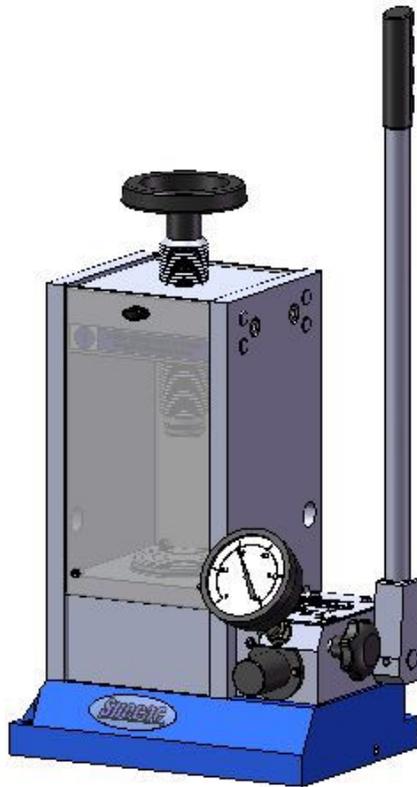


Sirius 0.5 Ton Manually Operated Hydraulic Press

User Manual



2I-508-016 Issue 3

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MANUALLY OPERATED HYDRAULIC PRESS

USER MANUAL

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1. Introduction

A 0.5 ton load manually operated hydraulic press has been designed by Specac for Sirius Analytical Instruments. It is to be used to provide the force needed for formation of 3mm pellets within a specific die set for dissolution studies.

This instruction manual is based upon the standard 15 and 25 ton manual hydraulic presses (P/N's GS15011 and GS25011 respectively) that are offered by Specac and so the majority of instructions and operation guidance within is consistent, but there are certain features regarding the 0.5 Ton press for Sirius that are different to the 15 and 25 Ton load capable presses.

As standard the Sirius press has a 0 to 0.5 Ton load gauge fixed directly to the pump block assembly. The maximum tonnage load that can be applied to this press is 0.5 Tons, indicated at the load gauge. To ensure safe operation and prevent overloading, the pressure relief valve assembly beneath the load gauge at the front of the press has been covered with a protective cap. As supplied from the factory the relief valve mechanism on this press has been set to vent off any excess oil pressure in the system that would lead to a load above a 0.5 Ton load indication at the load gauge.

These presses work by pumping a hydraulic fluid (oil) to raise a piston and compress a sample held in the pressing area. The press consists of a pump block assembly, where the oil is pressurized by the simple pumping action from a handle, and the sample pressing side, where the pressurized oil is forced under the piston assembly. When resistance is offered by a sample, the pressure build up in the system is shown on the 0.5 Ton load gauge, located on the pump block assembly.

This operating manual has been written in two main sections. The first section is for instruction on general everyday operation of the press. The second is for maintenance and routine servicing of the presses. Numbered parts are shown in the legend at the back of this manual.

2. Specifications of the Press.

Maximum Height (at pump handle)	610 mm
Maximum Width	310 mm
Maximum Depth	190 mm
Weight	50 Kg
Lower Piston Stroke	25.4 mm
Upper Lead Screw Travel	89 mm
Minimum Daylight (Distance Between Pressing Faces)	38 mm
Maximum Daylight (Distance Between Pressing Faces)	152 mm
Lower Pressing Face Diameter	86 mm
Upper Pressing Face Diameter	32 mm
Maximum Width Of Sampling Area (side to side)	134 mm
Maximum Depth Of Sampling Area (back to front)	141 mm
Oil Capacity	0.284 Liters (0.5 Pint)
Oil Type	CL 37

Section 1

General Operation of the Press

3. Unpacking and Installation

Beware: *This press is very heavy and care must be taken to transport it properly. This will protect you and the press from accident or injury.*

The Sirius 0.5 Ton press leaves the factory in specially designed packaging. It sits on a wooden pallet and has a thick outer cardboard casing held to the pallet by three tie straps. There are direction arrows on the casing indicating which way up the press is to be handled.

To unpack the press first cut the three straps with a sharp knife and lift up the outer cardboard casing from the pallet.

The press has internal transport packing around the top, by the lead screw handle. This packing is four pieces of cardboard stacked on top of each other, held tight by the lead screw handle and supporting the pump handle in an upright position. To remove these four pieces loosen the lead screw handle (turn anticlockwise) and then carefully lift them up and over the lead screw handle.

The press is now ready to be lifted off of the wooden pallet. There are two holes in the upright supports on the sample pressing side of the press (used for vacuum tubing when an evacuable pellet die is in the press). These two holes can be used to lift up and position the press by passing strong nylon rope through them to provide a sling. If available, a hoist can be used to lift the press via this sling. If a hoist is not available, then a minimum of two people will be required to lift the press. Use heavy-duty gloves and lift the press from underneath by the base casting. **DO NOT ATTEMPT TO LIFT THE PRESS BY THE LEAD SCREW HANDLE OR PUMP HANDLE.**

Place the press in its working position. In certain circumstances, it may be necessary to attach the press permanently to a laboratory bench. Two 10 mm diameter holes are provided in the base casting for this purpose. It is recommended that M8 diameter bolts are used to secure the press and that the bench top is at least 25 mm thick.

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The press is supplied filled with hydraulic oil and is ready to use. The only preparation required before operation is to remove the nylon vent screw (37) from the pump plate (36) of the pump block assembly. (Please refer to figure 3 at the back of this manual).

Note: A light smearing of oil is applied around the main pressing piston area (5) when the press is supplied as new. It is perfectly normal and not a sign that oil is leaking.

Please keep the press packing materials for future transportation. Replacing a press in its packaging is the reverse of the procedure described previously.

For any inquiries to Specac regarding the press the serial number must be quoted. The serial number is a five digit number preceded by a letter of the alphabet e.g. H, and is found engraved on the press at the rear of the pump block assembly. The serial number is also on the Test Certificate found at the rear of this manual.

4. Safety Considerations when Operating the Press

The Sirius 0.5 Ton press is provided with front and rear safety guards (65). These must be kept closed (lowered) at all times when a sample is being pressed. The guards will fall to the lowered, safe position if not purposefully raised or kept open by other means.

Note:

The use of press guards is a requirement for high tonnage applications. There is no requirement for their use with the Specac Film making kits P/N's 15620 and 15800.

When using a film making kit without press guards it is a requirement that the pressure relief valve (66 to 73) on the 15 and 25 Ton manual hydraulic presses is adjusted to read a 2 Tons maximum load at the load gauge (31).

If you ever need to move or reposition the press, always lift it from underneath the base casting (1). Do not move it by pulling or lifting the pump handle (32), load gauge (31), or lead screw handle (20). It is recommended that a minimum of two people are used to lift or move the press.

5. Operation of the Press

(This text refers to the figures 1 to 6 found at the back of this manual).

The Sirius 0.5 Ton press is supplied filled with hydraulic oil and is ready to use. The only preparation required before operation is to remove the nylon vent screw (37) from the pump plate (36) of the pump block assembly. (Please refer to figure 3 at the back of this manual).

Raise the front safety guard (65) and place the work to be pressed on the lower bolster pressing face (5) covering the piston (4). Ensure that the work is positioned centrally and lower the safety guard. Screw down the top bolster pressing face (23) attached to the lead screw (21), by turning the lead screw handle (20) clockwise.

Important: *Ensure that all the components of the work to be pressed have been squeezed tightly together before starting to pump.*

Rotate the pressure release handle (30) clockwise until it has tightened firmly. This closes the pumping system so that it is ready for you to build up the pressure with the pump handle grip (33).

Warning: *Ensure that the safety guard is lowered before pumping.*

Now start to pump the press by pulling and pushing gently, but smoothly, on the pump handle grip (33). (The correct leverage and force is applied by holding at the rubber handle.)

It will take a few strokes to build up pressure in the oil, but once resistance is offered by the work to the raising of the piston, the load will be indicated on the load gauge (31). Keep on pumping until the required load is achieved.

There is a maximum piston travel of 25 mm. There is a red ring around the piston to show when this limit has been reached. DO NOT

CONTINUE PUMPING WHEN THIS RED RING SHOWS. If you do not stop pumping, you will cause damage to the press mechanism.

There is an internal spring stud (16) that is designed to break, protecting the press if the allowed piston travel is exceeded. This spring stud (16) allows the action of the piston spring (19), to pull the piston (4) back down when the pressure in the system is released. If the stud is broken, the spring is not compressed when the piston is pumped. Therefore, if the stud is broken the piston will not return easily to the start position once the pressure is released.

If the work being pressed is compressing to the extent that the piston is travelling its maximum distance, release the pressure by turning the pressure release handle (30) anticlockwise by about one complete rotation. This will allow the piston to return to rest. The work will sink down with the piston and a gap will be created between the work and the top bolster pressing face (23). Turn the lead screw handle (20) clockwise to bring the top bolster pressing face onto the work again, and reapply the load from the piston (tighten pressure release handle (30) and pump via pump handle (33)). This procedure should be followed with samples that are highly compacted when compressed within an evacuable pellet die.

When the required load is indicated on the load gauge (31) stop pumping. You can hold the pressure for as long as required by your application. You may observe a slight decrease in the pressure applied, indicated at the gauge, as the work being pressed may relax over time. You can bring the pressure back up to the required load by pulling gently on the pump handle grip (33).

To release the load on the work turn the pressure release handle (30) anticlockwise by about one complete rotation. There is no need to turn this handle completely open.

6. *Fault Finding, Causes and Remedy*

The Sirius 0.5 Ton manual hydraulic press should give years of trouble free operation, if used and cared for correctly. However, if there is complete failure of the press operation, it is recommended that you contact your local Specac representative immediately.

However, certain faults can be easily identified and repaired without returning the press to Specac. The following information is provided to identify faults and carry out the necessary repairs and adjustments should you decide to do so.

Fault: Loss of pressure in the pumping system

Cause 1: **Oil seal or gasket has failed.** This will be evident by excessive oil leaks around the piston, cylinder block, or pump block.

Remedy: It may only be necessary to re-tighten the six cylinder block securing screws (3), and the four pump block securing screws (29). If the oil leak continues, it will be necessary to renew the individual seal(s) and gasket(s), depending on age and usage. (Seals and gaskets that may need replacing are numbered 8, 9 (2 off), 11, 27, 28, 38, 43, 44, 57 and 67. They are all included in the 15 and 25 ton press seal kit (15100).) For instructions on how to replace these seals and gaskets follow the relevant sections in the maintenance section of this manual.

Cause 2: **Non-return valve is leaking.** (This is a ball bearing (50) trapped in position by the load gauge (31).) It is likely that the non-return valve ball bearing (50) is not seating correctly due to foreign matter adhering to the seat or the ball.

Remedy: By pumping the press without the pressure release handle (30) tightened, the foreign matter may be removed from the valve seat by a flow of oil washing through the system.

Pump the press about ten times. If this does not work, then you will need to gain access to the non-return valve ball bearing (50) for inspection. The procedure to gain access to this ball bearing is in the maintenance section of this manual.

Cause 3: **Release valve leaking.** (This is a ball bearing (58) trapped behind the pressure release handle (30).) It is likely that the ball bearing (58) is not seating correctly due to foreign matter adhering to the seat or to the ball.

Remedy: Similar to the non-return valve procedure, pumping the press without the pressure release handle (30) tightened may remove the foreign matter from the valve seat by a flow of oil washing through the system. Pump the press about ten times. If this does not work, you will need to gain access to the ball bearing (58) for inspection. Unscrew the pressure release handle (30) completely. A small dribble of oil may flow from the hole when the release handle assembly (30) is removed, but the amount lost is not significant. Check the O-ring (57) for signs of wear or cracks etc and replace if necessary. The ball bearing (58) can be seen inside the hole resting in the area of the valve seat. To remove the ball bearing the press needs to be tipped over slightly, allowing the ball to roll out. Be careful when lifting the press as it is heavy, and also be careful not to lose the ball bearing if it rolls out onto the work bench. Inspect the ball bearing, clean and replace in the hole. Ensure that it rolls back into its valve seat area. Replace the pressure release handle (30), tighten and repump.

Fault: Failure to achieve pressure in the pumping system

Cause 4: **Non-return valve is leaking.**

Remedy: The same procedure is used as for Cause 2.

Cause 5: **The oil filter (55) is blocked.**

Remedy: The procedure to gain access to the oil filter (55) for cleaning and/or replacement is in the maintenance section of this manual.

Cause 6: Airlock in pump assembly.

Remedy: The pump block assembly and possibly the piston side of the press must be bled of air trapped within the oil. The procedure can be split into two distinct operations: Bleeding air from the pump block assembly (below) and bleeding air from the piston assembly (next page)

Bleeding air from the pump block assembly.

To gain access to the oil bleed screw (40), the pump plate (36) must first be removed. Loosen and remove the four securing screws and lift the pump plate and the pump block upper gasket (38) clear. Be careful not to tear the gasket material. Loosen, but do not remove the oil bleed screw (40) by turning anticlockwise.

Take a piece of work (for example, a block of metal) and place it into the pressing area on the lower pressing face, and press it in the usual way (Close pressure release handle (30) and pump via the pump handle (33)). As the pressure tries to build up in the system, any trapped air in the pump block will start to bubble out from the opened oil bleed screw (40). Keep on pumping until the oil flows clearly, without bubbling. Retighten the bleed screw (40) and wipe away any expelled oil. Now release the pressure from the system (open the pressure release handle (30)) and remove the work from the press. Carefully replace the pump block upper gasket (38) and the pump plate (36) and secure with the four fixing screws.

The pump block assembly side of the press has now been primed and purged of air in the oil. The press may now operate but it is advisable to also purge the piston side of the press.

Bleeding air from the piston assembly

The pump block assembly side of the press should have already been purged of air (see previous page). If any trapped air remains in the system, it will be in the piston pressing side of the press.

There is a second oil bleed screw (6) on the top of the piston (4). Remove the lower bolster pressing face (5) on the piston, to gain access to the bleed screw (6). (The bolster simply lifts clear of the piston. There may be some suction due to a thin film of oil on the bolster and piston contact faces). Loosen, but do not remove this bleed screw and take a piece of work (e.g. a block of metal) and place it on the piston (4), but do not obscure the bleed screw. Press the work in the usual way. As pressure tries to build up in the system, any trapped air in the piston will start to bubble out from the open oil bleed screw (6). Keep on pumping until the oil flows clearly, without bubbling. Retighten the bleed screw (6) and wipe away any expelled oil. Now release the pressure from the system (open the pressure release handle (30)) and remove the work from the press. Replace the lower pressing face bolster (5) onto the piston (4).

The piston pressing side of the press has now been primed and purged of air.

Fault: Piston does not return when pressure is released

Cause 7: **Foreign matter has become lodged between the piston (4) and the cylinder block (2).**

Remedy: It will be necessary to remove the piston and clean or replace any damaged parts. The procedure to do this is in the maintenance section of this manual.

Cause 8: **The piston has been pumped beyond the warning red ring causing damage to the return mechanism.**

Remedy: It will be necessary to remove the piston and clean or replace any damaged parts. The procedure to do this is in the maintenance section of this manual.

Section 2

*Maintenance, Dismantling and Reassembly of
the Press for Fault Corrections*

Maintenance, Dismantling and Reassembly of the Press for Fault Corrections

This section of the manual is to be used if you need to carry out any repair work to correct any observed faults in operation of the press.

In any instance where the level of repair work required is for skilled service engineers only, or if the press is under warranty, then Specac, or the representative of Specac that supplied the press, should be consulted.

7. The Pump Block Assembly

The following instructions allow you to remove the pump block assembly to gain access for the inspection and replacement of the seals and gaskets (27, 28, 38, 43 and 44). (See Cause 1 in Fault Finding, Section 1).

The seal (57) is part of the pressure release handle assembly (30), and the seal (67) is part of the pressure relief valve assembly. Both of these sub-assemblies can be removed independently from the pump block assembly for inspection and replacement of parts. (The pump block assembly does not need to be removed from the press to carry out these operations.)

Caution: *If you remove the pressure relief valve assembly from the pump block beware that you do not lose any of the 24 1/16" ball bearings (72). The bearings are situated in grooves, as two rings of 12, and are held in position by a thin film of grease.*

If you are not certain that malfunction of the press is due to the pressure relief valve, then it may be best to only remove the relief valve set knob (69) (turn fully anticlockwise), to check the ball bearing (70) and spring (71). Do not remove the pressure relief valve assembly from the pump block assembly but consult Specac.

For any repair to the press parts, it is easier to work on the press with the front and rear safety guards (65) removed. This is achieved by loosening and removing the two screw stop assemblies at the base of the guards, allowing them to be pulled up and out of their running grooves from the top of the press. You MUST replace these guards again before using the press for any pressing operations.

Removal of the Pump Block Piston

To remove the pump block piston (42), in order to gain access to the seal (43) and O-ring (44), it is not necessary to remove the pump block assembly from the press. However, it is necessary to remove the pump handle (32) and crank assembly (60 to 64). (You can use the following procedure, even if the pump block assembly has been removed from the press.)

The pump plate (36) must be removed from the pump block assembly by undoing the four securing screws. (This is the same procedure involved for bleeding air from the pump block assembly). Carefully remove the pump block upper gasket (38), inspect and replace if necessary.

Turn the press so you can gain access to the rear. Move the pump handle so that it is fully upright and at a 90 degree angle to the pump piston (42). You will then see two roll spiral fixing pins (63), one that attaches the pump handle (32) through the crank shaft (61), and a second that passes through the crank (60) and crank shaft (61). You will need to remove this second spiral pin (63). Use a 5.0 mm stainless steel rod, or punch, and hammer to tap it through completely (there is a special recess hole in the pump block to accommodate the spiral pin as it is knocked through), whilst ensuring that the pump handle (32) remains fully upright.

The crank shaft (61) is now only connected to the pump handle (32), and this assembly is pulled out through the two crank shaft bushes (62) and removed from the pump block. (This is a tight fit and might require a slight backward and forward motion of the pump handle (32).) You can now pull the pump piston (42) completely out of the pump, along with the crank (60) and the crank pin (64).

Important: *The spiral pin (63) will now be seen in the recess hole. Remove this pin and inspect. It may be usable for reassembly, if not replace with a new one. It is important to remove it from the recess hole before reassembly because the accommodation recess would*

already be filled the next time you needed to tap out the spiral pin (63) from the crank (64) connection.

To gain access to the pump piston seal (43) and O-ring (44), the pump piston sealing housing (45) is removed by undoing the four screws (47). The O-ring (44) is contained within the housing (45), and the seal (43) is retained in the pump block. Inspect both seal and O-ring for wear and replace if necessary. (It is usually worthwhile replacing these parts whilst you have access to them.) Take care to replace the piston seal (43) in the correct way. One face of the seal is flat and the other face has a groove. The grooved face of the seal is inserted into the pump block, and when the housing (45) is replaced, the flat faces of the seal and the housing are in contact with each other. When re-tightening the four screws (47) do not over tighten them, as they will squash the piston seal (43) and make it difficult to reinsert the pump block piston (42). Test the tightness by inserting the pump block piston (42), prior to reassembly of the crank mechanism.

Reassembly of the pump block piston (42), crank assembly (60 to 64), and pump handle is the reverse procedure to the above. Slide the crank pin (64), still fixed to the crank (60), into the U shaped part of the pump block piston (42). Push the piston (42) into the pump block piston housing (45), with the crank pieces attached, until the crank (60) is in its upright position. Now slide the crank shaft (61) and pump handle (32) assembly back through the crank shaft bearings (62), so that it also passes through the crank (60). Realign the crank shaft (61) (pump handle (32) is fully upright) and the crank (60) such that both parts will accept the spiral pin (63), to reattach the crank (60) to the crank shaft (61). Tap the spiral pin (63) back into position to secure.

Removal Of The Pump Block Assembly

To remove the pump block assembly from the base casting (1), you need to undo the four M10 pump block screws (29). Keep the press upright and very carefully move the press to the edge of a workbench to gain access to the screws from the underside. (It is highly recommended that two people are used for this operation). Whilst one person holds and secures the press, the second can loosen and remove the pump block screws using an 8 mm Allen key.

Tip: *To get sufficient leverage on the Allen key to start the movement of the screws you could extend the key handle by sliding a piece of steel tubing over the end. Once the screw has been started then only the Allen key will be required to continue with the screw removal.*

When the screws have been removed push the press back away from the edge of the workbench to make safe.

The pump block assembly can now be lifted away from the base casting (1), taking care not to damage the pump block lower gasket (27). There may be some seepage of oil, but normally the oil will be level with the top of the base casting (1). If the lower pump block gasket (27) is damaged it can be replaced now. Remove the old gasket and ensure the contact faces of the base casting and pump block are clean before reassembly.

Important: *The pump block O-ring (28) must also be inspected now. We recommend that this O-ring is replaced whenever the pump block assembly has been removed.*

Oil Filter Assembly

The removed pump block assembly will have the load gauge (31), pump handle (32), pressure release handle (30), the pressure relief valve (66 to 73) and the oil filter intake assembly (51 to 56) attached to it.

If you suspect that the oil intake filter (55) is blocked, (found with old presses and old oil), then you can check this now. The oil intake pipe (54) is unscrewed from the pump block. The non-return valve ball bearing (52) sits in the recess at the top of the oil intake pipe and comes away with the removed pipe. The oil intake seal (53) may also come away with the removed pipe (54). Check that the ball is clean and that there are no blockages in the pipe (54) and filter gauze (55). Clean if necessary. Replacement of the oil intake pipe to the pump block is the reverse procedure. Make sure that the oil intake seal (53) is in position when retightening.

Pressure Gauge Removal

If you suspect that the non-return valve ball bearing (50) under the load gauge (31) is not seating properly (See Cause 2 in Fault Finding at Section 1 of this manual), then you can inspect it with this procedure.

Loosen the gauge connector (39), then carefully remove the pressure gauge (31) and put by for safe keeping. The gauge connector (39) is then removed from the pump block assembly. Behind the connector there is the non-return valve spring (49), and under this there is the non-return valve ball bearing (50). Remove the spring (49) to allow the ball (50) to roll out of its seating. Inspect for signs of wear and clean, or replace if necessary.

Reassembly is the reverse procedure to above. It may be necessary to reseat the ball bearing in its valve seating. When replaced in the pump block assembly, reseat it with a very light tap using a suitable metal punch.

Pressure Relief Valve Removal

As previously stated, if you remove and disassemble the pressure relief valve from the pump block assembly, you must be careful not to lose the 1/16" ball bearings (72) that assist in the relief valve plunger (68) travel. However, it may be necessary at some stage to replace the relief valve seal (67). This is achieved by unscrewing the pressure relief valve body (66) assembly via its 19 mm hexagonal nut, and

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pulling it out from the pump block assembly. The O-ring seal (67) can then be prized off of the body (66) and be replaced.

On removal of the pressure relief valve body (66) assembly, it is usual for the relief valve seating (73) to remain in the pump block assembly. Before replacing the pressure relief valve body (66) assembly (with a new O-ring seal (67)) into the pump block assembly, ensure that the relief valve seating (73) is in its correct upright position within the pump block assembly. Carefully insert the pressure relief valve body (66) assembly and retighten the 19 mm hexagonal nut.

8. *The Piston and Cylinder Assembly*

Should a fault develop that is suspected to be due to worn seals in the piston and cylinder block, or to the failure of the return mechanism (See Cause 1, Cause 7 and Cause 8 in Fault Finding, Section 1), then it will be necessary to remove the piston from the cylinder block.

This is a major procedure and will require removal of the pump block assembly from the base casting (1) (see Removal of Pump Block Assembly in Sections 2 - 7).

When the pump block assembly has been removed (and the pump block lower gasket (27)), the piston lower bolster (5) should be removed and the oil should be drained out from the base casting (1).

The piston lower bolster (5) is removed from the piston (4) by prizing it up from the piston with a thin flat bladed screwdriver, placed through the slot in the rear of the piston. Now, tip the press over and allow the oil to spill into a container (for example, a flat tray). You will not remove all of the oil at this stage, as some will remain in the piston (4) and the base casting (1) under the cylinder block (2). This remaining oil will be ejected when the piston is removed.

Turn the press over onto its back side to gain access to the three M6 caphead spring housing screws (14) from underneath the base casting. Remove these three M6 caphead screws (14) using a 5 mm Allen key. (You may need to use a piece of tubing over the Allen key to extend its leverage and loosen the screw). The copper sealing washer (13) may come away with the screw (14), but if it does not it can be removed by tapping it with the 5 mm stainless steel rod, or punch, and a hammer. (New copper washers, supplied in the O-ring and seals kit (15100), must be used when replacing the three M6 caphead screws (14)).

Now remove the six M12 cylinder block screws (3) using the 10 mm Allen key. (Once again, a piece of tubing over the key to extend its leverage may help loosen the screws).

Note: Be very careful as you remove the last screw (3) as the base casting (1) is heavy and could shift in position as it is loosened from the press.

The base casting (1) can now be removed from the press and put to one side (TAKE CARE AS IT IS HEAVY).

The piston assembly can now be removed carefully from the cylinder block, by pushing it through from above with a block of metal and turning of the lead screw (21). If the piston (4) is stuck in position, you can tap it through the cylinder block (2) using a rubber headed mallet. Now inspect and change the two piston seals (9) on the piston (4). The “wiper” O-ring seal (8) contained within the cylinder block (2) must also be replaced, as must the main cylinder block O-ring (11).

Clean and inspect all of the parts and reassemble using the reverse procedure, which follows.

Note: *Make sure that the hole and oil bleed screw (6) on the piston (4) is towards the front of the press when reinserting into the cylinder block (2). This allows for easier access to the bleed screw (6) when bleeding any air out of the oil in the piston.*

Slide the piston assembly carefully up from below into the cylinder block (2), use the specified oil (15101) to lightly lubricate the piston (4). Replace the base casting (1) and loosely reconnect the spring housing screws (14) and copper washers (13), while you can see the location holes in the spring housing (12). Refit the six cylinder block screws (3) and tighten in rotation (in a diagonally opposite sequence) to a torque of 110 lb/ft. Then tighten the three spring housing screws (14) and copper washers (13) until sealed.

Stand the press upright, refit the pump block assembly and fill with oil.

The Piston Assembly

If the return mechanism has failed in the press, it is most probably due to a broken spring stud (16). When the piston has been removed from the cylinder block, you can gain access to the spring stud by further disassembly of the piston and return spring assembly.

Remove the piston as described previously (Section 2 - 8). Take the piston, invert it and hold it in a vice with protective jaws. If the spring stud (16) is broken, then it will have sheared at its constriction point. The small locking nut (17), washer and 30 mm spring nut (18) will be attached to the broken-off piece. Remove these parts and then pull out the spring spacer (15), piston spring (19), and spring housing (12). You will see the remains of the broken spring stud (16) screwed into the piston (4). Using strong grips, unscrew the broken stud out of the piston (4) anticlockwise.

Now reassemble the piston and return spring assembly. Take a new spring stud (16) and screw the shorter length of thread into the piston (4) as far as it will go. (The notched groove constriction in the spring stud is at the opposite end of the piston face.) Insert the spring housing (12), smaller diameter aperture first, over the spring stud (16) and into the piston (4). Insert the piston spring (19) and then the spring spacer (15). (The small drilled holes on the spring spacer are also at the opposite end of the piston face.) Take the 30 mm spring nut (18) and tighten onto the thread of the spring stud (16) until the spring is compressed level with the depth of the spring spacer (15). DO NOT OVERTIGHTEN. (You will have had to remove the spring nut (18), washer and locking nut (17) from the broken spring stud piece). Finish by placing the washer and locking nut (17) in position.

The piston and return spring assembly can now be placed back into the cylinder block (2) as in the procedure described at 2 - 8.

9. *The Top Bolster Assembly*

If the lead screw top bolster (23), or the lead screw (21) and handle (20) assembly, become damaged they will need to be replaced. Damage is unlikely, as these components are extremely robust.

The lead screw top bolster (23) is held in the lead screw by an O-ring (22), which allows for easy removal if, for example, a heated top platen is used. The bolster simply pulls free of the lead screw and the new one is pushed into place.

The lead screw (21) may become stiff to turn. This could be due to the thread being damaged, or clogged with dirt. Remove the lead screw by unscrewing it out completely at the top support, and clean and examine. If the thread is damaged, small burrs may be removed with a small file. If damage is extensive, it is best to replace with a new lead screw (21) and handle (20) assembly.

On reassembly of the lead screw into the top support, ensure that the threads are clean and smeared with a light oil.

10. Preparing the Press for use after Reassembly

Whenever any work has been done on the press involving the procedures in Section 2 it will be necessary to check and prepare the press as follows.

Filling with Oil

The press is filled with half a pint of Shell Tellus type 37 oil. To fill the press, remove the pump plate (36) and pump block upper gasket (38). Remove the piston lower bolster pressing face (5) and slacken bleed screws (6) and (40).

Pour the oil into the large hole in the top of the pump block, until the level of oil can be seen approximately 2" from the top of the pump block. (The level will then be approximately at the pump block lower gasket (27), between the top of the base casting (1) and the pump block assembly.)

Now bleed any air from the press. (See Section 1, 5. Fault Finding, Causes and Remedy, Cause 6). Check the oil level, top up if necessary and repeat the procedure for bleeding air out of the oil.

Replace the pump block upper gasket (38) and the pump plate (36).

Checking Piston Travel

Close the system (close the pressure release handle (30)) and without any work in the press, pump until the piston (4) rises to 25mm above the cylinder block (2). At this height a red ring will appear around the piston (4). STOP PUMPING WHEN THIS RED RING APPEARS.

Open the pressure release handle (30) and the piston will slowly return to its lowest position. After new O-rings have been fitted the piston movement may be a little sticky, so it may be necessary to aid the piston return by use of a block of metal and turning the lead screw

User Manual

(21). Repeat this procedure a few times and it will be found that the piston will return without assistance as the piston seals “bed in”.

11. Legend

Item	Description	Item	Description
1	Base casting	28	Pump block O-ring
2	Cylinder block	29	Pump block screw * (4 off)
3	Cylinder block screw * (6 off)	30	Pressure release handle *
4	Piston	31	Load gauge
5	Piston lower bolster	32	Pump handle
6	Piston bleed screw *	33	Pump handle grip
7	Bleed ball 3/16" dia.	34	Upright screw * (8 off)
8	Piston wiper O-ring	35	Upright dowel (16 off)
9	Piston O-ring (2 off)	36	Pump plate
10	Upright screw * (4 off)	37	Pump vent screw (not needed)
11	Cylinder block O-ring	38	Pump block upper gasket
12	Spring housing *	39	Gauge connector
13	Copper sealing washer (3 off)	40	Pump bleed screw *
14	Piston spring housing screw * (3 off)	41	Bleed ball 3/16" dia.
15	Piston spring spacer	42	Pump piston
16	Piston spring stud *	43	Pump piston seal
17	Piston spring nut *	44	Pump piston O-ring
18	Piston spring washer (not needed)	45	Pump piston sealing housing
19	Piston spring	46	Pump piston gasket (not needed)
20	Lead screw handle	47	Pump piston screws * (4 off)
21	Lead screw	48	Pressure gauge seal
22	Lead screw top bolster O-ring	49	Non-return valve spring
23	Lead screw top bolster	50	Non-return valve ball 9/32" dia.
24	Oilway plug seal ball 9/32" dia.	51	Inlet ball stop
25	Oilway plug screw *	52	Non-return valve ball 9/32" dia.
26	Pump block *		
27	Pump block lower gasket		

User Manual

Item	Description	Item	Description
53	Oil intake seal (2 off)	64	Crank pin
54	Oil intake pipe	65	Safety guard
55	Oil intake filter	66	Relief valve body
56	Oil intake circlip	67	Relief valve seal
57	Release handle O-ring	68	Relief valve plunger
58	Release ball 9/32" dia.	69	Relief valve set knob
59	Crank pin circlip	70	Relief valve ball 3/8" dia.
60	Crank	71	Relief valve spring
61	Crank shaft	72	Relief valve ball 1/16" dia (24 off)
62	Crank shaft bearing (2 off)	73	Relief valve seating
63	Crank fixing spiral pin (2 off)		

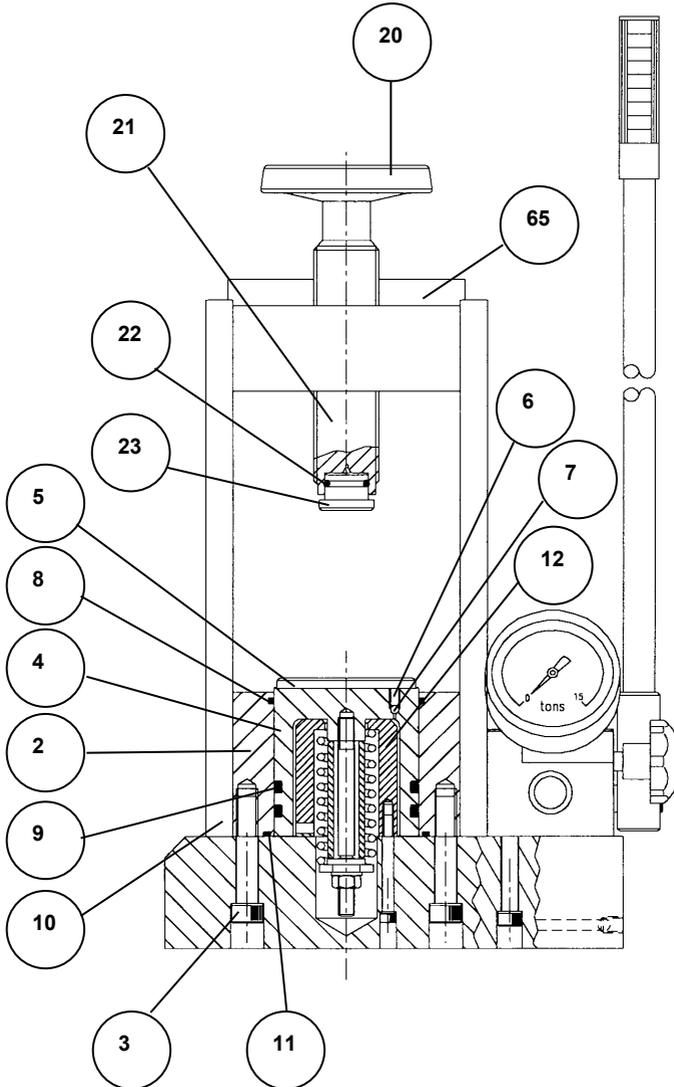
For those not wishing to strip down the piston assembly and/or the pump block assembly, Specac can supply these two items, built and tested.

Note: *When ordering spares, you must include a full description of the item (from the parts list) and where marked with an asterisk * also provide the serial number of your press.*

Parts 20 and 21 (lead screw handle and lead screw) are supplied as a complete assembly.

Sirius 0.5 Ton Manually Operated Hydraulic Press

Fig 1a: Front View of Manual Hydraulic Press



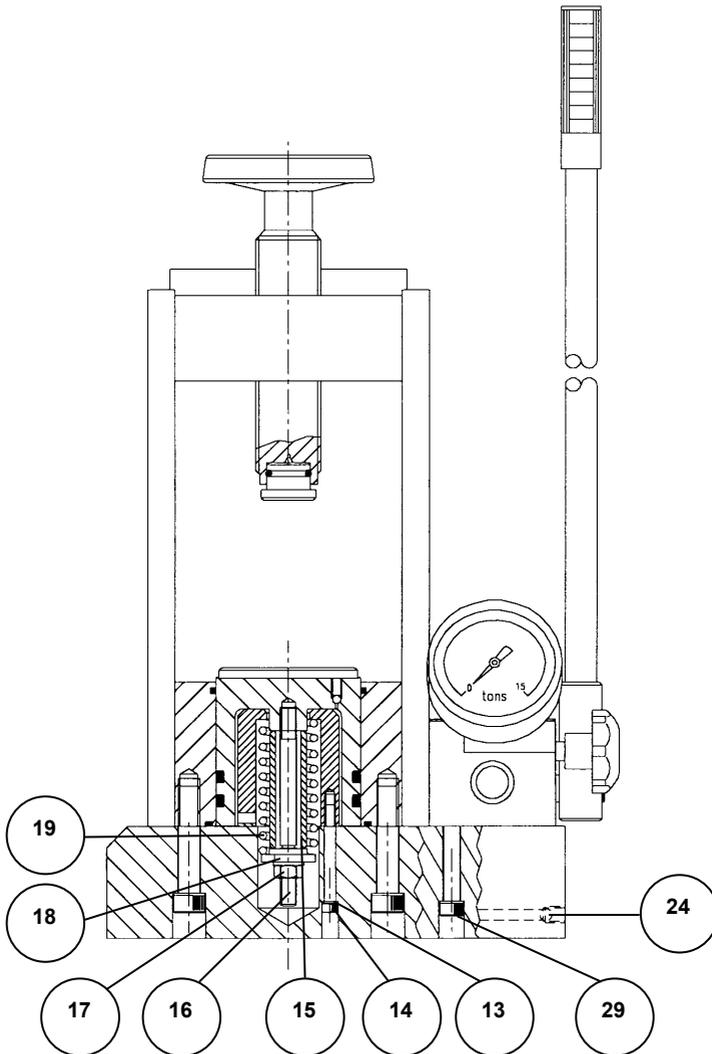


Fig 1b: Front View of Manual Hydraulic Press

Sirius 0.5 Ton Manually Operated Hydraulic Press

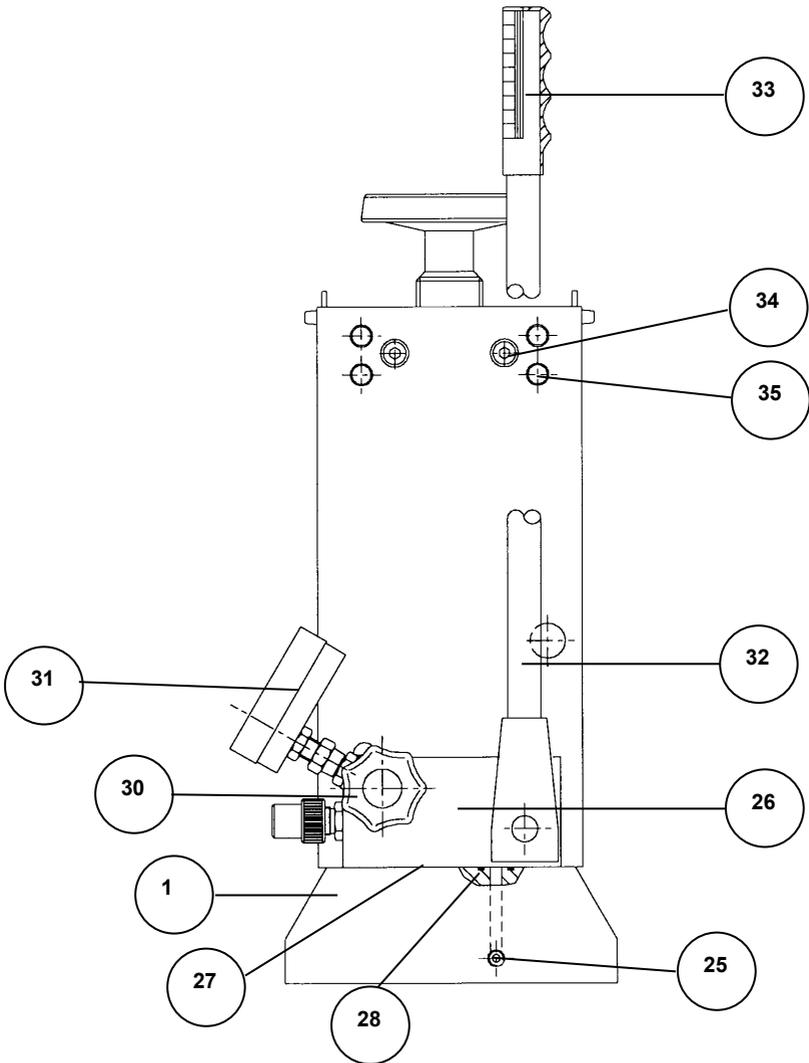


Fig 2: Side View of Manual Hydraulic Press

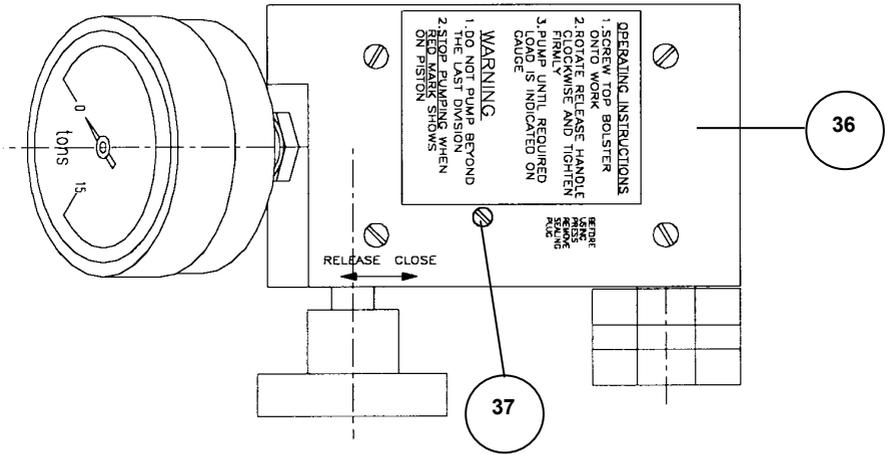


Fig 3: Details (Top) of Pump Block Assembly

Sirius 0.5 Ton Manually Operated Hydraulic Press

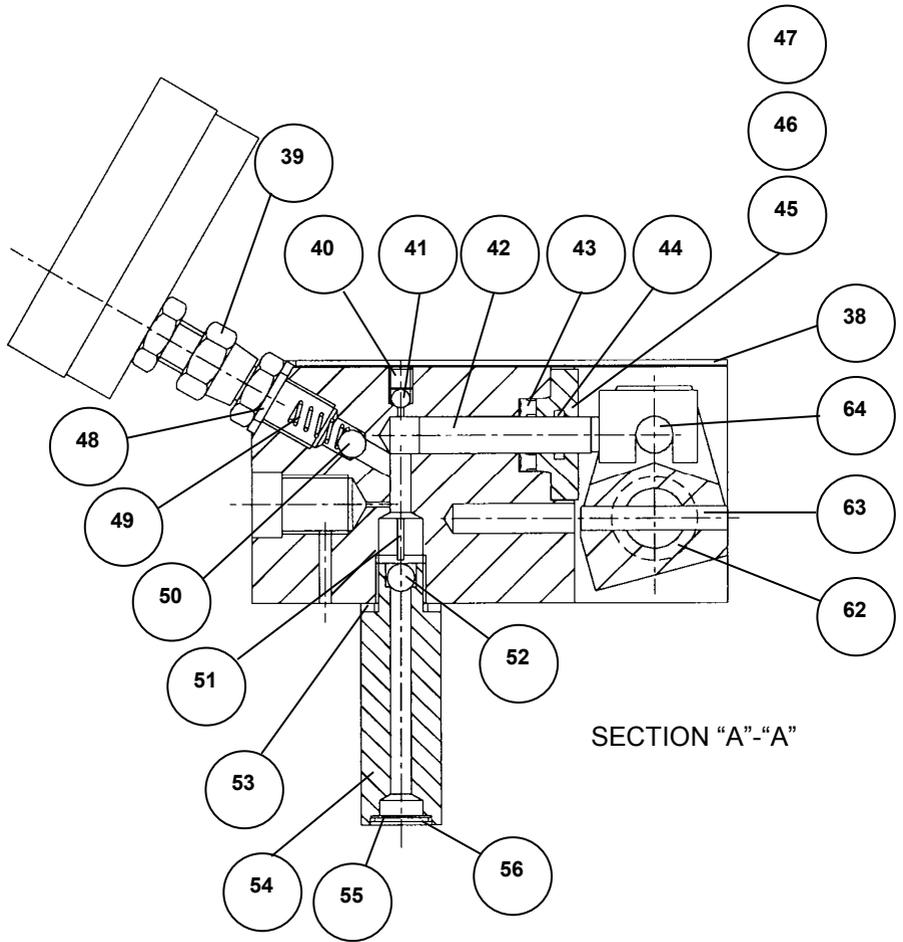


Fig 4: Side View of Pump Block Assembly

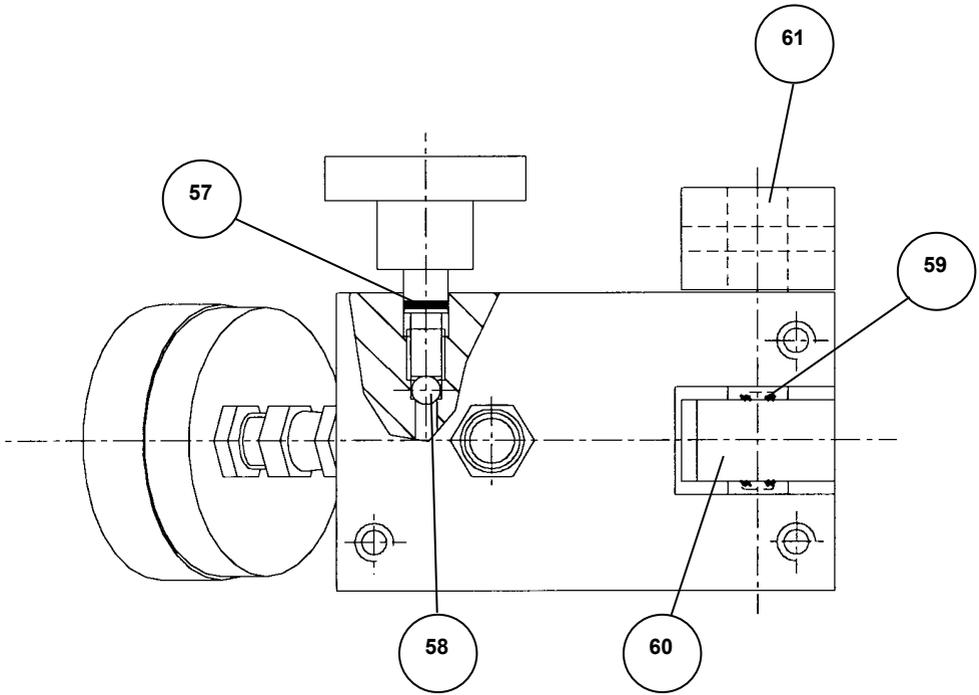


Fig 5: Details (Underside) of Pump Block Assembly

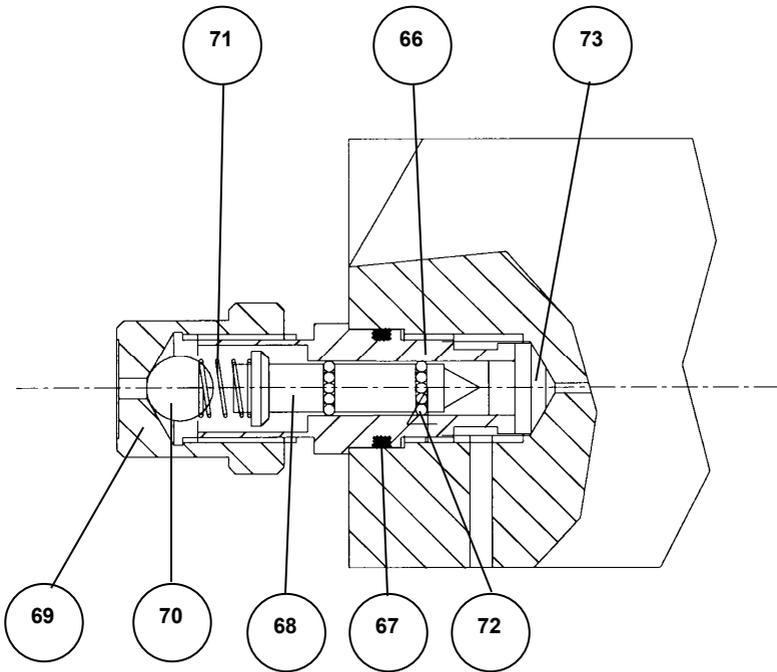


Fig 6: Details of Pressure Relief Valve Assembly

Please note that the components of the Pressure Relief Valve Assembly (items 66 to 73) have been permanently set for a 0.5 Ton load maximum capability on the Sirius 0.5 Ton manually operated hydraulic press and the entire mechanism is covered by a protective cap fixed to the front of the pump block assembly.

12. Tool Kit for Maintenance

Although not supplied with your new press, a press tool kit is available. This kit contains the following tools and one liter of oil. The oil is also available separately (15101).

Tool kit

The press tool kit comprises the following items:

- 1 Allen key 10.0 mm A/F
- 1 Allen key 8.0 mm A/F
- 1 Allen key 5.0 mm A/F
- 1 Allen key 3.0 mm A/F
- 2 Open end spanner 18.0 mm x 19.0 mm A/F
- 1 Screwdriver
- 1 5.0 mm stainless steel rod (punch)
- 1 Allen key 6.0 mm A/F

Spares

All spare parts for the press can be ordered using the part number and description from the parts list, Section 11).

Further Spares are:

- 15100 Seals and gasket kit for 15 and 25 ton presses. This kit contains all of the seals and gaskets required when the press has been fully disassembled.
- 15101 Hydraulic oil (CL 37) for 15 and 25 ton presses (1 liter).

Test Certificate

Sirius 0.5 Ton Manually Operated Hydraulic Press

Product Number: 508-016

Serial No: _____ Order No: _____

Item	Check/Test	Checked
1	Visual inspection of Guard	
2	Visual inspection of gauge nuts	
3	Visual inspection of bolts	
4	Condition of paint	
5	Correct function of gauge	
6	Check for oil leaks	
7	Check piston release	
8	Press able to reach 0.5 Tons	
9	Drop back @ 15 tons = less than 1 ton in 15 minutes. (Tested with 15 ton gauge on line)	
10	Pressure release valve - set to 0.5 Tons	

Tested By: _____

Approval By: _____ Date: _____

Original to file

Completed TAG Label on Press

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