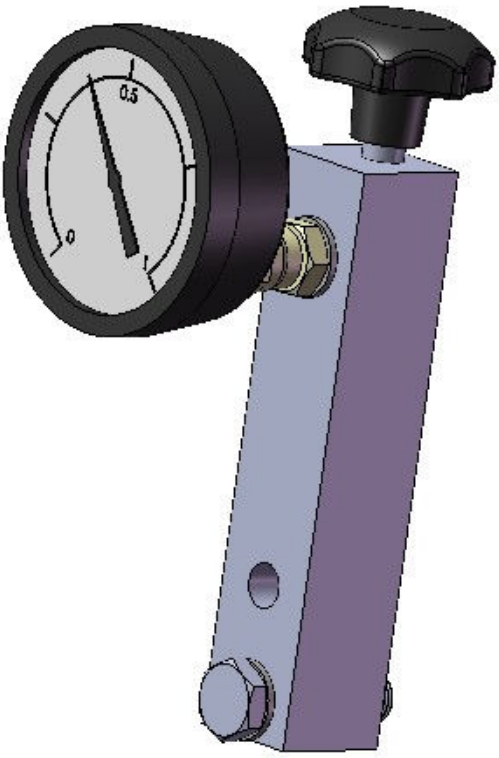
Low Tonnage Gauge Kits for Atlas™ Manual Hydraulic Presses

User Manual



2I-15051-7

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1. Introduction

Thank you for buying a Specac product.

The Low Tonnage Gauge Kits enable a standard Atlas™ 15T or 25T Manual Hydraulic Press (P/N GS15011 and P/N GS25011 respectively) to be used more accurately for the reading of a low tonnage load that has been applied during a pressing. The low tonnage gauge conversion kits for a 0 to 1 tons range (P/N GS15051), 0 to 2 tons range (P/N GS15052) and 0 to 5 tons range (P/N GS15055) provide an ADDITIONAL low tonnage load gauge to be used along with the standard 15 or 25 ton load gauge fitted on the press.

The appropriate low tonnage gauge kit is fitted by the user to allow both gauges to be connected to the press and used in-line to register an applied tonnage load. The lower tonnage gauge that has been fitted in this way to a press can be independently switched off from the pressure system, but any pressure of oil in the system **will always be registered** as an appropriate applied tonnage load at the 15 or 25 ton gauge fitted.

The lower tonnage load gauge has finer divisions for reading of an applied load, so, for example, if it is important to know that you are applying say 4.1 tons as opposed to possibly 4.5 tons, then the low tonnage gauge kit for a 0 to 5 ton load range would be required for fitting to the press.

Beware! *When a low tonnage gauge kit option is fitted to a press, the press itself can only be operated up to the maximum load allowable when the particular low tonnage gauge is switched on line for reading the load. (e.g. 2 tons maximum load for the 0 to 2 tons load gauge kit P/N GS15052).*

As an operating safety precaution, to prevent accidental over-pressurisation of a lower tonnage gauge when fitted (if it has not been switched off-line when higher tonnage loads are to be applied), Specac recommend that the **pressure relief valve assembly** situated underneath the standard load gauge of the press is adjusted to vent off

at the maximum tonnage load capability of the low tonnage gauge fitted. Higher tonnage loads than the low tonnage gauge maximum can still be obtained on the 15T or 25T press if they are to be applied, but then the pressure relief valve assembly will have to be readjusted to allow for a higher tonnage load to be hand pumped and contained on the system and therefore the low tonnage load gauge control valve **MUST** also be turned off.

As an example for use of the 0 to 5 ton low tonnage gauge kit P/N GS15055 when fitted to an Atlas™ 15T Manual Hydraulic Press P/N GS15011 (which can be operated to apply up to a 15 ton maximum load), set the pressure relief valve accordingly such that a maximum load for 5 tons can be hand pumped on the press. This maximum load is indicated on both the standard 0 to 15 ton load gauge and 0 to 5 ton low tonnage load gauges that have been fitted. Any further pulls on the pump handle of the press results in an excess pressure being vented off at the pressure relief valve. In this way the pressure relief valve acts as a safety device to not only prevent overloading of and damage to the low tonnage gauge mechanism, but also to any sample or die assembly in the pressing area of the press itself.

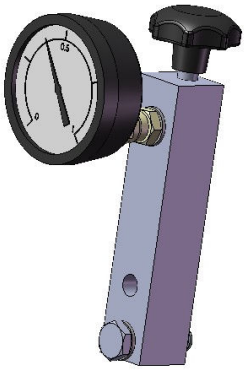
If a tonnage load higher than 5 tons is needed for application, switch off the low tonnage load gauge at its control valve and re-adjust the pressure relief valve assembly for a higher tonnage load to be applied and contained.

Therefore, use of an Atlas™ 15T Manual Hydraulic Press allows for any tonnage load up to 15 tons to be applied to a sample or an evacuable pellet die in the pressing area. However, if a finer reading of the load applied up to a maximum of 5 tons is required, then the low tonnage gauge kit P/N GS15055 can be fitted to the press and the additional low tonnage gauge provided is switched on-line.

2. Unpacking and Checklist

On receipt of your Low Tonnage Gauge Kit please check that the following parts have been supplied.

- 1 Manifold body (square tube) assembly with 0 to 1, 0 to 2, or 0 to 5 tons load gauge fitted.



- 1 Fixing bolt. (Fixing bolt with two Dowty seals is already in position at base of manifold body with a little red cap seal).
- 1 Open ended spanner (18mm A/F and 19mm A/F).
- 1 Spare (Dowty) seal for gauge connection part of press.
- 1 Instruction manual.

Carefully remove the parts from packaging and prepare the parts for fitting to the Atlas™ Manual Hydraulic Press.

3. Installation of the Low Tonnage Gauge Kit to the Atlas™ Manual Hydraulic Press

The Low Tonnage Gauge Conversion Kit is an **additional assembly of parts** that a user can fit to an Atlas™ 15T or 25T Manual Hydraulic Press to provide a facility of a finer reading for any tonnage load being applied, up to the maximum load capability of the particular low tonnage gauge fitted.

Note: *Specac recommend to test that the press you are using and would wish to adapt with a low tonnage gauge kit is functioning correctly to apply a tonnage load,* ***before*** *having to partially dismantle some of the parts from the pump block assembly of the press and rebuild it from the parts supplied with the low tonnage gauge kit. If a subsequent fitting of new parts introduces a problem of non-functionality (e.g. an airlock in the oil), you may be able to pinpoint more readily what is needed to correct and to get the new system operational.*

Procedure for Fitting

To help in the explanation of the procedure for fitting a low tonnage gauge kit to an Atlas™ manual hydraulic press, relevant parts in the following diagrams (**Figs.**) have been identified with a “bubble” part number that corresponds directly to the same part number as indicated in the Atlas™ Manual Hydraulic Press’s own user instruction manual. New parts from the low tonnage gauge kits have been “bubble” part numbered accordingly for consistency with the press numbering system.

The original load gauge (**31**) (15 or 25 tons) of the press is removed from the pump block assembly of the press and fitted to the manifold body (**74**) of the low tonnage gauge kit that already has the low tonnage gauge (**75**) option (1 ton, 2 tons or 5 tons range) fitted. The whole assembly of parts is then fitted onto the press at the pump block assembly from where the 15 or 25 tons load gauge has been removed.

Loosen the gauge connector (**39**) fitting to the load gauge (**31**) by unscrewing the top nut (**N1**) connection (see **Fig 1.**) using the 19mm A/F end of the spanner supplied.

Note: *The connection (**39**) nut at (**N1**) **must be turned clockwise**, using the 19mm A/F spanner and holding the gauge (**31**) with your other hand to separate the threaded parts.*

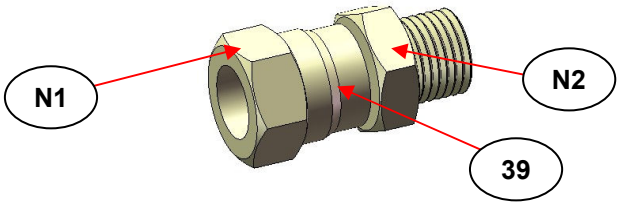


Fig 1. Load Gauge Connector Part of Press

Carefully remove the load gauge (**31**) and put it by for safe keeping. (See **Fig 2.)**

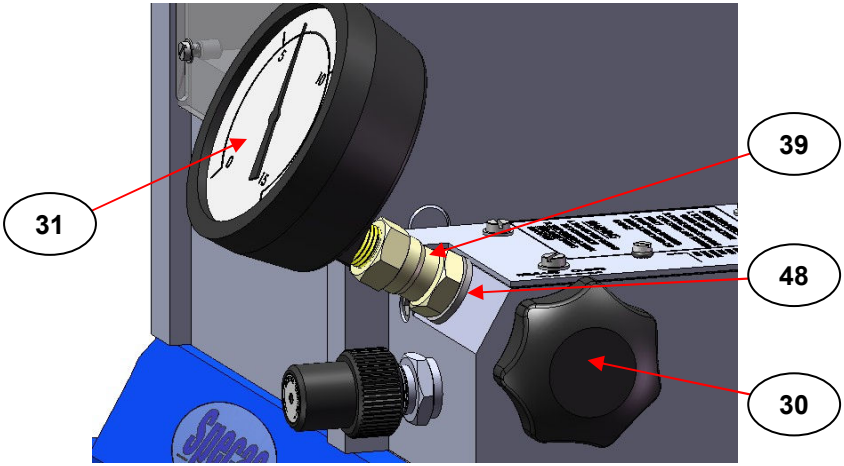


Fig 2. Removal of 15/25 Ton Load Gauge from Manual Press

The gauge connector (**39**) is then removed from the pump block assembly by unscrewing the lower nut (**N2**) connection by the “Dowty” seal (**48**). (See **Fig 1.** and **Fig 2.**) (Unscrew - turn (**N2**) **anticlockwise**.)

Transfer the gauge connector (**39**) and Dowty seal (**48**) parts for fitting to the bore opening (**76**) of the manifold body (**74**) by tightening of the lower nut connection (**N2**). (See **Fig 1.** and **Fig 3.**) If the removed Dowty seal (**48**) from the press is not suitable for re-use, then use the spare seal provided with the low tonnage gauge kit.

Note: *The bore opening (**76**) on the manifold body (**74**) will be plugged with a transport screw to prevent dust from entering. Remove this screw before fitting of the gauge connector (**39**) and Dowty seal (**48**) parts.*

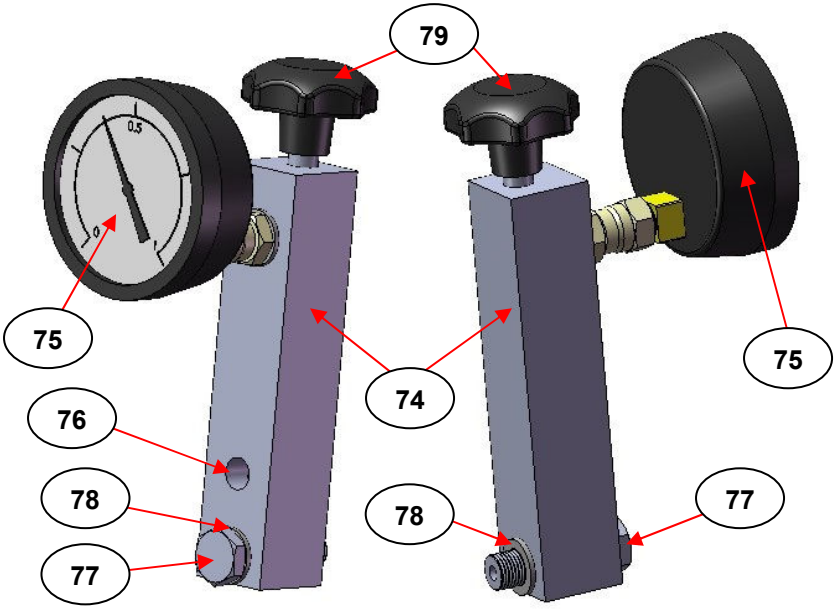


Fig 3. Front and Rear View of Low Tonnage Gauge Kit

Remove the dust cover cap from the fixing bolt (**77**) and Dowty seal (**78**) parts at the base of the manifold assembly (**74**). (See **Fig 3**.)

When the gauge connector (**39**) has been fitted to the manifold tube (**74**), fit the 15 or 25 ton load gauge (**31**) to the gauge connector by tightening of the top nut (**N1**) connection. (See **Fig 4.**) Tighten together by turning (**N1**) anticlockwise and holding the load gauge (**31**).

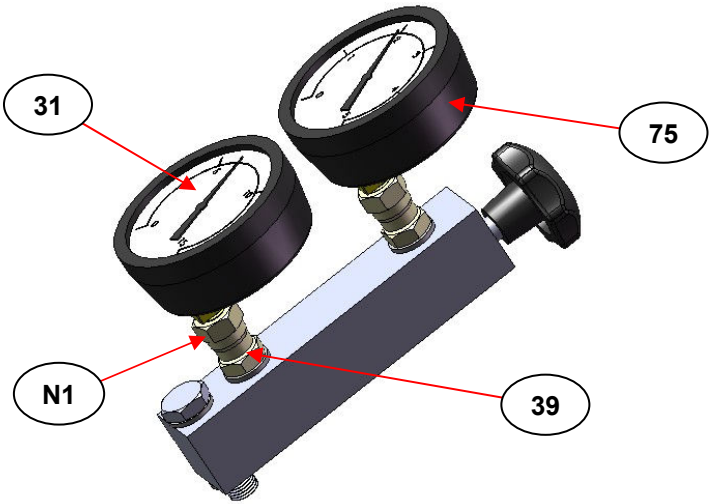


Fig 4. Both Gauges Fitted to the Manifold Block

Proceed to fit the complete manifold tube assembly with the two gauges via the fixing bolt (**77**) and Dowty seal (**78**) into position on the pump block assembly of the press, from where the original gauge (**31**) and gauge connector (**39**) have been removed. Tighten the fixing bolt (**77**) using the 19mm A/F end of the spanner supplied. The completed assembly of parts for a low tonnage gauge kit as fitted to an Atlas™ manual hydraulic press is shown as **Fig 5.**

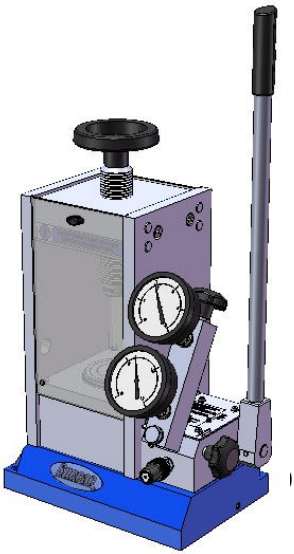


Fig 5. Complete Kit Assembly Fitted to a Manual Press

4. Operation of the Atlas™ Manual Hydraulic Press with a Low Tonnage Gauge Fitted

Safety Warnings When Operating the Press

Important*: As mentioned in the Introduction, it is extremely important that the Atlas™ manual hydraulic press is restricted to the* ***maximum load limit*** *of any low tonnage gauge fitted before use. Instructions how to set the load limit using the pressure relief valve assembly are found in the user instruction manual for the Atlas™ manual hydraulic press. This setting will prevent any over-pressurisation to the low tonnage load gauge (****75****) that would damage the gauge if the open/close valve tap (****79****) for the low pressure gauge* ***is accidentally left open*** *when higher tonnage loads are wished to be pumped on the press.*

Bleeding Air from the Low Tonnage Gauge Kit

Before the Atlas™ manual hydraulic press can be used to apply a tonnage load with the fitting of a low tonnage gauge kit, any possibility of air that might be trapped in the oil, preventing a pressure build up, must be bled from the manifold body (**77**).

To bleed any trapped air from the oil, carry out the following procedure:

Place an “unyielding” sample/work (e.g. a cylindrical block of metal) to press in the usual way, within the pressing area of the Atlas™ manual hydraulic press. Ensure that the the metal block to press is loosely clamped between the lead screw top bolster pressing face and the lower bolster pressing piston face.

Ensure the open/close valve tap (**79**) on the manifold body (**77**) is **closed**. Closing the valve tap (**79**) isolates the low tonnage gauge (**75**)

that has been fitted, to stop any oil pressure pumped on the system from reaching it. The valve tap (**79**) is a tapered “needle” type fitting and will be closed when the tap handle (**79**) is turned hand tight in a clockwise direction. There is an O-ring (**80**) on the valve tap assembly that makes an oil-tight seal when fully closed. (See **Fig 6**.)

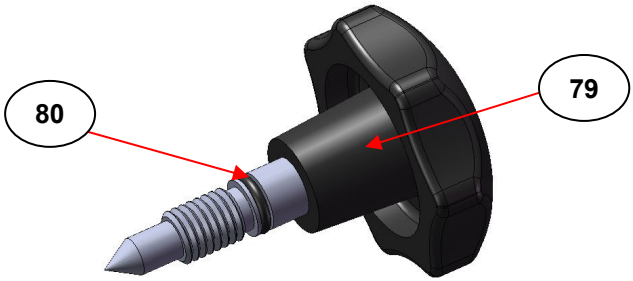


Fig 6. Low Tonnage Gauge Open/Close Valve Tap Assembly

Close the pressure release handle (**30**) of the press by turning clockwise (see **Fig 2.**) and begin to hand pump the press (slowly) in the usual way. Oil will be pressurized and forced from the press reservoir up and into the manifold body (**77**) to register at the higher load tonnage gauge (**31**) fitted at the base of the manifold body (**77**) and towards the shut off valve tap assembly (**79**). Pump to apply a tonnage load of about 1 (one) ton (no more) against the metal block to be registered at the higher tonnage load gauge (**31**) as fitted.

Now, very slowly open the valve tap (**79**) by anti-clockwise rotation of the handle until the O-ring (**80**) is just beginning to emerge from the top of the manifold body (**77**). (See **Fig 7**.) Any air that may be trapped in the manifold body (**77**) will be forced out at the top past the opened valve tap (**79**) and by the O-ring seal (**80**) from the oil pressure that has been pumped on the system. When air and oil is observed at the valve tap (**79**) by the O-ring (**80**), a slight decrease in the tonnage load that has been applied at the higher tonnage load gauge (**31**) and a registering of a low tonnage load at the low tonnage gauge (**75**) fitted will also be observed.

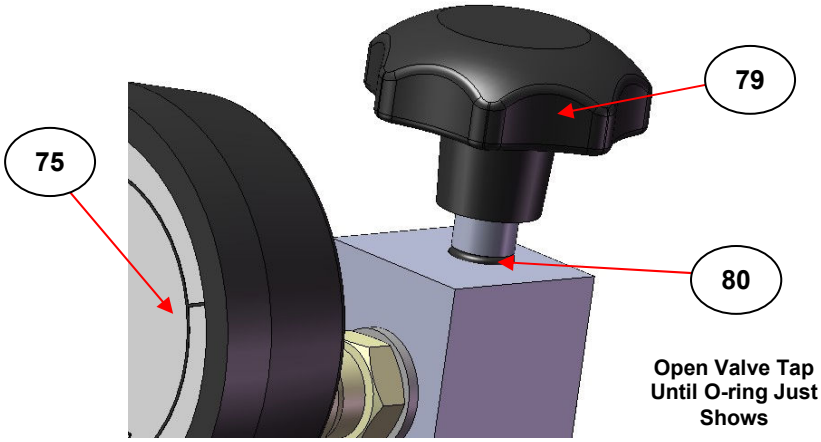


Fig 7. Opening of Valve Tap for Bleed of Air Procedure

Note: *Be **very careful** when opening the valve tap (**79**). It is not necessary to open it any further than when the O-ring appears and any air bubbles emerge with release of some pressurised oil. Applying a low tonnage reading of 1 ton to the metal block, ensures there is sufficient oil pressure in the system to allow the air to be bled off at this point of the manifold body (**77**) assembly. It is also a safe load to apply if the LOWEST tonnage gauge of 0 to 1 tons range has been fitted to the manifold body (**77**) and this gauge is switched on line to register an oil pressure from the bleed of air procedure.*

When the oil flows freely and no more air bubbles are observed, tighten the valve tap (**79**) clockwise to close it fully again. The newly fitted low tonnage gauge kit with twin gauges fitted to the press should now have been successfully bled free of air.

Release the overall pressure in the system and hence load from the metal block in the press by opening slowly and slightly (turn anti-clockwise) the pressure release valve (**30**) on the press.

Now, still with the valve tap (**79**) closed, follow the procedure to adjust the **pressure relief valve assembly** on the press to set a maximum tonnage load achievable on the press that corresponds to the maximum load capability of the low tonnage gauge (**75**) as fitted. (1 ton, 2 tons or 5 tons range.) The procedure to adjust the pressure relief valve is found in the user instruction manual for the Atlas™ manual hydraulic press.

Switching On and Off the Low Tonnage Gauge

To bring the low tonnage gauge "on line" for load reading, the valve tap (**79**) on the manifold body (**77**) is opened. (**79**) is a needle type valve (See **Fig 6.**) and the tap handle only needs **a quarter to half turn maximum** anti-clockwise to open for the low tonnage gauge (**75**) to be switched on to register a tonnage load.

Beware: *If the valve tap (**79**) is opened too far from turning the handle anti-clockwise for operation of the low tonnage gauge, there is a risk that the O-ring (**80**) will not seal effectively and so oil pressure in the system will be lost and there will be no effective build-up of a tonnage load that can be applied to any work/sample being held in the press.*

The following table shows the situation relating to which gauge is working when the pressure release valve (**30**) on the press and the valve tap (**79**) on the manifold body (**77**) are either open and/or closed.

Valve	Status of Valve	Gauge Being Used
(30) **(79)**	**Open** **Open**	**Neither**
(30) **(79)**	**Closed** **Open**	**(31)** **(75)**
(30) **(79)**	**Closed** **Closed**	**(31)**
(30) **(79)**	**Open** **Closed**	**Neither**

5. Legend – Bubble Number Part Identification

(**30**) Pressure release handle (valve) on press.
(**31**) Original 15 or 25 ton load gauge on press.
(**39**) Load gauge connector fitting on press.
(**48**) Dowty seal for gauge connector fitting on press.
(**74**) Manifold body of low tonnage gauge kit.
(**75**) Low tonnage gauge (0 to 1, 0 to 2, or 0 to 5 ton range option).
(**76**) Bore opening on manifold body.
(**77**) Manifold body fixing bolt.
(**78**) Dowty seal (2 off) for manifold body fixing bolt.
(**79**) Open/close valve tap assembly for low tonnage gauge.
(**80**) O-ring seal on valve tap assembly for low tonnage gauge.

6. Spare Parts for the Low Tonnage Gauge Kits

P/N GS15051 0 to 1 ton Low Tonnage Gauge Kit.
P/N GS15052 0 to 2 ton Low Tonnage Gauge Kit.
P/N GS15055 0 to 5 ton Low Tonnage Gauge Kit.

Notes for Use of Low Tonnage Gauge Kit

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