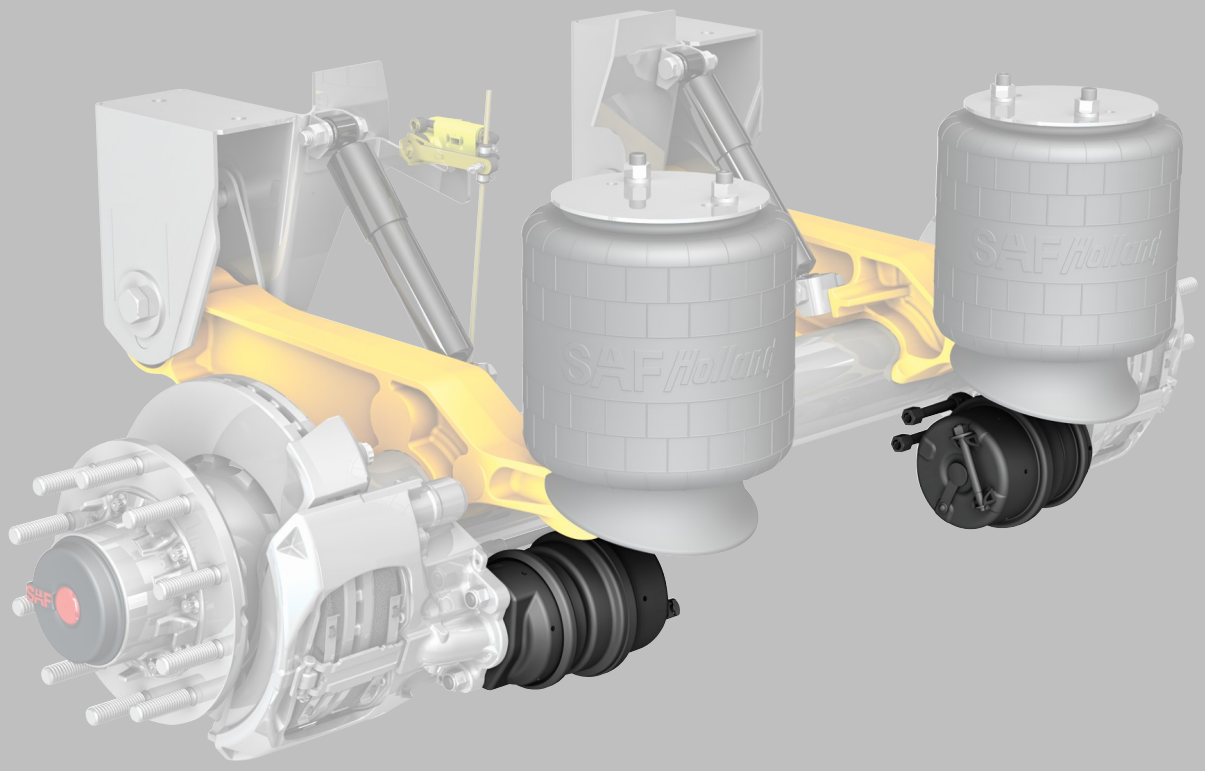
SAF-HOLLAND Group

Installation and Service Guide

Brake Chambers

For INTEGRAL ™ Disc Brakes



XL-SA10062IM-en-US Rev B

Introduction

This manual provides you with information necessary for the installation, inspection, maintenance, and safe operation of the SAF brake chambers. SAF brake chambers are designed and engineered to provide trouble-free service.

NOTE: For axle end/brake components replacement contact SAF-HOLLAND Customer Service 1-888-396-6501.

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 and can be found on the SAF-HOLLAND Web Site (www.safholland.us).

Notes, Cautions, and Warnings

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

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

NOTE: In the United States, work shop safety requirements are defined by federal and/or state Occupational Safety and Health Act. 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.

IMPORTANT: Read this manual before using this product. Keep this manual in a safe location for future reference.

⚠WARNING Failure to follow the instructions and safety precautions in this manual can result in death or serious injury

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

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

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

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

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

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

1. General Safety Instructions

Read and observe all Warning and Caution hazard alert messages in this publication. They provide information that 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 serious injury or death.

NOTE: Several maintenance procedures in this manual require re-positioning of the slack adjuster and/or ABS system. Consult the manufacturer's manual for procedures on the proper operation of slack adjuster and/or ABS system.

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 curb side of an axle.

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

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

1. The brake chamber internal components are under a spring preload of approximately 2,200 lbs. (1,000 kg). The brake chamber should never be opened or mishandled.

⚠WARNING Opening or mishandling the brake chamber may result in the release of internal spring pressure which, if not avoided could result in death or serious injury

2. Should the brake chambers show signs of material damage, significant corrosion, or other damage, the brake chambers must be immediately replaced.

3. If, during installation of the double diaphragm brake chamber, the parking brake section is not released using the release tool bolt, the plunger of the brake chamber may not fully engage in the lever arm of the disc brake. This can result in a limited function of the brake and/or damage to the internal components of the brake chamber.

⚠WARNING Failure to release the parking brake section of a double diaphragm brake chamber could result in limited brake function which, if not avoided could result in serious injury or death.

Note: The release tool bolt must always be removed and stored in the bracket provided on the brake chamber housing. The release tool bolt serves only for the manual caging of the parking brake with the trailer in the pressure-free state.

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

5. Only the wheel and tire sizes approved by the trailer builder may be used.

⚠CAUTION Failure to maintain tire clearance between tires and the nearest point of contact on the suspension or vehicle could cause fire or loss of vehicle control which, if not avoided may result in minor to moderate injury.

6. Before operating vehicle, ensure that the maximum permissible axle load is not exceeded and that the load is distributed equally and uniformly.

7. 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 serious injury or death.

8. The parking brake must not be immediately applied when the brakes are overheated, as the brake drums or discs may be damaged by different stress fields during cooling.

9. Observe the operating recommendation of the trailer manufacturer for off-road operation of the installed axles.

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 or you can contact SAF-HOLLAND Customer Service at 1-888-396-6501

Updates to this manual will be published as necessary online at www.safholland.us

2. Brake Chamber Installation

SAF Brake chambers are supplied ready for installation. Double diaphragm chambers with parking brake section are supplied with a release tool bolt for manual caging.

2.A. Single Diaphragm Brake Chamber

1. Check that all drain vent holes ***(1)*** are open (***Figure 1***). If necessary, completely remove the dust plug.

CAUTION Failure to keep bottom moisture drain vents open could result in damage to the brake chamber which, if not avoided may result in component or property damage.

Note: SAF accepts no liability for damage caused by the bottom moisture drain vents being closed.

2. The sealing surface on the brake caliper **(2)** must be free from dirt and corrosion ***(Figure 2)***.
3. Prior to installation, grease the spherical cap **(3)** in the brake lever ***(Figure 2)***.
4. Inspect the flange surface on the brake caliper **(4)** for flatness and cleanliness. Clean or replace if necessary ***(Figure 2)***.
5. Inspect the plungers, seals, and flange surface of the brake chamber for debris or damage. Clean or replace if necessary.
6. Move the brake chamber into the same orientation as the original chamber, ensuring that the plunger of the brake chamber engages in the spherical cap of the brake lever.
7. If the plunger is not in the correct position, it can be corrected as follows:

   Pressurize the service brake section of the brake chamber with compressed air five times and then relieve the pressure again. If the connecting rod has not moved into the desired position or if no compressed air is available, carefully maneuver the connecting rod into place manually.

Figure 1

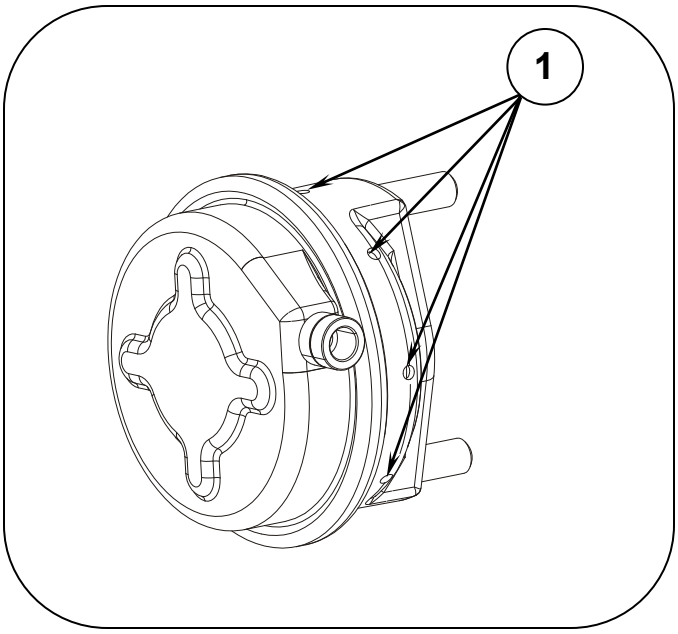
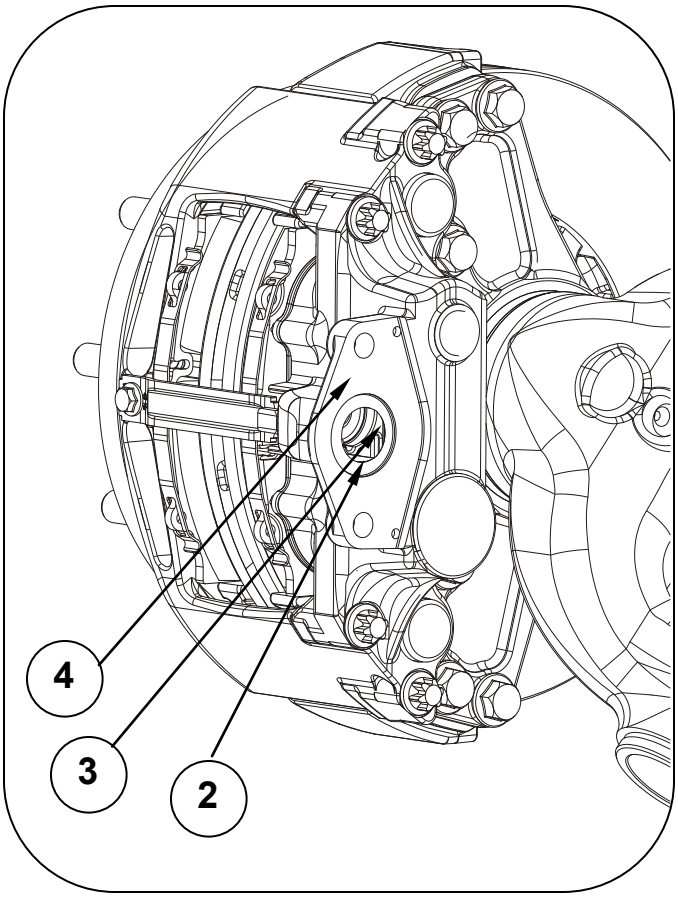


Figure 2



8. Install brake chamber nuts **(5)** until the brake chamber is in full contact with the mounting bracket ***(Figure 3)***. Pre-torque both nuts to 60-75 ft. lbs (80-100 Nm) and then torque to 130-155 ft. lbs (180-210 Nm).
9. Install air lines to the brake chamber (**6**) ***(Figure 3)***. Be sure to follow the installation instructions from trailer manufacture.
10. Spray a soapy water mix on all air line connections and test for air leaks, verify 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 brake system performance which, if not avoided may result in component or property damage.

11. After installation, be sure to check the brake system for proper function.

2.B. Double Diaphragm Brake Chamber

1. Check that all drain vent holes ***(1)*** are open (***Figure 4***). If necessary, completely remove the dust plug.

CAUTION Failure to keep bottom moisture drain vents open could result in damage to the brake chamber which, if not avoided may result in component or property damage.

Note: SAF accepts no liability for damage caused by the bottom moisture drain vents being closed.

2. The sealing surface on the brake caliper **(2)** must be free from dirt and corrosion ***(Figure 5)***.
3. Prior to installation, grease the spherical cap **(3)** in the brake lever ***(Figure 5)***.
4. Inspect the flange surface on the brake caliper **(4)** for flatness and cleanliness. Clean or replace if necessary ***(Figure 5)***.
5. Inspect the plungers, seals, and flange surface of the brake chamber for debris or damage. Clean or replace if necessary.
6. Confirm that the parking brake is released and the release bolt is installed. If the parking brake is not released, refer to Section 3 for manual caging instructions.

Figure 3

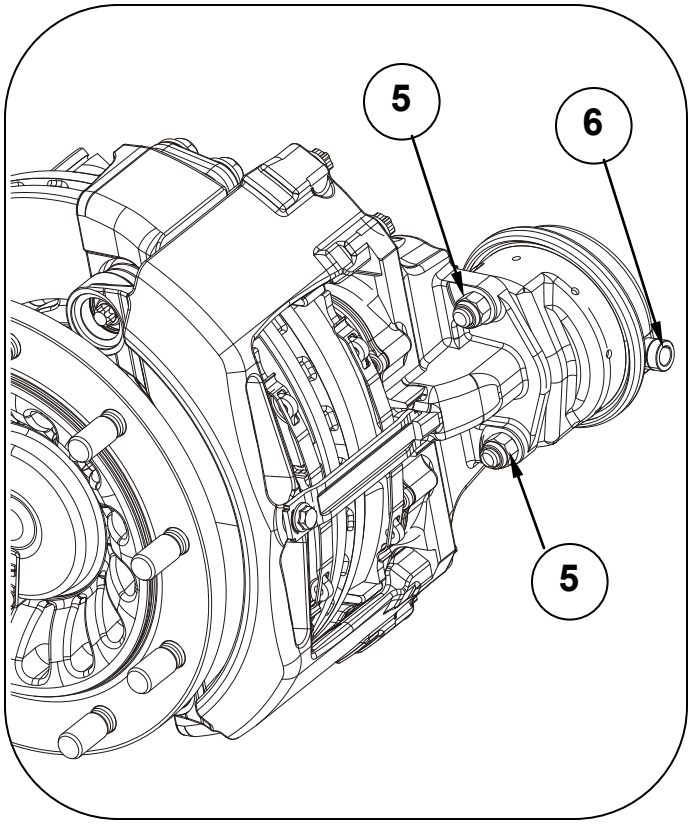
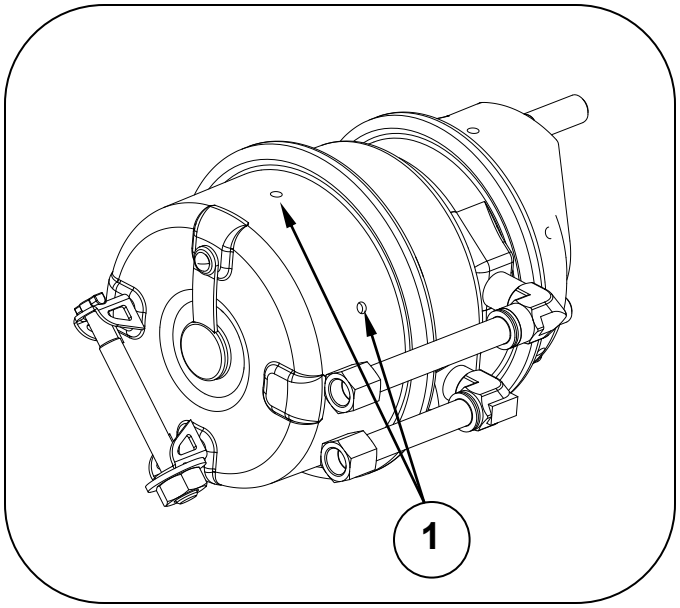


Figure 4



7. Move the brake chamber into the same orientation as the original chamber, ensuring that the plunger of the brake chamber engages in the spherical cap of the brake lever.

8. If the plunger is not in the correct position, it can be corrected as follows:

   Pressurize the service brake section of the brake chamber with compressed air five times and then relieve the pressure again. If the connecting rod has not moved into the desired position or if no compressed air is available, carefully maneuver the connecting rod into place manually.

10. Install brake chamber nuts **(5)** until the brake chamber is in full contact with the mounting bracket ***(Figure 6)***. Pre-torque both nuts to 60-75 ft. lbs (80-100 Nm) and then torque to 130-155 ft. lbs (180-210 Nm).

11. Install air lines to the brake chamber (**6 - 7**) ***(Figure (6)***. Be sure to follow the installation instructions from the trailer manufacture.

    Air line connections:
    Emergency brake port **(6)**
    Service brake port **(7)**

10. Spray a soapy water mix on all air line connections and test for air leaks, verify 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 brake system performance which, if not avoided may result in component or property damage.

13. After installation, be sure to check the brake system for proper function.

Figure 5

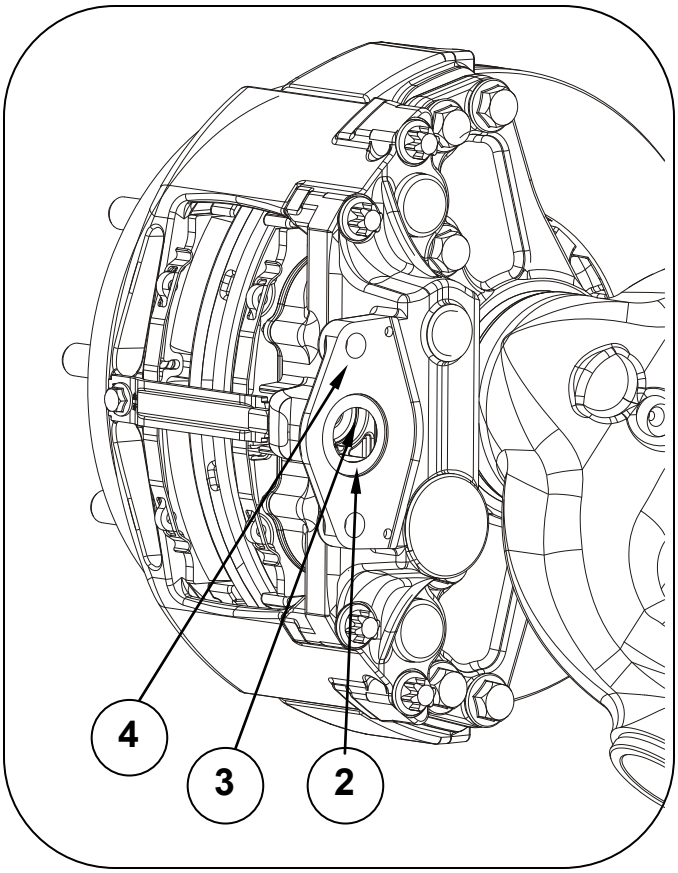
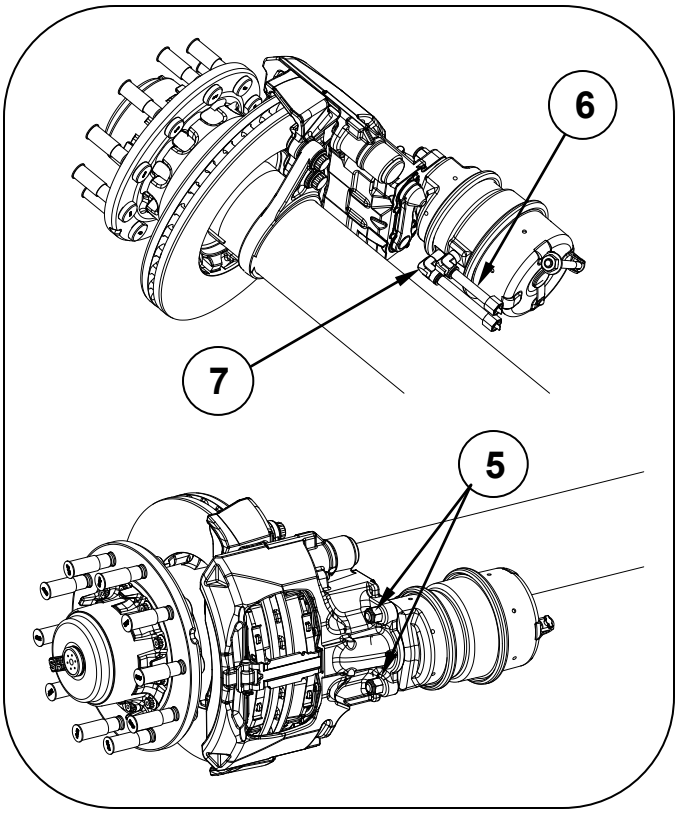


Figure 6



3. Manually Caging Brake Chambers

SAF brake chambers should preferably be caged using compressed air. If no compressed air is available, the parking brake can be caged using the release tool bolt supplied with the brake chamber.

3.A. Caging the Parking Brake using Release Tool Bolt and Compressed Air

1. Remove the dust plug **(8)** from the release bolt access hole in the middle of the brake chamber housing ***(Figure 7)***.
2. Remove the release bolt **(9)**, washer **(10)**, and nut **(11)** from the mounting bracket **(12)** on the back of the brake chamber ***(Figure 7)***.
3. Apply air to the trailer and release the parking brake. Apply and release the brakes three times.
4. Insert the release tool bolt **(9)** through the access hole provided until it engages with the pressure plate inside the brake chamber ***(Figure 8)***.
5. Ensure that the release tool bolt is correctly engaged with the pressure plate by turning the bolt clockwise and pulling the bolt outward at the same time. If the bolt is correctly engaged in the pressure plate it cannot be turned more than 1/4 turn and cannot be pulled out by more than 0.75" (19mm).
6. Install the washer **(10)** and nut **(11)** onto the release bolt and finger tighten ***(Figure 8)***.

IMPORTANT: Do not torque the nut to more than 35 ft. lbs [47 Nm]. Over-tightening the bolt can cause damage to the pressure plate, washer, and brake chamber housing.

⚠WARNING Over-tightening the release bolt could cause the main spring to suddenly release which, if not avoided could result in death or serious injury.

7. The parking brake is now caged and the air pressure can be removed.

Figure 7

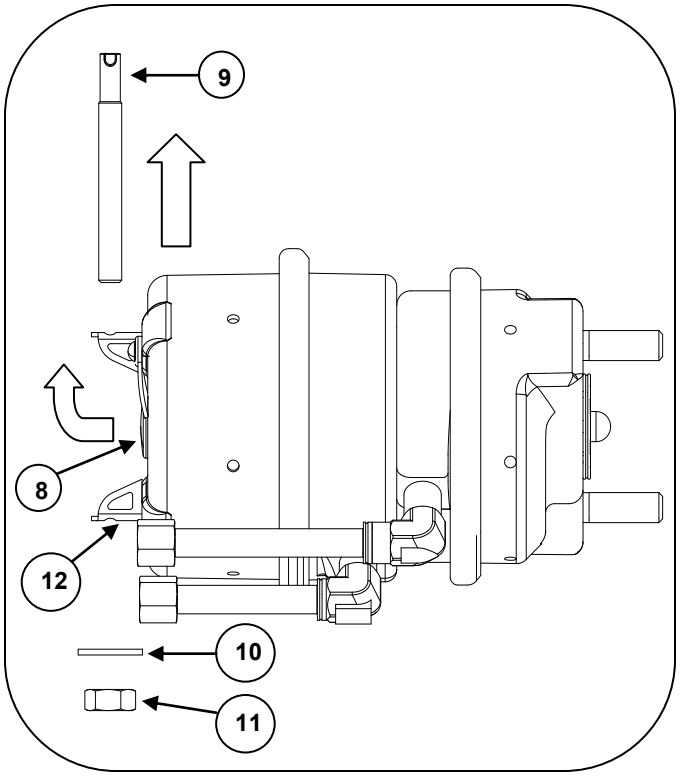
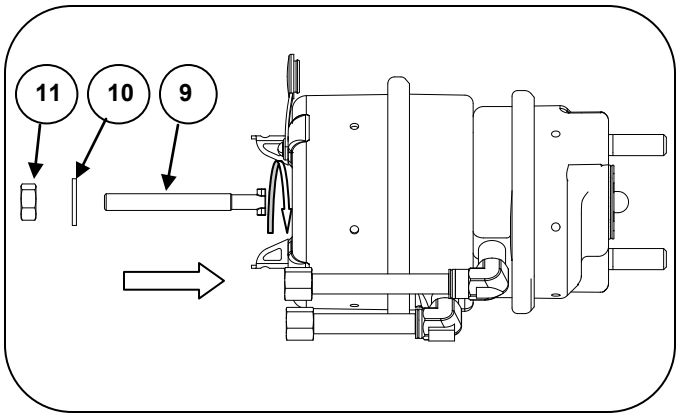


Figure 8



3.B. Caging the Parking Brake using Release Tool Bolt without Compressed Air

This method should only be used if not compressed air is available. The preferred method of caging is by using compressed air. Use this method only if the brake chambers are not pressurized.

1. Remove the dust plug **(8)** from the release bolt access hole in the middle of the brake chamber housing ***(Figure 9)***.
2. Remove the release bolt **(9)**, washer **(10)**, and nut **(11)** from the mounting bracket **(12)** on the back of the brake chamber ***(Figure 9)***.
3. Ensure that the pressure plate is between 2-1/2" - 3" [63-76mm] from the housing.
4. Insert the release tool bolt **(9)** through the access hole provided until it engages with the pressure plate inside the brake chamber ***(Figure 10)***.
5. Ensure that the release tool bolt is correctly engaged with the pressure plate by turning the bolt clockwise and pulling the bolt outward at the same time. If the bolt is correctly engaged in the pressure plate it cannot be turned more than 1/4 turn and cannot be pulled out by more than 0.75" (19mm).
6. Install the washer **(10)** and nut **(11)** onto the release bolt and tighten ***(Figure 10)***. While tighten the nut, the actuating plunger of the brake chamber must be pulled back into the housing. Stop tightening the nut when the plunger can no longer be pulled back into the housing. Do not exceed 35 ft. lbs [47 Nm].

IMPORTANT: Do not torque the nut to more than 35 ft. lbs [47 Nm]. Over-tightening the bolt can cause damage to the pressure plate, washer, and brake chamber housing.

⚠WARNING Over-tightening the release bolt could cause the main spring to suddenly release which, if not avoided could result in death or serious injury.

7. The parking brake is now caged and the air pressure can be removed.

Figure 9

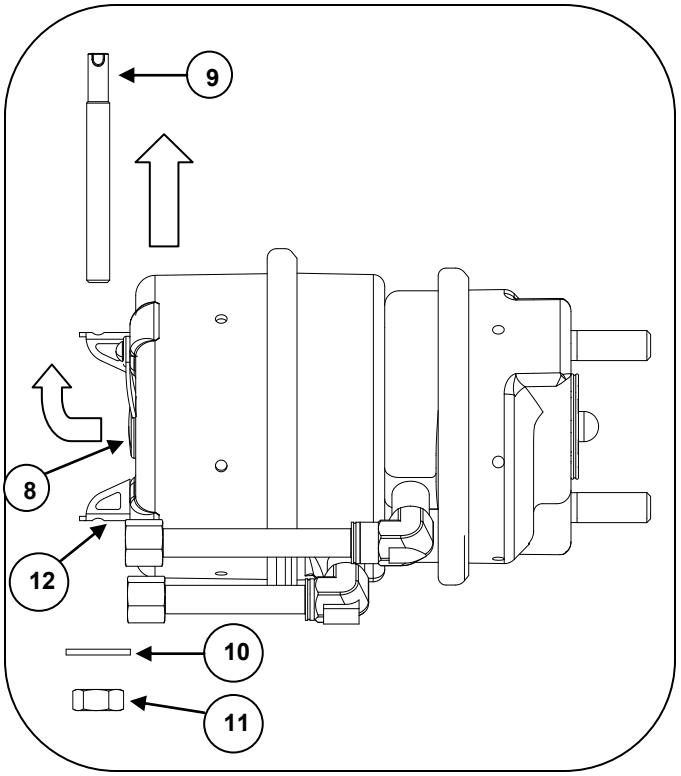
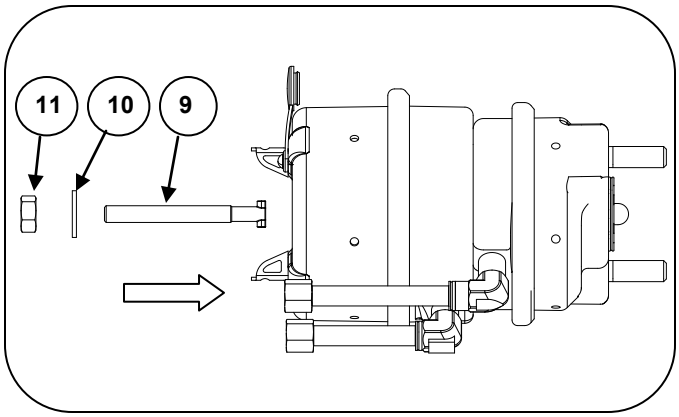


Figure 10



4. Uncaging Brake Chamber

1. Apply air to the trailer and set the parking brake.
2. Remove the nut (**11**) and washer (**10**) from the release bolt (**9**) and remove the release bolt from the brake chamber (***Figure 11***).
3. Insert the release tool bolt, washer, and nut into the mounting bracket on the back of the brake chamber (***Figure 12***). Torque the nut to 60 - 130 in. lbs (7-15 Nm).
4. Reinstall the dust plug (**8**) (***Figure 12***).
5. After uncaging the brake chamber, be sure to check the brake system for proper function.

Figure 11

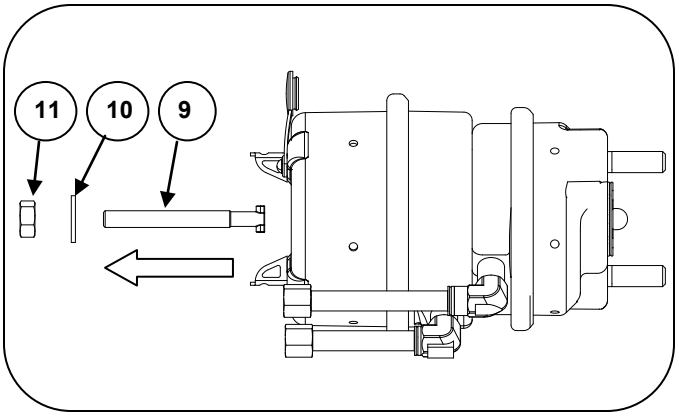
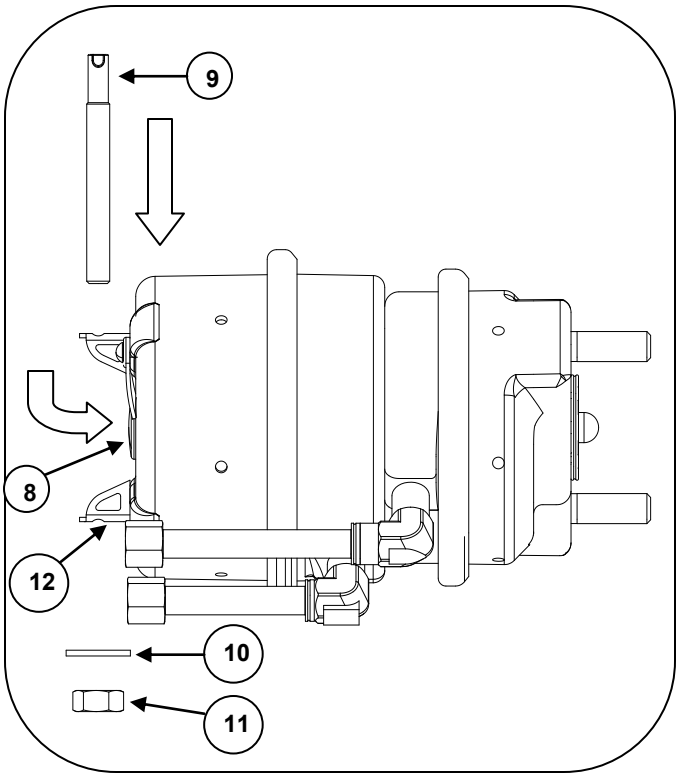


Figure 12



5. Routine Service Procedure

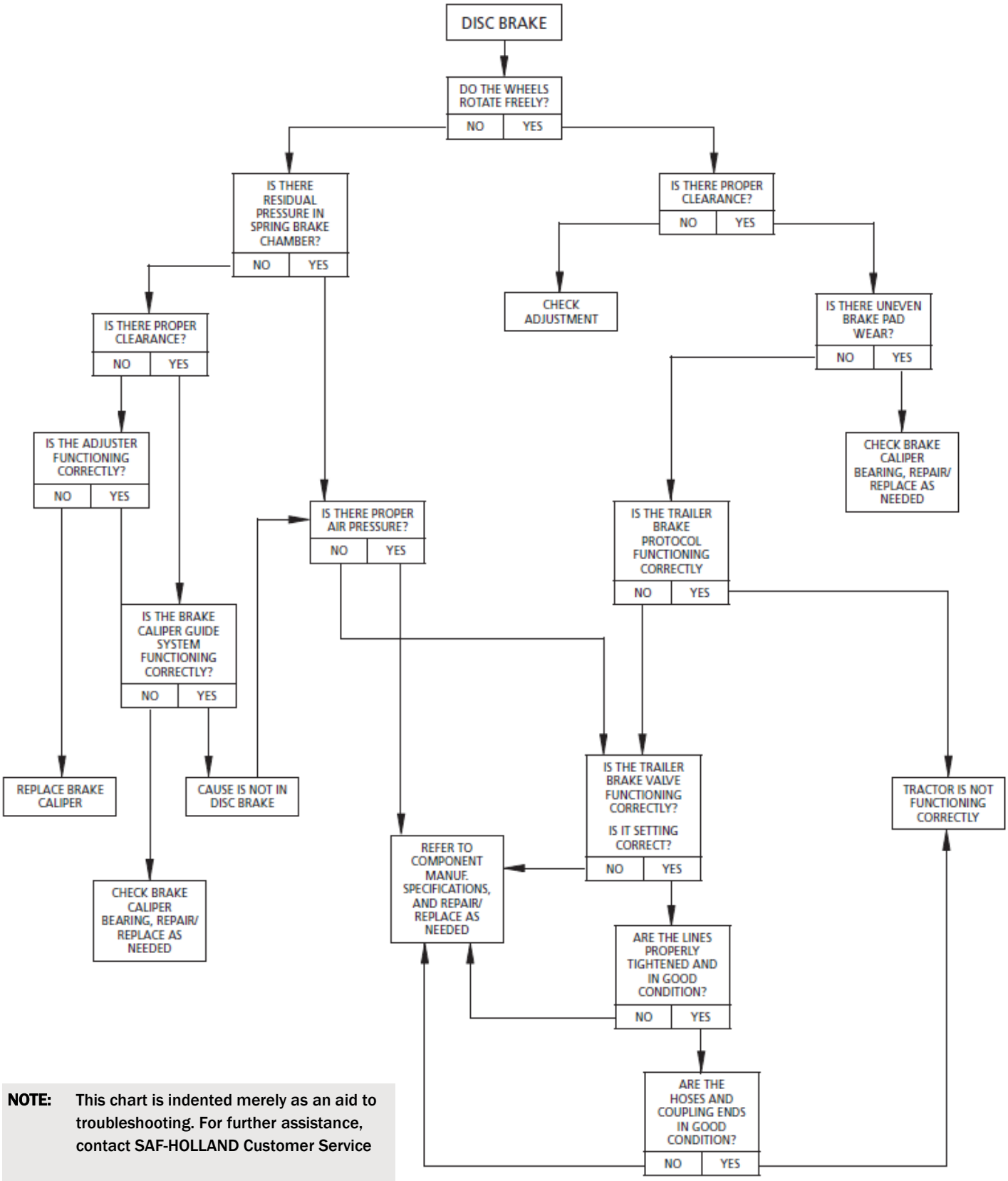
WHICHEVER OCCURS FIRST			PERIODIC CHECKS		
	MILEAGE INTERVALS	After First 3,000 Miles	Every 20,000 Miles	Every 50,000 Miles	Every 100,000 Miles
	TIME INTERVALS	After First Month	Every 3 Months	Every 6 Months	Every 12 Months
VISUAL & SAFETY INSPECTION					
Hub Unit Maintenance Free Check for grease leaks					●
Inspect the brake calliper guide system Check for free movement and sliding action					●
Check rubber dust covers for cracks and damage Check adjuster cap for correct seating					●
Inspect brake pad thickness regularly			●		
Inspect brake rotors for cracks					●
Perform general annual inspection (axle, brakes and suspension components, etc.)					●
Perform general annual safety check		●			●
Perform wheel rock and wheel noise tests					●
MECHANICAL CHECK					
Attention: Torque check wheel nuts after the first 30 miles (50 km) and 100 miles (150 km) (repeat also after every wheel removal).		●			

SPECIAL SERVICE CONDITIONS	
Vehicles with long standing periods	Service at specified time intervals. e.g. Trailer operating in continuous multi-shifts or in off-road construction sites.
Vehicles used under severe duty and extreme conditions	Service at suitably reduced intervals. e.g. Trailer operating in continuous multi-shifts or in off-road construction sites.

Warranty claims will only be accepted as long as the operation and maintenance instructions have been complied with and if SAF-HOLLAND approved spare parts have been fitted.

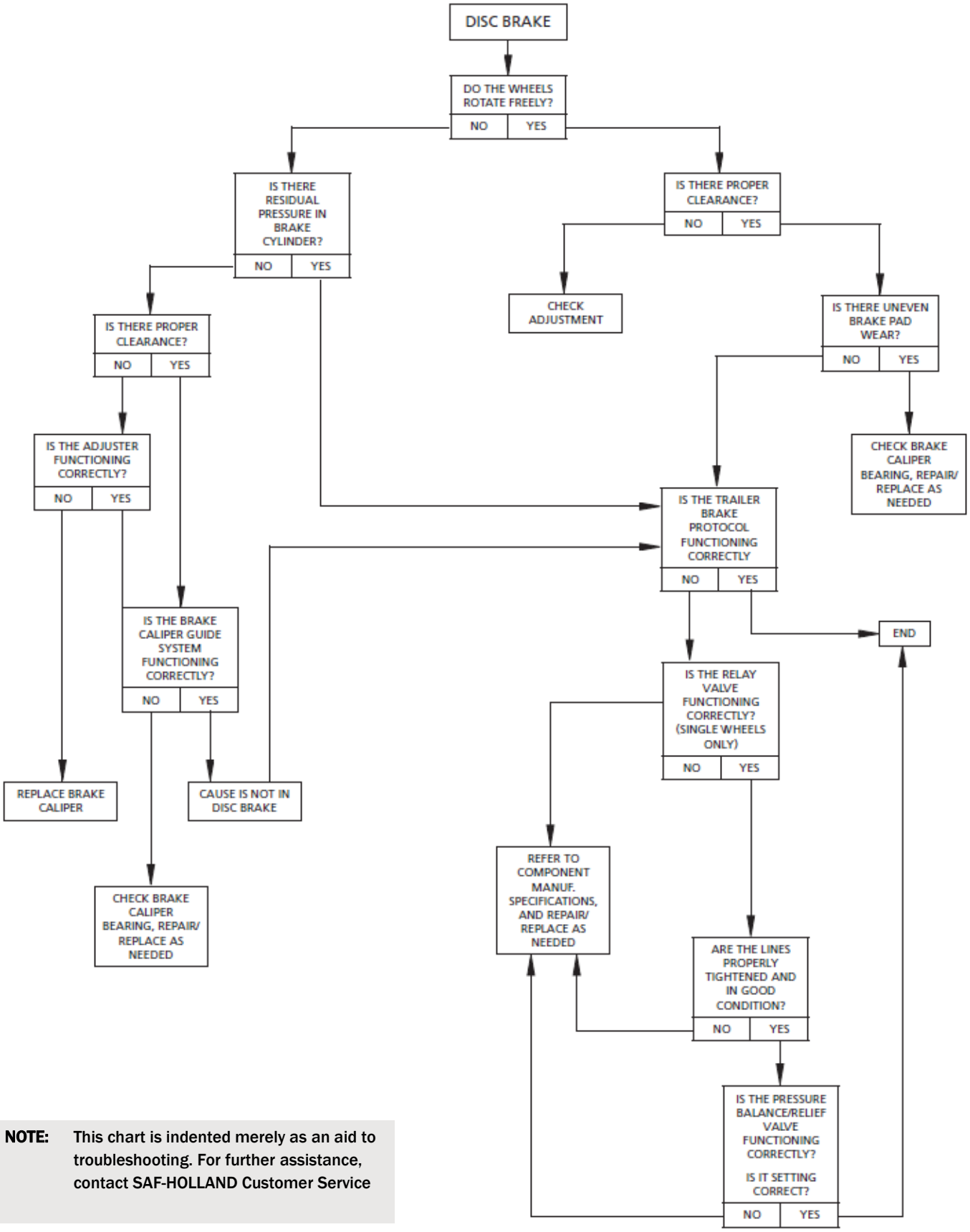
NOTE: If the seal mark on the hub nut is broken before the end of the stated warranty period this will invalidate all warranty coverage unless the repair works have been carried out in an SAF-HOLLAND authorized workshop.

6. Troubleshooting Chart for ALL WHEELS



NOTE: This chart is indented merely as an aid to troubleshooting. For further assistance, contact SAF-HOLLAND Customer Service

6. Troubleshooting Chart for INDIVIDUAL WHEELS



NOTE: This chart is indented merely as an aid to troubleshooting. For further assistance, contact SAF-HOLLAND Customer Service

ORIGINAL PARTS™

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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