important procedure to be done during reassembly of piston bearing and cylinder head back into barrel assembly should be to apply a heavy coat of grease or oil around both the o'ring and backup ring on the cylinder head and on the piston seal to prevent "shearing" these seals when installing into barrel assembly.



Hercules 2 Piece Seal Kits
 SCY1038, SCY1030, SCY222, & SCY10792

1. Cap screw 7/8"x2" NF
2. Dyna Seal 7/8"
3. Piston 2", 2-1/2", 3"
4. Seal, (2 Piece Hercules) 2", 2-1/2", 3"
5. Internal Lockwasher 7/8"

Polypac Seal Kits
 SCY14038, SCY13300

- 1) Cap screw 7/8"x2"NF
- 2) Dyna Seal, 7/8"
- 3) Piston 2", 2-1/2"
- 4) Piston seal (Polypac) 2", 2-1/2"
- 5) Internal Lockwasher 7/8"

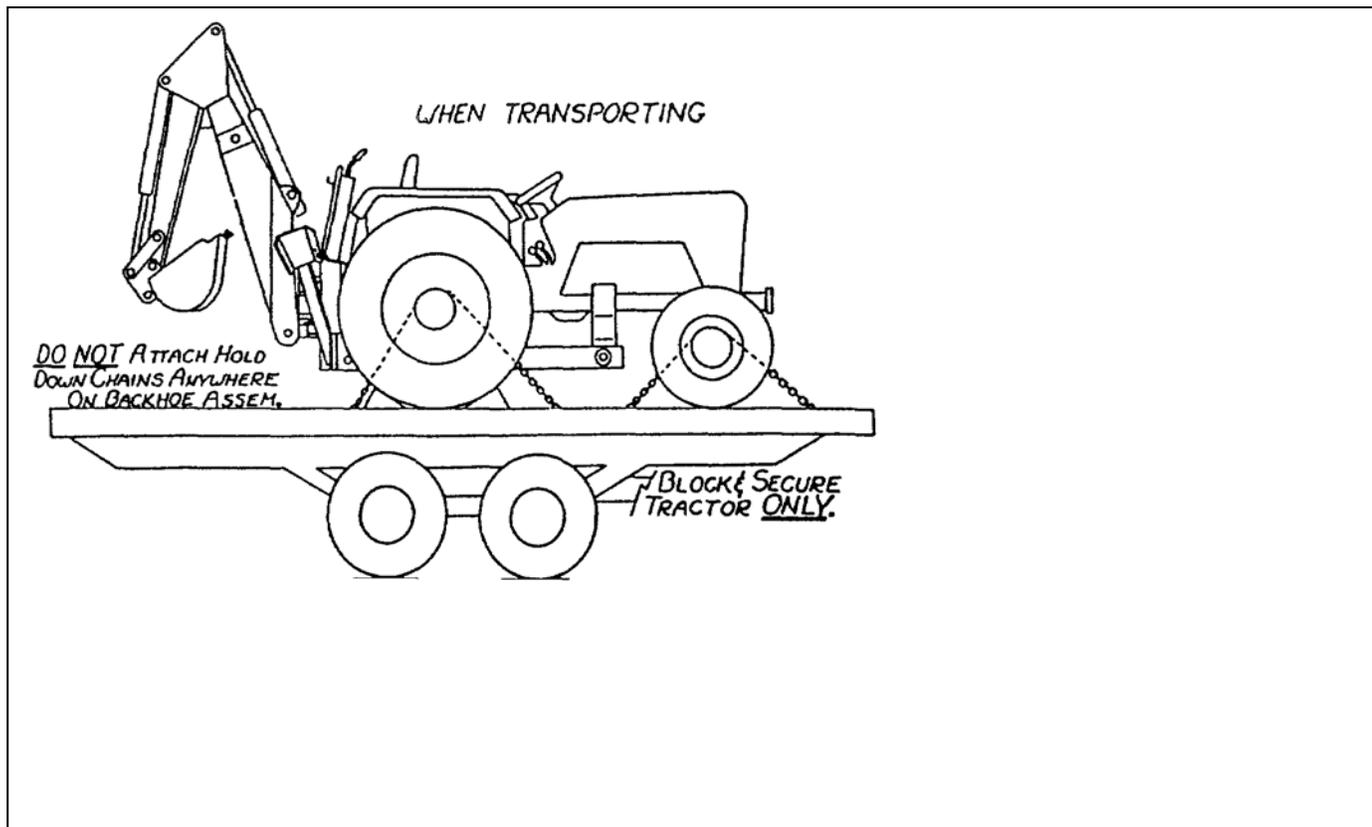
KELLEY CYLINDER ASSEMBLY INSTRUCTIONS

Shown on the left is the piston ring system for the 2 Piece Hercules seal, which consists of two parts: a inner rubber oval expander ring and an outer plastic piston ring. Shown on the right is the single piece polypac piston seal, which has only one polypac lipseal in it. The following assembly instructions are provided to insure optimum seal life.

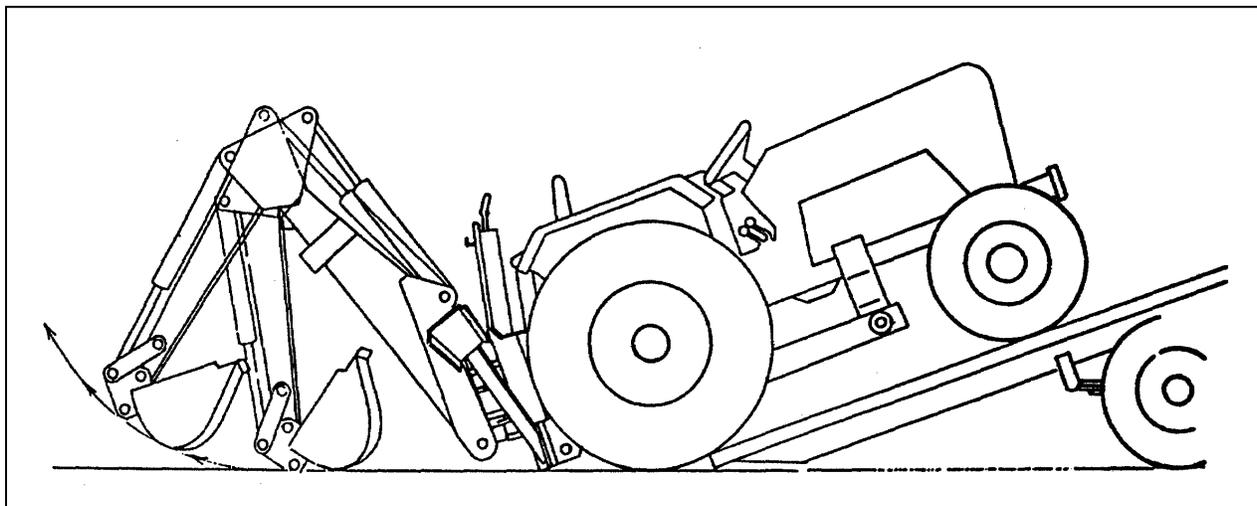
1. Inspect piston for sharp edges, nicks, gouges, and/or dirt, which will need to be repaired and/or removed.
2. Apply a film of hydraulic fluid to the oval expander and the piston ring or to the piston seal.
3. Using hands, prybar, etc. For the 2 piece Hercules piston seal, stretch expander ring over piston until it is located in the piston ring groove. Do not use tools with sharp edges. Use care not to twist oval expander ring while installing groove. It must lay flat.
4. Before installing piston ring onto piston, place the piston ring into the bore. Ends of ring have been designed to overlap. **DO NOT CUT DOWN RINGS.**
5. Place the piston ring over piston, making sure to expand diameter of ring only enough to slip over piston body. Excessive stretching can weaken piston ring. For polypack piston seal installation-position lip-o-ring side of this 1 piece seal towards "power side" of cylinder. Observe the lip-o-ring side of the original seal being replaced for correct positioning.
6. Check lead in chamfer and cylinder bore: both should be free of nicks and gouges. Repair if necessary.
7. Lubricate the cylinder bore with a film of hydraulic fluid or other suitable lubricant.
8. Install piston into cylinder bore so that the piston ring "step joint" for outer Hercules piston seal is approximately opposite the cylinder port. During assembly, it is important that the piston ring remains securely positioned in the piston-bearing groove. By using a ring compressor, it may make the installation easier.
9. Reinstall cylinder head into barrel with lockwire cross slot positioned so lockwire can be trapped through barrel slot and rotate full circle. The assembly is now complete.
10. Check hydraulic system filter and replace hydraulic fluid in system if contaminated or dirty. Stroke the service cylinder several times to remove air cavities and expand the new seals.
11. The piston ring system is a precision-machined unit that is manufactured for a specified bore and groove dimension. Any alteration of either of the component parts as received, or subsequent dimensional charges, will be detrimental to the sealing capability.

!!CAUTION!! !!CAUTION!! !!CAUTION!!

DO NOT CHAIN BACKHOE DOWN IN ORDER TO SECURE TRACTOR TO TRAILER.



NOTE: WHEN LOADING OR UNLOADING WITH SAFETY CHAINS STILL SECURED TO BOOM, STICK **MUST** BE EXTENDED (AS SHOWN) TO AVOID CONTACT WITH GROUND. FAILURE TO DO SO, MAY RESULT IN SERIOUS DAMAGE TO BACKHOE ASSEM.





specifications

Digging Depth	8'6" with 2' Flat Bottom	2.6 m./ .61m.
Maximum digging Depth	9'0"	2.9 m.
Reach (from swing Pivot)	11'-2"	3.48 m.
Reach (from rear axle)	14'-8"	4.47 m.
Transport Height	7'-8"	2.76 m.
Loading Height	7'-6"	2.68 m.
Shipping Weight	1238 lb.	510.3 kg.
Bucket Curl	180° max.	
Swing	180°	
Bucket Pryout Power	6725 lb.	2542 kg.
		2672 kg.
Dipper Stick Power	2510 lb.	1120 kg.
Stabilizer Spread		
Operating Position	9'-4"	1.75 m.
Transport Position	5'-10"	1.51 m
System Relief Valve Setting	2200 PSI	163 KP-cm
Independent Hydraulic System	Optional	
Pump furnished	Webster 388 K (LPP6242)	
Pump Rating	9GPM @600 RPM/34.07 liters @ 600 RPM	
Hydraulic System Capacity	5 gallons/18.93 liters	
Filter	Suction type	

BUCKETS

Width	Weight	Struck Capacity
12"/30.48 cm.	97 lb./44.9kg.	1 cu.ft./ .028 m
18"/45.72 cm.	121 lb./55.7 kg.	1.5 cu. Ft./ .042 m
24"/60.96 cm.	145 lb./66.6 kg.	2 cu. Ft./ .056 m.

NOTE: Specifications will vary with tractor model and are based on boom pivot 11" above ground level.

CYLINDERS

<u>Type</u>	<u>Piston Diameter</u>	<u>Stroke</u>	<u>Closed Length</u>	<u>Open Length</u>	<u>Rod Diameter</u>
Swing (BCY13019)	2-1/2" 6.35 cm.	10" 25.4	17" 43.18	27" 68.58	1-3/8" 3.49
Boom (BCY13028)	2-1/2" 6.35 cm	26" 66.04cm	33" 83.82 cm.	59" 149.86 cm.	1-3/8" 3.49cm.
Dipper Stick (BCY13029)	2-1/2" 6.35	20" 50.80 cm	27" 68.50 cm	47" 109.88 cm.	1-3/8" 3.49 cm.
Bucket (BCY13031)	2-1/2" 6.35 cm.	20" 50.80cm.	27" 68.50cm	47" 109.88cm	1-3/8" 3.49cm.
Stabilizer (BCY13015)	6.35 cm. 5.08 cm.	16" 40.64cm	23" 58.42 cm.	39" 99.06 cm.	1-3/8" 3.49cm

RELIEF VALVE SETTING

Main relief	2200 PSI
Boom and dipper	2500 PSI

Swing

1500 PSI

Note: When replacing the main relief on the swing relief valves it will be necessary to adjust them to the correct relief pressure.

Limited Warranty

Kelley Manufacturing Corporation warrants each new Kelley product to be free from defects in material and workmanship. This Warranty is applicable only for the normal service life expectancy of the product or components, not to exceed twelve consecutive months from date of the new Kelley product to the original purchaser. This warranty is valid only if the purchaser has returned to Kelley a signed Warranty Registration Form within ten days after the equipment is delivered to the purchaser. To verify the warranty period, purchaser should keep the sales slip or other proof of the purchase date.

Genuine Kelley replacement parts and components will be warranted for 90 days from date of purchase, or the remainder of the original equipment warranty period, whichever is longer.

Under no circumstances will it cover any merchandise or components thereof, which, in the opinion of Kelley, has been subjected to misuse, unauthorized modifications, alteration, an accident or if repairs have been made with parts other than those obtainable through Kelley. Warranty shall not apply to any part of the equipment if it has been installed, altered, repaired, misused in a way that in the opinion of Kelley affects the reliability of or detracts from the performance of the equipment. Neither does this warranty apply to any part of the equipment if its serial number has been altered, defaced, or removed; nor does it cover replacements or repairs necessitated by normal wear, loss or damage resulting from any cause beyond the control of Kelley including, but not limited to, Acts of God, acts of government, floods, fires, shortages of material, and labor difficulties.

Within twelve months from date of purchase any warranty claim must be brought to the attention of the Kelley dealer from whom the equipment was purchased. The dealer will complete a Request for Credit Authorization form and return it to Kelley for consideration. All defective parts must be returned freight prepaid to Kelley before a warranty claim will be considered.

Kelley in no way warrants engines, batteries, tires, pumps valves or other trade accessories since these items are warranted separately by their respective manufacturer.

Kelley's obligation under this warranty shall be limited to repairing or replacing, free of charge to the original purchaser, any part that, in its judgement, shall show evidence of such defects, provided further that such part shall be returned within thirty (30) days from date of failure to Kelley routed through the dealer and distributor from whom the purchase was made, transportation charges prepaid. The purchaser of the Kelley equipment is responsible for any transportation, damages, or losses that result from a warranty claim.

This Warranty shall not interpreted to render Kelley liable for any costs involving labor. No warranty shall be allowed as to the attachment of the equipment to specific tractors: it is beyond Kelley's control that tractor manufacturers make changes, which may require minor alterations of the mounting and or attachments. This warranty does not extend to the loss of crops, loss because of delays in completion of jobs or harvest, or any expense or loss incurred for labor, substitute machinery, rental or for any other reason.

Except as set forth above, Kelley shall have no obligation or liability of any kind on account of any equipment and shall not be liable for special or consequential damages. Kelley makes no other warranty, expressed or implied, and, specifically, Kelley disclaims any implied warranty or merchantability or fitness for a particular purpose. Some states or provinces do not permit limitations or exclusions of implied or incidental or consequential damages, so the limitations or exclusion in this warranty may not apply.

This warranty is subject to any existing conditions of supply, which may directly affect our ability to obtain materials or manufacture replacement parts.

Kelley reserves the right to make improvements in design or changes in specifications at any time, without incurring any obligation to owners of units previously sold.

No one is authorized to alter, modify or enlarge this warranty nor the exclusion, limitations and reservations.

Kelley Manufacturing Corporation

PO BOX 276, 131 PROGRESSIVE DRIVE

OTTOVILLE, OHIO 45876

Telephone 419-453-5539

Fax 419-453-2278

Kelley

EQUIPMENT