K.R. WILSON, INC. ARCADE, NEW YORK 14009, U.S.A.

Operation and Maintenance Manual

K.R. WILSON

HYDRAULIC PRESS

TONNAGE: 25 - 50 - 60 - 75 - 100

MODEL: 37 - 37E - 37G - 37F - 37K

SER. NO.: _____

_____

CUSTOMER

Above information should accompany all orders for parts or service.

CAUTION

It is the employer's responsibility to educate the operator in the safe work procedures and to provide proper safety devices or means of protection that may be necessary or required for any particular use, operation, setup, or service of this equipment.

The employer shall provide adequate supervision to insure correct operating procedures are being followed.

Never place any part of your body in the pressing area.

Never operate, install tooling (dies), or service this equipment without proper instruction or without first reading the operation manual.

Never set the system relief valve (C-1-2431, Item 2) higher than the maximum rated capacity of the press.

Never exceed the rated capacity of the press.

Never remove any safety equipment or stroke limiting devices installed by manufacturer.

Never attempt to exceed the recommended stroke of the cylinder. Damage to the cylinder or other components may result.

Never attempt to raise the table using the winch with a heavy work piece on the table.

Never attempt to raise the table while anything is in contact with the press ram.

Never attempt to move the table with both table pins removed from the press frame.

Never operate the press with the table supported by the winch cables. Always leave slack in cable so the table pins support the entire load.

Never leave spike handwheels in full out detented position unless actually in use.

Never attempt to increase the leverage ratio by adding to the length of the spike handwheel. Damage to the pinion or ram would occur.

CAUTION, Continued

Never attempt to press using only one "V" block to resist the force; damage to the block will occur. Both "V" blocks must be used simultaneously.

Never allow hydraulic pressure to increase within the cylinder when the ram is not extended contacting resistance (the work). This indicates a faulty stroke limiting valve or binding within the cylinder. Damage to the cylinder could occur.

Always insert table pins far enough to assure full bearing for both table plates.

Always remove spike handwheels if there is any possibility of work breaking under the ram or a possibility of sudden loss of resistance as in break-through when punching through material.

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INSTALLATION INSTRUCTIONS

Unless otherwise specified, all item numbers referred to in this section are taken from Frame Assembly Drawing C-1-2430.

Immediately upon receipt of your press, an inspection should be made to determine if any damage has occurred to the unit in transit. Check packing list to be sure all items listed have been received. This inspection can usually be made while the press is still attached to the shipping skid.

If installation is delayed, store the press in a dry, clean location. Do not remove protective crating, seals or connection plugs where used until the equipment is ready to be assembled. Remove all traces of dirt that may have accumulated during transportation.

When handling the press, arrange slings or other lifting devices for uniform weight distribution through frame openings in the press. NEVER lift or support by the piping or table plates. The press base has been drilled to accept foundation bolts, and these should be installed.

After the receiving inspection, the press should be moved to the approximate point of installation, removed from the shipping skid, set in an upright position for vertical units and leveled in accordance with accepted machine tool installation procedure.

The cable drum assembly (Item 30) which was detached from the press for shipment should be reattached to the press with the three 3/8" - 16 NC x 3/4" LG hex head cap screws provided.

There will be a loop of cable (Item 28) hanging down at the left side of the press. Draw it down and away from the press, making sure cable is contacting all pulleys.

With both ends of the cable taut, locate the center of the loop and form an eye. Pass this between the cable drum and its housing, then over the hex head cap screw on the drum.

FILLING THE OIL RESERVOIR AND PRESS SETUP

Unless otherwise specified, all item numbers referred to in this section are taken from 2 Speed Hand Pump Assembly Drawing A-1-2433.

The quantity of hydraulic fluid required for each model is as follows:

MODEL	CAPACITY
37, 37E, 37G, 37F	13 Quarts
37K	10 Gallons

When the press has been fully assembled, the oil reservoir can be filled with new or clean hydraulic fluid meeting the required hydraulic fluid specifications listed in this manual. (Moisture, dirt, or foreign material in the fluid will harm the hydraulic system). With the ram (C-1-2434 Item C-28) at its highest position and release valve handlever (Item 65) toward the back of the press, (thus closing the release valve situated at the bottom of the oil reservoir), fill the oil reservoir through the dip stick filler hole located at the rear of the reservoir cover (Item 2). The oil reservoir is full when the oil level is approximately 1" to 2" below the top of the tank.

Using the spike handwheels (C-1-2431 Item 7), bring the ram down slowly a few inches. Open the release valve by moving the release valve handlever (Item 65) forward towards the front of the press against the stop. Use the spike handwheels to raise the ram forcing oil back into the reservoir. Close the release valve and repeat the above operation until all of the air has been exhausted from the press. This can be determined by closing the release valve before the ram has been returned all the way to upper position. When all the air is exhausted, the piston (C-1-2434 Item C-7) will set firmly against oil within the cylinder, when an attempt is made to raise the ram. If air is still present, the resistance will be cushioned. Once the press is free of air, no more can enter, since the release valve is always

FILLING THE OIL RESERVOIR AND PRESS SETUP, Continued

submerged in oil. Once all of the air has been removed from the system, open the release valve by moving the release valve handlever fully forward. Raise the ram to its full up position and return the release valve handlever to the close position. Check the fluid level in the reservoir and add fluid if necessary. Generally, the oil need be changed only once every two or more years, depending on the extent to which the press is used. Normally, no additional oil will be required in the system.

TABLE (BED) ADJUSTMENT

Unless otherwise specified, all item numbers referred to in this section are taken from Frame Assembly Drawing C-1-2430.

The table is raised and lowered by a worm and gear mechanism. The only required attention is lubrication of the winch gears with grease approximately every thirty days and proper adjustment of the cable lengths so that all table pin holes will align simultaneously.

TO RAISE THE TABLE, turn the cable drum handle counter-clockwise until the table is just above the table pin holes for the desired table position. Slide the table pins (Item 11) out of the frame one at a time and move them to the holes directly under the table. Slide the table pins into the hole until the stop pins (Item 10) (pointing downward) contact the side members (Items 22 & 26). (This assures that the table pins are sufficiently extended out of the rear of the frame to support the rear table plate.)

With the table pins in place, lower the table to rest on the pins by rotating the cable drum handle clockwise. When all four corners of the table are resting on the table pins, give one additional full revolution of the cable drum handle to provide sufficient slack in the cable to prevent damage to the cable or winch during pressing operations. (Excessive slack in the cable could cause the cable to climb off of the pulleys.)

TO LOWER THE TABLE, turn the cable drum handle counter-clockwise until the table is just above the table pins. Slide the table pins (Item 11) out of the frame one at a time and move them to the holes directly under the desired table level. Slide the table pins into the hole until the stop pins (Item 10) (pointing downward) contact the side members (Items 22 & 26). (This assures that the table pins are sufficiently extended out of the rear of the frame to support the rear table plate.)

TABLE (BED) ADJUSTMENT, Continued

With the table pins in place, lower the table to rest on the pins by rotating the cable drum handle clockwise. When all four corners of the table are resting on the table pins, give one additional full revolution of the cable drum handle to provide sufficient slack in the cable to prevent damage to the cable or winch during pressing operations. (Excessive slack in the cable could cause the cable to climb off of the pulleys.)

If at any time, excessive force on the winch is required to raise the table, or the table will not freely move downward, a thorough inspection of the table, winch, and cables should be made to determine the cause.

CAUTION

Never attempt to raise the table using the winch with a heavy work piece on the table.

Never attempt to move the table with both table pins removed from the press frame.

Never operate the press with the table supported by the winch cables. Always leave slack in the cable so the table pins support the entire load.

Never attempt to raise the table while anything is in contact with the press ram.

"V" BLOCKS

K. R. Wilson "V" blocks are extra heavy and rigid. A dial gauge can be attached to the bed member to test the work as it is resolved in the "V's" to determine the run-out or bends.

CAUTION: Both "V" blocks must be used simultaneously. Never attempt to press using only one block to resist the force, damage to the block will occur.

TWO SPEED HAND PUMP OPERATION

Unless otherwise specified, all item numbers referred to in this section are taken from Two Speed Hand Pump and Release Valve Assembly Drawing A-1-2433.

Fluid in the reservoir under atmospheric pressure is admitted to the pump chambers through the inlet check valves. When the pump handle is moved upward, the plungers move outward and the displaced area fills with fluid. The inlet check valves then close. When the pump handle is pushed downward, the plungers move inward forcing the fluid from the pump chambers through the outlet check valves and into the cylinder circuit. The outlet check valves close and retain the fluid in the cylinder circuit. Additional strokes add their charge of fluid each time the pump is stroked, resulting in a movement of the cylinder ram or an increase in the cylinder pressure.

Both pumps simultaneously take in fluid from the reservoir through their own inlet check valves. Also, each pump will discharge its fluid through its own outlet check valve into the cylinder circuit, resulting in a fast pumping speed of fluid to the press cylinder. However, when the cylinder ram contacts the work, the resistance is too great to continue using the fast pumping speed. It is then necessary to eliminate one pump. Push the pump handle down to the bottom of its stroke and turn the speed selector key (Item 45) counter clockwise until the figure "1" marked on the key is visible (up). This disengages the large diameter plunger (Item 27) and allows only the small diameter plunger (Item 30) to deliver fluid to the cylinder circuit for attaining high pressure.

This pump assembly is equipped with a release valve, its purpose being to release fluid which has been forced past the outlet check valves of the pumps into the cylinder circuit. Shifting the release valve handlever towards the front of the press allows fluid to escape through the opened valve and return to the reservoir, permitting the cylinder to be retracted.

CYLINDER OPERATION

Unless otherwise specified, all item numbers referred to in this section are taken from Cylinder Assembly Drawing C-1-2434.

The cylinder is of the single acting type, using a piston cup to seal the fluid which extends the ram. Retraction of the ram is accomplished by the pinion and spike handwheels when the cylinder fluid is allowed to escape from the cap end of the cylinder to the reservoir. The lower piston seal (Item C-8) prevents air from entering the cylinder when the ram is extended through the use of the spike handwheels.

The stroke limiting valve opens to stop the ram travel by releasing hydraulic pressure to protect the cylinder assembly. This is accomplished in the following manner. A trip cup (Item C-25) and a trip bar (Item C-24) perpendicular to the ram direction of travel contacts the cylinder head (Item C-14) at the end of a normal ram movement. This action lifts the trip pin (Item C-23) which raises the ball (Item C-22) off its seat, allowing fluid to escape from the upper end of the cylinder into the lower cylinder area, then to the pump reservoir by way of a drain line. After the stroke limiting valve is actuated, a small amount of fluid will remain in the bottom side of the cylinder.

NOTE:

ALWAYS keep working parts lubricated.

ALWAYS have all pipe connections tight.

ALWAYS have hand pump plungers at bottom end of the stroke when turning speed selector key.

Moisture, dirt and foreign material in the hydraulic fluid will harm the hydraulic system.

Excessive slack in the cable could cause the cable to climb off of the pulleys.

If at any time, excessive force on the winch is required to raise the table, or the table will not freely move downward, a thorough inspection of the table, winch and cables should be made to determine the cause.

Shift release valve handlever towards the front of the press to open the valve and release pressure.

Shift the release valve handlever towards the rear of the press to close the valve.

Use the press with the ram in as high a position as possible to make operation at high pressure more rigid and to reduce side strain on the ram.

Avoid using the press with the ram extended to its outermost position.

The cylinder is equipped with a stroke limiting valve which will open and prevent the ram from exceeding its allowable stroke.

PRESS OPERATION AS A MECHANICAL (SENSITIVE) ARBOR PRESS

Unless otherwise specified, all item numbers referred to in this section are taken from 2 Speed Hand Pump and Release Valve Assembly Drawing A-1-2433.

This press is equipped with an integral 3 ton mechanical (sensitive) arbor press for pressing bushings, pins, dowels, small bearings, sleeves, gears, and many other parts that require comparatively little force. Since the mechanical press is an integral part of the hydraulic press, the full bed and frame area are available when used as a mechanical arbor press.

To operate the press as a mechanical (sensitive) arbor press, place the release valve handlever (Item 65) in the open position (toward the front of the press), rotate the spike handwheels (C-1-2431 Item 7) counter-clockwise advancing the ram to the work. By using the spike handwheels in its full out detented position, as shown in Figure 1 (under heading "Quick and Easy Press Operation to Full Capacity) and taking advantage of the compounding leverage, approximately 3 tons of force can be exerted by the ram. (This will vary from operator to operator).

CAUTION: Never leave spike handwheels in full out detented position unless actually in use.

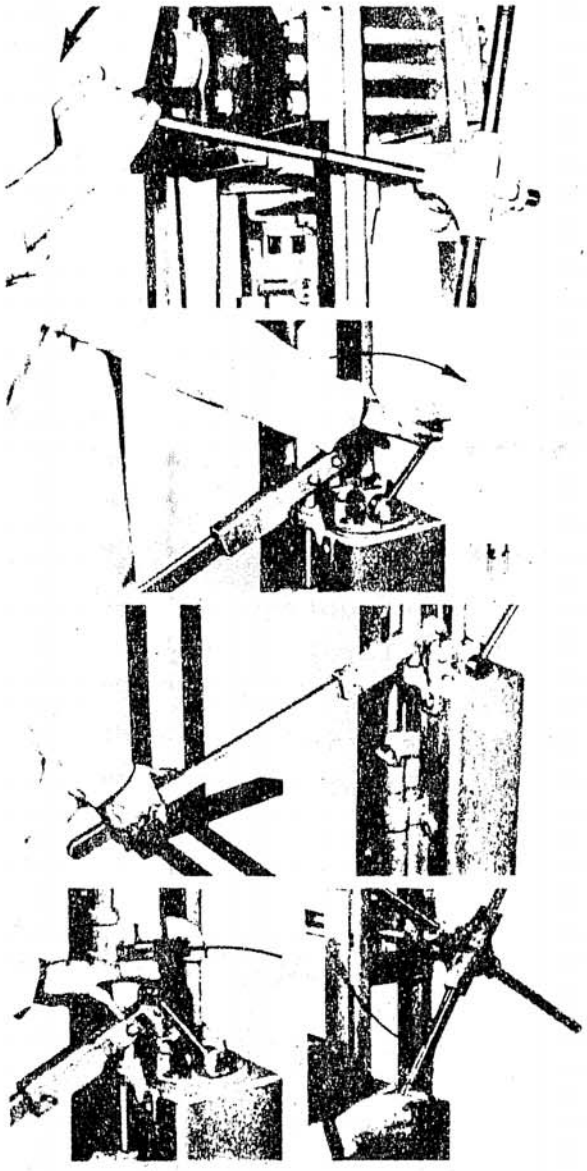
Never attempt to increase the leverage ratio by adding to the length of the spike handwheel. Damage to the pinion or ram would occur.

To return the ram, the operator must rotate the spike handwheel in a clockwise direction raising the ram to any convenient position.

If more pressure is needed than the spike handwheel affords, shift the release valve handlever (Item 65) to the close position (toward the rear of the press) and operate the press as described in heading "Press Operation as a Hydraulic Press".

NEVER operate the press with the table supported by the winch cables.

QUICK AND EASY PRESS OPERATION TO FULL CAPACITY



1. Bring ram to work quickly by rotating the spike handwheel counterclockwise. It's many times faster than inching the ram to the work by hydraulic pumping.

2. Close the valve by a simple movement of the release valve handlever toward the rear of the press. Fully open to tightly closed in a fraction of a second.

3. Tons of pressure are exerted with the first pumping stroke because the hydraulic cylinder is full of oil--automatically accomplished in operation #1. A few additional strokes quickly build the pressure up to the rated capacity of the press.

4. Open the release valve by moving the release valve handlever toward the front of the press, and return the ram by rotating the spike handwheels clockwise.

PRESS OPERATION AS A HYDRAULIC PRESS

Unless otherwise specified, all item numbers referred to in this section are taken from 2 Speed Hand Pump Assembly Drawing A-1-2433. (For more detailed descriptions of internal operation of handpump and cylinder, see separate headings.)

With the press completely assembled, including the attachment of the pump handle (Item 56) and the filling of the oil reservoir as described under the heading "Filling the Reservoir and Press Setup" the press is ready to be used hydraulically to its full capacity.

The two speed hand operated pump is equipped with two plungers. The smaller diameter plunger is for developing high hydraulic pressure with slow ram speed, the larger diameter plunger is used to supplement the output of the small diameter plunger for delivering a larger volume of fluid for faster ram movement at lower pressures. A speed selector key (Item #45) is provided on the two speed hand pump to select use or non-use of the high volume larger diameter plunger. The large diameter plunger is connected to and actuated by the pump handle when the speed selector key is in the "2" position, while the small diameter plunger is always connected to the pump handle.

The fast pumping feature can be put in or out of the circuit at will. Using correct speed selector key manipulation, force can be applied fast, to start; then shifted to low speed, high pressure to finish. For operations such as disassembly, high force can be applied slowly to start, (at low speed, high pressure) then shifted to high speed as desired. Always have pump handle in the bottom position when turning the speed selector key.

For the fastest operation of the ram, at a reduced pressing capacity, the spike handwheel can be used acting as a mechanical arbor press.

PRESS OPERATION AS A HYDRAULIC PRESS, Continued

With the release valve handlever (Item 65) in either position, advance the ram to contact the work piece by rotating the spike handwheel (C-1-2431 Item 7) counter-clockwise. Close the release valve by shifting the release valve handlever toward the rear of the press. When contact is made with the work, start pumping with the two speed hand pump. Tonnage will be developed with the very first stroke.

To operate most efficiently on pressures up to approximately 2500 PSI, use both pump plungers. This is accomplished by pushing pump handle down to the end of the stroke and turning the speed selector key (Item 45) clockwise to a horizontal position with the figure "2" visible (up). If after reaching approximately 2500 PSI, it is desired to go to higher pressures, push pump handle down to end of the stroke and turn the selector key counter-clockwise until the figure "1" is visible (up). This disengages the secondary (larger) plunger (Item 47), allowing the single plunger (Item 30) to develop the maximum capacity of the press.

NOTE: Always have pump handle in full bottom position when changing speed selector key position.

To release the pressure within the cylinder (generated by the two speed hand pump) and/or return the ram, shift the release valve handlever (Item 65) to the open position (toward the front of the press). This allows fluid to escape through the opened valve and return to the reservoir permitting the ram to be raised. The ram can be raised by rotating the spike handwheels (C-1-2431 Item 7) in a clockwise direction.

Using the press with the ram in as high a position as possible makes operation at high pressure more rigid, and tends to reduce side strain on ram.

The cylinder is equipped with a stroke limiting valve which will open and prevent the ram from exceeding its

PRESS OPERATION AS A HYDRAULIC PRESS, Continued

allowable stroke. Avoid using the press with the ram extended to its outermost position.

The pressure gauge is dual calibrated to indicate the PSI and tons of force exerted by the ram. Also incorporated in the circuit is a high pressure relief valve (C-1-2431 Item 2) which controls a preset maximum pressure that can be applied by the two speed hand pump.

CAUTION: NEVER set the system relief valve (C-1-2431 Item 2) higher than the maximum rated capacity of the press. This relief valve is factory set at the maximum press capacity. The relief valve can be set at any pressure less than the maximum press capacity by turning the handle while observing the hydraulic pressure gauge.

NEVER exceed the rated capacity of the press.

NEVER operate the press with the table supported by the winch cables.

NEVER allow hydraulic pressure to increase within the cylinder when the ram is not contacting resistance (the work). This indicates a faulty stroke limiting valve or binding within the cylinder. Damage to the cylinder could occur.

ADJUSTING RELIEF VALVE SETTING

(Refer to Drawing C-1-2431)

Incorporated in the circuit is a high pressure relief valve (Item 2). This valve controls a preset maximum pressure that can be applied by the two speed hand pump. This valve is factory set and should not be tampered with by inexperienced personnel.

To adjust this relief valve, center a pressure block capable of withstanding full tonnage below the ram. (The two "vee" blocks may be used simultaneously as a pressure block.)

> CAUTION: Never attempt to press using only one "V" block to resist the force; damage to the block will occur. Both "V" blocks must be used simultaneously.

Use the spike handwheel to advance the ram down to the pressure block. Shift the release valve handlever (A-1-2433 Item 65) to the "close" position (toward the rear of the press). Use the two speed handpump to increase pressure to the setting of the relief valve (Item 2) or the maximum capacity of the press, whichever is less. When the setting of the high pressure relief valve is reached, the system pressure will remain constant even though the handpump continues to be stroked.

To decrease the setting of the valve, rotate the handwheel on the relief valve (Item 2) counter-clockwise while observing the pressure gauge (Item 88). Continue to adjust until the desired setting, as viewed on the pressure gauge, is reached. Release pressure and test again. The relief valve may have to be readjusted a few times to get the desired setting.

To increase the setting, rotate the handwheel on the relief valve (Item 2) clockwise in small increments. After each increment, stroke the two speed handpump to increase system pressure to the setting of the relief valve.