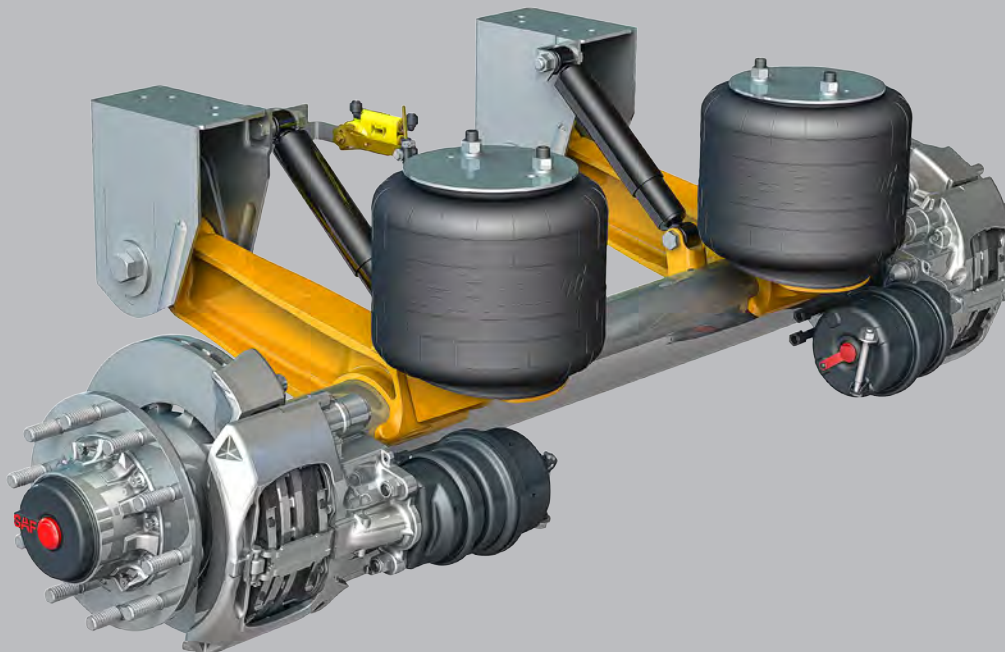


Maintenance Manual

CBX/CB Series

Fixed Frame Top Mount Trailer Air Suspension

- For Disc and Drum Brake Applications



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Introduction

The CBX suspensions includes a premium 5.75" diameter axles. The CB suspensions includes a standard 5.00" diameter axle. For axle end and/or brake servicing information or component replacements, contact 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.

Read this manual before using or servicing this product and keep it in a safe location for future reference. Updates to this manual, which are published as necessary, are available on the internet at www.safholland.us.

When replacement parts are required, SAF-HOLLAND® highly recommends the use of only SAF-HOLLAND Original Parts. A list of technical support locations that supply SAF-HOLLAND Original Parts and an Aftermarket Parts Catalog are available on the internet at www.safholland.us or contact Customer Service at 888-396-6501.

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.

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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. Safety Instructions

General and Servicing Safety Instructions

- Read and observe all Warning and Caution hazard alert messages. The alerts provide information that can help prevent serious personal injury, damage to components, or both.

⚠ WARNING Failure to follow the instructions and safety precautions in this manual could result in improper servicing or operation leading to component failure which, if not avoided, could result in death or serious injury.

- All maintenance should be performed by a properly trained technician using proper/special tools, and safe procedures.

NOTE: In the United States, workshop safety requirements are defined by federal and/or state Occupational Safety and Health Act (OSHA). 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.

- Properly support and secure the vehicle from unexpected movement when servicing the unit.

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

- If possible, unload the trailer before performing any service procedures.
- After re-positioning the brake chamber, slack adjuster and/or ABS system as instructed in this manual, always consult the manufacturer’s manual for proper operation.
- Service both roadside and curbside of an axle. Worn parts should be replaced in sets. Key components on each axle’s braking system, such as friction material, rotors and drums will normally wear over time.
- Follow all manufacturer’s instructions on spring pressure and/or air pressure controls.

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

- DO NOT paint the wheel contact surfaces between the wheel and hub.

IMPORTANT: The wheel contact surfaces MUST be clean, smooth and free from grease.

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

- Only the wheel and tire sizes approved by the trailer builder can be used.

Operational and Road Safety Instructions

- Before operating vehicle, ensure that the maximum permissible axle load is not exceeded and that the load is distributed equally and uniformly.
- Make sure that the brakes are not overheated from 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.

- The parking brake MUST NOT be immediately applied when the brakes are overheated.

CAUTION If the parking brake is immediately applied to the brakes when overheated, the brake drums or discs could be damaged by different stress fields during cooling.

- 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.

- Follow the recommended routine maintenance and inspections described in this manual. These procedures are designed so that optimum performance and operational safety are achieved.
- 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 vehicle from traffic, follow DOT safety requirements regarding emergency situations.
- 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; however in the event of an air system failure while in service, an internal rubber bumper built into the air spring will make it possible to temporarily operate the vehicle at reduced speed determined by road conditions.

⚠ 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.

2. CBX Fusion Model Identification

The CBX Fusion suspension serial tag is located on the frame bracket (**Figure 1**).

NOTE: If the suspension serial tag is not legible or is NOT available, it can be identified by the appearance of the equalizing beam (**Figure 3**). The CBX Fusion model will have a cast beam with a lower air spring mounting plate welded to it mounted on a 5.75" round axle.

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

NOTE: The CBX fusion models come in four (4) different beam lengths. Equalizing beam lengths are measured from the center line of the pivot to the center line of the air spring mounting plate (**Figure 3**).

3. CBX Fusion Model Nomenclature

The sample tag illustrated will help interpret the information on the SAF-HOLLAND, Inc. serial number 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 23 - 14

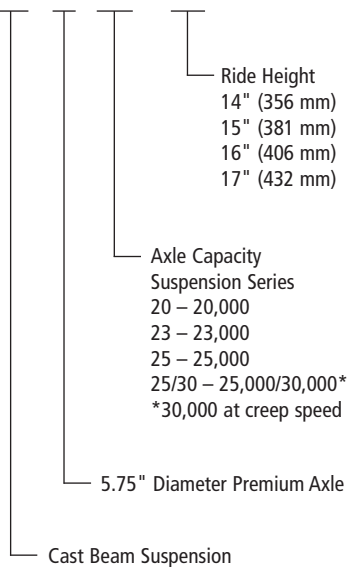


Figure 1

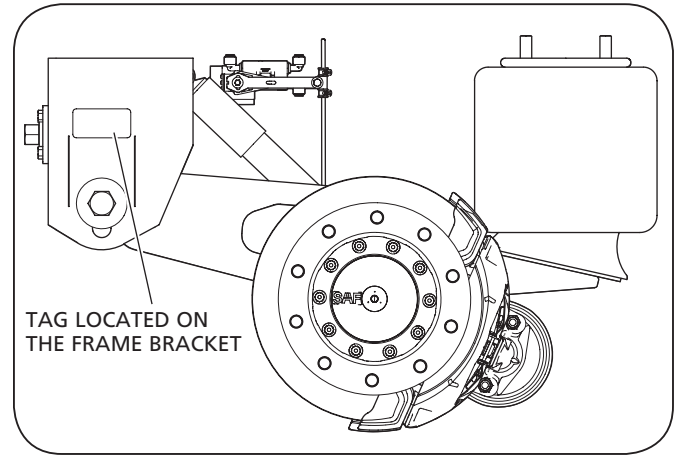


Figure 2

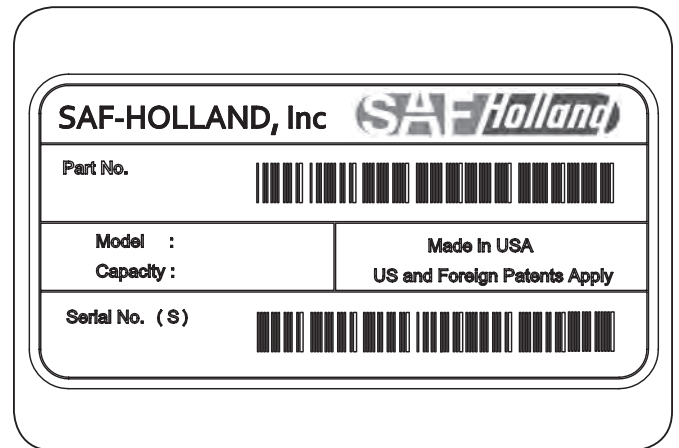
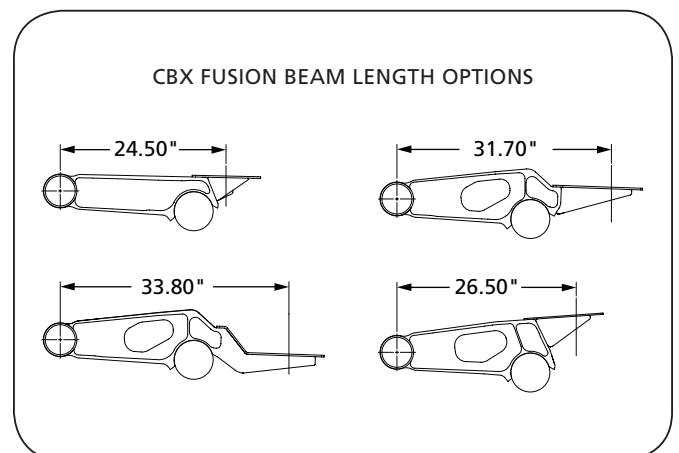


Figure 3



4. CBX Model Identification

The CBX suspension serial tag is located on the frame bracket (**Figure 4**).

NOTE: If the suspension serial tag is not legible or is NOT available, it can be identified by the appearance of the equalizing beam (**Figure 6**). The CBX model will have a cast beam with a lower air spring mounting plate welded to it mounted on a 5.75" round axle.

NOTE: This manual applies to the suspension models listed on the front cover. However, determine the specific model number, write that information below and refer to it when obtaining information or replacement parts (**Figure 5**).

NOTE: The CBX models come in three (3) different beam lengths (**Figure 6**). Equalizing beam lengths are measured from the centerline of the pivot to the centerline of the air spring mounting plate.

Figure 4

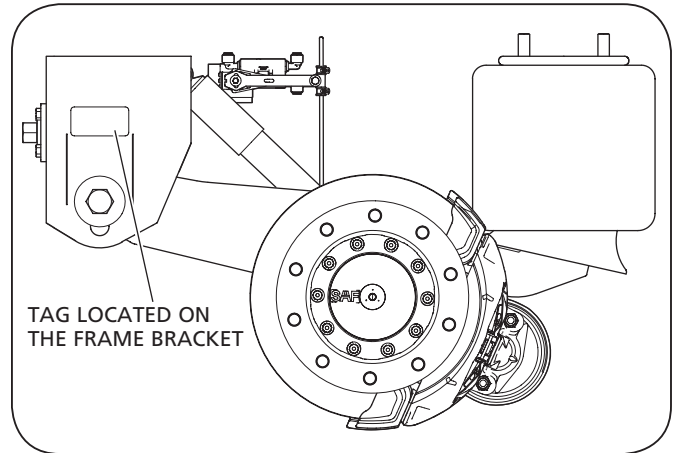
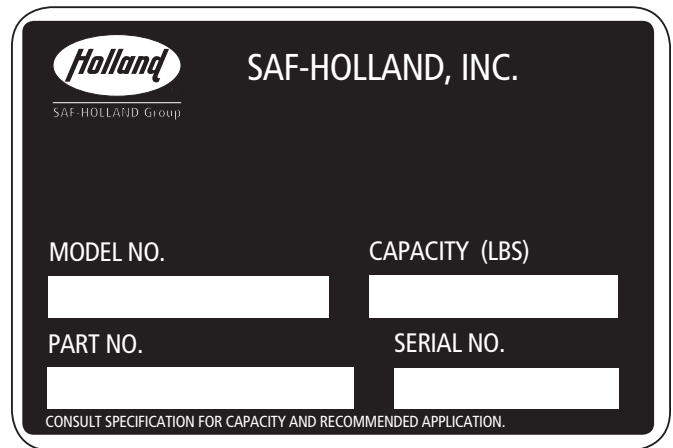


Figure 5



5. CBX Model Nomenclature

The sample tag illustrated will help you interpret the information on the SAF-HOLLAND, Inc. serial number tag. The model number is on the first line along with the suspension capacity. The second line contains the part number and the serial number (**Figure 5**).

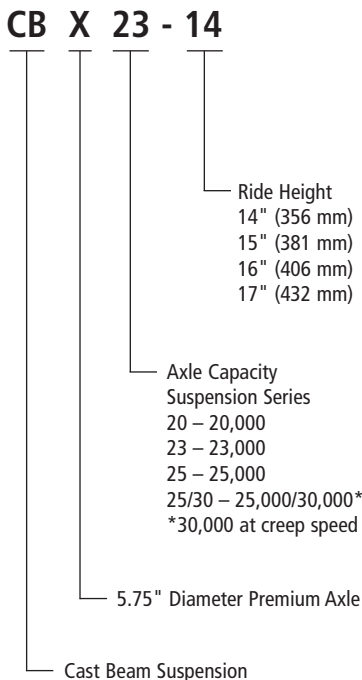
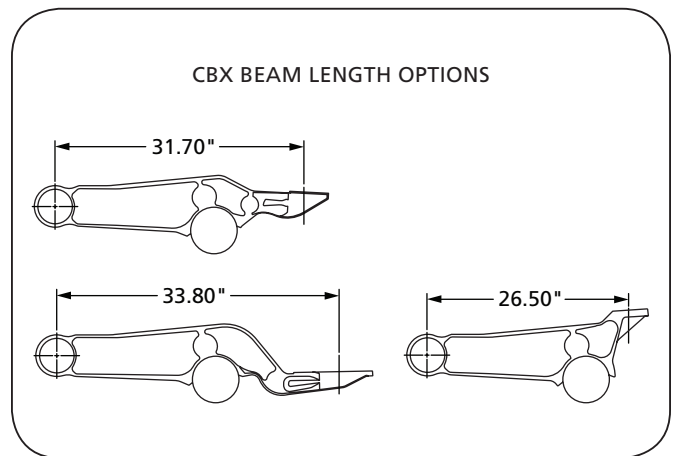


Figure 6



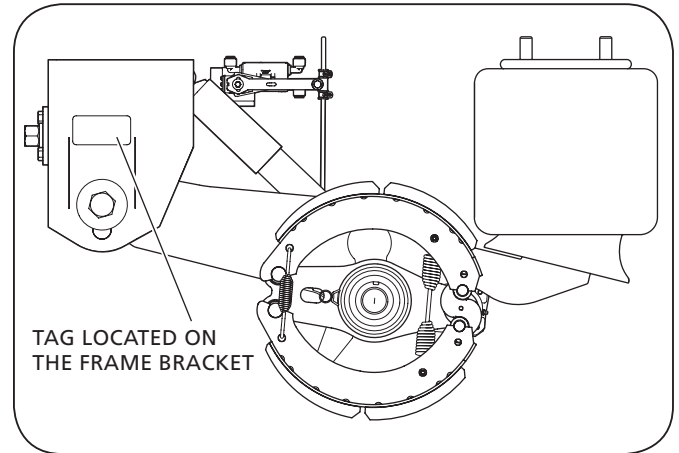
6. CB-2300 Model Identification

The CBX-2300 suspension serial tag is located on the frame bracket (**Figure 7**).

NOTE: If the suspension serial tag is NOT legible or is NOT available, it can be identified by the appearance of the equalizing beam. The CB-2300 model will have a cast beam and a 5" round axle (**Figure 7**).

NOTE: This manual applies to the suspension models listed on the front cover. However, determine the specific model number, write that information below and refer to it when obtaining information or replacement parts (**Figure 8**).

Figure 7



7. CB-2300 Model Nomenclature

The sample tag illustrated will help you interpret the information on the SAF-HOLLAND, Inc. serial number tag. The model number is on the first line along with the suspension capacity. The second line contains the part number and the serial number (**Figure 8**).

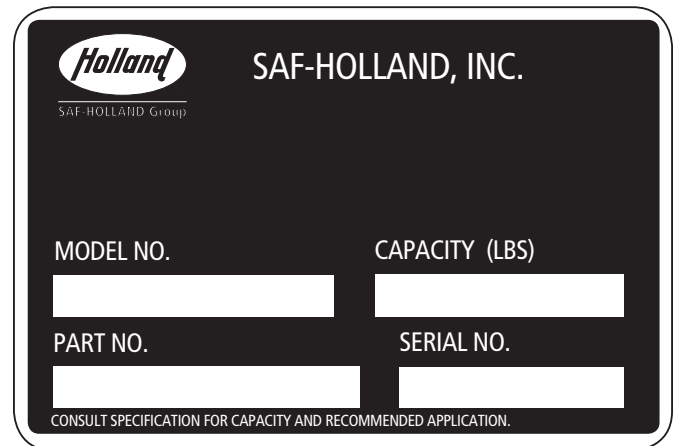
CB 2300 - 14

Ride Height
 14" (356 mm)
 15" (381 mm)
 16" (406 mm)
 17" (432 mm)

Axle Capacity
 Suspension Series
 23,000 lbs.

Cast Beam Suspension

Figure 8



8. Welding Standards

8.1 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 weld material and procedure differ from those listed below.

8.2 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.

8.3 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% CO₂. If a different gas is used, welds MUST comply with penetration requirements illustrated (**Figure 9**). Where the installation drawing specifies different than above, the drawing shall prevail.

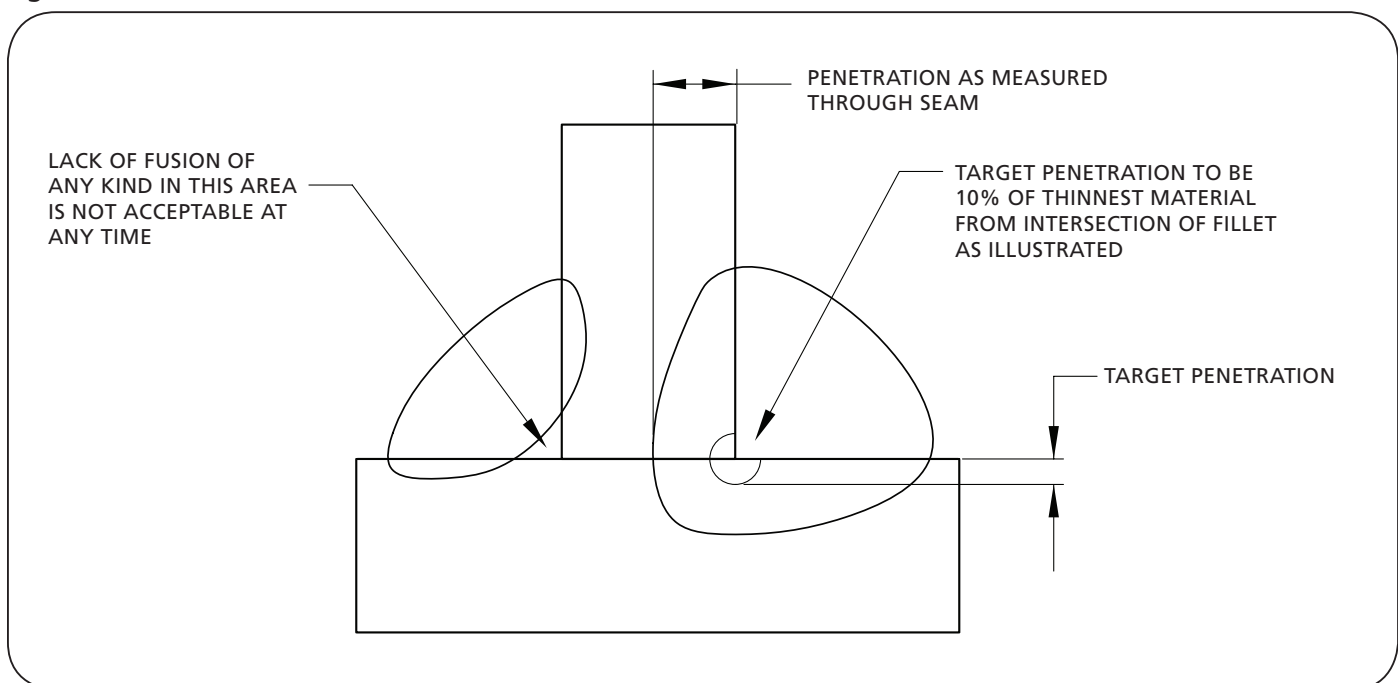
8.4 Procedures

Tack welds used for positioning components are to be located in the center of the final weld, where practical. 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 illustrated to 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.

8.5 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 9**).

Figure 9



9. Ride Height Adjustment

IMPORTANT: 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 10**).
2. Raise the trailer frame approximately 2" (51 mm) above the suspension's specified ride height (**Figure 11**).
3. Place multiple jack stands at the suspension's specified ride height (**Table 1**) under the vehicle frame at OEM specified locations, then lower the trailer onto the jack stands.

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

Table 1

MODEL	"A" RIDE HEIGHT
CBX/CB-14	14"
CBX/CB-15	15"
CBX/CB-16	16"
CBX/CB-17	17"

4. Exhaust all air from the suspension, set 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 the linkage from the control arm and lower axle mounting bracket (**Figure 12**).
6. Pin the height control valve so that the valve arm is in the center or neutral position (**Figure 12**).

Figure 10

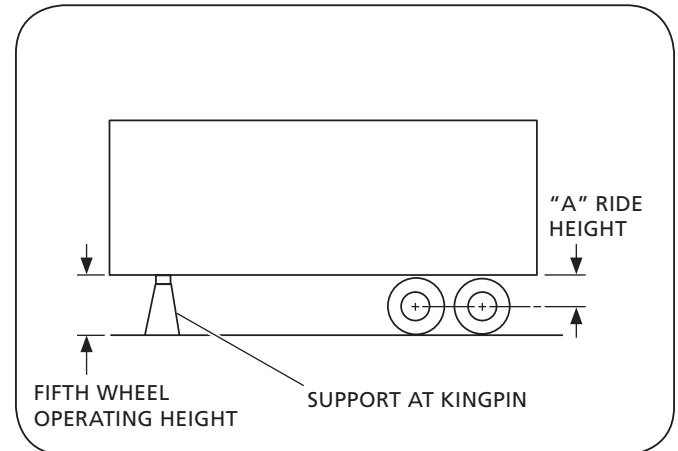


Figure 11

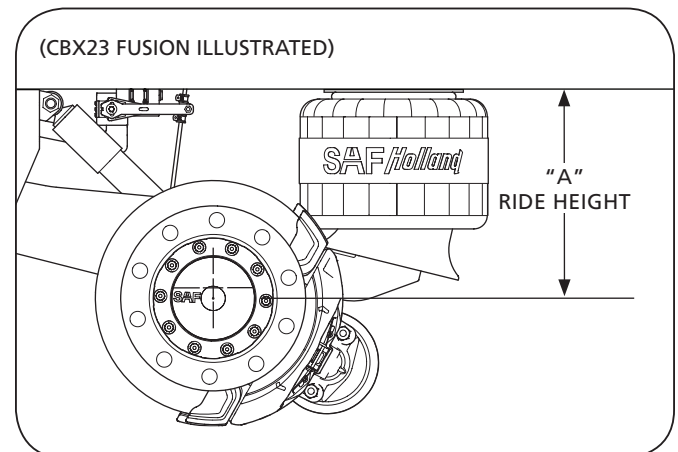
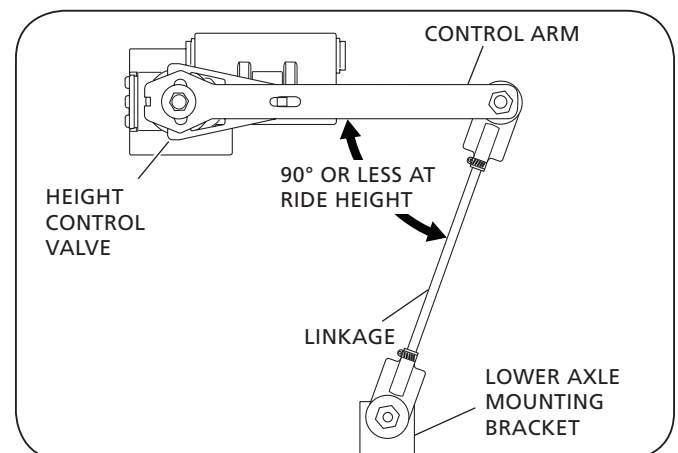


Figure 12



7. Measure distance "B" between the valve arm and mounting bracket holes to determine linkage length (**Figure 13**).
8. Adjust the linkage to required length and install the hardware into the upper and lower connections (**Figure 13**). Torque hardware to 30-40 in.-lbs. (3-5 N•m).

NOTE: It could be necessary to cut the linkage rod to achieve proper length. Be sure to de-burr the rod to prevent link end damage.

9. Raise the trailer approximately 2" (50 mm) above the ride height and remove the jack stands.
10. Slowly lower the trailer so that the trailer suspension is fully collapsed.
11. Pull pin and apply air to the trailer allowing the suspension to return to ride height.
12. With the suspension at rest, measure the ride height. Ride height must be within 1/4" (6 mm) of the suspensions specified ride height.
13. Spray a soapy water mix on all air line connections and test for air leaks and verify the fittings are tight.

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 performance which, if not avoided, could result in component or property damage.

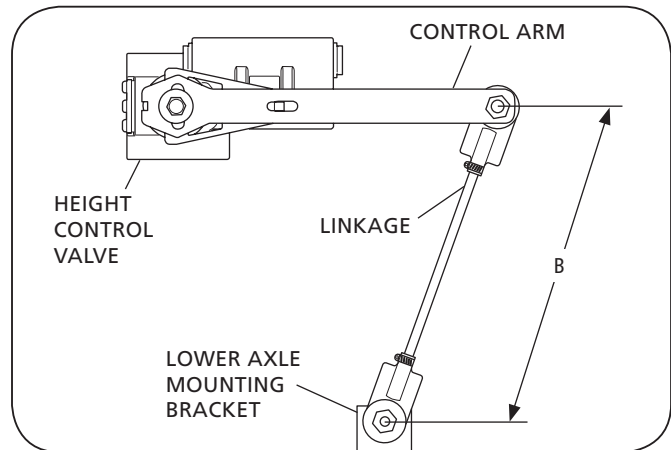
14. Remove the wheel chocks.

10. Height Control Valve Inspection

IMPORTANT: DO NOT grease height control valve.

1. Visually inspect the valve and linkage on a monthly basis for proper clearance, operation and adjustment.
2. Drain moisture from the air tank periodically. In severe cold weather an air dryer and/or an alcohol evaporator is recommended to avoid valve freezing and damage.
3. Ensure the air system is free of dirt and foreign particles as they may harm the valve.

Figure 13



11. Height Control Valve Performance Check

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

1. Apply air system pressure in excess of 85 psig (5.9 bars).
2. Using multiple jack stands support the vehicle frame approximately 2" (51 mm) below the ride height at 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. Disconnect 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 air spring(s) (**Figure 14**).
5. Move the control arm to center (neutral) position – valve should shut off the air flow (**Figure 14**).
6. Move the control arm down 45° for 10-15 seconds – air should exhaust (**Figure 14**).
7. Move the control arm to center (neutral) position – valve should shut off the air flow.
8. The valve is good if the performance is as noted.

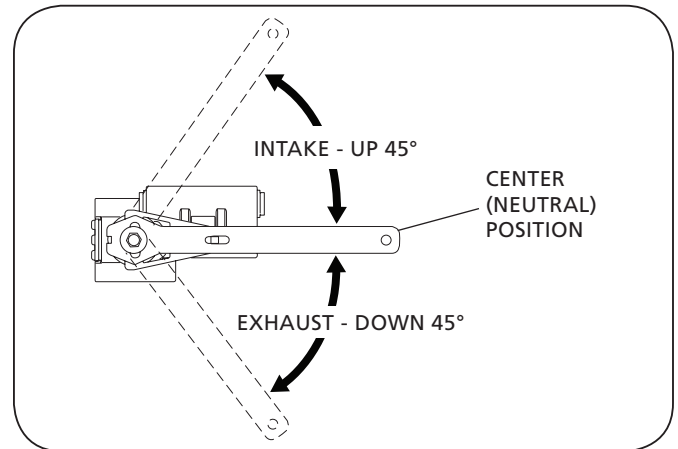
NOTE: If the valve DOES NOT perform correctly, replace the valve.

9. Reconnect 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) air system pressure cannot be achieved, check pressure protection valve and 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 14



12. SwingAlign Axle Alignment

12.1 Alignment Preparation

1. Pull the trailer in a straight line for a sufficient distance to ensure there are no binds in the suspension.
2. Disengage the trailer parking brakes and make sure the trailer is empty.
3. Manually measure or use an optical device specifically designed for alignment measuring to determine the following:
 - a. Measure the distance from the king pin to the center line of the front axle spindles. It is recommended that spindle extensions be utilized.
 - b. Dimensions A and B (**Figure 15**) MUST be equal to within 1/8" (3 mm).
 - c. Measure the distance from the center line of the front axle spindles to the center line of the rear axle spindles.
 - d. Dimensions C and D (**Figure 15**) MUST be equal to within 1/16" (1 mm).

12.2 Alignment Instructions

1. Using the measurements from Step 3, align each axle. Align by rotating the alignment bolt head using a 1-3/8" socket wrench on the front face of the roadside frame bracket. Rotate clockwise to move axle forward (**A arrows**); counterclockwise to move axle rearward (**B arrows**) (**Figure 16**).

IMPORTANT: DO NOT loosen the pivot bolts.

IMPORTANT: Two (2) 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." Inspect and repair trailer components as necessary and realign (**Figure 17**).

IMPORTANT: The SwingAlign design maintains proper alignment without welding or without loosening of the pivot connection. DO NOT weld alignment bolt or pivot bolts (**Figure 17**). If connection requires tightening, see torque chart in Section 19 of this manual.

Figure 15

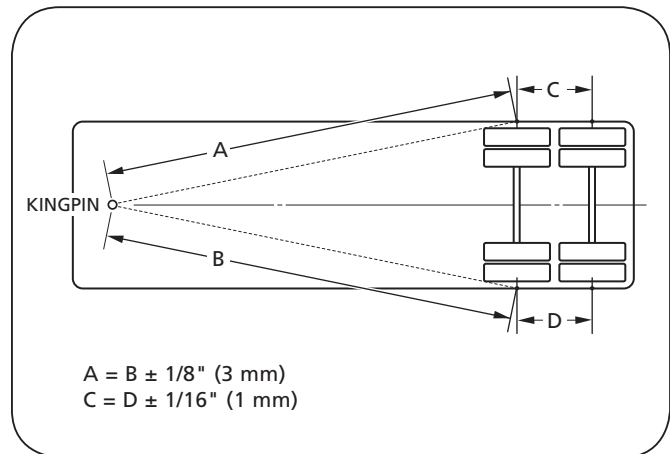


Figure 16

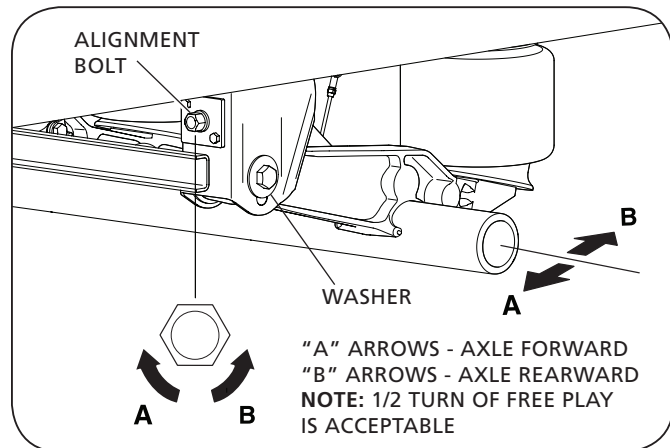
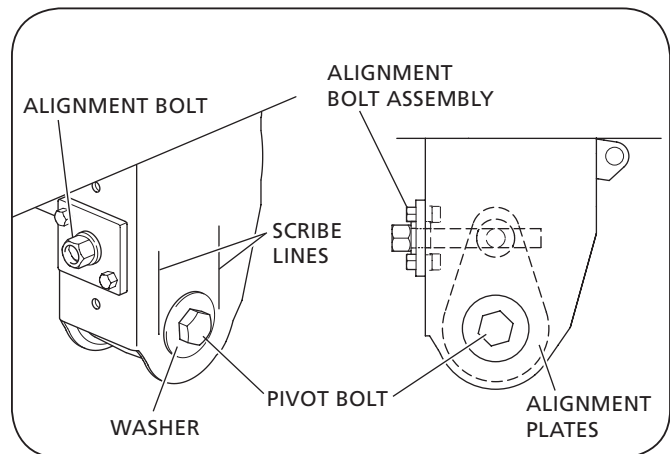


Figure 17



13. Air Spring Replacement

IMPORTANT: Air springs MUST be replaced with the proper air spring for your application. Check the flexible member and piston for the part number. If the part number cannot be found consult parts manual XL-AS11408PM-en-US.

NOTE: For further assistance with the air spring part number identification, contact SAF-HOLLAND technical assistance 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 coupled to a tractor (**Figure 18**).
2. Raise the trailer frame approximately 2" (51 mm) above the suspension's specified ride height.
3. Place multiple jack stands at the suspension's specified ride height (**Table 2**) under the vehicle frame at 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 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 (**Figure 19**).
6. Install the new air spring assembly and torque fasteners. Refer to the Torque Specifications listed in Section 19.
7. Reconnect the air supply line.
8. Raise the trailer approximately 2" (51 mm) above the ride height and remove the jack stands.

Figure 18

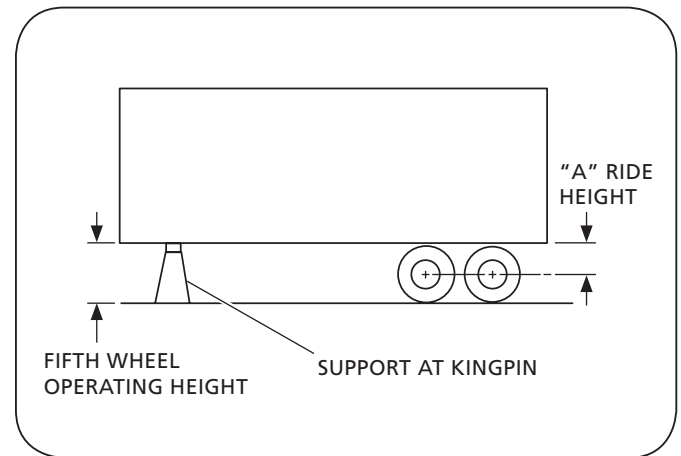
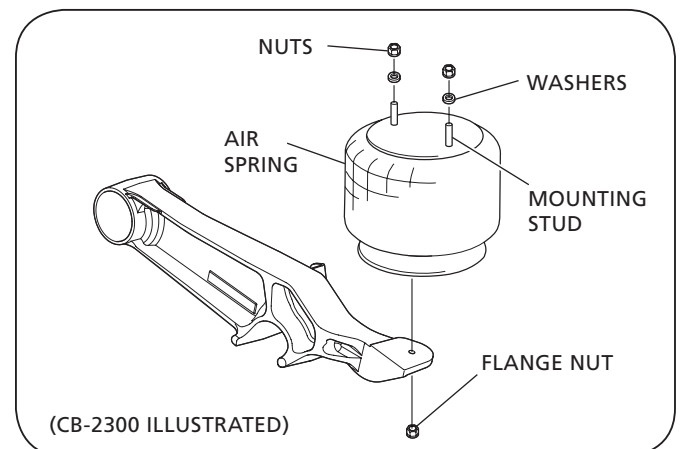


Table 2

MODEL	"A" RIDE HEIGHT
CBX/CB-14	14"
CBX/CB-15	15"
CBX/CB-16	16"
CBX/CB-17	17"

Figure 19



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 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 suspension performance which, if not avoided, could result in component or property damage.

12. Remove the wheel chocks.

14. Shock Absorber Replacement

IMPORTANT: The shock absorber **MUST** be replaced with the proper shock absorber. Check the shock for part number. If the part number cannot be found, consult parts manual XL-AS11408PM-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 coupled to a tractor (**Figure 20**).
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.

Figure 20

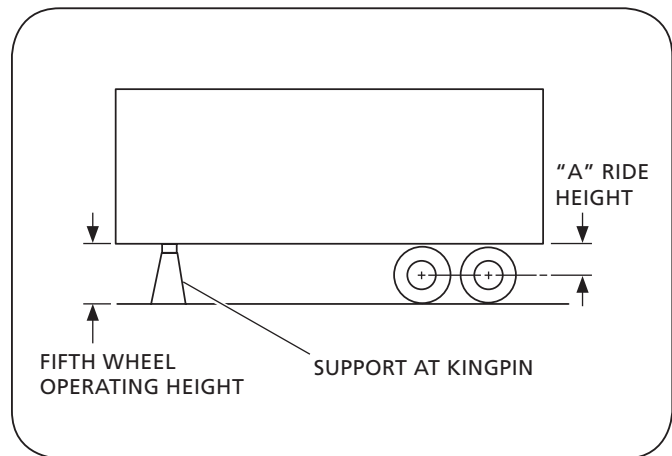


Table 3

MODEL	"A" RIDE HEIGHT
CBX/CB-14	14"
CBX/CB-15	15"
CBX/CB-16	16"
CBX/CB-17	17"

6. Remove the upper and lower mounting bolts and remove the shock absorber (**Figure 21**).
7. Replace with the correct shock absorber and fasteners and torque the hardware per specifications listed in Section 19.
8. Raise the trailer approximately 2" (51mm) above the ride height and remove the jack stands.
9. Slowly lower the trailer so that the trailer suspension is fully collapsed.
10. Apply air to the trailer and allow the suspension to return to ride height.
11. Remove the wheel chocks.

15. Pivot Connection Bushing Replacement

NOTE: If your suspension model is equipped with PosiLift™ refer to PosiLift™ manual XL-AR462 for the proper Service Repair Kit (SRK) and special replacement instructions.

IMPORTANT: When replacing the rubber bushing at this connection be sure the proper SAF-HOLLAND Service Repair Kit (SRK) is used as they contain all necessary parts to service one axle (two (2) kits per tandem). Refer to Service Repair Kit section of parts manual XL-AS11408PM-en-US for proper SRK. 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 coupled to a tractor (**Figure 22**).
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 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 21

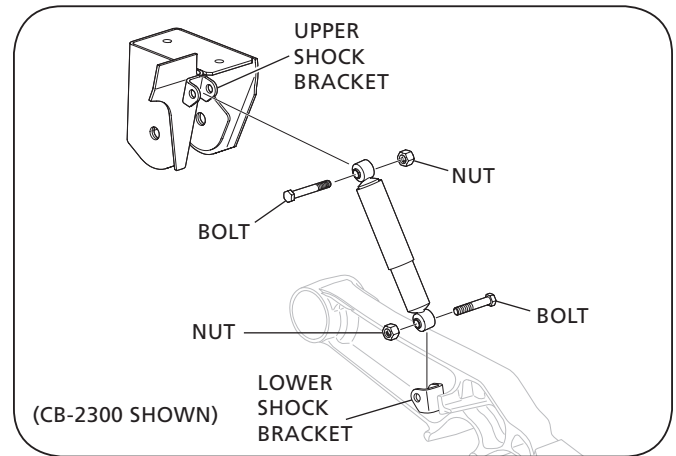


Figure 22

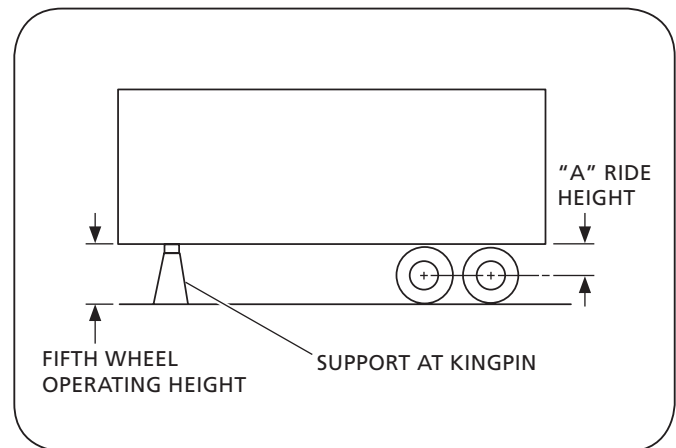


Table 4

MODEL	"A" RIDE HEIGHT
CBX/CB-14	14"
CBX/CB-15	15"
CBX/CB-16	16"
CBX/CB-17	17"

- 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.

- Disconnect the air spring and shock absorber at 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 is available to ease removal and replacement of bushings (**Figure 24 A**). 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.
- Remove the front pivot connection hardware and discard (**Figure 23 A or B**).
- Rotate the equalizing beams down. Make sure the equalizing beams are supported by the jack stands.

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

- Inspect the equalizing beams for wear, cracks and failed welds at the axle. If cracks are detected anywhere on an equalizing beam, replace the beam and the 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 24**) using a SAF-HOLLAND Bushing Service Tool, Part No. 50544015 (**Figure 24 A**).

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

- 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.

Figure 23

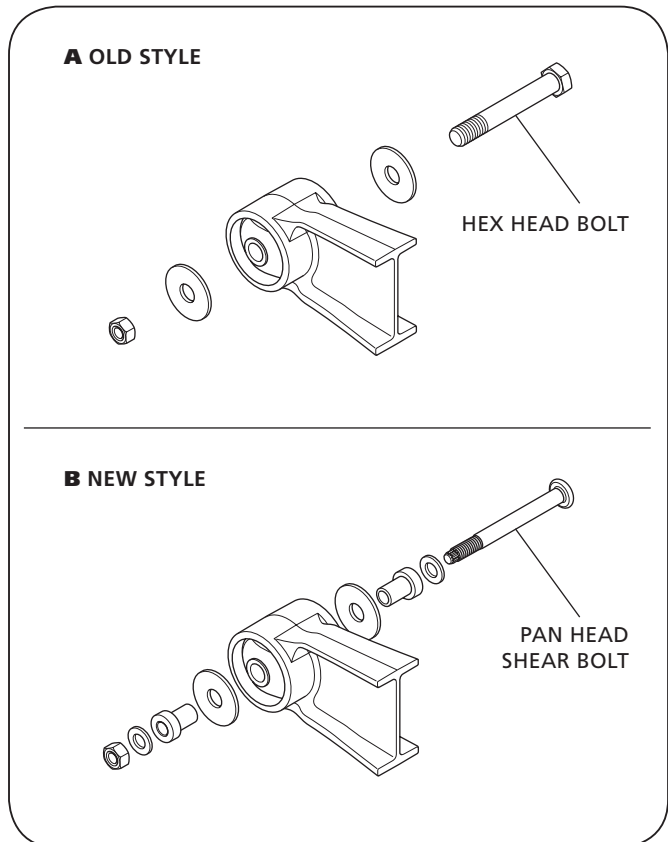
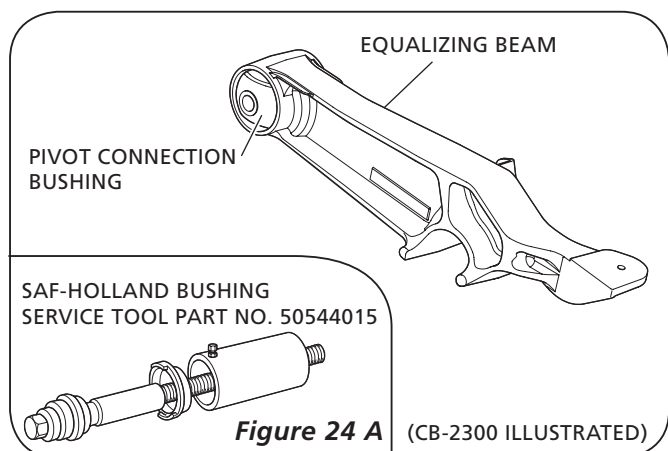


Figure 24



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

14. Press the new bushing into the beam. The bushing **MUST** be oriented, aligned and centered into the beam receptacles:
 - a. Orientate the bushings (**Figure 25**).
 - b. Press the bushings into the beam receptacles and center them (**Figure 26**).

IMPORTANT: It could be necessary to push the bushing past center approximately 1" (25.4 mm) and then re-center the bushing to relieve the rubber (**Figure 27**).

- c. Inspect the bushing's alignment (**Figure 27**). If the alignment is bad, press out the bushing and repeat the procedure.
15. Inspect the frame brackets for excessive wear on the inside wear washers or SwingAlign alignment plates. If the wear is excessive, refer to Section 17 for replacement information.
If only SwingAlign components need to be replaced, refer to Section 18 for replacement information.
If only fixed frame bracket components need to be replaced refer to Section 17 for replacement information.
16. Rotate the beams up into the frame brackets and reinstall the equalizing beam with the new bolts and nuts. Position at the ride height and torque the fastening hardware according to the specifications listed in Section 19.
17. Reconnect the air springs, shock absorbers and HCV linkage. Properly torque the fastening hardware according to the specifications listed in Section 19.
18. Raise the trailer approximately 2" (51mm) 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 the ride height.
21. Verify all 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.

⚠ WARNING

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

22. Remove the wheel chocks.

Figure 25

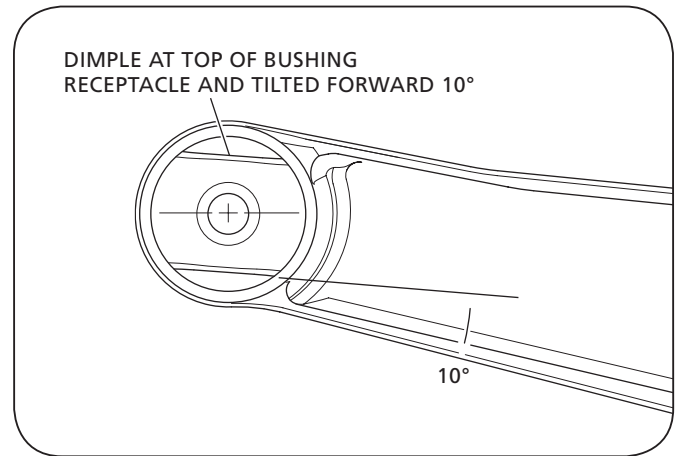


Figure 26

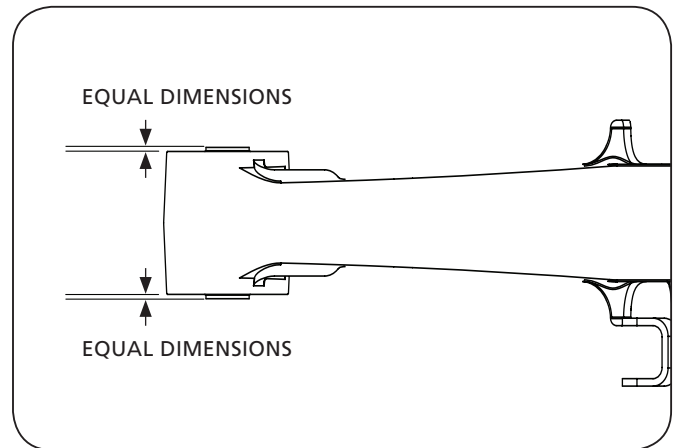
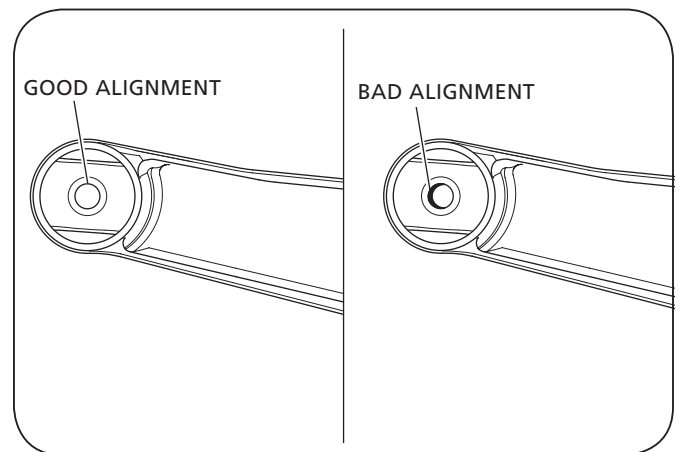


Figure 27



16. 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 coupled to a tractor (**Figure 28**).
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.

5. 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.

6. Raise the axle approximately 2" (51 mm) and support it with the 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.

7. Remove the tires.
8. Disconnect the air springs, shock absorbers and height control valve (HCV) linkage at the lower connections.
9. 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.
 - For Non-SAF® Manufactured Axles – contact axle manufacturer for recommended disassembly and reassembly procedures.
10. Remove the front pivot hardware from the suspension and discard (**Figure 29 A or B**).
11. Remove the axle and equalizing beam assembly.

Figure 28

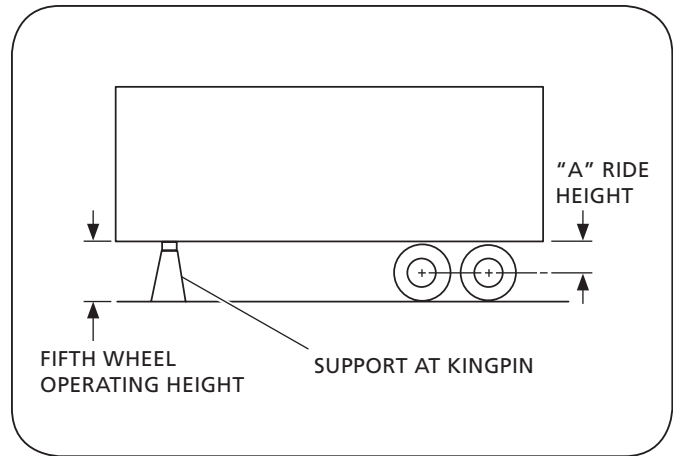
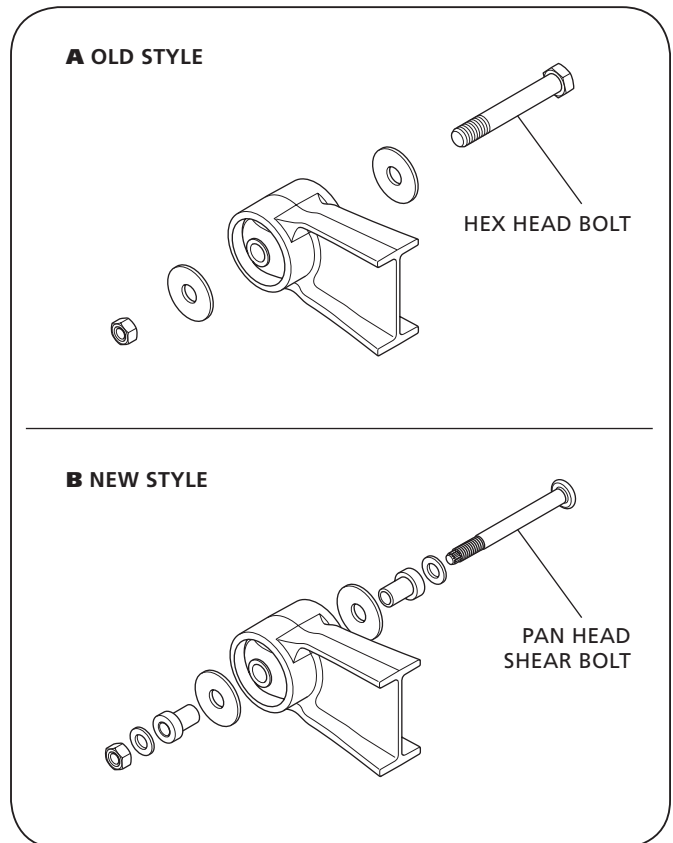


Table 5

MODEL	"A" RIDE HEIGHT
CBX/CB-14	14"
CBX/CB-15	15"
CBX/CB-16	16"
CBX/CB-17	17"

Figure 29



12. Install the new axle and equalizing beam assembly using the new pivot hardware (**Figure 30**). Position the axle at the ride height, support it with the jack stands.
13. Determine which pivot bolt style is being installed.
 - If 1-1/8" hex head bolt, verify torque on the nut is 550-600 ft.-lbs. (746-813 N•m) (**Figure 30 A**).
 - If 7/8" pan head shear bolt, verify spline has been sheared off (**Figure 30 B**).
14. Reconnect the lower connections on the air springs, shock absorbers and HCV linkage. Properly torque the hardware according to the specifications listed in Section 19.
15. Install the brake components and the wheel ends following the instructions in the appropriate manual referred to in Step 9.
16. Re-install the tires, remove the jack stands supporting the axle and equalizing beam assembly, and lower the axle.
17. Chock the wheels.
18. Raise the trailer approximately 2" (51mm) 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. With the suspension at rest, measure the ride height. The ride height **MUST** be within 1/4" (6.4 mm) of the suspensions specified ride height. Refer to Section 9 if the ride height needs to be adjusted.
22. 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 the air connections and fittings.

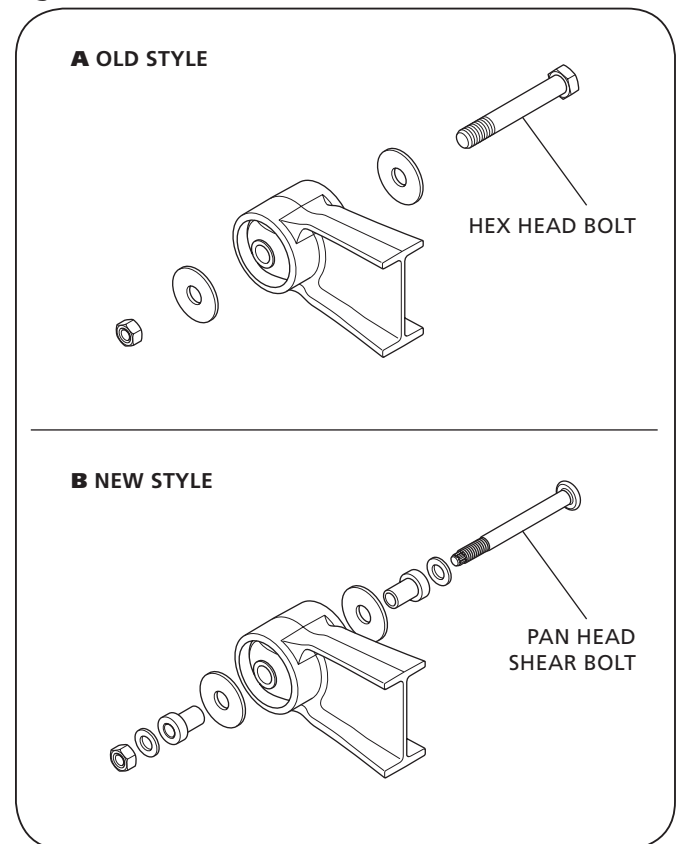
IMPORTANT: It is the responsibility of the air system installer to secure all the air lines and check for any air leaks. If air leaks are detected, repair as required.

CAUTION

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

23. Remove the wheel chocks.
24. Re-align the axles using the axle alignment procedures listed in Section 12.

Figure 30



17. Frame Bracket Replacement

NOTE: When replacing the frame bracket(s), refer to the parts manual XL-AS11408PM-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 18.

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 coupled to a tractor (**Figure 31**).
2. Raise the trailer frame approximately 2" (51 mm) above the suspension's specified ride height.
3. Place multiple jack stands at the suspension's specified ride height (**Table 6**) under the vehicle frame at 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.

5. 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.

6. 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.

7. Remove the tires.
8. Remove the front pivot hardware and discard (**Figure 32 A and B**). Rotate the equalizing beams downward out of the frame brackets.
9. On the side of the frame rail, mark the mounting location of the frame bracket to be replaced.
10. Remove the old frame bracket

Figure 31

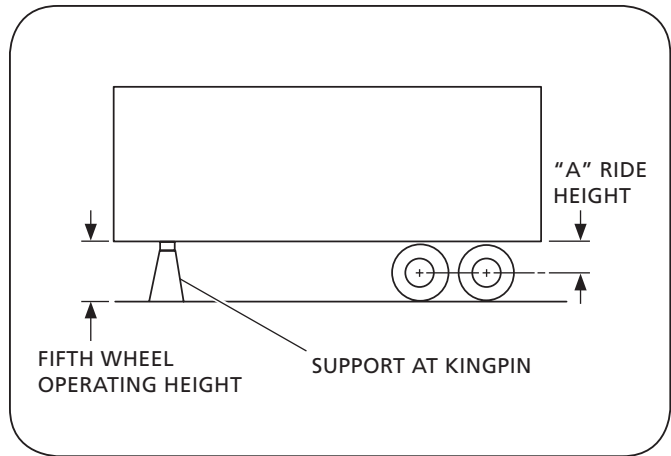
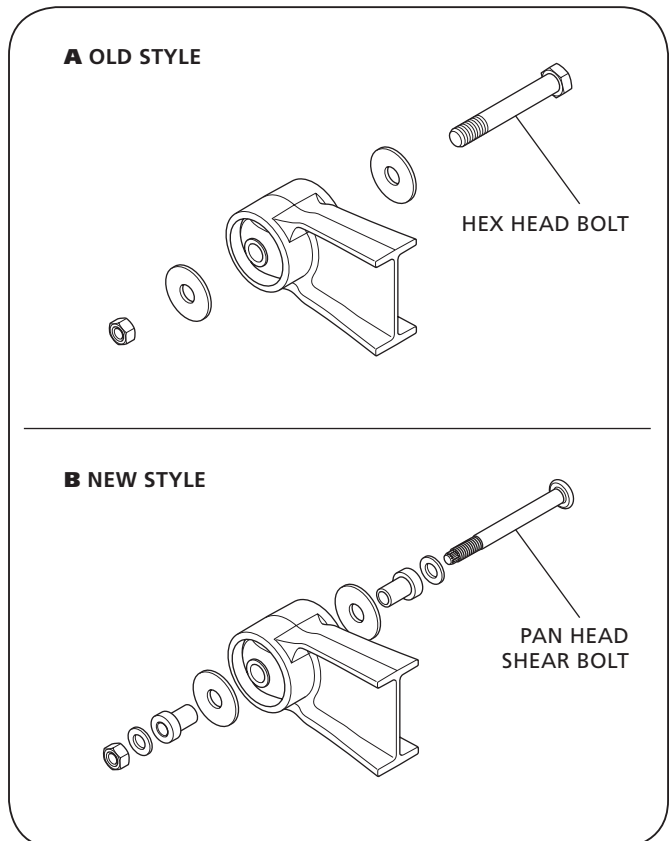


Table 6

MODEL	"A" RIDE HEIGHT
CBX/CB-14	14"
CBX/CB-15	15"
CBX/CB-16	16"
CBX/CB-17	17"

Figure 32



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

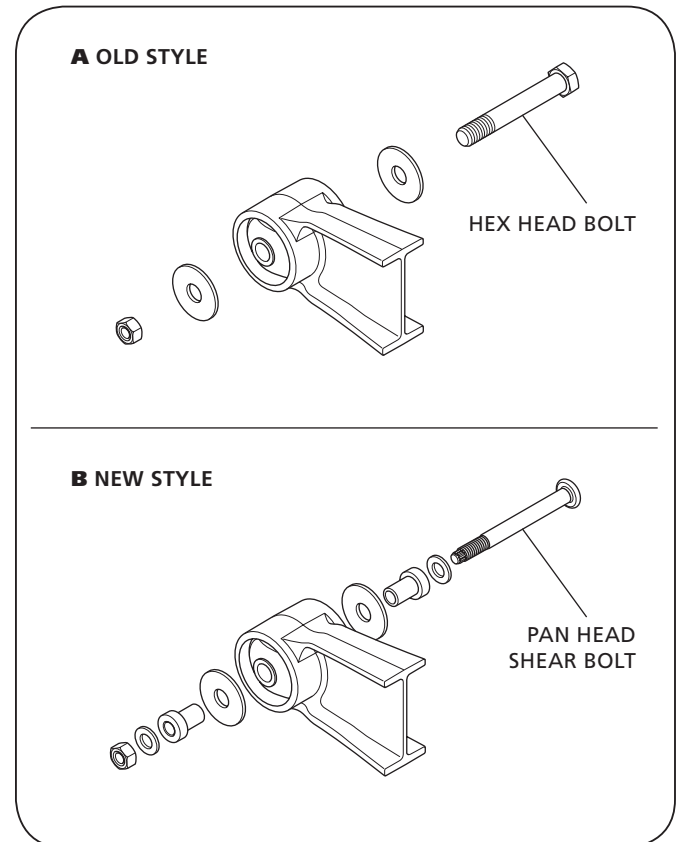
⚠ WARNING Failure to repair a damaged frame could cause damage to the suspension with possible loss of vehicle control which, if not avoided, could result in death or serious injury.

11. Place the new frame bracket(s) on the frame rail per the locations marked in Step 9. Refer to your model's specific installation drawing for the proper weld patterns and locations. Weld bracket in place according to the specifications listed in Section 8.

NOTE: To obtain a copy of your specific suspensions installation drawing, contact the SAF-HOLLAND customer service department at 888-396-6501.

12. If replacing the roadside SwingAlign frame bracket, refer to Section 18 for SwingAlign hardware installation procedures.
13. Rotate the equalizing beams upward into the frame brackets and install the new pivot hardware. Position the axle at the ride height.
14. Determine which pivot bolt style is being installed.
 - If 1-1/8" hex head bolt, verify torque on the nut is 550-600 ft.-lbs. (746-813 N•m) (**Figure 33 A**).
 - If 7/8" pan head shear bolt, verify spline has been sheared off (**Figure 33 B**).
15. Re-install the tires, remove the jack stands supporting the axle and the equalizing beam assembly, and lower the axle.
16. Chock the wheels.
17. Raise the trailer approximately 2" (51mm) above the ride height and remove the jack stands.
18. Slowly lower the trailer so that the trailer suspension is fully collapsed.
19. Apply air to the trailer and allow the suspension to return to the ride height.
20. With the suspension at rest, measure the ride height. The ride height must be within 1/4" (6.4 mm) of the suspensions specified ride height. Refer to Section 10 if the ride height needs to be adjusted.
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.

Figure 33



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 performance which, if not avoided, could result in component or property damage.

22. Remove the wheel chocks.
23. Re-align the axles using the axle alignment procedures listed in Section 12.

18. 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 coupled to a tractor (**Figure 34**).
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 7**), 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.

5. 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.

6. 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.

7. Remove the tires.
8. Remove the front pivot hardware and discard (**Figure 35 A or B**), and rotate the equalizing beams downward out of the frame brackets.

⚠ 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 34

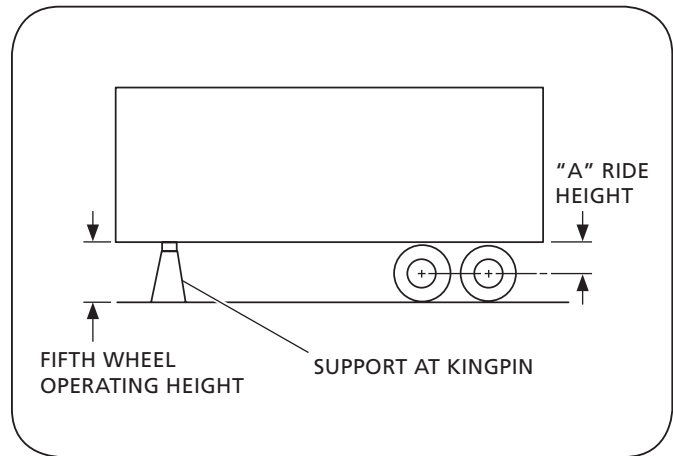
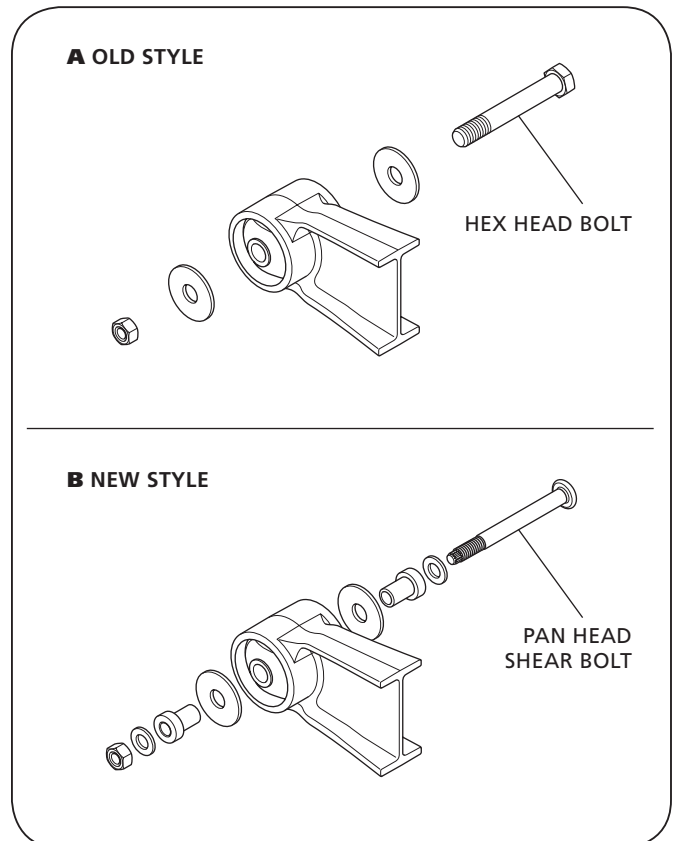


Table 7

MODEL	"A" RIDE HEIGHT
CBX/CB-14	14"
CBX/CB-15	15"
CBX/CB-16	16"
CBX/CB-17	17"

Figure 35



9. Remove and discard the SwingAlign mounting fasteners and rotate the threaded rod assembly counter-clockwise (CCW) until it disengages from the SwingAlign yoke (**Figure 36**).
10. Remove the threaded rod assembly, alignment plates, and yoke (**Figure 36**).
11. Assemble the new SwingAlign yoke between the two (2) new alignment plates and insert assembly into the frame bracket (**Figure 36**).

NOTE: Make sure the bosses on the alignment plates are fully seated into the frame bracket alignment plate holes (**Figures 36 and 37**).

12. From the front of the frame bracket, insert the new threaded rod assembly into SwingAlign yoke and rotate threaded rod clockwise until access to the pivot bolt hole is achieved (**Figure 37**).
13. Rotate the equalizing beams upward into the frame brackets. If necessary, adjust the threaded rod assembly until 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 36

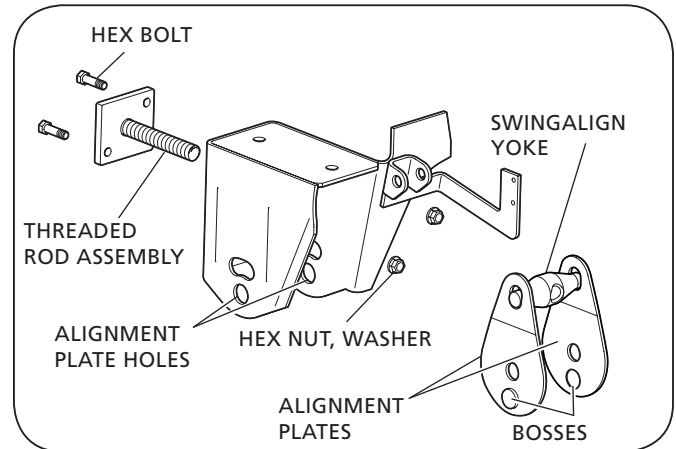
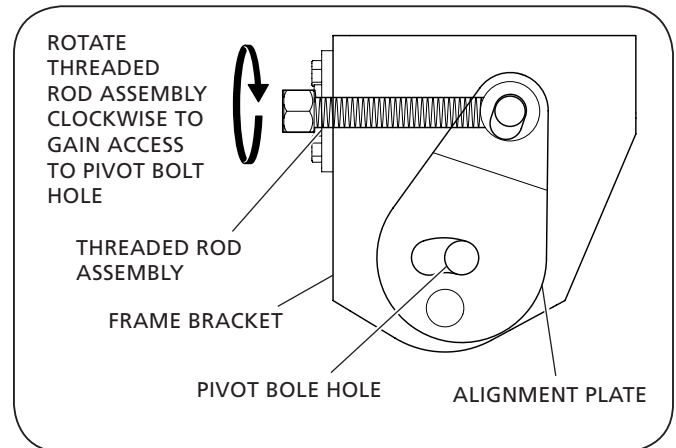


Figure 37



14. Position the axle at ride height and determine which pivot bolt style is being installed.
 - If 1-1/8" hex head bolt, verify torque on the nut is 550-600 ft.-lbs. (746-813 N•m) **(Figure 38 A)**.
 - If 7/8" pan head shear bolt, verify spline has been sheared off **(Figure 38 B)**.
15. Re-install the tires, remove the jack stands supporting the axle and the equalizing beam assembly, and lower the axle.
16. Chock the wheels.
17. Raise the trailer approximately 2" (51mm) above the ride height and remove the jack stands.
18. Slowly lower the trailer so that the trailer suspension is fully collapsed.
19. Apply air to the trailer and allow the suspension to return to ride height.
20. With the suspension at rest, measure the ride height. The ride height **MUST** be within 1/4" (6.4 mm) of the suspensions specified ride height. Refer to Section 9 if ride height needs to be adjusted.
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.

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

21. Remove the wheel chocks.
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 39)**.
23. Determine which pivot bolt style is being installed.
 - If 1-1/8" hex head bolt, verify torque on the nut is 550-600 ft.-lbs. (746-813 N•m) **(Figure 39 A)**.
 - If 7/8" pan head shear bolt, verify spline has been sheared off **(Figure 38 B)**.
24. Re-align the axles using the axle alignment procedures listed in Section 12.

Figure 38

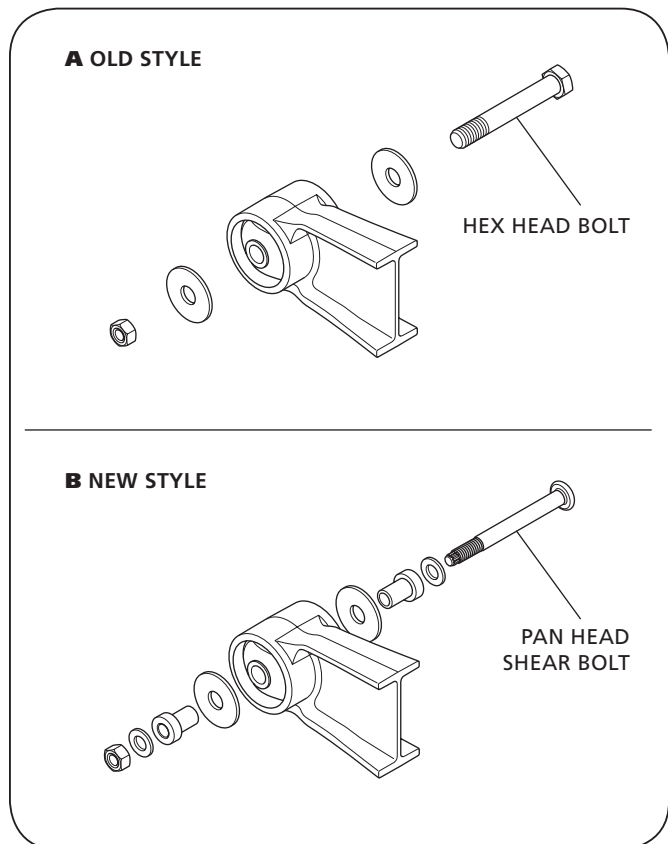
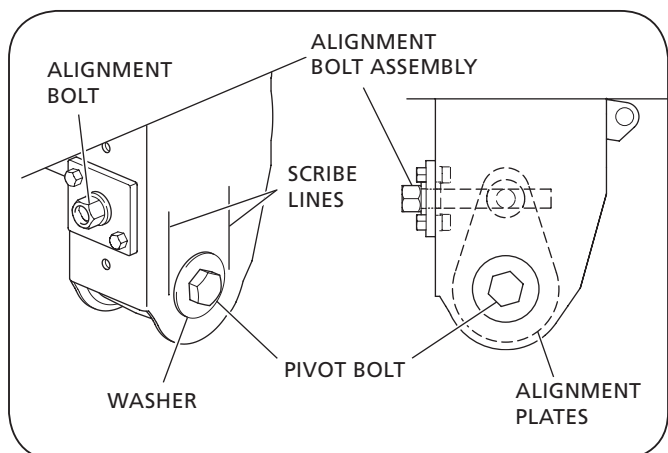


Figure 39



19. Torque Specifications

Table 8

COMPONENT	TORQUE VALUE	FASTENER SIZE
Shock Absorber	140-175 ft.-lbs. 190-237 N•m	3/4"
Pivot Connection, Hex Head Bolt	550-600 ft.-lbs. 746-813 N•m	1-1/8"
*Pivot Connection, Pan Head Shear Bolt	Visual Inspection	7/8"
Lower Air Spring Nut	30-40 ft.-lbs. 40-54 N•m	1/2"
Upper Air Spring Nut	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.

* If equipped with 7/8" splined shear bolt, ensure that the spline is sheared off and that there are no signs of movement.

NOTE: Torque specifications listed above are with clean lubricated / coated threads (**Table 8**). All new SAF-HOLLAND fasteners come pre-coated from the factory. For bolt and lock nut grade markings refer to **Figure 40**.

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.

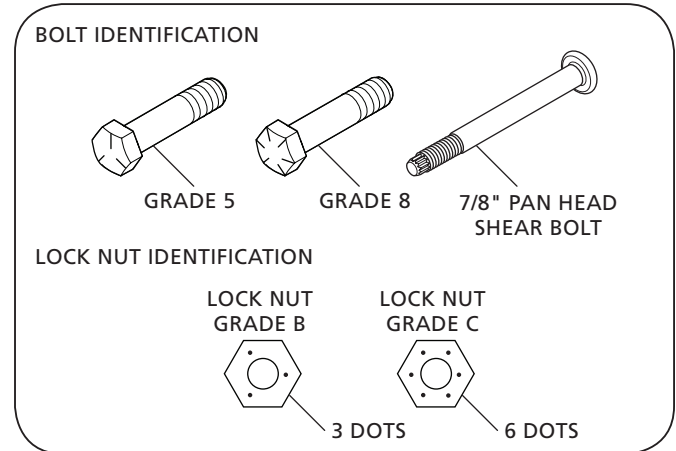
General Information

1. 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 40



20. Routine Maintenance and Daily Inspection

1. Daily or before each trip, check the suspension ensure it is fully operational.
2. Inspect all decals to ensure they are clearly legible and intact. Clean with a terry cloth towel, soap and water.
3. Visually inspect the air springs for sufficient inflation and that the suspension is at proper ride height. For ride height details and measurements, refer to Section 9 of this manual.

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

1. 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 the ride height, refer to Section 11.

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 or that the spline is sheared off. Refer to the specifications listed in Section 19. 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 air control system fittings for air leaks, by applying a soapy water solution and checking for bubbles at all the air connections and fittings.

20.2 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.

20.3 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.

21. Troubleshooting

PROBLEM	POSSIBLE CAUSE	RESOLUTION
All air springs flat (no air).	Insufficient air pressure to suspension.	Build air pressure in excess of 85 psig (5.9 bars). Malfunctioning air pressure protection valve – test the valve using instructions in Sections 10 and 11 . Replace if necessary. Check air compressor. Height control valve NOT working – follow height control valve inspection procedures in Section 11.
	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 soapy solution to connections and air springs if necessary to check for bubbles (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.	Readjust the height control valve – follow height control valve adjustment procedures in Section 9.
Air springs ruptured.	Tire, tire rim or brake component rubbing air spring.	Check inside to inside tire dimension. There must be 1" (25.4 mm) minimum clearance around air spring. If NOT, it may be necessary to reinstall suspension. Use tire rim back spacers to provide more clearance.
	Spring brake chamber rubbing air spring.	Relocate chamber or rotate clamp ring for more 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. Reconnect loose parts and replace any defective parts. Check the adjustment of the height control valve – refer to Section 9.
	Air spring(s) worn out.	Replace air spring(s) – refer to Section 13.
	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" (25.4 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 realign axles – refer to Section 18.
	Front pivot bolt loose.	Connection NOT properly tightened. Replace all worn or damaged components – refer to Section 15.
	Excessive lateral axle walk.	3/4" (19 mm) is maximum. Axle connection welds failed. Refer to Section 2 for welding specifications. Front pivot connection bushing worn – replace with proper Service Repair Kit refer to XL-AS11408PM-en-US – refer to Section 15.
Shock absorber failures.	Over-extending shock absorbers.	Suspension set at improper ride height – readjust height control valve – refer to Section 9. Suspension mounted at wrong ride height – check specification sheet, or refer to Section 9 for correct ride height and adjustment procedure. Wrong length or improper replacement shock absorber(s) replace if necessary – refer to Section 14.
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 specification, refer to Section 19 for torque information. Then, check axle alignment and realign if necessary. If worn – replace with proper Service Repair Kit refer to XL-AS11408PM-en-US – refer to Section 15.
	Suspension NOT properly installed.	Contact SAF-HOLLAND Service Department 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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