

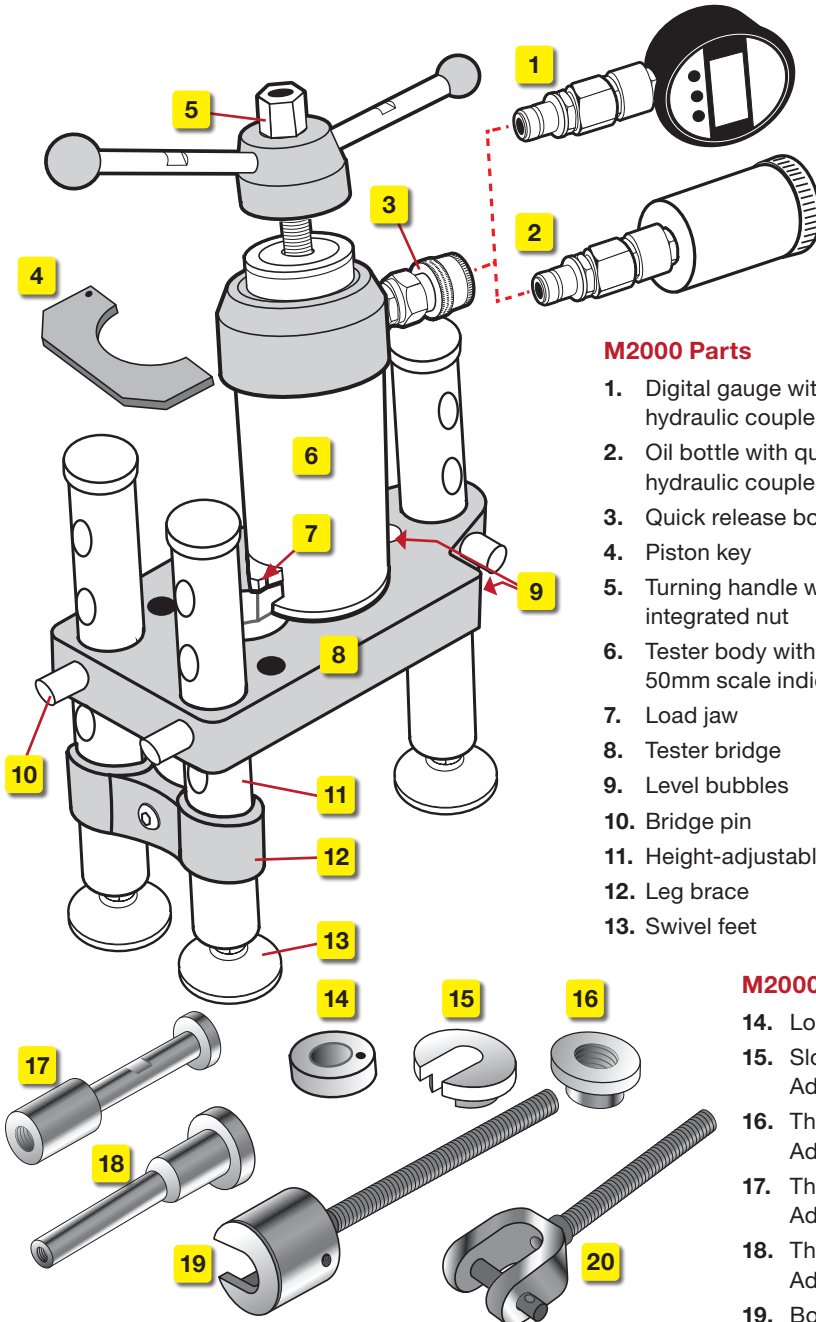
M2000 Tester Kits Range



M2000 Kits covered:

- PRO Tester
- Scaffold Tie Tester
- Safety Harness Eyebolt Tester
- Material Bond Tester

M2000 Tester parts and accessories



M2000 Parts

1. Digital gauge with quick release hydraulic coupler
2. Oil bottle with quick release hydraulic coupler
3. Quick release body coupler
4. Piston key
5. Turning handle with integrated nut
6. Tester body with 50mm scale indicator
7. Load jaw
8. Tester bridge
9. Level bubbles
10. Bridge pin
11. Height-adjustable Legs
12. Leg brace
13. Swivel feet

M2000 Accessories

14. Locking Adaptor
15. Slotted Button Adaptor
16. Threaded Button Adaptor
17. Threaded Stud Adaptor (Long)
18. Threaded Rod Adaptor
19. Bolt Test Adaptor
20. Clevis Adaptor

Note: Not all M2000 kits contain all accessories shown.

M2000 General Description

The M2000 pull-out tester is a purpose made system for testing fixings, fasteners and anchors. It consists of a mechanical screw arrangement acting through a hydraulic load cell, which measures the load applied to the fixing directly. The resulting load value is then indicated on the gauge.

The tester has a built in movement indicator scale 50mm to show “first movement” on the fixing prior to the test load being applied. The tester and bridge are supplied as an integral part of all the M2000 tester kit ranges.

A comprehensive range of accessories is also available, further increasing the scope of possible testing applications.

USE OF THE TESTER AS DIRECTED

The tester is intended for use by skilled personnel with the appropriate training and knowledge of the applicable safety precautions.

SAFETY RULES

- Modification of the tester, or tampering with its parts is not permissible.
- Observe the information printed in the operating instructions applicable to operation care and maintenance.
- The tester and its accessories may present hazards when used incorrectly by untrained personnel or not as directed.
- Use only the genuine Hydrajaws accessories or ancillary equipment listed in the operating instructions.

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It is essential that the operating instructions are read before the tester is operated for the first time.



Always keep these operating instructions together with the tester.

Ensure that the operating instructions are with the tester when it is given to other persons.

TECHNICAL SPECIFICATIONS

- Pull-out load range 0-25kN/5620 lbf
- Weight
 - Tester only: 2.2kg
 - Packaged weight: 8kg (will vary)
- Stroke scale 0-50mm
- Effective stroke 50mm
- Load gauge Interchangeable
- Casing Aluminium
- Loading jaw Pivotal through 360° with Spring return
- Operating handle Standard size with integrated 22mm operating nut for confined spaces

Load Gauges

- Indication of pull-out load
- Calibrated in kN
- Dual scale: kN/lbf
- 12 month calibration certificate
- Protective rubber cover
- Impact resistant glass
- Protection against sudden load relief (i.e. sudden failure of fixing)

Rechargeable Digital Gauge

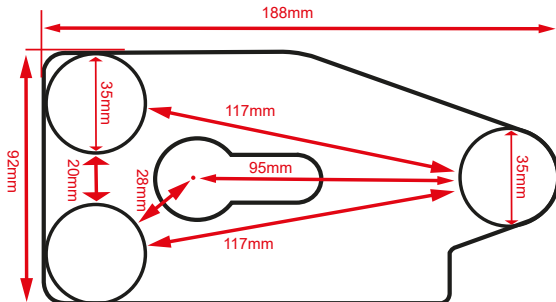
- Range: 0-25kN
- Accuracy: Digital to +/-1.5% fsd
- Peak hold memory
- IP rating IP54
- Working Temperature: -10°C to +50°C



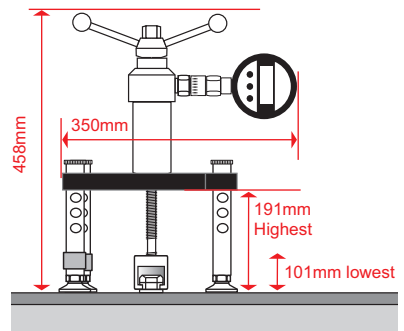
Rechargeable battery MUST be charged for 2 hours before first use. Please refer to the 'Hydrajaws Rechargeable Digital Gauge' manual for more details.

Bridge Footprint and Tester dimensions

M2000 Bridge Footprint



M2000 Dimensions



1. GENERAL TESTING PROCEDURE

SETTING UP THE TESTER

1. Fit the appropriate adaptor to the tester. Example shown is a bolt tester adaptor. (For fitting of other adaptors please see individual instructions in this manual).
2. The tester is supplied with a locking adaptor fitted into the tester body. This locking adaptor can be removed for fitting of different adaptors by using the 3mm Ball Driver. When replacing back in ensure it is fully engaged into the tester body before tightening (**fig 1**). Thread the bolt tester adaptor into this, until it is fully engaged, using a quarter turn for position (**fig 2**).
3. Make final adjustments so that the bolt tester adaptor, tester and fixing are aligned (**fig 3**).
4. Position the tester so that the gauge can be easily read.
5. Adjust the length of the adjustable legs (see section 8) so that all three are in contact with the base material and the load spreading bridge is aligned and level by referring to the bubble levels on the bridge.

Fig 1

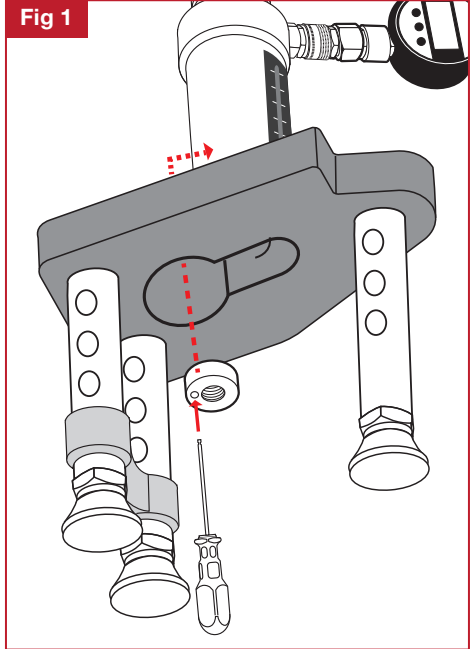


Fig 2

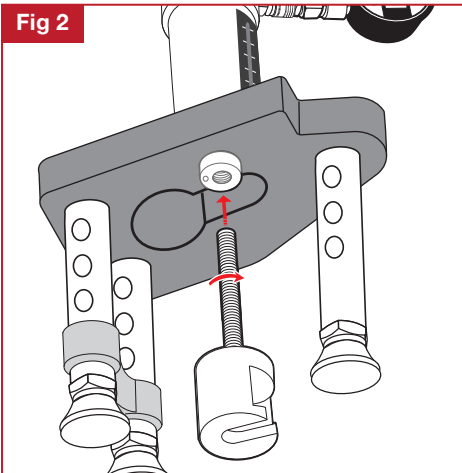
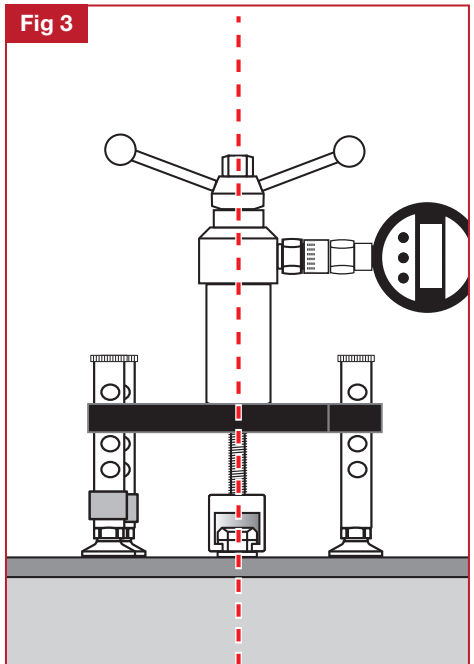


Fig 3



1. GENERAL TESTING PROCEDURE – *Continued*

TESTING PROCEDURE

6. Ensure the gauge is set to zero – hold the tester and proceed to load the fastener by turning the operating handle clockwise (**fig 4**).

CAUTION!

Hold the fastener securely as long as the fastener is under load. When the load increases, note the reading on the displacement scale on the tester. Indication of failure of the fastener may be obtained by comparing the current reading with the original reading.

7. Increase the load until the required test load is attained. Hold this load and observe any falling back of the readings which would indicate movement and possible failure of the fastener. Record the satisfactory result.
8. Release the load on the fastener by turning the operating handle anti-clockwise and allowing the test jaw to return to the original position.
9. Remove the tester and bolt tester adaptor.

Fig 4

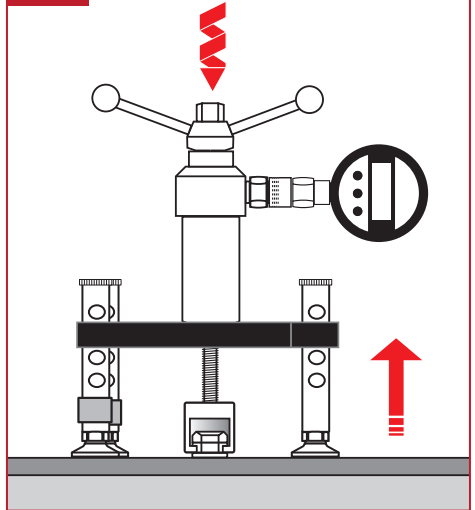


Fig 5

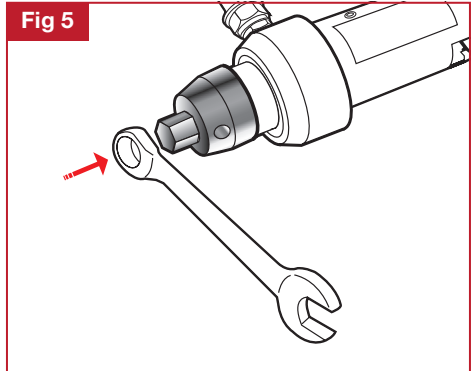
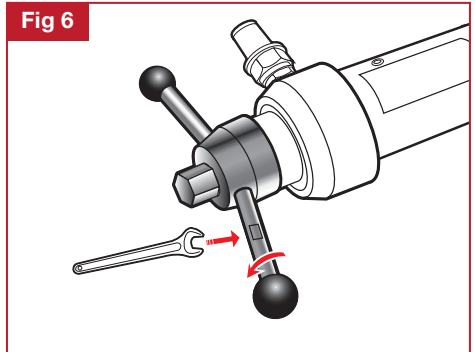


Fig 6



Using the integrated nut in confined spaces

In confined spaces the integrated nut can be used with a 22mm ratchet spanner for better access in confined spaces and for easier operation (**fig 5**).

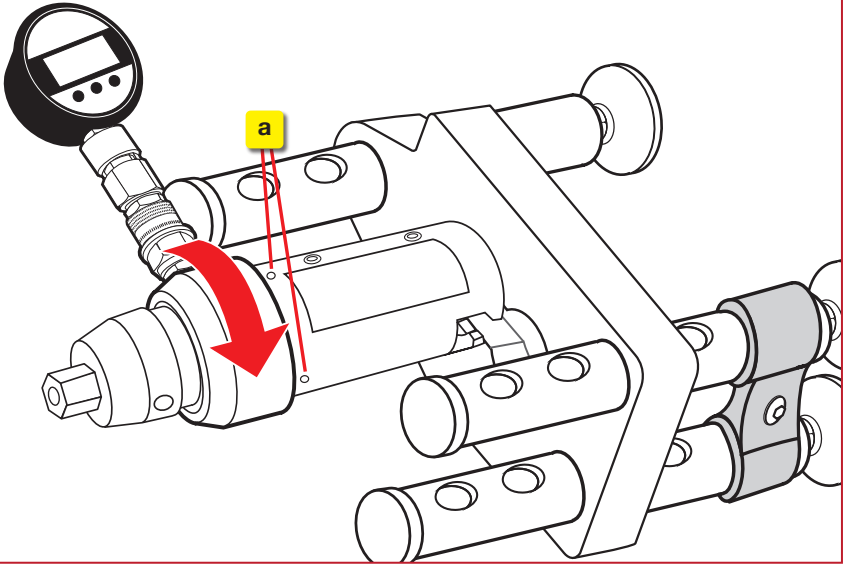
Remove the handles by unscrewing from the base using the 10mm wrench (**fig 6**). Ensure when re-attaching handles that they are tight on and secure.

Adjusting the handle position (fig 7)

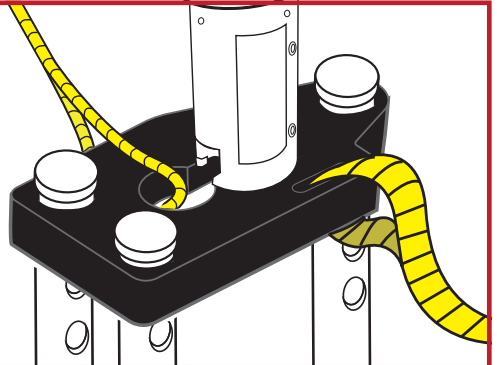
The top part of the unit can be rotated if the gauge is becoming obstructed by the unit legs or other objects.

This is achieved by loosening the three grub screws **(a)** on the body using the hex key provided. Rotate the top until the handle and gauge are clear of obstacles and re-tighten the screws.

Fig 7



It is recommended when testing on ceilings (inverted) and/or vertically, that a safety line is attached around the tester body (either through the loop hole or through the middle) and attached to a suitable solid fixing point. This will stop the tester falling and prevent injury to personnel and/or damage to test unit.



Always ensure the leg brace is fitted to give the tester vital balance and rigidity when under load.



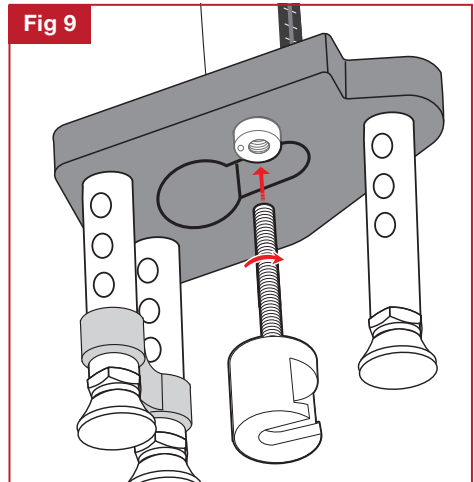
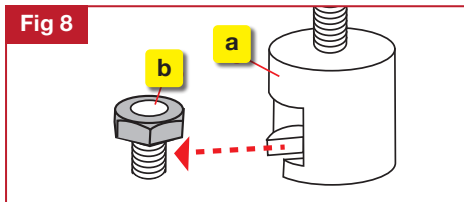
2. PULLING ADAPTORS

2.1 The BOLT TEST adaptor

Using the bolt test adaptor directly

For M16 nuts, (fig 8) the bolt tester adaptor (a) directly engages the nut (b) in the pulling jaw.

Mount the locking adaptor into the tester (see Section 1 General testing procedure). Then thread the bolt tester adaptor into the tester body (fig 9).

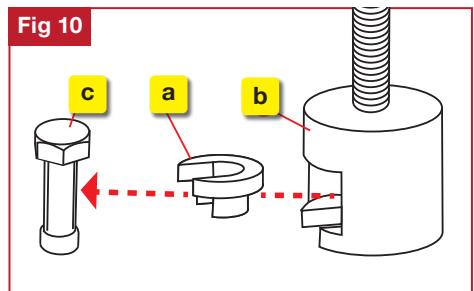


Using the bolt test adaptor with the slotted button adaptor

For testing fixings where a connection is made underneath the head of the fixing or anchor the slotted button adaptor is used.

Mount the locking adaptor into the tester (see Section 1 General testing procedure). Then thread the bolt tester adaptor into the tester body (fig 9).

The slotted button adaptor (a) slots into the bolt tester adaptor (b) and engages the fixing (c) (fig 10).

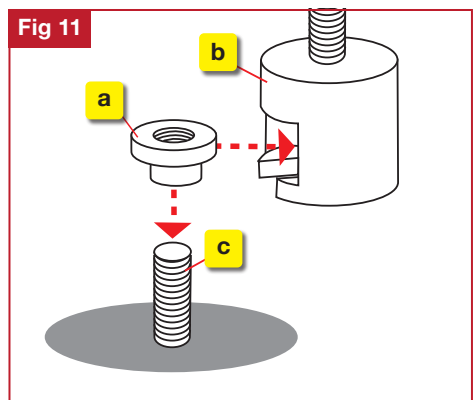


Using the bolt test adaptor with the threaded button adaptor

For testing threaded fixings the threaded button adaptor is used.

Mount the locking adaptor into the tester (see Section 1 General testing procedure). Then thread the bolt tester adaptor into the tester body (fig 9).

The threaded button adaptor (a) threads on to the fixing (c) and then slots into the bolt tester adaptor (b) (fig 11). Ensure the button adaptor has at least 2 complete thread turns on the fixing and is secure.

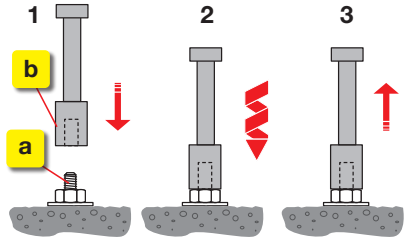


2.2 M10, M12, M16 and M20 THREADED STUD adaptors

Suitable for testing sleeve and stud anchors.

(fig 12) After the anchor has been set in accordance with the manufacturers recommendations, a suitable threaded rod (a) is screwed into the anchor and the adaptor (b) then fitted. The length of the threaded rod to be screwed into the anchor must be at least equal to the diameter of the anchor.

Fig 12

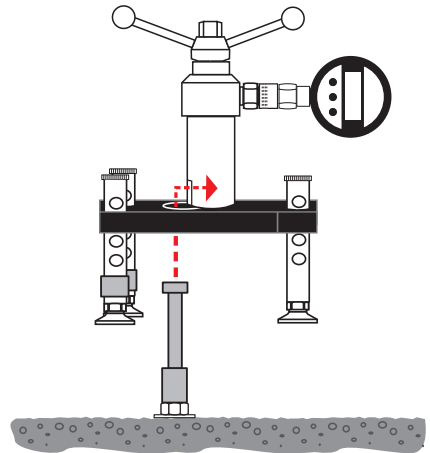


Remove the locking adaptor if fitted (see Section 1 General testing procedure).

When the adaptor is securely fitted to the anchor thread position, place the tester over the adaptor, passing the head through the hole in the bridge of the tester and engage it in the pulling jaw of the tester (fig 13).

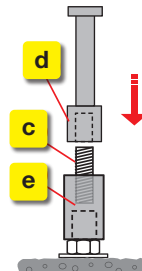
Level the load spreading bridge with the adjustable legs before commencing the application of the load.

Fig 13



Note: (fig 14) To use the optional M30 HD Threaded stud adaptor, first attach 45mm M20 thread piece (c) into adaptor (e) and attach to the fixing. Then thread the M20 Adaptor (d) and proceed as above.

Fig 14



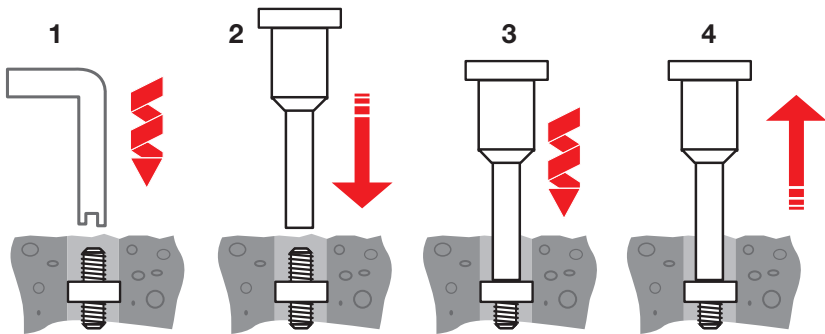
2. PULLING ADAPTORS — *Continued*

2.3 M5, M6, M8 and M10 THREADED ROD adaptors

The M5 and M6 threaded rod adaptors are equipped with an external M12 thread for use in conjunction with the M12 threaded button adaptor. They are used primarily for testing remedial wall ties. The M8 and M10 threaded rod adaptors are equipped with an M16 external thread and the M16 nut fitted with connects to the pulling slot in the tester or bolt tester adaptor.

Connect the threaded rod adaptor to the thread on the fixing (**fig 15**).

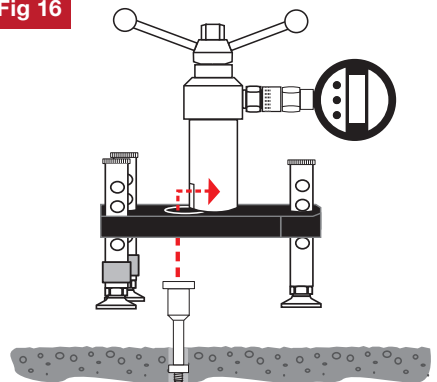
Fig 15



Remove the locking adaptor if fitted (see Section 1 General testing procedure). Adjust the length of the bridge legs and the height of the button adaptor/nut so that the adaptor can pass through the hole in the bridge and engage it in the pulling jaw of the tester (**fig 16**).

Level the load spreading bridge with the adjustable legs before commencing the application of the load.

Fig 16

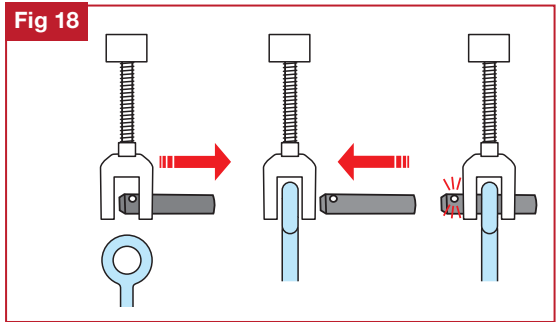
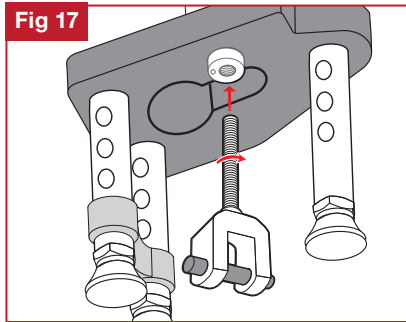


2.4 The CLEVIS adaptor

For testing ringbolts the Clevis adaptor is used.

Mount the locking adaptor into the tester (see Section 1 General testing procedure). Then thread the clevis adaptor into the tester body until it is fully engaged, using a quarter turn for positioning (**fig 17**).

Remove crosspin from the clevis adaptor and offer the tester and bridge to engage eye of the anchor in the clevis. Some adjustment will be required on the swivel feet, so that this fit is achieved. Push clevis pin through the clevis and eyebolt, ensuring that the ball on the pin clicks into place, having passed through the second fork (**fig 18**). Once fitted securely commence testing (see Section 1 General testing procedure).

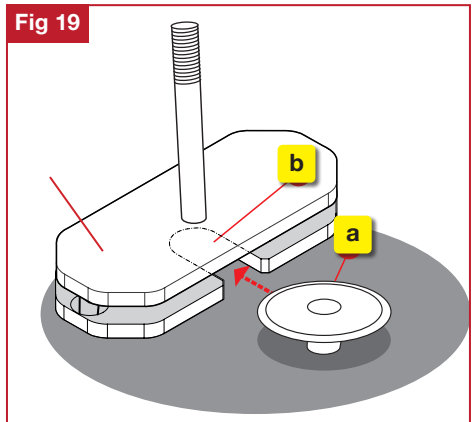


2.5 The INSULATION adaptor

Remove the insulation around the fastener.

Mount the locking adaptor into the tester (see Section 1 General testing procedure). Thread the insulation adaptor into the locking adaptor fully then back off until horizontal.

By holding the tester, slide the head of the insulation fastener (**a**) between the two plates with the stem of the fixing resting in the slot in the lower plate (**b**) and adjust the legs on the load spreading bridge to suit the base material. Ensure that the pull-out force acts along the axis of the fixing being tested (**fig 19**).



Note: This accessory is available separately at –
<https://www.hydrajaws.co.uk/product/etic-fixings-adaptor/>

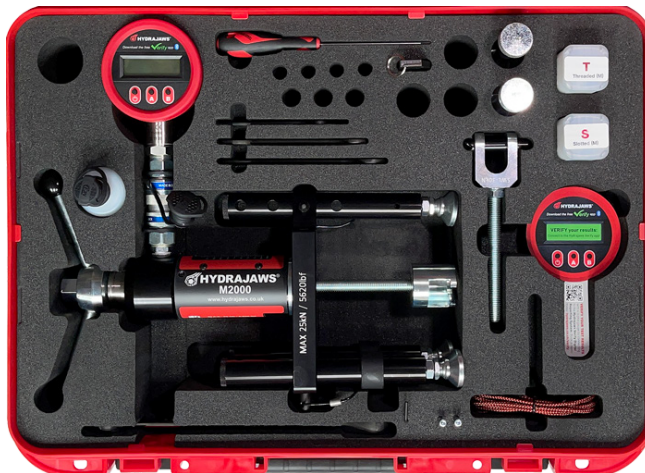
3. M2000 PRO TESTER KIT

The Hydrajaws M2000 PRO Tester Kit anchor tester contains a universal set of adaptors enabling a comprehensive range of fixings and safety-critical applications, up to a maximum tensile load of 25kN (5620lbf) to be tested, in line with BS 8539, BS 7883, BS EN 795 and AEFAC-TN05.

The Tester is factory assembled with the bolt tester adaptor screwed into the M12 locking adaptor located in the Tester jaw. Height can be adjusted using the swivel feet with 10mm of fine adjustment.

KIT CONTENTS:

- M2000 Medium Duty Tester with 25kN Digital/Analogue Gauge
- 2020 Load Spreading Bridge
- Turning handle with integrated 22mm operating nut
- Bolt Tester Adaptor
- M12 Ringbolt Adaptor Clevis
- M12 Locking Adaptor
- M16 & M20 Threaded Stud Adaptors
- Six slotted button adaptors: 4.5, 5.5, 6.5, 8.5, 10.5, 12.5mm
- Six threaded button adaptors: M4, M5, M6, M8, M10, M12
- Calibration Certificate
- Padded Carrying Case



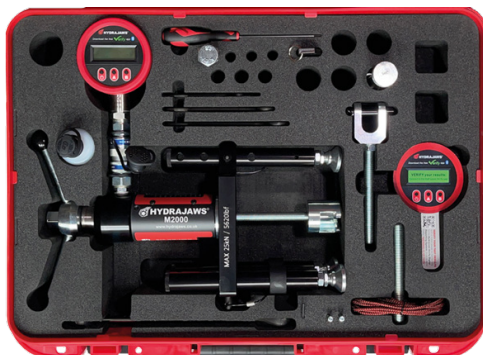
4. M2000 SCAFFOLD TESTER KIT

The Scaffold Tester Kit has accessories designed to test Scaffold Anchors and Ringbolts to the requirements of the guidance note TG4:25 issued by National Access and Scaffolding Confederation (NASC) and the Construction Fixings Association (CFA).

The Tester is factory assembled with the bolt tester adaptor screwed into the M12 locking adaptor located in the Tester jaw. Height can be adjusted using the swivel feet with 10mm of fine adjustment.

KIT CONTENTS:

- M2000 Medium Duty Tester with 25kN Digital/Analogue Gauge
- 2020 Load Spreading Bridge
- Turning handle with integrated 22mm operating nut
- Bolt Tester Adaptor
- M12 Ringbolt Adaptor Clevis
- M12 Locking Adaptor
- M16 Hex Setscrew
- M16x120 Stud bolt
- Calibration Certificate
- Padded Carrying Case



TESTING OF M16 DROP IN SCAFFOLD TIE ANCHORS

Fit the M16 hexagon setscrew to the anchor, ensuring at least two complete turns for ample thread engagement. Offer Tester with bridge to the hexagon head of the setscrew and engage head in bolt tester adaptor jaw. Make adjustment on each swivel foot by unscrewing from the legs so that each foot is resting on the material around the anchor and the bridge is square and level. Check that the gauge is registering zero.

Commence the test by turning the operating handle on the Tester clockwise and observe the gauge as the load on the anchor is increasing. Continue applying the load until the proof test load is reached. Stop applying the load and observe if the reading falls back. If the fall back is minimal, apply the load again until reading is at the test load required and leave the test load in place for approximately 10 seconds.

Should the reading not reach the maximum test load requirement, or the operating handle has to be turned to maintain the load, it is certain that the anchor will have failed the test.

4. M2000 SCAFFOLD TESTER KIT – *Continued*

TESTING OF EYE TYPE ANCHORS

Unscrew the bolt tester adaptor from the M12 locking adaptor in the Tester jaw and replace it with the ringbolt adaptor clevis. Ensure that at least 2 complete clockwise turns are made to safely engage the threads. Remove crosspin from the clevis and offer the tester and bridge to engage eye of the anchor in the clevis. Some adjustment will be required on the swivel feet, so that this fit is achieved, push clevis pin through the clevis and eyebolt, ensuring that the ball on the pin clicks into place, having passed through the second fork. Commence the test as described for drop in anchors.

Note: Longer Scaffold Eyebolts used in timber frame construction can be tested. But extra-long extension legs are required – not supplied in standard kit.

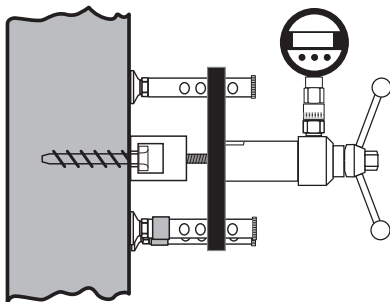
The NASC Guidance Note TG4:25* “Anchorage Systems for Scaffolding” sets out requirements for PRELIMINARY TESTS of scaffold anchors (to check the suitability and allowable loads of an anchor type in a particular base material) and PROOF TESTS (sample tests to check that anchors have been installed correctly – to be carried out on all jobs).

The new Proof Load testing requirement is for a tensile test of 1.5 x the design load. The Hydrajaws Scaffold Tester Kit will test all of these types to a maximum tensile load of 20kN. TG4:25 also describes six types of anchors most commonly used for anchoring scaffold ties. The Hydrajaws Scaffold Tester Kit will test all of these types to a maximum tensile load of 25kN.

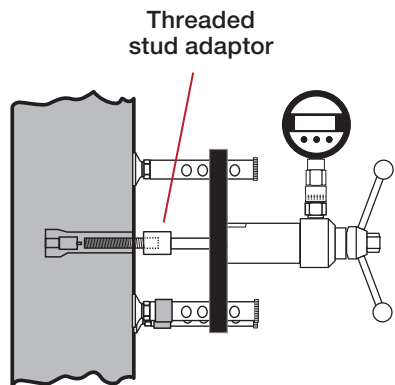
*TG4:25 Anchorage Systems for scaffolding can be downloaded from the NASC website www.nasc.org.uk

Fig 20

Test rig arrangements for:



Hex headed bolts, including self-tapping concrete screws

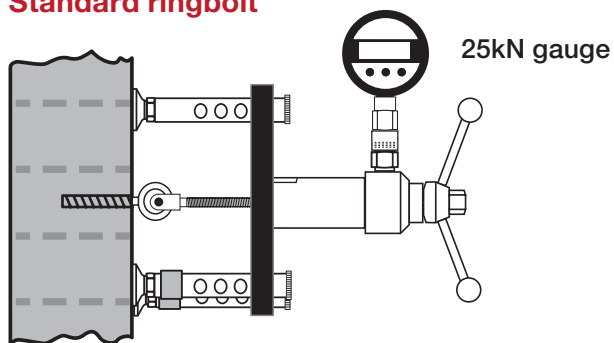


Socket anchors using slave bolts. e.g. for ringbolt

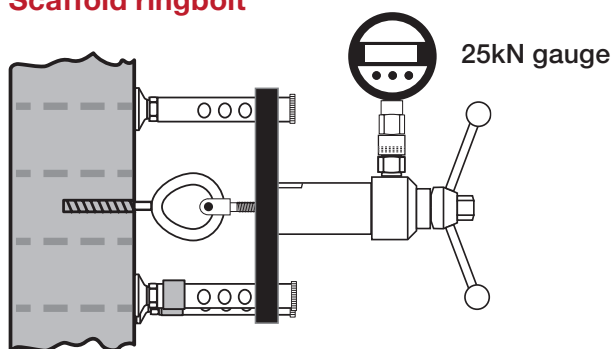
Fig 21

Test rig arrangements for:

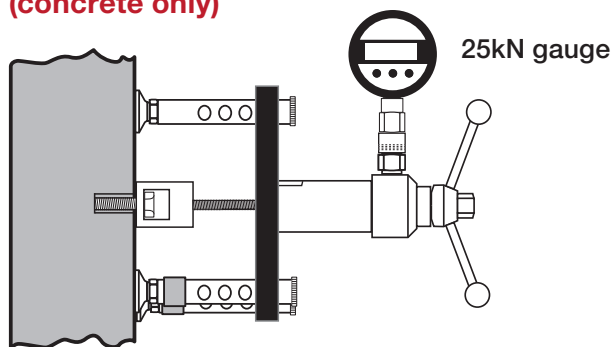
Standard ringbolt



Scaffold ringbolt



**Drop-in anchors
(concrete only)**



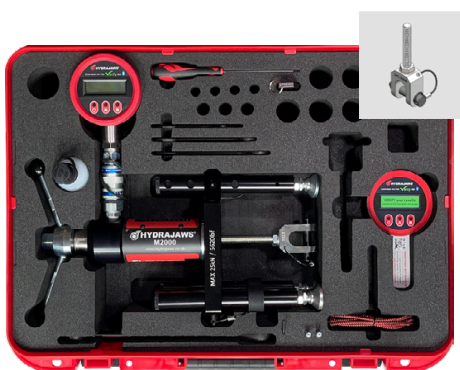
5. M2000 SAFETY HARNESS EYEBOLT TESTER KIT

For testing Safety Harness Eyebolts to the requirements of BS EN795 Personal Fall Protection Equipment, Anchor Devices – Requirement for Testing BS 7883: 2019 code of practice for Design, Selection, Installation, Use and Maintenance of Anchor Devices conforming to BS EN 795. The kit may also be used for testing Ladder Restraint Hooks and most Ringbolts in concrete or masonry.

The Tester is factory assembled with the ringbolt adaptor screwed into the M12 locking adaptor located in the Tester jaw and the load spreading bridge with the three height adjustable legs with swivel feet with 10mm of fine adjustment.

KIT CONTENTS:

- M2000 Medium Duty Tester with 25kN Digital/Analogue Gauge
- 2020 Load Spreading Bridge
- M12 Ringbolt Adaptor Clevis
- M12 Locking Adaptor
- Turning handle with integrated 22mm operating nut
- Calibration Certificate
- Padded Carrying Case



TESTING A SAFETY HARNESS EYEBOLT (Fig 22)

Place the bridge over the eyebolt to be tested. Locate the clevis on the eyebolt and fit the cross pin through the clevis and eyebolt, ensuring that the ball on the pin clicks into place, having passed through the second fork (**see section 2.5 The Clevis Adaptor**).

Adjust the swivel feet by unscrewing from the leg, so that each foot is resting on the material around the eyebolt and the bridge is square and level. If the area around the fixing is prone to damage, such as soft decorative surfaces, a protection plate may be fitted between the wall and bridge feet of the tester (please note that this is not supplied by Hydrajaws).

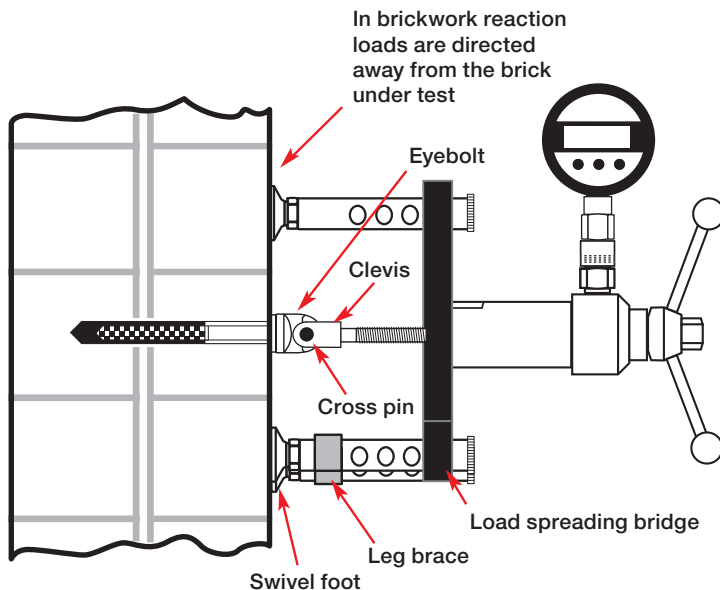
Check that the gauge is reading zero.

Commence the test by turning the operating handle on the tester clockwise and observe the gauge as the load on the eyebolt is increasing. Continue applying the load until the proof test load of 6kN* is reached. Stop applying the load and observe if the reading falls back.

If the fall back is minimal, apply the load again until reading is at the proof test load and the structural anchorage should then sustain the force for a minimum of 60 seconds.

* Under the latest requirements of BS 7883:2019 BSI Standards, allow 5% extra on the load when using a digital gauge to allow for settling.

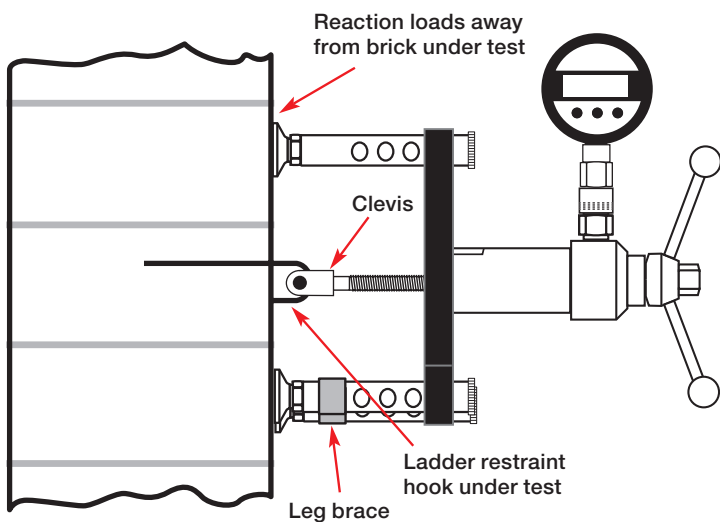
Fig 22



TESTING A LADDER RESTRAINT HOOK (Fig 23)

Follow the same setting up procedure as for Safety Harness Eyebolt test, and apply the load gradually until the required proof load of 2.5kN* is reached or failure occurs. Observe if the hook withdraws from the structure or the test load cannot be achieved. This would be considered a failure and must be taken out of service.

Fig 23



6. M2000 MATERIAL BOND TESTER KIT

The bonding strengths of a wide and varied range of materials including concrete, screeds, repair mortars, epoxy resin coatings, laminates, plastics, paints and enamels may be accurately determined using the Hydrajaws Material Bond Tester.

Adequate direct tensile strength or bonding strength between two layers is important if repairs to concrete structures or additional overlays and screeding on existing concrete is to be structurally sound.

The pull-off test as a means of projecting the compressive strength of concrete and other materials involves bonding a circular steel disc to the surface by means of an epoxy resin adhesive. A controlled tensile force is then applied to the disc, and as the strength of the bond is greater than that of the material under stress it will eventually fail in tension. From the area of the disc and the force applied at failure it is possible to calculate a nominal tensile strength for the material.

KIT CONTENTS:

- M2000 Medium Duty Tester with Digital/Analogue Gauge to 25kN
- Bond test stool with adjustable legs
- Bond test plug
- 10x50mm & 10x75mm steel bond discs
- Calibration Certificate
- Padded Carrying Case



Equipment that may be required in addition to the standard kit contents: *(Not supplied by Hydrajaws)*

- Adhesive
- Spatula
- Diamond-coated core drill
- Bondline spacers – i.e. ballotini (glass spheres)

ON SITE PULL-OFF METHOD

Procedure for preparing samples for pull-off testing:

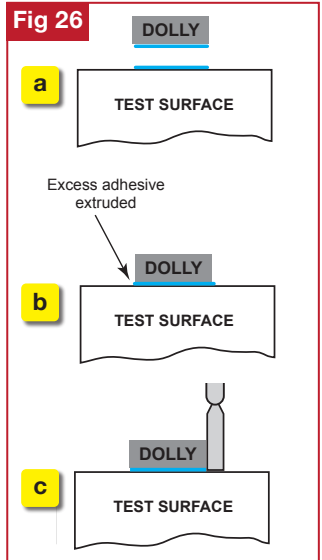
1. Clean the steel dollies (degrease and grit blast unless otherwise stated). This will help to prevent interfacial failures at the dolly interface.
2. For concrete substrates drill through the repair system with diamond core drill at $(90 \pm)^\circ$ to the surface into the test surface by $\sim 5\text{mm}$ or more.

This ensures a consistent bond area and will therefore help reduce variations in the test results.

3. Clean the substrate test surface as recommended by the manufacturer.
4. Mix the adhesive as recommended by the adhesive supplier and add 1% by weight of ballotini (usually 0.5mm unless stated otherwise).

Adding ballotini will reduce alignment errors and therefore help reduce variations in the test results.

Fig 26



5. Apply adhesive to steel dolly.
6. Apply adhesive to substrate test surface (**fig 26a**). This ensures the adhesive wets out both surfaces and helps prevent interfacial failures.
7. Press the steel dolly into the substrate test surface with a firm pressure (**fig 26b**). DO NOT 'seat' the dolly by twisting it into position. If the dolly is twisted into position, it will increase the likelihood of interfacial failures.
8. Remove excess adhesive from around the edge of the dolly without disturbing its position (**fig 26c**). This ensures a consistent bond area and will therefore help reduce variations in the test results. If working on a vertical or overhead surface, ensure the dollies are held firmly in position until the adhesive has cured.
9. Connect centering plug to disc using the 8mm thread and hand tighten until bottom is flush with top disc (**fig 27a**).
10. Lower load stool centre hole over centering plug and adjust the 3 screws until top of plug is flush and level with top of stool. It is essential that this levelling is carried out carefully to ensure a square and smooth pull through the stool. The load applied to the centre of the dolly should be at an angle of $90^{\circ} \pm 1$ (**fig 27b**).
11. Slide Tester over adaptor on top of plug and fit 22mm socket and ratchet to the operating nut (**fig 28**). Secure equipment so that it does not move during testing. This will cause excess misalignment which will reduce pull-off strengths.
12. Operate ratchet in a clockwise direction until required loading is obtained or bonding breaks. Record test temperature, failure load and failure mode (**fig 29**) (Record mixed failure modes in percentages of bond area, i.e. 90% substrate failure, 10% cohesive failure). Maximum loading achieved will be shown by red indicator pointer. Use this reading to calculate the bond strength MPa from the chart on page 20.

Fig 27

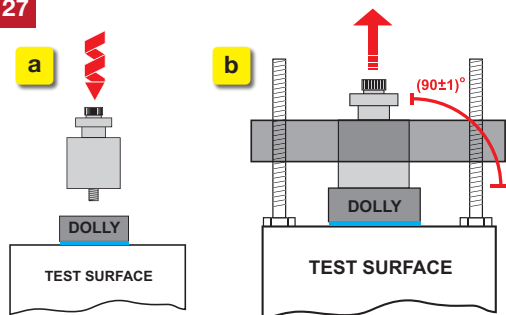


Fig 28

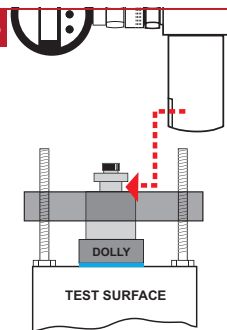
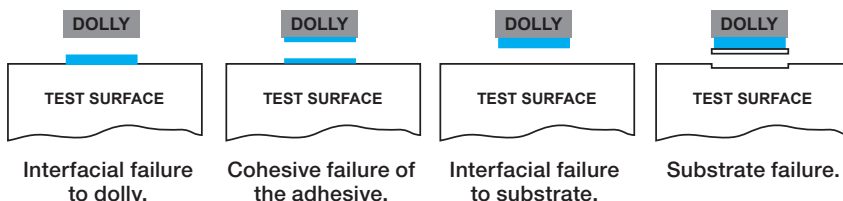


Fig 29



6. M2000 MATERIAL BOND TESTER KIT – *Continued*

IMPORTANT! A low reading will be obtained if:

- The pull-off tester is misaligned and not perpendicular to the specimen
- The specimen is misaligned and not perpendicular to the pull-off tester
- The bondline is not of uniform thickness (0.5mm)
- A sudden or erratic loading is applied.

Note: This information is for guidance only.

Please also refer to adhesive manufacturer's data and safety sheets.

Replacement discs available in both sizes from stock.

ACTUAL PULL FORCE READ DIRECT FROM GAUGE

50mm dia Disc Area 1964mm ² Bond Strength* MPa (Megapascal = N/mm squared)	Actual Pull Force kN	75mm dia Disc Area 4418mm ² Bond Strength* MPa (Megapascal = N/mm squared)
0.51	1.00	0.23
1.01	2.00	0.45
1.53	3.00	0.68
2.03	4.00	0.90
2.55	5.00	1.13
3.05	6.00	1.36
3.56	7.00	1.59
4.07	8.00	1.81
4.58	9.00	2.04
5.09	10.00	2.26
5.06	11.00	2.49
6.11	12.00	2.72
6.62	13.00	2.94
7.13	14.00	3.16
7.63	15.00	3.40
8.15	16.00	3.62
8.66	17.00	3.85
9.16	18.00	4.07
9.67	19.00	4.30
10.20	20.00	4.52
10.70	21.00	4.98
11.71	23.00	5.20
12.22	24.00	5.43
12.73	25.00	5.65

*MPa = Actual Pull Force divided by Area of Disc x 1000

7. OPTIONAL LOAD SPREADING BRIDGES

Hydrajaws offer three optional load spreading bridges, a pyramid stool with threaded legs and a 270mm or 600mm wider span bridge with height adjustable legs. These are designed to attach easily to the Hydrajaws M2000 Tester.

To install, first remove any existing load spreading bridge by removing the two positioning screws using the 3mm ball driver. Use the same screws to secure the tester to the optional bridge.

The 270mm and 600mm load spreading bridges can be installed so the tester is operated in two different positions as illustrated. The legs are fully adjustable to suit the testing application.

A thread adaptor coupler is also supplied to extend the accessory in use. The Pyramid stool is supplied with an extended bolt test adaptor.



Pyramid Stool



270 Bridge

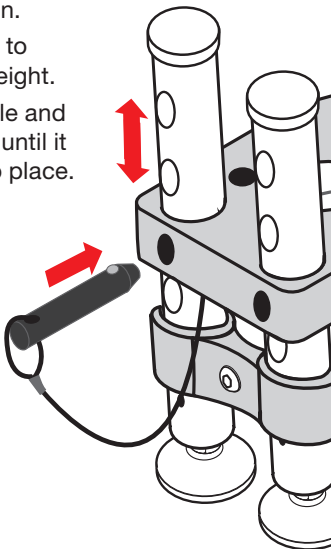


600 Bridge

8. LEG ADJUSTMENT

To adjust leg height:

- pull out pin.
- adjust leg to desired height.
- line up hole and insert pin until it clicks into place.

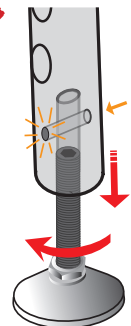
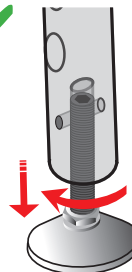


Fine adjustment can be made by unscrewing the feet by no more than approximately 10mm.



Caution:

If light is visible through the bottom indicator holes then the leg has been unscrewed too far. Don't expose more than 10mm of thread.



9. CARE OF TESTER

9.1 LUBRICATION

Lubrication of rod

This is required periodically depending on usage.

Unscrew and remove operating handle. Take care to avoid moving the washer and bearing below. Grease surfaces and threads before re-assembly (**fig 30**).

Oil refilling

Connecting and disconnecting Gauges from the Tester body will eventually use up the spare oil capacity and will not allow the tester plunger to travel its full stroke or give an accurate reading on the Gauge.

Fig 30

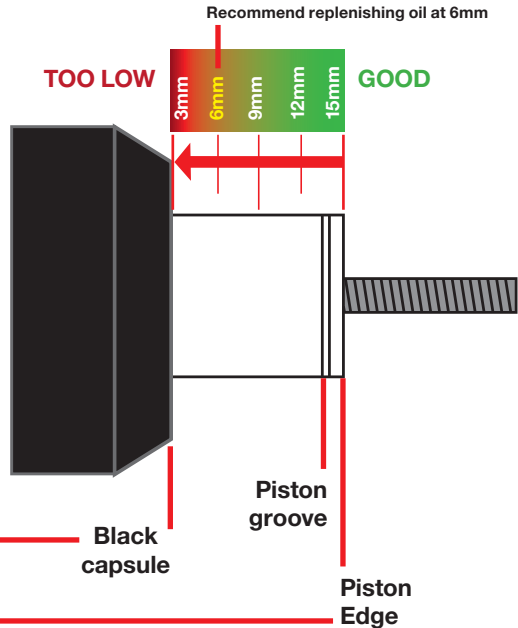
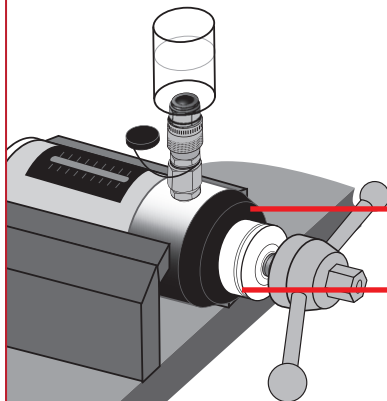


Recommended grease:
Rocol Sapphire 2
(Heavy Duty Multi-Purpose Bearing Grease).

Fig 31

Check the oil level frequently or eventually the plunger will stop at approx. 3mm from the edge and the tester will not function correctly.

(To refill oil see **9.2 oil refilling instructions**)



9.2 OIL REFILLING INSTRUCTIONS

NOTE: A tester with a fixed gauge cannot be filled with oil by the operator.

1. Remove the bridge and all accessories.
2. Secure the tester (e.g. in a vice or other suitable holding device if on-site) with the coupler in the vertical position.
3. Connect the oil bottle via the quick release coupler.
4. Loosen bottle cap (**fig 32**).
5. Turn the handle anti-clockwise a few turns then using the piston key provided insert this into the piston on the piston. Ensure the piston key outer slot is nearer the piston body (**fig 33**).
6. Force any air out of the system by pushing the piston in fully onto the face of the black capsule. Then pull out the piston key and handle away from the capsule. **Ensure not to pull the piston edge out further than 15mm**. This will draw oil from the bottle (**fig 34**).



Ensure not to pull the piston out further than 15mm.

7. Push the piston back in fully, pull out again and repeat until all the air bubbles are expelled into the bottle. Pull out the piston one more time to 15mm from the face of the capsule to replenish the oil.
8. Remove oil bottle.



Recommended oil:
**Light Mineral DTE Type
VISCOSITY 32**

Fig 32

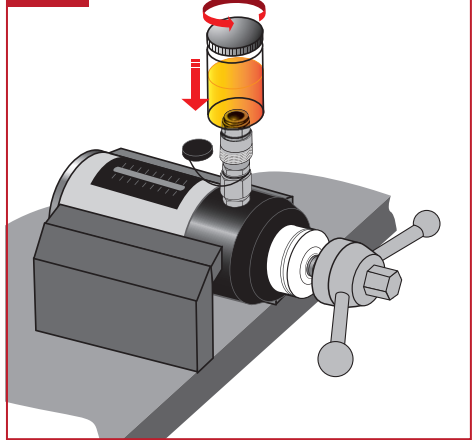


Fig 33

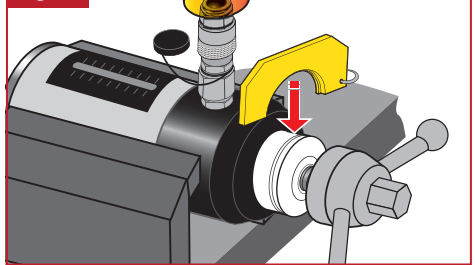
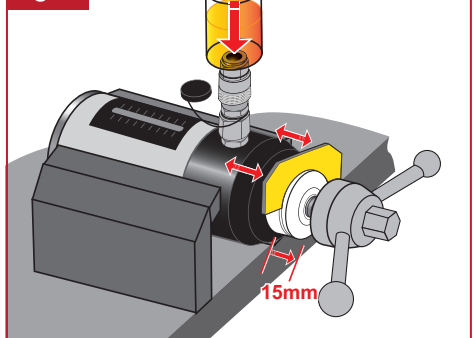


Fig 34



9.3 CALIBRATION

Your tester is calibrated for one year from date of purchase. After this time, the tester should be returned to Hydrajaws or to one of our official worldwide service agents for calibration.

**FOR MORE INFORMATION ON
HYDRAJAWS AND A FULL RANGE
OF TESTING APPLICATIONS
PLEASE VISIT OUR WEBSITE AT:
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