

## Maintenance Manual

# CBX50 TANDEM Slider Suspension Systems

- For Disc and Drum Brake Applications





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## Introduction

This manual provides information necessary for the maintenance of the SAF-HOLLAND® CBX50 trailer air suspensions.

**NOTE:** The CBX50 suspensions include premium 5.75" diameter axles.

**NOTE:** For axle end/brake components replacement, contact SAF-HOLLAND® Customer Service at 888-396-6501.

This suspension uses air drawn from the tractor air system to pressurize the air springs. The height control valve (HCV) regulates the air pressure required for varying loads while maintaining the design ride height. This suspension can provide a cushioned ride throughout the load range, from empty to fully loaded.

The suspension also provides excellent side-to-side and axle-to-axle loading which helps equalize and control braking.

## Warranty

Refer to the complete warranty for the country in which the product will be used. A copy of the written warranty is included with the product or available on the internet at [www.safholland.com](http://www.safholland.com).

## Notes, Cautions, and Warnings

Before starting any work on the unit, read and understand all the safety procedures presented in this manual. This manual contains the terms "NOTE", "IMPORTANT", "CAUTION", and "WARNING" followed by important product information. These terms are defined 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, could result in property damage.

### CAUTION

Indicates a potentially hazardous situation which, if not avoided, could result in minor or moderate injury.

### WARNING

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

# 1. General Safety Instructions

Read and observe all Warning and Caution hazard alert messages in this publication. The information provided can help prevent serious personal injury, damage to components, or both.

**⚠️ WARNING** Failure to properly support the vehicle and axles prior to commencing work could create a crush hazard which, if not avoided, could result in death or serious injury.

**IMPORTANT:** Key components on each axle’s braking system, including friction material, rotors and drums, are intended to wear over time. Worn parts should be replaced in sets on both the driver and curbside of an axle.

**⚠️ WARNING** Failure to follow manufacturer’s instructions regarding spring pressure or air pressure control could allow uncontrolled release of energy which, if not avoided, could result in death or serious injury.

**NOTE:** In the United States, workshop safety requirements are defined by federal and/or state Occupational Safety and Health Act. Equivalent laws could exist in other countries. This manual is written based on the assumption that OSHA or other applicable employee safety regulations are followed by the location where work is performed.

Please observe the following safety instructions in order to maintain the operational and road safety of the suspension:

1. The wheel contact surfaces between the wheel and hub **MUST NOT** be additionally painted. The contact surfaces **MUST** be clean, smooth and free from grease.

**⚠️ WARNING** Failure to keep the wheel and hub contact surfaces clean and clear of foreign material could result in wheel/hub separations which, if not avoided, could result in death or serious injury.

2. Only the wheel and tire sizes approved by the trailer builder may be used on this suspension.
3. Before operating the vehicle, ensure that the maximum permissible axle load is **NOT** exceeded and that the load is distributed equally and uniformly.

4. Ensure that the brakes are **NOT** overheated by continuous operation.

**⚠️ WARNING** Failure to minimize the use of brakes during overheating conditions could result in deterioration of brake efficiency which, if not avoided, could result in death or serious injury.

5. The parking brake **MUST NOT** be immediately applied when the brakes are overheated, as the brake drums or discs could be damaged by different stress fields during cooling.
6. Observe the operating recommendation of the trailer manufacturer for off-road operation of the installed axles.

**IMPORTANT:** The definition of OFF-ROAD means driving on non-asphalt/non-concrete routes, e.g. gravel roads, agricultural and forestry tracks, on construction sites and in gravel pits.

**IMPORTANT:** Off-road operation of axles beyond the approved application design could result in damage and impair suspension system performance.

7. All suspension and axles systems require routine service, inspection and maintenance in order to maintain optimum performance and operational safety as well as an opportunity to recognize wear.
8. In the event of suspension air pressure loss, quickly reduce speed as safely as possible and remove the vehicle from traffic. If unable to remove the vehicle from traffic, follow DOT safety requirements regarding emergency situations.
9. Contact a qualified towing and/or service company to assist in repairing the vehicle or to move it to a qualified repair facility. **DO NOT** operate the vehicle in the absence of suspension air pressure.

**⚠️ WARNING** Operating the vehicle without proper air pressure can cause tire failure, fire, or loss of vehicle control which, if not avoided, could result in death or serious injury.

We highly recommend the use of only SAF-HOLLAND® Original Parts.

A list of SAF-HOLLAND® technical support locations to supply SAF-HOLLAND® Original Parts can be found at [www.safholland.us](http://www.safholland.us) or contact SAF-HOLLAND® Customer Service at 888-396-6501.

Updates to this manual will be published as necessary online at [www.safholland.us](http://www.safholland.us).

## 2. CBX50 Model Identification

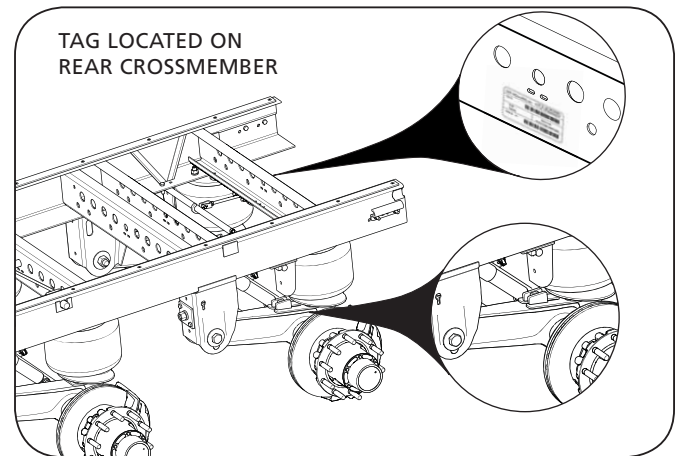
The CBX50 suspension's serial tag is located on the rear crossmember (**Figure 1**).

**NOTE:** Refer to the serial tag attached to the slider rear crossmember for information (**Figure 1**).

**NOTE:** If the suspension serial tag is NOT legible or is NOT available, the suspension model can be identified by the appearance. The CBX50 will be installed on a tandem sliding sub-frame and have a 5.75" round axle also, the cast beam will NOT have a hole forward of the axle (**Figure 1**).

**NOTE:** This manual applies to the suspension models listed on the front cover. However, we urge you to determine the specific model number, write that information below and refer to it when obtaining information or replacement parts (**Figure 2**).

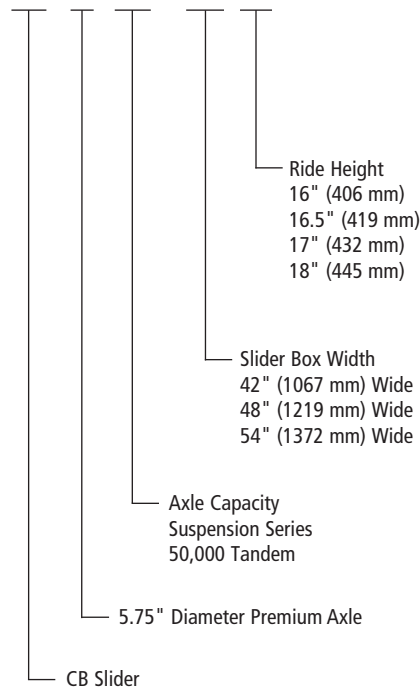
**Figure 1**



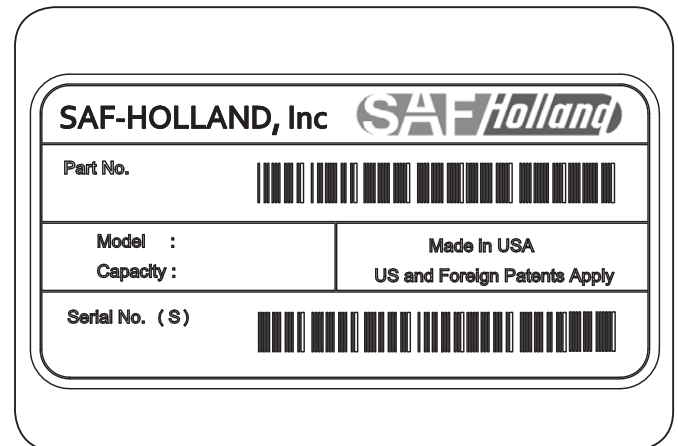
## 3. CBX50 Model Nomenclature

The sample tag illustrated will help interpret the information on the SAF-HOLLAND®, Inc. serial tag. The part number is on the first line. The model number along with the suspension capacity are on the second line. The third line contains the serial number (**Figure 2**).

**CB X 50 - 48 16**



**Figure 2**



## 4. Welding Standards

### 4.1 Scope

When welding is required for the suspension repairs, observe the requirements below. This specification applies to all components supplied by SAF-HOLLAND®, and its products. The customer assumes all responsibility for weld integrity if the weld material and procedure differ from those listed below.

### 4.2 Workmanship

All welding on SAF-HOLLAND® products MUST be performed by a welder qualified according to the appropriate AWS standard for the weld being made or an equivalent standard. It is the responsibility of the customer to provide good workmanship when welding on SAF-HOLLAND® products.

### 4.3 Material

Items to be welded that are made from low carbon or high-strength alloy steel are to be welded with AWS filler metal specification AWS A5.18, filler metal classification ER-70S-3, ER-70S-6 or equivalent unless specified on the installation drawing.

**NOTE:** Any substitution for filler material from the above standard must comply, as a minimum, with the following mechanical properties:

Tensile Strength - 72k psi (496 MPa)

Yield Strength - 60k psi (414 MPa)

Charpy V Notch - 20 ft.-lbs. (27 N•m) at 0°F (-17.7°C)

% Elongation - 22%

The recommended welding gas for gas metal arc welding (GMAW) is 90% Argon / 10% CO<sub>2</sub>. If a different gas is used, welds MUST comply with penetration requirements illustrated (**Figure 3**). Where the installation drawing specifies different than above, the drawing shall prevail.

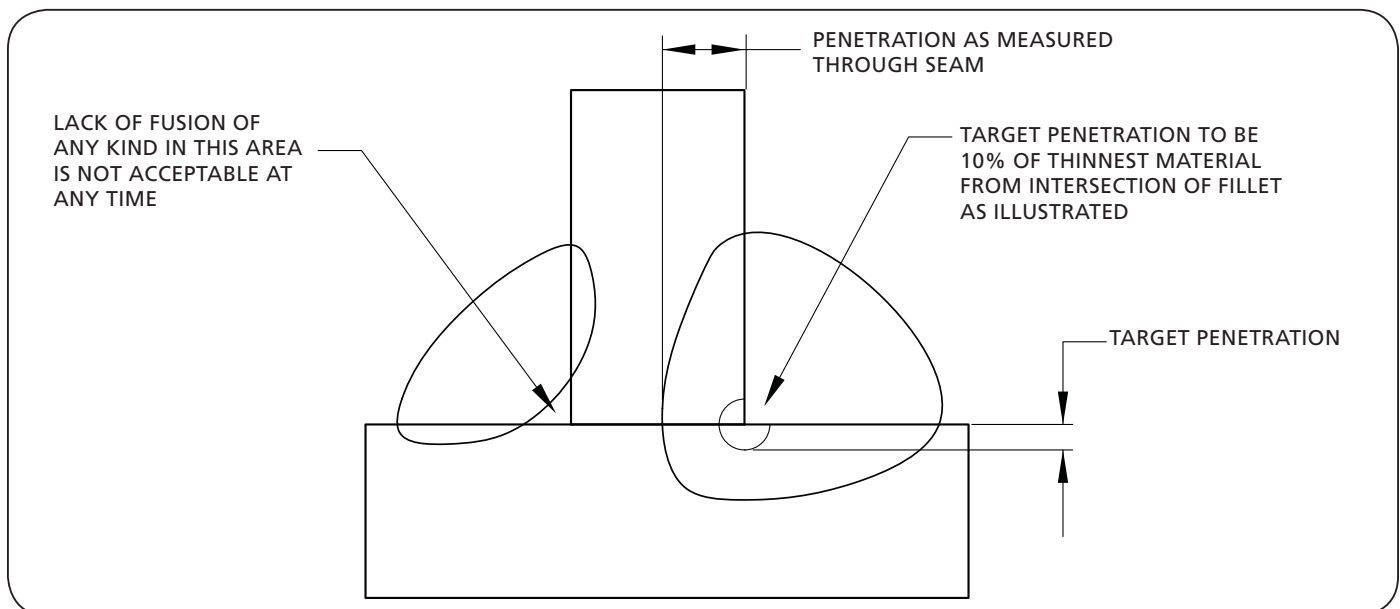
### 4.4 Procedures

Tack welds used for positioning components are to be located in the center of the final weld, where practical. The tack weld should be completely fused to the finish weld. DO NOT break arc at the end of the weld. Back up all finish welds at least 1/2" (12.7 mm) or a sufficient amount to prevent craters at the end of the weld. Where weld is shown go around corners, it is assumed the corner represents a stress concentration area. DO NOT start or stop weld within 1" (25.4 mm) of the corner. Particular care should be taken to prevent undercutting in this area.

### 4.5 Weld Size

If weld size is NOT specified, the effective throat of the weld MUST be no smaller than the thinnest material being welded (**Figure 3**).

**Figure 3**



## 5. Pre-Operation

**NOTE:** In the United States, workshop safety requirements are defined by federal and/or state Occupational Safety and Health Act. Equivalent laws could exist in other countries. This manual is written based on the assumption that OSHA or other applicable employee safety regulations are followed by the location where work is performed.

1. With the vehicle on a level surface, bring the air system to operating pressure, above 85 psig/5.9 bars.
2. Shut off the vehicle and inspect all the air control system fittings for air leaks by applying a soapy water solution and checking for bubbles at all the connections and fittings. Examine the air springs (**Figure 4**) for equal firmness.
3. Check the shock absorbers for proper installation and make sure that the upper and lower 3/4" shock absorber nuts are torqued to 140-175 ft.-lbs. (190-237 N•m) (**Figure 4**).
4. Verify that the 1/2" air spring mounting nuts are torqued to 30-40 ft.-lbs. (41-54 N•m), and the 3/4" air spring mounting nuts are torqued to 40-45 ft.-lbs. (54-61 N•m) (**Figure 4**).
5. With the suspension at full capacity, check that there is a 1" (25 mm) minimum clearance around the air springs.
6. The suspension's ride height should be within  $\pm 1/4$ " (6 mm) of the recommended design height. For the proper height, refer to Ride Height Adjustment Section 7.

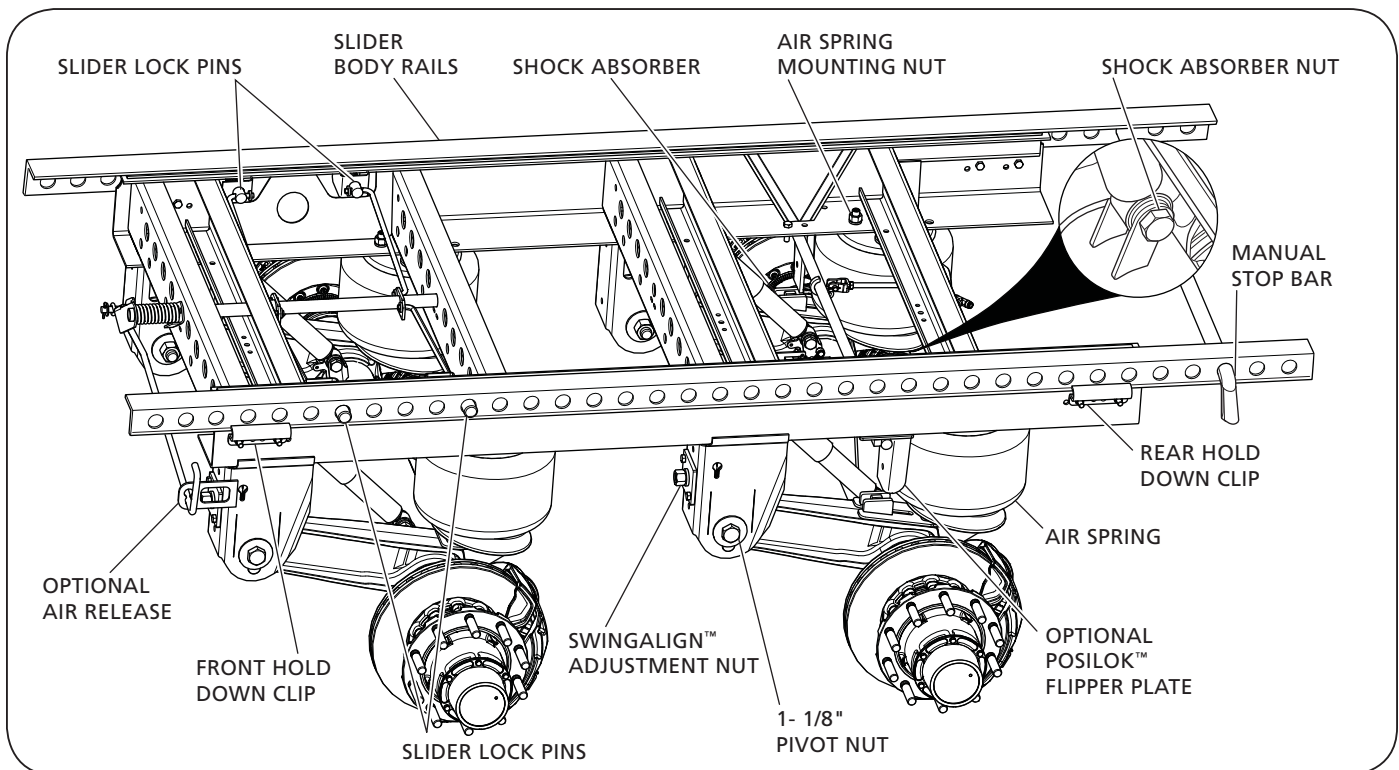
7. Verify that the 1-1/8" pivot nuts are torqued to 550-600 ft.-lbs. (746-813 N•m) (**Figure 4**).

**IMPORTANT:** The SwingAlign™ design maintains proper alignment under the correct torque without welding; DO NOT weld (**Figure 4**).

**NOTE:** SwingAlign™ pivot connections are on roadside and fixed alignment pivot connections are on curbside. For SwingAlign™ Connection Axle Alignment procedure, refer to Section 9.

8. If the vehicle is equipped with a PosiLok™ feature, make sure there is a 1" (25 mm) minimum clearance between the bottom of the flipper plate and the top of the beam pad when at ride height (**Figure 4**); Refer to PosiLok™ Installation and Operation Manual XL-AS20001BM-en-US for more information. Available at [www.safholland.us](http://www.safholland.us) or contact SAF-HOLLAND® Customer Service at 888-396-6501.
9. Check that the slider locking pins, slider pull-bar mechanism, and slider wear pads (**Figure 4**) are operating properly.
10. Inspect the front and rear hold down clips (**Figure 4**) to make sure that they are correctly secured around the slider body rails. Torque all 1/2" hold down clip nuts to 75-90 ft.-lbs. (102-122 N•m).

**Figure 4**



## 6. Standard Air Control System

The air control system of the CBX50 uses air drawn from the tractor air system to pressurize the suspension's air springs. The suspension, working with the air control system, provides optimum suspension performance only when all the air control system components are installed and operating properly.

**IMPORTANT:** Make certain that all the air lines and valves are free from obstruction through the full operational range of the suspension.

**IMPORTANT:** A pressure protection valve (PPV) **MUST** be attached to the air reservoir in order to maintain proper air pressure (**Figure 5**).

**IMPORTANT:** The air pressure protection valve (PPV) maintains safe brake pressure. Approximately 85 psig (5.9 bars) opens the valve, and 65 psig (4.5 bars) closes the valve.

**NOTE:** When installing pressure protection valve, use a drop of oil or loctite to lubricate threaded connections. **DO NOT** use a pipe compound or teflon tape because they could clog the valve.

A height control valve (HCV) is used to regulate the air pressure required for varying load capacities (**Figure 5**).

### Optional Air Release System

If the CBX50 was ordered with a slider pull pin air release system, the air release control valve and the actuator will need to be plumbed (**Figure 5.A**).

### Optional PosiLok™ System

If the CBX50 was ordered with a PosiLok™ anti-dock walk system, the PosiLok™ actuator will need to be plumbed (**Figure 5.B**).



Figure 5

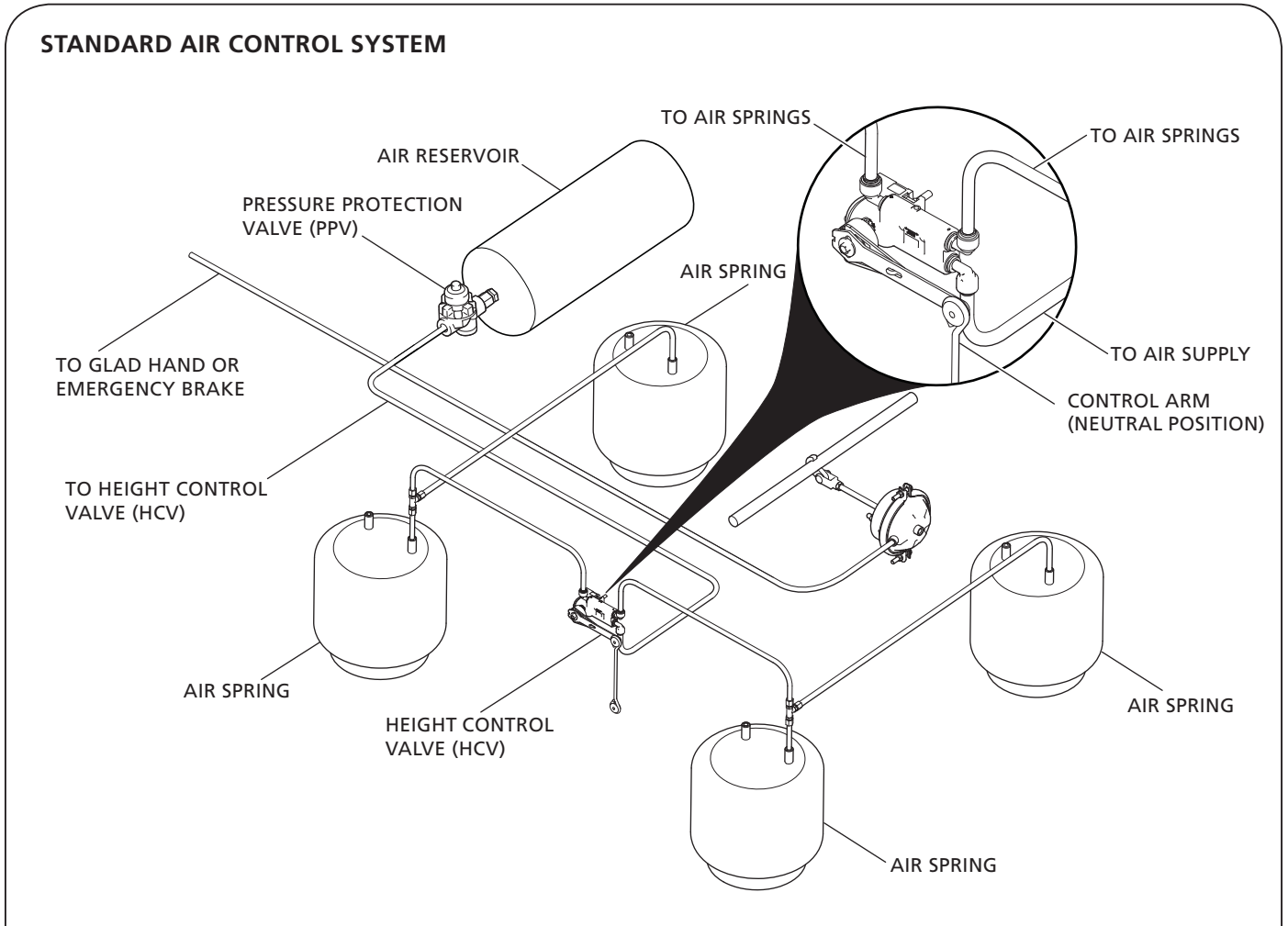


Figure 5.A OPTIONAL AIR RELEASE SYSTEM

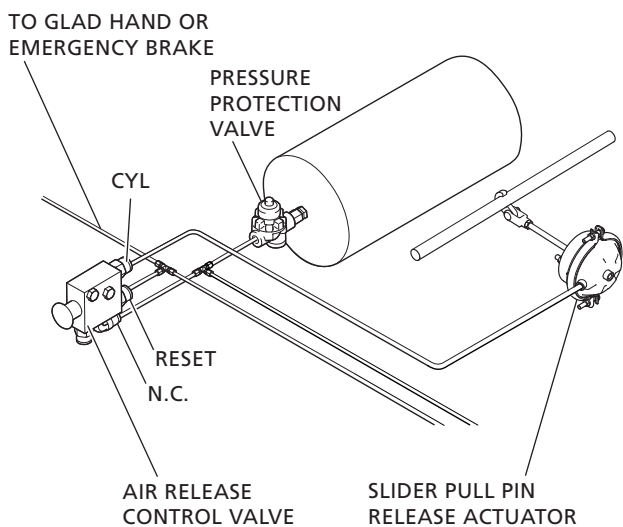
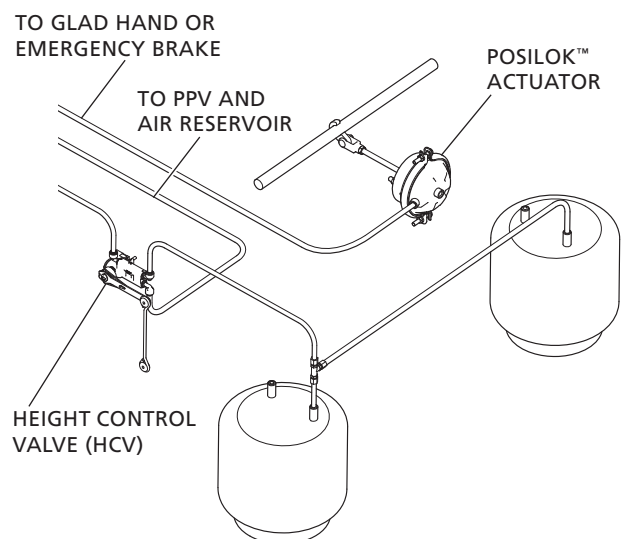


Figure 5.B OPTIONAL POSILOK™ SYSTEM



## 7. Ride Height Adjustment

1. Ensure that the linkage assembled to the height control valve (HCV) and suspension is the appropriate length (**Figure 6**).

**IMPORTANT:** A 15" linkage is used for ride heights of 16, 16.5" and 17". A 16" linkage is required for 18" ride heights (**Figure 6**).

**CAUTION** Failure to match the linkage length to the design ride height could result in improper suspension height which, if not avoided, could result in damage to trailer components.

2. Install the service and emergency lines to the slider and allow the suspension to air up.
3. Measure the ride height of the suspension (**Figure 7**) with a tape measure.
4. Compare the measured suspension ride height value to the appropriate value (**Table 1**). Make sure the measured ride height value is within  $\pm 1/4"$  (6 mm).

**Table 1**

MODEL	"A" RIDE HEIGHT
CBX50 - 16	16"
CBX50 - 16.5	16.5"
CBX50 - 17	17"
CBX50 - 18	18"

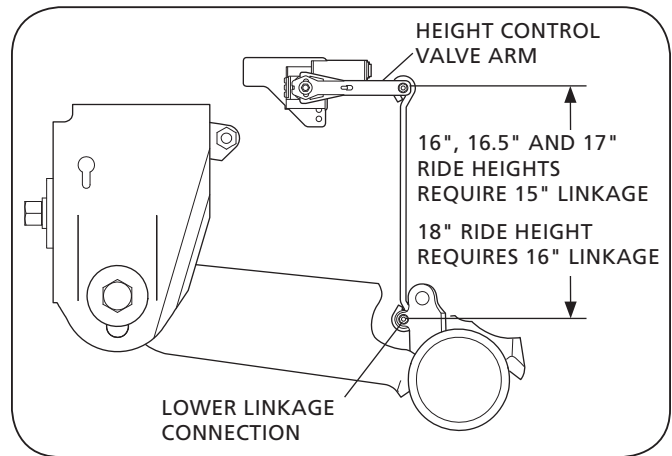
**IMPORTANT:** If the measured ride height value is NOT within  $\pm 1/4"$  (6 mm); use the table to verify the linkage length (**Table 2 and Figure 6**), and the hole location where the top mounting stud of the height control valve (HCV) is bolted to the mounting bracket (**Figure 8**).

**Table 2**

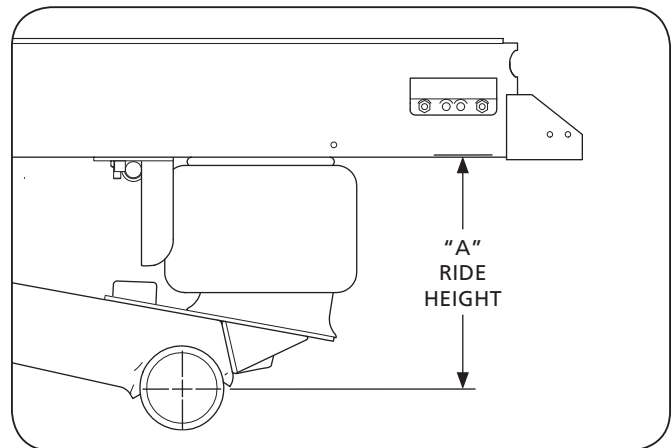
RIDE HEIGHT	HOLE LOCATION	LINKAGE LENGTH
16"	2ND HOLE	15"
16.5"	3RD HOLE	15"
17"	4TH HOLE	15"
18"	4TH HOLE	16"

5. Once the proper ride height is achieved, visually check all air control system fittings for air leaks by applying a soapy water solution and checking for bubbles at all the air connections and fittings.

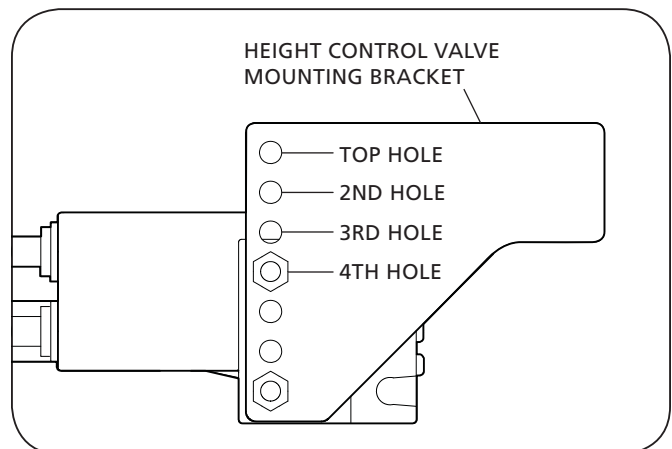
**Figure 6**



**Figure 7**



**Figure 8**



## 8. Height Control Valve Performance Check

**NOTE:** If the height control valve is equipped with a built in air exhaust feature, the pilot port of this feature **MUST** have air system pressure above 85 psig to ensure the proper height control valve function prior to conducting a performance check.

**IMPORTANT:** Proper inspection can eliminate unnecessary replacement of height control valve.

1. Apply air system pressure above 85 psig (5.9 bars).
2. Using multiple jack stands support the vehicle frame approximately 2" (51 mm) below the ride height per OEM specified locations.

**⚠ WARNING** Failure to properly support the suspension during maintenance could create a crush hazard which, if not avoided, could result in death or serious injury.

3. Detach the lower connection of the link assembly from the mounting bracket.
4. Move the control arm up 45° for 10-15 seconds – air should flow to the air spring(s) (**Figure 9**).
5. Move the control arm to center (neutral) position – valve should shut off air flow (**Figure 9**).
6. Move the control arm down 45° for 10-15 seconds – air should exhaust (**Figure 9**).
7. Move the control arm to center (neutral) position – valve should shut off air flow.
8. The valve is operating correctly if it performs as described in Steps 4 - 7 above.

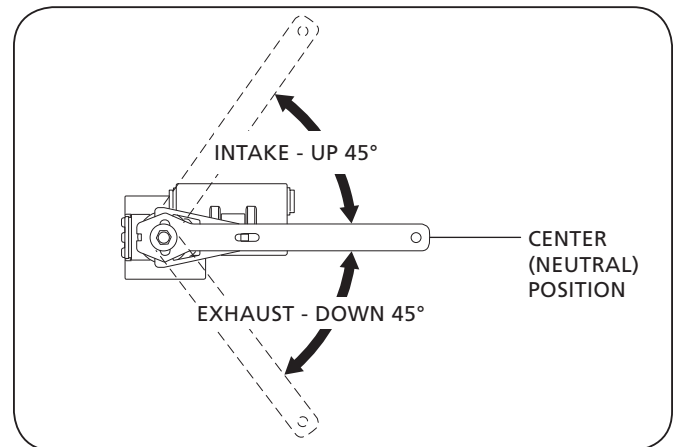
**NOTE:** If the valve **DOES NOT** perform correctly, replace the valve.

9. Re-attach the lower link assembly to the mounting bracket, and torque to 30-40 in.-lbs. (3 - 5 N•m).

**IMPORTANT:** If 85 psig (5.9 bars) of air system pressure cannot be achieved, check pressure protection valve and the vehicle air compressor to see if they are operating properly. Also, check the air lines for obstructions caused by dirt particles, foreign debris, ice, etc.

10. Remove the jack stands.

**Figure 9**



## 9. SwingAlign™ Axle Alignment

**IMPORTANT:** Axle alignment can only be achieved if the lock pin holes are the same distance from the kingpin, left and right. Axle alignment should always be done while the trailer is empty.

### 9.1 Alignment Preparation

1. Pull the trailer in a straight line for a sufficient distance to ensure there are no binds in the suspension.
2. Lock the trailer brakes and pull the trailer straight forward so the locking pins rest against the rear of the holes in the body rails.
3. Disengage the trailer parking brakes and make sure the trailer is empty.
4. Manually measure or use an optical device specifically designed for alignment measuring to determine the following:

- a. Measure the distance from the kingpin to the centerline of the front axle spindles. It is recommended that spindle extensions be utilized.

Dimensions A and B (**Figure 10**) MUST be equal to within 1/8" (3 mm).

- b. Measure the distance from the centerline of the front axle spindles to the centerline of the rear axle spindles.

Dimensions C and D (**Figure 10**) MUST be equal to within 1/16" (1 mm).

### 9.2 Alignment Instructions

1. Using the measurements from Step 4, align each axle by rotating the alignment bolt head on the front face of the roadside frame bracket clockwise to move the axle forward (**A Arrows**); counterclockwise to move the axle rearward (**B Arrows** - **Figure 11**).

**IMPORTANT:** DO NOT loosen the pivot bolt.

**IMPORTANT:** Two scribe lines on the side of the frame bracket indicate maximum adjustment for axle alignment. If the edge of the visible washer touches either scribe line the SwingAlign™ axle alignment adjustment is "out of stroke" (**Figure 12**). Inspect and repair trailer components as necessary and re-align.

**IMPORTANT:** The SwingAlign™ design maintains proper alignment without welding and without loosening the pivot connection. DO NOT weld alignment bolt or pivot bolts (**Figure 12**). If connection requires tightening, refer to the Torque Specifications listed in Section 16.

Figure 10

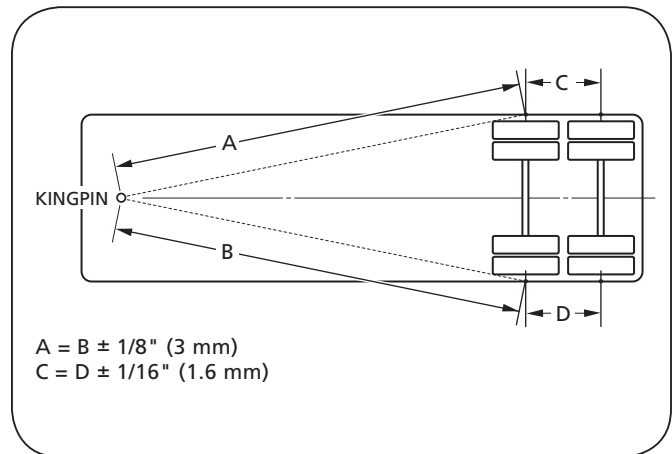


Figure 11

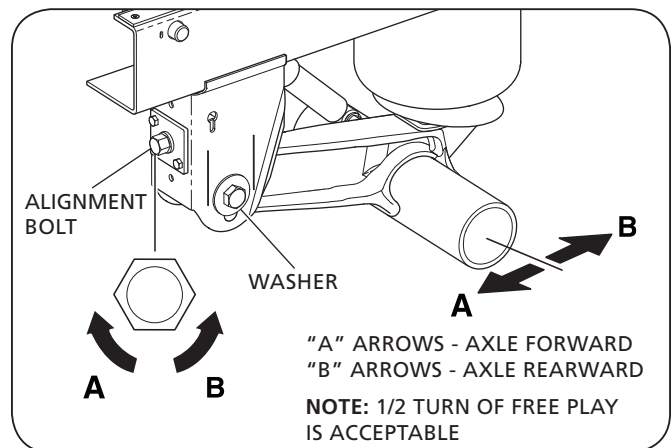
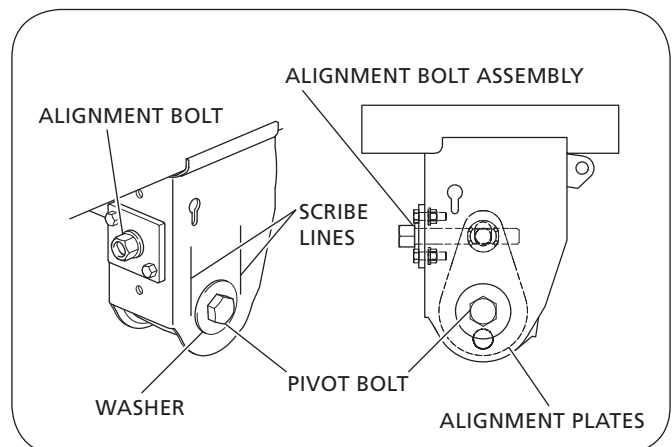


Figure 12



## 10. Air Spring Replacement

**IMPORTANT:** Air springs MUST be replaced with the proper air spring for the application. Check the flexible member and piston for the part number. If the part number cannot be found consult Parts Manual XL-AS11428PM-en-US.

**NOTE:** For further assistance with air spring part number identification, contact SAF-HOLLAND® Customer Service at 888-396-6501.

**IMPORTANT:** Maximum air spring static operation pressure is 100 psig (6.9 bars).

**⚠ WARNING** Failure to observe the maximum air spring static operating pressure could cause equipment failure which, if not avoided, could result in death or serious injury.

**IMPORTANT:** The trailer MUST be unloaded before beginning service procedures.

1. On a level surface, support the front of the trailer with either a kingpin stand, landing gear, or while coupled to a tractor (**Figure 13**).
2. Raise the trailer frame approximately 2" (51 mm) above the suspension's specified ride height.
3. At the suspension's specified ride height (**Table 3**), place multiple jack stands under the vehicle's frame per OEM specified locations, then lower the trailer onto the jack stands.

**NOTE:** It could be necessary to shim the jack stands to achieve specified height.

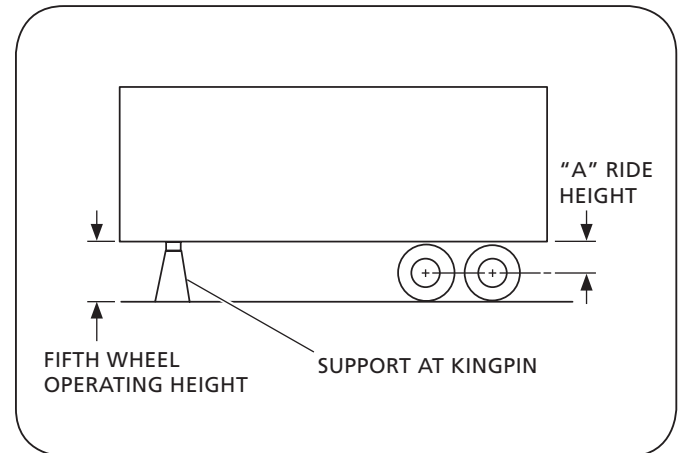
**⚠ WARNING** Failure to properly support the suspension during maintenance could create a crush hazard which, if not avoided, could result in death or serious injury.

4. Exhaust all air from the suspension, set the parking brakes, and chock the wheels.

**⚠ WARNING** Failure to exhaust the suspension air and chock the tires prior to beginning maintenance could allow vehicle movement which, if not avoided, could result in death or serious injury.

5. Disconnect, remove and discard the old air spring assembly and fasteners (**Figure 14**).
6. Install the fasteners, new air spring assembly and torque the fasteners. Refer to the Torque Specifications listed in Section 16.
7. Re-connect the air supply line.
8. Raise the trailer approximately 2" (51 mm) above ride height and remove the jack stands.

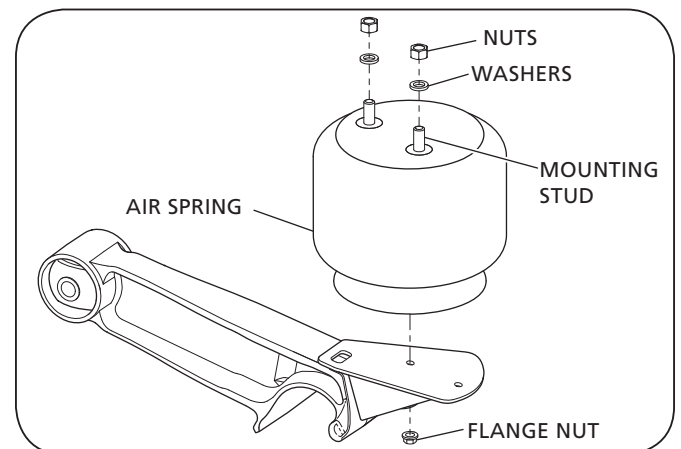
**Figure 13**



**Table 3**

MODEL	"A" RIDE HEIGHT
CBX50 - 16	16"
CBX50 - 16.5	16.5"
CBX50 - 17	17"
CBX50 - 18	18"

**Figure 14**



9. Slowly lower the trailer so that trailer suspension is fully collapsed.
10. Apply air to the trailer and allow the suspension to return to ride height.
11. Verify that all the air connection fittings are tight. Check all the fittings for air leaks by applying a soapy water solution and checking for bubbles at all air connections and fittings.

**IMPORTANT:** It is the responsibility of the air system installer to secure all the air lines and check for any air leaks. If air leaks are detected, repair is required.

**CAUTION** Failure to eliminate air leaks could compromise the suspension’s performance which, if not avoided, could result in component or property damage.

12. Remove the wheel chocks.

## 11. Shock Absorber Replacement

**IMPORTANT:** The shock absorber **MUST** be replaced with the proper shock absorber. Check the shock for the part number. If the part number cannot be found, consult Parts Manual XL-AS11428PM-en-US.

**IMPORTANT:** The trailer **MUST** be unloaded before beginning service procedures.

1. On a level surface, support the front of the trailer with either a kingpin stand, landing gear, or while coupled to a tractor (**Figure 15**).
2. Raise the trailer frame approximately 2" (51 mm) above the suspension’s specified ride height.
3. At the suspension’s specified ride height (**Table 4**), place multiple jack stands under the vehicle’s frame per OEM specified locations, then lower the trailer onto the jack stands.

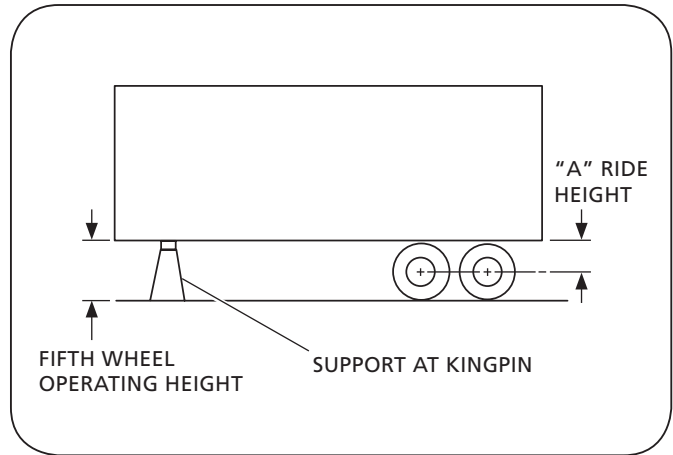
**NOTE:** It could be necessary to shim the jack stands to achieve the specified height.

**WARNING** Failure to properly support the suspension during maintenance could create a crush hazard which, if not avoided, could result in death or serious injury.

4. Exhaust all air from the suspension, set the parking brakes, and chock the wheels.

**WARNING** Failure to exhaust the suspension air and chock the tires prior to beginning maintenance could allow vehicle movement which, if not avoided, could result in death or serious injury.

**Figure 15**



**Table 4**

MODEL	"A" RIDE HEIGHT
CBX50 - 16	16"
CBX50 - 16.5	16.5"
CBX50 - 17	17"
CBX50 - 18	18"

5. Remove and discard the upper and lower mounting bolts and remove the shock absorber (**Figure 16**).
6. Replace with the correct shock absorber and fasteners. Torque the fasteners per specifications listed in Section 16.
7. Raise the trailer approximately 2" (51 mm) above ride height and remove the jack stands.
8. Slowly lower the trailer so that the trailer suspension is fully collapsed.
9. Apply air to the trailer and allow the suspension to return to ride height.
10. Remove the wheel chocks.

## 12. Pivot Connection Bushing Replacement

**IMPORTANT:** When replacing the rubber bushing at the pivot connection be sure the proper SAF® Service Repair Kit is used. The kits contain all the necessary parts to service one (1) axle (two (2) kits per tandem). Refer to Service Repair Kit section of Parts Manual XL-AS11428PM-en-US for the proper kit. It may be advantageous to service both pivot connections at the same time.

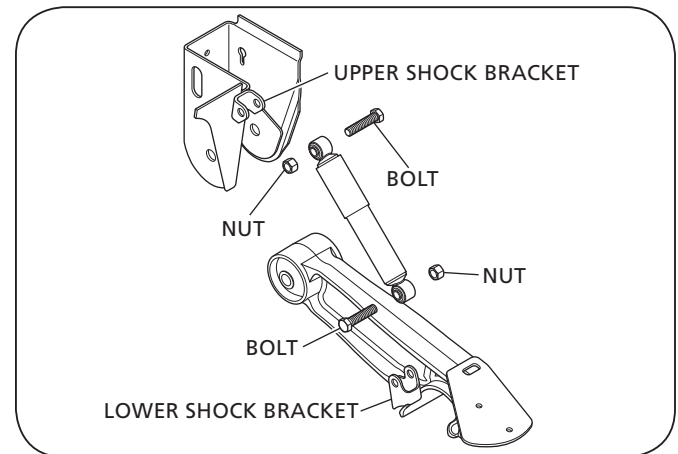
**IMPORTANT:** The vehicle **MUST** be unloaded before beginning service procedures.

1. On a level surface, support the front of the trailer with either a kingpin stand, landing gear, or while coupled to a tractor (**Figure 17**).
2. Raise the trailer frame approximately 2" (51 mm) above the suspension's specified ride height.
3. At the suspension's specified ride height (**Table 5**), place multiple jack stands under the vehicle's frame per OEM specified locations, then lower the trailer onto the jack stands.

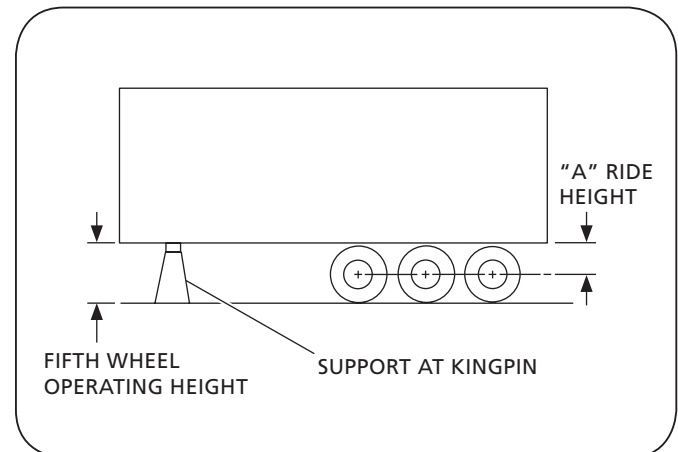
**NOTE:** It could be necessary to shim the jack stands to achieve the specified height.

**⚠ WARNING** Failure to properly support the suspension during maintenance could create a crush hazard which, if not avoided, could result in death or serious injury.

**Figure 16**



**Figure 17**



**Table 5**

MODEL	"A" RIDE HEIGHT
CBX50 - 16	16"
CBX50 - 16.5	16.5"
CBX50 - 17	17"
CBX50 - 18	18"

- Exhaust all the air from the suspension, set the parking brakes, and chock the wheels.

**⚠ WARNING** Failure to exhaust the suspension air and chock the tires prior to beginning maintenance could allow vehicle movement which, if not avoided, could result in death or serious injury.

- Disconnect the air spring and shock absorber at the lower connections on both roadside and curbside.
- Disconnect the height control valve (HCV) linkage at the lower connection.

**NOTE:** The SAF-HOLLAND® Bushing Service Tool, Part No. 50544015 (**Figure 18**) is available to ease removal and replacement of bushings. Contact your SAF-HOLLAND® distributor or Parts Manual for details.

- Raise the axle approximately 2" (51 mm) and support it with jack stands and remove the wheel chocks.

**⚠ WARNING** Failure to properly support the axle during maintenance could create a crush hazard, which if not avoided, could result in death or serious injury.

- Remove the tires.
- Disconnect the front pivot connection fasteners and discard (**Figure 19**).
- Rotate the equalizing beams down. Make sure the equalizing beams are supported by the jack stands.

**⚠ WARNING** Failure to properly support equalizing beams could create a crush hazard which, if not avoided, could result in death or serious injury or component damage

- Inspect the equalizing beams for wear, cracks and failed welds at axle. If cracks are detected anywhere on an equalizing beam, replace the beam and axle assembly.

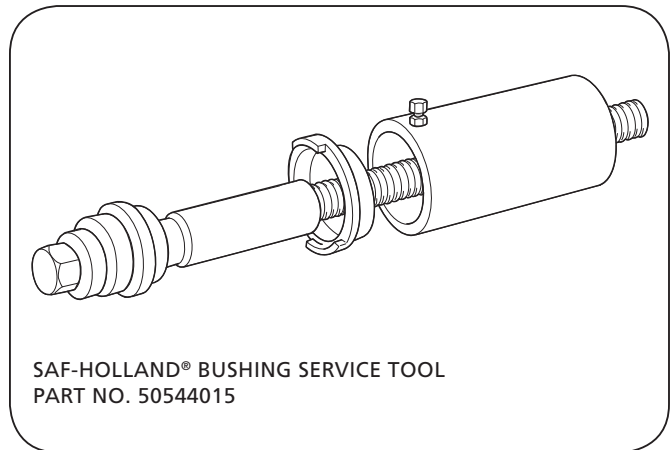
**IMPORTANT:** NEVER repair a cracked equalizing beam. DO NOT weld cracks.

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

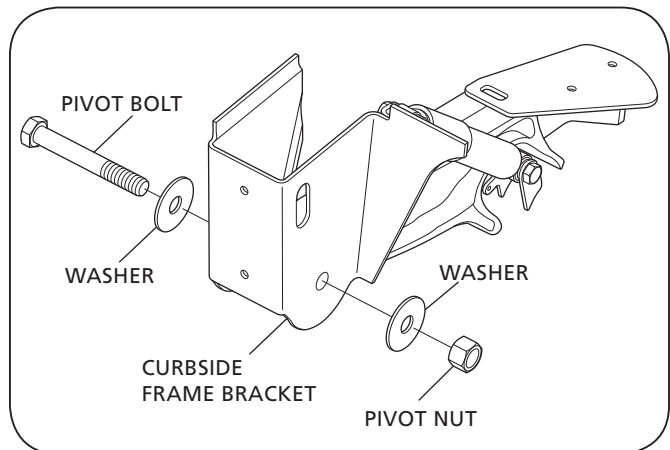
- Press out the old bushing (**Figure 20**) using a SAF-HOLLAND® Bushing Service Tool, Part No. 50544015 (**Figure 18**).

**IMPORTANT:** DO NOT use an open flame or other heat source to remove the bushings.

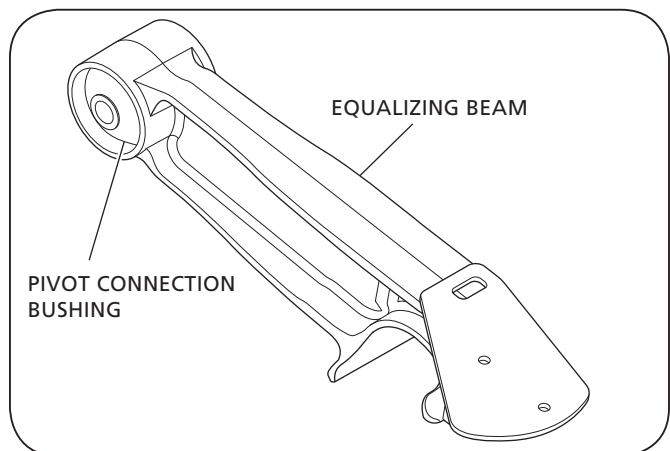
**Figure 18**



**Figure 19**



**Figure 20**





13. Clean out all foreign material from the bushing receptacle(s) with a wire brush or wire wheel. Lubricate the new bushing(s) with liquid dish soap and water solution.

**IMPORTANT:** DO NOT use oil-based lubricant or brake fluid, as they can cause damage to the rubber.

14. Press the new bushing in the beam. The bushing MUST be oriented, aligned and centered in beam receptacles:
  - a. Orientate the bushings per **(Figure 21)**.
  - b. Press the bushings into the beam receptacles and center them per **(Figure 22)**.

**IMPORTANT:** It could be necessary to push the bushing past center approximately 1" (25 mm) and then re-center the bushing to relieve the rubber **(Figure 22)**.

- c. Inspect the bushing's alignment **(Figure 23)**. If the alignment is bad, press out the bushing and repeat the procedure.
15. Inspect the frame brackets, inside of the washers and SwingAlign™ alignment plates for excessive wear. If wear is excessive, refer to Section 14 for replacement information. If only SwingAlign™ components need to be replaced, refer to Section 15 for replacement information. If only fixed frame bracket components need to be replaced refer to Section 14 for replacement information.
16. Rotate the beams up into the frame brackets and re-install the equalizing beam with new bolts and nuts. Position at ride height and torque the fasteners per the specifications listed in Section 16.
17. Re-connect the air springs, shock absorbers and height control valve linkage. Torque the fasteners per specifications listed in Section 16.
18. Raise the trailer approximately 2" (51 mm) above the ride height and remove the jack stands.
19. Slowly lower the trailer so that the trailer suspension is fully collapsed.
20. Apply air to the trailer and allow the suspension to return to ride height.
21. Verify that all the air connection fittings are tight. Check all fittings for air leaks by applying a soapy water solution and checking for bubbles at all air connections and fittings.

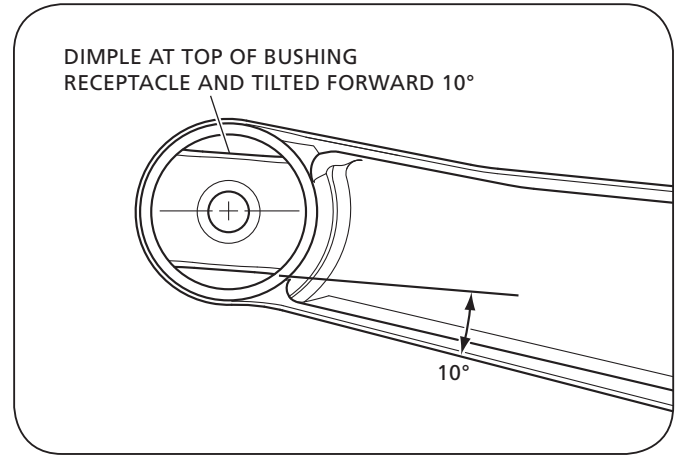
**IMPORTANT:** It is the responsibility of the air system installer to secure all air lines and check for any air leaks. If air leaks are detected, repair as required.

**⚠ WARNING**

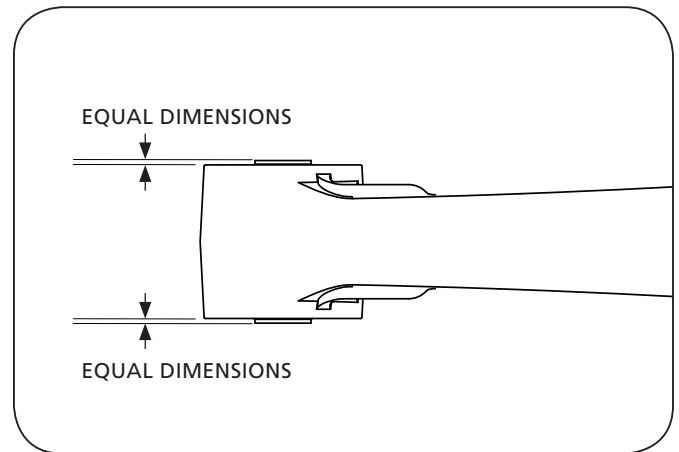
Failure to eliminate air leaks could compromise the suspension's performance which, if not avoided, could result in component or property damage.

22. Remove the wheel chocks.

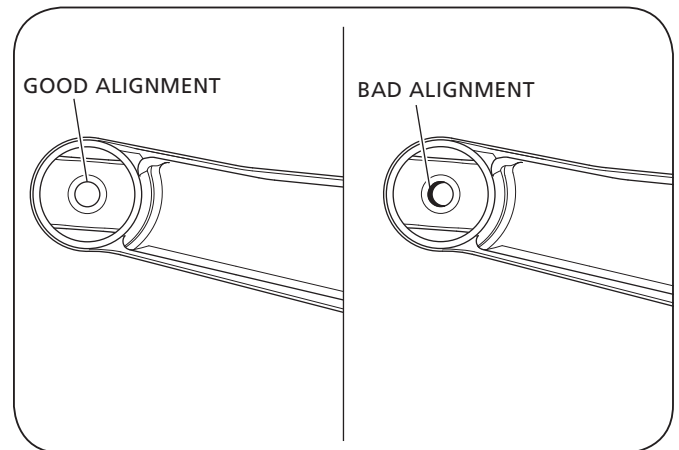
**Figure 21**



**Figure 22**



**Figure 23**



### 13. Equalizing Beam and Axle Assembly Replacement

**IMPORTANT:** The trailer MUST be unloaded before beginning any service procedures.

1. On a level surface, support the front of the trailer with either a kingpin stand, landing gear, or while coupled to a tractor (**Figure 24**).
2. Raise the trailer frame approximately 2" (51 mm) above the suspension's specified ride height.
3. At the suspension's specified ride height (**Table 6**), place multiple jack stands under the vehicle's frame per OEM specified locations, then lower the trailer onto the jack stands.

**NOTE:** It could be necessary to shim the jack stands to achieve specified height.

**⚠ WARNING** Failure to properly support the suspension during maintenance could create a crush hazard which, if not avoided, could result in death or serious injury.

4. Exhaust all the air from the suspension, set the parking brakes, and chock the wheels.

**⚠ WARNING** Failure to exhaust the suspension air and chock the tires prior to beginning maintenance could allow vehicle movement which, if not avoided, could result in death or serious injury.

5. Raise the axle approximately 2" inches (51 mm) and support it with jack stands and remove the wheel chocks.

**⚠ WARNING** Failure to properly support axle during maintenance could create a crush hazard, which, if not avoided, could result in death or serious injury.

6. Remove the tires.
7. Disconnect the air springs, shock absorbers and height control valve linkage at the lower connections.

8. Remove the brake equipment:
  - Drum Brakes – remove the brake chambers, slack adjusters, and wheel end assemblies. Refer to the XL-TA100060M-en-US Service Manual for detailed disassembly and reassembly procedures.
  - Disc Brakes – disconnect the brake chamber air supply lines. Refer to XL-SA100590M-en-US Service Manual for detailed disassembly and reassembly procedures.

9. Disconnect and discard the front pivot fasteners from the suspension (**Figure 25**).

10. Remove the axle and equalizing beam assembly.

Figure 24

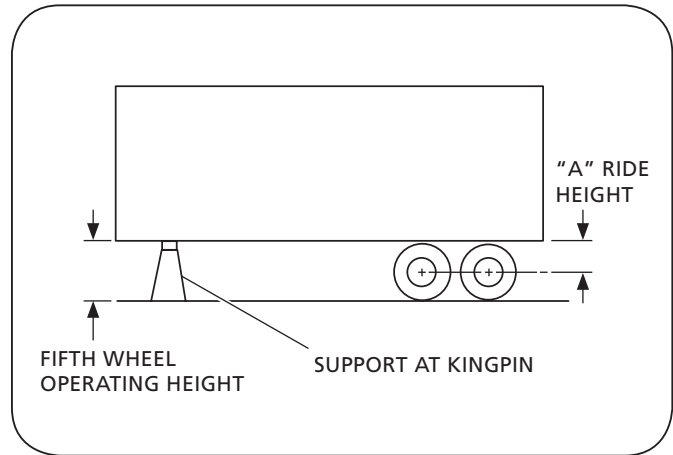
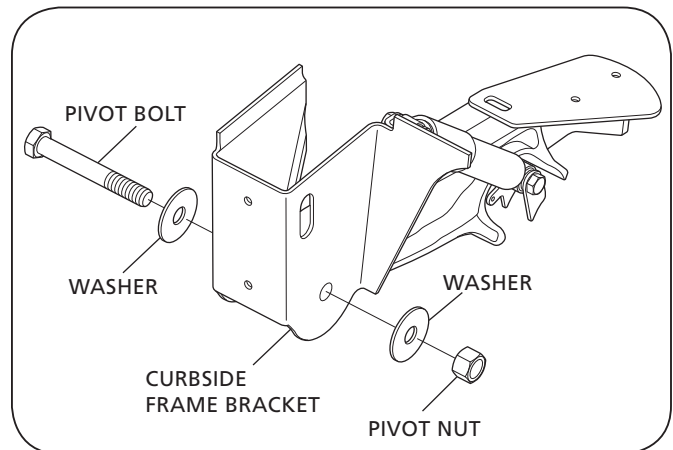


Table 6

MODEL	"A" RIDE HEIGHT
CBX50 - 16	16"
CBX50 - 16.5	16.5"
CBX50 - 17	17"
CBX50 - 18	18"

Figure 25



11. Install the new axle and equalizing beam assembly using the new pivot fasteners (**Figure 26**). Position the axle at the ride height, support the axle with jack stands, and torque the front pivot connection per specifications listed in Section 16.
12. Re-connect the lower connections on the air springs, shock absorbers and height control valve linkage. Properly torque the fasteners according to the specifications listed in Section 16.
13. Install the brake components and wheel ends following the instructions in the appropriate manual referred to in Step 8.
14. Re-install the tires, remove the jack stands supporting the axle and equalizing beam assembly, and lower the axle.
15. Chock the wheels.
16. Raise the trailer approximately 2" (51 mm) above ride height and remove the jack stands.
17. Slowly lower the trailer so that the trailer suspension is fully collapsed.
18. Apply air to the trailer and allow the suspension to return to ride height.
19. With the suspension at rest, measure the ride height. Ride height **MUST** be within 1/4" (6 mm) of the suspension's specified ride height. Refer to Section 7 if ride height needs to be adjusted.
20. Verify all the air connection fittings are tight. Check all fittings for air leaks by applying a soapy water solution and checking for bubbles at all the air connections and fittings.

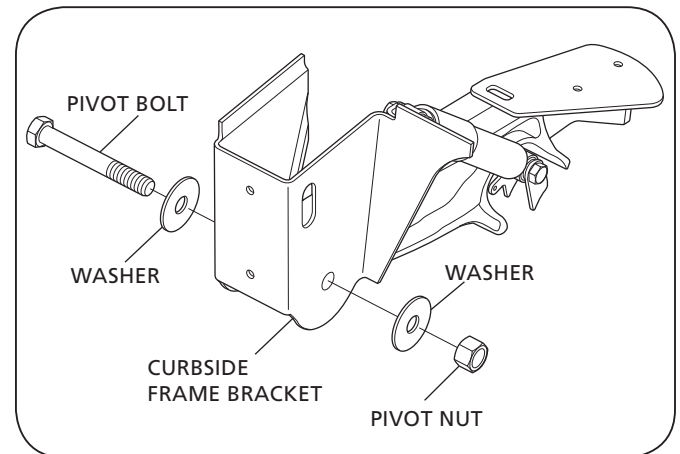
**IMPORTANT:** It is the responsibility of the air system installer to secure all air lines and check for any air leaks. If air leaks are detected, repair as required.

**CAUTION**

Failure to eliminate air leaks could compromise the suspension's performance which, if not avoided, could result in component or property damage.

21. Remove the wheel chocks.
22. Re-align the axles using the axle alignment procedures listed in Section 9.

**Figure 26**



## 14. Frame Bracket Replacement

**NOTE:** When replacing the frame bracket(s), refer to the Parts Manual XL-AS11428PM-en-US for the correct part number or Service Repair Kit.

**IMPORTANT:** If only SwingAlign™ frame bracket alignment plates and washers are to be replaced, refer to Section 15.

**IMPORTANT:** The trailer MUST be unloaded before beginning any service procedures.

1. On a level surface, support the front of the trailer with either a kingpin stand, landing gear, or while coupled to a tractor (**Figure 27**).
2. Raise the trailer frame approximately 2" (51 mm) above the suspension's specified ride height (**Table 7**).

**NOTE:** It may be necessary to shim the jack stands to achieve specified height.

**⚠ WARNING** Failure to properly support the suspension during maintenance could create a crush hazard which, if not avoided, could result in death or serious injury.

3. Exhaust all air from the suspension, set the parking brakes, and chock the wheels.

**⚠ WARNING** Failure to exhaust the suspension air and chock the tires prior to beginning maintenance could allow vehicle movement which, if not avoided, could result in death or serious injury.

4. Raise the axle approximately 2" (51 mm) and support it with jack stands and remove the wheel chocks.

**⚠ WARNING** Failure to proper support axle during maintenance could create a crush hazard, which, if not avoided, could result in death or serious injury.

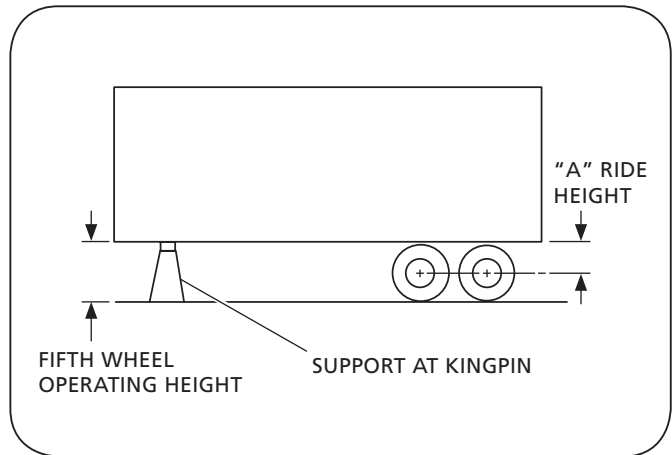
5. Remove the tires.
6. Disconnect and discard front pivot fasteners (**Figure 28**) and rotate equalizing beams downward out of the frame brackets. Make sure equalizing beams are supported by jack stands.

**⚠ WARNING** Failure to properly support equalizing beams could create a crush hazard which, if not avoided, could result in component damage, death or serious injury.

7. On the side of the frame rail, mark the mounting location of the frame bracket to be replaced.
8. Remove the old frame bracket.

**IMPORTANT:** Carefully air arc the welds connecting the frame bracket to the frame. DO NOT use frame if frame material is damaged. Replace the frame and then install the frame brackets.

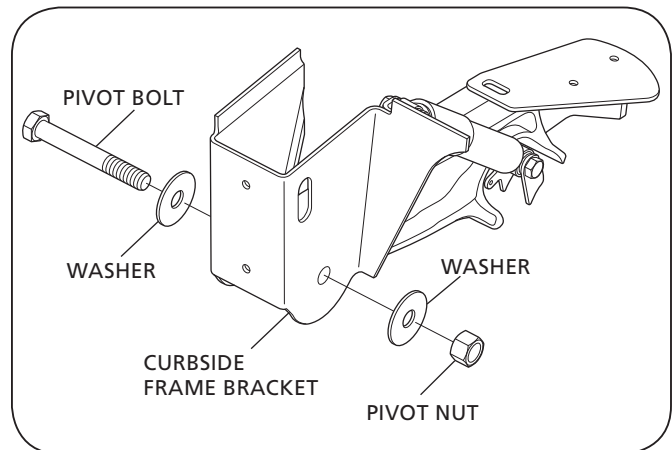
**Figure 27**



**Table 7**

MODEL	"A" RIDE HEIGHT
CBX50 - 16	16"
CBX50 - 16.5	16.5"
CBX50 - 17	17"
CBX50 - 18	18"

**Figure 28**



**⚠ WARNING** Failure to replace a damaged frame could cause damage to the suspension and possible loss of vehicle control which, if not avoided, could result in death or serious injury.

- Place the new frame bracket(s) on the frame rail per the locations marked in Step 7. Refer to the model's specific installation drawing for the proper weld patterns and locations. Weld bracket in place according to the specifications listed in Section 4.

**NOTE:** To obtain a copy of your specific suspension's installation drawing, contact the SAF-HOLLAND® Customer Service at 888-396-6501.

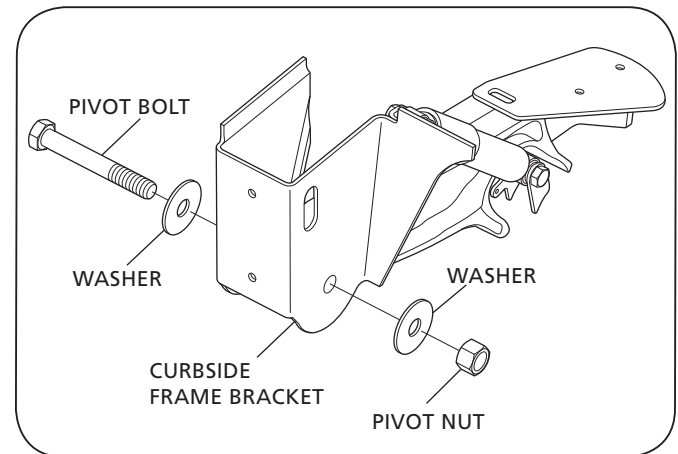
- If replacing the roadside SwingAlign™ frame bracket, refer to Section 15 for SwingAlign™ fasteners installation procedures.
- Rotate the equalizing beams upward into the frame brackets and install the new pivot fasteners (**Figure 29**). Position the axle at ride height and torque the pivot connection per the specifications listed in Section 16.
- Re-install the tires, remove the jack stands supporting the axle and equalizing beam assembly, and lower the axle.
- Chock the wheels.
- Raise the trailer approximately 2" (51 mm) above ride height and remove the jack stands.
- Slowly lower the trailer so that the trailer suspension is fully collapsed.
- Apply air to the trailer and allow the suspension to return to ride height.
- With the suspension at rest, measure the ride height. Ride height **MUST** be within 1/4" (6 mm) of the suspension's specified ride height. Refer to Section 7 if ride height needs to be adjusted.
- Verify that all the air connection fittings are tight. Check all the fittings for air leaks by applying a soapy water solution and checking for bubbles at all air connections and fittings.

**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.

**⚠ CAUTION** Failure to eliminate air leaks could compromise the suspension's performance which, if not avoided, could result in component or property damage.

- Remove the wheel chocks.
- Re-align the axles using the axle alignment procedures listed in Section 9.

**Figure 29**



## 15. SwingAlign™ Replacement

**IMPORTANT:** The trailer MUST be unloaded before beginning any service procedures.

1. On a level surface, support the front of the trailer with either a kingpin stand, landing gear, or while coupled to a tractor (**Figure 30**).
2. Raise the trailer frame approximately 2" (51 mm) above the suspension's specified ride height.
3. At the suspension's specified ride height (**Table 8**), place multiple jack stands under the vehicle's frame per OEM specified locations, then lower the trailer onto the jack stands.

**NOTE:** It could be necessary to shim the jack stands to achieve specified height.

**⚠ WARNING** Failure to properly support the suspension during maintenance could create a crush hazard which, if not avoided, could result in death or serious injury.

4. Exhaust all air from the suspension, set the parking brakes, and chock the wheels.

**⚠ WARNING** Failure to exhaust the suspension air and chock the tires prior to beginning maintenance could allow vehicle movement which, if not avoided, could result in death or serious injury.

5. Raise the axle approximately 2" (51 mm) and support it with jack stands and remove the wheel chocks.

**⚠ WARNING** Failure to properly support the axle during maintenance could create a crush hazard, which if not avoided, could result in death or serious injury.

6. Remove the tires.
7. Disconnect and discard the front pivot fasteners (**Figure 31**) and rotate the equalizing beams downward out of the frame brackets. Make sure the equalizing beams are supported by jack stands.

**⚠ WARNING** Failure to properly support the equalizing beams during maintenance could create a crush hazard, which if not avoided, could result in death or serious injury.

Figure 30

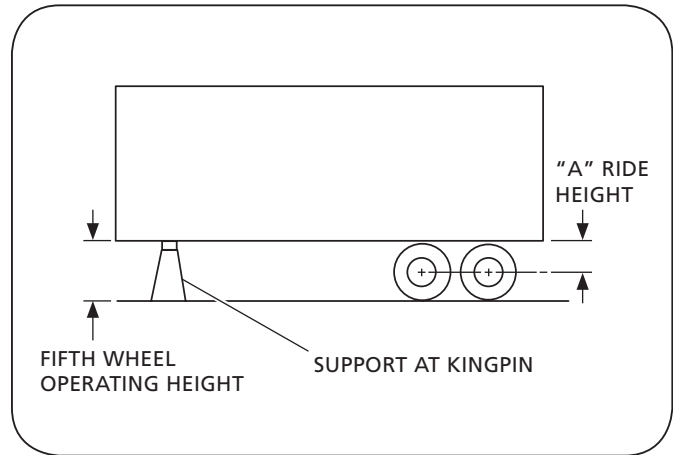
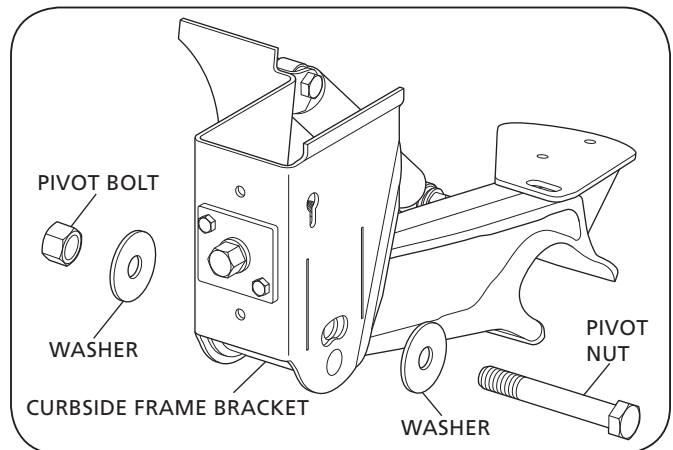


Table 8

MODEL	"A" RIDE HEIGHT
CBX50 - 16	16"
CBX50 - 16.5	16.5"
CBX50 - 17	17"
CBX50 - 18	18"

Figure 31



8. Remove and discard the SwingAlign™ mounting fasteners and rotate the threaded rod assembly counter-clockwise (CCW) until it disengages from the SwingAlign™ yoke (**Figure 32**).
9. Remove the threaded rod assembly, alignment plates, and yoke (**Figure 32**).
10. Assemble the new SwingAlign™ yoke between two (2) new alignment plates and insert the assembly into the frame bracket (**Figure 32**).

**NOTE:** Make sure the bosses on the alignment plates are fully seated into the frame bracket alignment plate holes (**Figures 32 and 33**).

11. From the front of the frame bracket, insert the new threaded rod assembly into the SwingAlign™ yoke and rotate the threaded rod clockwise until access to the pivot bolt hole is achieved (**Figure 33**).
12. Rotate the equalizing beams upward into the frame brackets. If necessary, adjust the threaded rod assembly until the holes in the alignment plate are aligned with the pivot bushing holes. When assembly and hole alignment is achieved install the new pivot fasteners (**Figure 34**).
13. Position the axle at ride height and torque the pivot connection per specifications listed in Section 16.
14. Re-install the tires, remove the jack stands supporting the axle and equalizing beam assembly, and lower the axle.
15. Chock the wheels.
16. Raise the trailer approximately 2" (51 mm) above ride height and remove the jack stands.
17. Slowly lower the trailer so that the trailer suspension is fully collapsed.
18. Apply air to the trailer and allow the suspension to return to ride height.
19. With the suspension at rest, measure the ride height. The ride height **MUST** be within 1/4" (6 mm) of the suspension's specified ride height. Refer to Section 7 if the ride height needs to be adjusted.
20. Verify that all the air connection fittings are tight. Check all fittings for air leaks by applying a soapy water solution and checking for bubbles at all air connections and fittings.

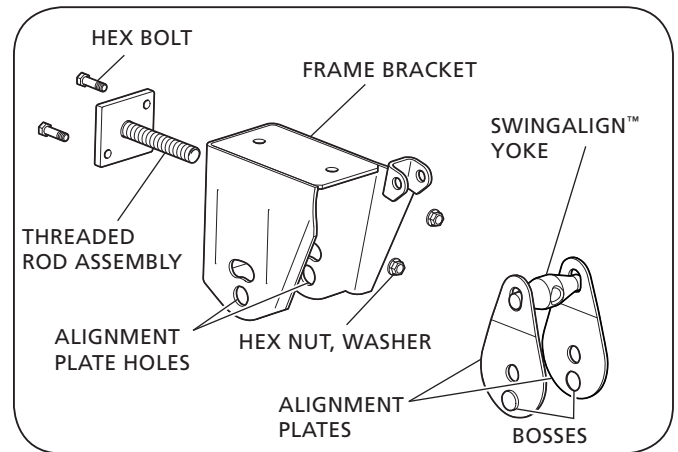
**IMPORTANT:** It is the responsibility of the air system installer to secure all the air lines and check for any air leaks. If air leaks are detected, repair as required.

**CAUTION**

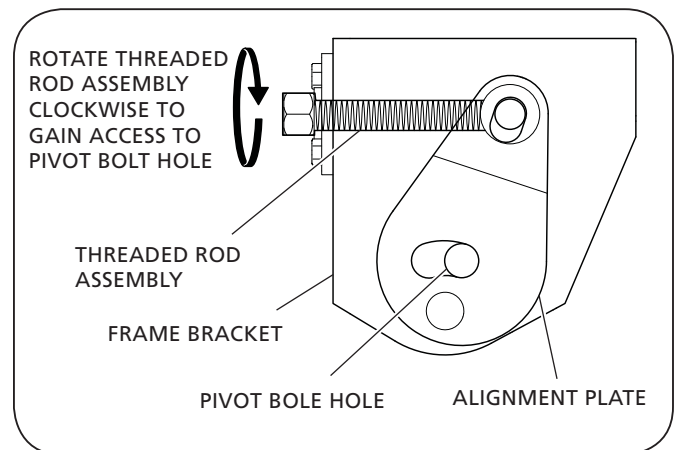
Failure to eliminate air leaks could compromise the suspension's performance which, if not avoided, could result in component or property damage.

21. Remove the wheel chocks.

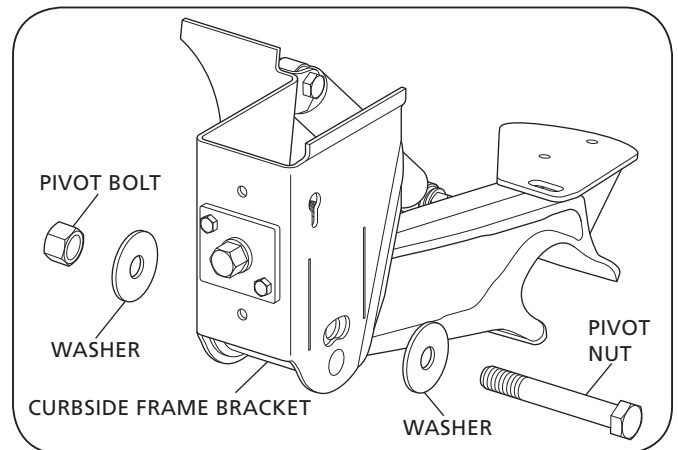
**Figure 32**



**Figure 33**

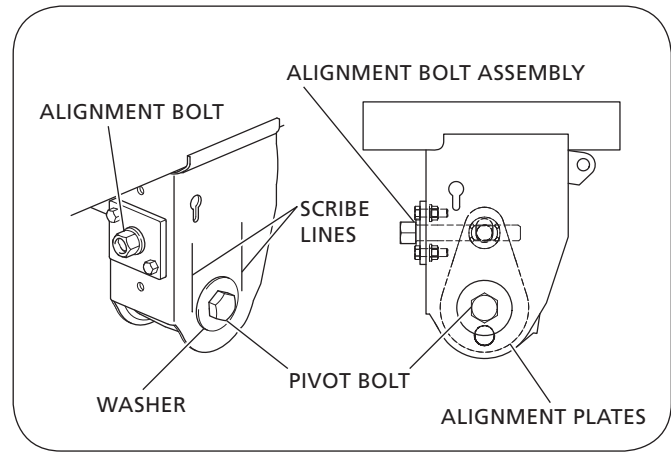


**Figure 34**



- 22. Rotate the bolt head of the threaded rod assembly clockwise (CW) until the edge of the washer reaches the forward scribe line. Then rotate the threaded rod assembly counter-clockwise (CCW) until it reaches the rearward scribe line. Then rotate the threaded rod assembly clockwise (CW) until it is centered between the scribe lines. **(Figure 35)**
- 23. Re-torque the SwingAlign™ front pivot connection per the torque specifications listed in Section 16.
- 24. Re-align the axles using the axle alignment procedures listed in Section 9.

**Figure 35**





## 16. Torque Specifications

COMPONENT	TORQUE VALUE	FASTENER SIZE
Shock Absorber	140-175 ft.-lbs. 190-237 N•m	3/4"
Pivot Connection	550-600 ft.-lbs. 746-813 N•m	1-1/8"
Air Spring	30-40 ft.-lbs. 40-54 N•m	1/2"
Air Spring	40-45 ft.-lbs. 54-61 N•m	3/4"
SwingAlign™ Mounting Fasteners Only - NOT Pivot Bolt	50-60 ft.-lbs. 68-81 N•m	1/2"
Height Control Valve Lower Linkage	30-40 In.-lbs. 3-5 N•m	1/4"

All torque specifications are  $\pm 5\%$ .  
Torques specified are for clean, lubricated threads.  
Always Apply torque to nut if possible.  
Required re-torquing at every brake re-lining.

**NOTE:** Torque specifications listed above are with clean lubricated/coated threads. All new SAF-HOLLAND® fasteners come pre-coated from the factory. For bolt and lock nut grade markings refer to **Figure 36**.

**IMPORTANT:** The use of special lubricants with friction modifiers, such as Anti-Seize or Never-Seez®, without written approval from SAF-HOLLAND® engineering, will void warranty and could lead to over torquing of fasteners or other component issues.

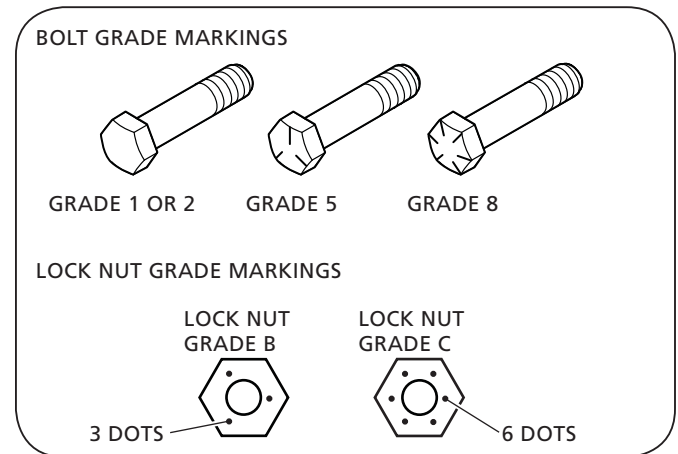
### General Information

- The torque specifications are applied to the nut and NOT the bolt.

**⚠ WARNING** Failure to use the proper fasteners when servicing the suspension could cause component failure which, if not avoided, could result in death or serious injury.

**⚠ WARNING** Failure to properly torque all fasteners could result in component failure which, if not avoided, could result in death or serious injury.

Figure 36



## 17. Routine Maintenance and Daily Inspection

Daily or before each trip, check the suspension to be sure it is fully operational. Visually inspect air springs for sufficient and equal pressure and make sure the suspension is set at the proper ride height. For ride height measurement and resetting instructions, refer to Section 7. Service as necessary.

### 17.1 Initial Three (3) Months or 5,000 Mile (8,000 km) Service Inspection

1. The suspension ride height (underside of frame to centerline of axle) **MUST** be within  $\pm 1/4$ " (6 mm) of the recommended design height. For instructions on measuring ride height, refer to Section 7.

#### CAUTION

An improperly set ride height could result in suspension component damage and/or poor vehicle ride performance.

2. After the first three (3) months or 5,000 miles (8,000 km) of service, whichever comes first, inspect the bolts and nuts at the pivot connections to ensure they are properly torqued. Check all other nuts and bolts for proper torque, refer to the specifications listed in Section 16. Re-torque as necessary thereafter.
3. With the vehicle on a level surface and air pressure above 85 psig (5.9 bars), verify that all the air springs are of sufficient and equal firmness.

**NOTE:** Check all the air control system fittings for air leaks, by applying a soapy water solution and checking for bubbles at all air connections and fittings.

### 17.2 Routine Physical Inspections

Every 100,000 Miles (160,000 km) or one (1) year, whichever comes first.

Check all other suspension components for any sign of damage, looseness, torque loss, wear or cracks. Repair, tighten or replace damaged part(s) to prevent equipment breakdown.

### 17.3 Visual Inspection Procedure

**IMPORTANT:** A schedule for physical and visual inspections should be established by the operator based on severity of operation or damage to the vehicle could occur.

**IMPORTANT:** During each pretrip and safety inspection of the vehicle, a visual inspection of the suspension should be done or damage to the vehicle could occur.

Visually check for:

- Loose, broken or missing fasteners. Repair or replace as needed.

#### WARNING

Loose, damaged, or missing fasteners can cause loss of vehicle control which, if not avoided, could result in death or serious injury.

- Air springs – clearances, wear damage, and proper inflation.
- Shock absorbers – leaking or damaged.
- Cracked parts or welds.

Also:

- Check the slider locking pins, slider pull-bar mechanism and slider wear pads for signs of excessive wear or binding, refer to Section 5 (**Figure 4**). Repair or replace as needed.
- Inspect the structure of the slider box and cross members for damage, refer to Section 5 (**Figure 4**). Repair or replace as needed.
- Inspect the front and rear hold down clips to make certain the clips are secured correctly around the body rails, refer to Section 5 (**Figure 4**). Torque all 1/2" nuts to 75-90 ft.-lbs. (102-122 N•m).

## 18. Troubleshooting

PROBLEM	POSSIBLE CAUSE	RESOLUTION
All air springs flat (no air).	Insufficient air pressure to suspension.	Build air pressure above 85 psig (5.9 bars). Malfunctioning air pressure protection valve – test the valve using instructions in Sections 8. Replace if necessary. Check air compressor. Height control valve NOT working – follow height control valve inspection procedures in Section 8.
	Air leakage from the suspension air system or the air brake system.	Test for air leakage due to loose fittings or damaged air lines, air springs, brake actuators or height control valve. Tighten loose fittings to stop leakage and/or replace worn or damaged parts.
Air springs deflate rapidly when vehicle is parked.	Air leakage from the suspension air system.	Test for air leakage due to loose fittings between air tank and air suspension or damaged air lines, air springs or height control valve. Apply a soap and water solution to connections and air springs to check for bubbles which signifies leaks. Tighten loose fittings to stop leakage and/or replace worn or damaged parts with new ones.
Ride height too high or too low.	Height control valve out of adjustment.	Re-adjust the height control valve – follow height control valve adjustment procedures in Section 7.
Air springs ruptured.	Tire, tire rim or brake component rubbing air spring.	Check inside to inside tire dimension. There MUST be 1" (25 mm) minimum clearance around air spring. If not, it may be necessary to re-install suspension. Use tire rim back spacers to provide additional clearance.
	Spring brake chamber rubbing air spring.	Re-locate chamber or rotate clamp ring for additional clearance.
Air spring failed.	Continual or repeated over-extension of the air spring.	Visually inspect for broken or loose shock absorber or shock absorber mounting bracket. Re-connect loose parts and replace any defective parts. Check the adjustment of the height control valve, refer to Section 7.
	Air spring(s) worn out.	Replace air spring(s), refer to Section 10.
	Air leak or damaged line.	Locate and repair. Air spring punctured or leaking – replace with proper air spring. Then check for proper clearance around air spring, 1" (25 mm) minimum. Also check shock absorbers.
	"Temporary Operation."	If air loss occurs in the air suspension system and after attempts to repair have failed to correct the problem, it is recommended that the height control valve linkage be disconnected and all air exhausted from the system. There is an internal rubber bumper built into the air spring which makes it possible to operate the vehicle cautiously while driving at a reduced speed to the nearest repair facility.
	Restricted air lines(s) between the height control valve and the air spring(s).	Disconnect the height control valve linkage and rotate the actuating lever to the 20° down position. If the air spring(s) remain inflated, check for pinched or blocked line(s).
Front pivot connection worn and loose.	Fixed frame bracket pivot wear washers worn.	If internal wear washers are worn, replace and realign axles.
	SwingAlign™ pivot alignment plates worn.	If alignment plates are worn, replace and re-align axles, refer to Section 15.
	Front pivot bolt loose.	Connection NOT properly tightened. Replace all worn or damaged components - refer to Section 12.
	Excessive lateral axle walk.	3/4" (19 mm) is maximum. Axle connection welds failed. Refer to Section 4 for welding specifications. Front pivot connection bushing worn – replace with proper Service Repair Kit refer to Parts Manual XL-AS11428PM-en-US.
Shock absorber failures.	Over-extending shock absorbers.	Suspension set at improper ride height – re-adjust height control valve, refer to Section 7. Suspension mounted at wrong ride height – check specification sheet, or refer to Section 7 for correct ride height and adjustment procedure. Wrong length or improper replacement shock absorber(s) replace if necessary, refer to Section 11.
Excessive tire wear.	Loose or worn bushings at pivot connection.	Inspect for damage and replace components as necessary, or if loose, tighten connection(s) to proper torque, refer to torque specifications listed in Section 16. Then, check axle alignment and re-align if necessary. If worn – replace with proper Service Repair Kit see Parts Manual XL-AS11428PM-en-US.
	Suspension NOT properly installed.	Contact SAF-HOLLAND® Customer Service and/or check trailer manufacturer for proper suspension installation; correct where necessary.



From fifth wheel rebuild kits to suspension bushing repair kits, SAF-HOLLAND Original Parts are the same quality components used in the original component assembly.

SAF-HOLLAND Original Parts are tested and designed to provide maximum performance and durability. Will-fits, look-alikes or, worse yet, counterfeit parts will only limit the performance potential and could possibly void SAF-HOLLAND's warranty. Always be sure to spec SAF-HOLLAND Original Parts when servicing your SAF-HOLLAND product.

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