Replacement Procedure
Trailer Axles

SAF-HOLLAND Group

Drum Brake Trailer Axles
Four-Bolt Bearing Bracket With Cam Enclosure

Introduction

This manual provides the information necessary for the replacement of the S-cam bearing brackets for SAF® axles equipped with drum brakes, from two-bolt to four-bolt design.

NOTE: SAF® Service Manual for Drum Brake Axles, XL-TA10006OM-en-US MUST be obtained prior to repairing the axle.

The Service Manual for Drum Brake Axles contains information about removal, installation and verification that the unit can be returned to service which is needed throughout the following procedures. The service manual is available on the internet at www.safholland.us or by contacting Customer Service at 888-396-6501.

When replacement parts are required, use 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.

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. 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 may 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.

- 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.

IMPORTANT: Key components on each axle system including but not limited to suspension, slack adjuster, brake chambers, bearings, hubs, and drums require information supplied by the original manufacturer of the components to ensure proper and safe operation of the axle system.

⚠WARNING Failure to follow the original manufacturer's instructions regarding spring brake or air pressure control may allow an uncontrolled release of energy which could result in death or serious injury.

- 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.

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2. Allowable Axle Repairs

SAF® axle repair is limited to the replacement of S-cam brackets on drum brake axles where an S-cam bracket has been damaged. If any damage, including bending, dents or cracks, is evident on the SAF® axle tube, DO NOT repair the axle. Remove and replace the entire axle.

⚠WARNING Failure to replace a damaged SAF® axle tube could result in reduced strength in the axle tube which, if not avoided, could result in death or serious injury.

3. Model Identification

Service manuals and repair part information for the SAF® axle and suspension can be located by the suspension model number on the internet at www.safholland.us.

If the serial number tag can not be located or repair and service information obtained from the internet, contact customer service at 888-396-6501.

The model number is located on the serial number tag. The serial number tag location varies by suspension model.

Fixed frame SAF® Air Ride suspensions: Serial Number Tag is located on the roadside frame bracket ***(Figure 1).***

4. Identification Tag

The sample tags shown will help interpret the information on the SAF-HOLLAND, Inc. serial number tag. The tags, which may vary, contain the model number, suspension capacity, part number and serial number. ***(Figures 2)***

Record the tag numbers below for future quick reference.

Model Number: _____

Part Number: _____

Serial Number: _____

Capacity: _____

In Service Date: _____

Figure 1

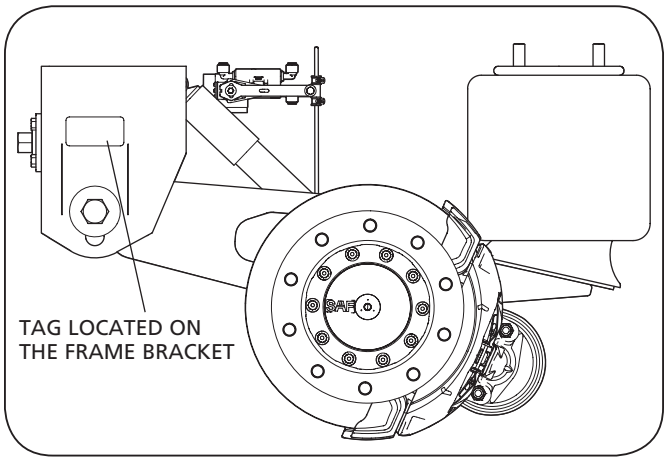
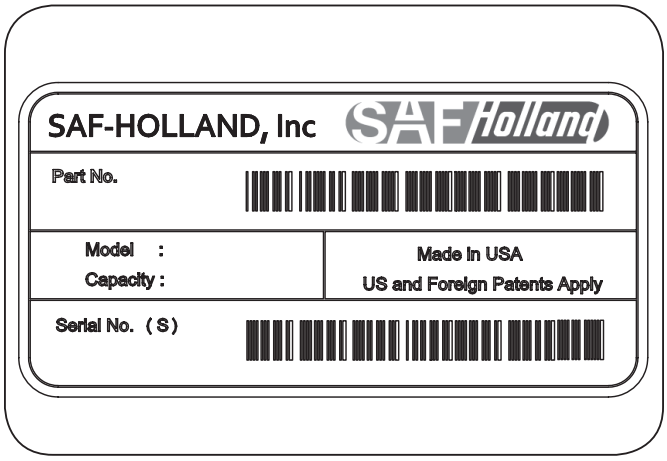


Figure 2



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5. Welding Standards

5.1 Scope

The SAF® axle has been designed to be installed on a trailer with no welding required. When welding is required for axle repairs, observe the requirements below. Customers may not weld on an SAF® axle without our prior approval, including the application of the American Welding Society standards by SAF-HOLLAND® engineering. 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.

5.2 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.

5.3 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 3)***. Where the installation drawing specifies different than above, the drawing shall prevail.

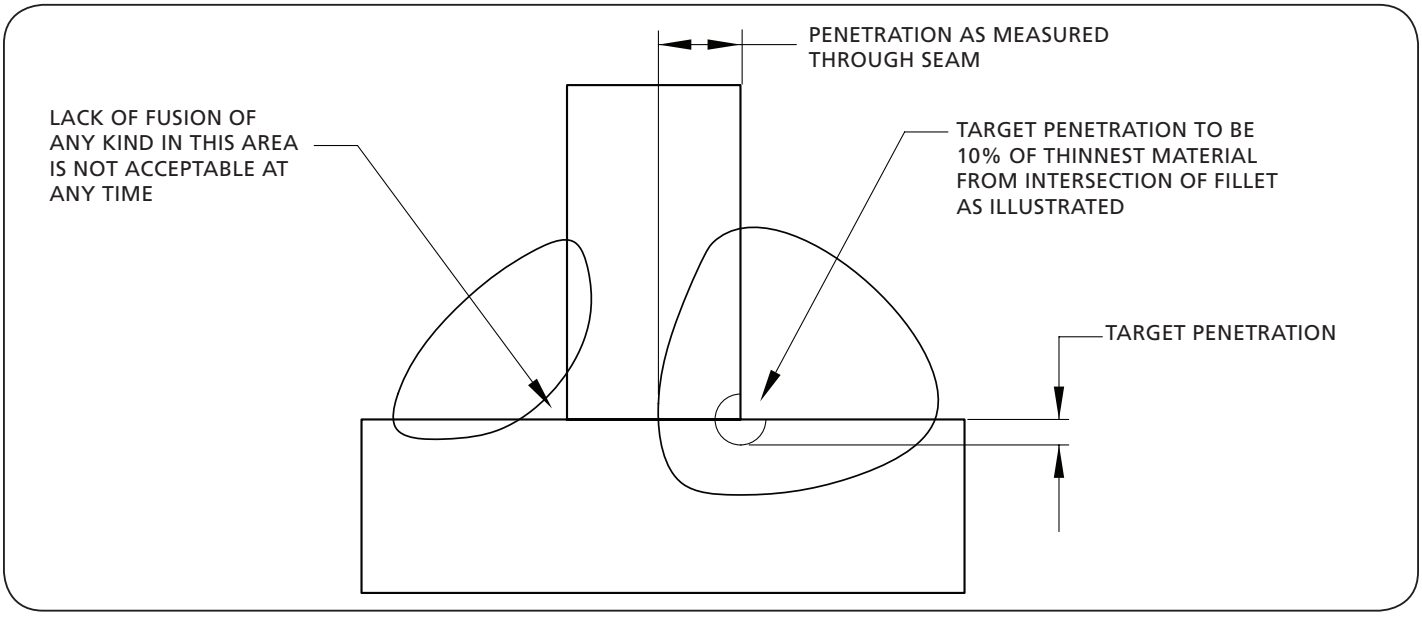
5.4 Procedures

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" (13 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 1/8" (3 mm) of the corner. Particular care should be taken to prevent undercutting in this area.

5.5 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



6. S-Cam Bracket Replacement

1. Remove the wheels and tires. Disassemble the brake adjusters and brake shoes. Retain all of these parts, as they will need to be reassembled in a later step.
2. Slide the S-cam shaft out of the spider bearing up to the hub.
3. Remove the cam enclosure assembly from the two-bolt axle bracket. Discard the cam enclosure assembly and mounting hardware as they will be replaced with new hardware in later steps ***(Figure 4)***.
4. Using a straight edge and paint pen or scribe, mark the existing bracket location ***(Figure 5)***.
5. Remove the existing two-bolt axle bracket. Be careful when removing the two-bolt axle bracket to avoid removing the location marks. Minimize the heat introduced into the axle tube by cutting the bracket off as quickly as possible, at a distance of 1/4" - 1/2" (6 - 13 mm) from the axle tube. When removing the two-bolt S-cam bracket, be careful not to cut or grind below the surface of the SAF axle tube ***(Figure 6)***.

NOTE: Damage to the axle tube may require the axle to be replaced.

⚠WARNING Failure to avoid grinding into the axle tube could result in stress points that weaken the axle which, if not avoided can cause death or serious injury during normal operation.

Figure 4

Figure 5

Figure 6

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6. Grind away the remaining portion of the bracket being careful not to remove the location marks ***(Figure 7)***.
7. Using a straight edge and a paint pen or scribe, reconnect the previously made location marks from Step 4 ***(Figure 8)***.
8. Replace the square cut O-ring on the inboard side of the spider. ***(Figure 9)***.

Figure 7

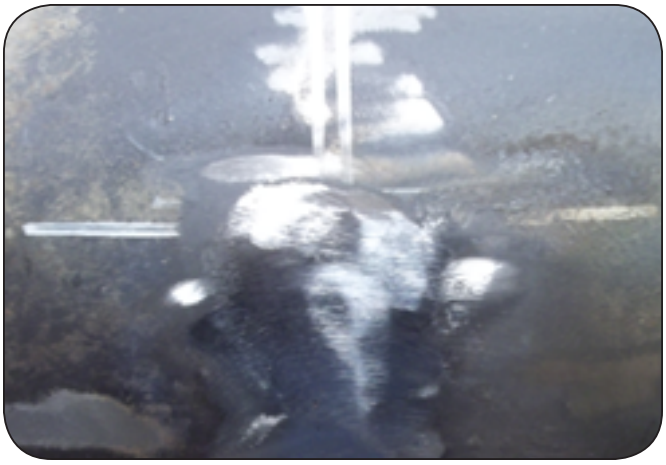


Figure 8

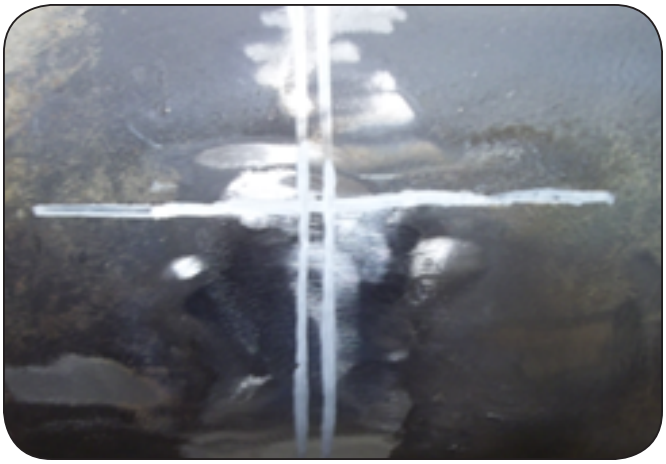


Figure 9

9. Slide the new cam enclosure tube over the S-cam shaft and push the new cam enclosure tube inside the spider until bottomed out against the square cut O-ring seal. Ensure that the cam enclosure grease fitting and vent plug hole are facing away from the axle.
10. Slide cam shaft inward back into position ***(Figure 10)***.
11. Slide the new four-bolt axle bracket over the cam enclosure tube ***(Figure 11)***.
12. Slide the new four-bolt cam enclosure plate over the cam enclosure tube and bolt the four-bolt axle bracket and four-bolt cam enclosure plates together. Ensure that the brake adjuster/stroke window is facing opposite of the brake chamber push rod. Torque to 25-30 ft-lbs. (34-41 N•m) ***(Figure 11)***.
13. Using the four-bolt axle bracket location marks from step 7, position the four-bolt axle bracket tight to the axle tube ***(Figure 11)***.
14. Tack weld the center of the four-bolt axle bracket to the axle tube with a 1/4" (6 mm) tack weld on both sides of the bracket ***(Figure 11)***.
15. Tack weld the inboard side of the four-bolt cam enclosure plate to the cam enclosure tube in the center with a 1/8" (3 mm) tack weld, top and bottom ***(Figure 12)***.

Figure 10

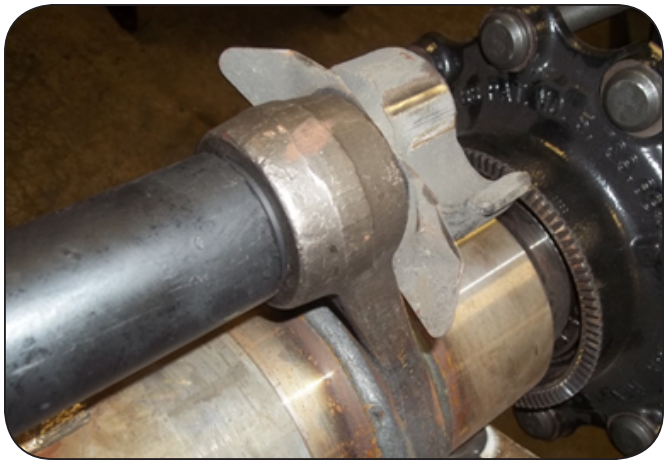


Figure 11

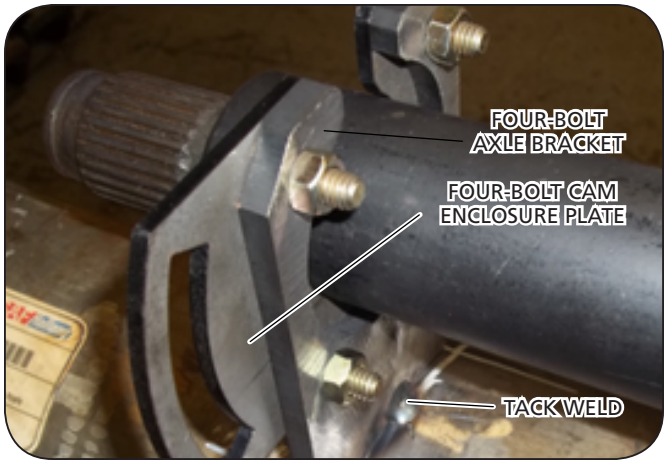
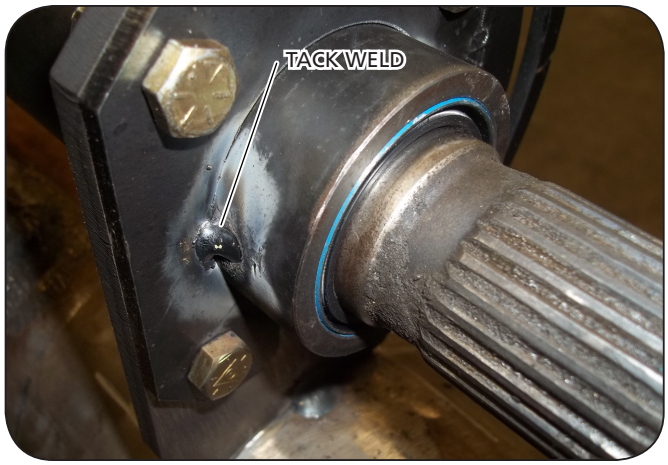


Figure 12



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16. Measure and mark the axle tube 1/8" (3 mm) from the top and bottom edge on the four-bolt axle bracket on both sides ***(Figure 13)***.
17. Prior to final weld, verify the four-bolt axle bracket is square to the axle tube as tacked.
18. Ensure that the axle tube, the cam enclosure tube, the four-bolt cam enclosure plate, and the four-bolt axle bracket are clean and free from all moisture, scale, grease, oil and weld slag from the tack welds.
19. Weld both sides of the four-bolt axle bracket with a 3/8" (9.5 mm) fillet weld; refer to welding standards in Section 5. Ensure that both welds stop at least 1/8" (3 mm) from the top and bottom edge of the bracket as marked in Step 16.
20. Weld both the top and bottom of the four-bolt cam enclosure assembly plate to the cam enclosure with a 3/16" (5 mm)fillet weld, 1 1/2" (38 mm) long on the inboard side only; refer to welding standards in Section 5 ***(Figure 14)***.
21. After the weld area has cooled, clean and paint/ undercoat the welded area and any adjacent area where paint was removed to facilitate bracket replacement ***(Figure 15)***.
22. Re-assemble the brake shoes. Refer to SAF Service Manual for Drum Brakes XL-TA10006OM-en-US.
23. Re-assemble the Brake adjuster. Refer to SAF Service Manual for Drum Brakes XL-TA10006OM-en-US or as recommended by the brake adjuster manufacturer.
24. Lubricate cam shaft and bearings per SAF Service Manual XL-TA10006OM-en-US.
25. Repeat these steps for the opposite side of the axle.
26. Re-install the wheels and tires.

Figure 13

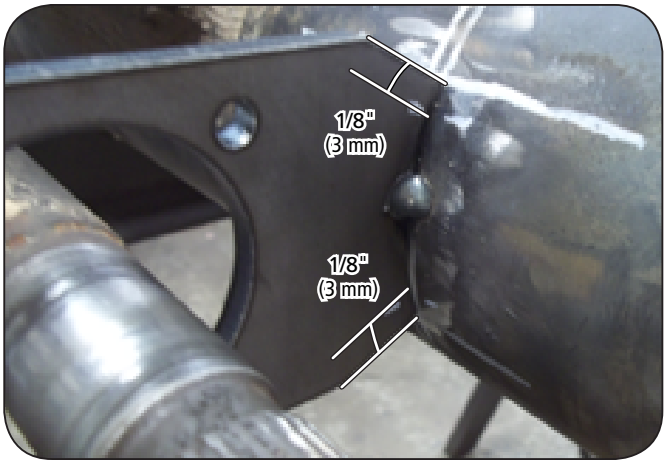

Figure 14

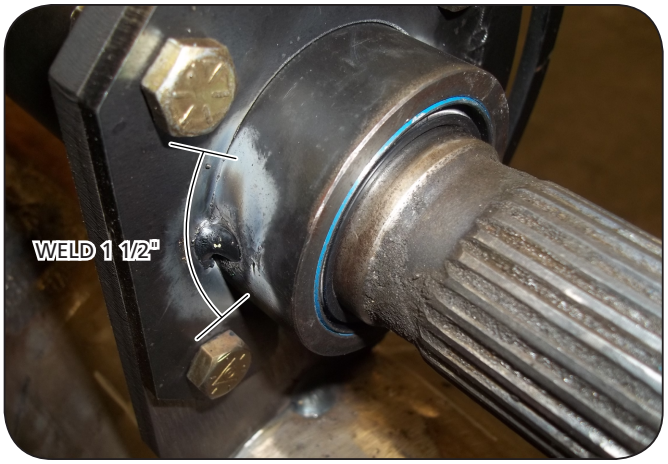

Figure 15

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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