James Heal

# ACCESSORIES GUIDE

## Titan 5/10/25
**Universal Tester**


Covering Model Numbers
1710 Titan 5
2310 Titan 10
2310 Titan 25

Publication Version 1


PPT Group UK Ltd
t/a James Heal®
Halifax, England

Published by:

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# 1. Introduction

This guide is a comprehensive list of the tooling available for the 1710 Titan 5, 2310 10 and 25. It includes details about each type of tool with some relevant standards and recommended load cells. The load cells specified should not be exceeded as this may cause the tooling to not work as accurately or could cause damage to the tooling or load cell.

It is important when carrying out any tests to consult an up-to-date copy of the relevant standard. The actual standard contains a wealth of detail which is not possible to cover in this accessories guide.

The applications covered in this section are based on textiles and leather, and the majority of textile tests are designed for the testing of fabrics, either woven, knitted or nonwoven.

The tooling is documented in number order and includes a full list of any other tooling required to be used on the machine.

# 2. 1710 Titan 5 Tooling

This part of the accessories guide lists all the 1710 tooling which connect directly onto the Titan 5 instrument using a James Heal square adaptor. These can be connected to the new 2310 Titan 10 and 25 models using adaptors described in Chapter 4.

## 2.1. T4 Button Holder

Purpose: - Used with the T27 grips to test button strength and security of attachment.
Features: - Includes integrated debris shield.
Recommended Load Cell: - 100N, 200N, 500N and 1000N.
Maximum force: - 1000N.
Other tooling required: - T27 Universal Pneumatic Grips.

### *Tooling*

### *Standards*

BS 4162
M&S P122
Next TM37

## 2.2. T5 Pneumatic Yarn Grips (Pair)

Purpose: - Pair of grips to test the strength of yarn.
Features: - Plain jaw faces, corrugated optional available.
Recommended Load Cell: - 100N and 200N.
Maximum force: - 120N.

### *Tooling*

### *Standards*

ASTM D2256
EN ISO 2062

## 2.3. T8 Needle Clamps – Apparel Version

Purpose: - To test seam slippage without sewing on apparel only. To be used in conjunction with T27.
Features: - A row of needles to simulate a sewn seam, more needles and thinner included than on the T9.
Recommended Load Cell: - 100N, 200N, 500N and 1000N.
Maximum force: - 1000N.
Other tooling required: - T27 Universal Pneumatic Grips.

### *Tooling*

### *Standards*

EN ISO 13936-3

## 2.4. T9 Needle Clamps – Upholstery Version

Purpose: - Tested using T27 grips for seam slippage on upholstery fabrics.
Features: - Needles to grip fabric so no sewn seam required, fewer and thicker needles than on the T8.
Recommended Load Cell: - 100N, 200N, 500N and 1000N.
Maximum force: - 1000N.
Other tooling required: - T27 Universal Pneumatic Grips.

### *Tooling*

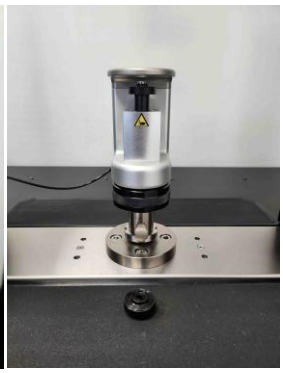
### *Standards*

EN ISO 13936-3
IKEA IOS-PRG-0023 (Refer to BS EN ISO 13934-1)

## 2.5. T12 Attachments Kit including OctoGrip

Purpose: - Various grip types used with the security of attachments to garments.
Features: - 6 individual grips including lever jaw assembly, hook assembly, pneumatic clamp, three-pronged grip, finger jaw face for T27 and diamante grip assembly.
Recommended Load Cell: - 100N, 200N and 500N.
Maximum force: - OctoGrip 200N and other assemblies 500N.
Other tooling required: - T27 Universal Pneumatic Grips.

### *Tooling*




## *Standards*

EN 71-1
M&S P115
M&S P124
Next TM42
Next TM45
Next TM46

## 2.6. T13 Pile Loop Extraction Kit

Purpose: - Used to test individual loop strength of Terry Towelling.
Features: - Two different hooks for thicker or thinner loops.
Recommended Load Cell: - 100N.
Maximum force: - 100N.
Other tooling required: - T27 Universal Pneumatic Grips.

### *Tooling*


### *Standards*

EN 15598

## 2.7. T14 Zip Testing Kit

Purpose: - Various tools used to test the strength of zips.
Features: - Separate operators guide for use of all tooling.
Recommended Load Cell: - 100N, 200N, 500N and 1000N.
Maximum force: - 1000N.
Other tooling required: - T27 Universal Pneumatic Grips.

### *Tooling*


### *Standards*

ASTM D2061 – Part 10.2 and 72.1
BS 3084
EN 16732 – Annex B, C, D, E, G, H, I and J

## 2.8. T15 Pneumatic Yarn Grips (Pair)

Purpose: - Test the strength of yarns, cords, and threads.
Features: - Maximum diameter 6mm. Pneumatic grips to initially hold the material in place lightly before clamping harder before the test starts for additional safety.
Recommended Load Cell: - 100N, 200N, 500N and 1000N.
Maximum force: - 1000N.

### *Tooling*


### *Standards*

ASTM D2256
EN ISO 2062

## 2.9. T18 Loop Bars (Pair)

Purpose: - Pair of grips to test for stretch and recovery on specimens up to 125mm wide.
Features: - Bars in different sizes, 4mm, 6.5mm, 8mm, 10mm and 13mm diameters.
Recommended Load Cell: - 100N and 200N.
Maximum force: - 200N.

### *Tooling*

### *Standards*

Adidas 4.27
ASTM D4964
BS 4952
EN 14704-1 Method B

## 2.10. T19 Check Weight Set

Purpose: - Set of weights to regularly check the accuracy of each load cell.
Features: - Individual weights making up to 5000N.
Recommended Load Cell: - 100N, 200N, 500N, 1000N and 5kN.
Maximum force: - 5kN.

### *Tooling*


### *Standards*

N/A

## 2.11. T20A Clamp for Ball Burst and Puncture (Not suitable for 2310 Titan 10/ 25)

Purpose: - Ball bursting clamp used to test bursting strength of fabrics.
Features: - Easy to use levers to clamp the fabric.
Recommended Load Cell: - 1000N and 5kN.
Maximum force: - 5kN.
Other tooling required: - T20A Ball Probe or T20B Screwdriver Attachment.

### *Tooling*

### *Standards*

ASTM D751 Section 18 and 22
ASTM D3787
ASTM D6797
GB/T 19976
NWSP 110.5

## 2.12. T20A Ball Probe

Purpose: - To be used with the T20A clamp to test fabrics for bursting strength.
Features: - Probe for specific type of bursting tests with 25mm diameter ball.
Recommended Load Cell: - 1000N and 5kN.
Maximum force: - 5kN.
Other tooling required: - T20A Clamp.

### *Tooling*

### *Standards*

ASTM D751 Section 18
ASTM D3787
ASTM D6797
GB/T 19976
NWSP 110.5

## 2.13. T20B Screwdriver Puncture Attachment

Purpose: - To be used with the T20A clamp to test fabrics for bursting strength.
Features: - Screwdriver probe for specific type of puncture tests.
Recommended Load Cell: - 1000N and 5kN.
Maximum force: - 5kN.
Other tooling required: - T20A Clamp.

### *Tooling*


### *Standards*

ASTM D751 Section 22

## 2.14. T20C Ball Probe

Purpose: - To be used with the T20A clamp to test fabrics for bursting strength.
Features: - Ball probe with a 38mm diameter ball for bursting tests using a larger sized ball.
Recommended Load Cell: - 1000N and 5kN.
Maximum force: - 5kN.
Other tooling required: - T20A Clamp.

### *Tooling*


### *Standards*

## 2.15. T21 C-Clamps (Pair)

Purpose: - Used to test for stretch and recovery.
Features: - Can be used to test specimens up to 125mm wide. Bars available in 8mm and 100mm diameter.
Recommended Load Cell: - 100N and 200N
Maximum force: - 200N.

### *Tooling*


### *Standards*

EN 14704-1 (Method B)

## 2.16. T22 Hank Bollards/ Skein Spools (Pair)

Purpose: - To test the strength of yarn in both hanks and skeins.
Features: - Round edged grips for easy fitting of the hank or skein.
Recommended Load Cell: - 5kN.
Maximum force: - 5kN.

### *Tooling*


### *Standards*

ASTM D1578 Option 2 and 3
ISO 6939

## 2.17. T23A Manual Fabric Grips (Pair)

Purpose: - Pair of grips used to test for a variety of test methods including tensile, tear and seam strength.
Features: - Two sets of jaw faces, one set full rubber and one pair of 25 x 25cm rubber faces for grab test methods.
Recommended Load Cell: - 500N, 1000N and 5kN.
Maximum force: - 5kN.

### *Tooling*


### *Standards*

ASTM D3759M Procedure A

## 2.18. T24 Button and Stud Holder

Purpose: - To test buttons and tack buttons/ studs for strength of attachment to garment.
Features: - Different sized plates to fit different sized buttons and stud fasteners.
Recommended Load Cell: - 100N, 200N, 500N and 1000N.
Maximum force: - 1000N.
Other tooling required: - T27 Universal Pneumatic Grips.

### *Tooling*

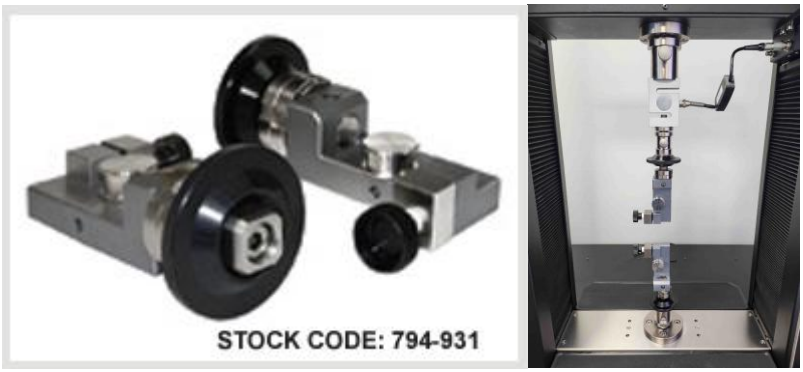

### *Standards*

BS 7907 Annex B
CEN/TR 16792 Annex B

## 2.19. T25 Manual Yarn Grips (Pair)

Purpose: - To test the strength of yarns.
Features: - Manual closing grips to allow customised pressure to hold the yarn.
Recommended Load Cell: - 100N, 200N, 500N and 1000N.
Maximum force: - 1000N.

### *Tooling*




### *Standards*

ASTM D2256
ISO 2062

## 2.20. T26 Bra Wire Penetration Tool

Purpose: - Used to test how much force a bra wire casing can withstand to puncture from a bra wire.
Features: - Prong for easy placement of the casing for testing.
Recommended Load Cell: - 100N, 200N, 500N and 1000N.
Maximum force: - 1000N.
Other tooling required: - T27 Universal Pneumatic Grips.

### *Tooling*


### *Standards*

H&M DS-12
M&S P11A
Next TM36
Pacific Brands PB-002

## 2.21. T27 Pneumatic Fabric Grips (Pair)

Purpose: - Universal fabric grips used as a pair to test for tensile, tear and seam strength or one grip to be used in combination with several other tools to grip the fabric during test.
Features: - Pneumatic function which holds the fabric lightly for easy adjustment and placement of the fabric until ready to test. Two sets of jaw faces, one set full rubber and one pair of 25 x 25cm rubber faces for grab test methods.
Recommended Load Cell: - 500N, 1000N, 2500N and 5kN.
Maximum force: - 5kN.

### *Tooling*


### *Standards*

ISO 13937-2, 3 and 4

## 2.22. T28 Coefficient of Friction Fixture (Cannot be used with the guard)

Purpose: - Test to determine the friction of a material such as cork, packaging and other sheet materials.
Features: - Two different sleds for varied applications.
Recommended Load Cell: - 100N.
Maximum force: - 100N.

### *Tooling*


### *Standards*

ASTM D1894
DIN 53375 (Refer to ASTM D1894)
TAPPI T549 (Refer to ASTM D1894)

## 2.23. T29 Compression Platens (Pair) (Not suitable for 2310 Titan 10/ 25)

Purpose: - Pair of platens to be used to test materials in compression.
Features: - 155mm diameter platen, made from aluminium and embossed surface to place specimen centrally.
Recommended Load Cell: - 100N, 200N, 500N, 1000N, 2500N and 5kN.
Maximum force: - 5kN.

### *Tooling*


### *Standards*

## 2.24. T30 Tuft and Loop Withdrawal Kit

Purpose: - To test the force to remove a tuft or loop of thread out of a carpet sample.
Features: - Clamp for the bottom and either scissors or a loop for attaching to the tuft or loop for removal.
Recommended Load Cell: - 100N and 200N.
Maximum force: - 200N.

### *Tooling*

Image Pending

### *Standards*

## 2.25. T32 EN 388 Nail Puncture Kit

Purpose: - To test the strength of materials used to make gloves from being penetrated by a nail.
Features: - Large clamp with plate for securing samples and sharp nail for puncturing the material.
Connection: - 15.9mm.
Recommended Load Cell: - 5kN and 10kN.
Maximum force: - 10kN.

### *Tooling*

### *Standards*

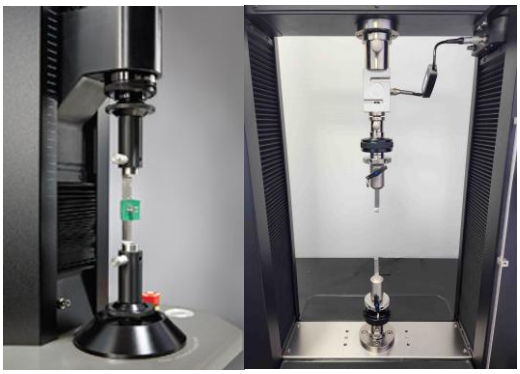
EN 388 Section 6.5

## 2.26. T33 Baumann/ Slit Tear Clamps (Pair)

Purpose: - Used to test the tear strength of a material by inserting the end of the grip into a hole in the fabric and pulling until it tears.
Features: - .
Recommended Load Cell: - 100N and 200N.
Maximum force: - 200N.

### *Tooling*

STOCK CODE:
794-885



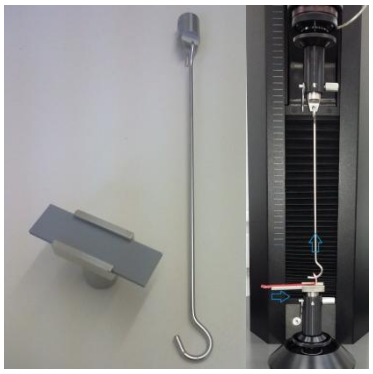
### *Standards*

ASTM D2212
ISO 3377-2 (IUP 8)
M&S P35

## 2.27. T35 Adhesion of Finish Kit

Purpose: - To determine the force required to remove one layer of material from another which has been bonded using an adhesive.
Features: - PVC plate available as consumable.
Recommended Load Cell: - 100N and 200N.
Maximum force: - 200N.

### *Tooling*



### *Standards*

ISO 11644 (IUF 470)

# 3. 2310 Titan 10 and 25 Tooling

Section 3 includes tooling which can be used directly on the new Titan 10kN and 25kN instruments. They have a pin and post connection for quick and easy connection to the instrument.
Using an adaptor, some of the tooling can be connected to the Titan 5 instrument, but the recommended load cell must be observed to prevent load cells from being overloaded.

## 3.1. T36P Leather Ball Burst

Purpose: - To test the bursting strength of leather using a clamp to hold the fabric and a ball to push through the fabric. Tested in tension to push the ball through the fabric.
Features: - Cage around the ball probe during test for additional safety.
Connection: - 15.9mm.
Recommended Load Cell: - 1000N.
Maximum force: - 1000N.

### *Tooling*

STOCK CODE:
705-681

### *Standards*

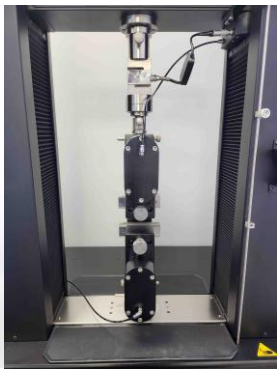
BS 3144 Method B
BS 3424 Part 6
ISO 3379 (IUP 9)

## 3.2. T37P Pneumatic Fabric Grips

Purpose: - Pneumatic grips used to test for a variety of tests including tensile, tear and seam strength. To be used on the medium capacity machine for tests between 5kN and 10kN.
Features: - Pin and post connection for compatibility with the Titan 10kN and 25kN. Higher maximum load force than T27 but with the same range of jaw faces for multiple applications.
Connection: - 15.9mm.
Recommended Load Cell: - 10kN and 25kN.
Maximum force: - 10kN.

### *Tooling*

STOCK CODE: 794-940



### *Standards*

## 3.3. T39P Circular Compression Platens 10kN

Purpose: - Round platens for testing specimens in compression.
Features: - 155mm diameter made from stainless steel.
Connection: - 15.9mm.
Recommended Load Cell: - 5kN and 10kN.
Maximum force: - 10kN.

### *Tooling*

STOCK CODE: 794-941

### *Standards*

## 3.4. T100P Safety Footwear Compression Platens

Purpose: - To test safety toe cap compression to 15kN.
Features: - Plasticine and mould included in the kit.
Connection: - 31.8mm.
Recommended Load Cell: - 25kN
Maximum force: - 25kN.

### *Tooling*

Image Pending

STOCK CODE: 705-734

### *Standards*

ISO 20344 5.5 (ISO 20345)

## 3.5. T101P Pincer Grips

Purpose: - Measurement of bond strength of soles of shoes.
Features: - Pyramid jaws.
Connection: - 15.9mm.
Recommended Load Cell: - 100N, 200N, 500N, 1000N and 2500N
Maximum force: - 2500N.

### *Tooling*

STOCK CODE: 705-738

### *Standards*

## 3.6. T102P Ribbon Grips 10kN

Purpose: - For higher strength tensile tests and for straps/ belts.
Features: - Locking mechanism with pins for easy insertion of specimen.
Connection: - 20mm.
Recommended Load Cell: - 10kN.
Maximum force: - 10kN.

### *Tooling*

STOCK CODE: 705-737

### *Standards*

## 3.7. T103P Ribbon Grips 25kN

Purpose: - Used to test straps, seatbelts, webbing, harness straps etc for tensile strength.
Features: - Pins used to lock the rollers in place for easier setup.
Connection: - 31.8mm.
Recommended Load Cell: - 25kN
Maximum force: - 25kN.

### *Tooling*

STOCK CODE: 705-735

### *Standards*

## 3.8. T104P Circular Compression Platens 25kN

Purpose: - Platens for different types of compression tests.
Features: - Made from stainless steel with 155mm test area, circular embossing for easy placement of the specimen and 31.8mm hole for connecting directly to the Titan 25 and 25kN load cell.
Connection: - 31.8mm.
Recommended Load Cell: - 25kN
Maximum force: - 25kN.

### *Tooling*

STOCK CODE: 705-736

### *Standards*

## 3.9. T105P Ball Burst 10kN

Purpose: - For all bursting strength testing at a higher capacity.
Features: - Lower clamp and top probe ball diameter 25.4mm.
Connection: - 20mm.
Recommended Load Cell: - 5kN and 10kN
Maximum force: - 10kN.

### *Tooling*

STOCK CODE: 794-958

### *Standards*

ASTM D751
ASTM D3797
ASTM D6797
GB/T 19976
WSP 110.5

# 4. Connecting 1710 Tooling to 2310 Models

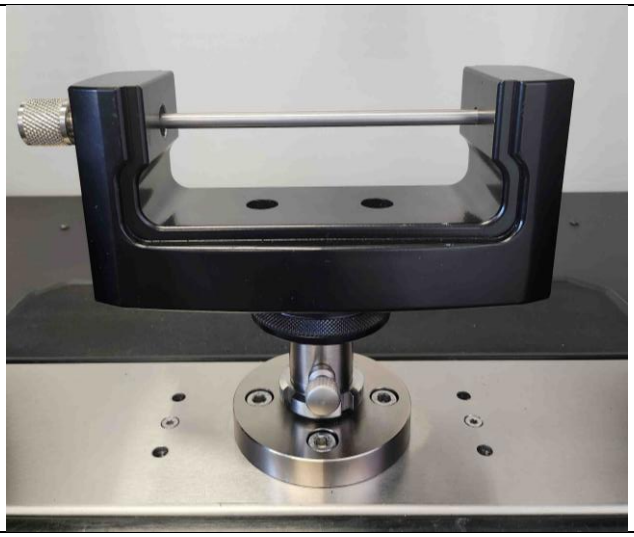
The Titan 5 accessories for the model number 1710 shown in section 2 can be used on the new 2310 Titan 10 and 25 models* using the adaptor setup shown below depending on whether you have the 10kN or 25kN instrument.
*Unless stated it is not compatible.

**NOTE:** The maximum force mentioned in Chapter 2 must be adhered to. Failure to use the grip on the correct load cell or to within the maximum force could result in breaking the load cell or grip. This will ensure the machine is used safely.

## 4.1. 2310 Titan 10kN

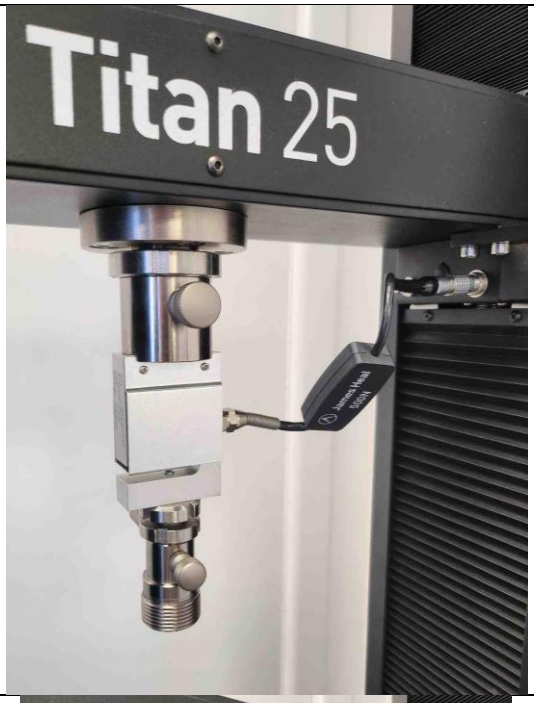
### *4.1.1. Bottom Adaptor – To use with Load Cells 100N to 10kN*

| | |
|---|---|
| 1. Fixed to the bottom of the instrument is a connector with a post size of 20mm diameter, a hole for a pin with an 8mm diameter and a locking nut. |  |
| 2. Connect the James Heal square to 20mm adaptor onto the bottom adaptor and push the pin through the hole. Secure the locking nut by screwing it up.<br>Note: Ensure the correct square adaptor is used (stock code – 544-977). |  |

| | |
|---|---|
| 3. Place the grip onto the top of the adaptor, aligning the square ensuring it is in the correct orientation.<br>Screw the connection onto the adaptor. |  |

### 4.1.2. Load Cells – 100N to 5kN

| | |
|---|---|
| 1. Load cell 100N to 5kN.<br>a) Push the load cell onto the top post on the top of the instrument. Push the pin through the load cell, the post on the Titan and back through the other side of the load cell.<br>Tighten the locking nut using the C spanner. |  |

| | |
|---|---|
| b) Using the James Heal square to 15.9 adaptor (stock code 544-976), screw this into the tooling to be used on the top of the instrument. Connect this to the bottom of the load cell and slide the pin all the way through, tighten the locking nut using a C spanner.<br>  |  |
| c) Place the grip onto the bottom of the adaptor, aligning the square ensuring it is in the correct orientation.<br>Screw the connection onto the adaptor. |  |

### 4.1.3. Load Cell – 10kN

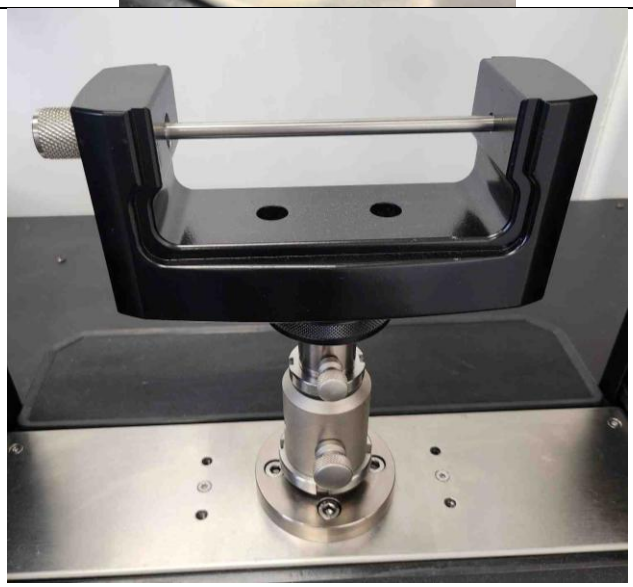
| | |
|---|---|
| 2. Load cell 10kN.<br>a) Push the load cell onto the top post on the top of the instrument. Push the pin through the load cell, the post on the Titan and back through the other side of the load cell.<br>Tighten the locking nut using the C spanner. |  |
| b) Connect a James Heal square to 20mm adaptor (stock code 544-977) to the tooling. Push the other side of the adaptor onto the post on the end of the load cell and slide the pin through the adaptor, load cell and back through to the other side of the adaptor.<br>  |  |

| | |
|---|---|
| c) Place the grip onto the bottom of the adaptor, aligning the square ensuring it is in the correct orientation.<br>Screw the connection onto the adaptor. |  |

## 4.2. 2310 Titan 25kN

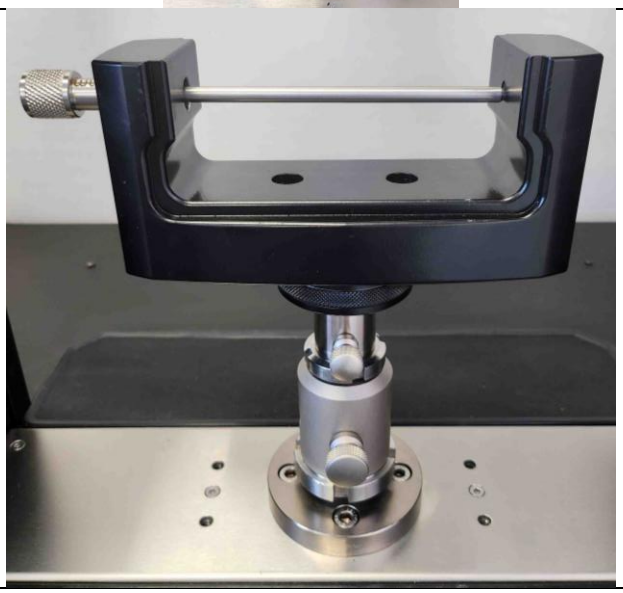
### *4.2.1. Bottom Adaptor – To use with Load Cells 100N to 5kN*

| | |
|---|---|
| 1. The bottom connector on the Titan 25kN instrument is a 31.8mm post with a hole for a 12mm pin with a large locking nut. |  |
| 2. Connecting the 1710 Titan 5 tooling to the instrument requires a 31.8mm to 15.9mm conversion adaptor (stock code 705-723). Put the adaptor onto the bottom connector, push the pin through the adaptor and connector until it is through to the other side.<br>Screw the locking nut up into place and tighten using the C spanner. |  |

| | |
|---|---|
| 3. Connect the James Heal square to 15.9mm adaptor (stock code 544-976) onto the tooling to be attached to the instrument.<br>Screw the locking nut up into place and tighten using the C spanner.<br>Note: You may need two of these adaptors, one for the top tool and one for the bottom.<br>  |  |
| 4. Place the grip onto the top of the adaptor, aligning the square ensuring it is in the correct orientation.<br>Screw the connection onto the adaptor. |  |

### 4.2.2. Bottom Adaptor – To use with Load Cells 10kN and 25kN

| | |
|---|---|
| 1. The bottom connector on the Titan 25kN instrument is a 31.8mm post with a hole for a 12mm pin with a large locking nut. |  |

| | |
|---|---|
| 2. Connecting the 1710 Titan 5 tooling to the instrument requires a 31.8mm to 20mm conversion adaptor (stock code 705-724). Put the adaptor onto the bottom connector, push the pin through the adaptor and connector until it is through to the other side.<br>Screw the locking nut up into place and tighten using the C spanner. |  |
| 3. Connect the James Heal square to 20mm adaptor (stock code 544-977) onto the tooling to be attached to the instrument.<br>Screw the locking nut up into place and tighten using the C spanner.<br>Note: You may need two of these adaptors, one for the top tool and one for the bottom.<br>  |  |
| 4. Place the grip onto the top of the adaptor, aligning the square ensuring it is in the correct orientation.<br>Screw the connection onto the adaptor. |  |

### 4.2.3. Load Cells – 100N to 5kN

See section 4.1.2.

### 4.2.4. Load Cell – 10kN

See section 4.1.3.

### 4.2.5. Load Cell – 25kN

| | |
|---|---|
| 3. Load cell 25kN.<br>a) Push the load cell onto the top post on the top of the instrument. Push the pin through the load cell, the post on the Titan and back through the other side of the load cell.<br>Tighten the locking nut using the C spanner. |  |
| b) Connect a 31.8mm to 20mm adaptor to the bottom of the load cell and slide the pin through the adaptor, load cell and back through to the other side of the adaptor. |  |

| | |
|---|---|
| c) Screw the James Heal square to 20mm adaptor (stock code 544-977) to the grip intended to be used on the top of the instrument. |  |
| d) Place the grip onto the top of the adaptor, aligning the square ensuring it is in the correct orientation.<br>Screw the connection onto the adaptor. |  |

# 5. Connecting 2310 Tooling to New Titan

The new Titan 10kN and 25kN instrument uses pin and post connections on all Load Cells. Higher capacity Load Cells use a different sized connector to the lower capacity Load Cells and therefore some tooling may require adapting to fit onto higher or lower capacity Load Cells.

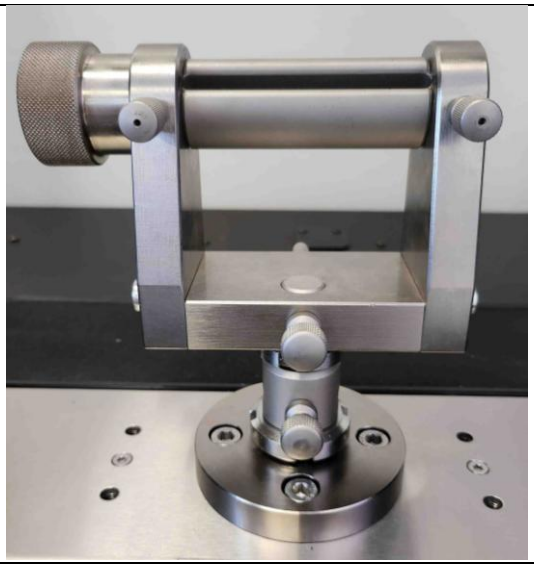
**NOTE:** The recommended Load Cell and maximum force mentioned in section 3 must be adhered to. Failure to use the grip on the correct Load Cell or within the maximum force could result in breaking the Load Cell or grip and will ensure the machine is used safely.

## 5.1. 2310 Titan 10kN

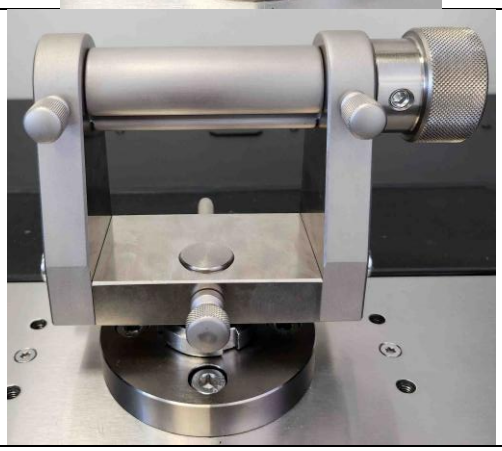
Any tooling with a 15.9mm connection can be used on the 100N to 10kN load cells and connect to the instrument bottom using an adaptor.
Any tooling with a 20mm connection can be used on the 10kN load cell only and connect directly to the instrument.
Tooling with a 31.8mm connection are not compatible with the 10kN Titan.

### *5.1.1. Bottom Adaptor – 15.9mm Tooling*

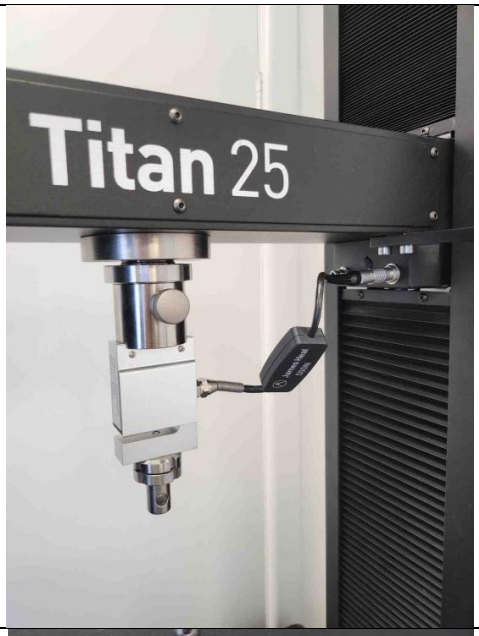
| | |
|---|---|
| 1. a) Fixed to the bottom of the instrument is a connector with a post size of 20mm diameter, a hole for a pin with an 8mm diameter and a locking nut. |  |
| b) Connect the adaptor (705-725) to the bottom of the instrument by inserting it onto the post, push the pin through the adaptors and tighten the locking nut using a C spanner. |  |

| | |
|---|---|
| c) Sit the grip onto the top of the adaptor in the same way, pushing the pin through the grip and then tightening the C spanner. |  |

### 5.1.2. Bottom Adaptor – 20mm Tooling

| | |
|---|---|
| 2. a) Fixed to the bottom of the instrument is a connector with a post size of 20mm diameter, a hole for a pin with an 8mm diameter and a locking nut. |  |
| b) Sit the grip onto the top of the bottom adaptor, pushing the pin through the grip and then tightening the C spanner. |  |

### 5.1.3. Load Cells 100N to 5kN – 15.9mm tooling

| | |
|---|---|
| 1. Load cell 100N to 5kN.<br>a) Push the load cell onto the top post on the top of the instrument. Push the pin through the load cell, the post on the Titan and back through the other side of the load cell.<br>Tighten the locking nut using the C spanner. |  |
| c) Push the grip onto the top of the adaptor in the same way, pushing the pin through the grip and then tightening the C spanner. |  |

### 5.1.4. Load Cell 10kN – 15.9mm tooling

| | |
|---|---|
| 2. Load cell 10kN.<br>a) Push the load cell onto the top post on the top of the instrument. Push the pin through the load cell, the post on the Titan and back through the other side of the load cell.<br>Tighten the locking nut using the C spanner. |  |
| b) Using the adaptor 705-725, push this onto the bottom of the load cell and insert the pin through the hole and tighten the locking nut using the C spanner. |  |
| c) Push the grip onto the top of the adaptor in the same way, insert the pin through the grip and then tightening the locking nut with the C spanner. |  |

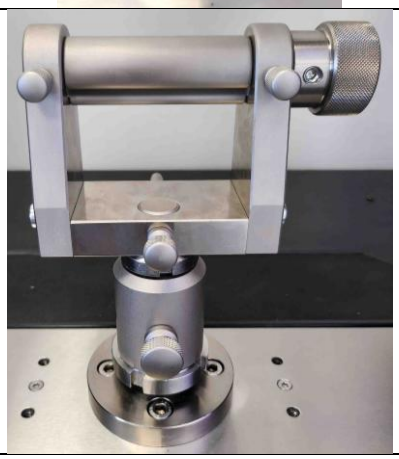
### 5.1.5. Load Cell 10kN – 20mm tooling

| | |
|---|---|
| 3. Load cell 10kN.<br>a) Push the load cell onto the top post on the top of the instrument. Push the pin through the load cell, the post on the Titan and back through the other side of the load cell.<br>Tighten the locking nut using the C spanner. |  |
| c) Push the grip onto the top of the adaptor in the same way, pushing the pin through the grip and then tightening the C spanner. |  |

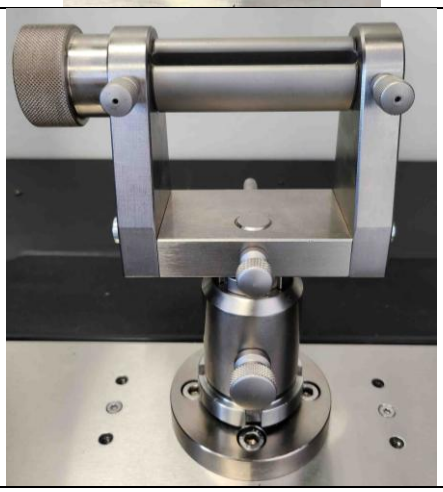
## 5.2. 2310 Titan 25kN

Any tooling with a 15.9mm connection can be used on the 100N to 10kN load cells and connect to the instrument bottom using an adaptor.
Any tooling with a 20mm connection can be used on the 10kN load cell only and connect to the instrument bottom using an adaptor.
Tooling with a 31.8mm connection can be used on the 25kN load cell only and connect directly to the instrument.

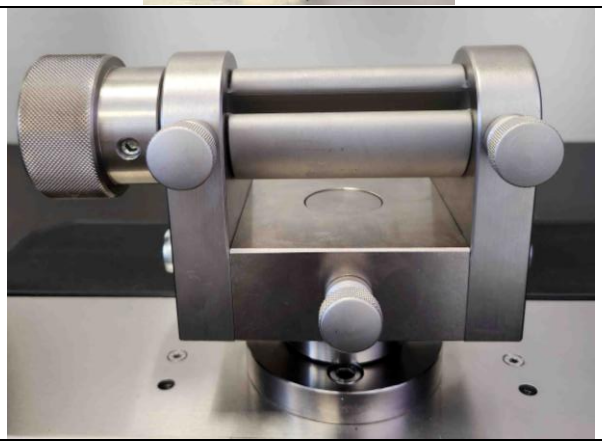
### 5.2.1. Bottom Adaptor – 15.9mm Tooling

| | |
|---|---|
| 2. a) Fixed to the bottom of the instrument is a connector with a post size of 31.8mm diameter, a hole for a pin with an 8mm diameter and a locking nut. |  |
| b) Connect the adaptor (705-725) to the bottom of the instrument by inserting it onto the post, push the pin through the adaptors and tighten the locking nut using a C spanner. |  |
| b) Sit the grip onto the top of the bottom adaptor, pushing the pin through the grip and then tightening the C spanner. |  |

### 5.2.2. Bottom Adaptor – 20mm Tooling

| | |
|---|---|
| 2. a) Fixed to the bottom of the instrument is a connector with a post size of 31.8mm diameter, a hole for a pin with an 8mm diameter and a locking nut. |  |
| Connect the adaptor (705-725) to the bottom of the instrument by inserting it onto the post, push the pin through the adaptors and tighten the locking nut using a C spanner. |  |
| b) Sit the grip onto the top of the bottom adaptor, pushing the pin through the grip and then tightening the C spanner. |  |

### 5.2.3. Bottom Adaptor – 31.8mm Tooling

| | |
|---|---|
| 2. a) Fixed to the bottom of the instrument is a connector with a post size of 31.8mm diameter, a hole for a pin with an 8mm diameter and a locking nut. |  |
| b) Sit the grip onto the top of the bottom adaptor, pushing the pin through the grip and then tightening the C spanner. |  |

### 5.2.4. Load Cells 100N to 5kN – 15.9mm Tooling

See section 5.1.3.

### 5.2.5. Load Cell 10kN – 15.9mm Tooling

See section 5.1.4.

### 5.2.6. Load Cell 10kN – 20mm Tooling

See section 5.1.5.

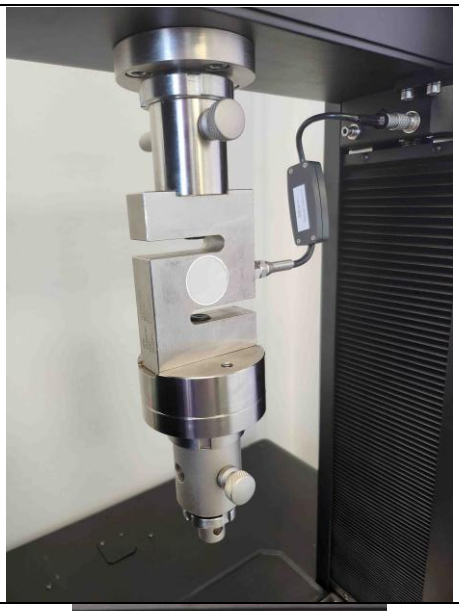
### 5.2.7. Load Cell 25kN – 15.9mm Tooling

| | |
|---|---|
| 4. Load cell 25kN<br>a) Push the load cell onto the top post on the top of the instrument. Push the pin through the load cell, the post on the Titan and back through the other side of the load cell.<br>Tighten the locking nut using the C spanner. |  |
| b) Using the adaptor 705-725, push this onto the bottom of the load cell and insert the pin through the hole and tighten the locking nut using the C spanner. |  |

| | |
|---|---|
| c) Push the grip onto the top of the adaptor in the same way, pushing the pin through the grip and then tightening the C spanner. |  |

### 5.2.8. Load Cell 25kN – 20mm Tooling

| | |
|---|---|
| 5. Load cell 25kN<br>a) Push the load cell onto the top post on the top of the instrument. Push the pin through the load cell, the post on the Titan and back through the other side of the load cell.<br>Tighten the locking nut using the C spanner. |  |

| | |
|---|---|
| b) Using the adaptor 705-725, push this onto the bottom of the load cell and insert the pin through the hole and tighten the locking nut using the C spanner. |  |
| c) Push the grip onto the top of the adaptor in the same way, pushing the pin through the grip and then tightening the C spanner. |  |

### 5.2.9. Load Cell 25kN – 31.8mm Tooling

| | |
|---|---|
| 6. Load cell 25kN<br>a) Push the load cell onto the top post on the top of the instrument. Push the pin through the load cell, the post on the Titan and back through the other side of the load cell.<br>Tighten the locking nut using the C spanner. |  |
| b) Push the grip onto the top of the adaptor in the same way, pushing the pin through the grip and then tightening the C spanner. |  |