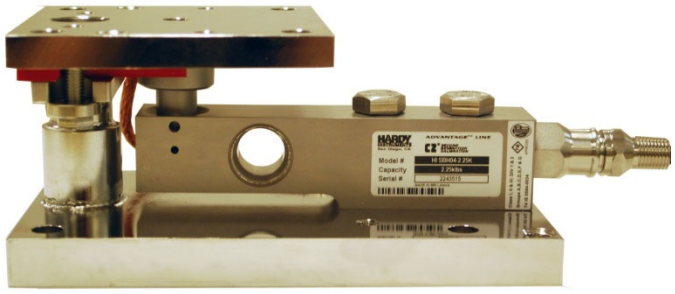
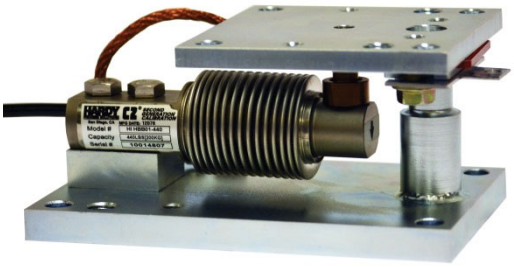
Hardy OneMount™

Load Point Assemblies

The Easiest Load Points to Install





Operation & Installation Manual

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Hardy Process Solutions Document Number: 0596-0348-01 Rev. D

Local Field Service

Hardy Process Solutions provides local field service for all scales and weighing equipment. Hardy's factory trained technicians can perform service on all Hardy equipment as well as most other manufacturers' systems. Enabled by the Hardy Process Toolbox, our technicians spend less time onsite, saving you money and reducing your downtime.

Services Include:

- Installation & Commissioning
- Preventative Maintenance & Calibration
- Onsite Emergency Service
- Service Agreements with Defined Turnaround Times
- Product, Service, and PLC Integration Training
- Pre-Installation Site Audit
- Scale Installed-Base Evaluation
- PLC Integration Support
- Engineering Design Support & Specification Development
- Quality Documentation Creation

Contact Us
To request any of the services mentioned, or to discuss your needs with a trained Hardy Service Agent, please call 800-821-5831 Option 4 (6:30 AM to 5:30 PM PST). For emergency downtime service after hours, leave a message in our emergency mailbox and your call will be returned promptly. Or email us at hardysupport@hardysolutions.com.

Contents

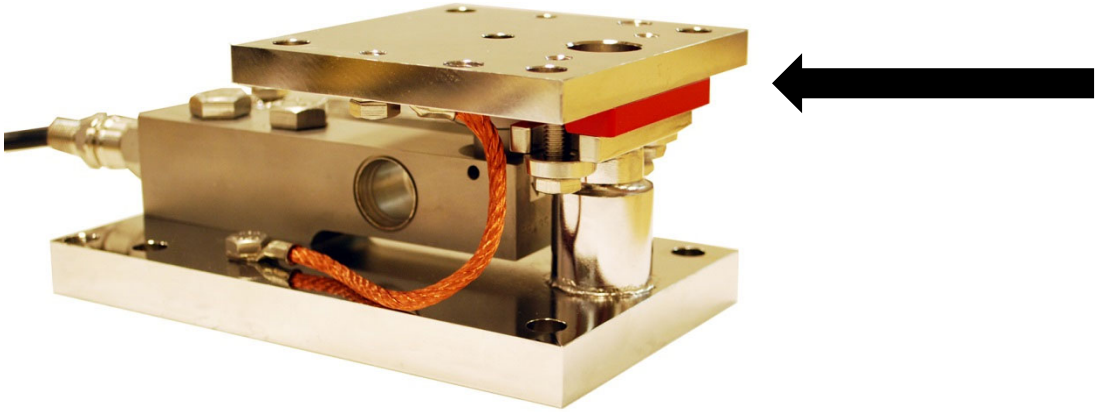
CAUTION: UNPACK WITH CARE 5
ATTENTION: DÉBALLEZ AVEC SOIN 6
General Information 7
Unpacking 7
Basic Weighing Principles and Guidelines 7
Principle #1 : Mechanical Integrity is Critical to Load Cell Accuracy and Safety 8
Principle #2: Choose the Proper Load Sensor Capacity 10
Principle #3: Balance the Load 11
Principle # 4: Protect the Cables 11
Precautions 12
Site Preparation 12
Piping Connections 13
Level Requirements 14
Environmental Considerations 15
Installation 17
Installation Overview 17
Detailed Installation Procedure 18
Wiring the Load sensor 24
Pre-commissioning Inspection 25
Calibration and Verification 25
C2 Calibration 25
Preventative Maintenance 26
Replacing a Load sensor 27
Troubleshooting 27
Electrical Tests for Load Point Assembly Problems 27
Zero Balance Test 27
Bridge Resistance Test 28
Resistance to Ground Test 29

Testing Insulation Resistance with a Megger 29
Mechanical Tests for Troubleshooting Binding and Other Load sensor Issues 30
Shift Testing 31
Specifications 33
Load Sensor Specifications 33
Advantage® Shear Beams 33
Advantage® Lite Shear Beams 34
Low-Capacity Advantage® Beam Sensor 35
OneMount™ Mount Specifications 36
Shear Beam Mounts 36
Low Capacity Mounts 36
Load Cell Deflection Charts 36
Hardy Installation and Commissioning 37
Emergency Service and Support 37

! ATTENTION !

DO NOT remove the RED SHIPPING SPACER until after the installation of the mount is complete.

The RED SHIPPING SPACER is designed to keep the top and bottom plates aligned during installation.



CAUTION: UNPACK WITH CARE

WHEN UNPACKING, DO NOT DISCARD THE PACKING CASE OR ANY PACKING MATERIAL, UNTIL THE CONTENTS OF THE PACKING CASE ARE INSPECTED AND CAREFULLY COMPARED WITH THE SHIPPING DOCUMENTS.

IF ANYTHING IS UNSATISFACTORY, PLEASE NOTIFY HARDY IMMEDIATELY BY CALLING, FAXING OR E-MAILING TO:

Customer Support Department
HARDY PROCESS SOLUTIONS
10075 Mesa Rim Road, San Diego, California 92121

Phone: (800) 821-5831
(858) 278-2900

E-mail: hardysupport@hardysolutions.com Web Address: www.hardysolutions.com

A RETURN MATERIAL AUTHORIZATION (RMA) NUMBER IS REQUIRED BEFORE RETURNING ANY DAMAGED PRODUCT. CALL THE CUSTOMER SUPPORT DEPARTMENT TO GET THE NUMBER. YOUR COMPANY NAME, ADDRESS, TELEPHONE NUMBER, SERIAL NUMBER OF THE UNIT AND A BRIEF DESCRIPTION OF THE PROBLEM SHOULD BE READY WHEN CALLING.

IN CASE OF DAMAGE DUE TO SHIPPING, NOTIFY THE DELIVERING CARRIER IMMEDIATELY FOR AN INSPECTION.

ATTENTION: DÉBALLEZ AVEC SOIN

QUAND DÉBALLAGE , NE PAS JETER LE CAS PACK ING OU TOUT MATÉRIEL DE CONDITIONNEMENT , JUSQU'AU LE CONTENU DE LA CASE PACKING sont inspectés et ATTENTIVEMENT REGARD DES DOCUMENTS D'EXPEDITION .

SI TOUT EST INSUFFISANT , S'IL VOUS PLAÎT INFORMER HARDY IMMÉDIATEMENT EN APPELANT , TÉLÉCOPIE OU E - ENVOI À:

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E-mail: hardysupport@hardysolutions.com Web Address: www.hardysolutions.com

A AUTORISATION DE RETOUR DE MATERIEL (RMA) NOMBRE EST REQUISE AVANT DE RENVOYER UN PRODUIT ENDOMMAGÉ . APPELEZ LE SERVICE SUPPORT TECHNIQUE POUR OBTENIR LE NOMBRE . VOTRE ENTREPRISE NOM, ADRESSE , NUMÉRO DE TÉLÉPHONE , NUMÉRO DE SÉRIE DE L'UNITÉ ET UNE BRÈVE DESCRIPTION DU PROBLÈME DEVRAIT ÊTRE PRÊT QUAND APPELER .

EN CAS DE DOMMAGES DUS À L'EXPÉDITION, INFORMER LE TRANSPORTEUR LIVRER IMMÉDIATEMENT POUR UNE INSPECTION.

General Information

Congratulations on your purchase of the Hardy Process Solutions OneMount Load Point Assembly!
The Hardy OneMount™ Load Point System combines intelligently designed mounting hardware and an Advantage® or Advantage® Lite precision load sensor to provide safe and accurate measurement in the most demanding applications from 22 lbs to 22,500 lbs. Key to the OneMount design is a singular form-factor that can be installed in any direction, and without the use of "disposable" accessories like dummy load sensors and welding fixtures. These features greatly simplify the installation process, saving both time and money. In addition, the hardware ensures the safety of your people and equipment through high lift-off and side force protection that was verified by independent third party testing.

Hardy Advantage or Advantage Lite shear beam load sensors take weight measurement to new heights. With exceptional accuracy and quality, all sensors are made of stainless steel, have matched mV/V and mV/V/Ω outputs, and are purged with nitrogen during the sealing process to eliminate the risk of load sensor drift over time. What truly separates a Hardy Load Sensor, however, is the onboard C2® electronic calibration. A small microchip in each sensor stores all factory performance characteristics data locally, and allows the user to perform test-weight free calibrations at the push of a button. C2 calibration ensures that the load sensor is operating within 0.02% RO combined error or better.

Unpacking

- Inspect the box, packing and products for any signs of damage that might occur during shipment.
- Load sensors and mounting hardware are shipped separately, as the load sensor must be removed for most installations. Shipping separately also helps to protect the load sensor from damage during travel.
- Do not remove the load sensor or mounting hardware from the packaging until just before installation. Although both are designed for harsh environments, the sensor is a precision instrument and should be treated as such. **UNDER NO CIRCUMSTANCES SHOULD THE LOAD SENSOR EVER BE LIFTED BY THE CABLE. ALWAYS PICK UP THE LOAD SENSOR BY ITS BODY.**
- ***Do NOT remove the RED SHIPPING SPACER until after installation of the mount is complete. The RED Shipping Spacer is designed to keep the top and bottom plates aligned during installation.***
- Write down the serial number(s) and the load sensor location on the inside of the back cover of the Junction Box for reference. Also store this information in a secure dry location.
- LOAD SENSOR CERTIFICATION SHEETS ARE AVAILABLE 24 HOURS A DAY IN THE SUPPORT SECTION OF OUR WEB- SITE: http://www.hardysolutions.com

Basic Weighing Principles and Guidelines

This section covers four basic principles that hold true for any scale system. While a seasoned scale technician may find this section elementary, the successful understanding and execution of these principles form the foundation for a high performance installation.

1. The importance of mechanical integrity.
2. Select the proper load sensor capacity.
3. Balance the load.
4. Protect the cables.

Principle #1 : Mechanical Integrity is Critical to Load Cell Accuracy and Safety

There's a reason reputable weighing companies put as much effort into designing mounting hardware as they do into designing load sensors. Without the proper mechanical integrity, a load sensor can't deliver high accuracy. There are several things to consider when choosing a mount:

Load Introduction: All load sensors are designed to receive weight (load) at a specific location for optimal performance. A proper mount ensures that this happens no matter what operating conditions the load sensor encounters. Some examples of difficult operating conditions are thermal expansion, wind loading, high vibration, mixing, etc. The Hardy OneMount uses a rocker pin design with convex load surfaces to ensure that the load is properly introduced to the cell when the load moves off-center, and to ensure that the load moves back to its original position naturally.

Figure 1: *Both the pin and the cup are machined smooth so there is no binding during use. The pin is designed to automatically return to center if the load point's top plate travels off-center.*

The Shear Beam rocker assembly uses an integral hole in the sensor on the bottom and a single cup in the top plate.

The low capacity Beam rocker assembly uses two cups, one mounted on the top plate and one affixed to the sensor

Safety: Load Point mounting hardware is designed to protect your system and your people from a catastrophic event. The Hardy OneMount is specifically designed to prevent system uplift, overload, and excessive side force from becoming catastrophic safety incidents.

In cases of shock, aggressive mixing, or excessive side loading situations, a weighing structure may rock. The uplift bolts are designed to prevent the top plate from lifting off the load sensor up to 50% of the rated capacity (See Specifications in the next Chapter). The OneMount has been designed with two bolts in u-shape brackets to prevent liftoff in all directions, enabling 360° installation.

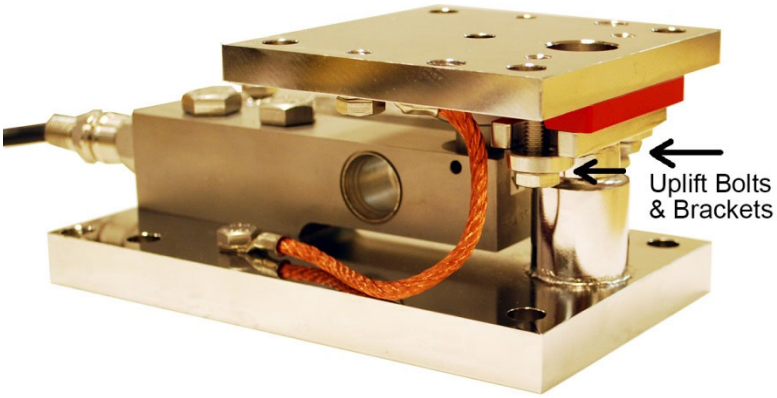


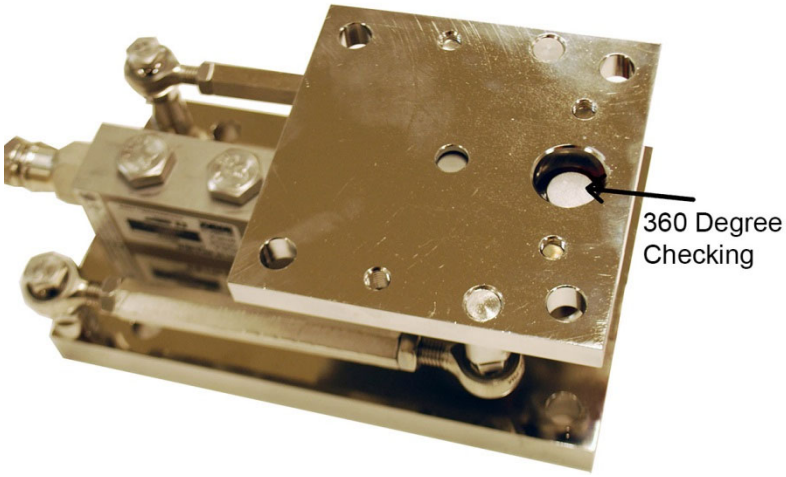
Figure 2: *Uplift Bolts secured by brackets provide lift off protection. Third party destructive testing rated this protection at 50% rated capacity.*

For applications requiring higher lift-off force protection, check links or check rods designed by a certified structural engineer should be used.

During installation, or in the rare case of a catastrophic load sensor failure, the uplift bracket doubles as a support for the load, preventing the tank from dropping more than a few millimeters. The bracket can safely support the full load sensor capacity without the load sensor installed.

The check-column design provides safety assurance during installation and maintenance. The check column is a robust steel cylinder that can support loads up to the full load sensor capacity without the load sensor installed. In addition, when side forces are present, the column strength has a safe limit of 100% of the load sensor capacity, and a much higher yield strength. When combined with the rocker pin design, the mount provides a self-centering mechanism for off-center loads. Should the top plate travel too far, the top plate will engage the column and the rocker pin will use gravity to naturally pull the structure back to center, ensuring accuracy and safety.

Figure 3: *The Central Column design permits the OneMount to be Installed in any orientation with the 360° Checking mechanism .*



Binding: Mechanical binding is the most common cause of inaccuracy in a weighing system and can come from a variety of sources.

- For maximum accuracy, the load should be centered over the rocker pin. A poorly aligned installation could cause the load point top plate to rest against the 360° check column. When this occurs, some of the load will be supported by the check column, and therefore take weight off the load sensor, causing a faulty measurement. Always ensure that the top plate is properly aligned, using the column and vertical alignment of the rocker pin as guides.

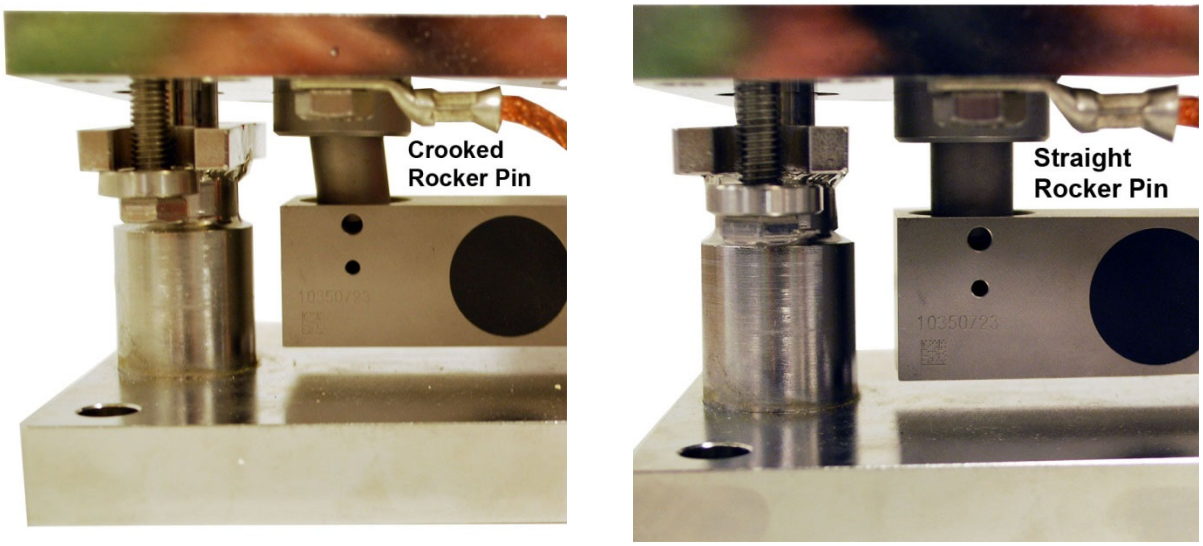


Figure 7: *A straight rocker pin indicates proper alignment and load introduction.*

- Mechanical issues from structural problems, rigid piping, etc. See ***Site Preparation Section*** for more information on structural integrity principles.
- Debris underneath the load sensor. If material gets stuck underneath a load sensor, it could prevent the load sensor from properly bending as weight is introduced. Even a significant amount of dirt buildup could have this effect. Best practice is to keep the area around the load sensor clean. For wash-down applications, always use a hermetically sealed Advantage® IP68/IP69K Load sensor.

Principle #2: Choose the Proper Load Sensor Capacity

All load point assemblies must have the same capacity when used in one scale. There are two key things to keep in mind: Gross weight and special application factors.

Under normal circumstances, the Gross Weight of the system is evenly distributed between the number of load points. The Gross Weight is the Dead Load of the structure sitting on the scale (including all valves, motors, piping, etc.), plus the maximum live load (weight of heaviest material) of the system when the structure is full. Once the Gross Weight is calculated, the minimum load sensor capacity can be calculated using the following formula.

$$\textbf{Minimum Load Cell Capacity} = \frac{\textbf{Gross Weight}}{\textbf{Number of Load Points}} = \frac{\textbf{Dead Weight + Live Load}}{\textbf{Number of Load Points}}$$

In cases where the load is uneven, the load sensor capacity must be increased to account for the heaviest corner. For example, if one of the legs of a tank has a motor or other heavy object attached to it, the load sensor under the loaded leg will see significantly more weight than the other load sensors. In this case, the following formula can be used:

$$\text{Minimum Load Cell Capacity} = \frac{\text{Gross Weight}}{\text{Number of Points}} + \text{Additional Weight on Loaded Cell}$$

Principle #3: Balance the Load

Load Points should be installed so that the load (weight) is distributed as evenly as possible between each load point assembly in the scale. There are two elements to an even distribution. First, the load points should be level and on the same plane. It should be noted that the levelling requirements for general purpose applications differ from the more strenuous requirements of NIST Class 3 or legal for trade applications (See the ***Precautions*** Section under ***Leveling Requirements***). Second, the load points should be evenly spaced around the weighing structure. The ideal positioning can be found by dividing 360° by the number of points, or:

$$\text{Spacing} = \frac{360°}{\text{Number of Points}}$$

Typically, the structure itself will dictate the proper spacing of the load sensors. The installer, however, is responsible for ensuring that the system meets the proper leveling requirements (See the ***Precautions*** Section under ***Leveling Requirements***). For the system to achieve maximum accuracy, the base plates and the top plates of the load point assembly must be level relative to one another.

Principle # 4: Protect the Cables

Positioning the mounts so that the cables face out into high traffic areas increases the risk of damage from passing people, equipment, and vehicles. As the OneMount can be installed in any orientation relative to another, if the option is available, ***always aim back of the load sensor with the cable exit away from heavy traffic.***

NOTE: ***Do Not Cut Load sensor C2 Cable.*** Load Sensors are calibrated with a specific load sensor cable length. Cutting this cable reduces the accuracy of a C2 Calibration. Special cable lengths are available for purchase through the factory. Please call Hardy Support for more information.

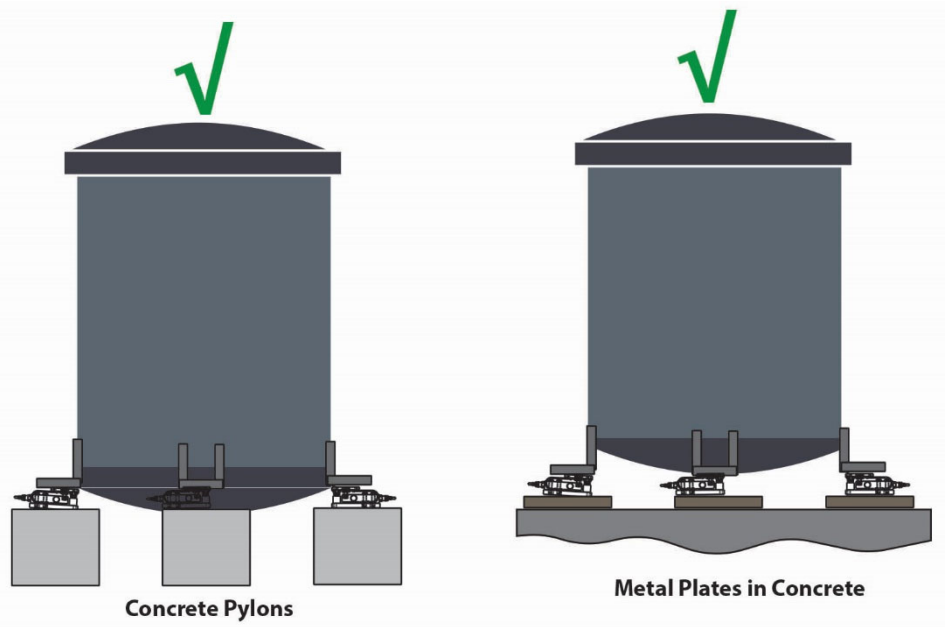
NOTE: **Never carry a load sensor by its cable**, as load sensors are precision instruments and this may cause damage.

Precautions

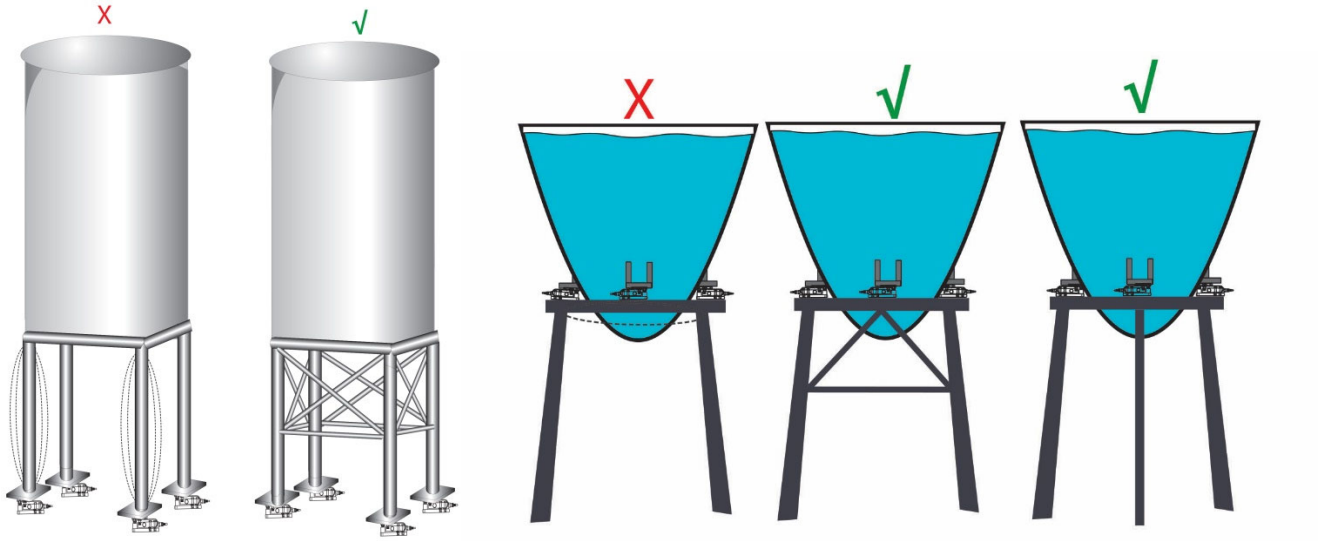
Site Preparation

An accurate weighing system requires a strong foundation. Therefore, when choosing a location to install your Hardy OneMount™ Load Points, it is critical that they be mounted to strong and rigid structures. Using non-rigid structures will cause deflection forces that reduce the downward force acting on the load sensor.

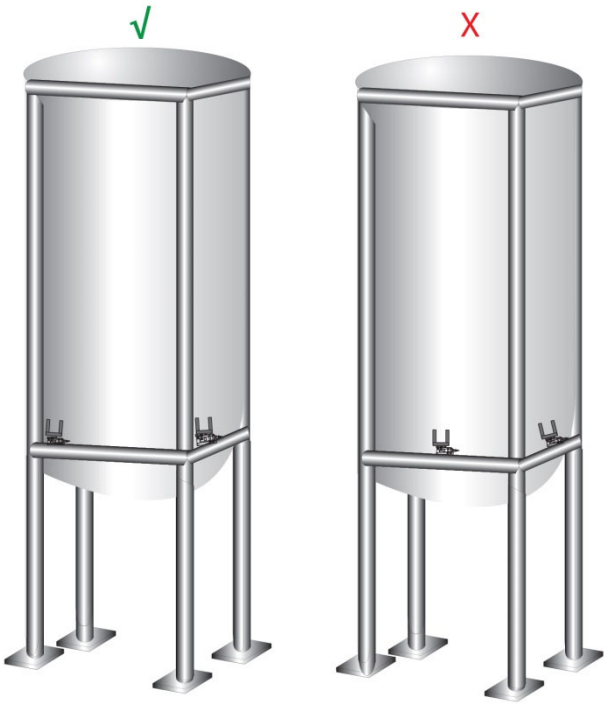
1) Best Practice is to use Concrete Pylons or Steel Base Plates set into concrete.



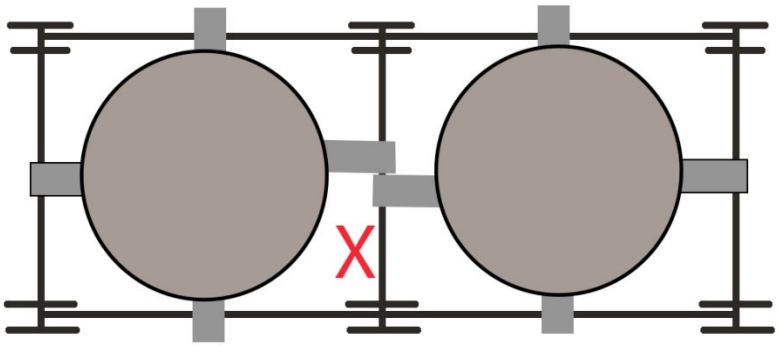
2) When using structural I-Beams, always make sure the structure is reinforced to minimize deflection.



3) Avoid mounting to the center of long I-Beams, as these have a tendency to deflect. Instead, mount to the corners of a structure and use additional I-Beam stock as cross-bracing for maximum effect.

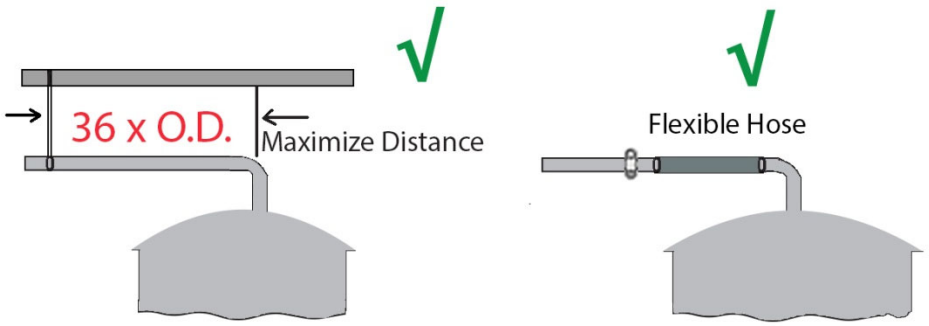


4) Avoid Shared I-beam Structures, as the deflection in the I-Beams would be greater on one beam relative to the others.



Piping Connections

Rigid Connections can ADD or SUBTRACT weight from the scale. There are two ways to avoid this. The recommended method is to use flexible connections instead of rigid connections to all vessels. Always ensure that flexible couplings are not twisted, as this can add force to the tank. If a rigid connection must be used, the piping distance should be maximized to the first pipe support. A distance of 36 times the pipe diameter is recommended, but the length of tubing should be limited to avoid sagging of the pipe. A U-coupling can also be used to provide flexibility.



Level Requirements

For the system to achieve maximum accuracy, the base plates and the top plates of the load point assembly must be level relative to the structure and to one another on the same plane. Load Points should be installed so that the load (weight) is distributed as evenly as possible between each load point assembly in the scale. There are two elements to an even distribution. The first is that the load points should be level.

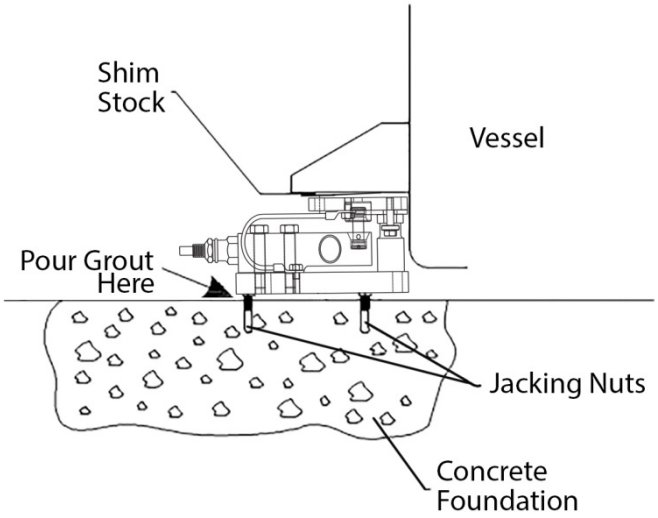
For scales that must meet NIST Class 3 (OIML Class 3) specifications:

1. The base plate support surfaces must be within 0.2 degrees (0.4mm/100mm)
2. The top plate support surfaces in the load carrier must be within 0.5 degrees (0.9mm/ 100mm)

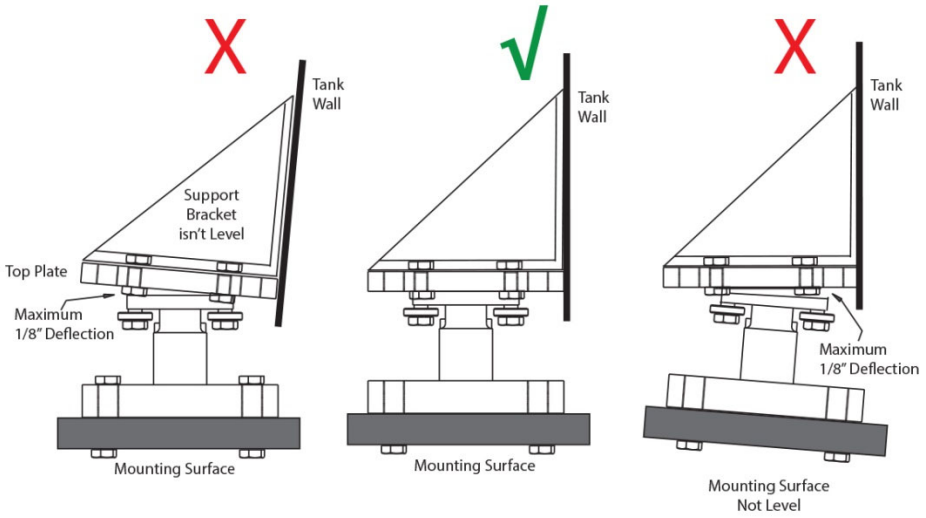
For scales with accuracy requirements => 0.1% (General Weighing)

1. The base plate support surfaces must be within 0.4 degrees (0.8mm/100mm)
2. Top plate support surfaces in the load carrier must be within 1 degree (1.8mm/100mm)

Shim stock can be used to help level the top plates, and jacking nuts and grout are recommended to adjust the level of the bottom plates. See the figure below:



Furthermore, it is critical that both the supports and the mounting surface are level. If only one of them is off, it will affect the accuracy of weight readings.



Environmental Considerations

The accuracy of a weighing system can be affected by several factors, and it is critical that the installer be aware of the factors and their effects.

Temperature

Hardy Load Sensors are meant to operate within specific temperature ranges. Operating outside of these ranges may cause accuracy issues. Ideally, the load sensors would all operate at equivalent temperatures. Installation teams should be aware of sun loading and other potential temperature gradients that could affect sensor performance. Some examples of gradient causing situations are installation near air conditioners, furnaces, open doors, heaters, and jacketed vessels.

Wind Loading

For outdoor vessels especially, engineering teams should be aware of wind loading that could cause higher leeward loads. Hardy OneMount Load Points have significant overload and liftoff protection for intermittent events, but the installer should consider a means of wind-deflection to maximize weighing accuracy. For indoor installations remember to look for indoor winds from fans, air conditioners, heaters, blowers, and even pressure relief valves.

Moisture / Humidity

Hardy sensors are designed for maximum protection again moisture ingress. For high moisture or wash-down applications, using a load sensor with true hermetic sealing is recommended.

Welding/Lightning/Static/Arc

The Hardy OneMount is equipped with a grounding strap to ensure that small electrical discharges (i.e. static) are routed to ground instead of through the load sensor. However, large electrical discharges caused by lightning or welding will break the load sensor. Installers should consider a means of structural grounding for all

installations, and it is critical that the load sensor not be installed whenever welding is performed on the load point or connected structure.

Unlike competitive offerings, the OneMount is designed to support the full structural load without the load sensor installed. No dummy load sensor or welding fixture is required during installation.

Vibration

System vibration causes real and measurable changes in the weight reading of any load sensor system. Hardy has developed a proprietary algorithm called WAVERSAVER to eliminate the effects of vibration on the weight reading. In addition, the OneMount can be purchased with one or two Hardy Dynamic Stabilization Rods to add rigidity to the mount and reduce the amount of vibration that the load sensor experiences. Both of these options provide customers with Processed, Stable Weight Readings at the Least Total Cost to Own.

Operational Shock

Operational shock is characterized by random or repeated vertical forces that exceed the rated capacity of the load sensor. This type of shock can be caused by uncontrolled load introduction (dumping or dropping of heavy material), seismic activity, or external forces. In general, if the customer believes operational shock may occur, higher capacity load sensors should be purchased. For dumping and other high shock loading applications, it is recommended that baffles or deflection cones be used to minimize the impact force on the load points.

NOTE: Excessive shock or vibration can lead to metal fatigue and early load sensor wear-out.

Electrical Noise / EMI / RFI

A weighing system measures small millivolt signal changes from the load cell to precisely calculate the weight of the system. Any Electromagnetic Interference (EMI), Radio Frequency Interference (RFI), static discharge or ground loop can cause the weight readings to fluctuate or “freeze”.

A properly designed weighing system has a single point for earth ground to collect any energy build-up before it reaches a level that affects the A/D circuits. This means that all grounds are connected to the same ground point and therefore have the same potential.

The vessel or silo's path to ground should NOT be through the load cells, as this may cause damage to the load cells or weight indicator in the event of an electric shock. Ground straps are supplied with all Hardy Load Points to connect the vessel to earth ground and allow electrical discharges to bypass the load sensor. Vessels bolted to, or sitting on, a concrete floor do not constitute a common ground point. Only by measuring resistance levels can you determine if your ground system is adequate.

The load sensor shield and vessel ground should be at the same ground potential as the PLC, DCS, and weight controller. This can be verified at the summing junction box by measuring the resistance between:

- The load sensor shield wires and the known earth ground
- The weight controller chassis and the known earth ground
- The load sensor shield wires and the weight controller chassis

NOTE: ***A measurement that is less than 1 Ohm verifies proper grounding.***

Electrical noise can be caused by a variety of sources (ground loops, poor cable shielding, two-way radios, large power lines, static electricity, and electromechanical devices). Installers should take extra precautions to ensure protection from electrical noise:

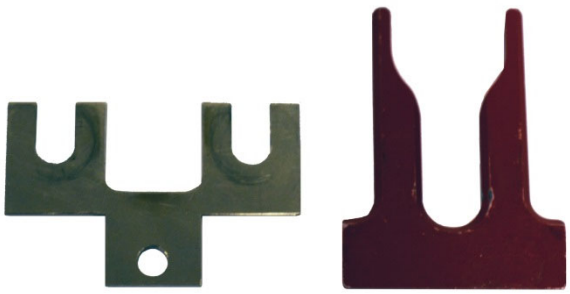
- Isolate with shielded cable. Beware of ground loops and properly ground the shields
- Route load sensor wire in a conduit separate from other cables
- Ensure your electromechanical relays have snubbers attached to suppress the noise
- Always cross high voltage/frequency lines at 90°. If run in parallel, always separate low voltage load sensor cable from high voltage cable (>50V) by at least 3 inches
- Avoid running load sensor cable near strong electro-magnetic fields. Keep a minimum clearance of 24 inches from 480 VAC lines, SCRs, motor controls, and/or relay banks
- Verify all equipment grounds are to the same point
- Insure all piping is grounded to the tank to reduce static discharge of material during filling and discharging operation
- Install isolation transformers to trap surges and power sags
- Install active tracking filters to trap power transients and AC noise
- Always ensure that grounding is done only at one point, not at several, to provide one clear ground to earth for stray currents

Installation

Installation Overview

The Hardy OneMount is designed for ease of installation. First, the mount is designed with 360° checking, meaning the mounts can be installed in any direction ***so long as the center of the load is located directly over the center of the rocker pin***. Second, the mount is designed with an integral shipping spacer that allows the mount to support the full load at the proper height without a load sensor installed. The Shear Beam sensors feature a single red spacer while the low capacity Beam sensor uses two shipping spacers.

Note: Do NOT remove the SHIPPING SPACER (s) until after installation of the mount is complete. The Shipping Spacer (s) is/are designed to keep the top and bottom plates aligned during installation.



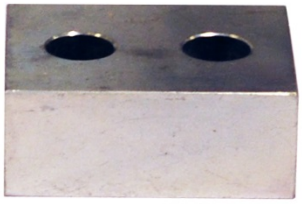
This makes the procedure very simple:

1) Position the top plate underneath the structure and mark the holes.
2) Level the mount base and top-plates.
3) Bolt or weld top plate in place.
4) Lower the structure onto the mounts and perform any peripheral piping and/or welding.

5) Bolt or weld baseplate in place.
6) Slide the load sensor into place and fasten to the base plate.

NOTE: ***The Low Capacity OneMount using the HI HBB01 beam type sensors require an additional spacer bar to hold the sensor level. This plate must be inserted under the back of the sensor and the screws run through it***

Low Capacity Spacer Block for HI HBB01 Sensors



7) Use a jack (or crane) to raise the structure up (only 1/8" – 1/4" is required).
8) Remove the shipping spacer (s) ***(save for future use)***.
9) Lower the structure back onto the load sensor for a live load point.
10) Set the liftoff gap per the specifications in section ***Detailed Installation Procedure.***
11) Attach the grounding strap.

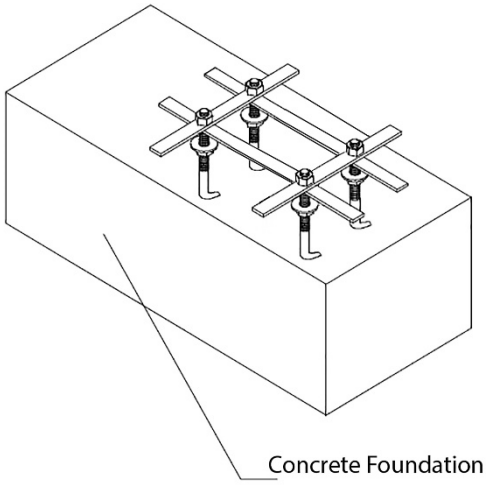
Detailed Installation Procedure

The drawings provide all base plate and top plate dimensions as well as through-hole diameters and center-to-center distances. All drawings are located online at www.hardysolutions.com under Products> Load Cells & Platform Scales >Compression > OneMount (then select the OneMount load mount product you are installing). The drawings are under Docs & Programs > Drawings. The drawings provide all base plate and top plate dimensions as well as through-hole diameters and center-to-center distances.

For new installations, customers either weld the baseplate to a metal plate set into concrete, or set anchor bolts into wet concrete, and mount the load points onto the anchor bolts once the concrete has dried. When using anchor bolts, use a "Hole Pattern Template" that replicates the hole pattern in the Load Point baseplate to ensure that the bolts remain upright and aligned during the drying process.

The procedure below details how to create and use such a pattern, but customers intending to weld the baseplate can skip irrelevant steps.

1) With the mount fully assembled and the load sensor removed, align the top plate center point under center of mass of the structural support that will sit on the top plate.
2) Determine the orientation of the base plate as best fit for the application. Although the OneMount works equally well in any orientation, there are safety and equipment protection reasons to consider. Refer to the ***Basic Weighing Principles and Guidelines*** in the ***General Information Section***.
3) With the top plate aligned, use the baseplate to mark the anchor bolt locations on the foundation.
4) Hardy recommends using plywood to make the Hole Pattern Template. Cut a piece of plywood to match the width and length of the baseplate. Clamp the plywood tight to the baseplate and drill holes in the plywood through the through-holes in the baseplate to match the anchor bolt diameters.
   Note: Customers may also opt to use the dimensions in the I/I drawing on the Hardy website to create the plywood templates in advance of receiving the mounts.
5) When you place the anchor bolts into the concrete foundation, slip the templates over the anchor bolts so that the bolts remain vertical in the exact pattern on the base plate. Templates can remain until after the concrete dries or has set to the point where the anchor bolts won't move.



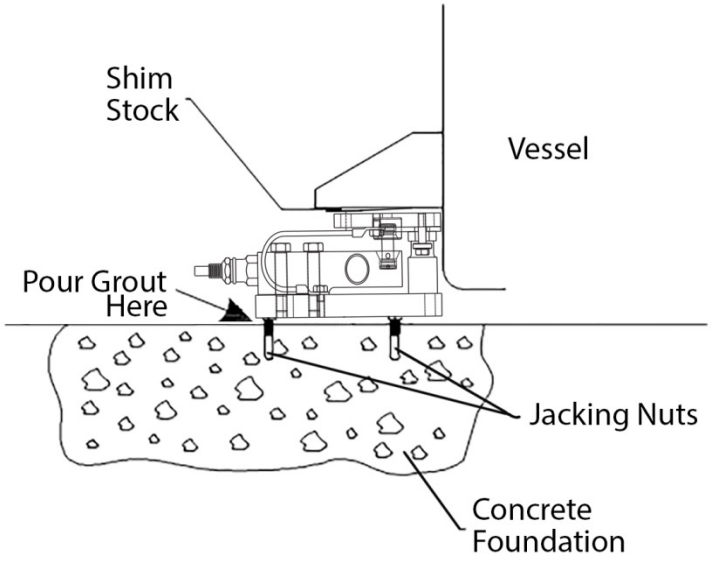
6) Install the jacking nuts onto the anchor bolts so there is about 1/2 inch between the concrete foundation and the jacking nuts.

7) Install four flat washers on each anchor bolt above the jacking nuts. (See Fig. 8)

Figure 8: When you place the anchor bolts into the concrete foundation, slip the plywood template over the anchor bolts so that the bolts remain vertical in the exact pattern on the base plate. This keeps them upright during drying.

8) Once the concrete has set, remove the template and slide the load point assembly/base plate onto the anchor bolts.

9) Use a bubble level to level the load point assembly from side to side and corner to corner. Use a box end wrench to adjust each of the jacking nuts until each load point assembly in the system is level.



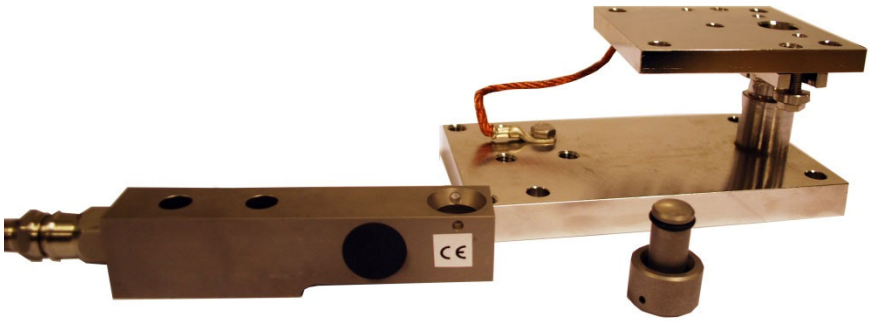
If welding, use shim stock and bubble gauges to level the mount.

WARNING: UNDER NO CIRCUMSTANCES MUST WELDING CURRENT BE ALLOWED TO PASS THROUGH THE LOAD SENSOR. TO DO SO WILL DESTROY THE LOAD SENSOR AND COULD POSSIBLY CAUSE PERSONAL INJURY AND/OR PROPERTY DAMAGE.

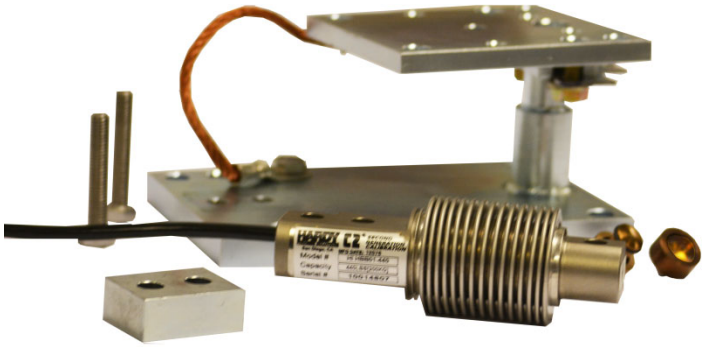
ATTENTION: EN AUCUN CAS DOIT ETRE COURANT DE SOUDAGE AUTORISÉS À PASSER PAR LE CAPTEUR DE CHARGE. POUR FAIRE DÉTRUIRONS LE CAPTEUR DE CHARGE ET POURRAIT DES BLESSURES ET / OU DES DOMMAGES.

10) Tighten base plate bolts (finger tight)
11) Use laser sight to level the mounts relative to each other per ***Level Requirements*** in the ***Precautions*** section.
12) Pour grout up to the bottom surface of the base plate and let dry
13) Tighten Base Plate Anchor Bolts using a torque wrench (or weld)
    - 22-550 lb capacity 15 ft-lbs (21 N-m)
    - 1125 lb – 4500lb capacity 65 ft-lbs (43 N-m)
    - 11250 lb capacity 133 ft-lbs (180 N-m)
    - 22500 lb capacity 273 ft-lbs (370 N-m)
14) Use a marker or scribe and trace the thru-hole pattern of the top plate on the support bracket. Drill four thru holes or drill and tap four holes for the fasteners. Install the top plate to the support bracket using the four fasteners.
    Note: For retrofit applications, customers may need to use fabricated adapter plates to match the top plate hole pattern to the structure.
15) Level top plate using bubble level and shims.
16) Tighten top plate bolts to the structure using a torque wrench (or weld)
    - 22-550 lb capacity 15 ft-lbs (21 N-m)
    - 1125 lb – 4500lb capacity 65 ft-lbs (43 N-m)
    - 11250 lb capacity 133 ft-lbs (180 N-m)
    - 22500 lb capacity 273 ft-lbs (370 N-m)
17) Perform peripheral piping, welding, structure modification, etc.
18) Install Load sensor.
    - Stage the sensor and the mount. Assemble the loading cup and pin. Make sure the shipping spacer (s) is/are in place.

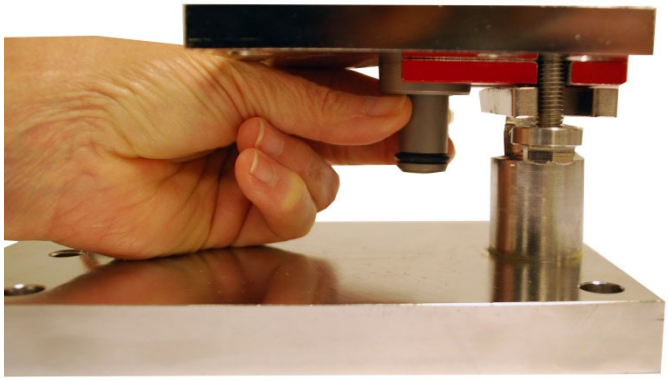
Note: ***Do NOT remove the RED SHIPPING SPACER until after installation of the mount is complete. The RED Shipping Spacer is designed to keep the top and bottom plates aligned during installation.***



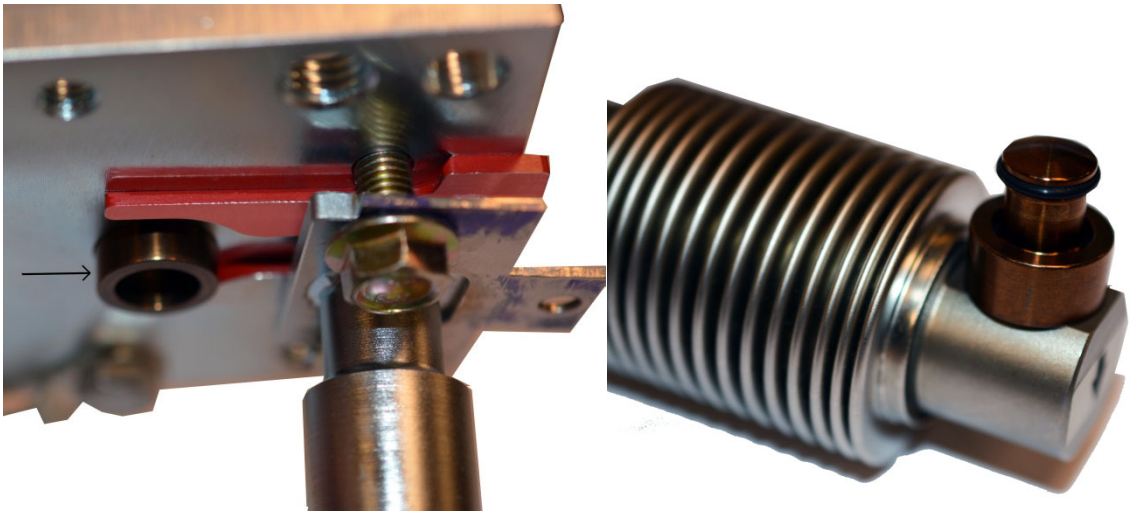
Low Capacity



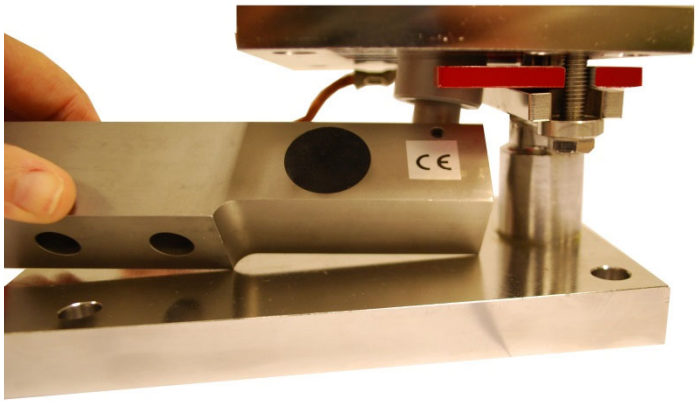
- Slide the loading cup and pin into the recessed area in the top plate of the mount.



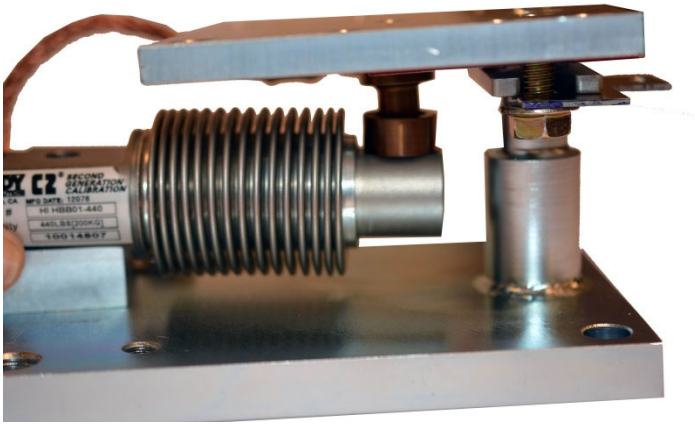
Low Capacity



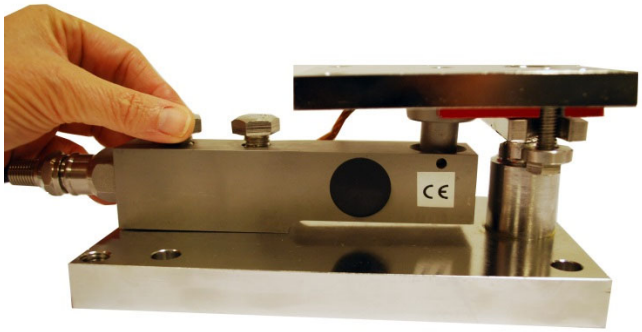
- From the side, slide the sensor in and rotate in place.



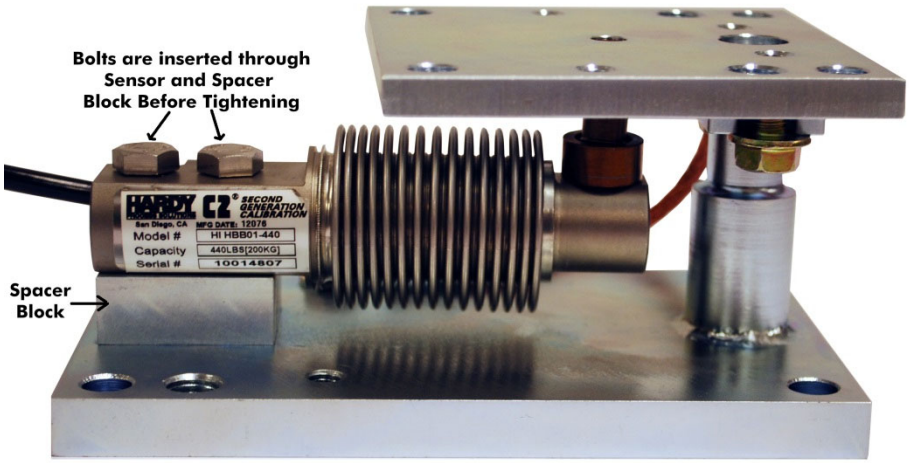
For the Low Capacity You Must Use the Spacer Block to Support the Rear of the Sensor



- Insert the sensor bolts into place and screw in loosely before tightening the bolts.



NOTE: ***The Low Capacity OneMount using the HI HBB01 Beam type sensors requires the additional spacer bar to hold the sensor level. This plate must be inserted under the back of the sensor and the two mounting screws run through both the sensor and the spacer block. See below.***



19) Tighten Load sensor bolts using torque wrench

- 22-550lb capacity 18.5 ft-lbs (25 N-m)
- 1125lb – 4500lb capacity 65 ft-lbs (88.5 N-m)
- 11250lb capacity 295 ft-lbs (400 N-m)
- 22500lb capacity 515 ft-lbs (700 N-m)

20) Use a jack/crane to raise the top plate and structure 1/8” – 1/4". Remove the red shipping spacer.

WARNING: STORE THE SHIPPING SPACER IN A SAFE LOCATION. IT CAN BE USED IN THE FUTURE IF THE LOAD SENSOR NEEDS TO BE REMOVED FOR MAINTENANCE.

ATTENTION: CONSERVER LES SPACER EXPÉDITION DANS UN ENDROIT SÛR . IL PEUT ÊTRE UTILISÉ À L'AVENIR SI LE CAPTEUR DE CHARGE DOIT ÊTRE RETIRÉ POUR L'ENTRETIEN.

WARNING: SHIPPING A LIVE LOAD POINT UNDERNEATH A VESSEL IS NOT RECOMMENDED UNDER ANY CIRCUMSTANCES.

ATTENTION: ENVOI D'UNE CHARGE POINT EN DIRECT SOUS UN NAVIRE EST PAS RECOMMANDÉ EN AUCUN CAS.

21) Lower the top plate and remove the jack.

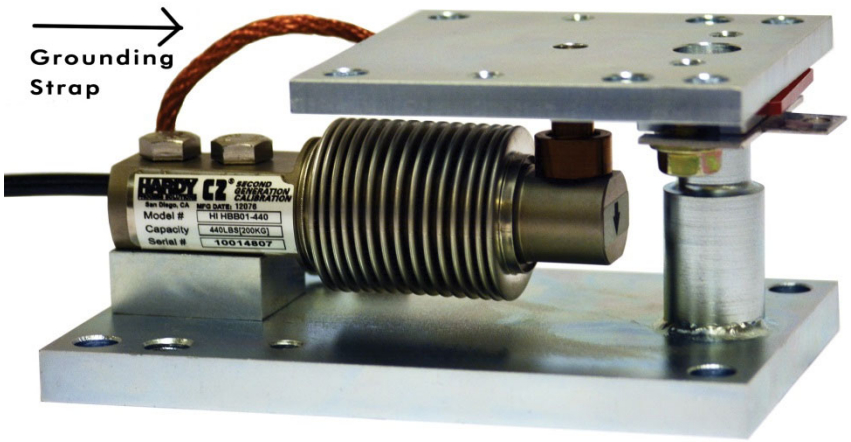
22) Set Liftoff Gap

- 22-550 lb capacity 2mm (0.079”)
- 1125lb – 4500 lb capacity 2mm (0.079”)
- 11250 lb capacity 3mm (0.1181”)
- 22500 lb capacity 3mm (0.1181”)

NOTE: ***The OneMount is specifically designed so that the liftoff gap will be appropriately set when bolt ends are flush with the top of the top plate. Assuming there is a flat surface***

on the other side of the top plate, the bolts can be screwed in until they bottom out. Furthermore, each bolt has a plastic bead to prevent it from backing out during vibration.

23) If not already in place, install the Grounding Strap



Wiring the Load sensor

1. Disconnect all power to the summing box/indicator
2. Use the wire color flag on the sensor cable to match the wires to the appropriate terminal block on the summing box or indicator. The cable is 6 conductor, shielded (floating).

C2 WIRE COLOR CODE FLAG LABEL IS FOUND APPROX. 10 IN. FROM END OF SENSOR'S CABLE	
EXCITATION +	RED
EXCITATION –	BLACK
SIGNAL +	GREEN
SIGNAL –	WHITE
C2 +	GRAY
C2 –	VIOLET
SHIELD	YELLOW

NOTE: ***If the sensor is being wired directly to the indicator, a jumper is required between Excitation+ and Sense+, and between Excitation- and Sense-. Hardy Weight Processors and Controllers come with these jumpers included on the load sensor connectors.***

NOTE: ***C2 Calibration only works with a Hardy Controller, Weight Processor, or Module.***

Pre-commissioning Inspection

Before doing any electrical tests do the following:

1) Visually inspect each load point assembly for physical damage. Look for distortions or cracks in all metal parts.
2) Check all welds to be sure they are not cracked or have deep pot marks.
3) Check all cables for cracks, cuts or crimping. Check for any abrasions on the cables.
4) Look for structural changes in the scale or supporting structures.
5) Look for binding of any kind on the load point assembly.
6) Obtain the Load Sensor certification sheets for reference. The certifications and product manuals are available 24 hours a day on our Web Site: http://www.hardysolutions.com
   > Support Center > Self Service > C2 Online Cert Lookup

If you find any of the problems stated above, replace the part that is damaged.

Calibration and Verification

The calibration of any scale system is performed in the weight controller. Before running a calibration, verify that the load sensors and mounts are installed properly and used in accordance with manufacturer specifications.

Calibration is required for any newly installed system, and it is good practice to verify the calibration at least once a year with certified test weights. Contact Hardy Service at 858.278.2900 option 4 to setup your calibration or verification.

C2 Calibration

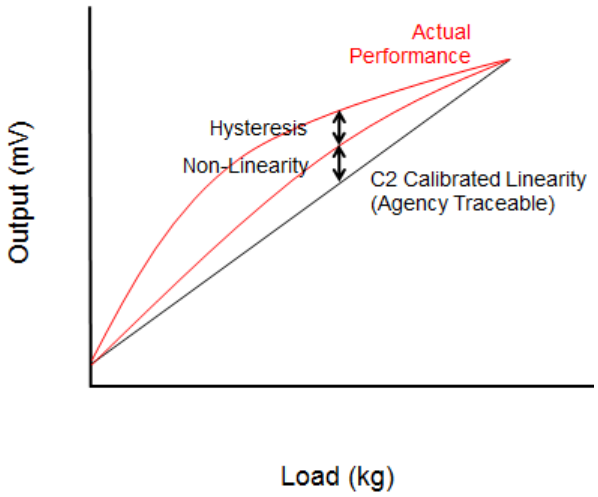
Exclusive to Hardy weighing and scale systems, C2 electronic calibration is designed to overcome some of the costs and safety risks of traditional test weigh calibration. Each individual Hardy load sensor has its agency traceable calibration data stored on an internal memory device when the sensor is manufactured. At the push of a button, a Hardy instrument automatically searches for C2 certified load points and downloads their performance characteristics, generating a reliable calibration curve around a single, known reference weight (typically the system deadweight). A simple verification and return to zero test using approximately 20% of the span weight confirms that the calibration is correct to within factory stated accuracy (See the ***Troubleshooting*** Section for more information about corner and shift testing). If binding, load sensor failure, or other mechanical problems are present, the verification will fail, alerting users to a problem.

Hardy Load Sensors deliver Total Cost of Ownership savings by:

- Ensuring customers the fastest calibration during installation or after routine maintenance
- Ensuring the calibration is always within the factory stated accuracy
- Identifying improper wiring and other installation errors quickly

- Identifying performance errors that traditional test weight calibration can mask (binding)
- Eliminating the need to remove the live weight from the scale
- Increasing the safety of personnel by eliminating the use heavy test weights, especially in hard to reach installations
- Individually matching load sensor mV/V and mV/V/Ω outputs to eliminate the need for technicians to balance trim pots during installation or replacement
- Using high quality sealing and nitrogen purging to protect against moisture and strain gauge degradation, ensuring the slope of the factory calibration curve does not drift throughout its life

Figure 9: *Each individual load sensor has its performance characteristics stored on an internal memory device. These characteristics are measured on National Institute of Standards and Technology (NIST) traceable test devices and electronically recorded when the sensor is manufactured. The C2 system uses these parameters, the instrument characteristics and a reference point to calibrate the scale system.*



To view or print a Hardy Load sensor calibration certificate, visit to our website at: http://www.hardysolutions.com/support-center/online-certification-tool/view

Preventative Maintenance

In addition to regular PM calibrations, weighing equipment should be visually inspected at least once per fiscal quarter. Items to inspect include:

1) Visually inspect each load point assembly for physical damage. Look for distortions or cracks in all metal parts.
2) Check all welds to be sure they are not cracked of have deep pot marks.
3) Check all cables for cracks, cuts or crimping. Check for any abrasions on the cables.
4) Look for structural changes in the scale or supporting structures.
5) Look for binding of any kind on the load point assembly.
6) Use Integrated Technician through a Hardy Weight Controller or Weight Processor to assess the performance of each load sensor.

7) Inspecting the Rocker Pin for wear/damage.
8) Look for debris or dirt buildup underneath the load sensor and remove as necessary.

Replacing a Load sensor

The Hardy OneMount makes load sensor replacement easy. To remove a load sensor, use a jack or crane to raise the top plate 1/8" to 1/4", unscrew the load sensor bolts, and slide the old load sensor out.

Install the new load sensor. Enter from side, lift up, rotate in, and bolt in place. (See step by step procedures including photographs in the ***Detailed Installation Procedure*** Section above under Step 18.)

Tighten Load sensor bolts using torque wrench

- 22-550 lb capacity 18 ft-lbs (25 N-m)
- 1125 lb – 4500lb capacity 65 ft-lbs (88.5 N-m)
- 11250 lb capacity 295 ft-lbs (400 N-m)
- 22500 lb capacity 515 ft-lbs (700 N-m)

Troubleshooting

A good reference for troubleshooting is located in the Hardy Webtech: http://hardyinst.custhelp.com/

Search for "Troubleshooting Tips - Load Cells & Weight Controllers"

Electrical Tests for Load Point Assembly Problems

Why run this test?

1) A Basic Power Check.
2) Instrument shows an ADC (ANALOG DIGITAL CONVERTER) Error.

To perform the test:

1. Measure the excitation voltage at the instrument to ensure 5-15 VDC.
2. Measure the excitation voltage at the summing card to ensure 5-15 VDC.
3. Measure the excitation voltage on each load cell to ensure 5-15 VDC.

If any of these checks fail, power is not reaching the load cell. Check connection points and cable integrity.

Zero Balance Test

Why run this test?

1. Instrument is showing Over-Range Error above a certain weight value that should be within the gross capacity of the load cells
2. Instrument does not respond until a specific and consistent amount of weight is added to the scale.
3. Other symptoms are occurring that suggest damaged load cell, such as consistent zero shift.

To perform the test: Use a voltmeter (millivolt range) or Integrated Technician feature and measure the load sensor output under "no load" conditions (including no dead load). To perform with a voltmeter, place the positive lead on the SIG+ of the load sensor and the negative lead on SIG-. Ensure that you're measuring the

load sensor signal and not the homerun cable signal. Record the voltage reading and confirm that the voltage is less than the voltage tolerance, which can be calculated as follows:

Tolerance = Excitation Voltage * mV/V Rating * Zero Balance Specification

NOTE: All Hardy Instruments Provide 5VDC Excitation.

Specifications for each OneMount Load Sensor are shown below:

Load Sensor	mV/V Rating	Zero Balance Specification	Tolerance @ 5VDC EXC
HISBH04	2mV/V + 0.1%	± 5% RO	± 0.5 mV
HISB05	2mV/V + 0.1%	± 5% RO	± 0.5 mV
HIHBB01	2mV/V + 0.1%	± 5% RO	± 0.5 mV

Result 1: The voltage reading is within the Zero Balance Specification.

Remedy 1: Load sensor is functioning properly. No action needed.

Result 2: The voltage reading exceeds the Zero Balance Specification.

Remedy 2: The load cell has been stressed or overloaded, and the useful range of the load cell has been altered. For best system performance, the load sensor should be replaced. At minimum, the system should be recalibrated and closely monitored.

Bridge Resistance Test

Why run this test?

1. Instrument shows an ADC (ANALOG DIGITAL CONVERTER) error.
2. It is suspected that a load cell is not responding, as would be caused by an “open signal” or a short circuit.
3. Other symptoms are occurring that suggest damaged load cell, such as consistent zero shift or inconsistent readings.

To perform the test:

1) Use an Ohmmeter and measure the resistance between the EXC + and EXC- leads. The Input Resistance Specifications for each OneMount Load Sensor are below.
2) Use an Ohmmeter and measure the resistance between the SIG + and SIG – leads. The Output

Resistance Specifications for each OneMount Load Sensor are below.

Load Sensor	Input Resistance	Output Resistance
HISBH04	1100 ± 50	1000 ± 2
HISB05	1100 ± 50	1000 ± 2
HIHBB01	380 ± 10	350 ± 3

Result 1: The resistance readings are both within the published specs.

Remedy 1: Load sensor is functioning properly. No action needed.

Result 2: The measured resistance readings are outside of the published spec.

Remedy 2: The load cell is damaged and must be replaced.

Resistance to Ground Test

Why run this test?

1. Instrument reading shows excessive noise or unstable output.
2. Instrument displays a ADC (ANALOG DIGITAL CONVERTER) error

To perform the test:

1) Disconnect Power to the summing box.
2) Disconnect the load cell from the summing box.
3) Tie together the load sensor excitation (2), signal (2) and ground (1) wires.
   NOTE: DO NOT INCLUDE THE C2 WIRES
   NOTE: HIHBB01, HISBH04, and HISB05 have a floating shield. If this test is performed on a load cell without a floating shield, leave the shield wire disconnected.
4) Use an Ohmmeter and measure the resistance between all five wires tied together and the load sensor metal body.

Result 1: Open Signal is measured indicating no continuity.

Remedy 1: Load sensor is functioning properly. No action needed.

Result 2: The ohmmeter measures resistance to ground.

Remedy 2: The load sensor is showing a resistance to ground, which can cause noise and other symptoms. The load sensor must be replaced.

Testing Insulation Resistance with a Megger

Why run this test?

Testing insulation resistance confirms electrical isolation between the bridge and the body of the load sensor. This is an advanced technique and the procedure is not covered in this manual. For more information, please contact Hardy Support.

Proper values are stated in the load sensor datasheets and below.

WARNING: WHEN USING A MEGGER DO NOT EXCEED THE PUBLISHED INSULATION RESISTANCE VOLTAGE .

ATTENTION: LORS DE L'UTILISATION A MEGGER NE PAS DEPASSER LA TENSION PUBLIE ISOLATION DE LA RÉSISTANCE.

Load Sensor	Insulation Resistance Voltage	Insulation Resistance
HISBH04	100VDC	≥ 5000MΩ
HISB05	100VDC	≥ 5000MΩ
HIHBB01	100VDC	≥ 5000MΩ

If the insulation resistance is below to stated value, remove the ground wire and test with only the four live leads. If the sensor then measures the proper resistance, an insulation problem in the cable is likely. The sensor should be replaced.

Mechanical Tests for Troubleshooting Binding and Other Load sensor Issues

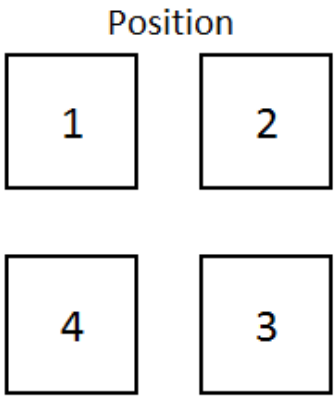
Corner Testing

Why run this test?

An easy method to quickly diagnose individual load sensor performance on a scale system is called a Corner Test. This test can be done either using certified test weights, or with any other known weight that does not exceed the load sensor capacity. In many circumstances, a rough evaluation can be done using a technician's own bodyweight.

To perform the test:

1) Record the initial weight value on the indicator
2) Add a known weight of at least 15% of the scale capacity directly above a single load sensor. Do not exceed the capacity of the individual load sensor
3) Confirm that weight measured at the indicator matches that which was added to the scale.
4) Remove the weight, and confirm that the indicator returns to the initial value.
5) Repeat this for each sensor, and record all the weights, ensuring that the scale returns to the original weight value at each point.



Result 1: All load sensors accurately read the added weight and return to the initial value when the weight is removed.
Remedy 1: None. This result indicates the load sensors are all working properly and the system is properly calibrated.

Result 2: None of the load sensors measure the weight added to the scale. All load sensors read the same value, but it is incorrect. In addition, all sensors return to the initial value when the weight is removed.
Remedy 2: It is likely that the system needs to be calibrated. All the load sensors are responding in the same way and return to the initial reading, but the calibration curve appears to be off.

Result 3: A single load sensor operates different from the other three when weight is added, but returns to the initial value when weight is removed. **OR** A single load sensor operates the same as the other three when weight is added, but does not return to the initial value when weight is removed.
Remedy 3a: The system may have some binding. Perform a physical inspection to look for any obvious binding. Try the Shift Test to try to identify a binding situation.
Remedy 3b: The load sensor is broken and must be replaced.

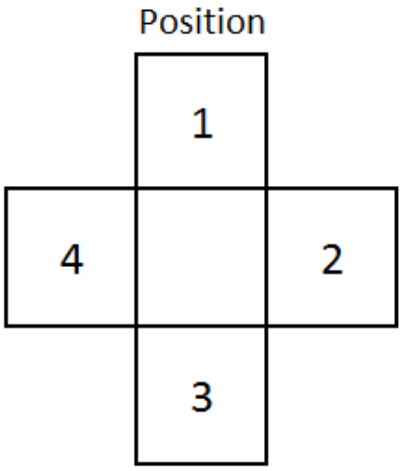
Result 4: A single load sensor reads negative when weight is added
Remedy 4: This sensor may we wired incorrectly to the junction box. Check the color codes and confirm proper wiring.

Shift Testing

Why run this test?
An easy method to quickly diagnose system binding on a scale system is called a Shift Test. This test measures how load sensors are working in conjunction to their adjacent cells. This test can be done either using certified test weights, or with any other known weight that does not exceed the load sensor capacity. In many circumstances, a rough evaluation can be done using a technician's own bodyweight.

To perform the test:

1) Record the initial weight value on the indicator
2) Add a known weight of at least 15% of the scale capacity to the structure between two load sensors. Do not exceed the capacity of the individual load sensor.
3) Confirm that weight measured at the indicator matches that which was added to the scale.
4) Remove the weight, and confirm that the indicator returns to the initial value.
5) Repeat this between each pair of sensors, and record all the weights, ensuring that the scale returns to the original weight value at each point.



Result 1: All positions accurately read the added weight and return to the initial value when the weight is removed.
Remedy 1: None. This result indicates the load sensors are all working properly and the system is properly calibrated.

Result 2: None of the load sensors measure the weight added to the scale. All positions read the same value, but it is incorrect. In addition, all positions return to the initial value when the weight is removed.
Remedy 2: It is likely that the system needs to be calibrated. All the load sensors are responding in the same way and return to the initial reading, but the calibration curve appears to be off.

Result 3: A single position operates differently from the other three when weight is added, but returns to the initial value when the weight is removed. OR A single position operates the same as the other three when weight is added, but does not return to the initial value when weight is removed.
Remedy 3: The system appears to have some binding above that position. Perform a physical inspection to look for any obvious binding.

Specifications

Load Sensor Specifications

Advantage® Shear Beams

SPECIFICATIONS	Units	HI SBH04
Maximum Capacity (Emax)	lbs	1.125k / 2.25k / 4.5k / 11.25k / 22.5k
Max number verification intervals	nmax	3000
Min load cell verification interval	vmin	Emax / 11000
Combined Error	%RO	± 0.0200
Non-Linearity	%RO	± 0.0166
Hysteresis	%RO	± 0.0166
Creep error (30 Minutes) / DR	%RO	± 0.0166
Temperature effect on min dead load output	%RO/10°C	± 0.0127
Temperature effect on sensitivity	%RO/10°C	± 0.0100
Non-Repeatability	%RO	Not Specified
Rated Output (RO)	mV/V	2 ± 0.1%
Calibration in mV/V/Ω		Matched
Zero Balance	%RO	± 5
Excitation Voltage	V	5-15
Input Resistance	Ω	1100 ± 50
Output Resistance	Ω	1000 ± 2
Insulation resistance (100VDC)	MΩ	≥ 5000
Load Cell Safe Load Limit	%Emax	200
Load Cell Ultimate Load Limit	%Emax	300
Load Cell Safe Side Load	%Emax	100
Maximum Platform Size	N/A	N/A
Compensated Temp. Range	°C	-10 …+40
Operating Temperature Range	°C	-40…+80
Load Cell Material		Stainless Steel 17-4PH (1.4548)
Sealing		Complete Hermetic Sealing - Glass to Metal Header
Protection EN 60 529		IP68 (up to 2m water depth) / IP69k
Cable Length	ft	20 ft
Hazardous Certification		IS Class 1,2,3 Div 1
Legal For Trade		NTEP COC 99-057A1

Advantage® Lite Shear Beams

SPECIFICATIONS	Units	HI SB05	HI SB05
Maximum Capacity (Emax)	klbs	1.125k / 2.25k / 4.5k / 11.25 klbs	22.5 klbs
Max number verification intervals	nmax	3000	N/A
Min load cell verification interval	vmin	Emax / 11000	N/A
Combined Error	%RO	± 0.0200	± 0.0500
Non-Linearity	%RO	± 0.0166	± 0.0400
Hysteresis	%RO	± 0.0166	± 0.0400
Creep error (30 Minutes) / DR	%RO	± 0.0166	± 0.0600
Temperature effect on min dead load output	%RO/10°C	± 0.0127	± 0.0400
Temperature effect on sensitivity	%RO/10°C	± 0.0100	± 0.0200
Non-Repeatability	%RO	Not Specified	Not Specified
Rated Output (RO)	mV/V	2 ± 0.1%	2 ± 0.1%
Calibration in mV/V/Ω		Matched	Matched
Zero Balance	%RO	± 5	± 5
Excitation Voltage	V	5-15	5-15
Input Resistance	Ω	1100 ± 50	1100 ± 50
Output Resistance	Ω	1000 ± 2	1000 ± 2
Insulation resistance (100VDC)	MΩ	≥ 5000	≥ 5000
Load Cell Safe Load Limit	%Emax	200	200
Load Cell Ultimate Load Limit	%Emax	300	300
Load Cell Safe Side Load	%Emax	100	100
Maximum Platform Size	N/A	N/A	N/A
Compensated Temperature Range	°C	-10 …±40	-10 …±40
Operating Temperature Range	°C	-20…±65	-20…±65
Load Cell Material		Stainless Steel 17-4PH (1.4548)	Stainless Steel 17-4PH (1.4548)
Sealing		Potted	Potted
Protection according to EN 60 529		IP67	IP67
Cable Length	ft	20 ft	20 ft
Hazardous Certification		IS Class 1,2,3 Div 1	IS Class 1,2,3 Div 1

Low-Capacity Advantage® Beam Sensor

SPECIFICATIONS	Units	HI HBB01
Maximum Capacity (Emax)	lbs	22 / 44 / 110 / 220 / 440 / 550
Max number verification intervals	nmax	3000
Min load cell verification interval	vmin	Emax / 11000
Combined Error	%RO	± 0.0200
Non-Linearity	%RO	± 0.0166
Hysteresis	%RO	± 0.0166
Creep error (30 Minutes) / DR	%RO	± 0.0166
Temperature effect on min dead load output	%RO/10°C	± 0.0140
Temperature effect on sensitivity	%RO/10°C	± 0.0100
Non-Repeatability	%RO	Not Specified
Rated Output (RO)	mV/V	2 ± 0.1%
Calibration in mV/V/Ω		Matched
Zero Balance	%RO	± 5
Excitation Voltage	V	5-15
Input Resistance	Ω	380 ± 10
Output Resistance	Ω	350 ± 3
Insulation resistance (100VDC)	MΩ	≥ 5000
Load Cell Safe Load Limit	%Emax	200
Load Cell Ultimate Load Limit	%Emax	300
Load Cell Safe Side Load	%Emax	100
Maximum Platform Size	N/A	N/A
Compensated Temperature Range	°C	-10 …±40
Operating Temperature Range	°C	-40…±80
Load Cell Material		Stainless Steel 17-4PH (1.4548)
Sealing		Complete Hermetic Sealing - Glass to Metal Header
Protection according to EN 60 529		IP68 (up to 2m water depth)
Cable Length	ft	10 ft
Hazardous Certification		IS Class 1,2,3 Div 1

OneMount™ Mount Specifications

Shear Beam Mounts

SPECIFICATIONS	Units	Capacities		
Capacity	lb	1125lb - 4500lb	11250lb	22500lb
Rated Liftoff Force	lb	2250	5625	11250
Rated Overload	lb	6750	16875	33750
Rated Side Force	lb	4500	11250	22500
Weight Excluding Load Cell	lb	9	24	43
Material	Metallurgy	Electropolished Stainless Steel / Stainless Steel / Plated Steel		
Levelling Required		0.4/100 (legal for trade) / 0.8/100 (general applications)		

Low Capacity Mounts

SPECIFICATIONS	Units	Capacities
Capacity	lb	22lb - 550lb
Rated Liftoff Force	lb	225
Rated Overload	lb	1100
Rated Side Force	lb	550
Weight Excluding Load Cell	lb	4
Material	Metallurgy	Electropolished Stainless Steel / Stainless Steel / Plated Steel
Levelling Required		0.4/100 (legal for trade) / 0.8/100 (general applications)

Load Cell Deflection Charts

Deflection (y) represents the axial deflection of the load cell under capacity load.

The Spring Rate K = P/y is the Stiffness of the load cell in the axial direction, and is the ratio between the force (P) and deflection (y).

The acceleration of gravity is 9.81 m/s^2.

Deflection at maximum capacity (mm)						
Maximum Capacity			HISBH04 / HISB05	Spring Rate	Natural Frequency (Hz)	Reaction Time (ms)
Lb	Kg	kN				
1,125	510	5	0.21	2,428.6	34.4	29.1
2,250	1,020	10	0.29	3,517.2	29.3	34.2
4,500	2,039	20	0.49	4,161.2	22.5	44.4
11,250	5,099	50	0.52	9,805.8	21.9	45.7
22,500	10,197	100	0.74	13,779.7	18.3	54.6

Deflection at maximum capacity (mm)						
Maximum Capacity			HIBBH01	Spring Rate	Natural Frequency (Hz)	Reaction Time (ms)
Lb	Kg	kN				
22	10	0.10	0.29	34.5	29.3	34.2
44	20	0.20	0.30	66.7	28.8	34.7
110	50	0.49	0.23	217.4	32.9	30.4
220	100	0.98	0.30	333.3	28.8	34.7
440	200	1.96	0.38	526.3	25.6	39.1
550	250	2.45	0.87	287.4	16.9	59.2
1,100	500	4.90	1.25	400.0	14.1	70.9

Hardy Installation and Commissioning

Hardy delivers on its reputation as a quality manufacturer of weighing equipment. Hardy solutions are EASY to install, integrate, commission, diagnose and maintain. Our customers find that this simplicity delivers the lowest total cost of ownership.

To ensure the best performance of Hardy products, we recommend that you add Hardy Installation to your product purchase. Great products without a quality installation risk long-term performance and availability, and Hardy has a broad network of trained service agents to perform, inspect, and commission new installations.

Hardy offers preferred rates for new installations and we guarantee that the installation will be done right the first time. Plus, with the use of the Hardy Toolbox features like C2 Electronic calibration, Hardy Technicians spend less time onsite than the competition, saving you cost and downtime.

For a fast and easy installation quote, please contact one our service specialists at:

800-821-5831 option 4, or email us at: hardysupport@hardysolutions.com

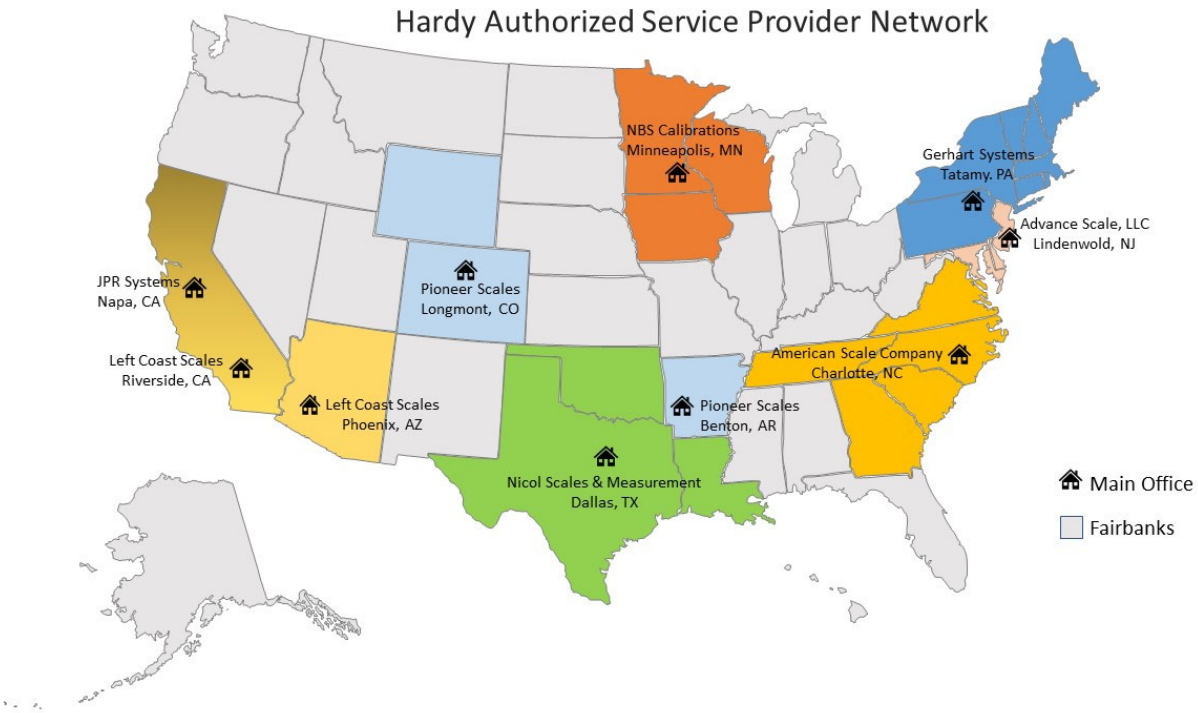
Emergency Service and Support

Even with the best quality equipment, failures can happen without warning. The question isn't "if" this will happen, but how prepared you are to rectify the situation "when" the unexpected happens.

Hardy Field Service Technicians are located nationwide to ensure the fastest response to your unplanned downtime, and our emergency after-hours mailbox is checked constantly to prevent customers experiencing a downtime event from having to wait until morning.

For rapid turnaround service, please contact one our service specialists at: **800-821-5831 option 4.**

See The Hardy Field Support Page on the Hardy Website:
https://www.hardysolutions.com/pages/support/onsite-field-service



Hardy Support locations throughout the United States.