

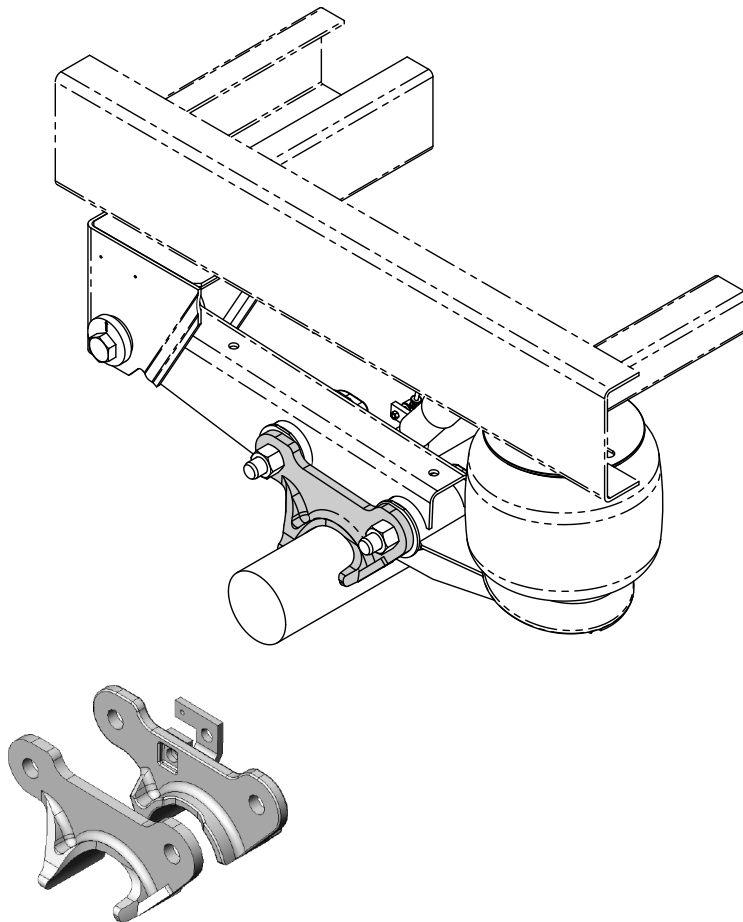


# 2-PC AXLE ADAPTERS

## INSTALLATION

**Trailer Suspensions: NS-Series, RL-228/230,  
RL-250 SB & SA-Series**

Installation Procedures



# CONTENTS

	Page		Page
Introduction.....	2	Component Replacement Instructions .....	3
Notes, Cautions, and Warnings .....	2	Contact Information .....	8

## INTRODUCTION

This SAF-HOLLAND manual provides you with the proper removal and installation of the 2-piece axle adapter provided in this axle adapter kit. Following these steps will allow you to safely remove and reinstall the axle adapters to the axle and the suspension to the trailer. All welding must be performed by a qualified welder.

## NOTES, CAUTIONS, AND WARNINGS

You must read and understand all of the safety procedures presented in this manual before starting any work on the suspension.

Proper tools must be used to perform the maintenance and repair procedures described in this manual. Many of these procedures require special tools.

Failure to use the proper equipment could result in personal injury and/or damage to the suspension.

**Safety glasses must be worn at all times when performing the procedures covered in this manual.**

Throughout this manual, you will notice the terms “NOTE,” “IMPORTANT,” “CAUTION” and “WARNING” followed by important product information. So that you may better understand the manual, those terms are as follows:

**NOTE:** Includes additional information to enable accurate and easy performance of procedures.

**IMPORTANT:** Includes additional information that if not followed could lead to hindered product performance.

**CAUTION** Used without the safety alert symbol, indicates a potentially hazardous situation which, if not avoided, may result in property damage.

**⚠CAUTION** Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.

**⚠WARNING** Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

# COMPONENT REPLACEMENT INSTRUCTIONS

## Axle Connection Rubber Bushings

**IMPORTANT:** It is recommended that the vehicle be unloaded before beginning service procedures.

1. Support vehicle frame with adequate jack stands. Set jack stand height at approximately 2" (51mm) above the suspension's specified ride height.

**⚠ WARNING** Failure to properly support suspension during maintenance may allow suspension to fall which, if not avoided, could result in death or serious injury.

**NOTE:** The height control valve may be used as an improvised jack by disconnecting the lower height control valve (HCV) linkage and moving the HCV control arm to "up" position to raise vehicle. With vehicle raised above the height specified in step 1, position jack stands under vehicle frame at OEM specified locations and move control arm to "down" position to lower vehicle onto jack stands. Hold control arm down until air springs are completely exhausted.

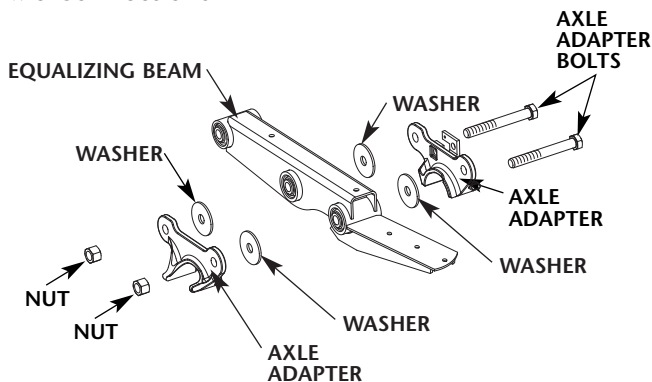
**⚠ CAUTION** Exhaust all air pressure from the system or personal injury may occur.

2. Exhaust air from the suspension system by:
  - Automatic control — use height control valve by disconnecting link at lower connection, then rotate control arm to exhaust (approx. 45° down) position, or
  - Disconnect air supply line from air spring.

**NOTE:** Vehicle must be at model's specified ride height or below to assure that tension is relieved on shocks.

3. Disconnect air spring and shock absorber at lower connections.
4. Disconnect height control valve linkage at lower connection.
5. Disconnect axle connection hardware then remove equalizing beam (**FIGURE 1**).

**FIGURE 1**  
Axle Connections



6. Inspect equalizing beam bushings for wear. Replace if necessary.
7. Inspect axle adapters for wear, cracks and failed welds. Axle adapters should have a 1/2" (13mm) (3 pass) fillet weld (refer to proper SAF-HOLLAND NS-65-83 specifications). Replace all worn or cracked axle adapters.
8. Inspect equalizing beams for wear, cracks and failed welds. Replace cracked equalizing beams.

**IMPORTANT:** NEVER repair a cracked equalizing beam. DO NOT weld cracks. Secondary weld failures during use may cause loss of vehicle control.

**⚠ WARNING** Failure to replace a cracked equalizing beam may cause loss of vehicle control which, if not avoided, could result in death or serious injury.

9. Inspect frame brackets for cracks or out-of-round holes in alignment plates. Replace if necessary.
10. Remove the axle adapter welds.

**NOTE:** Care should be taken when removing welds not to damage the axle. Clean the axle so the new adapters will seat flush on the axle.

**NOTE:** It is recommended the axle assembly be removed for ease of welding. If axle assembly is removed, use a 1-1/8" diameter rod through the pivot bushings to insure proper pivot alignment prior to welding the new axle adapter in place.

11. Assemble the new adapters to the equalizing beam. See *Table 1, Torque Chart* (page 4) for proper torque.
12. Re-install the equalizing beam into the frame bracket making sure the washers are in the correct position to achieve the proper beam centers.
13. Set the axle at proper ride height and clamp the axle adapters to the axle. Refer to SAF-HOLLAND NS-65-83 for proper welding recommendation and procedures.
14. Reconnect air springs, shock absorbers, and height control valve linkage. Properly torque fasteners at the pivot and axle connections (see Torque Chart). Check air system for leaks.
15. Remove jack stands. Build system air pressure in excess of 75 psig (5.2 bars) and check for leaks in air system at all connections.

**IMPORTANT:** It is the responsibility of the air system installer to secure all air lines and check for any air leaks. If air leaks are detected, repair as required. Failure to eliminate the air leaks may compromise the suspension performance.

*continued*

# COMPONENT REPLACEMENT INSTRUCTIONS *continued*

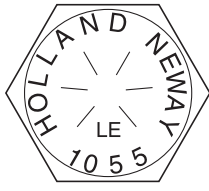
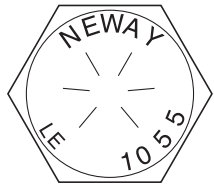
**TABLE 1**  
**Torque Chart**

SIZE	TORQUE FT. LBS.	TORQUE NM
3/4"	140 - 175	189 - 237
1 1/8" (Axle Conn.)	800	1083
1 1/8" (Pivot Conn.)	See Table 2	
1/2" - Air Spring	30 - 40	41 - 54
3/4" - Air Spring	40 - 45	54 - 61

**IMPORTANT:** Torque requirements listed are for clean and lubricated threads.

**IMPORTANT:** Torque requirements listed are for clean and lubricated threads. Use of special lubricants with friction modifiers, such as Anti-Seize or Never-Seize, without written approval from SAF-HOLLAND Engineering will void warranty and could lead to premature bolt failure or other component issues.

**TABLE 2**  
**Pivot Bolt Torque Chart**

IDENTIFIER	NEW PIVOT BOLT	OLD PIVOT BOLT
Bolt Head Marking		
Color	Silver	Black
Surface Appearance	Dry	Wet - Oily
Torque Specification	<b>550 - 600</b> FT. LBS. (745 - 812 Nm)	<b>800</b> FT. LBS. (1083 Nm)

**⚠ WARNING** DO NOT torque **old** pivot bolt to the new torque specification of 550 ft. lbs. (745 Nm). Pivot may loosen causing premature wear or fracturing of the bolt and other suspension components that could result in a loss of vehicle control.

**⚠ CAUTION** DO NOT torque **new** pivot bolt to the old torque specification of 800 ft. lbs. (1083 Nm). Removal or loosening of pivot bolt for service, repair, or axle alignment may become difficult if the new bolt is torqued to 800 ft. lbs. (1083 Nm).

# COMPONENT REPLACEMENT INSTRUCTIONS *continued*

**FIGURE 2**  
**Axle Weld Specification: NS-65-83, sheet 1 of 2**

	SPEC. NUMBER: <b>NS-65-83</b>	PART NUMBER: <b>94100686</b>																																																																																					
TITLE: WELDING RECOMMENDATION FOR NEWAY ROUND AXLE ADAPTER ROUND AXLE NS-SERIES, SA-SERIES, RL-228, RL-230, RL-250-SB	CHANGE RECORD																																																																																						
	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 5%;">LTR</th> <th style="width: 65%;">WAS</th> <th style="width: 10%;">BY</th> <th style="width: 10%;">ECN</th> <th style="width: 5%;">CHK</th> <th style="width: 5%;">ENG</th> <th style="width: 5%;">DATE</th> </tr> </thead> <tbody> <tr> <td>A</td> <td>REVISION</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>A1-2</td> <td>ADDED RL-250 PER FORM # REMOVED RL-250 PER 22801</td> <td></td> <td>2002</td> <td></td> <td></td> <td>09/09/01</td> </tr> <tr> <td>C</td> <td>ADDED PART NO. 94100686</td> <td></td> <td>2002</td> <td></td> <td></td> <td></td> </tr> <tr> <td>P</td> <td>UPDATES TO THIS SPEC.</td> <td></td> <td>2002</td> <td></td> <td></td> <td></td> </tr> <tr> <td>D</td> <td>UPDATES TO THIS SPEC. RE: PERMANENT</td> <td></td> <td>2002</td> <td></td> <td></td> <td></td> </tr> <tr> <td>E</td> <td>UPDATES TO THIS SPEC. RE: PERMANENT</td> <td></td> <td>2002</td> <td></td> <td></td> <td></td> </tr> <tr> <td>F</td> <td>ADDED RL-228, RL-230</td> <td>SS</td> <td>2002</td> <td></td> <td></td> <td></td> </tr> <tr> <td>G</td> <td>ADDED RL-250 PER FORM # 199</td> <td></td> <td>2002</td> <td></td> <td></td> <td></td> </tr> <tr> <td>H</td> <td>ADDED NOTATION: BACKFILL WELD END .50</td> <td>JO</td> <td>9063</td> <td></td> <td></td> <td></td> </tr> <tr> <td>J</td> <td>ADDED XL-AR339-01, &amp; NS &amp; SA-SERIES, RL-228 &amp; 230</td> <td>CS</td> <td>X-1077</td> <td>BJB</td> <td>SH</td> <td>28NOV01</td> </tr> <tr> <td>K</td> <td>ADDED RL-250-SB TO TITLE</td> <td>CR</td> <td>26723</td> <td>SH</td> <td>MJE</td> <td>22APR03</td> </tr> </tbody> </table>	LTR	WAS	BY	ECN	CHK	ENG	DATE	A	REVISION						A1-2	ADDED RL-250 PER FORM # REMOVED RL-250 PER 22801		2002			09/09/01	C	ADDED PART NO. 94100686		2002				P	UPDATES TO THIS SPEC.		2002				D	UPDATES TO THIS SPEC. RE: PERMANENT		2002				E	UPDATES TO THIS SPEC. RE: PERMANENT		2002				F	ADDED RL-228, RL-230	SS	2002				G	ADDED RL-250 PER FORM # 199		2002				H	ADDED NOTATION: BACKFILL WELD END .50	JO	9063				J	ADDED XL-AR339-01, & NS & SA-SERIES, RL-228 & 230	CS	X-1077	BJB	SH	28NOV01	K	ADDED RL-250-SB TO TITLE	CR	26723	SH	MJE	22APR03		
LTR	WAS	BY	ECN	CHK	ENG	DATE																																																																																	
A	REVISION																																																																																						
A1-2	ADDED RL-250 PER FORM # REMOVED RL-250 PER 22801		2002			09/09/01																																																																																	
C	ADDED PART NO. 94100686		2002																																																																																				
P	UPDATES TO THIS SPEC.		2002																																																																																				
D	UPDATES TO THIS SPEC. RE: PERMANENT		2002																																																																																				
E	UPDATES TO THIS SPEC. RE: PERMANENT		2002																																																																																				
F	ADDED RL-228, RL-230	SS	2002																																																																																				
G	ADDED RL-250 PER FORM # 199		2002																																																																																				
H	ADDED NOTATION: BACKFILL WELD END .50	JO	9063																																																																																				
J	ADDED XL-AR339-01, & NS & SA-SERIES, RL-228 & 230	CS	X-1077	BJB	SH	28NOV01																																																																																	
K	ADDED RL-250-SB TO TITLE	CR	26723	SH	MJE	22APR03																																																																																	

THE FOLLOWING WELDING RECOMMENDATIONS ARE FOR THE INSTALLATION OF A NEWAY AXLE ADAPTER FOR THE ABOVE LISTED MODELS. WELDING SHOULD BE PERFORMED BY A QUALIFIED WELDER.

- 1) ADAPTER MUST BE BOLTED TO EQUALIZING BEAM BEFORE WELDING TO PREVENT HARDWARE DISTORTION DURING WELDING.
- 2) THE ADAPTERS MUST BE CLAMPED SECURELY IN THE PROPER POSITION. (NO GAPS MAY EXIST BETWEEN TOP CENTER OF AXLE AND AXLE ADAPTER.)  
 NOTE: TESTING HAS SHOWN THAT EVEN A SLIGHT GAP BETWEEN TOP OF AXLE AND ADAPTER CAN SEVERELY REDUCE SERVICE LIFE OF AXLE AND ATTACHMENTS.
- 3) THE AXLE TUBE AND ADAPTER MUST BE 70° F MINIMUM AND BE FREE FROM DIRT, SCALE & GREASE.
- 4) THE ELECTRODE OR WIRE SELECTED MUST CONFORM TO ONE OF THE FOLLOWING SPECIFICATION:
  - A) ELECTRODE AWS E-8018-C3 (OVEN DRIED)  
 5/32" DIA. 120-190 AMPS D.C. + 135-225 AMPS A.C.  
 3/16" DIA. 170-280 AMPS D.C. + 200-300 AMPS A.C.
  - B) WIRE SPEC. E71 T-1 (OUTERSHIELD 71H)  
 GAS 25% CO2 75% ARGON  
 VOLTS 29 - 30 DCRP  
 AMPS 210 - 250  
 WIRE DIA. .045  
 WIRE FEED SPEED 300 - 400 IN./MIN.
- 5) APPLY WELDS IN THE SIZES AND SEQUENCES SHOWN IN FIG. 1 & 2. DO NOT BREAK THE ARC AT THE END OF THE WELD. BACK UP ALL FINISH WELDS AT LEAST 1/2" OR A SUFFICIENT AMOUNT TO PREVENT CRATERS BEING FORMED AT THE END OF THE WELD.  
 NOTE: EACH PASS IS TO BE COMPLETED WITH ONE SINGLE PASS.

FIG 1

FIG 2

FIGURE 3  
Axle Weld Specification: NS-65-83, sheet 2 of 2

**SPEC. NS-65-83**

# NS-Series, RL-228/230 & SA-Series

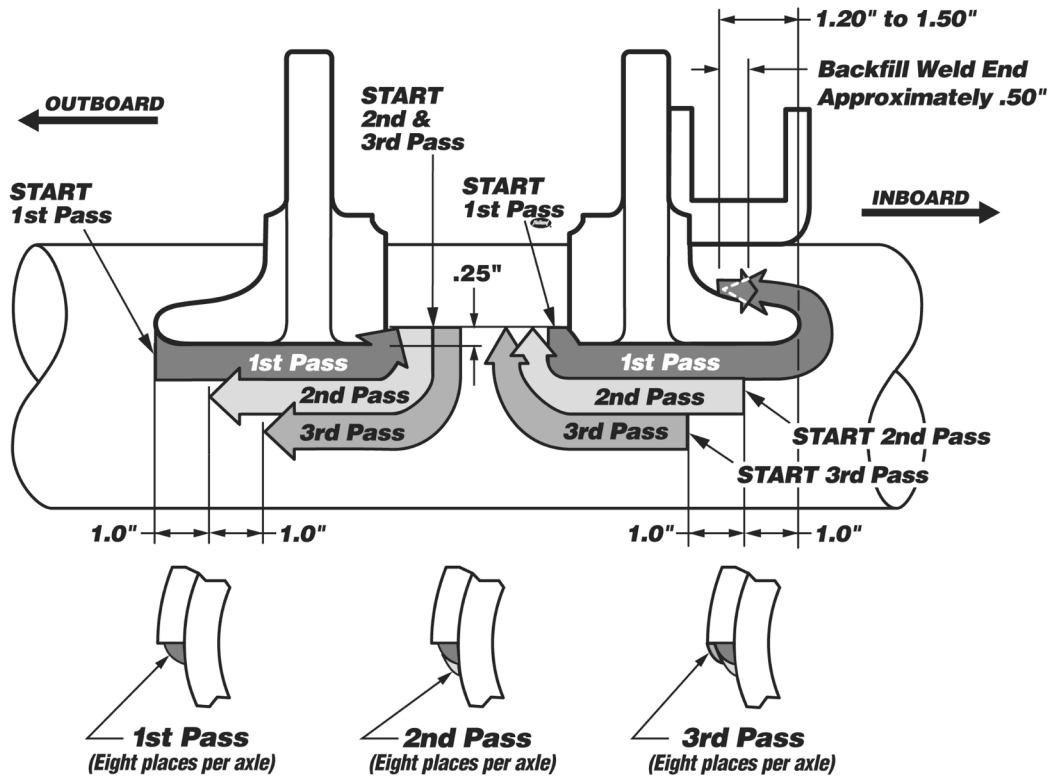
## Axle Adapter Welding Procedures *(See Reverse Side First)*

**Step 1. Apply welds in sequence**

**Step 2. Clean the weld between passes**

**Step 3. Grind excess flush with adapter**

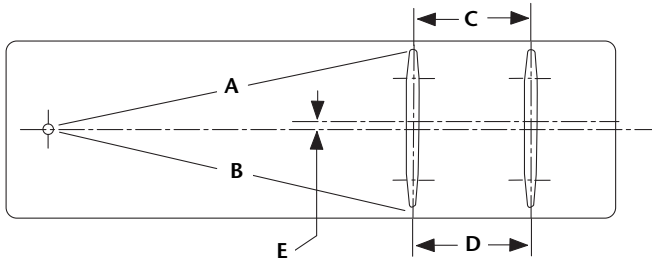
**NOTE: Each weld is to be completed with one single pass.**



# AXLE ALIGNMENT

1. To properly align the suspension, the trailer should be pulled in a straight line for a sufficient distance to insure there are no binds in the suspension.
2. The trailer should then be pulled straight forward a sufficient distance to insure there are no binds in the suspension.
3. Alignment can be achieved with an optical device designed especially for this purpose or manually by the following manner: Measure the distance from the king pin to the center line of the spindles on the axle. It is recommended that spindle extensions be utilized. Dimensions A and B must be equal within 1/8" (3mm). Dimension E is equal to the distance between the trailer center line and the axle center line (**FIGURE 4**).
4. If your trailer has EZ-Align, see *EZ-Align (Non-welded) Connection* below.

**FIGURE 4**  
Suspension Alignment



$A = B \pm 1/8'' (3\text{mm})$   
 $C = D \pm 1/16'' (1.6\text{mm})$   
 $E = \leq 1/16'' (1.6\text{mm})$

## **EZ-Align (Non-welded) Connection Axle Alignment**

1. Loosen the 1-1/8" pivot bolt connection nut (**FIGURE 5**).

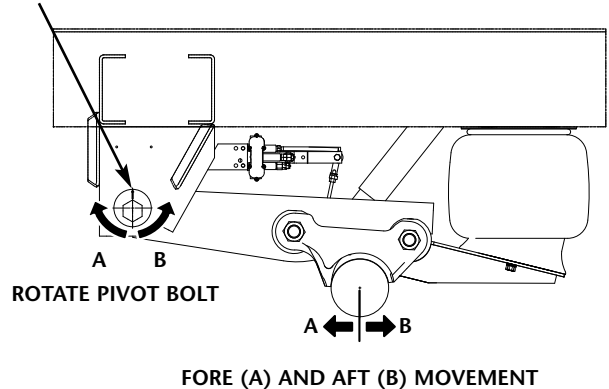
**IMPORTANT:** DO NOT remove weld from bolt head.

2. Rotate bolt head clockwise to move axle forward (A arrows); counterclockwise to move axle rearward (B arrows) (**FIGURE 5**).
3. Retorque the pivot bolt connection nut, no weld required (**FIGURE 6**). See **TABLE 2 Pivot Bolt Torque Chart** on page 4.

**IMPORTANT:** DO NOT weld EZ-Align pivot bolt (alignment block) assembly to alignment collars on frame brackets (**FIGURE 7**).

**FIGURE 5**  
EZ-Align

Alignment arrow indicates (neutral position of) alignment adjustment

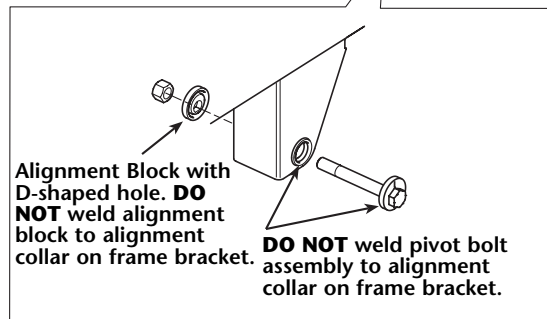


**FIGURE 6**  
EZ-Align (Non-welded) Axle Alignment  
NON-WELDED STYLE SIDE VIEW

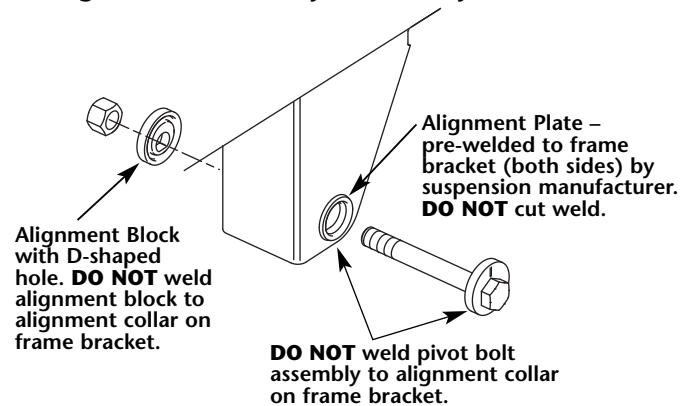
**IMPORTANT:**

The EZ-Align design maintains proper alignment under correct torque without welding.

Alignment Plate (with hidden collar) pre-welded to frame bracket (both sides) by suspension manufacturer. **DO NOT** cut weld.



**FIGURE 7**  
EZ-Align Non-Welded Style Assembly



**IMPORTANT:** The EZ-Align design maintains proper alignment under correct torque without welding.

# PRE-OPERATIONAL CHECKLIST

---

**Prior to placing unit in service, check the following items:**

**⚠ WARNING** Failure to chock tires prior to beginning maintenance could allow vehicle rollaway which, if not avoided, could result in death or serious injury.

1. Build air pressure above 75 psig (5.2 bars). With the vehicle shut off, check the system for air leaks.

**IMPORTANT:** It is the responsibility of the air system installer to secure all air lines and check for any air leaks. If air leaks are detected, repair as required. Failure to eliminate the air leaks may compromise the suspension performance.

2. With the vehicle on a level surface and air supply pressure in excess of 75 psig (5.2 bars), check the air springs for equal firmness.
3. Check the shock absorbers for proper installation. The 3/4" shock absorber nuts must be torqued to specifications (see Table 1, Torque Chart).
4. The 1/2" and 3/4" air spring mounting nuts must be torqued to specifications (see Table 1, Torque Chart).
5. Check for 1" (25mm) minimum clearance around the air springs with vehicle loaded.
6. The 1 1/8" axle connection nuts must be torqued to specifications (see Table 1, Torque Chart).
7. The suspension ride height should be within  $\pm 1/8$ " of the recommended design height.

**IMPORTANT:** The EZ-Align design maintains proper alignment under correct torque without welding; DO NOT weld alignment blocks (FIGURE 6).

**NOTE:** EZ-Align pivot connections (non-welded) are on roadside and fixed alignment pivot connections (welded) are on curbside. However, some manufacturers use EZ-Align on both sides. See page 7 for EZ-Align (Non-welded) Connection Axle Alignment procedure.

8. A 1 1/8" pivot nut must be torqued to specifications (see Table 1, Torque Chart).



SAF-HOLLAND USA, Inc.  
888.396.6501 Fax 800.356.3929

SAF-HOLLAND Canada Limited  
519.537.3494 Fax 800.565.7753  
Western Canada  
604.574.7491 Fax 604.574.0244