Adjusting Relief Valve Setting, Continued

Continue to increase pressure in steps until the desired pressure setting is reached, as observed on the pressure gauge (Item 38). If the setting is exceeded, decrease the pressure setting as described in the preceeding paragraph. Release pressure and test. The relief valve may have to be readjusted a few times to get the desired setting.

CAUTION: The system relief valve (Item 2) should never be set 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 with the cylinder under pressure.

REPLACEMENT OF WINCH OR CABLE

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

Fasten cable drum assembly (Item 30) to left side of press using three 3/8" - 16 NC x 3/4" Lg. hex head cap screws. Put crank handle in place and turn drum until hex head cap screw in center of drum is pointing away from the press. Back out the screw approximately 5/16". Undo coil of steel cable (Item 28) and allow it to straighten out on floor.

Facing the left side of the press, pass one end of cable over left pulley (Item 1), over center pulley (Item 5) and over right pulley (Item 1) under the table pulley (Item 9) and up to the upper spacer (Item 2) on the side member (Item 22). Loop the cable around the spacer and fasten with a clamp (Item 27).

Again facing the left side of the press, pass the other end of the cable up over left pulley (Item 1) under the table pulley (Item 9) and up to the upper spacer (Item 2) on the side member (Item 26). Loop the cable around the spacer and fasten with a clamp (Item 27).

> NOTE: Press Model 37 (25 Ton) cables are single strung. Therefore, instead of the cable being passed under the table pulley, it is clamped to the table stud (Item 20). All presses except Model 37K (100 ton) were single strung prior to 1981.

This will leave a loop of cable 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. Tighten the screw to hold the cable eye in place.

REPLACEMENT OF WINCH OR CABLE, Continued

Holding the slack cable in one hand, turn the cable drum handle counter-clockwise until the slack is taken up. Guide the cable so it winds evenly on the cable drum. Raise the table (Item 8) to the desired position and insert the table pins (Item 11) until the stop pins (Item 10) (pointed downward) contact the side members (Items 22 & 26). Lower the table to rest on the table pins and leave slack in the cables.

NOTE: After raising or lowering table, always insert table pins (Item 11) far enough to insure full bearing for both plates.

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

SERVICING TWO SPEED HAND PUMP

(Refer to Drawing A-1-2433)

All valves in the pump are simple ball checks. If the pump is working improperly, the usual cause is dirt on one or more of the ball seats. Sometimes this problem can be solved without requiring disassembly. Open the release valve by shifting the release valve handlever (Item 65) toward the front of the press. Engage both pumps by turning the speed selector key (Item 45) clockwise until the figure "2" is visible (up) and stroke the pump several times rapidly to dislodge dirt from the ball seats. Close the release valve by shifting the release valve handlever (Item 65) toward the rear of the press, and test for leakage.

If leakage is still present, and it is not due to cylinder leakage (see Trouble Shooting Hydraulic Cylinder), the hand pump must be disassembled and serviced.

If the pump handle rebounds (raises) at the end of the pumping stroke, outlet ball check (Item 51) is leaking which is located under plug (Item 55) or pipe (Item 43). If the pump is being operated and no pressure develops, inlet ball check (Item 51) located under either pump plunger is leaking.

The two speed hand pump must be removed from the oil reservoir as a complete assembly. The oil must be drained from the oil reservoir by removing the drain plug (C-1-2431, Item 15).

> NOTE - The ram should be in its uppermost position displacing all of the oil from the cylinder before draining the reservoir.

When the oil is fully drained from the reservoir, disconnect the union (C-1-2431, Item 28), the right angle adapter (C-1-2431, Item 6) and drain line pipe (C-1-2431, Item 14). Remove 4 bolts (Item 1) holding the oil tank cover (Item 2) in place, 2 bolts (Item 42) holding the plunger guide (Item 40) in place, and 3 bolts (Item 53) holding the double plunger pump (Item 52) in place. Raise to remove the two speed hand pump assembly from the reservoir and place it in a clean area for further disassembly.

SERVICING TWO SPEED HAND PUMP, Continued

If the leakage is in the outlet ball checks, remove ball retainer (Item 50), plug (Item 55) and pipe (Item 43). Take out the two 1/2" balls (Item 51). Clean the parts and seats thoroughly and replace the balls on the seats. Place a bar of soft steel or brass over the balls and tap lightly with a hammer to reseat the balls. Replace the ball retainer (Item 50) and pour kerosene into the hole where the pipe was screwed in, until the kerosene is flush with the top of the hole. If this level is maintained for 30 seconds, the ball seats are satisfactory. If leakage is still present, repeat the cleaning and reseating procedure.

NOTE: This testing method will only work if all oil is drained out of the double pump plunger body (Item 52).

If the ball seats are satisfactory, replace the pipe plug (Item 55) and pipe (Item 43) and reassemble the pumping unit or continue on to service the inlet ball checks.

If the leakage is in the inlet ball checks, loosen the packing glands (Items 29 & 48). Engage both plungers (by turning the speed selector key clockwise until the Figure "2" is visible (up) and withdraw the plungers as a unit. Take out the two 1/2" balls (Item 51). Clean the parts and seats thoroughly. Take this opportunity to inspect the plunger packing for wear and replace if necessary. Replace the balls (Item 51) on the seats. Place a bar of soft steel or brass over the balls and tap lightly with a hammer to reseat the balls. Pour enough kerosene into each plunger hole to cover each ball. If this level is maintained for 30 seconds, the ball seats are satisfactory. If leakage is still present, repeat the cleaning and reseating procedure. If the ball seats are satisfactory, inspect the plungers for wear, apply a thin coating of hydraulic fluid to them, and reinsert them into the pump body through the packing.

SERVICING TWO SPEED HAND PUMP, Continued

Tighten the packing gland nuts (only moderate pressure on the nut is required to get proper sealing action). Check O-Ring Item (25) to see if it needs to be replaced. Check release valve assembly to determine if service is required. Reattach the two speed hand pump assembly to the oil reservoir. Reconnect the union (C-1-2431, Item 28), the right angle adapter (C-1-2431, Item 6) and drain line pipe (C-1-2431, Item 14). Insure all connections are tight and properly sealed so they will not leak.

Refill the reservoir with new or clean hydraulic fluid meeting the aforementioned fluid specifications. Test the pump assembly for proper operation.

If the pump still will not develop pressure within the system, check other components for leakage or consult the factory.

If oil is leaking past the pump plunger (Item 30 or 47), tighten the packing gland (Item 29 or 48). It is important that only enough pressure is applied to the packing to stop the leak. Overtightening could result in binding on the plunger and premature wear of the packing. If a moderate amount of tightening fails to stop the leak, replace with new packing (Items 28 & 49).

ADJUSTMENT AND SERVICING OF RELEASE VALVE

(Refer to Drawing A-1-2433)

If the release valve is not working properly, it may be necessary to adjust the linkage. Some adjustments require removal and disassembly of the pump, while others may be done while the pump is still mounted to the reservoir.

If the press will not release pressure, and release valve handlever (Item 65) can be shifted its full stroke easily, an external adjustment may be sufficient. To adjust the release valve, remove plug (Item 36) on the tank cover (Item 2). This will provide access to the control rack (Item 3). Hold the release valve handlever (Item 65) in the "open" position (toward the front of the press).

To get an approximate setting, insert a screwdriver in the slot in the control rack (Item 3) and rotate clockwise. Continue turning clockwise until the handlever begins to raise off its stop. If the handlever was already raised off its stop, turn the control rack several turns clockwise and test. Return the handlever to the close position (toward the rear of the press) and pressurize the cylinder. If the cylinder will not pressurize, give the control rack (Item 3) several counter-clockwise turns and test for pressure again. If the pressure cannot be released, give several additional clockwise turns and test again. Use only moderate force when adjusting the control rack, do not overtighten. If repeatedly adjusting the release valve does not allow pressurization, the release valve must be disassembled, inspected and cleaned. (See the latter part of this section for disassembly proceedure.)

When the cylinder is able to be pressurized, final adjustment of the control rack linkage can be made. With the cylinder pressurized, there should be approximately 1" of play in the release valve handlever (Item 65) before pressure is released. If there is less than 1" of play, adjust the control rack counterclockwise, if there is more than 1" of play, adjust the control rack clockwise. Pressurize and

ADJUSTMENT AND SERVICING OF RELEASE VALVE, Continued

release pressure several times, recheck setting.

If the press cannot increase pressure, there is no leakage in the cylinder (see Trouble Shooting Hydraulic Cylinder) and the pump handle does not rebound (raise) at the end of a pumping stroke, the problem may be either in the pump inlet ball checks (See servicing 2 speed hand pump) or in the release valve assembly.

If the release valve is at fault, an external adjustment may be sufficient. To determine if an external adjustment will help, place the release valve handlever (Item 65) in the "close" position (toward the rear of the press) and advance the ram using the spike handwheel. Then attempt to retract the ram (with the release valve handlever still in the "close" position) by rotating the spike handwheel clockwise. If the ram will not retract, this indicates the release valve is not fully open, although there may be dirt on the ball seats allowing pressure to bleed off. If the ram will retract, this indicates the release valve is fully open even though it is supposed to be closed. This may be corrected by resetting the external adjustment on the release valve linkage.

To externally adjust the release valve, remove plug (Item 36) on the tank cover (Item 12). This will provide access to the control rack (Item 3). Hold the release valve handlever (Item 65) in the open position (toward the front of the press).

To get an approximate setting, insert a screwdriver in the slot in the control rack (Item 3), and rotate counter-clockwise. The release valve handlever may move toward the "open" position. Continue turning counter-clockwise until the handlever has fully moved to its stop. If the handlever was already on its stop, turn the control rack several turns counter-clockwise and test. Return the handlever to the

ADJUSTMENT AND SERVICING OF RELEASE VALVE, Continued

close position (toward the rear of the press) and pressurize the cylinder. If the cylinder still will not pressurize, give the control rack (Item 3) several additional counter-clockwise turns and test for pressure again. Use only moderate force when adjusting the control rack, do not overtighten. If repeatedly adjusting the release valve does not allow pressurization, the release valve must be disassembled, inspected and cleaned. (See the latter part of this section for disassembly procedure.)

When the cylinder is able to be pressurized, final adjustment of the control rack linkage can be made. With the cylinder pressurized, there should be approximately 1" of play in the release valve handlever (Item 65) before pressure is released. If there is less than 1" of play, adjust the control rack counter-clockwise; if there is more than 1" of play, adjust the control rack clockwise. Pressurize and release pressure several times, recheck setting.

If it is determined that the release valve within the reservoir needs to be serviced or adjusted, the release valve and the two speed hand pump must be removed from the oil reservoir on units with a 3 gallon oil reservoir. On units with a 10 gallon oil reservoir, cleanout plate (Item 69) may be removed to service the valve.

The release valve and two speed hand pump must be removed from the oil reservoir as a complete assembly. The oil must be drained from the oil reservoir by removing the drain plug (C-1-2431, Item 15).

NOTE: The ram should be in its uppermost position displacing all of the oil from the cylinder before draining the reservoir.

When the oil is fully drained from the reservoir, disconnect the union (C-1-2431, Item 28), the right angle adapter (C-1-2431, Item 6) and drain line pipe (C-1-2431, Item 14). Remove 4 bolts (Item 1) holding the oil tank cover (Item 2) in place,

ADJUSTMENT AND SERVICING OF RELEASE VALVE, Continued

2 bolts (Item 42) holding the plunger guide (Item 40) in place, and 3 bolts (Item 53) holding the double plunger pump (Item 52) in place. Raise to remove the release valve and two speed hand pump assembly from the reservoir and place it in a clean area for further disassembly.

Inspect for bent, broken, or worn components.

To thoroughly clean the components of the release valve (Items 11 thru 27), the lower assembly must be disassembled. Remove cotter pin (Item 8) and hinge pin (Item 16). This frees the tripping bar (Item 19) from the control rod (Item 9). Pivot the tripping bar away from the release valve body (Item 11). Remove the push pin (Item 23) from the release valve body (Item 11). Place a wrench on reducer bushing (Item 10) and rotate the release valve body to unscrew it from the reducer bushing. Remove ball stop pin plug assembly (Item 12) and pipe plug (Item 27). Invert the valve body allowing ballast pin (Item 26), 1/4" diameter ball (Item 24) and the large ball (Item 13) to drop out. Clean all components thoroughly. Reseat the 1/4" diameter ball and the large ball by replacing them on their seat, placing a bar of soft steel or brass over the balls, and tapping lightly with a hammer. Replace the ball stop pin plug assembly (Item 12) and pour kerosene into the holes until it is flush with the top of the holes. If this level is maintained for 30 seconds, the ball seats are satisfactory. If leakage is still present, repeat the cleaning and reseating procedure.

If the ball seats are satisfactory, replace the ballast pin (Item 26) and pipe plug (Item 27). Reassemble the release valve body to the reducer bushing.

NOTE: Proper piping procedures should be followed to insure that there will be no leaks at any of the piping connections or around any of the pipe plugs.

ADJUSTMENT AND SERVICING OF RELEASE VALVE, Continued

Replace push pin (Item 23) and pivot the tripping bar (Item 19) toward the release valve body to hold the pin. Use the hinge pin (Item 16) to re-attach the tripping bar (Item 19) to the control rod (Item 9). Lock the hinge pin in place with the cotter pin (Item 8).

To check for proper operation of the release valve with the unit disassembled, place the release valve handlever (Item 65) in the closed position (away from the pump section). Apply shop air to one of the external pipe connections (the union (C-1-2431, Item 28) or the right angle adapter (C-1-2431, Item 15)) and plug the other connection. With the air pressure applied and the handlever in the "close" position, there should be no air leaks. Slowly bring the release valve handlever forward. After approximately an inch of travel, the small 1/4" diameter ball should lift off its seat allowing air to escape past push pin (Item 23). If the release valve handlever must be shifted more than or less than 1" nominal travel to release the small ball, the control rack should be adjusted. (See the control rack adjustment procedure described earlier in this section.) Continue to shift the handlever toward the full "open" position. Shortly after the small ball check is opened, the large ball check should open. If the large ball check is unseated before the small ball is unseated, the trip screw (Item 20) on the tripping bar (Item 19) must be adjusted.

NOTE: The trip screw (Item 20) is factory set and locked in place. This screw should not be adjusted unless the ball checks are not being unseated in proper sequence as described above and the release valve handlever (Item 65) is difficult to shift when holding pressure.

ADJUSTMENT AND SERVICING OF RELEASE VALVE, Continued

To adjust the trip screw (Item 20) on the tripping bar (Item 19), loosen lock nut (Item 21). Insert a screwdriver into the slot in the trip screw (Item 20) and rotate clockwise a small amount. Test the operation of the release valve as described in the preceeding paragraph. If the setting is still incorrect, continue to adjust the screw and test again. When proper adjustment of the trip screw (Item 20) is attained, lock the screw in place by tightening lock nut (Item 21). Disconnect the shop air and unplug the other line.

Take this opportunity to inspect and/or service the two speed hand pump (See "Servicing Two Speed Hand Pump").

Reattach the release valve and two speed hand pump assembly to the oil reservoir. Reconnect the union (C-1-2431, Item 28), the right angle adapter (C-1-2431, Item 6) and drain line pipe (C-1-2431, Item 14). Insure all connections are tight and properly sealed so they will not leak.

Refill the reservoir with new or clean hydraulic fluid meeting the aforementioned fluid specifications. Test the pump assembly for proper operation.

If the pump still will not develop pressure within the system, check other components for leakage or consult the factory.

REMOVAL OF PISTON ASSEMBLY

(Refer to Drawing C-1-2434)

If it is necessary to remove the piston assembly from cylinder, first move the release valve handlever (A-1-2433 Item 65) towards the front of the press into the "Open" position. Raise the ram to its top position, forcing most of the oil back into the oil reservoir. Disconnect union (C-1-2431 Item C-28) to vent the pipe, and prevent siphoning oil into the cylinder from the reservoir. Bring the ram (Item C-28) down against a support placed on the table. Remove the set screw which locks the pinion (Item C-15) in place and withdraw the pinion. Remove the cap screws (Items C-27) which hold the cylinder head in place. Lower the cylinder head down to the support on the table plate.

Two men are required to complete the disassembly. With one man supporting the piston assembly, lower the piston assembly out of cylinder by lowering table using the winch. Reverse operations to replace. Have a large pan under the table to catch any oil trapped within the cylinder.

Examine the piston seal for damage. Check the piston lock nut (Item C-2) to see that it is tight. Check the stroke limiting valve (Items C-20 thru C-25) to see if it is bent or broken. It may be unscrewed from the under side of piston and checked. (See Servicing Stroke Limiting Valve.)

NOTE: The lower piston seal (Item C-8) is not subjected to pressure and prevents air from entering the cylinder when the ram is brought down with the spike handwheel, allowing oil to be siphoned from the reservoir.

If the piston (Item C-7) is to be removed from the ram (Item C-28), remove lock nut (Item C-2), piston follower (Item C-4), upper cup (Item C-6), and piston (Item C-7) for inspection. When reassembling, be sure to put piston key (Item C-11) in place to hold stroke limiting valve in line with tripping well in cylinder head (Item C-14).

SERVICING STROKE LIMITING VALVE

(Refer to Drawing C-1-2434)

Remove spring (Item C-20), ball (Item C-22), and push pin (Item C-23) from valve in the above order.

Clean all parts throughly. Replace the ball (Item C-22) and reseat it by placing a bar of soft steel or brass over the ball and tapping the bar lightly with hammer. With the ball (Item C-22) in place, and the valve in a vertical position, fill the valve flush with the top with kerosene to test for leakage. If this level is maintained for 30 seconds, the ball seat is satisfactory. If leakage is present, repeat the cleaning and reseating procedure.

If the ball seat is satisfactory, remove the ball (Item C-22), replace the push pin (Item C-23), ball (Item C-22), and the spring (Item C-20). Screw the assembly tightly into piston.

TROUBLE SHOOTING THE HYDRAULIC CIRCUIT

Cleanliness and the proper oil is an absolute requirement for proper operation. Normally, any trouble in the hydraulic circuit can be attributed to dirt or lack of fluid. Each valve seat must have perfect contact with its mating ball and the valve seat should be as narrow as possible.

The following is intended as a test procedure for trouble in the system. The listing of possible causes for the difficulty is in order of the degree of probability. It is recommended that corrective procedures for any of the major headings listed below be performed in the sequence listed.

For corrective procedures for the various causes listed, refer to the heading for service or adjustment of the specific item involved.

1. OBSERVED DIFFICULTY: RAM MOVEMENT AND PRESSURE BUILDUP AT "2 PUMP" POSITION ONLY. CANNOT INCREASE PRESSURE AT "1 PUMP" POSITION.

   A. Faulty or dirty small diameter plunger inlet check valve seat.
   B. Faulty or dirty small diameter plunger outlet check valve seat. (Pump handle will rebound or raise at end of pumping stroke.)
   C. Improper relief valve setting
   D. Faulty or dirty relief valve seat
   E. Faulty piston seal
   F. Faulty stroke limiting valve in cylinder
   G. Piston lock nut loose
   H. Faulty or dirty release valve seat
   J. Release valve misadjusted

RE-ASSEMBLY OF PISTON AND RAM INTO CYLINDER

(Refer to Drawing C-1-2434)

Be sure all surfaces are clean before inserting piston and ram assembly into the cylinder. Carefully insert piston to avoid injury to the edge of the piston cup (Item C-6). As the lower cup (Item C-8) is about to enter cylinder, flare the edge of the cup with fingers to insure contact with the cylinder wall. Push the ram part way up into the cylinder and support. Replace the cylinder head (Item C-14) and pinion (Item C-15) and connect the union (C-1-2431 Item C-28). Move the ram up and down several times with spike handwheels until the cylinder has been filled with oil, and the air has been exhausted. Test for pressure before replacing drain pipe. If gauge indicates that pressure is being developed but not held, and no oil is apparent at the drain opening, check the release valve and two speed handpump assembly.

TROUBLE SHOOTING THE HYDRAULIC CIRCUIT, Continued

2. OBSERVED DIFFICULTY: PRESSURE WILL INCREASE, BUT MAXIMUM PRESS CAPACITY CANNOT BE REACHED.

   A. Improper relief valve setting
   B. Faulty or dirty relief valve seat
   C. Faulty or dirty small diameter plunger inlet valve seat
   D. Faulty or dirty small diameter plunger outlet valve seat. (Pump handle will rebound or raise at end of pumping stroke.)
   E. Faulty piston seal
   F. Faulty stroke limiting valve seat
   G. Piston lock nut loose
   H. Faulty or dirty release valve seat
   J. Release valve misadjusted

3. OBSERVED DIFFICULTY: RAM MOVES SLOWLY AT "2 PUMP" POSITION.

   A. Faulty or dirty large diameter plunger inlet check valve
   B. Faulty or dirty small diameter plunger inlet check valve. (Press will not increase pressure in "1 pump" position.)
   C. Faulty or dirty pump plunger outlet check valve (Pump handle will rebound or raise at end of pumping stroke.)
   D. Low oil level
   E. Improper relief valve setting
   F. Faulty or dirty relief valve seat
   G. Faulty piston seal
   H. Faulty stroke limiting valve in cylinder
   J. Piston lock nut loose
   K. Faulty or dirty release valve seat
   L. Release valve misadjusted

TROUBLE SHOOTING THE HYDRAULIC CIRCUIT, Continued

4. OBSERVED DIFFICULTY: PUMP HANDLE REBOUNDS OR LIFTS UP WHEN OPERATOR RELEASES IT.
   A. Faulty or dirty small diameter plunger outlet check valve seat. (Only small plunger will raise in "1 pump" position.)
   B. Faulty or dirty large diameter plunger outlet check valve seat. (Both plungers will raise when in "1 pump" position.)

5. OBSERVED DIFFICULTY: LEAKAGE OF FLUID AT THE BOTTOM OF THE PUMP PLUNGERS.
   A. Worn plunger packing
   B. Worn or damaged plunger

6. OBSERVED DIFFICULTY: CYLINDER PRESSURE INCREASES BEFORE CONTACTING WORK.
   A. (At full stroke) broken stroke limiting valve in cylinder
   B. Binding within cylinder

7. OBSERVED DIFFICULTY: NO RESISTANCE NOTED WHEN ADVANCING OR RETRACTING RAM THROUGH THE USE OF THE SPIKE HANDWHEEL.

   Note: Resistance is caused by restriction to movement of hydraulic fluid entering or leaving the cylinder.
   A. No oil in reservoir.
   B. Faulty or dirty stroke limiting valve
   C. Faulty lower piston seal
   D. Piston lock nut loose

8. OBSERVED DIFFICULTY: PRESSURE SLOW TO INCREASE OR CYLINDER OPERATION IRRATIC DUE TO AIR IN CYLINDER
   A. Faulty or dirty stroke limiting valve
   B. Faulty lower piston seal
   C. Piston lock nut loose

TROUBLE SHOOTING THE HYDRAULIC CIRCUIT, Continued

9. OBSERVED DIFFICULTY: PRESS WILL NOT RELEASE PRESSURE

   A. Release valve handle must be in "open" position
   B. Release valve misadjusted
   C. Release valve linkage broken

10. OBSERVED DIFFICULTY: RAM CANNOT BE RETRACTED BY SPIKE HANDWHEEL.

   A. Release valve handle must be in "open" position
   B. Release valve misadjusted
   C. Release valve linkage broken
   D. Binding within the cylinder

11. OBSERVED DIFFICULTY: PRESS RELEASES PRESSURE SLOWLY WHEN RELEASE VALVE OPENED.

   A. Release valve misadjusted (large ball check not opening)
   B. Release valve broken.

12. OBSERVED DIFFICULTY: RELEASE VALVE HANDLEVER DIFFICULT TO SHIFT (WHEN PRESS IS HOLDING PRESSURE).

   A. Release valve misadjusted (adjustment of trip screw at bottom of release valve in reservoir).
   B. Release valve broken (small ball not being opened).

TROUBLE SHOOTING HYDRAULIC CYLINDER

(Refer to Drawing C-1-2434)

There are six ways that fluid can escape from the cylinder. They are as follows:

1. Leaking piston seal (Item C-6)
2. Loose piston lock nut (Item C-2)
3. Through the stroke limiting valve (Items C-20 thru C-25)
4. Through pump outlet check valves
5. Through pumping unit release valve
6. Leaking pipe connections.

If a leak exists at the piston seal (Item C-6) or through the stroke limiting valve (Items C-20 thru C-25), fluid will flow into the reservoir through the cylinder bottom side return line into the top of the pump reservoir. Remove this line and check for oil flow. Remember that fluid will escape if the ram is extended to its maximum stroke limit.

A leaky stroke limiting valve can frequently be remedied by bringing the ram down until the valve contacts the bottom of the by-pass well in the cylinder head (Item C-14) and opens. The dirt may be dislodged by pumping at fast pumping speed several times after the stroke limiting valve opens.

> CAUTION: 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.

Hydraulic pressure should never be able to be increased unless the ram is contacting resistance (the work). Any hydraulic pressure increase, as shown on the hydraulic pressure gauge, when the ram is not contacting resistance (the work) indicates a faulty stroke limiting valve or binding within the