TECHNICAL PROCEDURE

HT™ SERIES SUSPENSION SYSTEMS

SUBJECT: Installation Procedures

LIT NO: L577
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HENDRICKSON
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CONVENTIONS APPLIED IN THIS DOCUMENT

This section explains the techniques used in this document to convey important information, safety issues, how to contact Hendrickson and how to apply hyperlinks.

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 comply with ANSI Z535.4 and indicate the use of safety 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 a hazardous situation which, if not avoided, could result in minor or moderate injury.

NOTICE: Indicates hazards or unsafe practices which could result in damage to machine or equipment.

IMPORTANT: An operating procedure, practice or condition that is essential to emphasize.

⚠ Safety alert symbol used to indicate a condition exists that may result in personal injury or harm to individuals. It must be applied to DANGER, WARNING and CAUTION statements, which emphasize severity.

LINKS

Links are identified by a dark grey line under the linked text. Internal links allow the reader to jump to a heading, step or page in this document. External links open the website or document referenced.

GENERAL SERVICE NOTES

IMPORTANT: Special attention should be paid to the information included in EXPLANATION OF SIGNAL WORDS.

Before you begin

Read, understand and comply with:

- All instructions and procedures.
- All signal word (CAUTION, WARNING and DANGER) statements to help avoid personal injury or property damage.
- Company's maintenance, service, installation and diagnostic practices.
- Vehicle manufacturer's safety instructions when working on the vehicle.
- Vehicle manufacturer's instructions for recommended practices not described in this manual.
- Local safety regulations.

DURING SERVICE

- Work must be carried out by trained personnel.
- Sudden release of parking springs (e.g. the spring brake part of the brake chamber or the brake return spring) may cause injury.
- Use recommended tools only.
- Before releasing trailer back into service, perform operational checks and test the trailer to ensure brakes are working correctly.

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 NOTICES

Proper installation, maintenance, service and repair is important to the reliable operation of the suspension system. The procedures recommended by Hendrickson and described in this publication are methods of performing inspection, maintenance, service and repair.

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

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

⚠WARNING: DO NOT modify or rework parts. Use ONLY Hendrickson authorized replacement parts. Use of substitute, modified or replacement parts not authorized by Hendrickson may not meet Hendrickson's specifications. It can also result in failure of the part, loss of vehicle control and possible personal injury or property damage. Do not modify parts without written authorization from Hendrickson.

⚠WARNING: Always wear proper eye protection and other required personal protective equipment (PPE) when performing vehicle maintenance, repair or service. Follow federal, state and local regulations as appropriate.

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

⚠WARNING: The following precautions and considerations should be applied when handling brake lining:

- **Compressed air or dry brushing should never be used for cleaning brake assemblies or work areas.**
- **Follow applicable shop, local, state and federal safe practices for working with and disposal of brake lining materials.**
- **Hendrickson recommends that workers doing brake work should take steps to minimize exposure to airborne brake lining particles. Proper procedures to reduce exposure include:**
  - **Working in a well-ventilated area**
  - **Segregation of areas where brake work is done,**
  - **Use of local filtered ventilation systems or use of enclosed cells with filtered vacuums.**
- **Material Safety Data Sheets (MSDS) on this product, as required by OSHA, are available online from Hendrickson at www.hendrickson-intl.com/TrailerLit**

⚠CAUTION: A mechanic using a service procedure or tool 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.

NOTICE: When welding to or on the axle, take every caution to prevent bearing damage. When grounding welding equipment to axle, 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.

CONTACTING HENDRICKSON

Contact Hendrickson Trailer Technical Services for technical assistance as needed. To do so, several options are available.

Prior to contacting Technical Services, it is best to have the following information about your Hendrickson suspension available (all that apply):

- Suspension ID Tag information (Refer to Hendrickson literature number L977 *ID Guide*, page 2 for tag location and details):
  - Suspension model number
  - Suspension serial number
  - Approximate number of suspension miles
- VIN plate data. Refer to trailer OEM manual for VIN plate location.
  - Trailer Type (van, reefer, flat bed, etc.)
  - Manufacturer
  - VIN (vehicle identification number)
  - In-service date [1]
- If applicable, description of the system problem, part number and/or part description of the reported non-functioning part.
  - Date of failure
  - Where applicable: location of problem on suspension / trailer (e.g., road side, front axle, rear axle, curb side rear, etc.)
  - Symptoms-
    - » Systems, components or function effected by problem
    - » When does failure occur?
    - » How often do they occur?
    - » Etc.
- Any troubleshooting and/or measurements performed?
- Digital photos of suspension and damaged areas.
- Special application approval documentation (if applicable).

[1] If the in-service date is unknown or not available, the vehicle date of manufacture can be substituted.

PHONE

Contact Hendrickson directly in the United States at **866**-RIDEAIR (**743-3247**). From the menu, select:

- **Technical Services**/Warranty for technical information.
- Other selections include:
  - Aftermarket Sales for replacement parts information and ordering.
  - Original Equipment Sales for parts inquiries and ordering for trailer manufacturers.

EMAIL

For **H**endrickson **T**railer **T**echnical **S**ervices, use the following e-mail address:

HTTS@hendrickson-intl.com

LITERATURE

If you suspect your version of this or any other Hendrickson manual is not "up-to-date", the most current version is free online at:

www.hendrickson-intl.com/TrailerLit/

Available Hendrickson documentation can be viewed or downloaded from this site.

All Hendrickson online documentation is in PDF format that requires PDF reader software to open. A free application is downloadable from Adobe's home page (http://get.adobe.com/reader/).

Other relative literature may include:

NAME	DESCRIPTION
B31	*Torque Specifications*
L64	*Welding Procedures*
B92	*QUIK-ALIGN® Pivot-Connection Fastener Upgrade*
L388	*Recommended Ride Height Settings*
L427	*Bushing Replacement Procedures*
L459	*Checking Trailer Ride Height*
L578	*Preventive Maintenance Guide*
L579	*Alignment Procedures*
L583	*Comprehensive Warranty Statement*
L1073	*Primary Suspension Information* (includes list of installation drawings)
L1074	*Slider Suspension Information* (includes list of installation drawings)
L1075	*Hendrickson HCA® Hendrickson Chassis Axle™ Installation Procedure*
L1182	*Controls Parts Catalog*

Table 1: *Literature*

PREPARING TRAILER FOR SERVICE

NOTE: DO NOT service a suspension or any components that is under warranty without first contacting Hendrickson Technical Services. Refer to CONTACTING HENDRICKSON for details.

⚠WARNING: To prevent serious eye injury, always wear safety glasses when performing trailer maintenance and service.

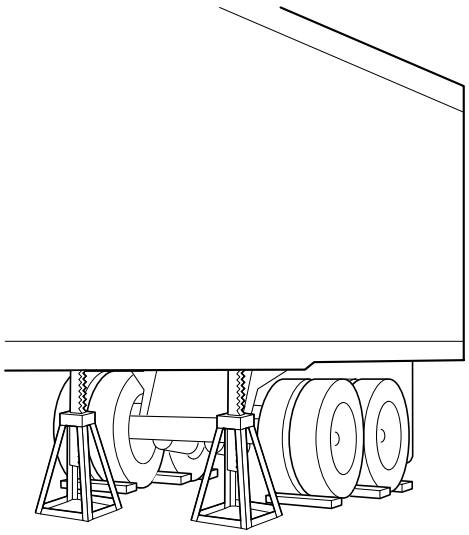


Figure 1: *Trailer preparation*

Before beginning any work on a trailer suspension system, the following steps help to ensure conditions are safe. Refer to GENERAL SERVICE NOTES on page 3.

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 an axle not being raised.
4. **Exhaust** the air from the trailer suspension.

If required during service:

5. **Release** the trailer parking brakes.
6. Using a jack, **raise** trailer and/or axle until wheels clear the work surface.
7. **Support** the raised trailer 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. Always use safety stands to support a raised trailer.

PRE-INSTALLATION

For the purpose of planning and preparation, review the information provided in this section.

SPECIAL NOTES

- Defective or incorrect components are to be returned to Hendrickson, who will supply replacements for components in question per product warranty conditions.
- It is the responsibility of the installer to determine the correct location of the suspension in order to provide the proper trailer load distribution. The load carried by each axle must not exceed the rated capacity of the components involved.
- No welding of any suspension components is permitted, except where specified by Hendrickson.
- No alteration of any suspension components is permitted.
- Any installation deviations must be approved, in writing. See CONTACTING HENDRICKSON on page 5.
- It is the responsibility of the installer to ensure that proper clearances exist between:
  - Tires
    - » Laterally
    - » Vertically
    - » Fore and aft
  - Air springs when they are at their maximum diameter (refer to suspension installation drawing[2] for specifications).
- The **proper positioning of suspension components**, relative to one another, as well as to other trailer components, **is crucial** to extended component life. The three most important factors in this relationship are as follows (refer to Figure 2):
  1. PARALLEL BEAM CENTERS — The centers of the suspension beams (and, therefore, the suspension frame brackets) must not vary more than $^1/_8$ inch (3.2 mm) from front to rear of the suspension.
  2. PARALLEL AXLE/PIVOT CENTERS — The center axis of the axle spindles must be parallel with the center axis of the pivot connections, both vertically and horizontally.
  3. BEAMS SQUARE TO AXLE — The suspension beams must be square to the axle.

[2] An installation drawing is provided with each HT suspension. Generic versions are listed in Hendrickson literature number L1073 and available online at www.hendrickson-intl.com/TrailerLit.

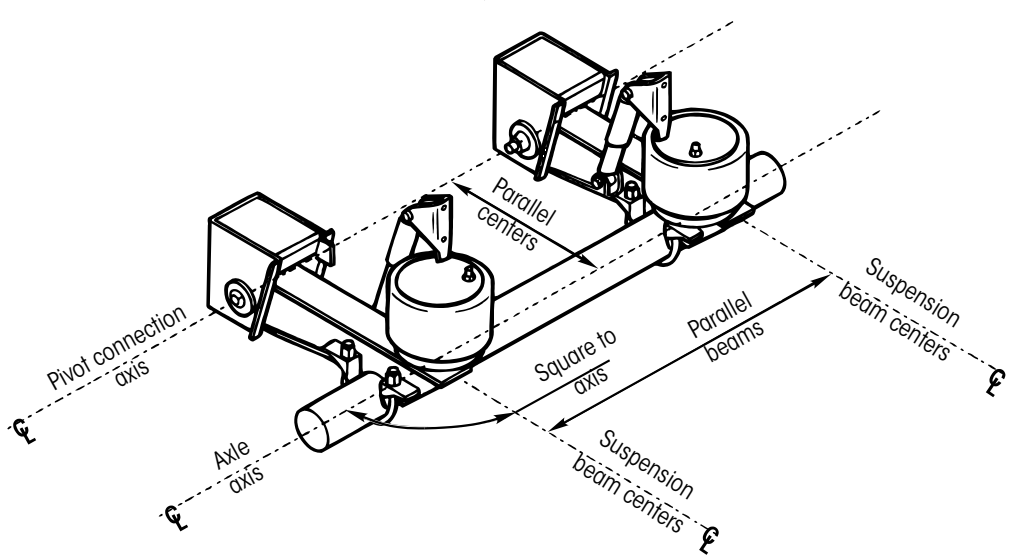


Figure 2: *Component position factors*

- Failure to correctly position components can lead to the following trailer problems:
  - Trailer Lean
  - Improper Tracking
  - Premature Tire Wear
  - Shortened Suspension Life
- Failure to comply with these installation procedures without written permission will void the suspension warranty.
- To ensure quality and make assembly more efficient, **Hendrickson recommends the use of an axle locating fixture** (See USING HT™ SERIES FIXTURES on page 8) to correctly position the suspension onto the axle. While assembly can be performed without such a fixture, the additional measurements required increase the likelihood of error or misunderstanding.

REQUIRED SUPPLIES

The following equipment and materials are required to install a Hendrickson HT™ Series suspension:

1. Welding equipment and supplies. (See Hendrickson literature number L64 *Welding Procedures*)
2. Torque wrench able to measure 800±25 ft. lbs. (1085±30 N•m) minimum or a HUCK® gun that is capable of handling $1^{1}/_{8}$ inch (28.6 mm) diameter fasteners.

   NOTE: A torque wrench or HUCK gun will be required only if the frame brackets and beam assemblies are supplied unassembled by Hendrickson.
3. Tape measure or scale(s)
4. Trammel bar
5. Crane or lifting capability
6. Hand grinder
7. Compressed air supply
8. Air impact gun capable of 600 ft. lbs. (813 N•m)
9. Air fittings, tubing and associated tools
10. $^{1}/_{2}$ inch drive breaker bar
11. Axle locating fixture (recommended): Figure 4 on page 8, Figure 8 on page 10 or Figure 33 on page 23. Use of these fixtures is recommended, contact sales representative or refer to CONTACTING HENDRICKSON on page 5 for information.
12. Socket set and wrenches, including the following sizes:
    - $^{3}/_{8}$ inch
    - $^{9}/_{16}$ inch
    - $^{3}/_{4}$ inch
    - $1^{1}/_{8}$ inch
    - $1^{1}/_{4}$ inch deep well socket
    - $1^{5}/_{16}$ inch deep well socket
    - $1^{11}/_{16}$ inch (for suspensions with threaded pivot bolt only)
    - TORQ-RITE® socket or a $1^{7}/_{16}$ inch shallow socket
    - $1^{7}/_{16}$ inch wrench
13. Suspension installation drawing[3] supplied by Hendrickson. See Table 1 on page 5.
14. Clamps with a $12^{1}/_{2}$ inch minimum opening.
15. Wheel chocks

[3] An installation drawing is provided with each HT suspension. Generic versions are listed in Hendrickson literature number L1073 and available online at www.hendrickson-intl.com/TrailerLit. Where duplication exists, refer to installation drawing.

PRE-INSTALLATION CHECKLIST

Before beginning the installation:

- Check that the new suspension matches specifications provided by your production or engineering department.
- Verify that the actual trailer crossmember locations correspond with locations specified on the suspension installation drawing.
- Check that the axle brake components are within parameters specified by the suspension installation drawing.
- Confirm that the components listed on the suspension installation drawing have been provided in sufficient quantities.

IF INSTALLING ON A SLIDER SYSTEM:

- Verify the body rail length corresponds to required slider travel.
- Verify that the body rail hole spacing pattern corresponds to that of the slider box requirements (e.g., four inch hole spacing pattern versus six inch hole spacing pattern).

SURFACE COAT CONSIDERATIONS

NOTE: This information only applies to suspensions equipped with QUIK-ALIGN® pivot connections.

⚠**CAUTION: DO NOT apply undercoating, paint or other surface coating to the suspension and frame brackets until after completing the alignment. These products will act as a lubricant to contaminate and compromise the fastener clamp load; resulting in a loose connection or worse.**

If coating prior to assembly cannot be avoided, areas where alignment collars and bushing inner metal contact the frame bracket (suspension beam for Y-beams) **must be masked** as shown in Figure 3.

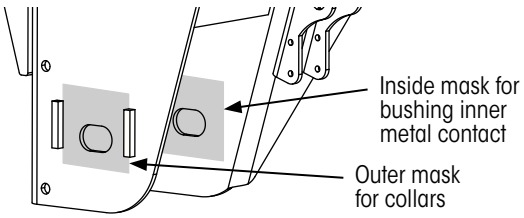


Figure 3: *Paint mask areas (example for QUIK-ALIGN®)*

AXLE/SUSPENSION BEAM POSITIONING

When assembling a loose axle to an HT™ Series suspension system, alignment of the axle to suspension beam is critical (see SPECIAL NOTES on page 6). The use of an axle locating fixture is recommended.

IMPORTANT: In all cases, the axle seat must face upward with the axle placed on top and securely clamped while welding.

USING HT™ SERIES FIXTURES

The procedures in this section assume a Hendrickson HT Axle Locating Fixture (Figure 4 and Figure 8) is used. The HT Axle Locating Fixture (axle on top of positioned beams) can be used to install all HT underslung and top-mount style suspensions, providing the correct pivot and beam stands are supplied.

PRE-ASSEMBLED BEAM AND FRAME BRACKET

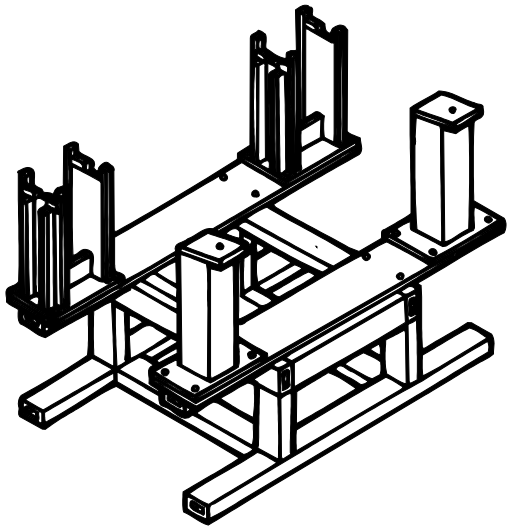
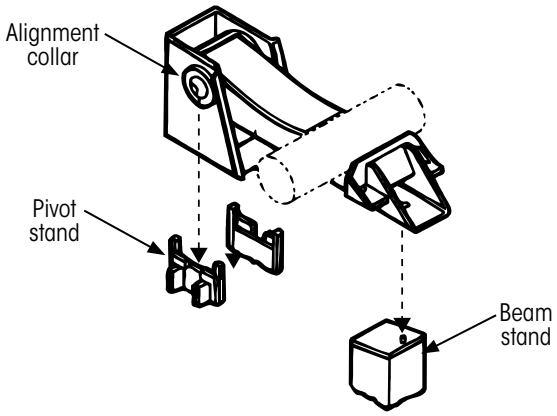
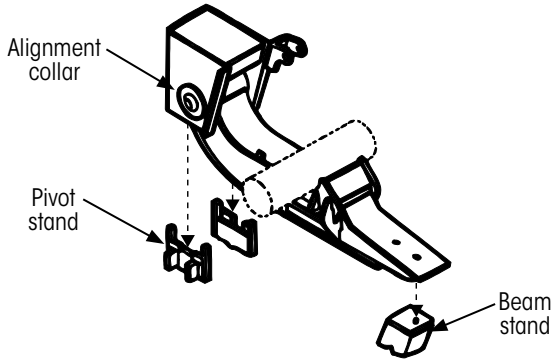


Figure 4: *HT Axle Locating Fixture, **assembled** suspension configuration*

1. **Configure** the HT Axle Locating Fixture (Figure 4) with the proper beam and pivot stands for the suspension being assembled. Adjust for desired beam center spacing.
2. **Lift** and position one frame bracket/beam assembly over top of both the beam and pivot stands (Figure 5).



Assembled TOP-MOUNT suspension
(beam upside down)



Assembled UNDERSLUNG suspension
(beam right-side up)

Figure 5: *Fixture frame bracket/beam placement*

3. **Lower** the frame bracket/beam assembly onto both the beam and pivot stands (Figure 5).

NOTE: The frame bracket will slip down into the pivot stand and be supported by the alignment collars. All four alignment collars must be resting on the pivot stand. The beam stand will locate and support the trailing end of the suspension beam. Failure to correctly position the alignment collars can result in trailer lean.

4. **Repeat** procedure on remaining frame bracket/ beam assembly.

5. **Proceed** to POSITIONING AXLE WITH FIXTURE on page 10.

EXAMPLE A: Assembled HT250US Suspension

Frame Bracket/Beam Placement

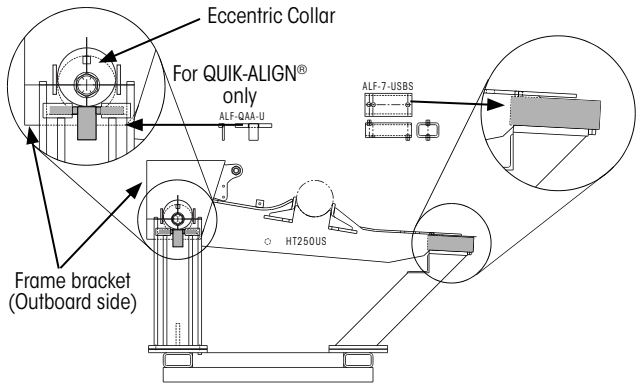
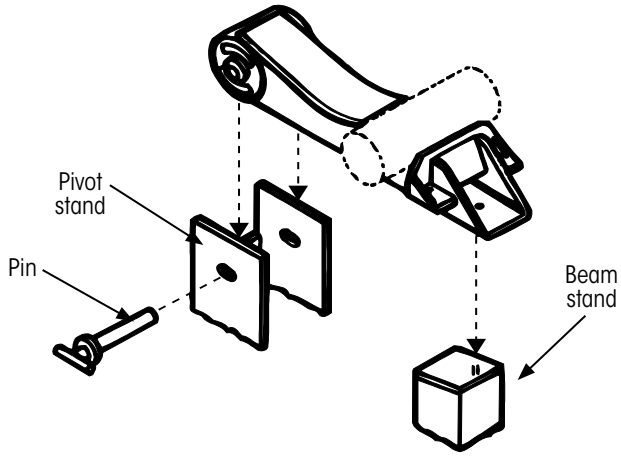
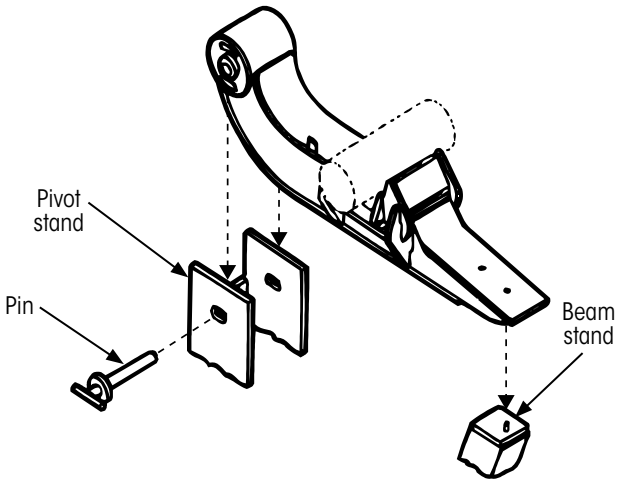


Figure 6: *HT250US assembly with HT Axle Locating Fixture*

If HT250US, place adaptors as shown in Figure 6.



Unassembled Top-mount (beam upside down)



Unassembled UNDERSLUNG (beam right-side up)

Figure 7: *Fixture beam only placement*

UNASSEMBLED SUSPENSION BEAMS

These include beams only, without frame brackets and pivot connection hardware.

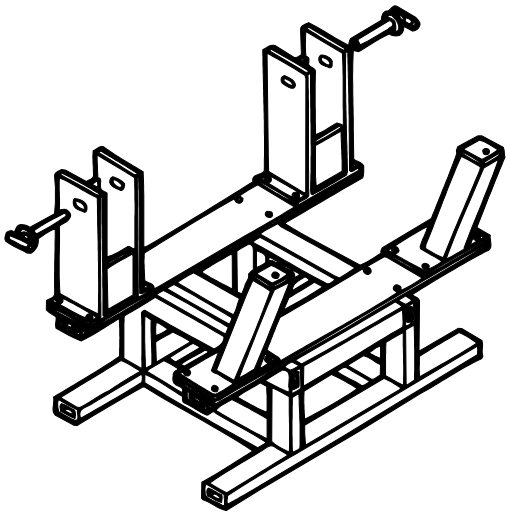


Figure 8: *HT Axle Locating Fixture, **unassembled** suspension configuration*

1. **Configure** the HT Axle Locating Fixture (Figure 8) with the proper beam and pivot stands for the suspension being assembled. Adjust for desired beam center spacing.
2. **Lift** and position one suspension beam over top of both the beam and pivot stands.
3. **Lower** beams into the pivot stands and onto the top of the beam stands (Figure 7). The beam stand will locate and support the trailing end of the suspension beam.
4. **Align** the pivot stand slots with the inner metal bushing hole and **insert** the pivot pin.
5. **Repeat** procedure on remaining suspension beam.
6. **Proceed** to POSITIONING AXLE WITH FIXTURE on page 10.

USING A Y-BEAM FIXTURE

The procedures in this section assume that a Hendrickson Y-beam version of the HT Axle Locating Fixture is used. The fixture can be used for Y-beams with welded collar or QUIK-ALIGN® pivot connections.

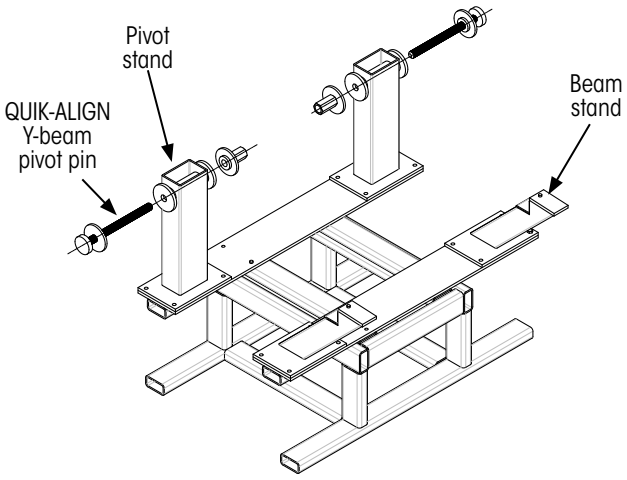


Figure 9: *HT Axle Locating Fixture, **Y-beam** configuration*

1. **Configure** the HT Axle Locating Fixture (Figure 9) with the proper beam and pivot stands for the Y-beam suspension being assembled.
2. **Adjust** for desired beam center spacing.
3. **Lift** and position the suspension Y-beam over top of the beam and pivot stands, similar to Figure 7 on page 9.
4. **Lower** beam around the pivot stand and **align** the alignment slot on the beam's side plates with the holes on the pivot stand.
5. **Insert** applicable welded collar or QUIK-ALIGN Y-beam pivot components.
6. **Repeat** procedure on remaining suspension beam.

POSITIONING AXLE WITH FIXTURE

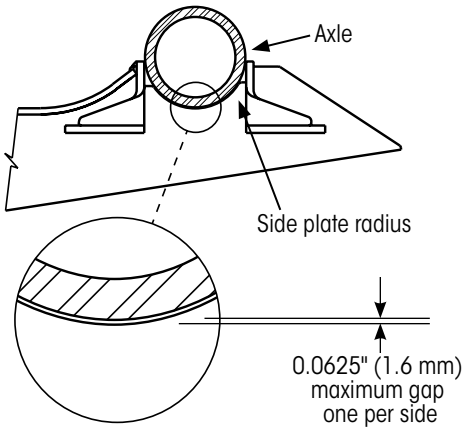
With beams properly placed and secured in the fixture, the axle can now be placed in the axle seats.

NOTE: Reference trailer axle installation manual for other considerations relative to axle placement and alignment.

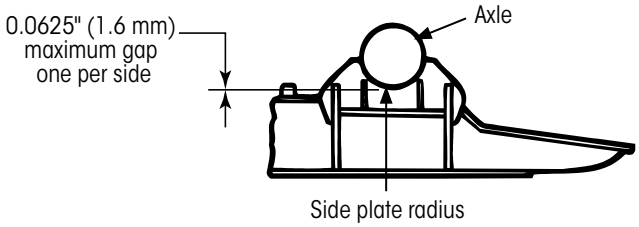
1. **Place** axle on top of beam axle seats with brakes oriented as shown on the suspension installation drawing [4].
2. **Rotate** axle to position the S-cam according to the dimension as shown on installation drawing.

[4] An installation drawing is provided with each HT suspension. Generic versions are listed in Hendrickson literature number L1073 and available online at www.hendrickson-intl.com/TrailerLit. Where duplication exists, refer to installation drawing.

3. **Center** the axle by measuring left and right spaces between the positioned beams and hub assembly. **Position** the axle until both spaces are equal (Figure 12, Figure 13 on page 12). For more details specific to the suspension model, reference applicable installation drawings.



New Style Suspension (formed axle seat)



Old Style Suspension (cast axle seat)

Figure 10: *Axle seat specifications*

IMPORTANT: At least one side plate radius (Figure 10) per beam must be seated on the axle. Gaps between the non-seated side plate radius and the axle may be up to $^{1}/_{16}$ inch (1.6 mm) maximum.

4. **Remove** surface coat on the areas to be welded.
5. Use a large clamping device to **secure** the centered axle onto the positioned beams.
6. **Tack weld** the axle to the beam as defined in Hendrickson literature number L64 *Welding Procedures*.
7. **Remove** the clamping device(s).
8. **Follow** procedures listed in Hendrickson literature number L64 *Welding Procedures* for axle-to-beam welded connection requirements.
9. Once the axle welds have cooled completely, **install** the supplied U-bolts. Refer to U-BOLT INSTALLATION on page 13.

AXLE INSTALLATION WITHOUT AN AXLE LOCATING FIXTURE

Although an axle locating fixture is recommended, it is possible to correctly install the axle onto the suspension without such a fixture. To do so without lessening the life of the suspension, and to maintain the warranty coverage, the following procedures must be followed.

PREPARING SUSPENSION BEAMS

NOTICE: The supporting surface must be flat and level to avoid the possibility of a leaning trailer after the installation.

If fixed suspension:

1. **Place** suspension beams on a smooth, flat surface with **axle seats facing upward**.

NOTE: It may be necessary to evenly elevate suspension beams to avoid attached frame brackets from supporting beams and/or wheel ends from resting on the surface.

2. **Reference** Figure 12 and the installation drawing provided to space apart at the approximate suspension beam center-to-center dimension.

If slider with top-mount suspension(s):

1. **Place** slider upside down on smooth flat surface.

NOTE: New sliders are shipped upside down with beams in frame bracket and loose pivot bolts.

2. **Remove** air springs.
3. **Remove** suspension beam shock bolts.
4. **Move** the shock absorbers out of the way.

POSITIONING AXLE WITHOUT FIXTURE

NOTE: Reference trailer axle installation manual for other considerations relative to axle placement and alignment.

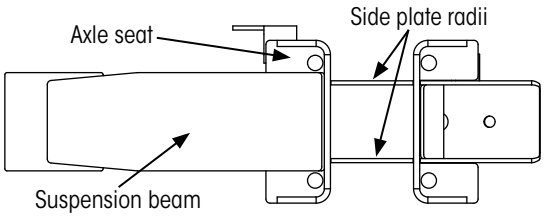


Figure 11: *HT sample beam*
(Beam with formed axle seat shown)

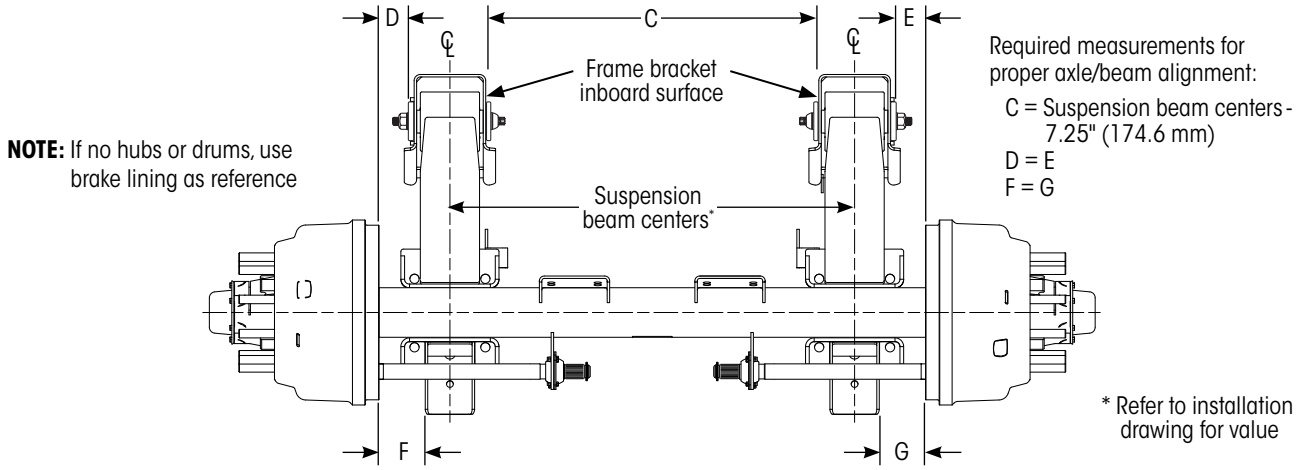


Figure 12: *Centering suspension pivots with frame bracket/beam assembly*

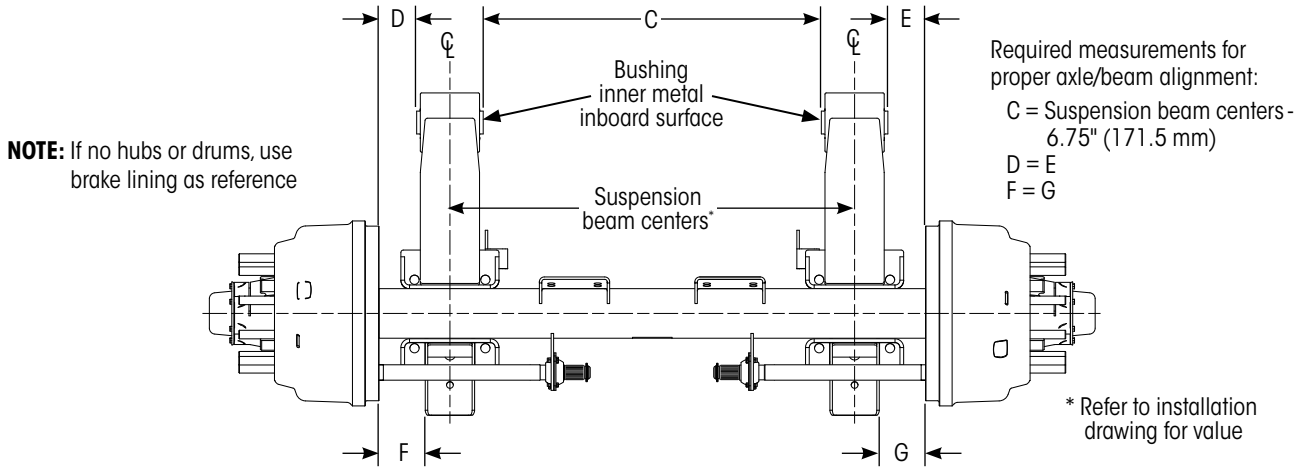


Figure 13: *Centering suspension pivots without frame bracket/beam assembly*

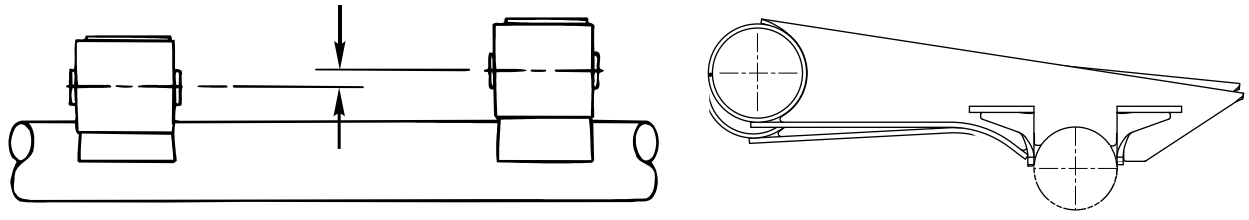


Figure 14: *Beams vertically out of parallel*

IMPORTANT: At least one side plate radius (Figure 10 and Figure 11) per beam must be seated to the axle. Gaps between the non-seated side plate radius and the axle may be up to $^1/_{16}$ inch (1.6 mm) maximum.

1. Roughly **center** axle above suspension beams and **lower** into axle seats as shown in installation drawing; similar to Figure 10, above; Figure 2 on page 7; Figure 12 and Figure 13.
2. If slider, **move** suspension beams all the way forward in the alignment slots.
3. **Rotate** axle to accurately position the S-cam according to the dimension as shown on installation drawing.

4. **Accurately center** axle and align axle/beam assembly by measuring left and right spaces between the positioned beams and brake or hub assembly. **Refer** to measurements listed in (Figure 12 or Figure 13).

5. **Remove** surface coat from the areas to be welded.

6. **Check** beam parallelism (Figure 14). Adjust as needed.

7. Using a large clamping device(s), **secure** the beam assembly to the axle.

IMPORTANT: DO NOT OVERTIGHTEN CLAMPS.

NOTE: U-bolts are installed after the axle seat and beam assembly have been welded completely and allowed to cool.

NOTICE: The axle must be centered to the suspension beams at the axle seat AND the suspension pivots in order to provide an axle connection that is square to the axle (also see Figure 2 on page 7). An out-of-square connection can cause improper tracking under load and frame bracket failure.

NOTE: The beams must remain vertically parallel to each other to avoid trailer lean (Figure 14). Check to ensure suspension beam pivots or frame brackets continue to lie flat on the level surface during the entire process.

8. **Recheck** measurements to **ensure:**
   - Suspension pivots remain parallel with the axle (Figure 2 on page 7).
   - The axle is tightly seated to at least one side of the plate radius on each beam (Figure 10).
   - Gaps between the non-seated side plate radius and the axle may be up to 1/16 inch (1.6 mm) maximum (Figure 10).
   - S-cam position is correct, Step 3 on page 12.

9. Securely **tack weld** the axle to the beam as defined in Hendrickson literature number L64 *Welding Procedures*.

10. **Remove** clamping device(s).

11. **Complete** the welding of the suspension beams to the axle as described in Hendrickson literature number L64 *Welding Procedures*.

12. Once the axle welds have cooled completely, **install** the supplied U-bolts.

U-BOLT INSTALLATION

NOTE: The type of U-bolt (Figure 15) differs among HT™ Series suspensions. Refer to parts lists at www.hendrickson-intl.com/TrailerLit for the correct U-bolt type.

1. **Check** U-bolts for thread damage or burrs.

⚠CAUTION: Do not apply additional lubricant to U-bolt. Failure of the U-bolt could occur.

2. **Install** U-bolts:
   A. **With spacers** (round or flattened U-bolts): **Install** U-bolts and spacers on the axle and through the mounting holes in both suspension beams. Ensure U-bolt spacer fits properly in the mounting area.
   B. **Without spacers** (coined U-bolts): **Install** U-bolts on the axle and through the mounting holes in both suspension beams.

3. **Install** washers and nuts on U-bolts and use a wrench to snug the nuts.

4. If with spacers, **check** to ensure correct positioning on the axle (Figure 15). **Adjust** if needed.

5. **Torque** nuts on U-bolts to Hendrickson's recommended torque specifications[5]. Alternate tightening opposing corners of the clamp assembly as shown in Figure 16.

[5] Refer to Hendrickson literature number B31 *Torque Specifications* and on installation drawings (values on drawings are most current).

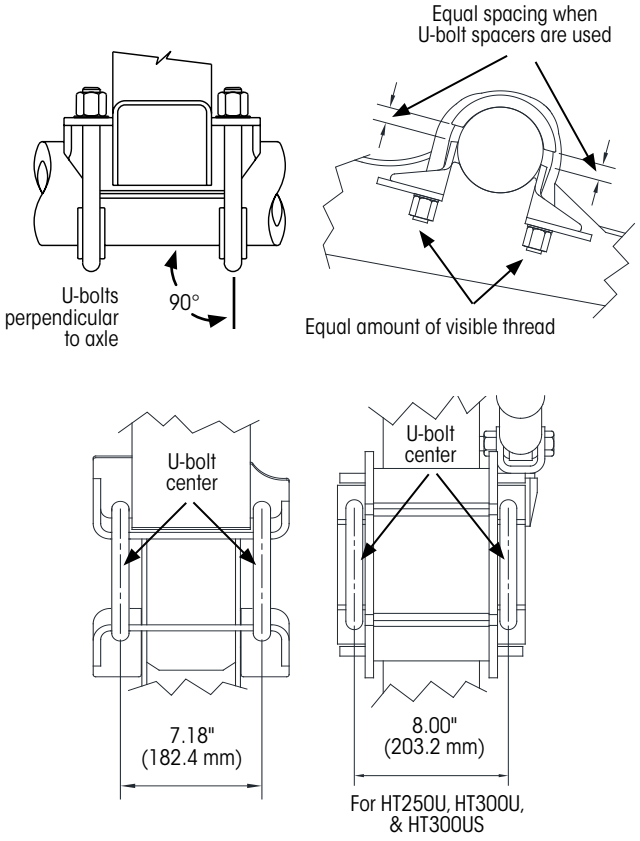


Figure 15: *U-bolt positioning*

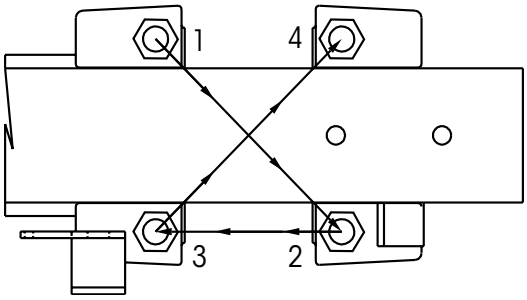


Figure 16: *U-bolt nut tightening sequence*

IMPORTANT: Proper tightening will result in an equal amount of thread visible above the nut on each side of the U-bolt (Figure 15).

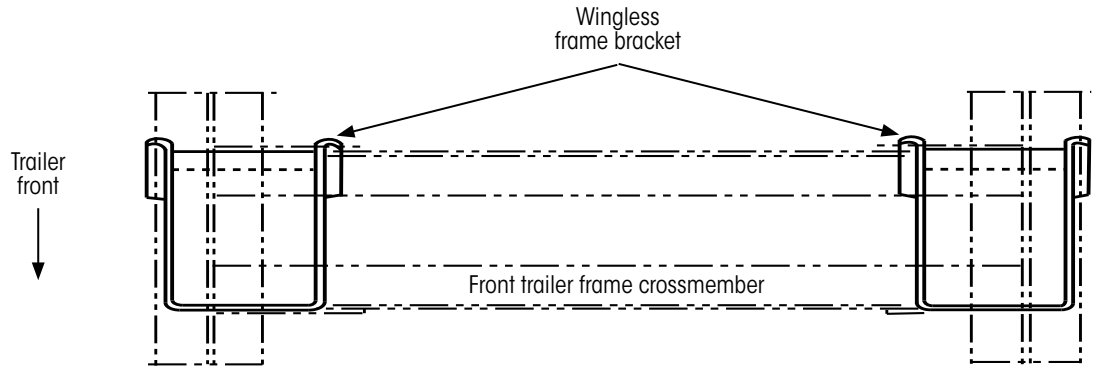


Figure 17: *Sample wingless frame bracket installation*

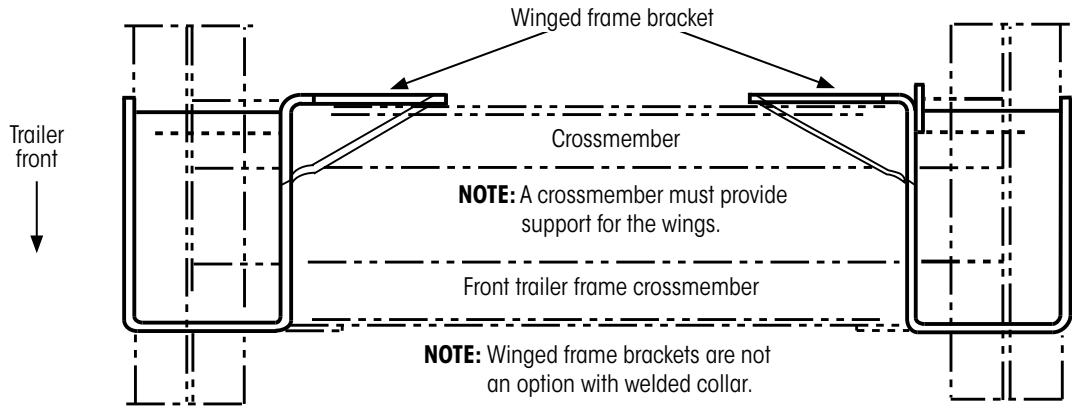


Figure 18: *Sample frame bracket installation for QUIK-ALIGN® pivot connection models with winged frame brackets*

SUSPENSION MOUNTING

Once the axle/beam assembly is complete, refer to the installation drawing[6] and the following procedures for attaching frame brackets (bushing sleeve for Y-beams), upper air spring plates, air springs, shocks and other applicable suspension components.

FRAME BRACKET INSTALLATION

A HT™ Series suspension can be ordered with or without the frame bracket pre-assembled to the beam. For a welded collar frame bracket, the pivot connection (Figure 21) is factory-assembled with Huck® Bolt fasteners; it is not necessary to break this connection for attaching the frame bracket.

For frame brackets with QUIK-ALIGN®, it is optional, but not necessary to break the connection for frame bracket attachment.

NOTE: For bolt-on frame brackets, follow the trailer manufacturer's procedures and specifications.

1. **Lift and position** the frame brackets onto trailer frame rails and crossmembers as specified in the supplied suspension installation drawing (Figure 17 and Figure 18).
2. **Tack weld** the frame brackets into place and **recheck**.
3. **Complete** the weld as specified by the installation drawing and Hendrickson literature number L64 *Welding Procedures*.

FRAME BRACKET SUPPORT

Additional support (Figure 19 and Figure 20) may be required.

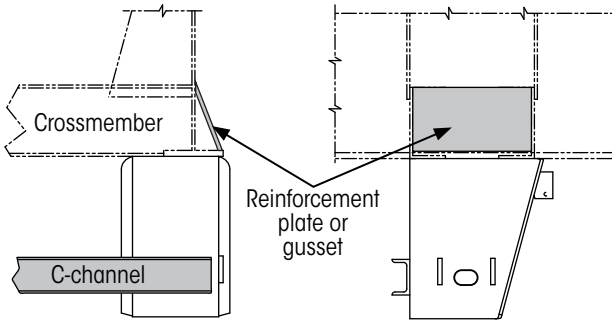


Figure 19: *Frame bracket reinforcement examples*

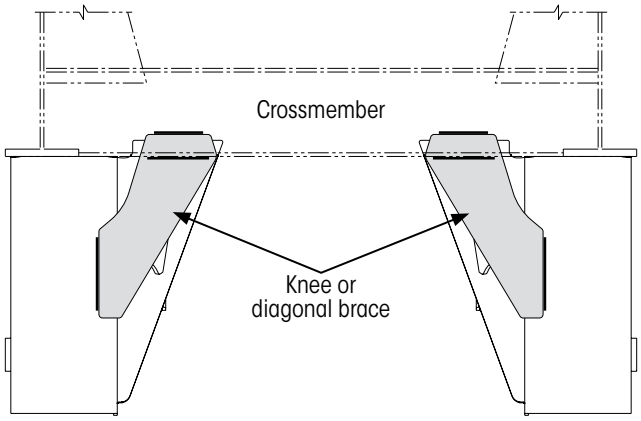


Figure 20: *Frame bracket knee brace example*

These methods of reinforcement (e.g. C-channel, knee brace, gusset, etc.) will be called out on the installation drawing and/or specified by the trailer OEM.

For more details, refer to the installation drawing and Hendrickson literature number L64 *Welding Procedures*.

SUSPENSION BEAM/FRAME BRACKET ASSEMBLY — WELDED COLLAR

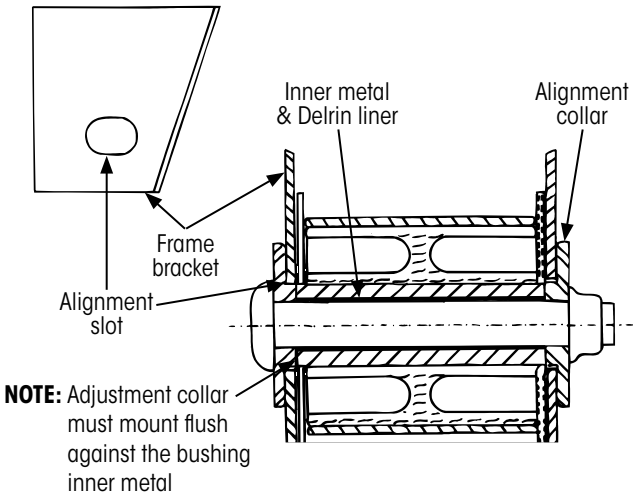


Figure 21: *Welded collar pivot connection assembly*

If the HT™ Series suspension system is ordered pre-assembled with welded collar, the pivot connection (Figure 21) will likely be factory-assembled with a Huck® Bolt. The welded collars are not welded to the frame brackets at the factory and can slide freely in the alignment slots.

If pivot connection is not pre-assembled with frame brackets, install the suspension beam as follows:

1. **Insert** Delrin® liner into bushing inner metal (Figure 23).

[6] An installation drawing is provided with each HT suspension. Generic versions are listed in Hendrickson literature number L1073 and available online at www.hendrickson-intl.com/TrailerLit. Where duplication exists, refer to installation drawing.

NOTE: Alternately, the Delrin liner can be inserted through the alignment slot after placing the suspension beam in Step 3.

IMPORTANT: The liner must be installed to prevent components from rusting together.

2. **Lift and position** the suspension to the frame brackets as shown on the suspension installation drawing.

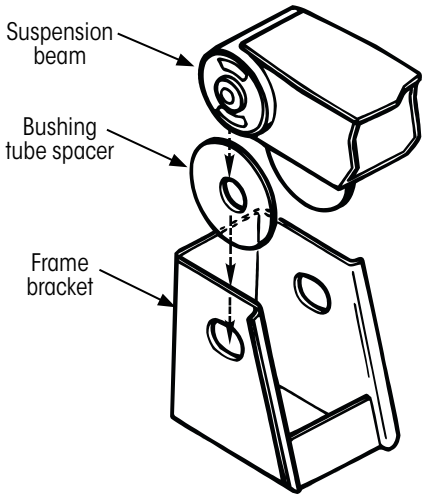


Figure 22: *Suspension beam placement*

3. **Place** the suspension beam pivot bushings into the frame brackets. At this time, **install** pivot bushing tube spacers (Figure 22).

NOTE: The assembly will be tight in the frame bracket. It may be necessary to spread the frame bracket. **DO NOT GRIND** material from the bushing inner metal.

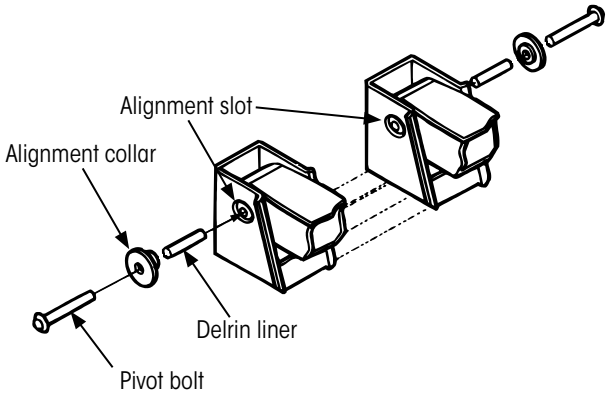


Figure 23: *Pivot connection assembly, welded collar*

4. **Place** an alignment collar onto both pivot bolts.

5. As shown in Figure 23, working from the outboard side of the trailer, **insert** each pivot bolt toward the center of the trailer through the alignment slots and Delrin® liner (previously inserted in the bushing inner metal).

6. Slide the second welded alignment collar onto the inboard threaded end of the pivot bolt.

7. **Thread** the prevailing torque hex nut onto the bolt.

IMPORTANT: Before tightening the pivot connection fasteners, ensure the alignment collars are within the alignment slots and against the bushing inner metal (Figure 21). Failure to follow these procedures and/or properly torque the pivot bolts at this time can result in a failed pivot connection and a loss of warranty coverage.

8. **Tighten** to Hendrickson's recommended torque specification[7].

9. Once torqued, **tack weld** the nut to the bolt threads.

IMPORTANT: The above step applies to welded alignment only.

10. Collars will be welded to the frame bracket as part of the alignment procedure (refer to AXLE ALIGNMENT on page 21).

[7] Refer to Hendrickson literature number B31 *Torque Specifications* and on installation drawings (values on drawings are most current).

SUSPENSION BEAM/FRAME BRACKET ASSEMBLY — QUIK-ALIGN®

If the suspension beam was not pre-assembled with the frame brackets during frame bracket installation, install the suspension beam as follows:

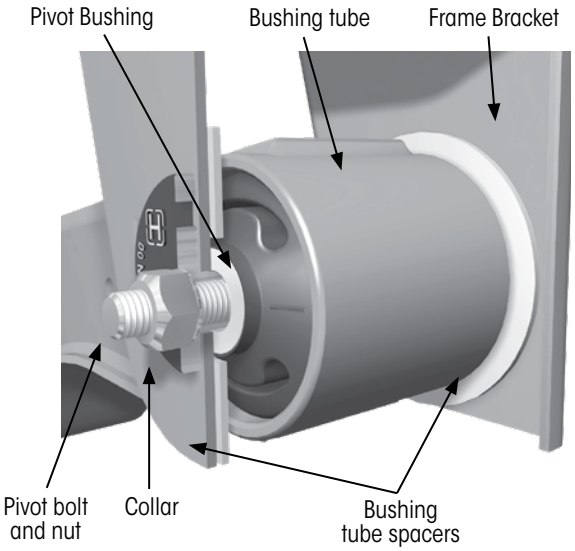


Figure 24: *QUIK-ALIGN pivot connection assembly*

⚠CAUTION: DO NOT apply anti-seize compound or additional lubricant to pivot connection hardware. A dry lubricant coating has been applied to the threads of the pivot connection bolt and nut. Do not allow undercoating, paint, surface coatings, or any other commonly used compounds to contact the threads of the pivot connection fasteners. These compounds can act like a lubricant, reducing the friction between the threads of the nut and bolt. This can lead to overtightened fasteners, unpredictable pivot connection clamp loads and unreliable axle alignments. Threads should be clean, dry and free of contamination, as supplied by Hendrickson.

⚠CAUTION: DO NOT apply undercoating, paint or other surface coating to the suspension and frame brackets until after completing the alignment. Refer to SURFACE COAT CONSIDERATIONS and Figure 3 on page 8.

IMPORTANT: DO NOT tack weld the cap screw to the QUIK-ALIGN alignment collar.

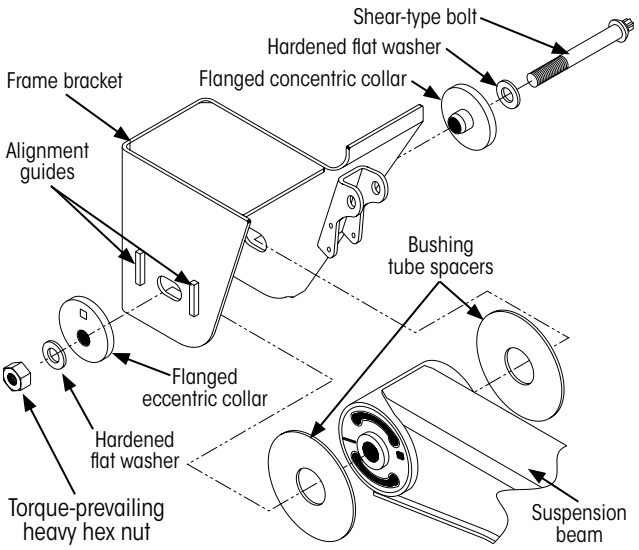


Figure 25: *Installing suspension beam in frame bracket*

1. **Lift and position** the suspension to the frame brackets as shown on the suspension installation drawing[8].

2. **Place** the suspension beam Pivot Bushings into the frame brackets. At this time, install bushing tube spacers (Figure 25).

NOTE: The eccentric collar must remain flat against the frame bracket throughout the alignment procedure. If too loose, the eccentric collar may raise upon the alignment guide, resulting in an improper alignment.

3. **Install** the hardened flat washer and flanged concentric washer onto pivot bolt (shear-type bolt).

NOTE: If the assembly fits tightly in the frame bracket, it may be necessary to spread the frame bracket. **DO NOT GRIND** material from the bushing inner metal.

4. Working from the inboard side of the trailer, **insert** the pivot bolt through the frame bracket toward the tires (Figure 25).

5. **Place** outer eccentric flanged collar, hardened flat washer and torque prevailing heavy hex nut onto the pivot bolt.

[8] An installation drawing is provided with each HT suspension. Generic versions are listed in Hendrickson literature number L1073 and available online at www.hendrickson-intl.com/TrailerLit.

6. **Tighten** the torque prevailing heavy hex nut on each shear-type bolt to hold the flanged eccentric and concentric collars in place between the alignment guides, but loose enough to permit the hardened washers to rotate freely; do not shear off the Torx® head until axle alignment procedure has been performed. Refer to L579 *Alignment Procedure*.

AXLE/Y-BEAM SUBASSEMBLY INSTALLATION

Information in this section provides complementary details to HT™ Series Y-beam suspension installation drawings[9].

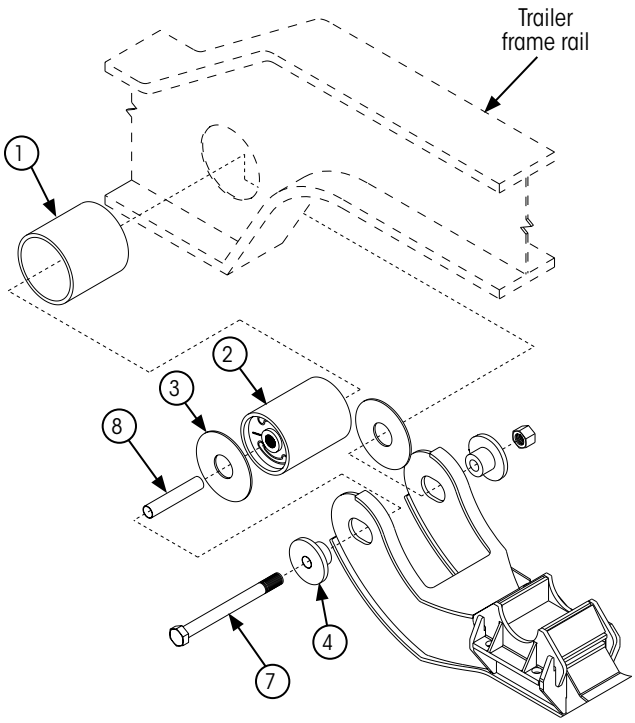


Figure 26: *Welded collar pivot connection hardware*

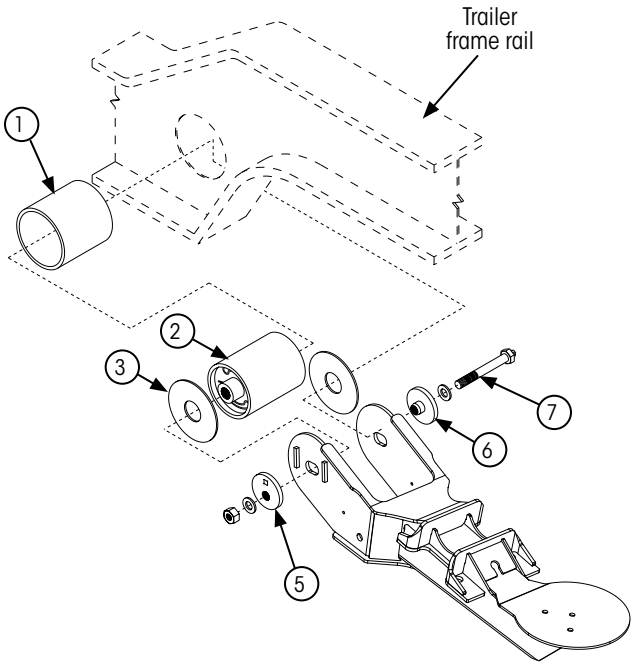


Figure 27: *QUIK-ALIGN® pivot connection hardware*

ITEM	DESCRIPTION	WELDED	QUIK-ALIGN
1	Bushing tube sleeve	4	4
2	Bushing assembly	4	4
3	Bushing tube spacers (2 ea)	4	4
4	Welded alignment collars (2 ea)	4	
5	Eccentric alignment collar		4
6	Concentric alignment collar		4
7	Pivot bolt and nut	4	4
8	Delrin® liner	4	

Table 2: *Y-beam pivot connection hardware list*

[9] An installation drawing is provided with each HT suspension. Generic versions are listed in Hendrickson literature number L1073 and available online at www.hendrickson-intl.com/TrailerLit. Where duplication exists, refer to installation drawing.

BUSHING TUBE SLEEVE INSTALLATION

Y-beam suspensions require bushing tube sleeves which are welded directly to the existing trailer frame as part of the suspension installation procedure (Figure 26, Figure 27 and Table 2).

NOTE: The installer must locate and cut a 7 inch (177.8 mm) diameter clearance hole through the trailer frame for the bushing tube sleeve. For details, refer to the suspension installation drawing [10].

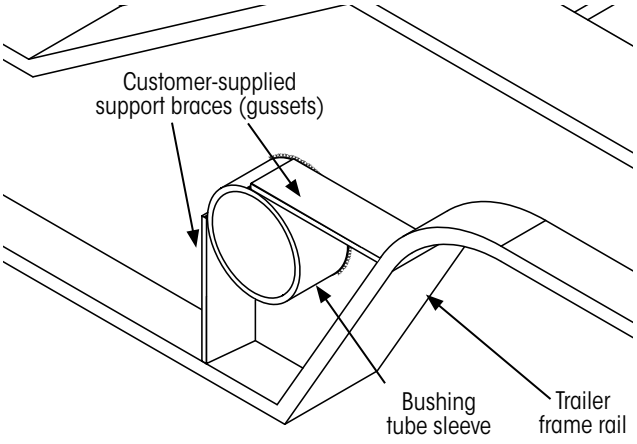


Figure 28: *Bushing tube sleeve assembly*

1. **Center** bushing tube sleeves (Figure 26 and Figure 27, item 1) into the cutouts located on the trailer frame web.
2. **Verify** bushing tube sleeves are perpendicular (both horizontally and vertically) to the web of the trailer frame rail as defined in installation drawing and parameters listed in L64 *Welding Procedures*.
3. **Tack weld** in place.
4. Completely **weld** the bushing tube sleeves (all around, 4 places) to the web of the trailer frame in accordance with procedures listed in L64.
5. **Install** additional customer supplied support braces (gussets) to the bushing tube sleeves.

IMPORTANT: It is the responsibility of the suspension installer and the vehicle designer to provide adequate vehicle frame design and tube gusset support in the area of our suspension attachment.

Y-BEAM PIVOT CONNECTION ASSEMBLY

Unlike suspensions with a frame bracket, Y-beam bushings come pre-assembled in a casing (Figure 26 and Figure 27, item 2) and do not require a bushing tool to assemble.

Procedures for installing and replacing the bushing assembly can be found in Hendrickson literature number L427 *Bushing Replacement Procedures*. Axle alignment is included in L579 *Alignment Procedure*.

IMPORTANT: QUIK-ALIGN® and welded collar require different pivot connection components. Refer to L58 *HT Y-Beam Parts List* for required pivot connection kits and hardware.

SHOCK CLEVIS INSTALLATION

Configurations for shocks may vary depending on the type of HT™ Series suspension. Suspensions may be equipped with both front and rear shocks. The upper shock clevis for front shocks is typically located on the frame bracket. Rear shocks could be attached to the upper air spring plate, trailer frame or remotely mounted to an existing trailer crossmember as shown in Figure 29 and Figure 31 on page 20.

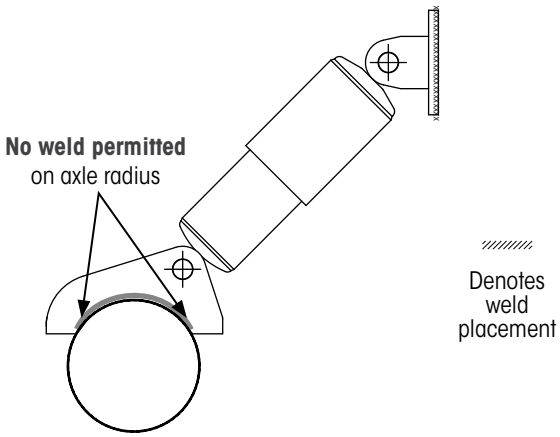


Figure 29: *Rear facing shock mount example*

The lower shock clevis could be attached to the suspension beam or axle as shown Figure 29.

For proper shock clevis type and positioning, refer to the applicable installation drawing and Hendrickson literature number L64 *Welding Procedures* for weld parameters.

[10] An installation drawing is provided with each HT suspension. Generic versions are listed in Hendrickson literature number L1073 and available online at www.hendrickson-intl.com/TrailerLit. Where duplication exists, refer to installation drawing.

The top dimensions are for 35 inch (889 mm) suspension beam centers. The bottom dimensions (in parentheses) are for 41 inch (1041.4 mm) beam centers.

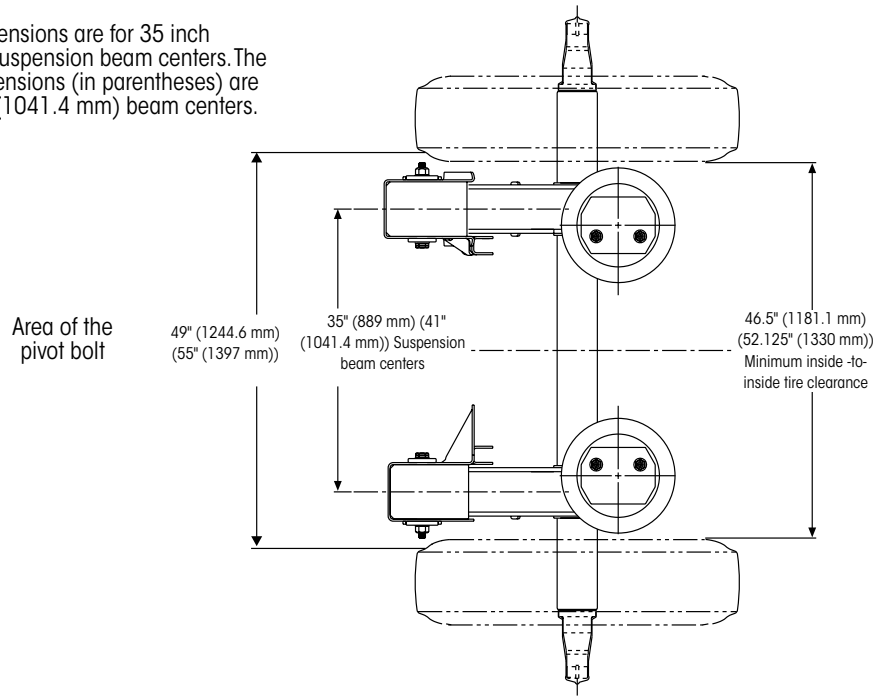


Figure 30: *Inside-to-inside tire measurements*

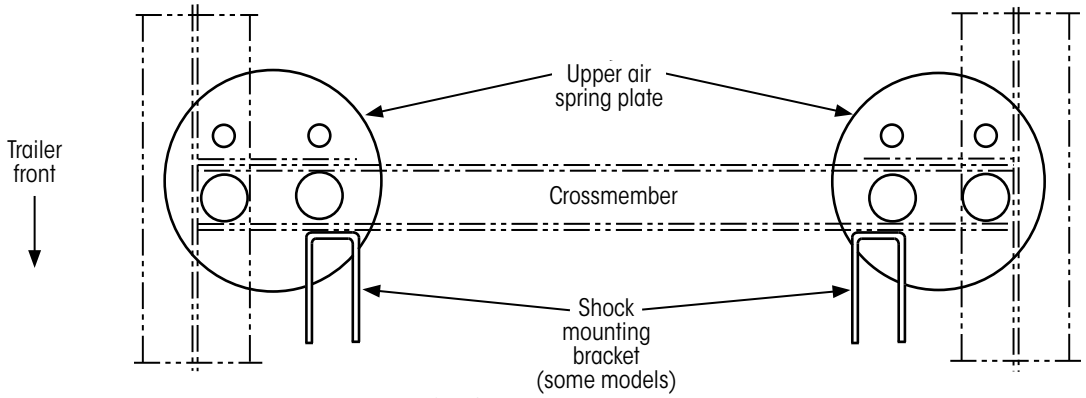


Figure 31: *Sample upper air spring plate installation*

INSTALLING AIR SPRINGS AND SHOCKS

1. **Install** air springs and shocks per the suspension installation drawing[11].
2. **Tighten** mounting bolts to Hendrickson's recommended torque specifications[12].

TIRE CLEARANCE

Hendrickson specifies 1 inch (25.4 mm) of tire clearance above jounce must be included for HT Series suspensions. 2 inchs (50.8 mm) of tire clearance (Figure 30 and Figure 32) is specified between the trailer frame and inside tire inboard sidewall. This will provide sufficient clearance to allow for tire distortion and axle walk[13].

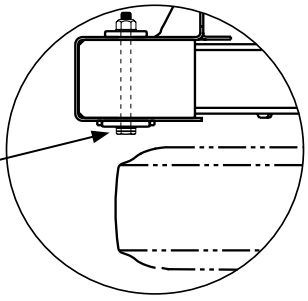


Figure 32: *QUIK-ALIGN® alternative pivot bolt installation*

[11] An installation drawing is provided with each HT suspension. Generic versions are listed in Hendrickson literature number L1073 and available online at www.hendrickson-intl.com/TrailerLit. Where duplication exists, refer to installation drawing.

[12] Refer to Hendrickson literature number B31 *Torque Specifications* and on installation drawings (values on drawings are most current).

[13] Information for tire clearance and axle walk can be found in Hendrickson literature number T15001 *Concepts and Functions* available online at www.hendrickson-intl.com/TrailerLit.

UPPER AIR SPRING PLATE

NOTE: Not required for slider suspension.

1. **Lift and position** upper air spring plates (Figure 31) onto both trailer frame rail and crossmember as specified in the supplied suspension installation drawing [14].
2. **Tack weld** the upper air spring plates into place and recheck.
3. **Complete** the weld as specified by the Installation drawing and Hendrickson literature number L64 *Welding Procedures*.

AIR CONTROLS INSTALLATION

Hendrickson offers a variety of air control systems for trailer air suspensions. Refer to CONTACTING HENDRICKSON on page 5 or Hendrickson literature number L1182 *Controls Parts Catalog* for more information.

The following notes apply to all Hendrickson Trailer air control kits:

- Installation procedures vary depending on the specified air control kit and the trailer's air system.
- A diagram showing the components and plumbing is supplied with each kit [15]. Review the supplied suspension installation drawing for additional notes, such as height control valve arm length.
- Fittings and air lines are not provided with kits. Tubing and fittings should be furnished by the customer.
- Do not add lubrication to air system. Air system lubricants can erode rubber components and seals.
- All connections must be leak-proof. Use soapy water to test for leaks while testing system operation.
- Avoid sharp bends in air lines that can restrict airflow.
- Provide adequate excess air line when connecting to moving parts.
- Ensure adequate strain relief is added when connecting hoses and tubing to moving components.
- Ensure hoses and tubing are adequately secured to avoid dragging or catching onto obstacles while trailer is moving.

IMPORTANT: DO NOT USE pipe compound or Teflon® tape.

AXLE ALIGNMENT

Pivot connection fasteners are installed by the trailer OEM during trailer build and suspension/axle assembly. The trailer OEM is responsible for initial axle alignment as defined in Hendrickson literature number L579 *Alignment Procedure*.

[14] An installation drawing is provided with each HT suspension. Generic versions are listed in Hendrickson literature number L1073 and available online at www.hendrickson-intl.com/TrailerLit. Where duplication exists, refer to installation drawing.

[15] Height control valve kits include installation procedures for proper assembly and adjustment. L388 lists ride height specifications.

FINAL INSPECTION

1. **Verify** the following welds have been completed per specifications (refer to Hendrickson literature number L64 *Welding Procedures* for details):
   A. Axle welds:
      i. POSITIONING AXLE WITH FIXTURE on page 10, Step 8.
      ii. POSITIONING AXLE WITHOUT FIXTURE on page 11, Step 11.
   B. Frame bracket mounting page 15.
   C. Frame bracket supports page 15.
   D. Bushing tube sleeve to trailer frame defined on page 19 (Y-Beam only).
   E. Bushing assembly installation listed on page 19.
   F. Pivot bolt nut, Step 9 on page 16.
   G. Alignment collars, Step 10 on page 16.
2. **Verify** air springs and shocks have been installed per instructions on page 20.
3. **Verify** all suspension bolts are tightened to Hendrickson-recommended torque specifications listed in suspension installation drawing [16] and Hendrickson literature number B31 Torque Specifications.
4. **Verify** installation of air controls page 21.
5. **Articulate** the suspension through its entire travel to ensure that adequate component clearances have been provided.

   NOTE: Special attention should be paid to both the height control valve (HCV) linkage and the height control valve arm length as specified in the supplied suspension installation drawing and other applicable literature provided by the HCV kit.
6. If equipped with QUIK-ALIGN® pivot connections, **verify** the shear-type bolts have been sheared off and collars are flat against the frame bracket.
7. **Test** drive trailer and then continue final installation inspection procedure.
8. **Check** for proper suspension ride height. For the proper procedure, refer to Hendrickson literature number L459 *Checking Trailer Ride Height*. Adjust if necessary [17].

   NOTE: The distance from the bottom of the frame to the top of the axle must be within 1/8 inch (3.2 mm) from side to side.
9. **Verify** a minimum of 2 inches (50.8 mm) has been provided from the tire to the trailer structure to allow for lateral or fore/aft tire movement.
10. **Verify** a minimum of 1 inch (25.4 mm) has been provided above the top of the tire when the suspension is fully compressed or in its FULL jounce position [18].

    Tire Clearance at Ride Height = Jounce Specification + 1 inch (25.4 mm).
11. **Verify** front axle alignment does not exceed a maximum variation of 1/8 inch (3.2 mm) kingpin to front axle and a maximum variation of 1/16 inch (1.6 mm) axle to axle on any additional axles as specified in Hendrickson literature number L388 Recommended Ride Height Settings and L579 *Alignment Procedure*.
12. **Verify** a minimum of 1 inch (25.4 mm) clearance is maintained around the air spring when it is at its maximum diameter specification [19].

[16] An installation drawing is provided with each HT suspension. Generic versions are listed in Hendrickson literature number L1073 and available online at www.hendrickson-intl.com/TrailerLit. Where duplication exists, refer to installation drawing.

[17] Height control valve kits include installation procedures for proper assembly and adjustment. L388 lists ride height specifications.

[18] For definitions, refer to Hendrickson literature number T15001 *Air Ride Suspension Concepts and Functions*.

[19] The installation drawing provided with each HT suspension includes the maximum air spring diameter. If the drawing is not available, a generic is listed in Hendrickson literature number L1073 available online at www.hendrickson-intl.com/TrailerLit.

APPENDIX A: ALTERATION OF EXISTING AXLE LOCATING FIXTURE

Any "T" Series Axle Locating Fixture supplied by Hendrickson can be altered to accept the HT™ Series suspension beams, providing the suspension ordered conforms to the following:

- The frame brackets are shipped pre-assembled onto the suspension beams.
- The suspension beam centers of the ordered suspension match the fixture setup.

Use the following procedure to modify the "T" fixture:

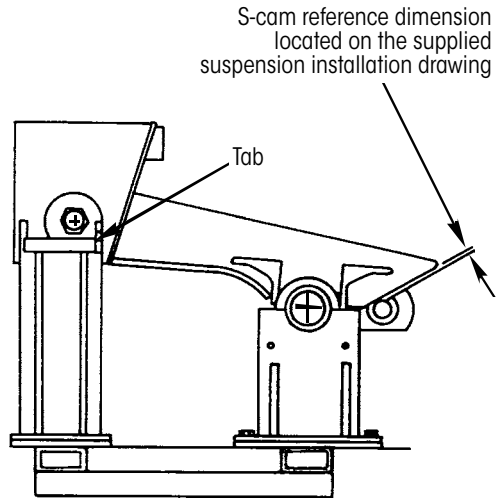


Figure 33: *Altering "T" series fixture*

1. **Remove** S-cam stands and shock bracket stands.
2. **Cut** off upright "tab" portion of the hanger stands as shown (Figure 33).

*Call Hendrickson at **866.RIDEAIR (743.3247)** for additional information.*

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