

TECHNICAL PROCEDURE INTRAAX[®] SUSPENSION SYSTEMS

SUBJECT: Installation Procedures

LIT NO: L341

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INTRAAX® INSTALLATION PROCEDURES

INTRODUCTION

The following instructions are intended for use with the Hendrickson **INTRAAX® Air Ride Suspension**.

For instructions concerning other suspension models, contact the Hendrickson Trailer Suspension Systems Technical Service Department at (330)456-7288.

NOTE: Always read the entire installation instructions thoroughly before proceeding with a suspension installation.

It is very important that the proper suspension is chosen for the trailer application. The following criteria must be considered when selecting a suspension:

- required capacity
- loaded frame-to-ground measurement
- axle travel
- axle spacing

For additional information concerning suspension selection, contact the Hendrickson Trailer Suspension Systems Customer Service Department at (330) 456-7288.

⚠ CAUTION: The INTRAAX suspension system, as with all air suspension systems, must be installed with the proper amount of frame-to-ground clearance to ensure trouble-free operation. If there is too much ground clearance, the suspension will not carry its share of the load. Too little ground clearance may damage the suspension or other vehicle components.

A correct installation must result in a LOADED suspension ride height that is within the range specified on the suspension assembly drawing.

The trailer manufacturer should be consulted before making any changes to the vehicle's frame. Typically, cutting or altering the trailer's frame or side rail is not permitted and may affect the manufacturer's warranty coverage.

SPECIAL NOTES

Defective or incorrect components are to be returned to Hendrickson, which will supply replacements for the 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 of the suspension components is permitted, except where specified by Hendrickson.

No welding of the axle assembly or axle components is permitted.

No alteration of any of the suspension components is permitted.

Any installation deviations must be approved, in writing, by Hendrickson Trailer Suspension Systems Product Engineering Department at (330) 456-7288.

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 assembly drawing for specifications).

PRE-INSTALLATION PROCEDURES

REQUIRED SUPPLIES

The following equipment and materials are needed when installing a Hendrickson INTRAAX suspension:

1. Welding equipment and supplies. (See RECOMMENDED WELDING PROCEDURES.)
2. Torque wrench (capability of 600 ft-lbs).
3. Tape measure or scale(s) and machinist square.
4. Trammel bar.
5. Crane or lifting capability.
6. Hammer or center punch (for bolt-on).
7. Compressed air supply.
8. Air impact gun (capability of 600 ft-lbs).
9. Air fittings, tubing and associated tools.
10. 1/2" drive breaker bar.
11. Socket set and wrenches, including the following sizes:
 - 3/8"
 - 9/16"
 - 3/4"
 - 1 1/8"
 - 1 1/4" deep well socket
 - 1 5/16" deep well socket
 - 1 7/16" wrench
 - 1" drive, E-20 socket (Hendrickson P/N A-24536)
12. Suspension assembly drawing and plumbing schematic supplied by Hendrickson.
13. Wheel chocks.
14. Frame jacks or supports.

PRE-INSTALLATION CHECKLIST

Before beginning the installation:

1. Check that the new suspension matches the specifications provided by your Production or Engineering Department.
2. Verify that the vehicle will have the proper load distribution after installation.
3. Verify that the actual trailer crossmember(s) locations correspond with the locations specified on the suspension assembly drawing.
4. Confirm that the components listed on the suspension assembly drawing have been provided in sufficient quantities. Contact the Hendrickson Trailer Suspension Systems Customer Service Department if any missing or damaged components are found.

INTRAAX® INSTALLATION PROCEDURES

SUSPENSION ASSEMBLY INSTALLATION

UPPER BAG PLATE

1. Lift and position the upper bag plates onto both the trailer frame rail and the crossmember as specified in the supplied suspension assembly drawing (Figure 1).
2. Tack weld the upper bag plates into place and recheck bag position. See suspension assembly drawing for locating dimensions.
3. Refer to RECOMMENDED WELDING PROCEDURES section.

FRAME BRACKET

1. Lift and position the frame brackets onto the trailer frame rails and the crossmembers as specified in the supplied suspension assembly drawing (Figures 2 and 3).
2. Tack weld the frame brackets into place and recheck.

NOTE: DO NOT ATTACH the air spring mounting plate or air spring to **BOTH** the trailer main rail and the trailer crossmember. The air spring mounting is not designed to resist the movement between the trailer crossmember and the main rail.

3. Check that the frame-brackets have not been compressed or distorted. Both alignment slots must line up.
4. Refer to RECOMMENDED WELDING PROCEDURES section.

FINAL WELD

1. Completely weld the frame brackets to both the crossmembers and trailer frame rails as described in the RECOMMENDED WELDING PROCEDURES section.

AIR SPRINGS AND SHOCKS

1. Install the air springs and shocks, as per the suspension assembly drawing.
2. Torque the mounting bolts to Hendrickson's recommended values (see APPENDIX).

BOLT-ON ASSEMBLIES

1. For bolt-on assemblies, follow the trailer manufacturer's procedures and specifications.

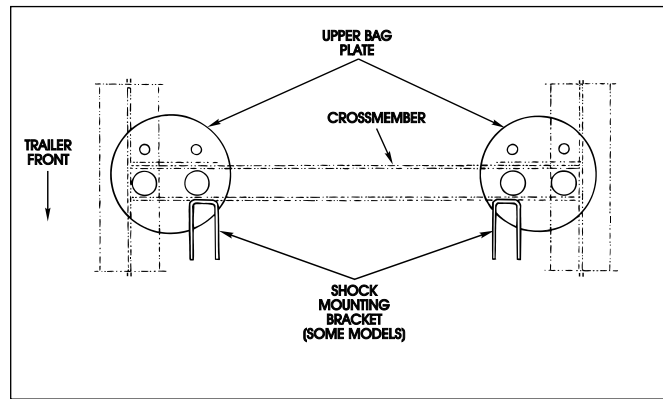


Figure 1. Upper bag plate installation

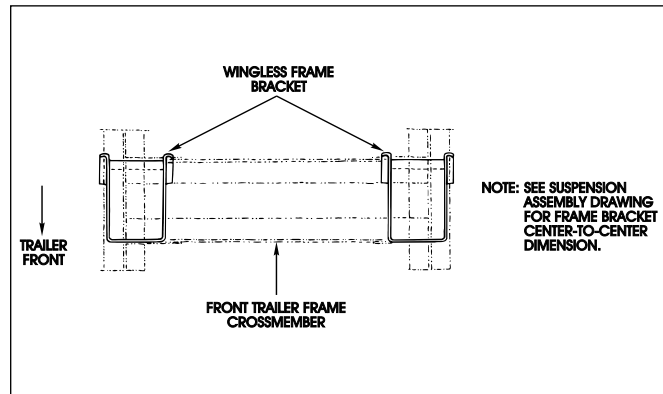


Figure 2. Frame bracket installation

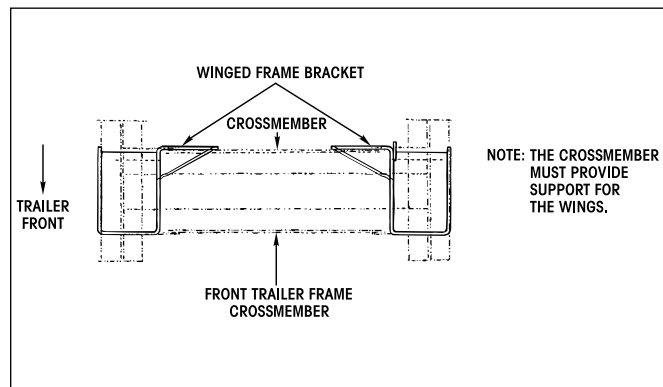


Figure 3. Frame bracket installation for QUIK-ALIGN® models with winged frame brackets

TRAILING ARM/FRAME BRACKET ASSEMBLY — QUIK-ALIGN®

⚠ CAUTION: DO NOT APPLY undercoating to the suspension and frame bracket until after completing the alignment. Undercoating will effect clamp load of the pivot connection fastener and can damage the hardware.

If the trailing arm is not preassembled with the frame brackets, install the trailing arm as follows:

1. Lift and position the suspension to the frame brackets as is shown on the suspension assembly drawing.
2. Lower the trailing arm TRI-FUNCTIONAL® BUSHINGS into the frame brackets. Also install bushing wear pads at this time (Figure 4).
3. Install the hardened flat washer and flanged concentric washer onto pivot fastener (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 fastener through the frame bracket (toward the tires) (Figure 4).
5. Place outer eccentric flanged washer, hardened flat washer and torque prevailing heavy hex nut onto fastener.
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.

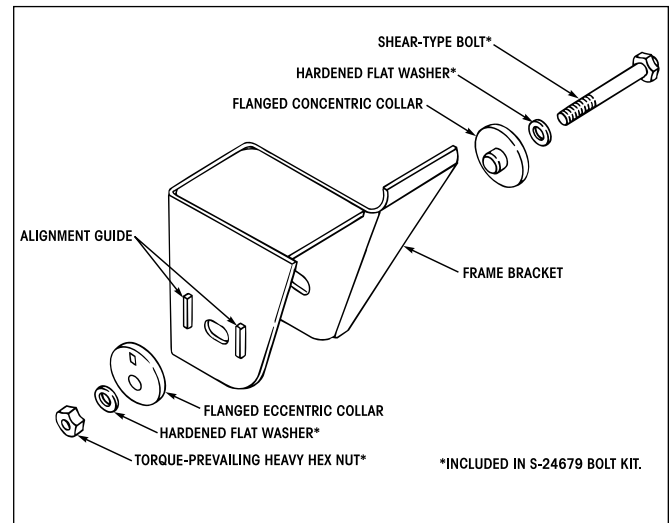


Figure 4. Installing trailing arm in frame bracket

INTRAAX® INSTALLATION PROCEDURES

TIRE CLEARANCE

Hendrickson specifies that the tire clearance above the jounce requirement must include one inch for INTRAAX. A two-inch clearance is specified between the trailer frame and inside tire inboard sidewall. This will provide sufficient clearance to allow for tire distortion and axle walk (Figures 5 and 6).

FINAL ASSEMBLY

1. Install the air springs and shocks, as per the suspension assembly drawing.
2. Torque the mounting bolts to Hendrickson's recommended values (see APPENDIX).
3. If required, position and tack weld the frame bracket cross channel to both frame brackets as shown on the suspension assembly drawing.
4. Completely weld the frame bracket cross channel to both frame brackets as described in the RECOMMENDED WELDING PROCEDURES section.

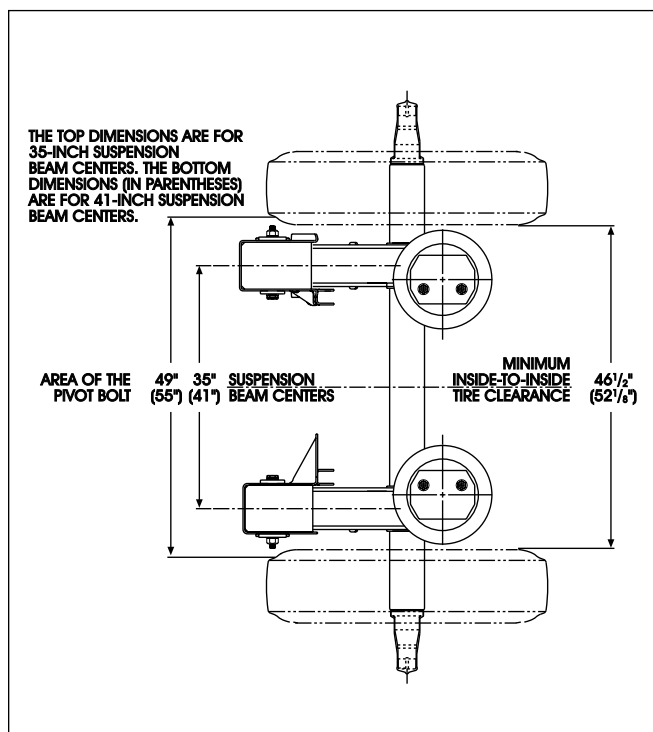


Figure 5. Inside-to-inside tire measurements

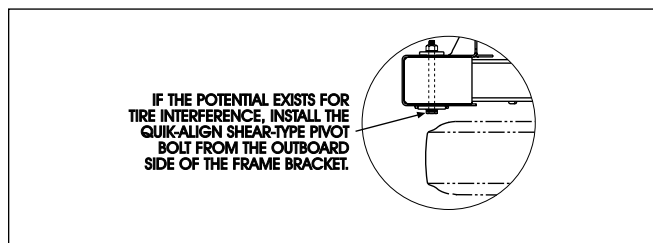


Figure 6. Alternative installation of the QUIK-ALIGN pivot bolt

RECOMMENDED WELDING PROCEDURES

⚠ WARNING: IF THESE PROCEDURES AND SPECIFICATIONS ARE NOT FOLLOWED, DAMAGE TO THE AXLE OR SUSPENSION COULD RESULT. THE RESULTING AXLE OR SUSPENSION DAMAGE COULD CAUSE AN ACCIDENT, PROPERTY DAMAGE, AND/OR SERIOUS INJURY.

WELDING PARAMETERS

NOTE: A welder qualified in 2G position per ANSI/AWS D1.1-94 Section 5 Part C "Welder Qualification" must perform the welding.

NOTE: The specification shown below is for horizontal (2F) positioning.

1. Suspension components and their mating parts must be at a minimum temperature of 60°F (15.5°C) and free from moisture, dirt, scale, paint and grease.
2. All welds must be performed in a flat, or horizontal, position.

3. Achieve spray arc transfer with the following welding parameters:

- Standard Electrode: AWS E-7018 (Oven Dried)
 - .125 DIA.
120-140 AMPS D.C.
ELECTRODE POSITIVE
 - .156 DIA.
120-160 AMPS D.C.
ELECTRODE POSITIVE
- Standard Wire: AWS ER-70S-6
 - .045 DIA.
(i.e., LA-56 or NS-115)
- Optional Wire: AWS ER-70S-3
 - .045 DIA.
(i.e., LA-50 or NS-101)
- Volts: 26-30 DCRP
- Current: 275-325 AMPS
- Wire Feed Speed: 380-420 IPM
- Electrode Extension: ¾"-1"
- Gas: 86% Ar 14% CO₂
at 30 to 35 CFH

NOTE: Any deviation from these welding parameters must be approved by Hendrickson Trailer Suspension Systems in writing.

INTRAAX® INSTALLATION PROCEDURES

FRAME BRACKET, CROSSMEMBER, UPPER SHOCK BRACKET AND AIR SPRING MOUNTING WELDING PROCEDURES

Weld all miscellaneous suspension componentry using the parameters at the beginning of this section.

The following figures are examples of typical suspension installations. The procedures illustrated may need to be adapted due to varying trailer designs (Figures 7 through 16).

IMPORTANT: Starting and stopping points should be **no closer than 1/2"** from the mating edge of the suspension component and the trailer frame and/or the crossmembers.

NOTE: It is the responsibility of the suspension installer and the vehicle designer to provide both adequate vehicle frame design and proper securing method for the suspension system.

NOTE: The suspension installer has the responsibility to determine the proper welding parameters for the materials being used. For specifications of the suspension component material, contact Hendrickson Trailer Suspension Systems.

The attachments shown are designed to properly support the suspension. The suspension frame brackets are not to be used as a structural component of the trailer. Close attention should be paid to the attachment of the trailer crossmember to the trailer main rail to ensure that the frame bracket does not support this connection. Contact Hendrickson Trailer Suspension Systems at (330) 456-7288 with any questions concerning this connection.

NOTE: DO NOT ATTACH the air spring mounting plate or air spring to **BOTH** the trailer main rail and the trailer crossmember. The air spring mounting is not designed to resist the movement between the trailer crossmember and the main rail.

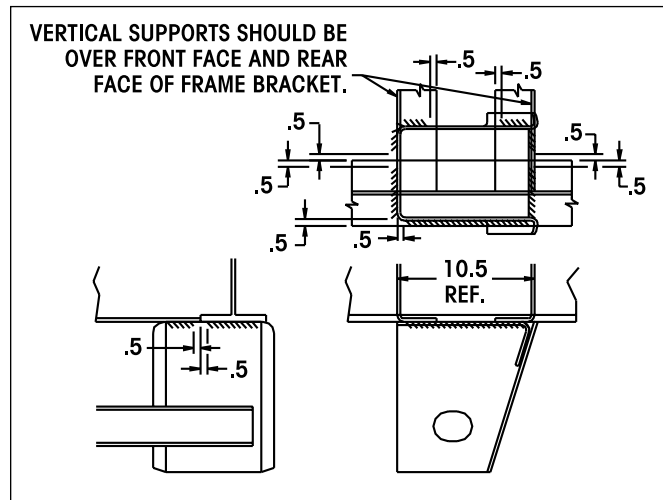


Figure 7. Typical frame bracket-to-frame attachment

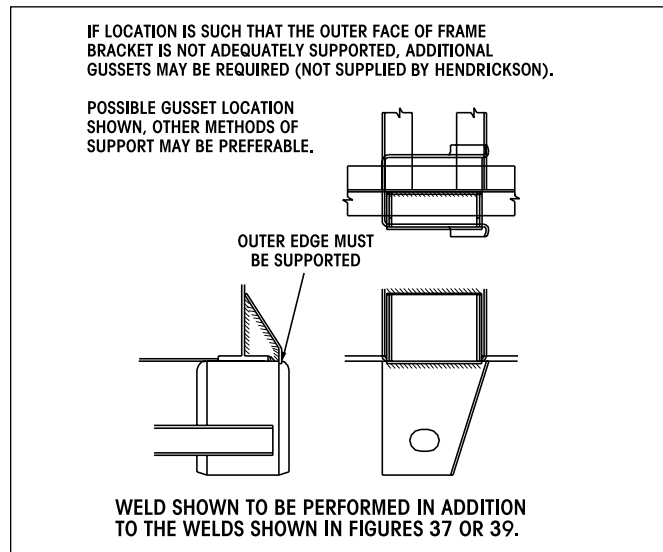


Figure 8. Severe offset frame bracket attachment

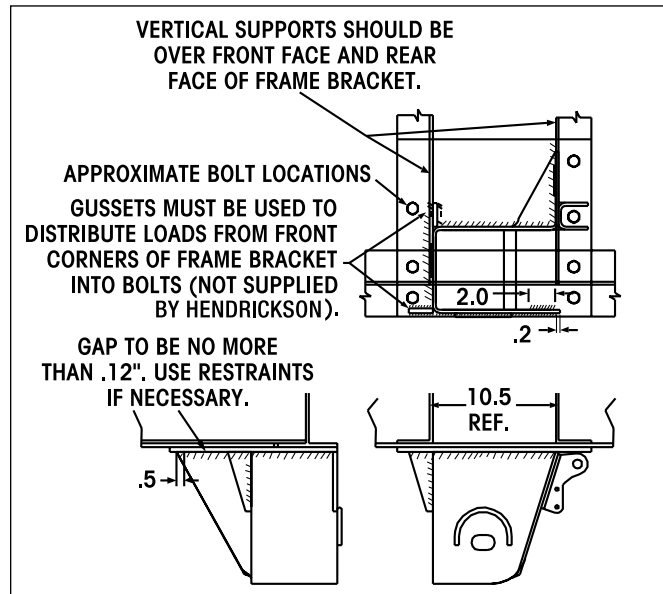


Figure 9. Frame bracket-to-mounting plate attachment (customer supplies bolt-on plate and gussets)

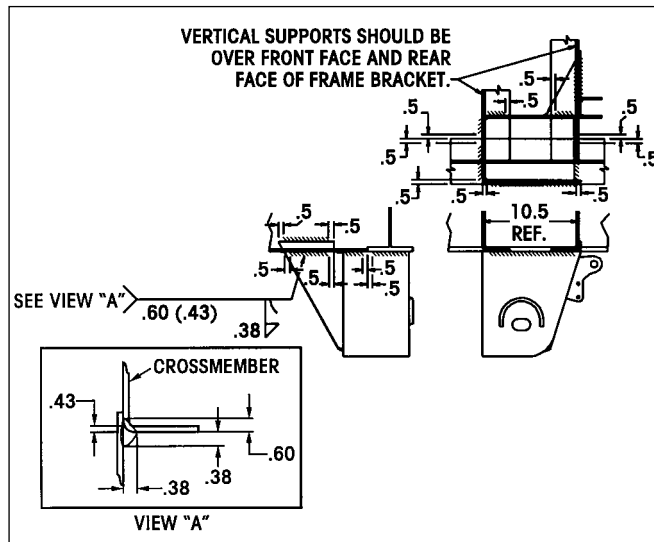


Figure 10. Typical QUICK-ALIGN winged frame bracket-to-frame attachment

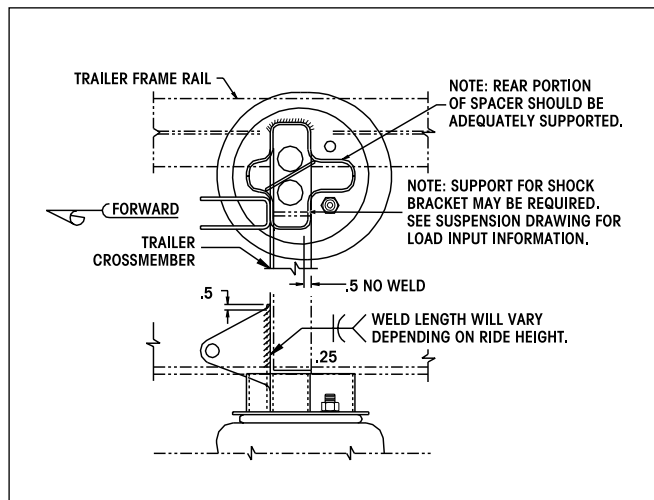


Figure 11. Air spring spacer attachment

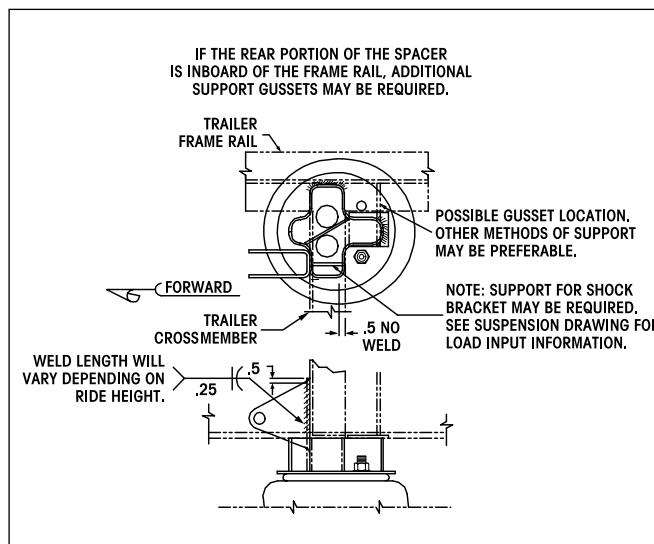


Figure 12. Severe offset mounting with spacer

INTRAAX® INSTALLATION PROCEDURES

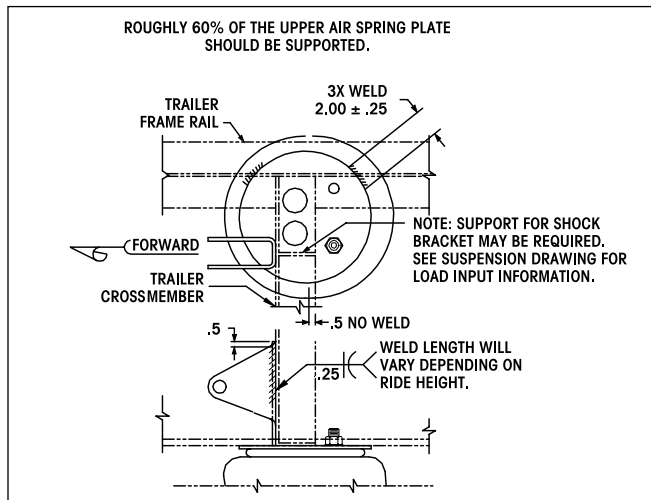


Figure 13. Air spring mounting plate attachment

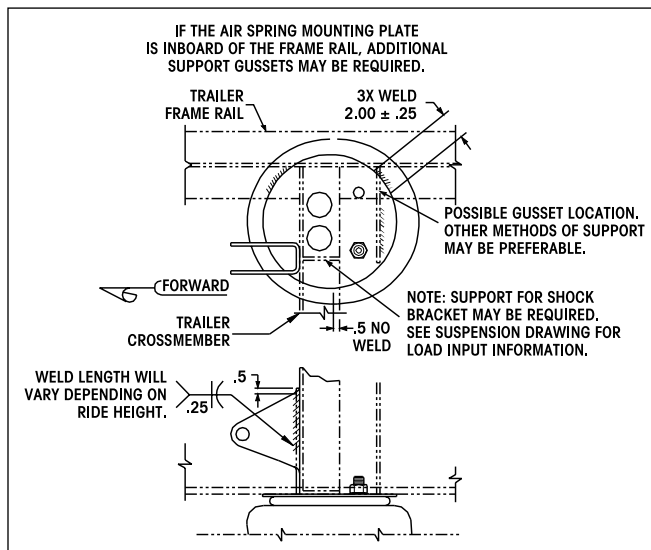


Figure 14. Severe offset mounting without spacer

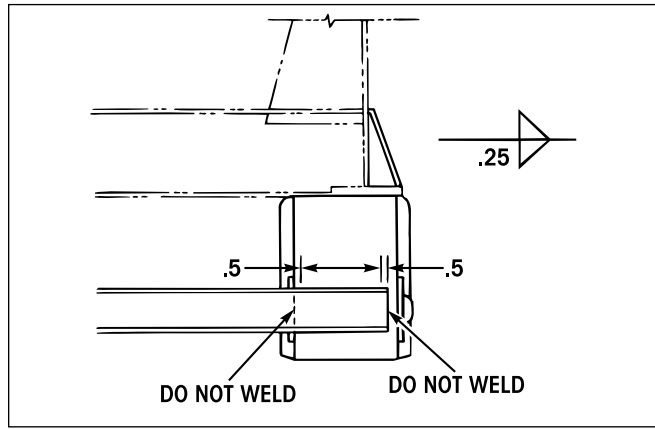


Figure 15. C-channel attachment to frame bracket

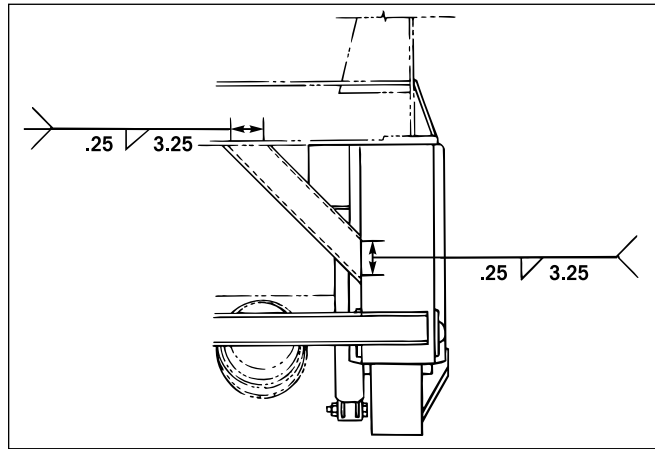


Figure 16. Frame bracket knee brace attachment

INTRAAX® INSTALLATION PROCEDURES

AIR CONTROLS INSTALLATION

Hendrickson offers a variety of air control systems for trailer air suspensions. The installation procedures vary depending on the specified air control kit for the trailer and the trailer's air system. A diagram showing the component and air line arrangement is supplied with each kit. Review the supplied suspension assembly drawing for additional notes, such as height control valve arm length. Fittings and air lines are not provided. Contact Hendrickson Trailer Suspension Systems Technical Service Department at (330) 456-7288 with any questions regarding installation of air controls.

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

1. Do not add lubrication to air system.
2. All connections must be leak proof.
3. Avoid sharp bends in the air lines that can restrict airflow and provide adequate excess air line when connecting to moving parts.
4. D.O.T.-approved tubing and fittings are to be furnished by the customer.

DESIGNED RIDE HEIGHT MEASUREMENT

1. To determine the ride height of your INTRAAX suspension, locate the suspension ID tag on the inside of the suspension beam. The model and description information found on the tag indicates the designed ride height as shown in the following example (Figures 17a and 17b).

INTRAAX (early) Model: AA230TBA..J **14A1A01...**
INTRAAX (current) Model: AA250TC140
Description: **A14U775N7**

2. Measure the ride height (Figure 18). If necessary, adjust the height control valve. The designed ride height is the distance from the center of the axle to the mounting surface of the suspension.

NOTE: To determine the ride height, add half of the diameter to the measurement shown on the tape measure. For example, a 5" diameter axle would have 2½" added to the measurement.

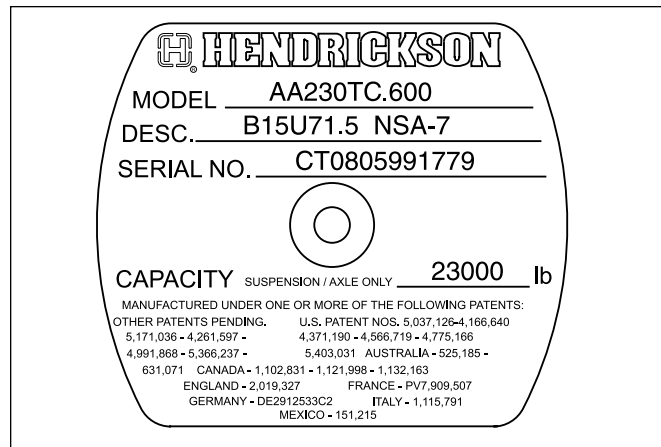


Figure 17a. ID tag on current INTRAAX suspensions



Figure 17b. ID tag on early INTRAAX suspensions



Figure 18. Measure the ride height

INTRAAAX RIDE HEIGHT SETTINGS

SUSPENSION TRAVEL	RIDE HEIGHT (inches)		
	NOMINAL	MINIMUM	MAXIMUM
AA230T/AA250T INTRAAAX SUSPENSIONS			
STANDARD	13.5	13.25	15.75
	14	13.25	15.75
	15	14.25	15.75
	16	15.25	17.75
	17	16.25	17.75
LIMITED JOUNCE	14	13.25	14.5
	16	15.25	16.5
AA230L/AA250L INTRAAAX SUSPENSIONS			
STANDARD	6.5	6.5	7.5
	7.5	6.5	7.5
	9	7.25	10
	12	10	13.5
	14	11.25	15
	15	12.75	15
	16	13.5	17
	17	14.25	17
	19	16.5	19
LIMITED JOUNCE	21	18.5	21
	9	8.5	10
	12	11	13.5
	14	12.5	15
	15	13.5	15
	16	14.5	17
	17	15.5	17
19	17.5	19	
21	19.25	21	
HKA180 VANTRAAX® SUSPENSIONS (INTRAAAX & K-2)			
STANDARD	14	13.75	15.25
	15	14.75	15.25
	16	16	17.25
	16.5	16.5	17.25
	17	17	17.25
	18	18	19.25
	19	19	19.25
HKA200 VANTRAAX SUSPENSIONS (INTRAAAX & K-2)			
STANDARD	14	13.75	15.75
	15	14.75	15.75
	16	16	17.75
	16.5	16.5	17.75
	17	17	17.75
	18	18	19.75
	19	19	19.75
HKA250 VANTRAAX SUSPENSIONS (INTRAAAX & K-2)			
STANDARD	16	16	17.5
	16.5	16.5	17.5
	17	17	17.5
	18	18	19.75
	19	19	19.75

HEIGHT CONTROL VALVE

THEORY OF OPERATION

The height control valve is the part of the air suspension system that imports and exports air to and from air springs. Our height control valve maintains a constant static design height and does not respond to short duration dynamic changes in axle position.

Hendrickson Trailer Air Suspension Systems need only one height control valve per trailer, regardless of the number of axles. The reason is our own patented design that uses the TRI-FUNCTIONAL BUSHING in conjunction with a rigid axle connection. The beams and axle act like a tension bar which, in turn, gives the suspension its roll stability.

Hendrickson generally recommends the height control valve be mounted on the rear axle in tandem applications and on the center axle in tri-axle applications. If a SURELOK mechanism is installed, the height control valve must be mounted to the same axle as the SURELOK.

With the axle parallel to the trailer frame, the single height control valve maintains ride height and simultaneously delivers and/or exhausts air from the air springs as required. In order for the trailer to lean, the axle must be torsionally twisted, or the axle connection has failed.

IMPORTANT: The use of two height control valves is not an approved practice. Continued use will void the warranty, unless approved in writing by the Hendrickson Trailer Suspension Systems Engineering Department.

A height control valve kit consists of one valve, sub-assembly, and fittings to attach valve to air spring.

The height control valve can be used in either a right-hand, left-hand, fore, or aft applications, with both long and short control arm accommodations.

IMPORTANT: DO NOT USE a pipe compound or teflon tape.

NOTE: For installation instructions, refer to materials provided with the air control kit.

ADJUSTING THE HEIGHT CONTROL VALVE

1. Maintain pressure in the air system.

IMPORTANT: There must be a minimum of 80 psi air pressure in the air reservoir to open the brake protection valve and allow air to flow through the height control valve.

2. Push the control arm (prior to linkage installation) up to raise the ride height or down to lower it until the distance between the vehicle frame and the center of the axle matches the suspension ride height.
3. After adjusting the ride height, insert the locating pin into the adjusting block and bracket on the height control valve.
4. Install the linkage between the suspension bracket and the lever arm on the height control valve. Adjust or replace the linkage to fit.

IMPORTANT: There are two types of linkage for the height control valve.

Clamped-Type Linkage: Trim rod, if required, and insert into both the clamps and link ends. Tighten clamps as required to hold the height control valve in its neutral position when the suspension is at proper ride height.

Bolted-Type Linkage: Trim, if required, and fasten both links together with the supplied fasteners as required to hold the height control valve in its neutral position when the suspension is at proper ride height.

5. Remove the locating pin.
6. Verify ride height by measuring it.

IMPORTANT: When returning the height control valve to the center position, wait for the air to stop flowing through the valve before checking the ride height.

7. Ensure that adequate component clearances have been provided (see FINAL INSPECTION PROCEDURES).

INTRAAX® INSTALLATION PROCEDURES

WHEEL BEARING ADJUSTMENT

1. INTRAAX typically uses the double nut wheel attaching system of an adjusting nut, lockwasher, jamnut and set screw (Figure 19).

NOTE: A single nut system is now available for some combinations.

2. After mounting the hub assembly, torque the inner adjusting nut to 200 ft-lbs (271 N•m) while rotating the hub assembly (Figure 20).

IMPORTANT: Never use an impact wrench to adjust wheel bearings.

3. Loosen the inner adjusting nut one full turn and rotate the wheel.

4. Rotate the hub assembly while retorquing the inner nut to 50 ft-lbs (68 N•m).

NOTE: This will position the bearings for final adjustment.

5. Loosen the inner nut 1/4 turn.

6. Install the lock washer.

NOTE: The tang must fit in the slot cut in the spindle while the dowel in the nut aligns with a hole in the washer.

7. If the dowel does not align, remove the washer, flip it over and reinstall.

⚠ CAUTION: Never tighten the inner spindle nut for dowel pin alignment. This may cause pre-load to the bearing and cause premature failure.

8. If necessary, loosen the inner nut slightly to align the dowel of the nut with a hole in the washer (Figure 21).

9. Install the outer nut.

10. Torque outer nut to 315-385 ft-lbs (427-521N•m).

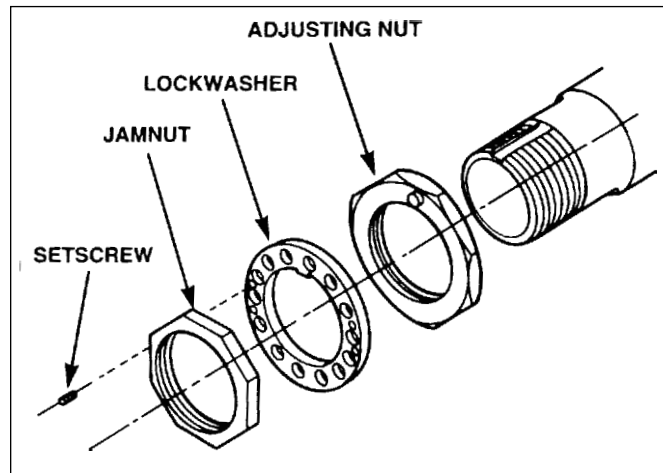


Figure 19. Double nut wheel attaching system

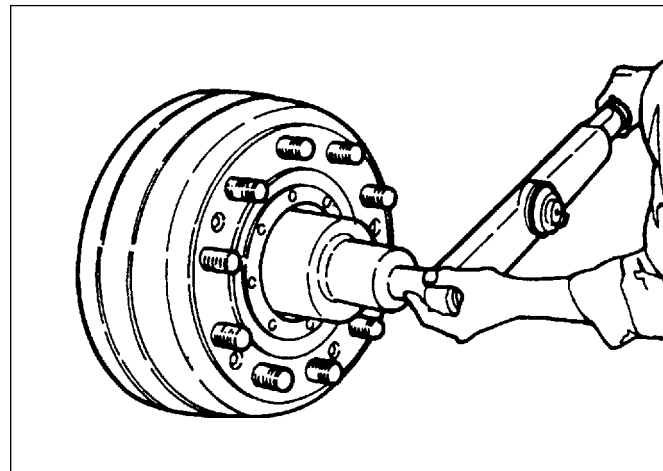


Figure 20. Torque the inner adjusting nut

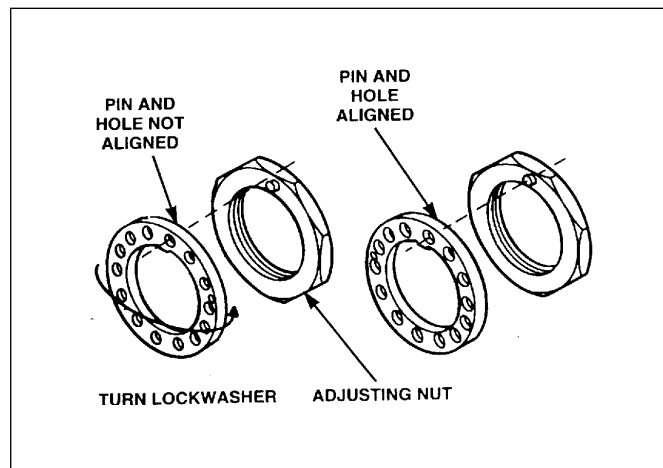


Figure 21. Align the dowel of the nut with the hole in the washer

11. Verify the end play with a dial indicator by using the following procedure:
 - a. Attach the magnetic base of the dial indicator to the spindle end. The stem of the dial indicator must touch the gasket surface of the hub (Figure 22).
 - b. Rotate the hub slightly in both directions while pushing the assembly inward until the reading does not change. Zero the dial indicator (Figure 23).
 - c. Slightly rotate the hub in both directions while pulling outward on the assembly until the reading remains constant (Figure 24).

NOTE: Wheel end play should be between .001"-.005". If end play is not within specifications, then readjustment is required.

12. Install and tighten the set screw to 18-19 ft-lbs (24-25 N•m) in the lock washer, after the wheel end play has been verified.

CONMET PRESET™ HUB PROCEDURES

INSTALLING CONMET PRESET HUBS

1. All PreSet hubs are shipped ready for installation with a thin film of lubricant on the bearings. (If using an oil-filled hub, additional lubricant will be added after installation.)
2. Install the PreSet hub all the way onto the spindle. Allow the temporary plastic alignment sleeve to be pushed out of the PreSet hub as it is installed onto the spindle.
3. Once the bearing is on the spindle, **NEVER REMOVE THE OUTER BEARING**. Removing the outer bearing may cause the seal to become misaligned, resulting in premature seal failure.
4. Remove the plastic bearing cover and install the spindle nut.
5. Torque the inner (adjusting) nut to 300 ft-lbs (407 N•m). Do not back off inner spindle nut.
6. Install the spindle locking nut. If the dowel pin and washer are not aligned, turn it over and reinstall. If required, tighten the nut until alignment takes place. **NEVER LOOSEN THE SPINDLE NUT FOR DOWEL PIN ALIGNMENT.**

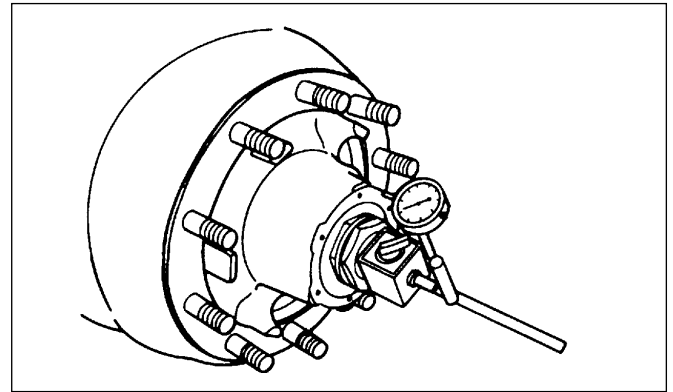


Figure 22. Attach dial to spindle head

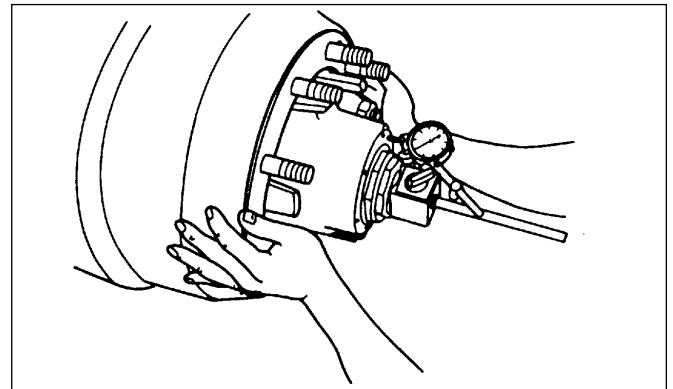


Figure 23. Measure the inward play

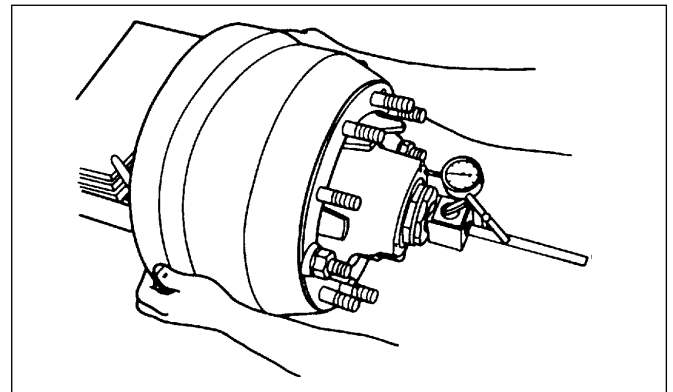


Figure 24. Measure the outward play

7. Install the outer spindle (jam) nut. Torque to 200 ft-lbs (271 N•m).
8. Install and tighten the locking set screw to 18-19 in-lbs.

AXLE ALIGNMENT — QUIK-ALIGN

OVERVIEW

The QUIK-ALIGN alignment feature incorporates two flanged washers that are inserted into slots located on each side of the frame bracket. The outboard flanged washer is eccentric. Its outside diameter is guided by an adjustment guide. Rotating the eccentric washer clockwise or counterclockwise provides fore and aft movement at the suspension's axle. The pivot connection is clamped together with a torque prevailing heavy hex nut, hardened flat washers and shear-type bolt. The shear-type bolt ensures proper torque and eliminates the need for a torque wrench.

REQUIRED MATERIALS

The following sockets and wrenches are needed to adjust QUIK-ALIGN equipped suspensions:

1. 1" drive E-20 Torx socket (Hendrickson P/N A-24536)
2. 1⁷/₁₆" wrench
3. 1/2" breaker bar
4. Impact wrench capable of 600 ft-lbs

ALIGNMENT PREPARATION

1. The axle alignment site area should be flat, level and free of debris.

NOTE: Alignment of sliders — If the suspension is mounted on a slider assembly, remove the slack in the locking pins to match the slider as closely as possible to its operational state. A recommended procedure is to lightly apply the trailer's brakes and gently pull forward, thus removing all of the slack. This procedure will avoid pre-loading the TRI-FUNCTIONAL BUSHINGS when moving the trailer.

2. Set the trailer's bolster plate (upper coupler) to its designed height by adjusting the landing gear. Set suspension(s) at the ride height specified on the suspension assembly drawing.
3. Inspect each tire set. Tires of each dual wheel set must be matched to a maximum of 1/8" tire radius or a maximum of 3/4" variation in tire circumference.
4. Secure trailer and release the trailer's brakes. This will allow wheel rotation while positioning the suspension fore and aft.

ALIGNMENT PROCEDURE

1. Tighten the torque-prevailing heavy hex nut on each shear-type pivot bolt to hold the flanged eccentric collar in place between the alignment guide, but loose enough to permit the hardened flat washers to rotate freely.

⚠ CAUTION: DO NOT APPLY OR ALLOW any type of lubricant to contact the threads of the shear-type pivot bolts. Lubricant will reduce the friction between the threads of the bolts and the torque-prevailing heavy hex nut. Failure of the shear-type pivot bolts may occur.

⚠ CAUTION: DO NOT APPLY undercoating to the suspension and frame bracket until after completing the alignment. Undercoating will effect clamp load of the pivot connection fastener and can damage the hardware.

IMPORTANT: You can reuse the shear-type pivot bolt and torque-prevailing heavy hex nut one time prior to the trailer being put into service. If future realignment becomes necessary, you must use new pivot-connection hardware P/N S-24679 to prevent failure of the pivot connection due to insufficient clamp load. Hendrickson provides the means to achieve correct axle alignment. However, the OEM or repair facility is responsible for proper assembly and performing the axle alignment. Therefore, Hendrickson assumes no liability for pivot-joint failures or incorrect axle alignment.

2. Inspect the orientation of the square hole in the flanged eccentric collar (outboard side). The square hole should be at the twelve o'clock (12:00) position or the middle of the alignment adjustment.
3. If necessary, adjust the flanged eccentric collar so the square hole is at the 12:00 position. To adjust the flanged eccentric collar, insert the 1/2" square drive breaker bar into the square hole in the flanged eccentric collar. Rotate the flanged eccentric collar a maximum of 45 degrees clockwise or counterclockwise to produce fore-and-aft axle positioning.

4. Repeat steps 1 through 3 on the remaining pivot connections.
5. Measuring from the trailer's kingpin, rotate the flanged eccentric collar on one side of the forward axle clockwise or counterclockwise until both axle ends are equal distance from the kingpin.

IMPORTANT: A maximum of $\frac{1}{8}$ " tolerance from side to side is considered acceptable.

6. If the flanged eccentric collar reaches 45 degrees without achieving alignment, rotate the flanged eccentric collar of the suspension's other frame bracket; repeat step 2.

IMPORTANT: Beyond 45 degrees in either the fore or the aft directions of the flanged eccentric collar, there is no change in adjustment.

7. Tap on the flanged concentric collar (inboard side of the frame bracket) with a rubber mallet during adjustment.

IMPORTANT: The tapping allows the concentric and eccentric collars to move in unison. If the collars do not move together, the concentric collar may wedge against the frame bracket during the adjustment. The result of the "wedged" collar (Figure 25) is an inaccurate alignment.

IMPORTANT: Figure 27 depicts a properly positioned eccentric collar.

8. If additional axle movement is necessary, adjust the flanged eccentric collar on the opposite side of the forward axle from the 12:00 position.

IMPORTANT: When making these axle movements, avoid compressing the TRI-FUNCTIONAL BUSHING.

CAUTION: Always wear eye protection when operating pneumatic tooling.

CAUTION: Always pin the socket to the pneumatic tooling.

9. After achieving proper alignment of the forward axle, snug the pivot-connection fasteners and recheck alignment.

10. Torque the shear-type pivot bolt to 550 ft-lbs (± 45 ft-lbs) with the 1" drive socket until the Torx head shears off from the bolt.

11. Align the additional axles to the forward axle by rotating their flanged eccentric collars until the ends of the axles are an equal distance from the axle in front of it. Repeat steps 1-3 and 6-9.

IMPORTANT: A maximum alignment tolerance of $\frac{1}{16}$ " is considered acceptable on the additional axle(s).

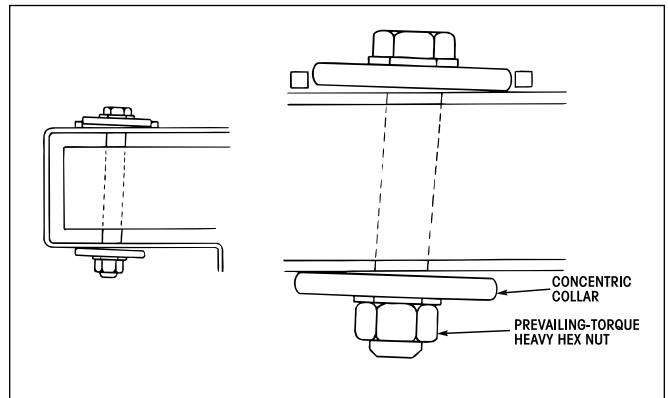


Figure 25. "Wedged" pivot connection hardware

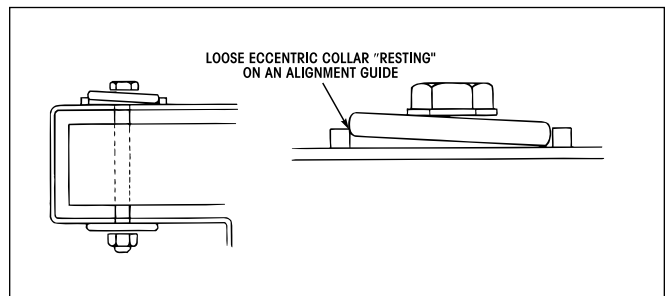


Figure 26. "Raised" eccentric collars

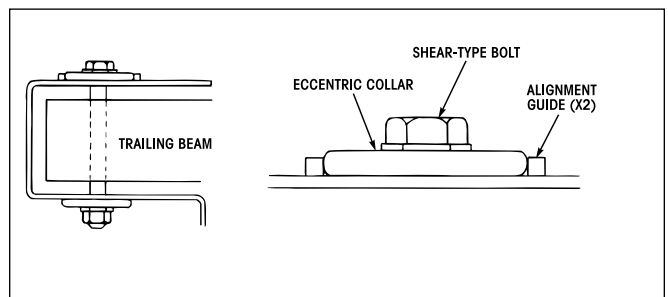


Figure 27. Properly positioned eccentric collar

HK SLIDER SYSTEM INSTALLATION

COMPONENT POSITIONING

The proper positioning of the slider components, relative to one another as well as to the trailer components, is crucial to extended component life. The four most important factors in this relationship are as follows: (Figure 28)

1. BODY RAIL SPACING — Body rail spacing must be held to permit slider longitudinal movement, and yet limit slider misalignment.
2. PARALLEL BODY RAILS — Both body rails must remain parallel to one another both vertically and horizontally.
3. PIN HOLE ALIGNMENT — The coaxial hole alignment must not vary more than $\pm 1/16$ ".
4. ALIGNMENT WITH TRAILER — The longitudinal center axis of the trailer must match that of the slider system.

Failure to correctly position the components can lead to the following trailer problems and void any future warranty coverage:

- Positioning Difficulties
- Improper Tracking
- Improper/Inadequate Pin Engagement
- Premature Tire Wear
- Shortened Slider System/Suspension Life

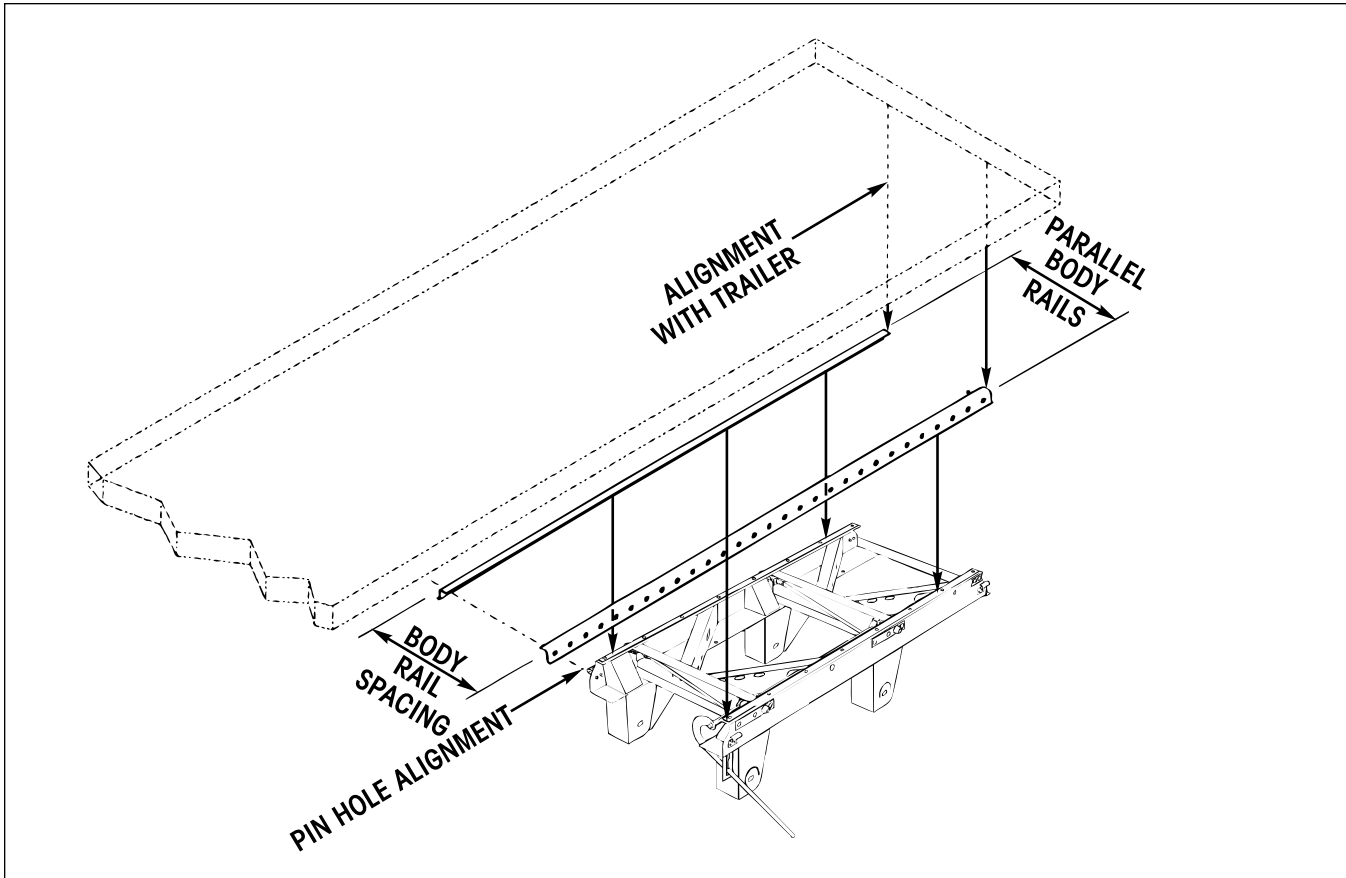


Figure 28. Component positions

BODY RAIL INSTALLATION

1. Place both slider body rails face down (large flange pointing down) on a flat level surface, spaced apart at the approximate width of the slider box (Figure 29). It is important that the surface be level to avoid the possibility of unparallel (both horizontally and vertically) body rails.

NOTE: A forward and rearward positive stop must be provided and installed by the trailer OE or other slider installer on the body rail ends. (See Figure 30 for Hendrickson’s recommended method.)

2. Using a flexible rule, measure the body rail hole spacing (Figure 31, dimension X1). Both body rails and slider box should possess the same hole spacing.
3. Using the same measuring instrument, measure the body rail width at the most forward and rearward location. Adjust rails accordingly to achieve the same spacing (Figure 31) that equals that of the body rail clearance specification dimension located on the overall slider assembly drawing (supplied with the slider system). Be sure that the body rail clearance specification corresponds to the rail spacing in Figure 30.
4. Measure both body rail diagonals (from hole centers) (Figure 31). If diagonals are unequal, adjust as required. Equal “W” and “Z” measurements will position the body rails correctly, guaranteeing parallel body rail spacing and coaxial hole alignment.

5. Insert positive stops in the most forward and rearward hole of the body rails and tack weld in place (Figure 30).
6. With the positive stops in place and tacked, weld completely as described in the HK SLIDER WELDING PROCEDURES section on page 24.
7. Once the positive stop welds have cooled, lift and position the rail weldment over the top trailer crossmembers. Lower the weldment onto the crossmember aligning the end of the body rail with the intended end of the trailer, making sure both are centered to one another laterally.

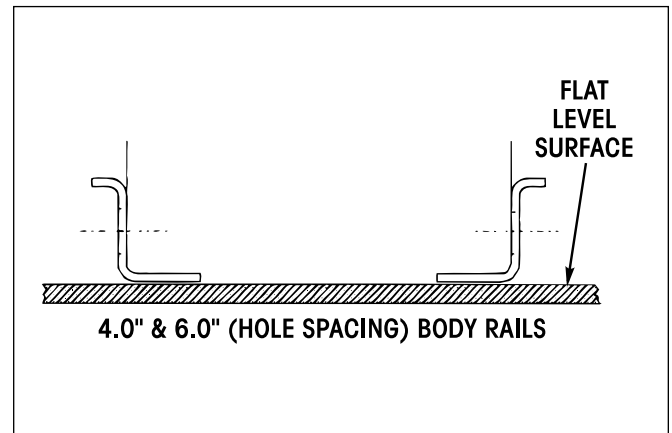


Figure 29. Slider body rail positions

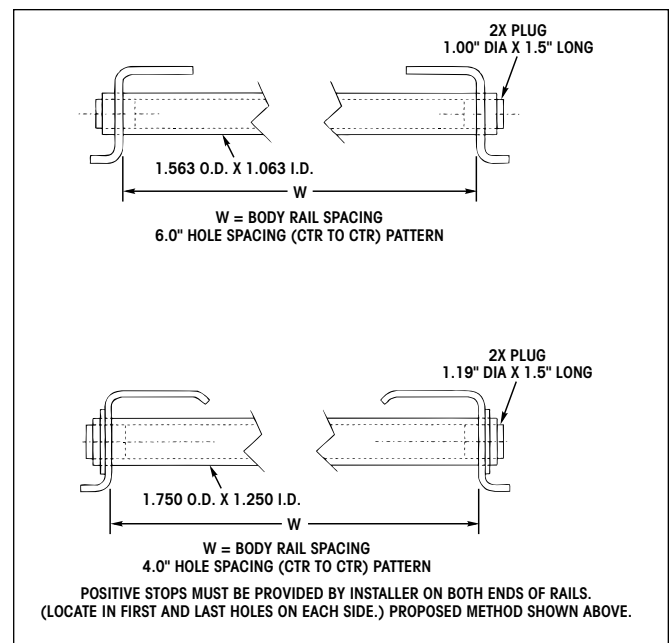


Figure 30. Positive stops installation

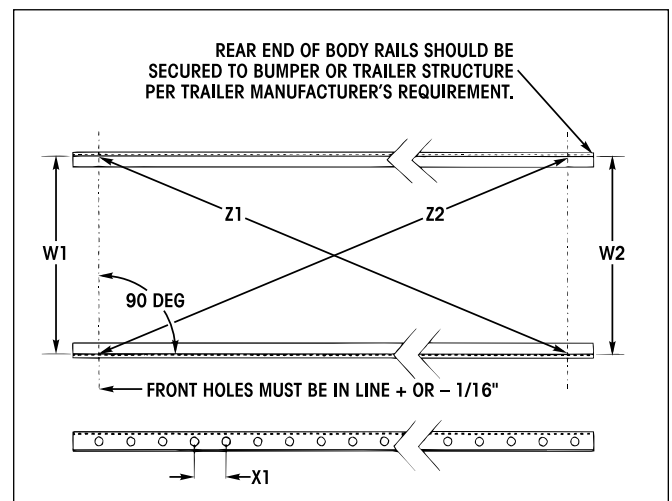


Figure 31. Body rail spacing and diagonals

INTRAAX® INSTALLATION PROCEDURES

- Starting from the most rearward location on the body rails, inspect the width measurement approximately every 48" (Figure 32). The value for Y1, Y2 and Y3 comes from the width of the slider box and whether or not shims are present (Figure 30). Adjust accordingly and completely weld the slider body rails to the trailer's crossmembers, as described in the HK SLIDER WELDING PROCEDURES section on page 24 (Figure 37) and welding parameters on page 7.

SLIDER BOX INSTALLATION

The instructions that follow assume that the body rails have been installed completely and have been inspected.

- Using an open-end wrench or ratcheting wrench and socket, loosen all of the fasteners (qty. 8) that secure four body rail clips (Figure 33).
- Double check body rail spacing (Figure 30).
- Inspect the condition of the slider box's slide pads (Figure 36). In order to achieve optimum slide performance, it is important that all slide pad fastener heads be located below the top surface of the pads.

⚠ CAUTION: Check the trailer underbody to ensure no burrs, paint, undercoating, or other contamination exists on it, which could damage the slide pads. If burrs, paint, undercoating, or other contamination exists on the trailer underbody, remove it before installing the slider box.

NOTE: The box slide pads do not require lubrication. Its composition (U.H.M.W. Polyethylene) is such that many slides can be made before replacement is needed.

- Locate the slider box operating handle. The handle is located on the driver side at the front of the slider box. To release the pins, raise the operating handle and lock in the "up" position. Inspect all four pins for disengagement (pins must be flush with, or just below, the box side rail) (Figure 34).

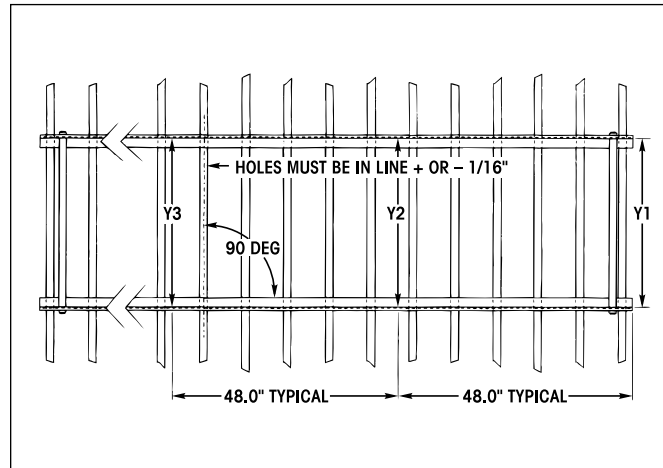


Figure 32. Spacing measurements

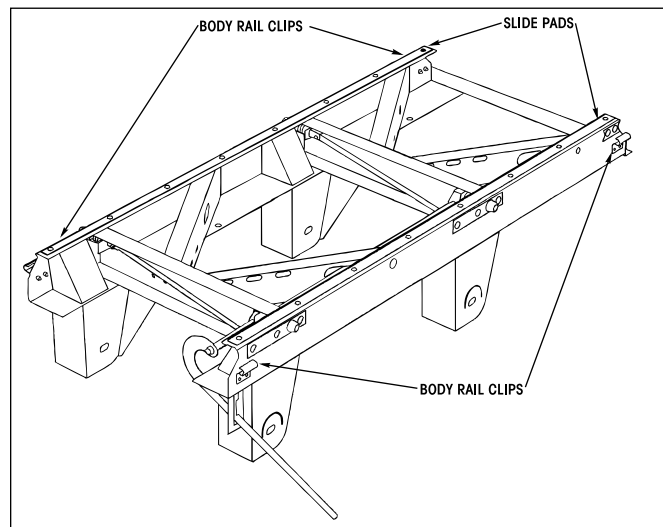


Figure 33. Body rail clips

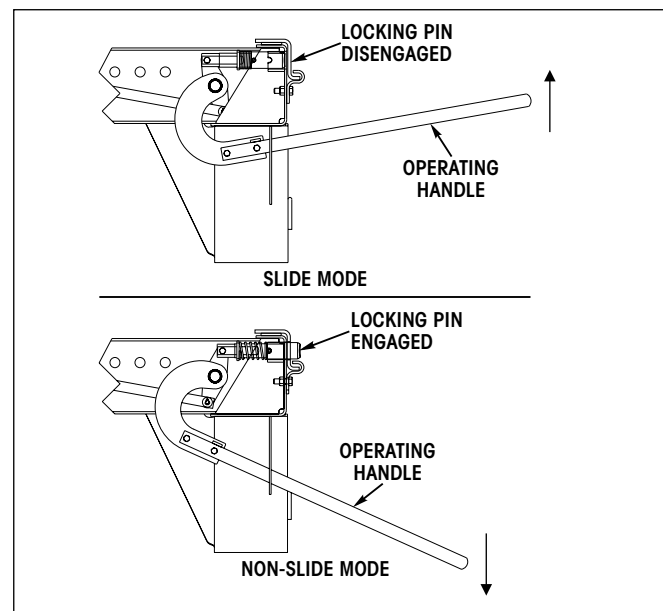


Figure 34. Locking pin position

5. Lift and position the trailer over top of the slider box. Lower the trailer onto and between the slider body rails, making sure that the box end with the operating handle is positioned closest to the trailer kingpin.
6. Position the body rail clips over the body rail flange (Figures 35 and 36).

⚠ CAUTION: Improper positioning of the body rail clips and the body rail flange can result in premature failure.

7. Lower the operating handle and lock in the “down” position to engage the pins. Inspect pins, making sure pin engagement (chamfered end projects through body rail) occurs at all four locations (Figure 34).

8. Position body rail clips over the body rail flange (Figure 35), and torque all of the body rail clip fasteners to the recommended value listed in the APPENDIX.
9. Locate the supplied K2 Operating Instructions sticker (L712). Remove backing and install in an area clearly visible near the slider’s operating handle.

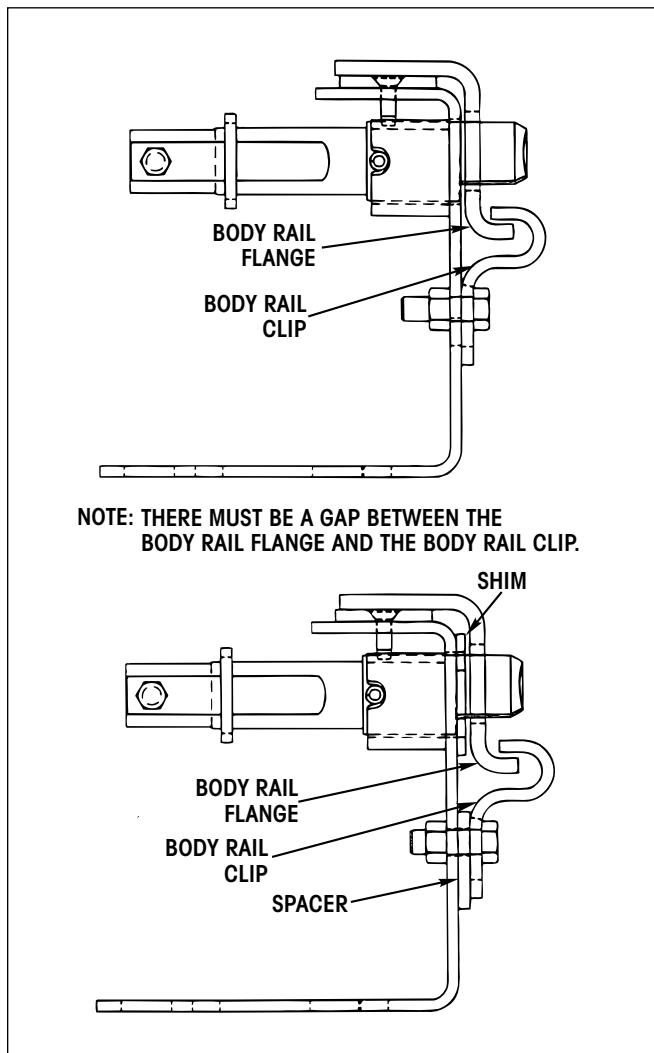


Figure 35. Correct body rail clip installation

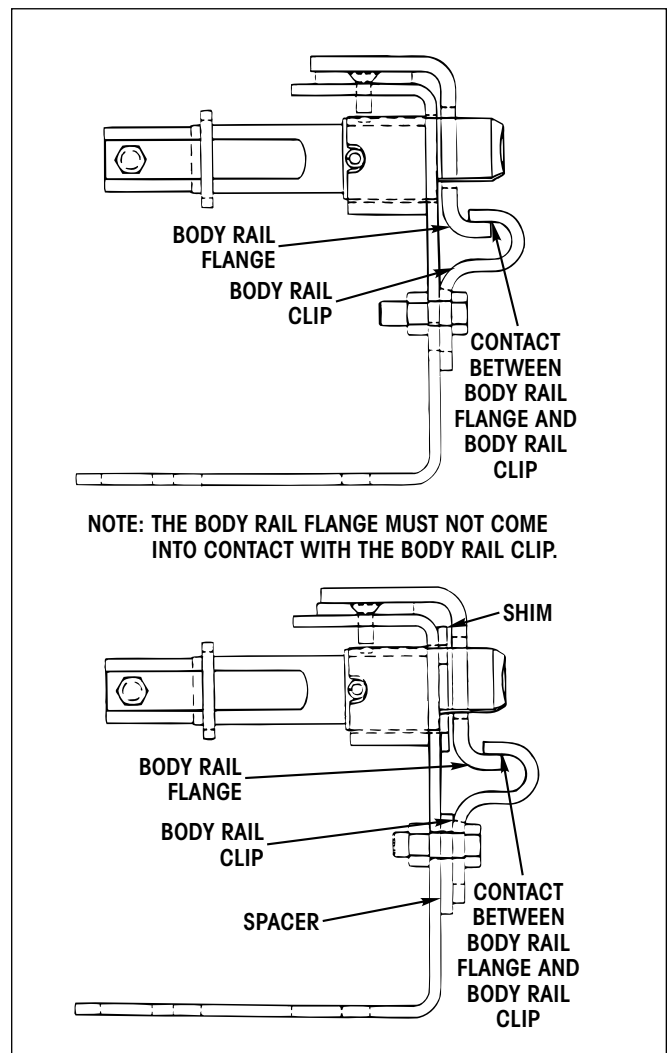


Figure 36. Incorrect body rail clip installation

INTRAAX® INSTALLATION PROCEDURES

HK SLIDER WELDING PROCEDURES

Starting and stopping points should be no closer than 1/4" from the mating edge of the suspension component and the trailer frame and/or the crossmembers. The procedures illustrated may need to be adapted due to varying trailer designs (Figures 37 and 38).

NOTE: It is the responsibility of the suspension installer and the vehicle designer to provide both adequate vehicle frame design and proper securing method of the suspension system.

NOTE: The welding parameters for these procedures are on page 21.

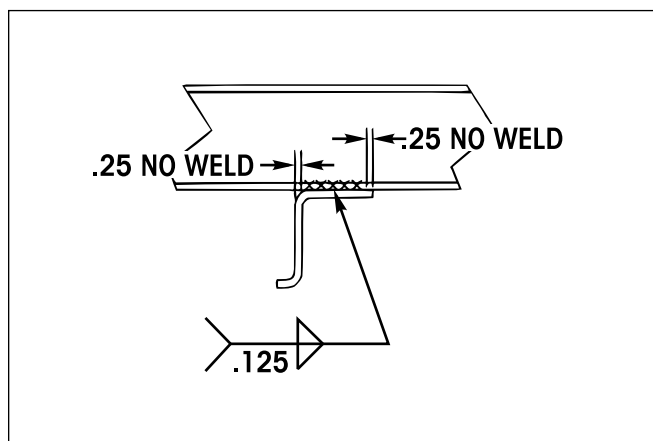


Figure 37. HK slider recommended body rail attachment

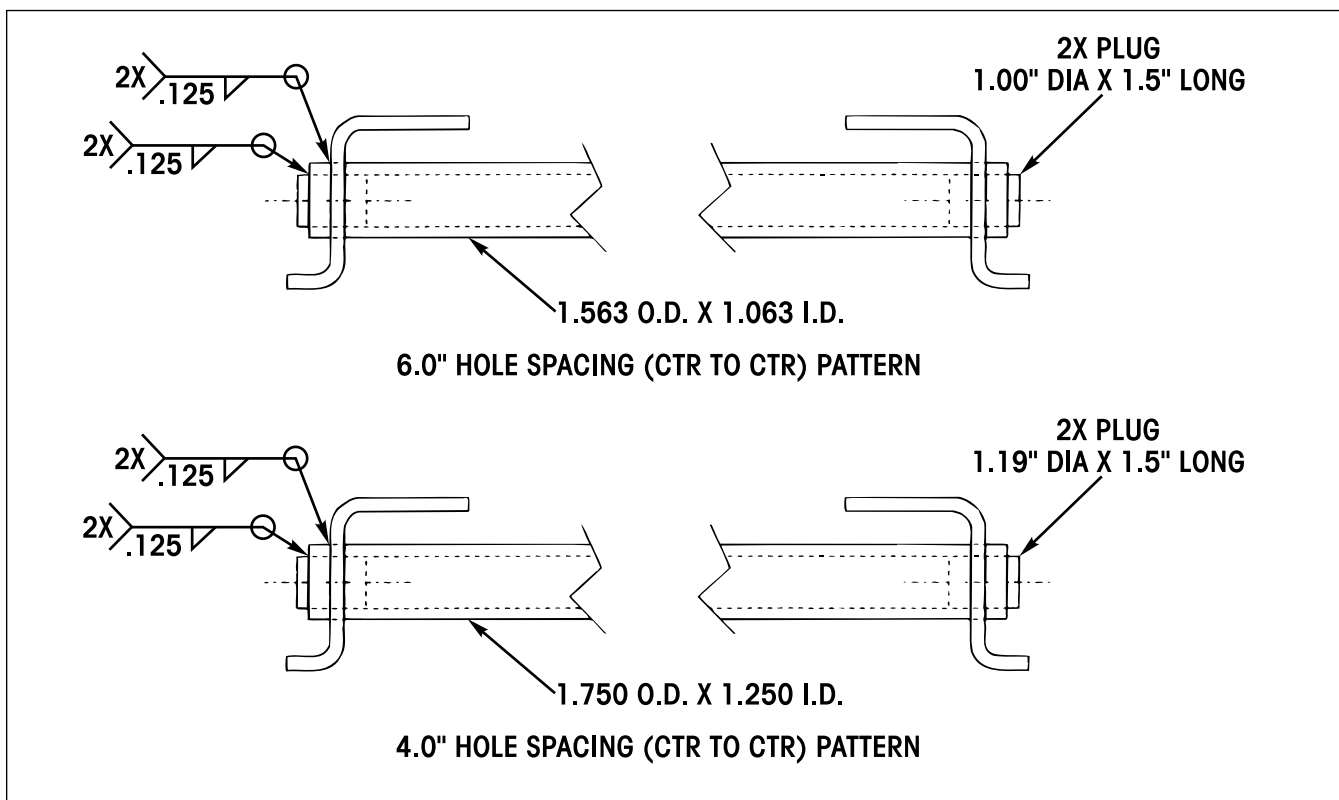


Figure 38. HK slider recommended weld procedure

**FINAL INSPECTION
INSPECTION PROCEDURE**

1. Verify that the following welds have been completed per specifications:
 - Frame brackets to mounting frame (if applicable)
 - Upper air spring/plate to mounting frame
 - Body rails to trailer crossmembers (slider system)
 - Forward and rearward stop bars to slider body rails (slider system)
2. Check that all suspension bolt torques are to Hendrickson recommended specifications.
3. Articulate the suspension through its entire travel to ensure that adequate component clearances have been provided. Special attention should be paid to both the height control valve linkage (Figure 39) and the height control valve arm length as specified in the supplied suspension assembly drawing.
4. Verify that the shear-type bolts have been sheared on QUIK-ALIGN installations.
5. Inspect all four locking pins for proper engagement (slider system).

6. Test drive the trailer and then continue the final installation inspection procedure.
 7. Check for proper suspension ride height. Adjust, if necessary. For the proper procedure, refer to Checking Trailer Ride Height (L459).
- NOTE:** The distance from the bottom of the frame to the top of the axle must be within $\frac{1}{8}$ " from side to side.
8. Verify that a minimum of 2" has been provided from the inner tire inside sidewall to the trailer structure to allow for lateral or fore/aft tire movement.
 9. Verify that a minimum of 1" has been provided above the top of the tire when the suspension is fully compressed or in its FULL jounce position.
 - Tire Clearance at Ride Height = Jounce Specification + 1"
 10. Verify that the front axle alignment does not exceed a maximum variation of $\frac{1}{8}$ " kingpin to front axle and a maximum variation of $\frac{1}{16}$ " axle to axle on any additional axles.
 11. Verify that a minimum of 1" clearance is maintained around the air spring when it is at its maximum diameter specification.

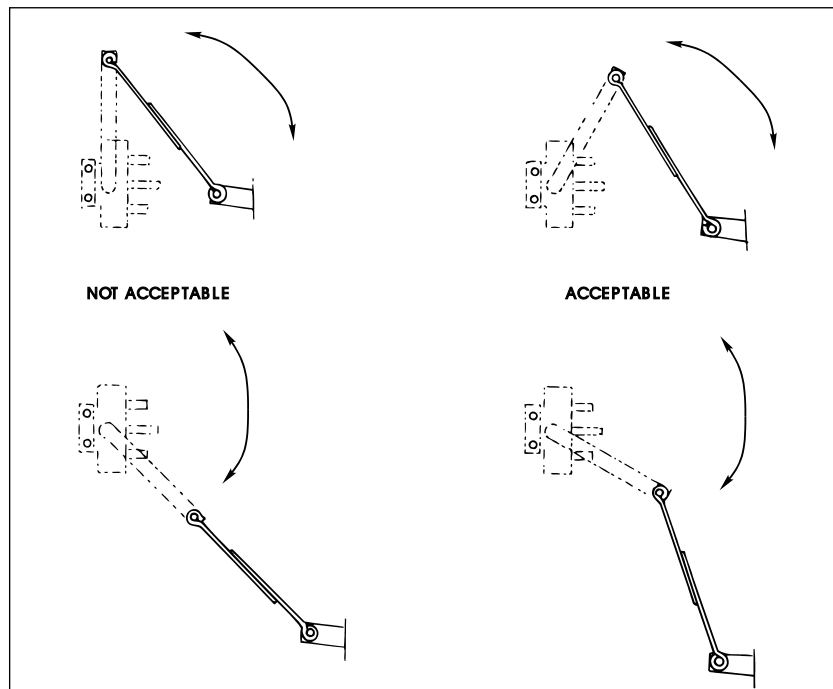


Figure 39. Height control component travel

INTRAAX® INSTALLATION PROCEDURES

APPENDIX

TORQUE SPECIFICATIONS

Use these torque specifications when installing the fasteners covered below.

COMPONENT DESCRIPTION	FT-LBS	N•m
QUIK-ALIGN Pivot Connection	505 to 595	685 to 807
Welded Pivot Connection (1 ¹ / ₈ inches)	750 to 825	1017 to 1119
Shock Bolts	210 to 235	285 to 319
Upper Air Spring Nuts	80 to 100	108 to 136
Lower Air Spring Nuts (INTRAAX)	25 to 35	34 to 47
Brake Chamber Mounting Nut (INTRAAX)	100 to 110	136 to 149
S-Cam Support Bearing Mounting Nut (INTRAAX)	35 to 45	47 to 61

COMPONENT DESCRIPTION	IN-LBS	N•m
ABS Bracket Bolt and Nut (INTRAAX)	75 to 100	8 to 11
Dust Shield, Bolt-to-Spider (INTRAAX)	160 to 180	18 to 20
Dust Shield, Clamp-on (INTRAAX)	95 to 170	11 to 19

NOTE: Torque values are specified for the fasteners in the condition in which they are supplied by Hendrickson.

DO NOT APPLY ANY ADDITIONAL LUBRICANTS.

 **CAUTION:** Overtorquing could result in fastener failure.

Trailer Suspension Systems
2070 Industrial Place SE
Canton, OH 44707-2600 USA
330.456.7288
Fax 330.456.0105



Trailer Suspension Systems
250 Chrysler Drive, Unit #3
Brampton, ON L6S 6B6 Canada
905.789.1030
Fax 905.789.1033