

H TECHNICAL PROCEDURE

TRAILER SUSPENSION SYSTEMS

SUBJECT: UBL Installation Procedure For
Wide-Bushing Suspension Models

LIT NO: L719

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REVISION: A



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SERVICE NOTES

This publication provides under-beam lift kit installation instructions for Hendrickson Suspension Systems. Before you begin:

- Read and understand all instructions and procedures before installing any component.
- Read and observe all Caution and Warning statements to help avoid personal injury or property damage.
- Follow your company’s maintenance, service, installation and diagnostic practices.

Hendrickson reserves the right to make changes and improvements to its products and publications at any time. Consult the Hendrickson website (www.hendrickson-intl.com) for the latest version of this manual.

IMPORTANT SAFETY NOTICE

Proper installation is important to the reliable operation of your Hendrickson suspension. The procedures recommended by Hendrickson and described in this publication are methods of performing such installation.

The warnings and cautions should be read carefully to help prevent personal injury and to assure that proper methods are used. Improper installation can cause damage to the vehicle and other property, personal injury, an unsafe operating condition or void the manufacturer’s warranty.

Carefully read, understand and follow all safety related information within this publication.

EXPLANATION OF SIGNAL WORDS

Hazard signal words (such as Danger, Warning or Caution) appear in various locations throughout this publication. Information accented by one of these signal words must be observed at all times.

Additional notes are utilized to emphasize areas of procedural importance and provide suggestions for ease of repair. The following definitions indicate the use of these signal words as they appear throughout the publication.

- DANGER** Indicates immediate hazards which will result in severe personal injury or death.
- WARNING** Indicates hazards or unsafe practices which could result in severe personal injury or death.
- CAUTION** Indicates hazards or unsafe practices which could result in damage to machine or minor personal injury.
- IMPORTANT** An operating procedure, practice or condition that is essential to emphasize.

⚠ WARNING: DO NOT MODIFY OR REWORK PARTS. DO NOT USE SUBSTITUTE PARTS OF THE SUSPENSION OR AXLE COMPONENTS. USE OF A MODIFIED PART OR REPLACEMENT PART NOT AUTHORIZED BY HENDRICKSON MAY NOT MEET HENDRICKSON’S SPECIFICATIONS AND CAN RESULT IN FAILURE OF THE PART, LOSS OF VEHICLE CONTROL AND POSSIBLE PERSONAL INJURY OR PROPERTY DAMAGE. USE ONLY HENDRICKSON AUTHORIZED REPLACEMENT PARTS. DO NOT MODIFY PARTS WITHOUT AUTHORIZATION FROM HENDRICKSON.

⚠ CAUTION: A mechanic using a service procedure or tool which has not been recommended by Hendrickson must first satisfy himself that neither his safety nor the vehicle’s safety will be jeopardized by the method or tool selected. Individuals deviating in any manner from the provided instructions assume all risks of consequential personal injury or damage to equipment.

⚠ WARNING: ALWAYS WEAR PROPER EYE PROTECTION AND OTHER REQUIRED PERSONAL PROTECTIVE EQUIPMENT WHEN PERFORMING VEHICLE MAINTENANCE, REPAIR OR SERVICE.



⚠ WARNING: Solvent cleaners can be flammable, poisonous and can cause burns. To help avoid serious personal injury, carefully follow the manufacturer's product instructions and guidelines and the following procedures:

- Wear proper eye protection
- Wear clothing that protects your skin
- Work in a well ventilated area
- Do not use gasoline, or solvents that contain gasoline. Gasoline can explode.
- Hot solution tanks or alkaline solutions must be used correctly. Follow the manufacturer's recommended instructions and guidelines carefully to help prevent personal accident or injury.

WELDING HARDWARE TO AXLES

⚠ CAUTION When welding to or on the suspension, take every caution to prevent bearing damage. When grounding welding equipment to the suspension, prevent current from passing through the wheel bearings.

A connection that places a wheel bearing between the ground cable connection and the weld area can damage the bearing by electric arcing.

STEP 1. — PREPARING THE SUSPENSION FOR UBL INSTALLATION

⚠ WARNING: TO PREVENT SERIOUS EYE INJURY, ALWAYS WEAR SAFETY GLASSES WHEN PERFORMING INSTALLATION PROCEDURES.

IMPORTANT: The under-beam lift kit (UBL) can be installed either before or after the suspension is mounted to the trailer.

If the suspension intended for UBL installation is already installed on the trailer, follow steps 1 through 10 below to prepare the suspension for UBL installation.

If the suspension intended for UBL installation has not yet been installed on a trailer, follow steps 9 and 10 below to prepare the suspension for UBL installation.

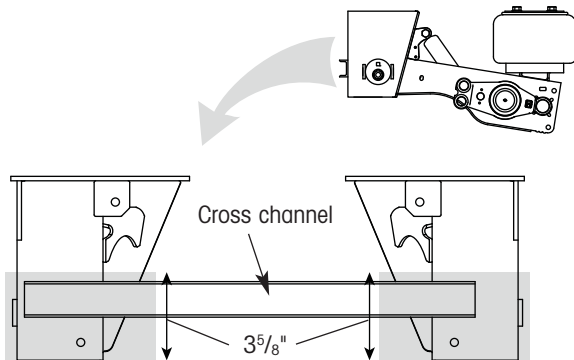
1. Park the trailer on a level, debris-free surface.
2. Set the trailer parking brakes.
3. To prevent the trailer from moving, chock the wheels of the axle not intended for UBL installation.
4. Exhaust the air from the trailer suspension.
5. Release the trailer parking brakes.
6. Using a jack, raise the axle intended for UBL installation until the trailer wheels clear the work surface.
7. Support the raised axle with safety stands.

⚠ WARNING: DO NOT WORK UNDER A TRAILER SUPPORTED ONLY BY JACKS. JACKS CAN SLIP OR FALL OVER, RESULTING IN SERIOUS PERSONAL INJURY.

8. Remove the trailer wheels to gain access to the suspension frame brackets and trailing arms.
9. If brake chambers are installed on the suspension intended for UBL installation, remove them now.
10. Check the frame brackets for UBL kit clearance. A UBL kit requires 3⁵/₈ inches at the bottom of the frame brackets for installation (see figure A). If frame bracket gussets or a cross channel reinforcement member are installed in this 3⁵/₈ inch area on the suspension intended for UBL installation, remove them now.

IMPORTANT: DO NOT throw away the cross channel or brake chambers if removed in the

previous step. They will be reinstalled with the UBL kit. If these items were damaged during the removal process, install new replacements.



In this instance, the cross channel is interfering with the 3⁵/₈ required for UBL kit installation, so it will have to be removed. In the image below, the same is true of the frame bracket gussets.

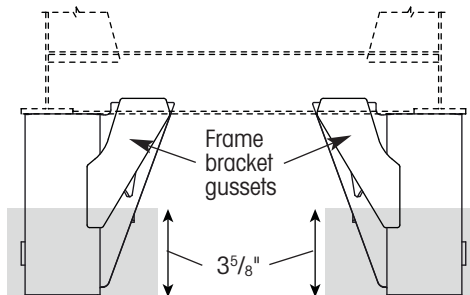


Figure A. Checking frame brackets for UBL kit clearance

IMPORTANT: If frame bracket gussets or a cross channel reinforcement member are installed but do not interfere with the 3⁵/₈ inch installation requirement, then they do not have to be removed.

IMPORTANT: Some low-ride-height models do not have 3⁵/₈ inches of available frame bracket space on which to mount a UBL kit. If this is the case, contact Hendrickson technical service at 800-455-0043 in the United States or 800-668-5360 in Canada.

11. Prepare the UBL kit components, trailing arms and frame brackets for welding. The items to be welded must be a minimum temperature of 60°F (16°C) and free of moisture, dirt, rust, scale, paint and grease. Consult the assembly drawings included with the UBL kit for weld area locations.

STEP 2. — INSTALLING THE LIFT BRACKET

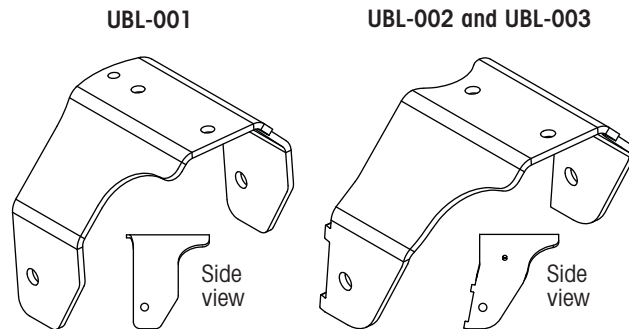


Figure 1. Lift brackets

To install the lift brackets (figure 1), accurately position the bracket on the bottom of the suspension beam and weld in place. There are three methods for accurately positioning the lift bracket on the suspension beam. Your suspension model and suspension beam bottom plate appearance (figure 2) determine which method to use for lift bracket positioning. As shown in figure 2, look at your suspension beam bottom plate to determine which method to use.

Newer INTRAAX suspensions have locating holes on the suspension beam bottom plate that make easy work of lift bracket positioning.

Older INTRAAX suspensions do not have locating holes on the suspension beam bottom plate, therefore the template (figure 10) included in this document must be used to drill locating holes so the lift bracket can be accurately positioned on the suspension beam.

HT model suspensions do not have locating holes on the suspension beam bottom plate either, but the lift brackets can be accurately positioned on these models using the dimensions given in this document and on the installation drawings.

BEAM BOTTOM PLATE HAS LOCATING HOLES

1. Install the lift bracket to the suspension beam bottom plate with two 3/8 -16 x 3/4-inch self-tapping screws from the kit. Tighten the screws to 160-180 in. lbs. (18-20 N•m) of torque.

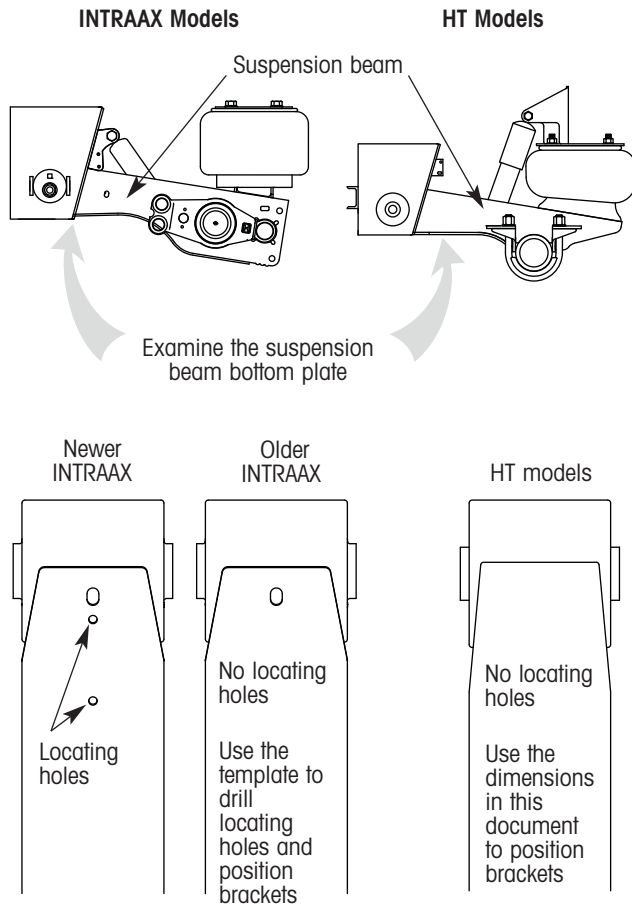


Figure 2. Suspension beam bottom plate appearance

⚠ WARNING THE SELF-TAPPING SCREWS ARE FOR BRACKET LOCATING PURPOSES ONLY. THE BRACKET MUST BE WELDED AS DESCRIBED IN STEP 2.

2. Weld the lift bracket to the suspension beam with a 1/4-inch fillet weld. Refer to figure 3, the installation drawings included with this kit, and the WELDING PARAMETERS section of this document for complete welding details.
3. Repeat steps 1 and 2 on the other suspension beam.

BEAM BOTTOM PLATE DOES NOT HAVE LOCATING HOLES AND YOU HAVE AN INTRAAX MODEL SUSPENSION

1. Position the template (figure 10) on the bottom of the suspension beam (figure 9). Tape the template in place.

2. Using a center punch and a hammer, mark the bottom of the suspension beam with two holes as shown on the template. Carefully remove the template, it will be reused on the other suspension beam.
3. Drill two 23/64-inch holes at the indicated positions on the suspension beam.
4. Install the lift bracket to the suspension beam bottom plate with two 3/8 -16 x 3/4-inch self-tapping screws from the kit. Tighten the screws to 160-180 in. lbs (18-20 N•m) of torque.

⚠ WARNING THE SELF-TAPPING SCREWS ARE FOR BRACKET LOCATING PURPOSES ONLY. THE BRACKET MUST BE WELDED AS DESCRIBED IN STEP 5.

5. Weld the lift bracket to the suspension beam with a 1/4-inch fillet weld. Refer to figure 3, the installation drawings included with this kit, and the WELDING PARAMETERS section of this document for complete welding details.
6. Repeat steps 1 through 5 on the other suspension beam.

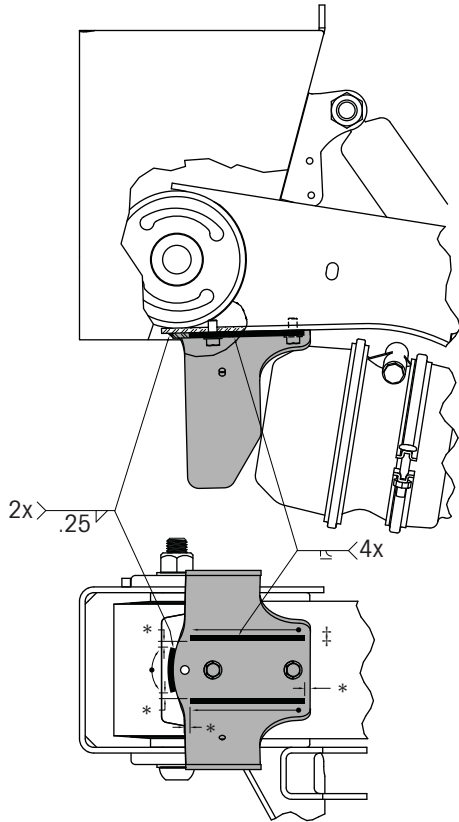
BEAM BOTTOM PLATE DOES NOT HAVE LOCATING HOLES AND YOU HAVE AN HT MODEL SUSPENSION

1. Using the dimensions given in figure 3 view b or view d and C-clamps or any other suitable device, position and temporarily clamp the lift bracket to the suspension beam.
2. Tack weld the lift bracket to the suspension beam and remove clamps.
3. Weld the lift bracket to the suspension beam with a 1/4-inch fillet weld. Refer to figure 3 and the installation drawings for complete welding details.

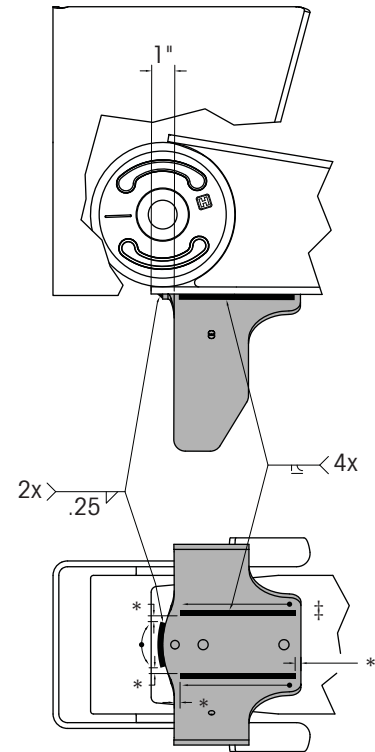
IMPORTANT: The holes in the lift bracket for HT models are not used to mount the lift bracket. DO NOT drill holes in the suspension beam.



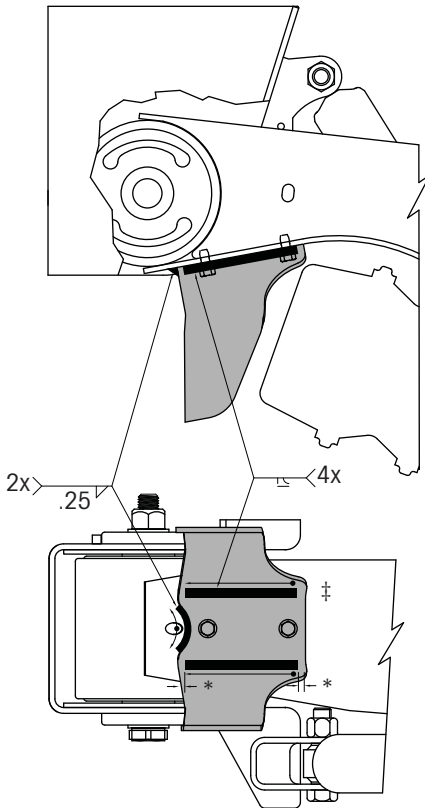
UBL-001 — INTRAAX Models
view a.



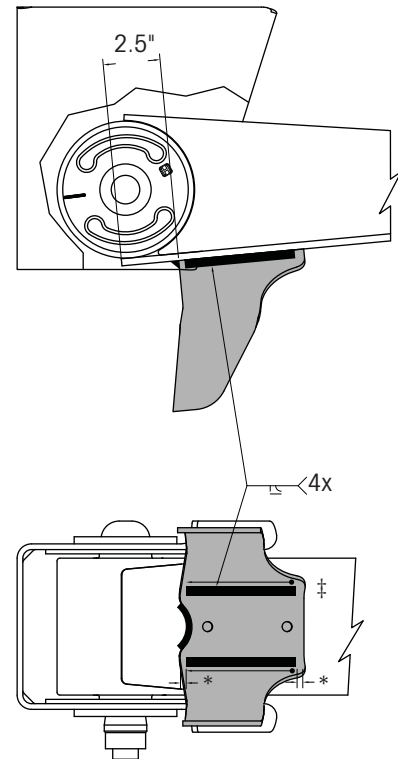
UBL-001 — HT230 Models
view b.



UBL-002 and UBL-003 — INTRAAX Models
view c.



UBL-002 and UBL-003 — HT250T Models
view d.



— indicates weld placement

* = .25-inch no-weld zone

All dimensions in inches unless otherwise shown

‡These welds are normally hidden in this view, but are shown here for clarity

Weld direction:



Figure 3. Lift bracket welding and positioning details

STEP 3. — INSTALLING THE FRAME BRACKET SUPPORT ASSEMBLY

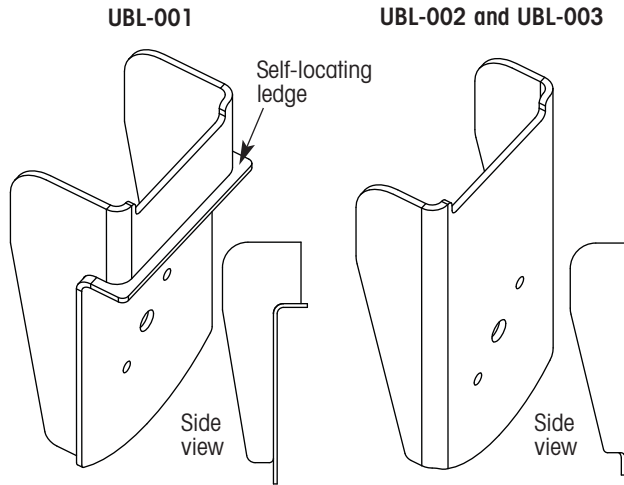


Figure 4. Frame bracket support assembly

To install the frame bracket support assembly (figure 4), accurately position it on the frame bracket and weld in place.

Note that the frame bracket support assembly included in UBL kit -001 is self locating and does not require measuring for placement. Simply position the self-locating ledge against the bottom of the frame bracket (figure 5, view a) for correct placement.

The frame bracket support assemblies included in UBL kits -002 and -003 must be placed $3\frac{5}{8}$ inches from the bottom of the frame bracket to be accurately positioned (figure 5, view b).

POSITIONING AND WELDING THE FRAME BRACKET SUPPORT ASSEMBLY ON THE FRAME BRACKET

NOTE: The frame bracket support assembly in UBL kit -001 is self-locating and does not require steps 1 and 2 of the following procedure.

1. Measure $3\frac{5}{8}$ inches up from the bottom of the frame bracket as shown in figure 5, view b and scribe a level line across the front surface of the frame bracket.
2. Align the top edge of the frame bracket support assembly to the line scribed in step 1.

IMPORTANT: The frame bracket support assembly must be flush with the sides of the frame bracket.

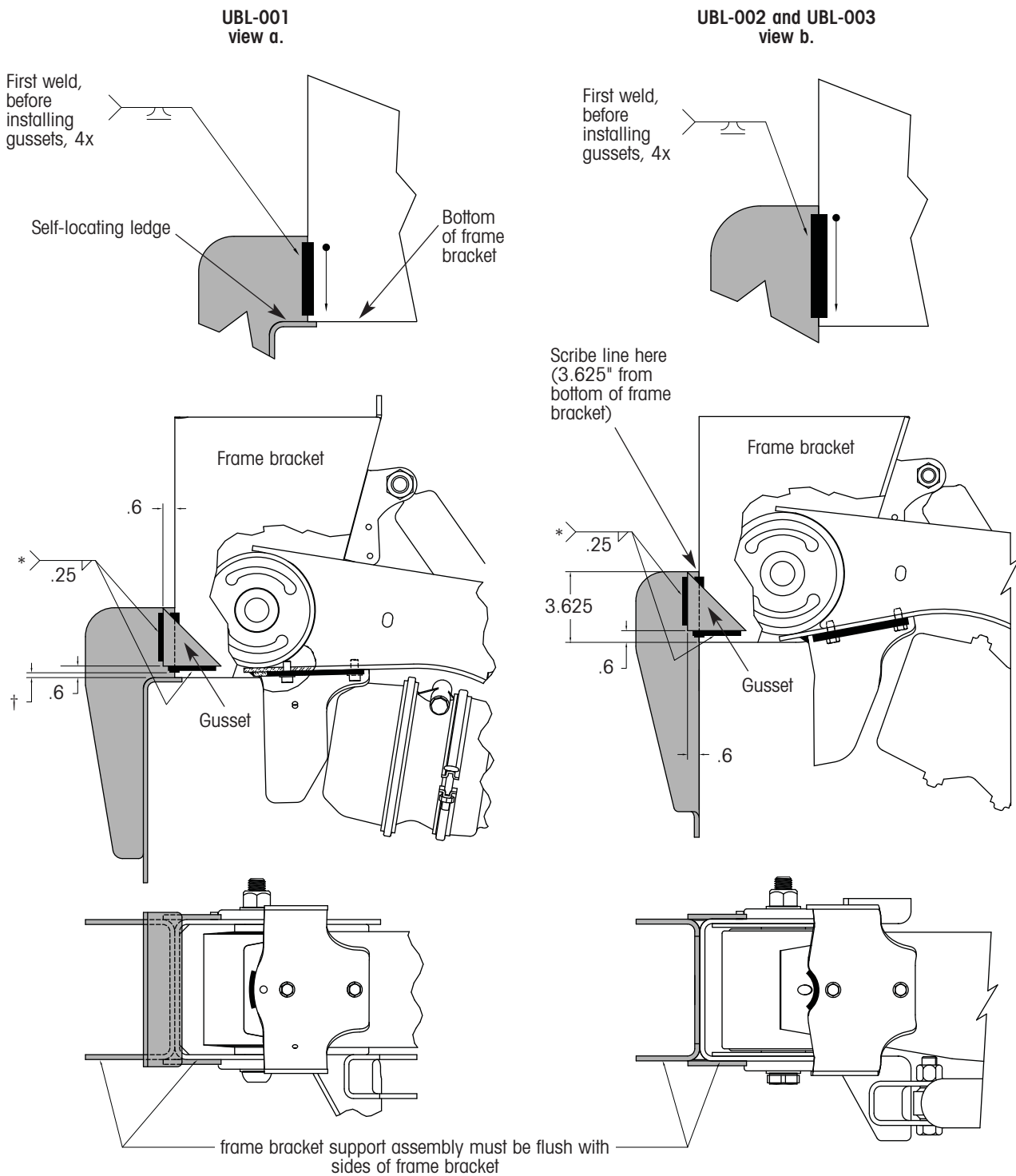
3. Temporarily clamp the frame bracket support assembly in place and tack weld the frame bracket support assembly to the frame bracket. Remove temporary clamps and verify the frame bracket support assembly is properly positioned on the frame bracket.
4. Weld each side of the frame bracket support assembly to the frame bracket with a $\frac{1}{4}$ -inch fillet weld as shown in figure 5.
5. Repeat steps 1 through 4 (steps 1 and 2 not required if installing UBL kit -001) on the other frame bracket.

INSTALLING THE GUSSETS

1. Position gussets as shown in figure 5, .6 inches from the bottom of the frame bracket and .6 inches forward of the frame bracket front edge. Gusset must straddle the frame bracket and frame bracket support assembly as shown in figure 5.
2. Weld in place with $\frac{1}{4}$ -inch fillet welds as shown in figure 5.

NOTE: Start and stop weld passes $\frac{1}{4}$ inch from gusset ends. Fill all craters at the end of each weld pass.

IMPORTANT: Weld gussets to both sides of the frame bracket.



* Install gussets only after frame bracket support assembly has been welded to frame bracket, and weld as shown, 4x

— indicates weld placement

† = .25-inch no-weld zone (typical)

All dimensions in inches unless otherwise shown

Weld direction: Stop ← Start →

Figure 5. frame bracket support assembly welding and positioning details

STEP 4. — INSTALLING THE CROSS CHANNEL OR FRAME BRACKET GUSSETS

If your suspension has wingless frame brackets, or if a cross channel reinforcement member or frame bracket gussets were originally on the suspension but removed during kit installation preparation, reinstall them now.

1. Rest the cross channel on top of the frame bracket support assembly as shown in figure 6.
2. Weld the cross channel to the front surface of the frame bracket with $\frac{1}{4}$ -inch fillet welds as shown in figure 6.
3. Repeat step 2 on the other end of the cross channel.
4. Obtain new frame bracket gussets. Reorient and weld to the suspension as shown in figure 6.

STEP 5. — INSTALLING THE BRAKE CHAMBERS

If the brake chambers were originally on the suspension but removed during kit installation preparation, reinstall them now.

1. Position the brake chamber on the brake chamber mounting bracket and tighten the mounting nuts to 100 - 110 ft. lbs. (136 - 149 N•m) of torque.

IMPORTANT: If installing long-stroke brake chambers, it may be necessary to remove the rear self tapping screw (used in positioning the lift bracket to the suspension beam bottom plate).

2. Repeat step 1 for the other brake chamber.

STEP 6. — INSTALLING THE REST OF THE UBL KIT COMPONENTS

1. Position the beam plate assembly (figure 7) onto the lift bracket as shown in figure 8 and attach using the $\frac{1}{2}$ -13 x $1\frac{1}{4}$ -inch nuts and bolts supplied in the kit. Tighten to 55-75 ft. lbs. (75-102 N•m) of torque.

NOTE: If a gap exists between the lift bracket legs and the "M-shaped" beam plate assembly

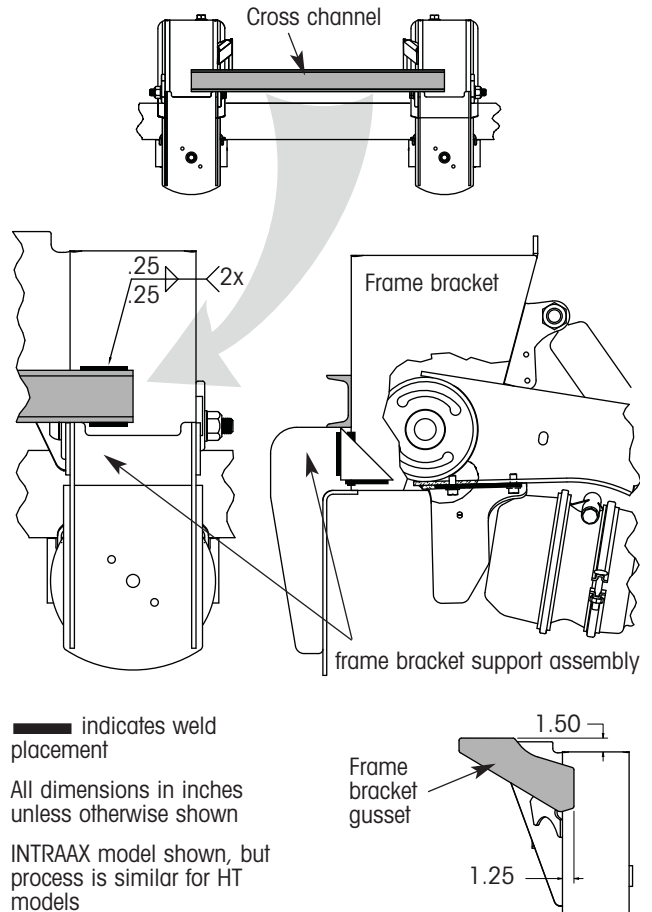


Figure 6. Cross channel installation details

reinforcement, use a C-clamp to compress the legs of the lift bracket against the beam plate assembly reinforcement so the fasteners can be installed.

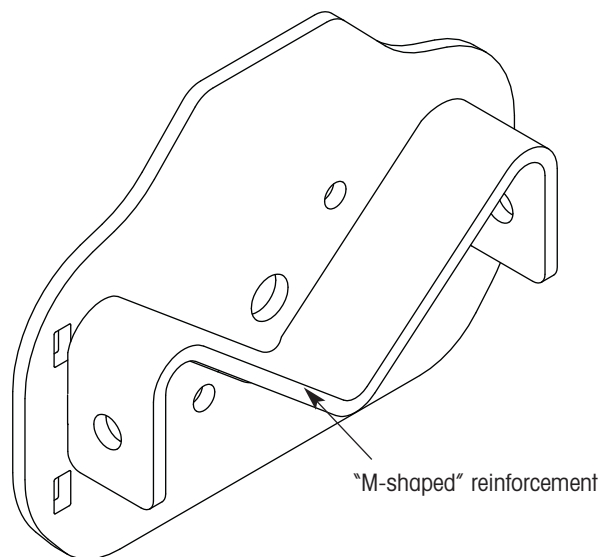
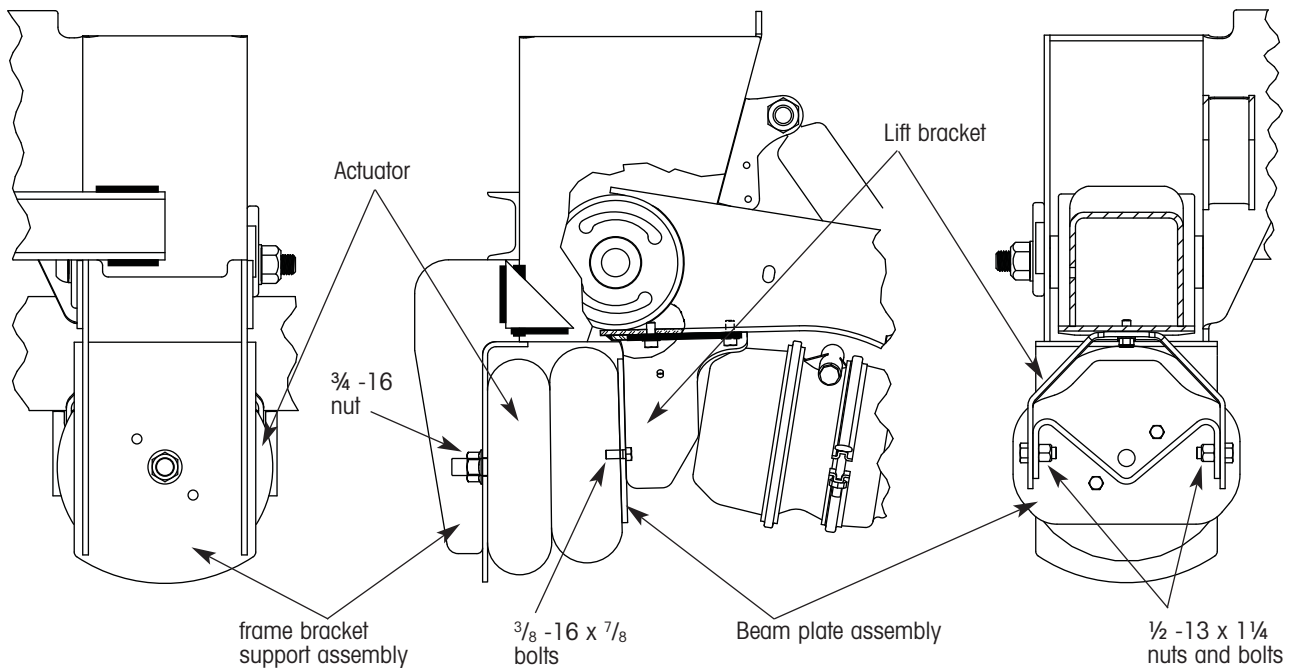


Figure 7. Beam plate assembly



All dimensions in inches unless otherwise shown

INTRAAAX model shown, but component installation process is similar for HT models

Figure 8. Remaining UBL kit component installation details

- Repeat step 1 for the other beam plate assembly.

NOTE: Some brake chambers cannot be caged with the UBL in place.

- Position the actuator between the beam plate assembly and the frame bracket support assembly as shown in figure 8 and attach using the $\frac{3}{8}$ -16 x $\frac{7}{8}$ -inch bolts supplied in the kit. Tighten to 25-35 ft. lbs. (34-47 N•m) of torque.
- Repeat step 3 for the other actuator.
- Install the $\frac{3}{4}$ -16 nuts supplied in the kit on the air spring combo studs (stud doubles as an air inlet). Tighten to 45-55 ft. lbs. (61-75 N•m) of torque.
- Install air lines and the air kit for operating the under beam lift.
- If the suspension intended for UBL installation is already installed on the trailer, reinstall the trailer wheels. Tighten the lug nuts to the torque recommended by the manufacturer.

WELDING PARAMETERS

28.5 volts
 400 IPM
 275-300 amps
 35 cfh (gas flow)
 .045 wire

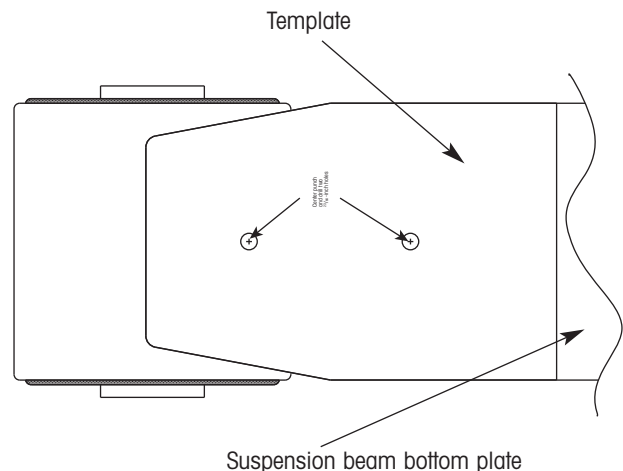


Figure 9. Position template on suspension beam bottom plate

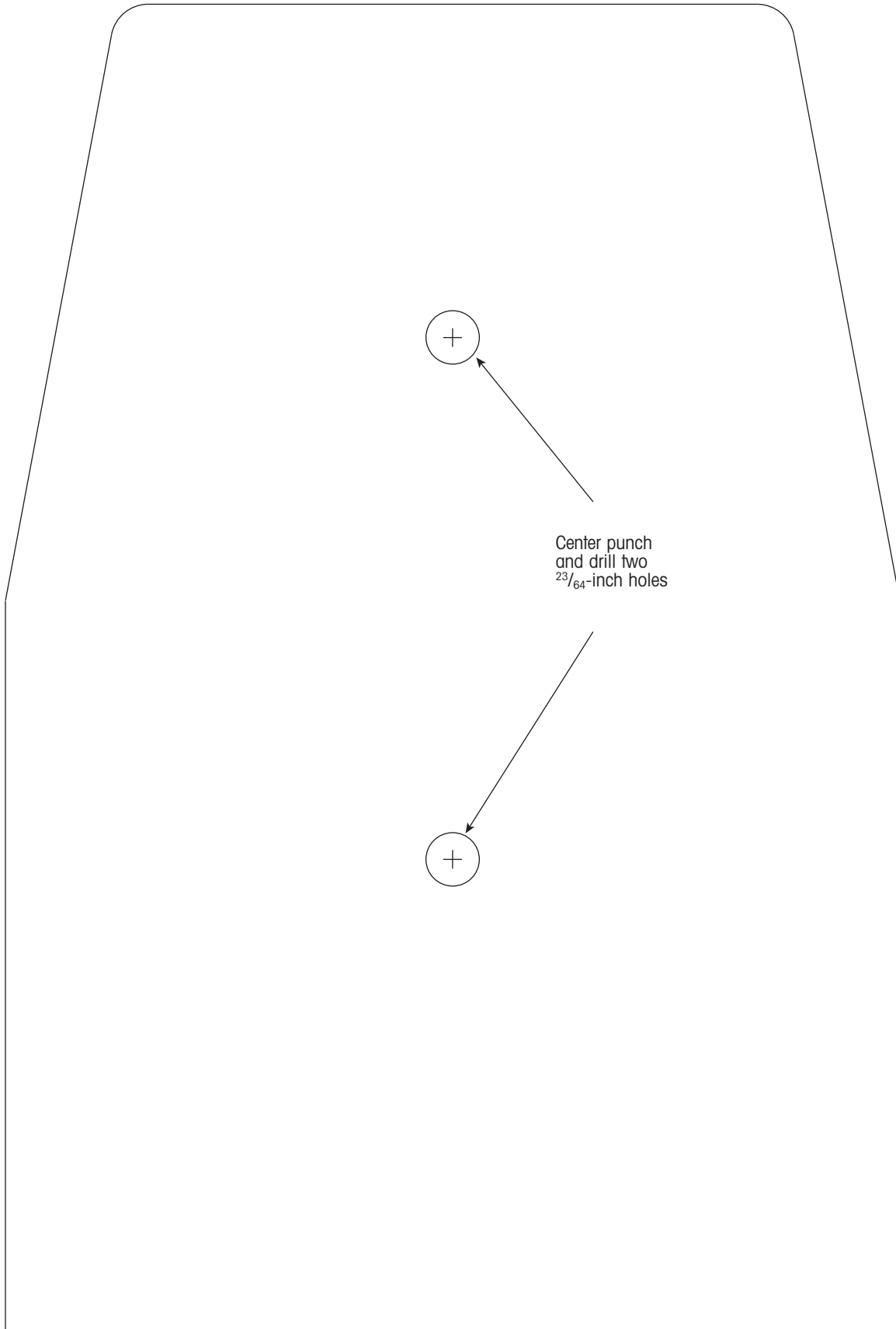


Figure 10. Hole template for lift bracket positioning

CONTROLLING THE UBL

An air control kit is required to operate the lift mechanism in running or raised mode. Refer to Hendrickson publication L782, *Vehicle Controls Quick Reference Guide* (available at www.hendrickson-intl.com), for information on selecting a lift axle control kit.

Hendrickson also requires the installation of a crossover air control kit on all INTRAAX AAL and AAEDL 30K lift axle installations, along with the elimination of any quick-exhaust valve from the suspension plumbing. This patented crossover air control provides increased air volume and pressure when and where it is needed, and at the same time reduces the volume of air required from the reservoir.

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