



SI ONBOARD

Installation Instructions

For Single Point / Trunion Suspension Trailer Scale

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Introduction

The SI on-board scale is a highly advanced electronic measuring device. Weight is “sensed” by two load cells that are mounted between the trunnion and frame. These rugged load cells are strong enough to provide years of reliable service, yet are sensitive enough to detect a change in weight of just a few pounds.

SI scales are available for all types of single point suspension. Due to the differences in the models, there may be minor assembly variations. The installation process is virtually the same whether it is being performed as a retrofit or to a new vehicle.

It is extremely important to follow these installation guidelines and use the specified materials to ensure that the completed assembly will maintain its high strength and maximum safety. It will also result in minimum installation costs, high accuracy and long life for your scale system.

Warning:

Failure to follow these instructions could cause a hazardous operating condition.

Upon completion of the load cell installation, you will need to install the SI 9100 digital meter, transmitter and cabling. You also need to calibrate the scale system. Complete instructions for these procedures can be found in the operator’s manual included with your SI 9100 digital meter.

Warning:

Installation must be in accordance with regulations of the U.S. Department of Transportation, State and local regulations, SAE recommended practices and standard, and tractor and trailer manufacturer’s specifications.

International users: Installation must be in accordance with the regulations of city, state, province and country, as they may apply to installations outside of the USA.

An installation checklist has been provided on page 8 of this manual. Refer to it during installation and check off the important steps as they are completed.

Shear Beam Load Cell

SI Technologies' shear beam load cell (83-01610-20) is designed for trailers with single point suspension, such as Neway suspension. 83-01610-20 is unitized with load cell, trunnion stand, trunnion cap and bearing blocks (see Figure 1). It consists the following items:

- One 83-01610-10 shear beam load cell welded on trunnion stand.
- One trunnion cap
- Two bearing blocks
- Two 1 1/8"-12 UNF X 3" long Grade 8 cap screws
- Six 5/8"-18 UNF X 2" long Grade 8 cap screws
- Two 1 1/8" flat washers
- Six 5/8" flat washers
- Six 5/8"-18 UNF Grade 8 nuts with nylon insert.

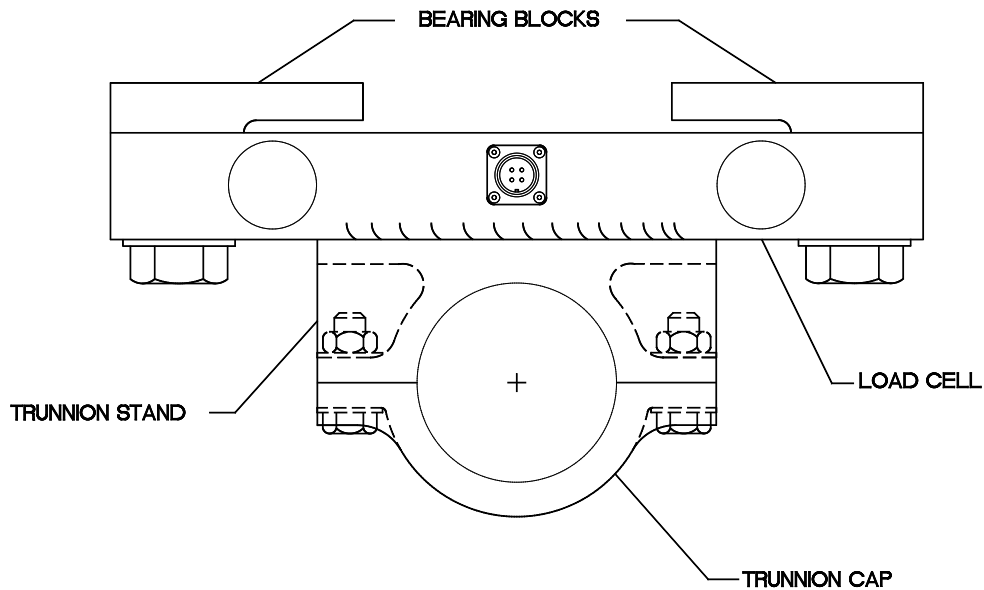


Figure 1

Installation

Note:

For visual help on the installation, see Figure 2.

1. Cut the weld and separate the frame bracket from the trunnion clamp casting. Grind and smooth the mounting surfaces for the load cells. Make sure the mounting surfaces are flat.
2. The frame bracket must be extended to install the load cell which is longer than removed trunnion clamp. Weld a plate (3/4" x 6" x 17") to the bottom of the frame bracket. Gussets may be necessary to provide the proper support for the ends of the load cells. See drawing.
3. If the load cells are not assembled with the bearing blocks yet, assemble the load cells to the bearing blocks with 1 1/8" -18 UNF cap screws, which are provided by SI Technologies.
4. Position the load cell on the trunnion tube. The connector on the load cell should be faced inside.

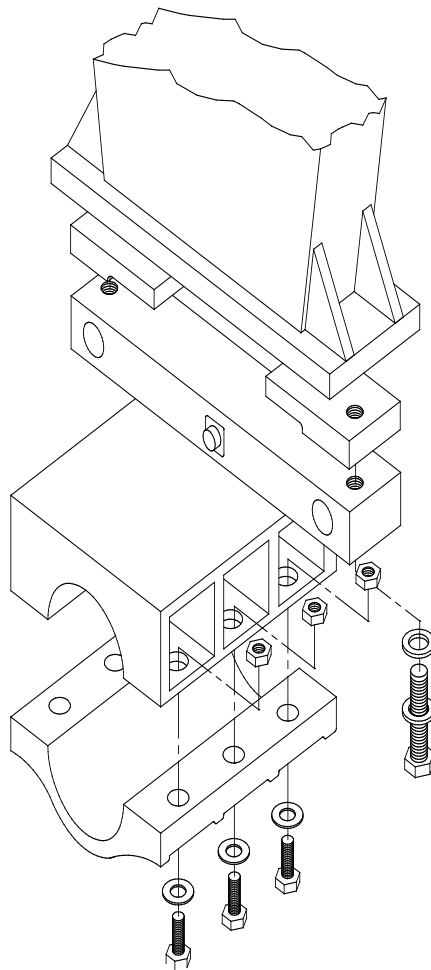


Figure 2

5. Mount the trunnion cap (lower half) to the trunnion stand with six 5/8-18UNF X 2" cap screws and six 5/8 inch washers. Tighten the screws to a loose fit between the trunnion and tube.
6. Align the suspension with the trailer frame according to manufacturer's specification.
7. Tack weld the bearing blocks to the trailer frame.
8. Remove two 1-1/8" end cap screws, separate the load cells from the bearing blocks. Move the trailer suspension away.

Warning:

Welding the bearing blocks while the load cell is still on will damage the load cell electronics. Be sure you remove the load cell before any welding job started. *Warranty will be VOID if load cell is damaged by welding.*

9. Complete welding of the bearing blocks to the trailer frame. All welds should be done in three passes. All welding procedures should meet AWS standard. See welding procedures on page 5 of this manual.
10. Reassemble the load cells to the bearing blocks. Torque the bolts to the specification on page 7 of this manual.
11. Install transmitter per instructions in the meter manual.
12. Install 9100 meter per instructions in the meter manual.
13. Install the cabling according to the instructions on page 7 of this manual.
14. Calibrate the scale system per instructions in the meter manual.

Welding Procedures

The procedure has been prepared to guide the welder on the proper method for welding bearing plates to frame mounting members. For visual welding sequence, see Figure 3.

Warning:

All welding, metal working, and assembly **MUST** be performed by a qualified person using proper tools and safe work habits. When welding, use a procedure which assure a sound, good quality weld. Over-welding may cause distortion and damage; under-welding may not develop sufficient strength.

Caution:

Take precautions to ensure that the vehicle's electrical system is not damaged by welding. Attach ground strap directly to vehicle frame when welding to prevent electrical current flow through load cells.

Welding Process:

Use a low hydrogen process and AWS E7018 rod or equivalent. The bearing plate may be welded using SMAW stick, GMAW spray transfer, or FCAW. The user should not use GMAW short circuit transfer.

Welding Configuration:

The bearing blocks should be attached using a multi-pass fillet weld sequence as shown in Figure 3.

Deposited Weld Metal Fillet Sizes:

The finish multi-pass fillet assembly should be a minimum of ½" (13mm) as shown in Figure 3.

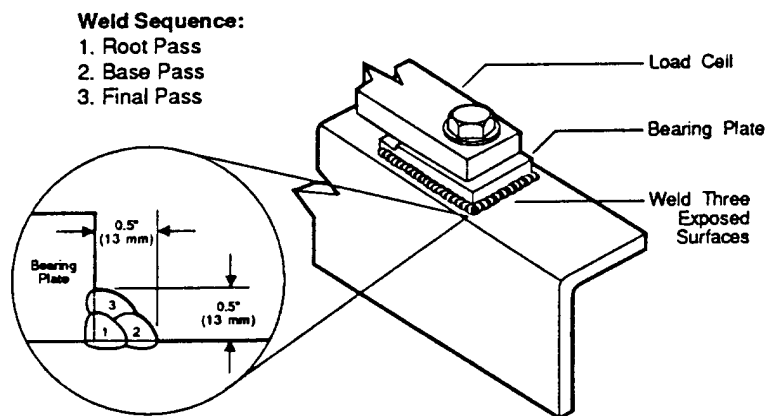


Figure 3

Fillet Metal:

The electrode should be in Table 1:

Electrode specification:

Process	Size	Type	Comment
SMAW	1/8, 5/32, or 3/16	E7018	Must be dry
FCAW	.045 to 3/32	E71T-5 or E70T-5	Gas shielded
GMAW	.035 to 1/16	E70S-6	Spray transfer

Table 1

Preheat:

The bearing blocks and frame mounting surface should be warmed in preparation for welding to reduce shrinkage stress. Any suitable torch arrangement is satisfactory. Spot heating should be avoided. The preheat temperature should be a minimum of 70° F and a maximum of 150° F.

Cleaning Before Welding:

The bearing plates will come to customer ready for welding. Edges of the bearing plates should be visually inspected to verify that there is no oil, grease, dirt, paint or other foreign substance that will reduce the weld quality. The mounting surface should be surface ground or power wire brushed so as to remove all paint, primer, or other surface coating. An area the size of the bearing block plus one inch needs to be cleaned and grounded to bare base metal.

In Process Cleaning:

Each fillet bead shall be visually inspected with all slag cover removed, before proceeding with next bead. A stiff wire brush or needle scalar may be used for slag removal.

Final Inspection:

Long service life depends on quality application of the fillet welds and **THE FINAL SIZE OF THE FILLETS**. There shall be no undercut on either the upper leg (on the bearing plate) or the lower leg (frame base metal). Any undercut shall be repaired with an additional fillet or continued by grinding to remove the mechanical notch. Visually inspect all weld stops and starts. Weld craters should be filled. All weld stops need to be staggered. New paint should be applied after final inspection.

Periodic inspection:

These primary load carrying fillet welds should be inspected during routine maintenance.

Warning:

Heat from welding may loosen bolts. Therefore, all torque values should be rechecked after installation when all welds have cooled.

Bolt Torque Value

Torque value can vary significantly depending upon the lubricating of the threads. The following values are based upon new, clean threads. SI recommends the use of a thread lubricant such as Loctite 767 or equivalent, to prevent the seizing of threads over long period of time. These torque values can be used for bolts with this lubricant, without over-stressing bolts.

All bolts are to be SAE Grade 8, all lock nuts Grade C. Use only new bolts and lock nuts.

Screw size	1-1/8" -12 UNF Gr.8	5/8" -18 UNF Gr.8
Torque value	1000 ft•lb	225~250 ft•lb

Table 2

Cable Installation

SI cables are specially designed to provide maximum single strength and high reliability. Substitution of cabling other than SI supplied cabling may cause inconsistent and erratic readings. Care should be taken when routing the cables, to provide protection from the sharp edges, exhaust pipe or any other potential damage. Secure in place with cable ties to a snug fit (see Figure 4).

Connect the cable connector to the load cells.

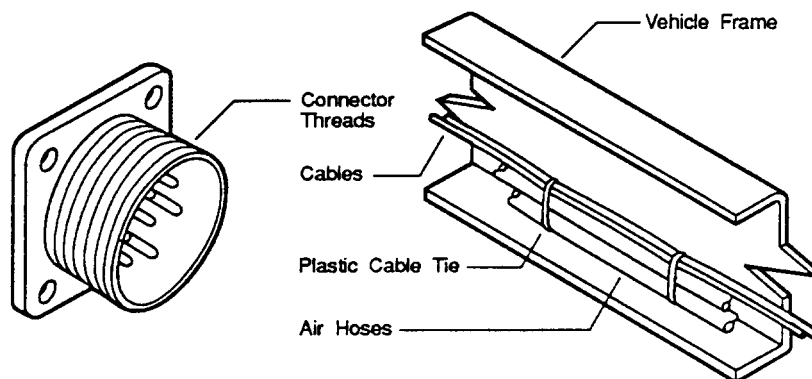


Figure 4

Routine Maintenance

Listed below are four simple steps that should be periodically performed to ensure safety, and to maintain your scale system in top operating condition.

1. Inspect all welds for signs of cracking or corrosion.
2. Retighten all fasteners to specified torque values.
3. Inspect cables and connectors for damage and tightness.
4. Clean truck/trailer connection.

Installation Checklist

- Frames have been inspected and are in good condition.
- Surfaces for load cell bearing plates are rigid or have been reinforced.
- All welds “triple pass or equivalent” (See welding procedure)
- All bolts are torqued to the specifications.
- All connectors properly inserted tight and facing inward.
- All cables routed and secured in protected areas of the frame.
- Indicator installation per manual
- System Calibration: See meter user’s manual
- Troubleshooting: See meter user’s manual