

LSZ13/20 Repair Manual

Brakes and Wheel End



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Introduction

This manual provides the necessary information for the maintenance, inspection, and safe operation of the NEWAY® LSZ Series Auxiliary Air Suspension.

NOTE: To assist with installation, customer inspection drawing LSZ13_TAB_CI or LSZ20_TAB_CI is required and is included in the literature kit.

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.

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 installations 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.

- 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 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.

- The wheel contact surfaces between the wheel and hub/drum MUST NOT be additionally painted.

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 SAF-HOLLAND can be used.
- Tire clearance between tires and the suspension MUST be regularly monitored and maintained.

⚠ WARNING 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, could result in death or serious injury.

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 and in accordance with state and federal bridge laws.

- 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.

- Observe the operating recommendation of the truck 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.
- The suspension springs should ALWAYS be operated with a static operating pressure between 20 psi (1.38 bar) and 107 psi (7.38 bar).

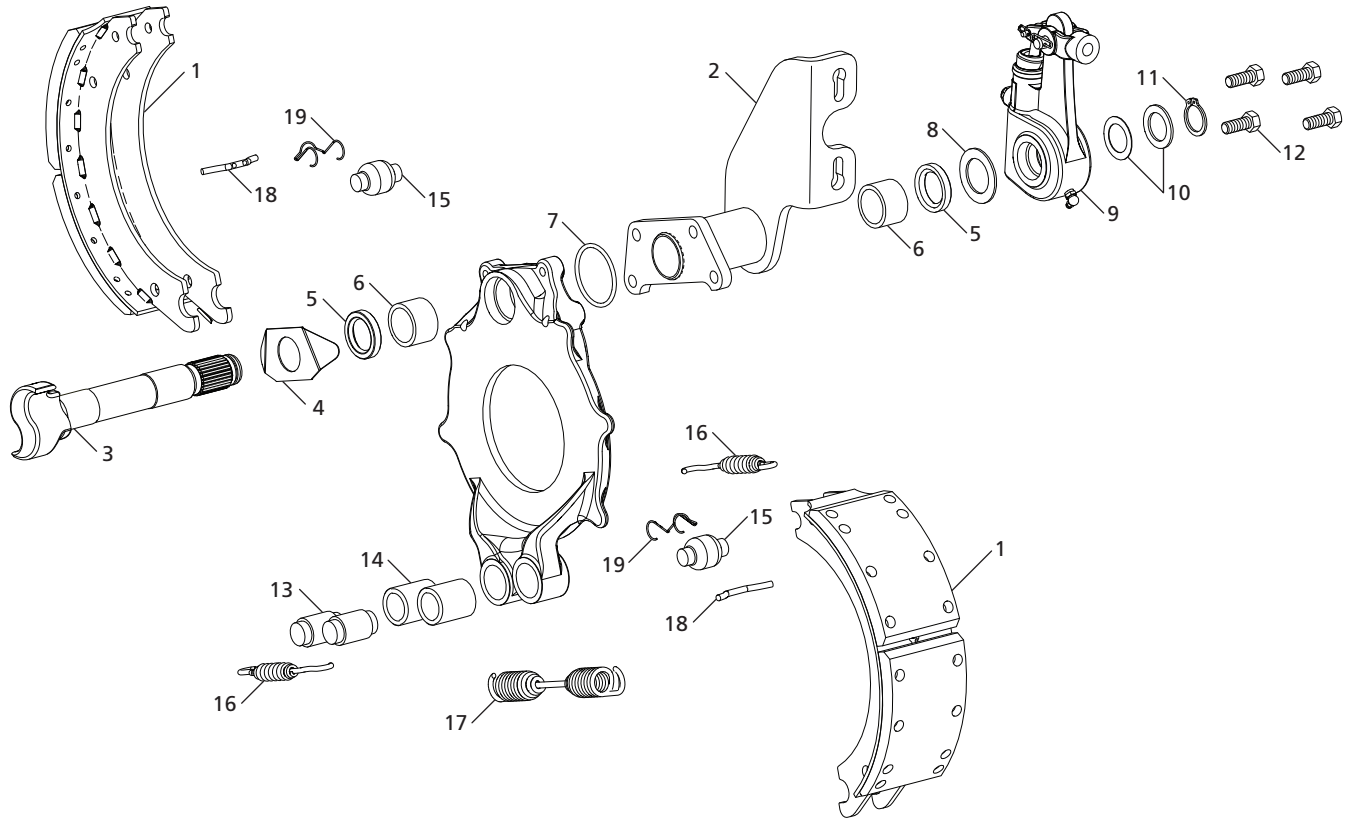
⚠ WARNING Failure to operate the air springs with a proper static operating pressure could cause premature component failure and loss of vehicle control which, if not avoided, could result in death or serious injury.

- 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.

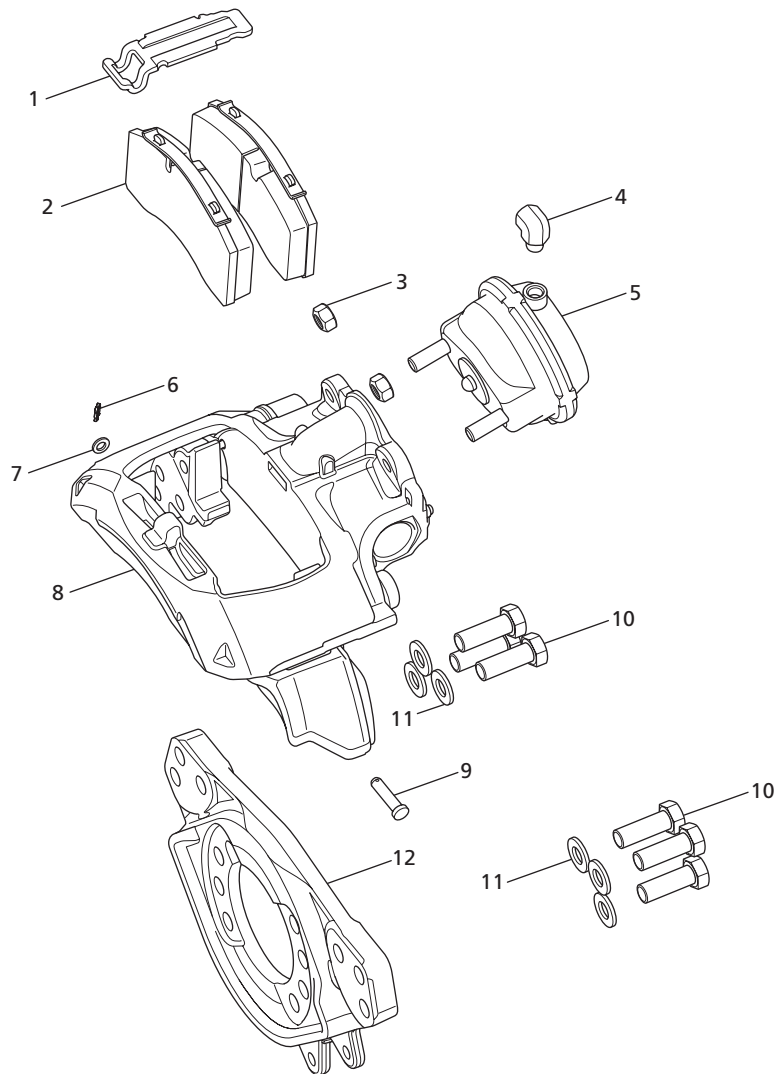
⚠ WARNING Operating the vehicle without proper air pressure can cause tire failure, fire, or loss of vehicle control which, if not avoided could result in death or serious injury.

- The suspension MUST be lifted when the vehicle is moving in reverse.

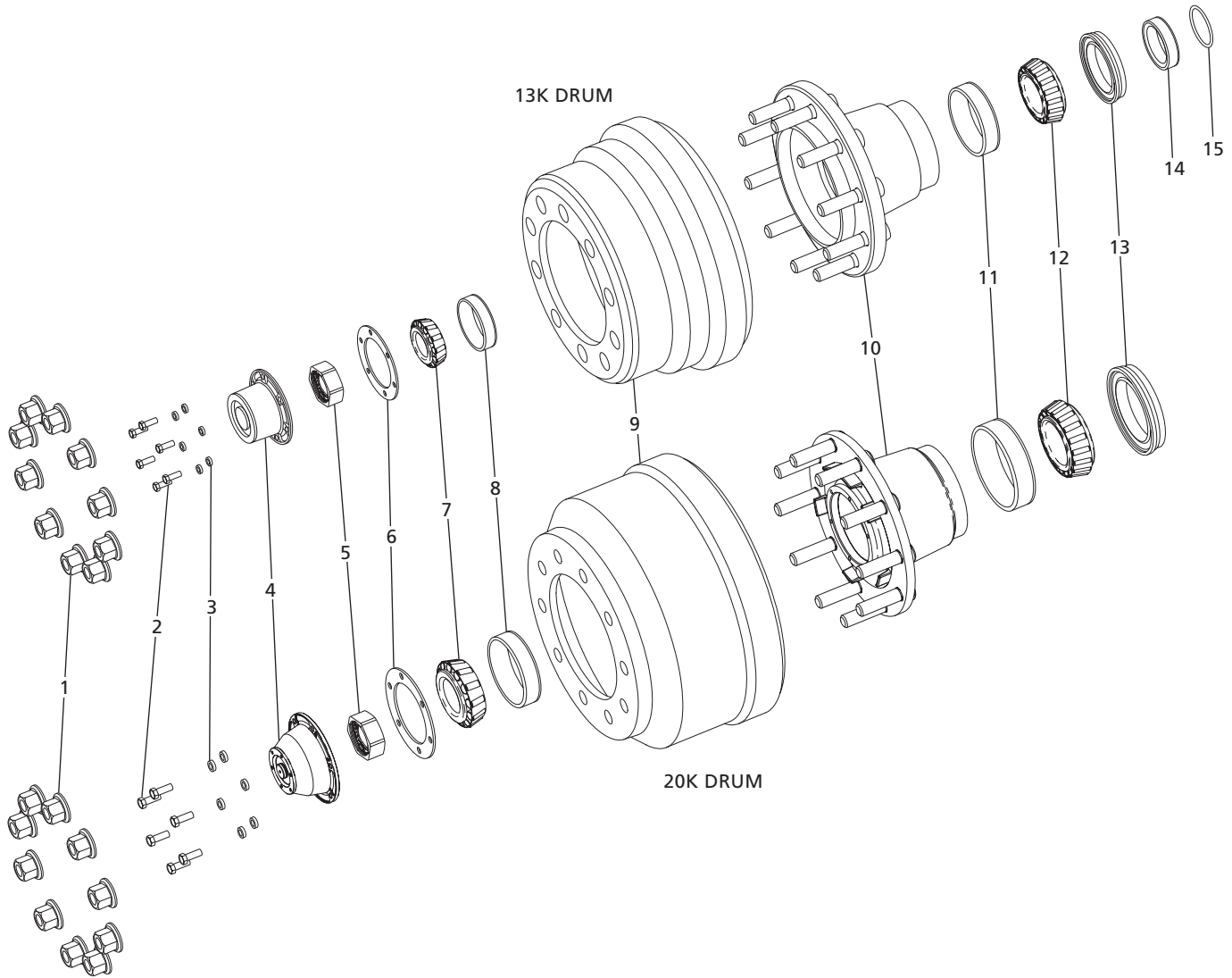
CAUTION Failure to lift axle when in reverse could result in tire or axle damage.



BRAKE ASSEMBLY (DRUM)	
ITEM #	DESCRIPTION
1	Brake Shoe
2	Chamber Bracket
3	S-Camshaft
4	Cam Head Washer
5	S-Camshaft Seal
6	S-Camshaft Bushing
7	Chamber Bracket Seal
8	Thrust Washer
9	Slack Adjuster
10	Camshaft Spacer Washer(s)
11	Snap Ring
12	Chamber Bracket Cap Screws
13	Anchor Pins
14	Anchor Pin Bushings
15	Brake Shoe Roller
16	Shoe Retaining Spring
17	Return Spring
18	Return Spring Pin
19	Shoe Roller Retainer

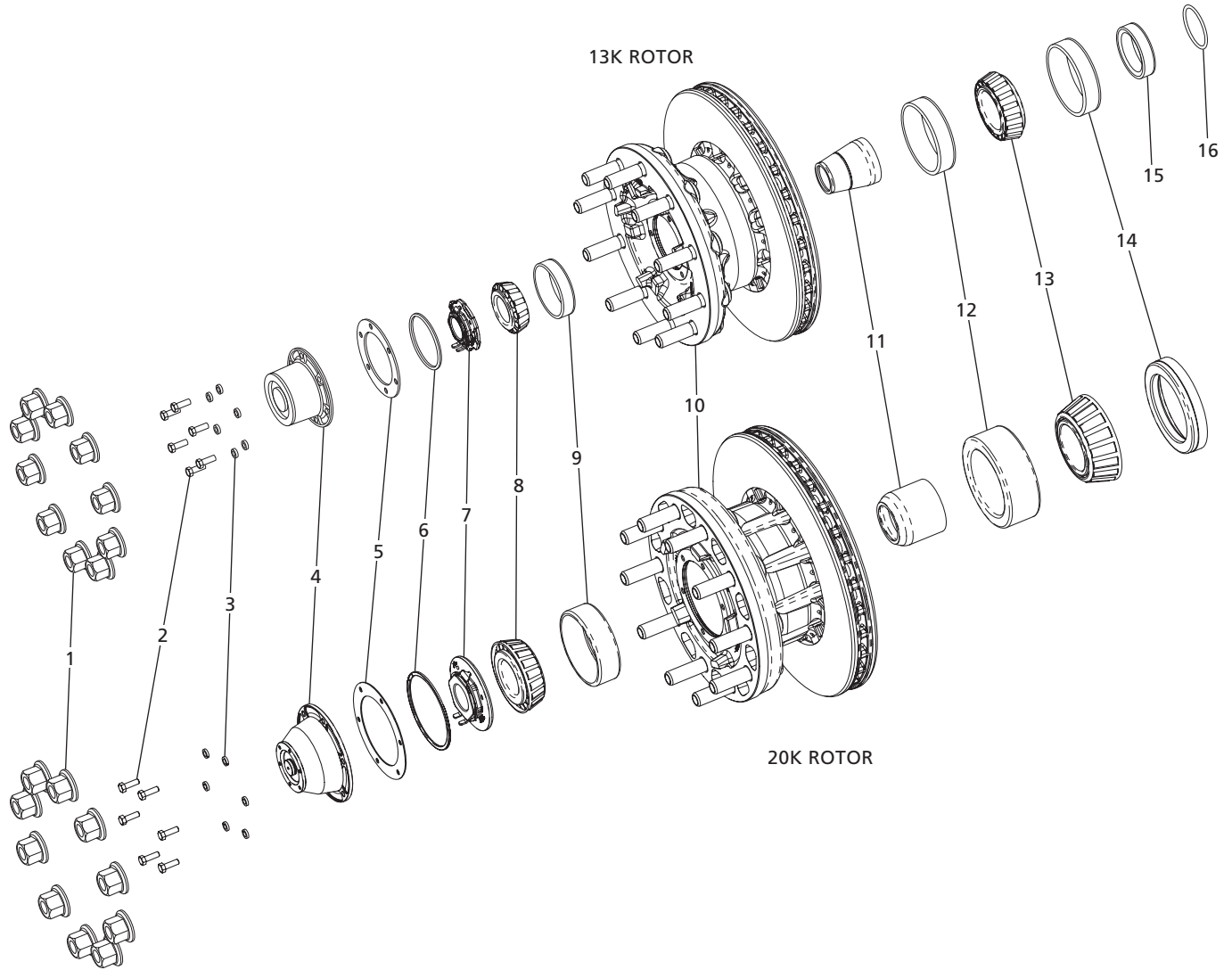


BRAKE ASSEMBLY (DISC)	
ITEM #	DESCRIPTION
1	Pad Retainer
2	Pad Assemblies
3	Locknuts
4	3/8" Street Elbow
5	Type 14 Service Chamber
6	Spring Clip
7	Washer
8	ADB22X Caliper
9	Pad Retainer Pin
10	M20 x 25 x 60mm
11	3/4" Washer
12	Anchor Plate



DRUM ASSEMBLY	
ITEM #	DESCRIPTION
1	Lug Nuts
2	5/16" Bolts
3	5/16" Lock Washers
4	Hub Cap
5	Spindle Nut with Keeper
6	Hub Cap Gasket
7	Outer Bearing Cone
8	Outer Bearing Cup

DRUM ASSEMBLY	
ITEM #	DESCRIPTION
9	Brake Drum 15" Dia, 13K
	Brake Drum 16.5" Dia, 20K
10	Hub
11	Inner Bearing Cup
12	Inner Bearing Cone
13	Hub Seal
14	Axle Ring (13K ONLY)
15	O-Ring (13K ONLY)

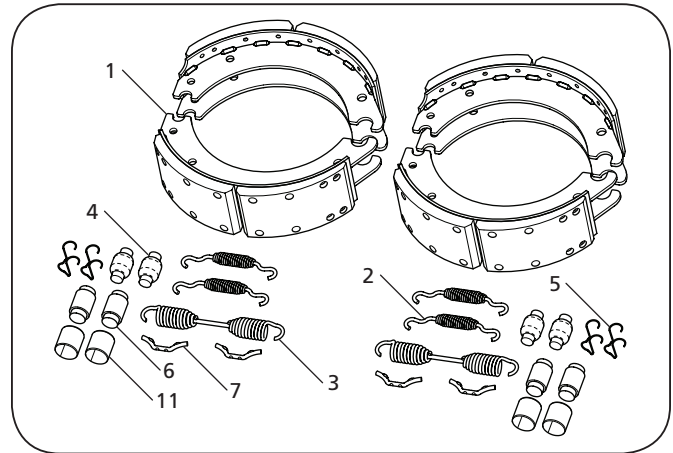


ROTOR ASSEMBLY	
ITEM #	DESCRIPTION
1	Lug Nuts
2	5/16" Bolts
3	5/16" Lock Washers
4	Hub Cap
5	Hub Cap Gasket
6	Retaining Ring
7	Spindle Nut Assembly
8	Outer Bearing Cone
9	Outer Bearing Cup

ROTOR ASSEMBLY	
ITEM #	DESCRIPTION
10	Hub Rotor, 13K ONLY
	Hub Rotor, 20K ONLY
11	Preset Spacer
12	Inner Bearing Cup
13	Inner Bearing Cone
14	Hub Seal
15	Axle Ring (13K ONLY)
16	O-Ring (13K Only)

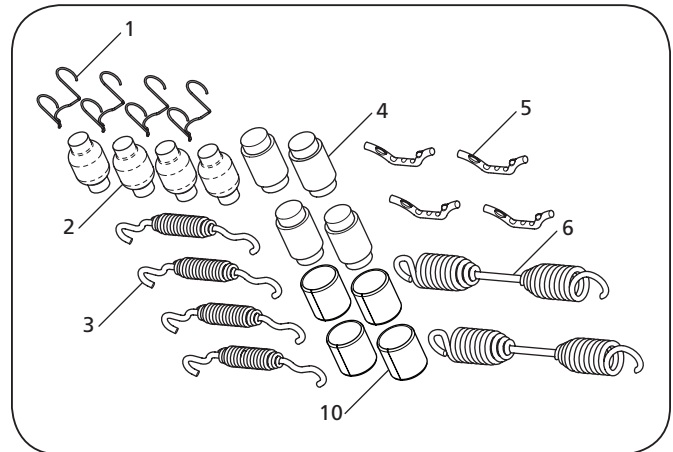
SRK 48100559: BRAKE SHOE AND HARDWARE KIT 13K			
ITEM	DESCRIPTION	PART NUMBER	QTY.
1	Shoe Assembly, Brake, Lined - 15 x 4	90066021	4
2	Spring, Anchor Pin	01447006700Z	4
3	Spring, Brake Shoe Return - 15 x 4	90066012	2
4	Roller, Brake Shoe	01265002300Z	4
5	Retainer, Cam Roller	01189010400Z	4
6	Pin, Anchor	01214006600Z	4
7	Pin, Return Spring	01395101600Z	4
8	Brake and Wheel End Repair Manual (not shown)	XL-PS20062RM-en-US	1
11	Bushing, Anchor Pin	01230022800Z	4

SRK 48100559



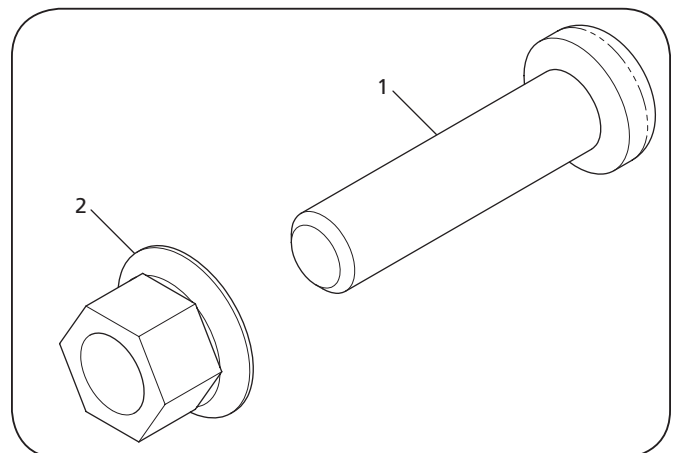
SRK 48100562: BRAKE SHOE HARDWARE 13K			
ITEM	DESCRIPTION	PART NUMBER	QTY.
1	Retainer, Cam Roller	01189010400Z	4
2	Roller, Brake Shoe	01265002300Z	4
3	Spring, Anchor Pin	01447006700Z	4
4	Pin, Anchor	01214006600Z	4
5	Pin, Return Spring	01395101600Z	4
6	Spring, Brake Shoe Return	90066012	2
7	Brake and Wheel End Repair Manual (not shown)	XL-PS20062RM-en-US	1
10	Bushing, Anchor Pin	01230022800Z	4

SRK 48100562



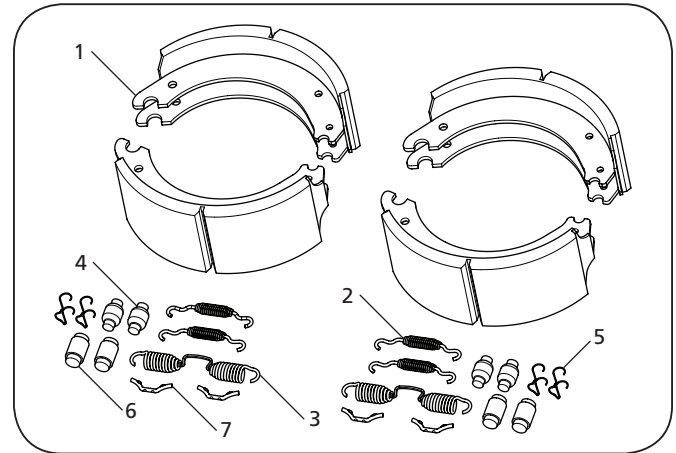
SRK 48100567: WHEEL STUD KIT - WALTHER 13K			
ITEM	DESCRIPTION	PART NUMBER	QTY.
1	Stud, M22 x 1.5 x 87.9 - FF/FG Spindle	90070006	1
2	Nut, Wheel, M22 x 1.5	04247301201Z	1
3	Brake and Wheel End Repair Manual (not shown)	XL-PS20062RM-en-US	1

SRK 48100567

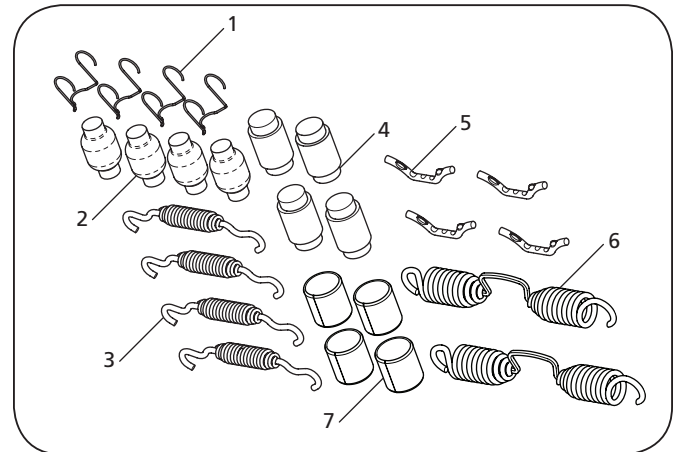


SRK 48100619: BRAKE SHOE AND HARDWARE KIT 20K

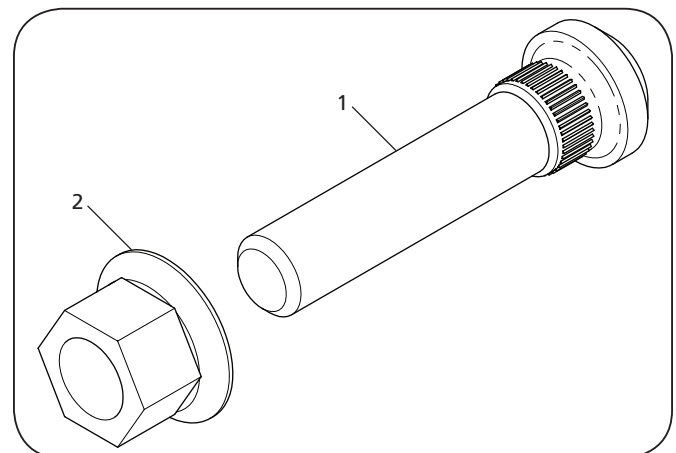
ITEM	DESCRIPTION	PART NUMBER	QTY.
1	Shoe Assembly, Brake, Lined -16.5 x 6	90066038	4
2	Spring, Anchor Pin	01447006700Z	4
3	Spring, Brake Shoe Return -16.5 x 6	90066032	2
4	Roller, Brake Shoe	01265002300Z	4
5	Retainer, Cam Roller	01189010400Z	4
6	Pin, Anchor	01214006600Z	4
7	Pin, Return Spring	01395101600Z	4
8	Bushing, Anchor Pin	01230022800Z	4
8	Brake and Wheel End Repair Manual (not shown)	XL-PS20062RM-en-US	1

SRK 48100619

SRK 48100621: BRAKE SHOE HARDWARE 20K

ITEM	DESCRIPTION	PART NUMBER	QTY.
1	Retainer, Cam Roller	01189010400Z	4
2	Roller, Brake Shoe	01265002300Z	4
3	Spring, Anchor Pin	01447006700Z	4
4	Pin, Anchor	01214006600Z	4
5	Pin, Return Spring	01395101600Z	4
6	Spring, Brake Shoe, Return - 16.5 x 6	90066032	2
7	Bushing, Anchor Pin	01230022800Z	4
8	Brake and Wheel End Repair Manual (not shown)	XL-PS20062RM-en-US	1

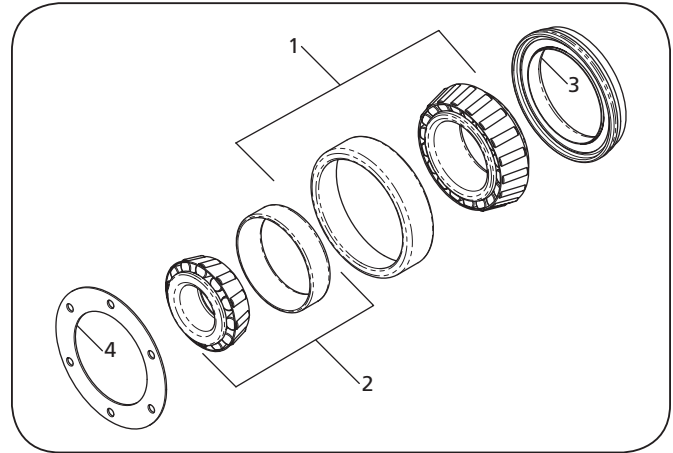
SRK 48100621

SRK 48100624: WHEEL STUD KIT - KIC 20K

ITEM	DESCRIPTION	PART NUMBER	QTY.
1	Stud, M22 x 1.5 x 108, KIC - FL Spindle	90070020	1
2	Nut, Wheel, M22 x 1.5	04247301201Z	1
3	Brake and Wheel End Repair Manual (not shown)	XL-PS20062RM-en-US	1

SRK 48100624


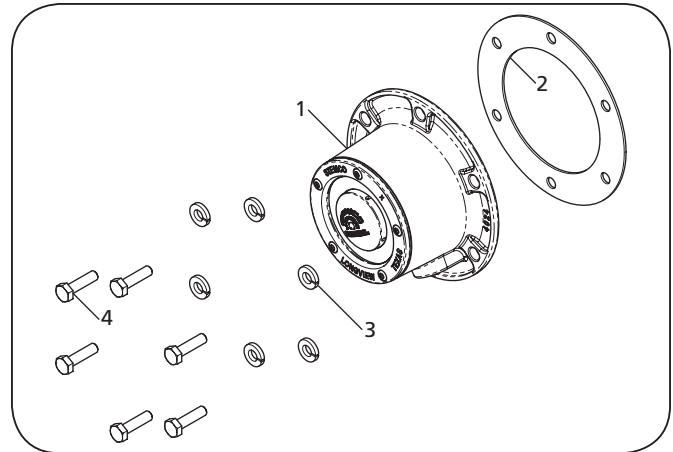
SRK 48100566: HUB REPAIR KIT 13K			
ITEM	DESCRIPTION	PART NUMBER	QTY.
1	Bearing, Wheel, Large	90570012	1
2	Bearing, Wheel, Small	90570013	1
3	Seal, Wheel	90070000	1
4	Gasket	90070004	1
5	Brake and Wheel End Repair Manual (not shown)	XL-PS20062RM-en-US	1

SRK 48100566



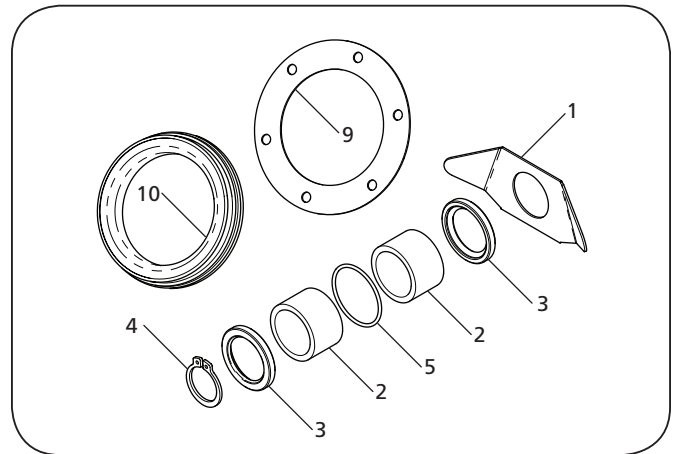
SRK 48100565: HUBCAP KIT 13K			
ITEM	DESCRIPTION	PART NUMBER	QTY.
1	Hubcap	90070003	1
2	Gasket	90070004	1
3	Lock Washer, Extra Duty, Helical Spring	93600043	6
4	Bolt Hex 0.31 - 18 x 1.00 GR 5	93002463	6
5	Brake and Wheel End Repair Manual (not shown)	XL-PS20062RM-en-US	1

SRK 48100565



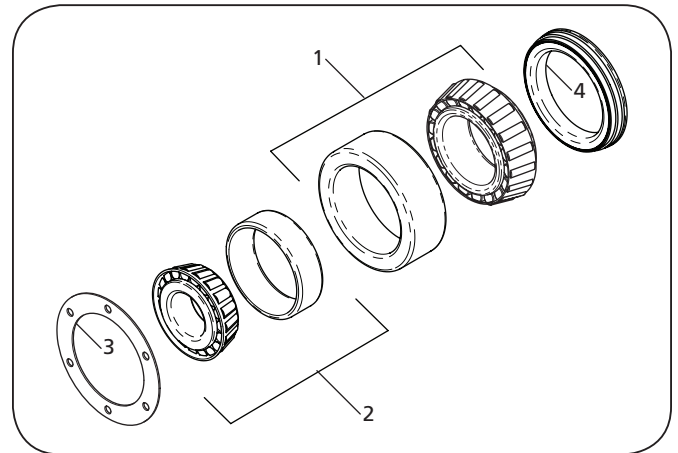
SRK 48100561: S-CAMSHAFT BUSHING SEAL KIT 13K			
ITEM	DESCRIPTION	PART NUMBER	QTY.
1	Washer, Cam Head	90066006	1
2	Bushing, Camshaft - 1.5" I.D. x 1.88" O.D. x 1.19" LG	90066003	2
3	Seal, Camshaft	90066016	2
4	Retaining Ring - 1.16" I.D. x .09" Thick	90066004	1
5	O-ring, Camshaft Tube	90066000	1
6	Brake and Wheel End Repair Manual (not shown)	XL-PS20062RM-en-US	1
9	Gasket	90070004	1
10	Seal	90070000	1

SRK 48100561

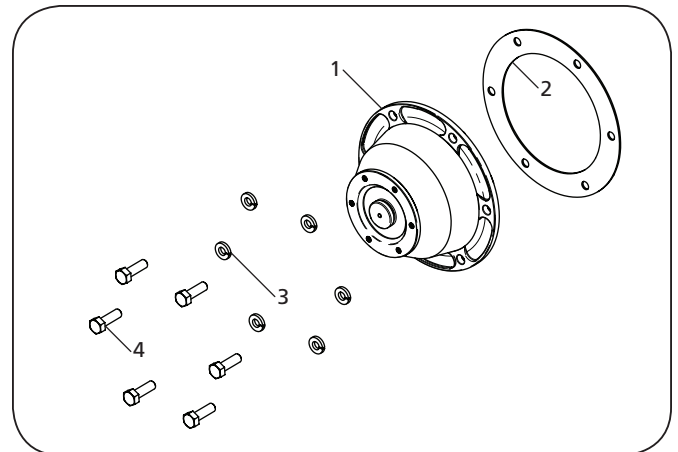


SRK 48100623: HUB REPAIR KIT 20K

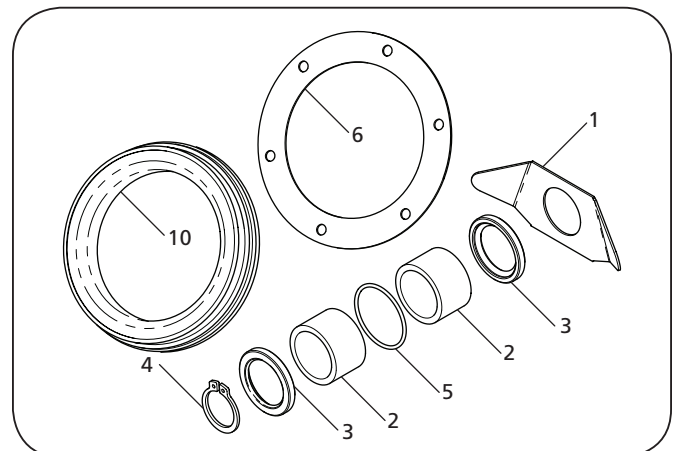
ITEM	DESCRIPTION	PART NUMBER	QTY.
1	Bearing, Wheel, Large	90570029	1
2	Bearing, Wheel, Small	90570030	1
3	Gasket	90070017	1
4	Seal Bearing	90070018	1
5	Brake and Wheel End Repair Manual (not shown)	XL-PS20062RM-en-US	1

SRK 48100623

SRK 48100622: HUBCAP KIT 20K

ITEM	DESCRIPTION	PART NUMBER	QTY.
1	Hubcap, Aluminum - Taper	01304012000Z	1
2	Gasket	90070017	1
3	Washer, 5/16	93600043	6
4	Bolt 5/16 - 18 x 1.00 GR 5	93002463	6
5	Brake and Wheel End Repair Manual (not shown)	XL-PS20062RM-en-US	1

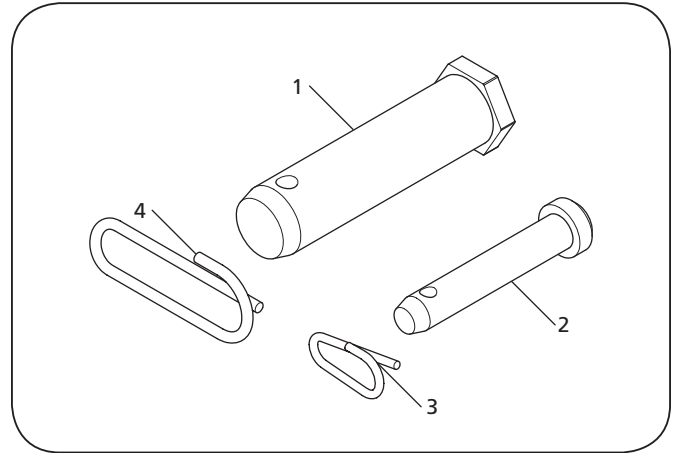
SRK 48100622

SRK 48100620: S-CAMSHAFT BUSHING SEAL KIT 20K

ITEM	DESCRIPTION	PART NUMBER	QTY.
1	Washer, Cam Head	90066006	1
2	Bushing, Camshaft - 1.5" I.D. x 1.88" O.D. x 1.19" LG	90066003	2
3	Seal, Camshaft	90066016	2
4	Retaining Ring - 1.16" I.D. x .09" Thick	90066004	1
5	O-ring, Camshaft Tube	90066000	1
6	Gasket	90070017	1
7	Seal Bearing	90070018	1
8	Brake and Wheel End Repair Manual (not shown)	XL-PS20062RM-en-US	1

SRK 48100620


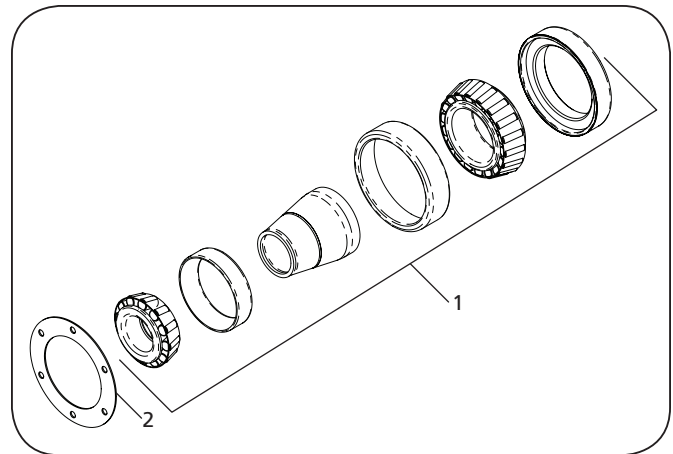
SRK 48100560: SLACK ADJUSTER CLEVIS PIN KIT 13K/20K			
ITEM	DESCRIPTION	PART NUMBER	QTY.
1	Clevis Pin, Large	90066023	1
2	Clevis Pin, Small	90066024	1
3	Clip, Wire, Small	90066026	1
4	Clip, Wire, Large	90066025	1
5	Brake and Wheel End Repair Manual (not shown)	XL-PS20062RM-en-US	1

SRK 48100560



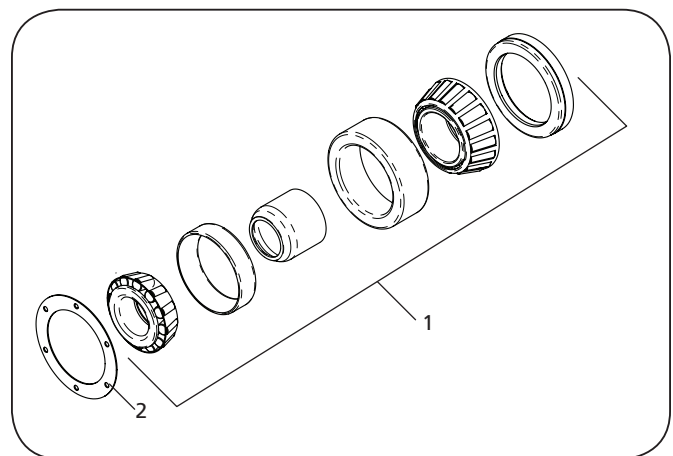
SRK 48100706: HUB REBUILD KIT, DISC BRAKE - 13K			
ITEM	DESCRIPTION	PART NUMBER	QTY.
1	Hub Rebuild Kit, Disc Brake - FF/FG Spindle	90570035	1
2	Gasket	90070004	1
3	Brake and Wheel End Repair Manual (not shown)	XL-PS20062RM-en-US	1

SRK 48100706



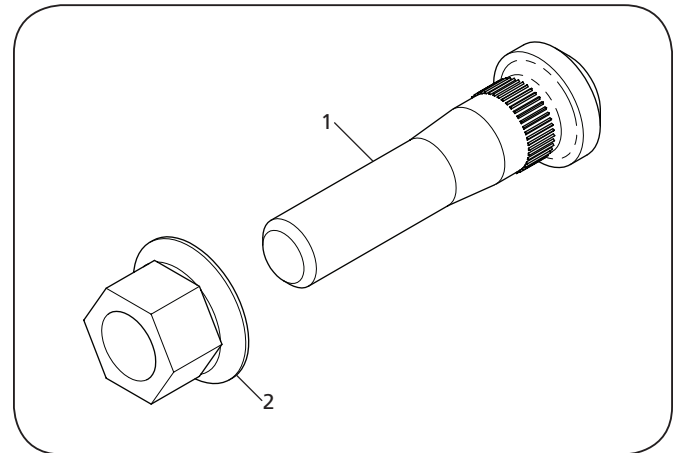
SRK 48100707: HUB REBUILD KIT, DISC BRAKE - 20K			
ITEM	DESCRIPTION	PART NUMBER	QTY.
1	Hub Rebuild Kit, Disc Brake - FL Spindle	90570036	1
2	Gasket	90070017	1
3	Brake and Wheel End Repair Manual (not shown)	XL-PS20062RM-en-US	1

SRK 48100707



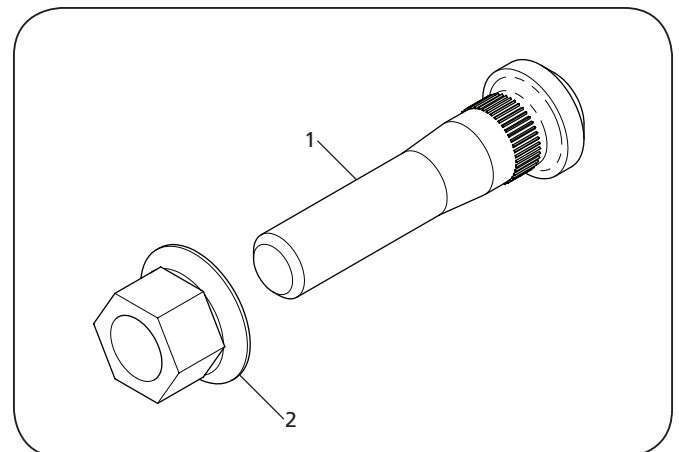
SRK 48100710: WHEEL STUD KIT, CONMET - 13K			
ITEM	DESCRIPTION	PART NUMBER	QTY.
1	Stud, M22 x 1.5 x 104, ConMet - FF/FG Spindle	90070032	1
2	Nut, Wheel, M22 x 1.5	04247301201Z	1
3	Brake and Wheel End Repair Manual (not shown)	XL-PS20062RM-en-US	1

SRK 48100710



SRK 48100711: WHEEL STUD KIT, CONMET - 20K			
ITEM	DESCRIPTION	PART NUMBER	QTY.
1	Stud, M22 x 1.5 x 108, ConMet - FL Spindle	90070031	1
2	Nut, Wheel, M22 x 1.5	04247301201Z	1
3	Brake and Wheel End Repair Manual (not shown)	XL-PS20062RM-en-US	1

SRK 48100711



2. Wheel End Component Identification

Prior to starting maintenance procedure(s), determine the make of the hub/drum or hub/rotor installed on the axle. This information will be used later in this procedure (**Figure 1**).

LSZ XX XX X X X X - X X

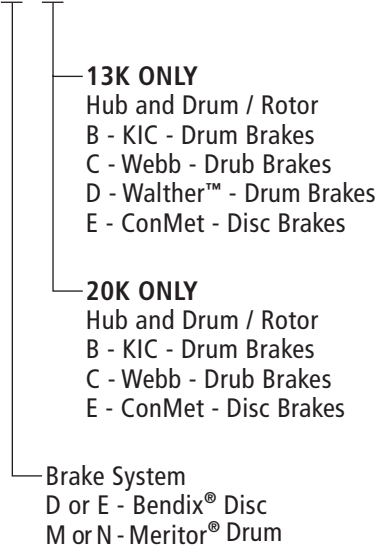
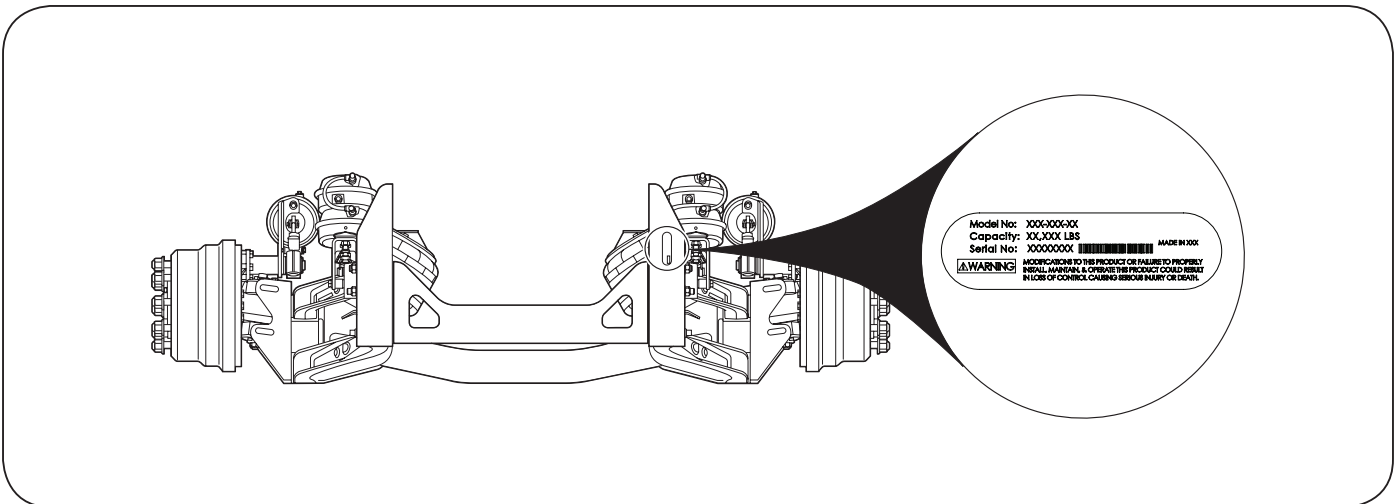


Figure 1



3. Axle Preparation

1. With vehicle unloaded and/or trailer disconnected on a level surface, set parking brakes and chock drive tires to prevent the vehicle from rolling forward or backward.

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

2. Put suspension in-service position. Exhaust air pressure in suspension air springs. Remove air pressure using air pressure regulator or control valve.

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

3. Using a floor jack lift axle with tires just off ground.
4. Remove ten (10) 22mm flange nuts retaining wheel/tire assembly onto the hub/drum or hub/rotor assembly. Remove wheel/tire assembly.
5. Lift axle and place a jack stand under axle at both ends. Lower axle onto jack stands.

NOTE: When removing or replacing the hubcap, refer to Section 8.

When removing or replacing the hub seal with deflector ring, refer to Section 9.

4. Drum Brake Assembly Maintenance

LSZ13 and LSZ20 Auxiliary axles are supplied with Meritor Q-Plus Cam Brakes – Refer to the manufacture’s guidelines for repair procedures.

5. Drum Brake Hub/Drum Assembly Maintenance

LSZ13 and LSZ20 Auxiliary axles are supplied with KIC, Walther or Webb hub/drum assemblies – Refer to the manufacture’s guidelines for repair procedures.

6. Disc Brake Assembly Maintenance

LSZ13 and LSZ20 Auxiliary axles are supplied with Bendix ADB22X Air Disc Brakes – Refer to manufacture’s guidelines for repair procedures.

7. Hub/Rotor Assembly Maintenance

LSZ13 and LSZ20 Auxiliary axles are supplied with ConMet Hub/Rotor Assemblies – Refer to the manufacture’s guidelines for repair procedures.

8. Hubcap Removal and Replacement

1. Measure the oil level in current hubcap. Record this measurement.
2. Remove 1/4" pipe plug from the side of the hubcap and drain hub oil.
3. Remove and discard six (6) 5/16" bolts with lock washers that retain hubcap to the hub.
4. Remove and discard gasket from both hubcap and hub.
5. Before installing hubcap make sure both hubcap and hubs mounting surface are completely clean of the old gasket. Install hubcap using a new gasket.

Torque six (6) 5/16" bolts using pattern in **(Figure 2)** to the torque specified in Section 10.

7. Install oil into hubcap using measurement recorded earlier. Install 1/4" pipe plug into the side of a hubcap.

9. Hub Seal Replacement

NOTE: When replacing the hub seal the deflector ring must also be replaced.

- Prepare spindle to install hub seal.
- LSZ13 Hub Replacement ONLY.
- Remove axle ring.
- Clean retaining paste from both spindle brake plate and face of axle ring.
- Remove hub seal deflector ring from axle ring.
- Install new hub seal deflector ring onto axle ring following Stemco's online instructions with O-ring gland towards the spindle brake plate.
- Install O- ring into axle ring. Apply a thin film of SAE85-90 to inside portion of O-ring **(Figure 3)**.
- Apply Loctite 668 retaining paste to the inboard vertical face of axle ring.
- Install axle ring with O-ring and hub seal deflector ring onto the spindle, rotate axle ring at least a quarter turn to spread retaining paste evenly.

Figure 2

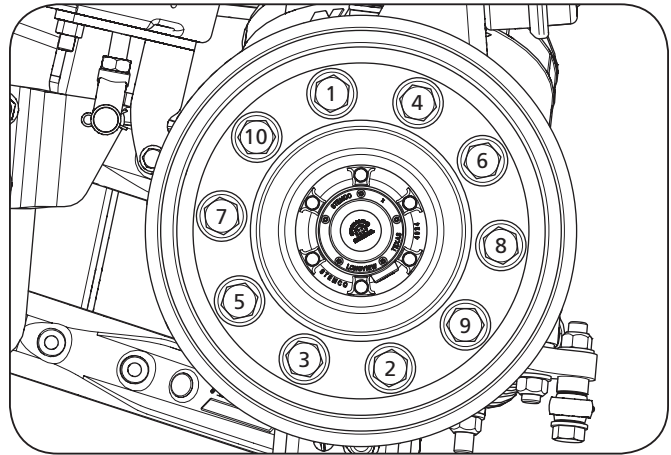
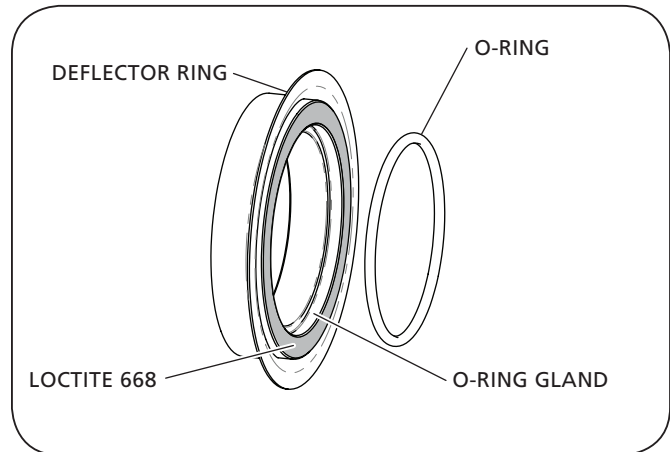


Figure 3



10. Torque Specifications

NOTE: Torque specifications listed in this section are with clean lubricated/coated threads, supplied by SAF-HOLLAND.

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

⚠ 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 will result in component failure which, if NOT avoided, could result in death or serious injury.

- All fasteners MUST be re-torqued after the first 100 hours of service or 5,000 miles (8,000 km).
- Refer to vehicle OEM for torque specifications for vehicle frame fastener hardware.

11. Lubrication Specifications

Lubricate the suspension in accordance with the approved lubricants (**Table 2**).

IMPORTANT: Replacement of SAF-HOLLAND supplied fasteners with non-SAF-HOLLAND could result in unpredictable performance.

⚠ WARNING Failure to maintain the LSZ suspension with SAF-HOLLAND original parts can result in unpredictable performance which, if NOT avoided, could result in death or serious injury.

Table 2

GREASE	HUB OIL
CITGO SynDurance Premium Synthetic 460	Exxon Mobil Mobilube HD Plus 80W-90
Mystik JT-6 Hi Temp with Moly	Shell Spirax S 75W-90
Valvoline Palladium Grease	Shell Spirax ASX 75W-90
Chevron Delo Heavy Duty Moly 5% EP	Exxon Mobil Mobilube 1 SHC 75W-90
	Exxon Mobil Delvac 75W-90

Figure 4

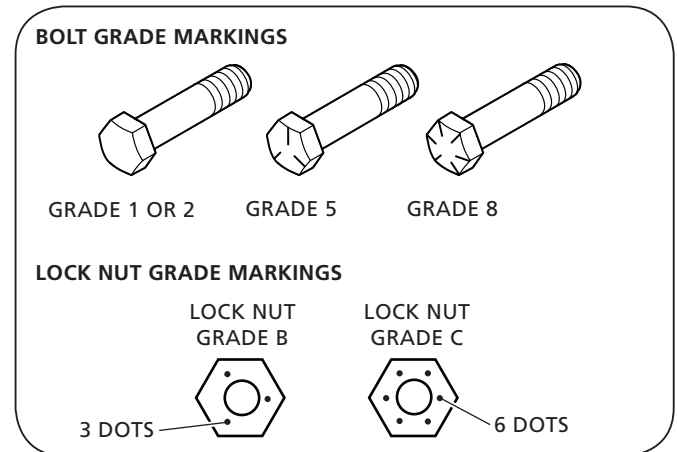


Table 1

COMPONENT	TORQUE RANGE	SIZE
Hubcap	12-16 ft-lb. 16-22 N•m	5/16"-18



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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