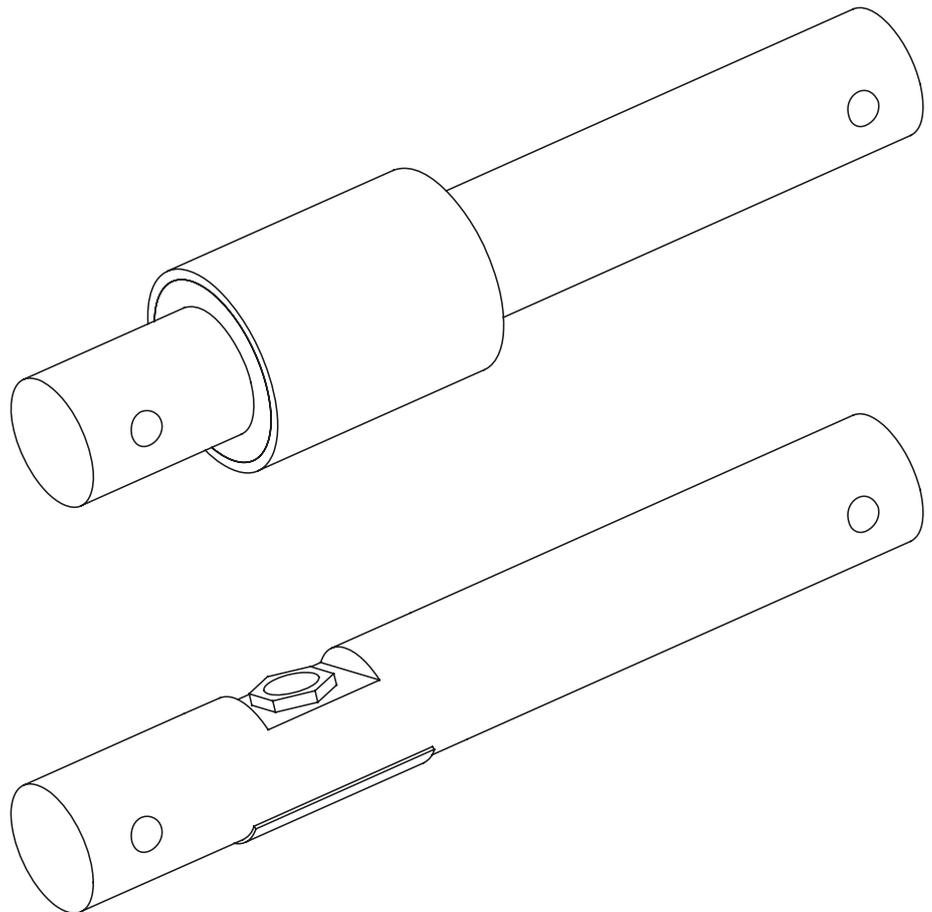


# XHD10000

USER MANUAL



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# XHD10000

The Tru-Test eXtra Heavy Duty (XHD) 10000 consists of a junction box and four XHD load cells. The complete weighing system includes a microprocessor controlled indicator (keyboard/display unit), sold separately.

The XHD load cells are fitted beneath a chute/crush holding the animal. They transmit the weight signal to the indicator. The indicator displays the weight and, through the keypad, provides control over the processing facilities of the scale.

- XHD load cells are designed for permanent installations where extra capacity and durability are required.
- XHD load cells are especially suited for use under a hydraulic squeeze chute/crush. Their industrial strength construction makes them the load cell of choice for feedlots where there are severe loadings and high usage rates.
- Load cells are interchangeable within a Tru-Test weighing system, with no special configuration changes required.
- Individual load cells are easily replaced.
- When connected to a Tru-Test 3000 indicator with software version 1.4 or later or an EC2000 or EziWeigh indicator with software version 2.1 or later, no span calibration is necessary. The standard calibration feature automatically selects pre-programmed load cell calibration.
- XHD load cells will operate with any other Tru-Test indicator, but the weighing system will require sensitivity calibration or span calibration unless the indicator is upgraded. Sensitivity calibration and span calibration can be performed with the help of your Tru-Test Service Centre, where applicable. Span calibration requires a test weight of known mass that is one third of the capacity of the scale or more.

## Caution!

- Load cells are precision transducers and should be treated with care.
- Do not spray the weighing system directly with a water blaster (high pressure water hose).
- Be particularly careful when welding around the load cell. Do not allow welding currents to pass through the load cell.

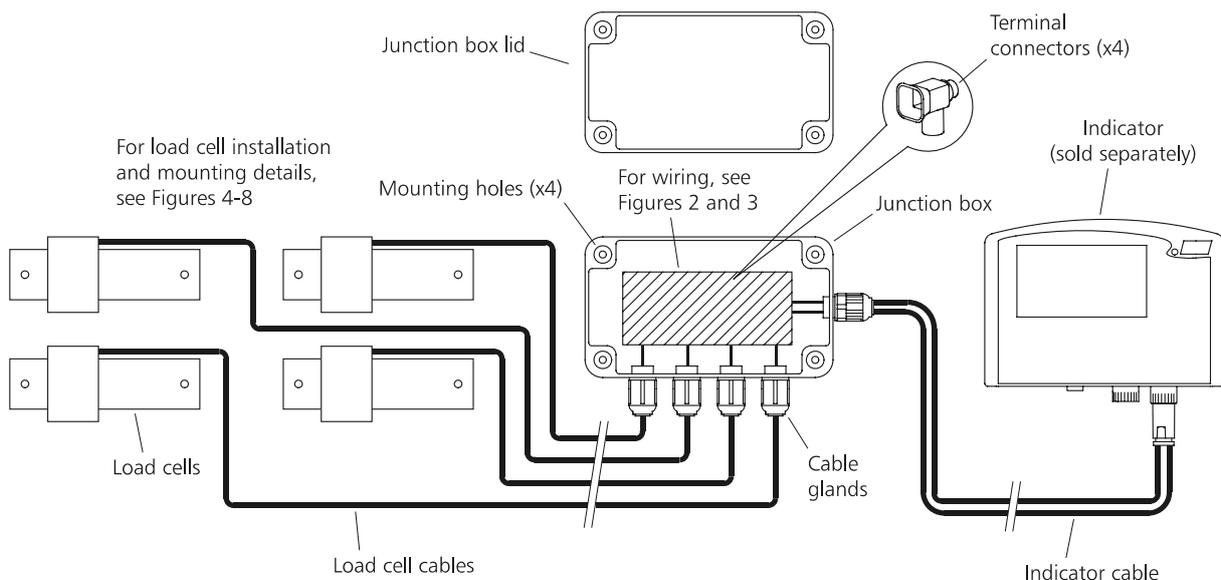


Figure 1 Parts of the weighing system.

# Installing the XHD load cells

## Selecting a site for the installation

---

Select a site for the weighing system that is flat and level, preferably a concrete pad. The junction box and indicator should be installed:

- where all cables will reach the junction box with some slack in them.
- high off the ground.
- away from areas that will be high-pressure washed.

## Installing the load cell junction box

---

The junction box comes complete with the cable glands installed and terminal connectors inside the box.

*Caution!* The junction box has mounting holes molded into the box. These are the same holes used to attach the lid. Do not drill new mounting holes as this may allow water to enter the junction box.

- 1 Remove the lid.
- 2 Mount the box by inserting screws into the mounting holes. Use the screws provided, or screws/bolts less than 5/32" (4 mm) in diameter.
- 3 Make sure the indicator cable runs down from the box to prevent water entering the junction box.

*Tip:* A protective cover may be installed over the junction box, if desired.

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## Routing the load cell cables

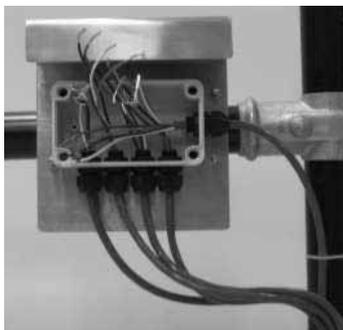
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*Caution!*

Cable damage is the most common reason for load cell failure.

- Secure load cell cables firmly so that they cannot move during operation. This will prevent the core of the cables being damaged.
- Route cables so that they do not touch the ground and are as protected as possible.
- Ensure that the load cell cables run down from the load cells to prevent water running down through the cable.

- 1 Attach the load cell cables to the chute/crush using cable ties or other means.
- 2 Push the load cell cables through the cable glands at the bottom of the junction box. It does not matter which cable gland each load cell uses as each load cell is identical in performance. Do not tighten the cable glands.



*Figure 2 Load cell cables in the junction box.*

## Wiring the load cell and indicator cables

---

Terminal connectors are used to connect wires in the load cell cables to wires in the indicator cable.

- 1 Group wires together according to color (all red wires together, all black wires together etc).

<u>Wire</u>	<u>Indicator cable</u>	<u>Load cell cable</u>
Excitation +	Red	Red
Excitation -	Black	Black
Signal +	Green	Green
Signal -	White	White

- 2 Twist all five wires of one color together and then insert them into a terminal connector.
- 3 Tighten the terminal connector screw.



*Figure 3 Terminal connector with five wires inserted.*

- 4 Gently pull on each wire to ensure that the connection is secure.
- 5 Repeat the procedure for the remaining terminal connectors.
- 6 Spray a moisture-proofing compound intended for electrical circuits (e.g. CRC 2.26) to coat the terminal connectors.
- 7 Gently pull the load cell cables from the outside of the box so that the connected wires fit neatly inside the junction box. Do not pull them so hard that the wires are strained.
- 8 Tighten the cable glands.
- 9 Replace the junction box lid and tighten the lid screws firmly to ensure a watertight seal.
- 10 Plug the indicator cable into the indicator.

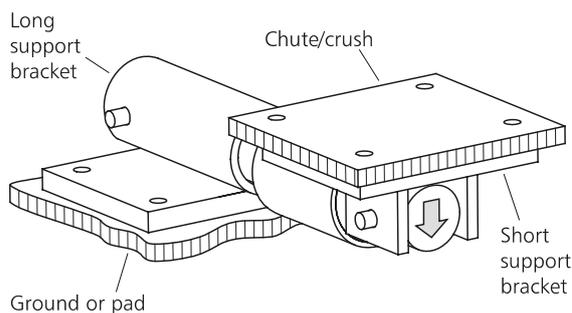
## Mounting the load cells

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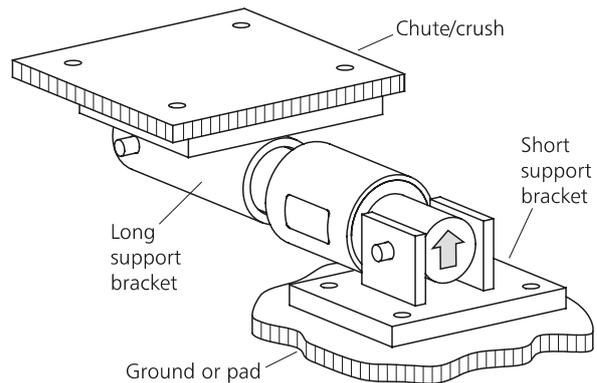
*Note:*

- Each load cell installation will be different, depending on the hardware being used. The mounting configurations depicted in the figures below are provided as a guideline only and are not intended to represent a manufactured design. Contact your Tru-Test representative for more details about mounting bracket designs.
  - Install load cells so that the total load is equally distributed.
  - Ensure the mounting surface is of sufficient strength to bear the load to be applied without distortion.
  - Do not apply a torque to the load end of the load cell.
  - Ensure the load cells are installed correctly. Incorrect installation will cause inaccurate weights.
- 

- Load cells may be installed in one of two orientations. Choose the orientation that best suits the mounting hardware being used. Install load cells either:
  - with the short support bracket attached to the chute/crush (see *Figure 4*).
  - with the long support bracket attached to the chute/crush and the short support bracket mounted to the ground or to a pad (see *Figure 5*).
- Whichever orientation is being used, install load cells with the arrow pointing to indicate the direction of loading. Load cells installed with the short support end mounted to the crush should have the cable facing upwards. Load cells installed with the short support end mounted to the ground should have the cable facing the ground.



*Figure 4 Short support bracket attached to the chute/crush, long support bracket mounted to the ground and loading direction arrow down.*



*Figure 5 Long support bracket attached to the chute/crush, short support bracket mounted to the ground and loading direction arrow up.*

*Note:* If the reading on the indicator shifts in a negative direction when the load cells are connected and tested then the load cells are installed "upside down". If all load cells are installed the same way then this may be corrected by connecting the white wire from the indicator to the green wires from the load cells and the green wire from the indicator to the white wires from the load cells.

- Load cells must be adequately supported. On the long support bracket, the distance between the mounting pin and the end of the bracket must be 4" (102 mm) minimum (see *Figure 6*). The distance used must be identical for each load cell in the installation.

**Caution!** If a load cell is not adequately supported, it will overload and be damaged.

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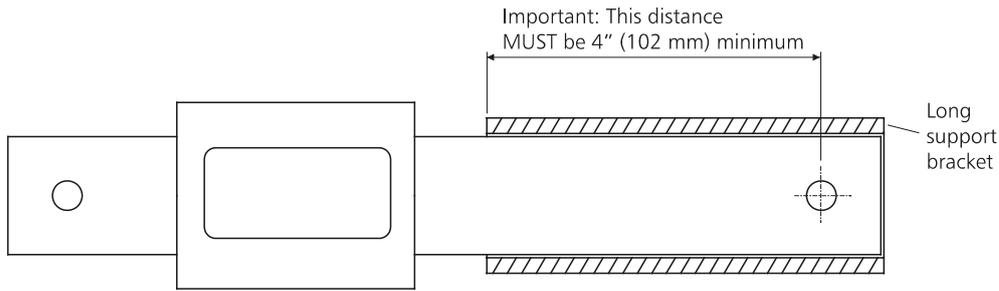


Figure 6 A well supported load cell.

- Install load cells either widthways across the chute/crush or lengthways parallel to the chute/crush (see Figure 7).
- Align load cells so the centrelines are lined up (or within ½" [12 mm] of each other).

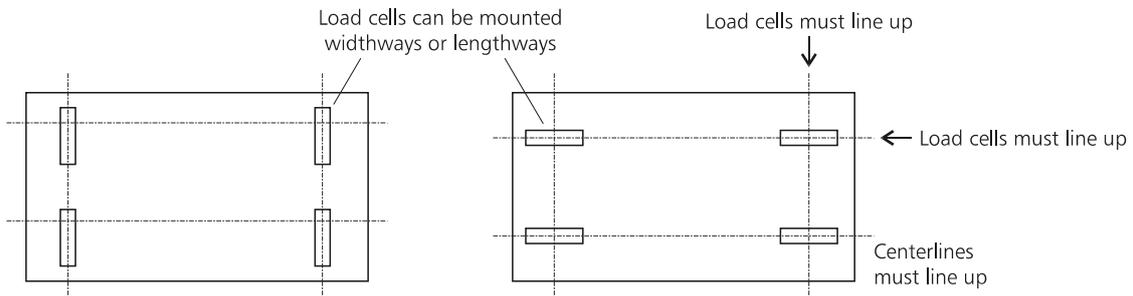


Figure 7 Four load cells installed under the chute/crush.

- All load cells must be installed in the *same* direction so that the weight is distributed evenly (see Figure 8).

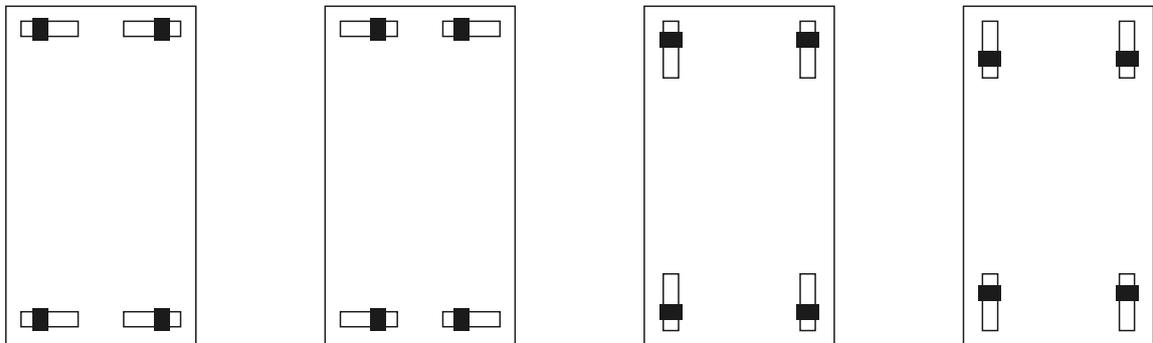


Figure 8 Recommended installation configurations.

- Each corner of the chute/crush must be level for accurate weighing. This ensures that the load is distributed equally.

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*Tip:* Shim the corners, if required, in order to make the surface level.

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- Lubricate the mounting pins with anti-seize grease.

## Calibration

Tru-Test indicators (3000 indicator software version 1.4 or later; or EC2000 or EziWeigh indicator software version 2.1 or later) have a standard calibration feature that allows them to automatically identify and calibrate to XHD load cells connected to them. When swapping from one load cell to another, there is *no need* to re-calibrate an indicator that has the standard calibration feature.

Other Tru-Test indicators can be sensitivity calibrated or span calibrated with known test weights. Sensitivity calibration and span calibration can be performed with help from your Tru-Test Service Centre, where applicable. Span calibration requires a test weight of known mass that is one third of the capacity of the scale or more. If a load cell is replaced when the weighing system has been *sensitivity calibrated*, re-calibration is not required. If a load cell is replaced when the weighing system has been *span calibrated* re-calibration is required.

## Testing the load cells

After installation, the load cells should be tested. In addition, test the load cells frequently during use and before use if the equipment has not been used for some time.

- 1 Connect the load cells to the indicator.
- 2 Turn on and zero the indicator.
- 3 Put a test weight (which may be yourself or another person) at one end of the chute/crush and note the stable reading on the indicator.
- 4 Put the test weight at the other end of the chute/crush and note the stable reading on the indicator.
- 5 Remove the test weight and note whether the reading returns to zero.
- 6 If the two readings differ by more than 1 division, OR the reading does not return to zero, see *Troubleshooting* on page 7.

# Troubleshooting

Fault	Remedy
Reading does not return to zero between animals. OR Difference in readings at each end of the crush/chute by 1 division.	1 Check for binding. Ensure that the crush/chute is not touching any other part of the race work or concrete pad. There should be no debris (e.g. stones or dung) lodged around the load cell and their mounts and the chute. 2 Corners may not be level. Check that the crush/chute is shimmed correctly so that the load is shared equally at each load cell.
Under reading (readings lighter than expected). OR Difference in readings at each corner of the crush/chute by 1 division or 1% (whichever is greater).	1 Check items 1 to 2 above. 2 Check that all the load cell wires are joined inside the junction box. Either stand on each corner of the crush/chute and note which corner gives the lowest reading, or open the junction box and check all wires are connected. 3 Check that all load cells have been installed the same way with the loading direction arrows pointing in the same direction (see <i>Mounting the load cells</i> on page 4). This is for new installations or for replacement load cells. 4 Check for damaged load cell cables. If cable is damaged, return the load cell for servicing.
No reading.	1 Inspect junction box to make sure that all wires are connected. 2 Inspect junction box to make that all the same color wires are joined together.
Negative reading.	Load cells have been installed upside-down. If all load cells have been installed the same way, this can be corrected: 1 Connect the white wire from the indicator to the green wires from the load cells. 2 Connect the green wire from the indicator to the white wires from the load cells.
Reading unstable.	Moisture in the junction box. 1 Open the junction box. Dry the junction box and the terminal connectors using a hair drier. 2 Moisture in the load bar connectors. Removed moisture from the plugs and caps using methylated spirits, ethyl alcohol, or a suitable electrical contact cleaner. Stronger spirits should not be used, as they react with the plastic. 3 Damaged cable. Return the load cell for servicing. 4 Moisture in load cells. Return the load cell for servicing.
Reading moves, display shows underload or overload then displays a reading if cable moved.	Damaged cable. Return the load cell for servicing.

# Autoranging

Tru-Test indicators are usually set to autorange. This means that the display resolution automatically changes to coarser increments when the weight reaches the equivalent of 200 or 250 times the next coarser division size. This better reflects the actual accuracy of the scale.

The weight is still displayed in pounds or kilograms, it is only the resolution (precision) which changes at higher loads.

Autorange

Weight range	Resolution	Weight range	Resolution
0-2500 lb	5 lb	0-1000 kg	2 kg
2500-5000 lb	10 lb	1000-2000 kg	5 kg
5000-capacity	20 lb	2000-capacity	10 kg

# Specifications

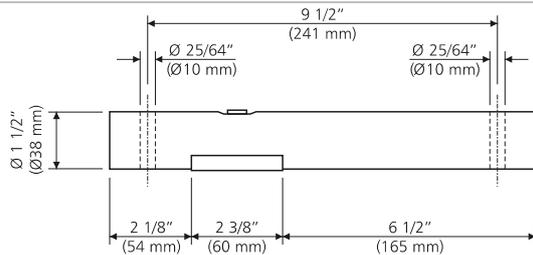
Accuracy System accuracy (with Tru-Test indicator):  $\pm 1\%$  or two resolution steps, whichever is greater, when installed as recommended.

Operating temperature +15 to +105 °F (-10 to +40 °C)

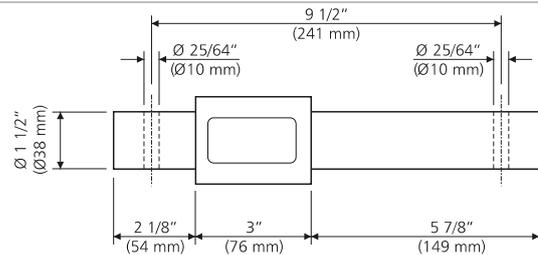
Storage temperature -5 to +140 °F (-20 to +60 °C)

Humidity 95 % relative humidity

Physical dimensions



Australia



USA

Packaged dimensions	21 1/4" x 13" x 5 1/2" (540x335x140 mm) LxWxH
Packaged weight	31 lb (14 kg)
Length of load cell cable	26 ft (8 m)
Length of indicator cable	16.5 ft (5 m)
Weight of 1 load cell	7 lb (3.2 kg)
Capacity of 4 load cells	10,000 lb (4,500 kg)
Capacity of 1 load cell	2,500 lb (1,134 kg)
Output at rated capacity	0.286 mV/V at 10,000 lb (0.2837 mV/V at 4,500 kg)
Load cell code	69

# Servicing

Return load cells to:

528 Grant Road  
 Mineral Wells  
 Texas 76067  
 Telephone: 800 874 8494  
 Fax: 877 495 9129

25 Carbine Road  
 Mt Wellington,  
 Auckland 1060  
 Telephone: 09 978 8888  
 Fax: 09 978 8889

2/2 Birmingham Avenue  
 Villawood  
 Sydney  
 Telephone: 1800 641 324  
 Fax: 1800 831 847

## Warranty

This product is warranted against faulty material and workmanship for a period from the date of purchase. If a warranted defect occurs, return this product with proof of purchase to the place of purchase. Details of warranty periods and other terms applying are available at the place of purchase or at [www.tru-test.com](http://www.tru-test.com).

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**Note:**

- No responsibility is accepted for any accident or damage caused subsequent to any tampering with or modification to or misuse of this product, including (but not limited to) alterations made by anyone other than Tru-Test or its agents.
  - To the maximum extent permitted by law, this warranty is exclusive, personal to you and in lieu of all other warranties, representations or conditions relating to this product (whether express or implied and whenever arising) whether originating by statute, law, trade, custom or otherwise.
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