



SI ONBOARD

Installation Instructions

For Sliding Fifth-Wheel Scale

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Introduction

The SI on-board fifth wheel scale is highly advanced electronic measuring device. Weight is “sensed” by two load cells that are mounted between the tractor frame and fifth wheel. 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 most popular fifth wheels. Due to differences between 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 completed assembly will maintain it 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 10 of this manual. Refer to it during installation and check off the important steps as they are completed

Fifth Wheel Preparation

Begin the scale installation by removing the stop plates located at the rear of the Slider base (the stop plates may already be loose if the installation is on a new Slider).

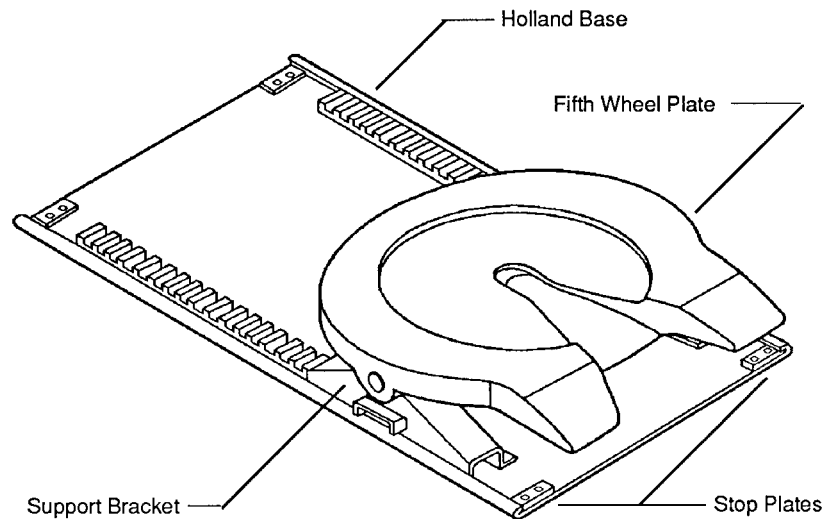


Figure 1

Separate the fifth wheel plate/support bracket assembly from the base by sliding it off toward the rear (see Figure 1). Pull the pivot pins and disassemble the fifth wheel plate from the support brackets. Set the support brackets aside for later use.

Notes:

All fifth wheels must be thoroughly cleaned and inspected for damage prior to installation the fifth wheel load cells. DO NOT use faulty components in the fifth wheel installation.

Fifth Wheel/Load Cell Assembly

The load cells are shipped with support brackets and fifth wheel trunnion already attached. Attach the load cell/trunnion assemblies to the fifth wheel plate by using the pivot pins (see Figure 2).

Notes:

Load cells should be attached to the fifth wheel so that the cable connectors are faced inward for maximum protection.

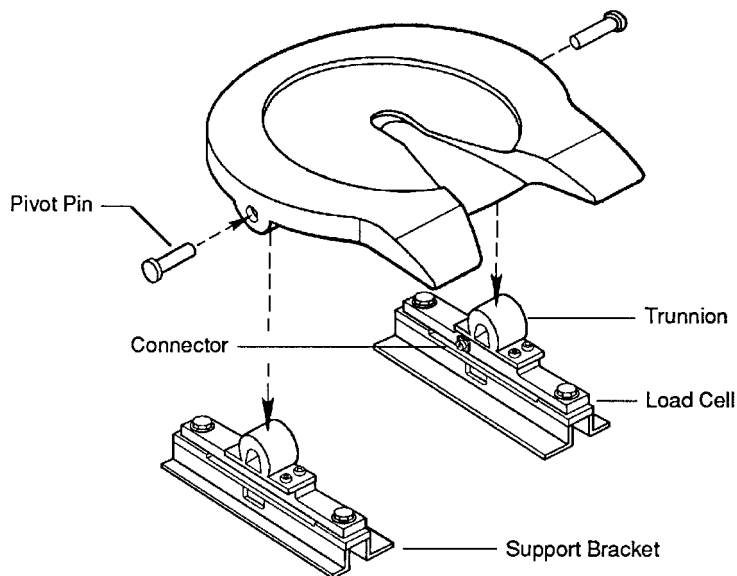


Figure 2

Reinstall the fifth wheel (with the load cell assembly attached) into the Holland Base.

Note:

Weight distribution on the tractor axles is dependent upon the position of the fifth wheel. The indicator will need to be re-calibrate each time the fifth wheel is positioned to ensure the accurate weight measurement.

Sliding Fifth Wheel Re-assembly

With the fifth wheel/load cell assembly in place on the Sliding base, re-assemble the locking mechanism.

Note:

SI Sliding fifth wheel brackets were designed to be directly interchangeable with the new design of the slider bracket and locking plunger. Shown in Figure 3 are the old and new style locking plungers.

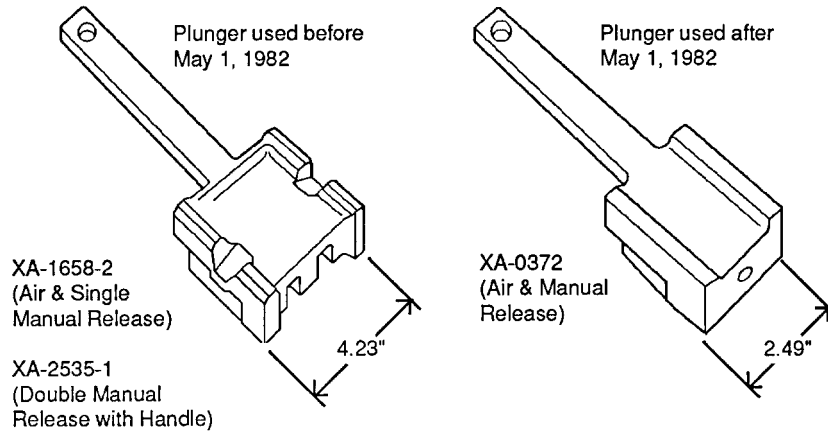


Figure 3

Carefully remove the reinforcing plates welded between the old Slider brackets using a low hydrogen process and E70XX filler metal (see Figure 4).

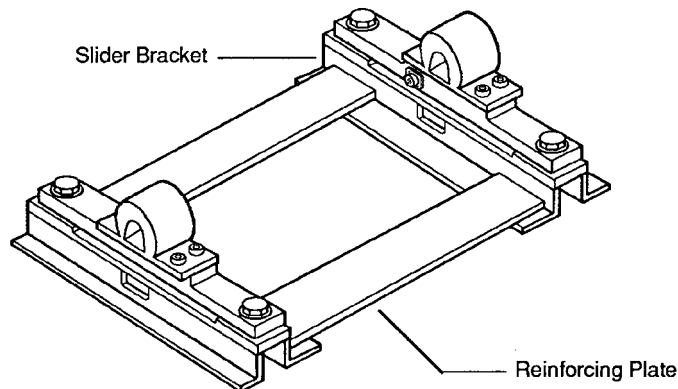


Figure 4

Check the freedom of movement of the slider brackets and proper operation of the release mechanism.

Slide the fifth wheel to its rearmost position. Locate the rear slide stops so that $\frac{1}{8}$ " to $\frac{1}{4}$ " space is provided between slider brackets and stop. Weld stop securely to base plate. Weld in the location shown in Figure 5 and ensure that the weld does not interfere with the slider operation.

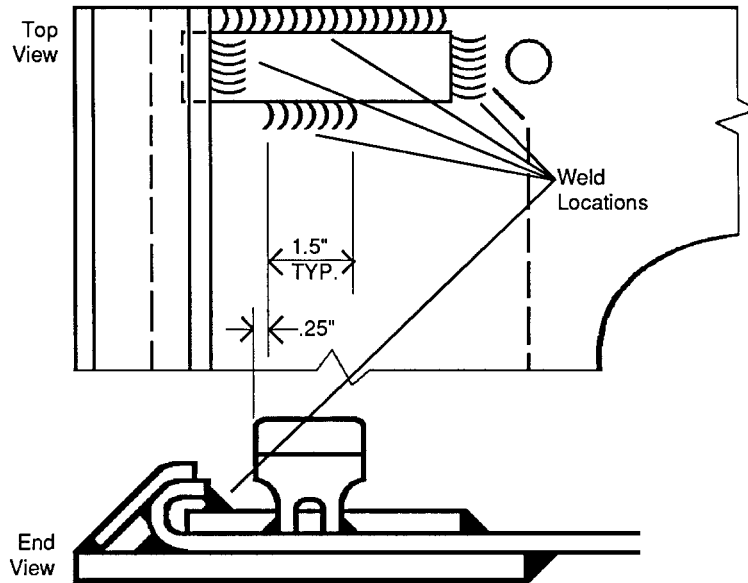


Figure 5

Welding procedure

The procedure has been prepared to guide the welder on the proper method for welding bearing plates to frame mounting members.

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 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 6.

Deposited Weld Metal Fillet Sizes:

The finish multi-pass fillet assembly should be a minimum of 1/2" (13mm) as shown in Figure 6.

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

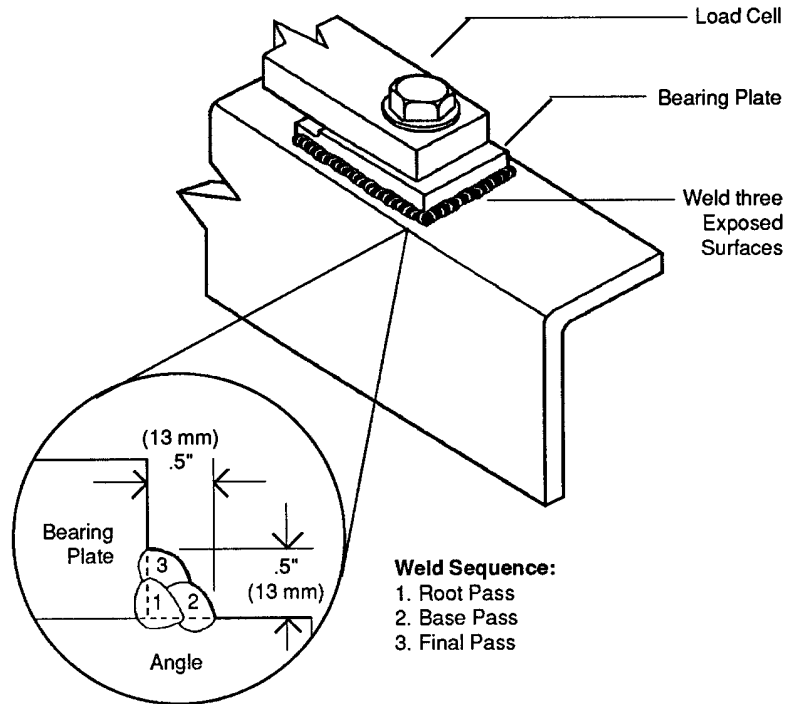


Figure 6

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 angles 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 should 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 (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 shall be staggered. A light coat of primer and paint may 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.

Application	Fastener Size	Torque Value
Frame Mount	5/8"-18 UNF	225 ~ 250 ft•lb
Load Cell Mount	1 1/4" -12 UNF	1000 ft•lb
Trunnion Mount	3/4" -16 UNF	380 ~ 420 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 (see Figure 7). Secure in place with cable ties to a snug fit.

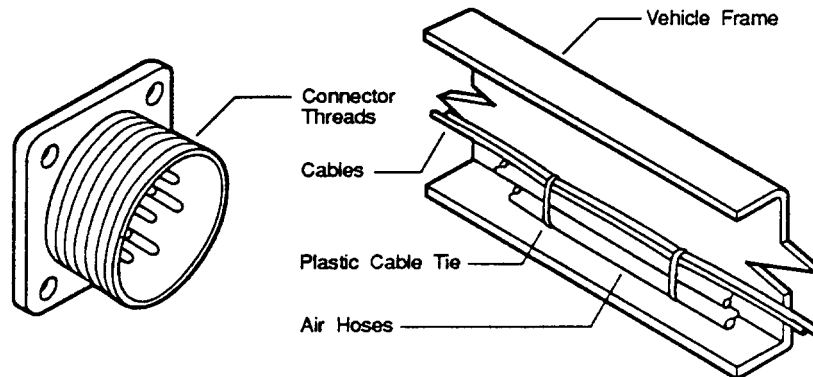


Figure 7

Connect the cable connector to the load cells. Assembly of the cable connector to the load cell should not be forced. Align the “Keyways” and insert the cable connector into the load cell. As the cable connector is being inserted, rotate the threaded sleeve clockwise until hand tight. Ensure the connector has been fully inserted for maximum moisture protection by wiggling the connector and re-tightening the sleeve.

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

- Fifth wheel has been cleaned and inspected for damage.
- Mounting angles have been inspected for burrs, inconsistencies, and tureens.
- Truck 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 in-board.
- All cables routed and secured in protected areas of the frame.
- Indicator installation per meter user’s manual.
- System Calibration: See meter user’s manual.
- Troubleshooting: See meter user’s manual.