



TRAILER AXLE HUB
REPLACEMENT
SERVICE MANUAL

L I P P E R T
C O M P O N E N T S ®

TABLE OF CONTENTS

Safety Information	2
Hub Removal	2
Brake Drum Inspection	5
Bearing Inspection	6
Replacing the Bearing Cup	6
Bearing Lubrication - Oil	7
Brake/Idler Hub Installation	8
Inner Bearing Cone and Grease Seal Installation	8
Hub Replacement	11
Wheel Torque Requirements	13

Safety Information

WARNING

The “WARNING” symbol is a sign that precedes a service, maintenance or operational procedure containing a possible personal safety risk that could result in serious injury or death if stated safety precautions and procedural steps are not followed as set forth in this manual.

Always wear eye protection when performing service or maintenance to the vehicle. Other safety equipment to consider would be hearing protection, gloves and possibly a full face shield, depending on the nature of the service. The owner’s manual for your unit may have more procedures for service and maintenance.

NOTE: The images shown in this manual are for illustrative purposes only and may not exactly match the components on the axle being serviced.

NOTE: It is normal to have a small residual amount of grease on the exterior of a new hub. Most of the time, simply wiping off the residual grease is an appropriate solution. However, if there is noticeable diminished braking capability or grease continues to weep, the hub should be checked by a qualified service provider. It is not normal for a hub to continue to weep grease after its initial installation. Excess grease can coat the brake pads, magnets and braking surfaces inside of the hub.

Hub Removal

1. Lift and support unit per manufacturer’s requirements.

WARNING

Always lift the trailer by its frame and never by its axle or suspension. Axle and suspension components are not designed, or rated, for the dead weight, point-of-contact loads that the trailer’s frame is. Do not go under the trailer unless it is supported by appropriately rated jack stands. Improperly supported trailers can collapse, causing possible serious personal injury or death.

WARNING

Wear appropriate personal protective equipment (PPE) when performing service or maintenance operations. Always wear eye protection when servicing trailer axles, brakes, hubs, springs and wheels. Not using PPE may result in serious personal injury or death.

Fig. 1

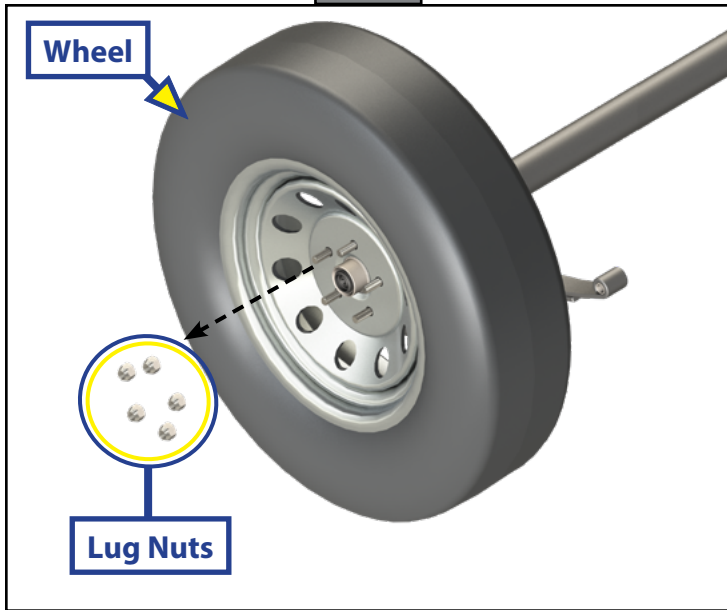
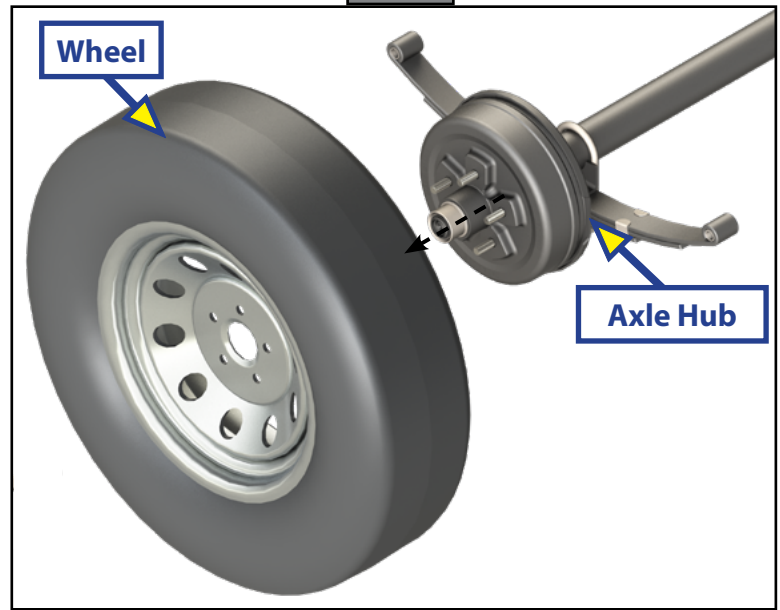


Fig. 2



2. Remove the lug nuts from the wheel and set aside (Fig. 1). If using an impact driver, ensure the driver has come to a complete stop before moving to the next lug nut to avoid rounding the edges of the nut.
3. Remove the wheel from the axle hub and set aside (Fig. 2).
4. Remove the dust cap by prying the edge out of the hub with a flathead screwdriver (Fig. 3). Pry evenly around the edge until it comes free. If equipped with oil lubrication, unscrew oil cap using a 2½" socket. Let oil drain into pan.
5. Pull the cotter pin from the castle nut with pliers and discard (Fig. 4). Cotter pin is a one-time use part. Do **NOT** re-use.

Fig. 3

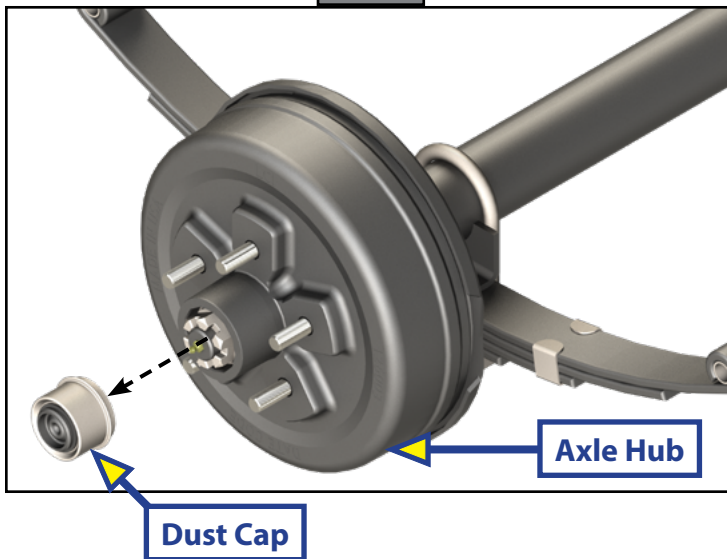
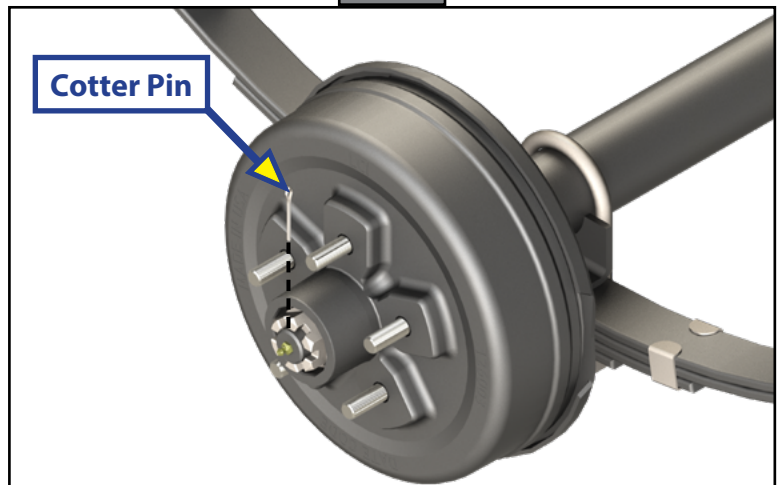


Fig. 4



6. Remove the castle nut from the spindle (Fig. 5) and set aside.
7. Remove the spindle washer from the spindle (Fig. 5) and set aside.
8. Place hand over nose of hub during removal to contain outer bearing cone or remove outer bearing cone prior to removal of hub. Remove the hub from the spindle.

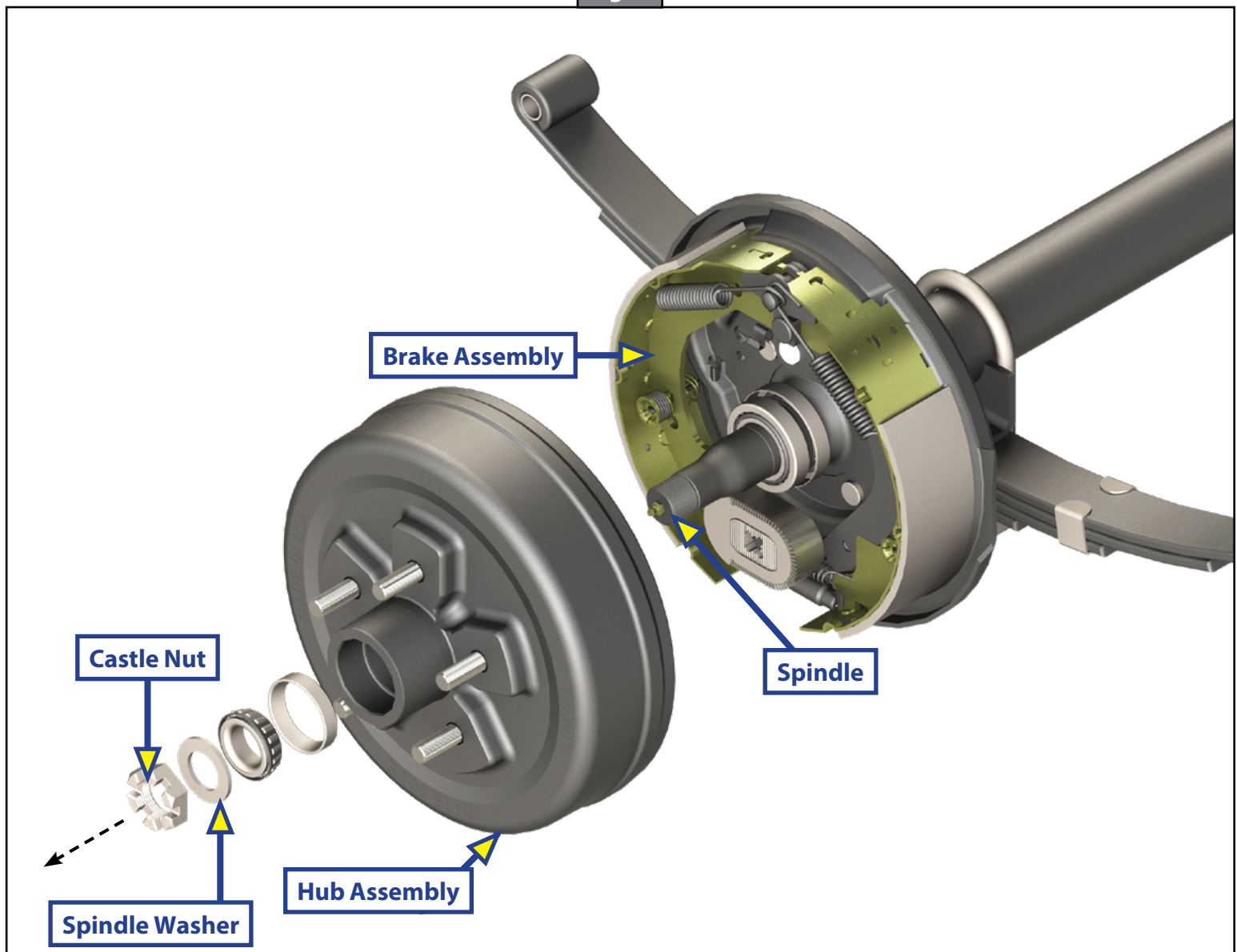
NOTE: Brakes may need to be adjusted or backed off to remove drum from spindle.

NOTE: A gear puller may be necessary to remove hub from spindle.

⚠ CAUTION

Be aware that when hubs and braking components are opened, disassembled, or otherwise tampered with, there is a possibility of grease coating the brake pads, magnet and braking surfaces of the hub, greatly reducing the mechanism's ability to effectively bring the vehicle to a slower speed or stop. If grease is present on the brake pads, magnet or the braking surface of the hub, the hub and brake assemblies must be replaced.

Fig. 5



Brake Drum Inspection

The brake shoes contact the drum's inner surface and the brake magnet contacts the armature. These surfaces are subject to wear and should be inspected periodically. The hubs and brake assembly must be inspected for excess grease existing on the spindle area of the axle. Excess grease can coat the brake pads, magnets and the braking surfaces inside of the hubs (Fig. 6 and Fig. 7). Fig. 8 shows a hub that has grease on the spindle only. This is acceptable. For more information go to:

[TI-215 - Axle Grease/Brake Contamination FAQ](#)

⚠ CAUTION

Resurfacing procedures can produce metal chips and brake dust that can contaminate the wheel bearings and cause component failure. Make sure that the wheel bearing cavities are clean and free of contamination before reinstalling bearings and seals.

⚠ WARNING

Potential asbestos dust hazard. Do not use compressed air, a dry brush or dry rag to remove brake dust. Disturbed brake dust can become an airborne irritant that can be inhaled or ingested, causing serious personal illness or death. Wear appropriate personal protective equipment (PPE). Use aerosol brake cleaner to wash brake dust away.

Fig. 6



Fig. 7



Fig. 8



Bearing Inspection

Wash all grease and oil from the bearing cone using a suitable solvent. Dry the bearing with a clean, lint-free cloth and inspect each roller completely. If any pitting, spalling, or corrosion is present, then the bearing must be replaced. The bearing cup inside the hub must be inspected.

NOTE: Bearings must always be replaced in sets of one cone and one cup.

WARNING

Wear personal protective equipment (PPE) when using caustic materials. Aerosol, liquid and oil-based paste materials can present splash hazards and skin contact environments that can result in serious adverse eye and skin irritations. Follow all recommended safety precautions when using such materials.

Replacing the Bearing Cup

CAUTION

Resurfacing procedures can produce metal chips and brake dust that can contaminate the wheel bearings and cause component failure. Make sure that the wheel bearing cavities are clean and free of contamination before reinstalling bearings and seals.

1. With an appropriate seal pulling tool, remove the old grease seal from the hub assembly.

NOTE: As a new grease seal will be installed, it is acceptable to damage the old grease seal during removal. If any grease gets on the hub assembly during this process, clean it off immediately.

2. Remove the bearing from the hub assembly.
3. With the bearing removed, use a clean lint free towel to remove any old grease from the inside and outside of the hub assembly. Be thorough and ensure all old grease is removed
4. Place hub on a flat surface with bearing cup on the bottom.
5. With brass drift punch, lightly tap with a hammer around the small end of the cup to push it out. Tap around the cup in a circular manner, traveling around the edge of the cone until it comes free. Discard the bearing cup, as it must be replaced when replacing the bearings.
6. If replacing the outer bearing cone, flip the hub assembly over, supporting it with blocks of wood for stability. Perform the same brass drift punch procedure as performed in Step 5.
7. Clean the hub bore with a lint free rag, ensuring all old grease is removed. Using brake cleaner, work from the inside to the outside of the assembly to clean away any grease, brake dust, or rust.

NOTE: It is vital to remove any grease or buildup on the brake mating surfaces.

8. Replace the cup by tapping it in, ideally with a seal punch. Ensure the bearing cup is installed in the correct orientation, with the thicker side facing downward. If a seal punch is unavailable it is acceptable to use the brass drift punch. The cup should be seated against the retaining shoulder in the hub.

CAUTION

Bearing cup replacement is a precise procedure. When installed, the bearing cup MUST be fully seated against the retaining shoulder of the hub. If the cup is not seated correctly, damage to the completed hub assembly may occur, voiding warranty.

WARNING

Do not mix lithium, calcium, sodium or barium complex greases. Mixing of these incompatible compounds can create a corrosive and/or toxic chemical with fumes that can result in a serious health risk if exposed to skin or lungs. When converting from one grease to another, make sure all old grease is removed completely prior to applying new grease.

Bearing Lubrication - Oil

If your axles are equipped with oil lubricated hubs, then your lubrication procedure is to periodically fill the hub with a high quality hypoid gear oil to the level indicated on the clear plastic oil cap. The oil can be filled through the rubber plug hole in the cap.

Recommended Oil Lube for axle bearings:

Oil designation : SAE 90, SAE 80W-90, SAE 75W-90

Approved Sources - Bearing Lubrication Oil	
Union Oil Co.	Unocal MP Gear Lube
Exxon Co.	Gear Oil GX 80W-90
Mobil Co.	Mobilube SHC 75W-90
Pennzoil Co.	Gear Plus 80W-90 GL-5
	Gear Plus Super 75W-90

The axle bearings are lubricated with a SAE 80-90W hypoid gear oil. Periodically check oil levels as follows:

1. Make sure trailer has been parked for a few minutes to allow oil to cool.
2. Check and refill brake hub oil to the level indicated on the plastic oil cap.
3. To fill brake hub with oil, remove rubber plug or cap plug from the hub's oil cap.
4. Fill oil through the plastic cap until oil level is complete.
5. Insert rubber plug or cap plug into plastic oil cap.
 - A. Tighten oil cap to 25 ft-lbs. Do not over-tighten oil cap or an oil leak may occur.

CAUTION

Do not over-tighten plastic oil cap. Over-tightening can damage O-ring, resulting in an oil leak.

Refer to the Components pages for part numbers. Refer to Approved Sources - Bearing Lubrication Oil chart for recommended axle bearing lubricants.

Brake/Idler Hub Installation

Install the brake or idler hub onto the brake drum or spindle as follows:

1. Obtain appropriate hub for installation.
2. Inspect hub for cleanliness.
3. If both bearing cups are installed in the hub bearing bores, go to the Inner Bearing Cone and Grease Seal Installation procedure.
4. If either one of the bearing cups is not installed in the hub, do as follows:
 - A. Place hub on a solid, flat surface with installed bearing cup side of the hub facing down.
 - B. Obtain the appropriate bearing cup for installation. Refer to the Components pages for part numbers.



Bearing cup replacement is a precise procedure. When installed, the bearing cup MUST be fully seated against the retaining shoulder of the hub. If the cup is not seated correctly, damage to the completed hub assembly may occur, voiding warranty.

- C. Bearing cup replacement is a precise procedure. Consult Lippert prior to replacing a bearing cup. The trailer should be taken to a certified service center for this work to be done.
 - D. Gently place new bearing cup into hub bearing bore.
 - E. Using a brass drift punch, lightly tap around the outer edge of the cup to drive it into the hub bearing bore.
 - I. Continue tapping the drift punch around the circumference of the cup's edge until the cup is fully seated against the hub's bearing bore retaining shoulder.
 - F. Wipe the inside of the bearing cup (race) with a clean, lint-free cloth.
 - I. Inspect the bearing cup race to make sure no damage occurred during installation.
5. If no bearing cups are installed in the hub, do as follows:
 - A. Perform step 4 of this procedure.
 - B. Flip hub, exposing the other, open hub bearing bore.
 - C. Perform step 4 of this procedure.
 - D. Make sure both bearing cup races are clean and ready for bearing cone and grease seal installation.
6. After both bearing cups have been installed in the brake or idler hub, go to Inner Bearing Cone and Grease Seal Installation procedure.

Inner Bearing Cone and Grease Seal Installation

Bearing grease should be replaced annually or every 36,000 miles, whichever comes first.

1. Make sure all old grease has been removed from wheel hub, bearings and axle spindle.
2. Make sure all mating surfaces for new bearing cone and grease seal are clean.
3. Bearings should be packed by machine, if possible, however packing by hand is a viable alternative.

⚠ WARNING

Do not mix lithium, calcium, sodium or barium complex greases. Mixing of these incompatible compounds can create a corrosive and/or toxic chemical with fumes that can result in a serious health risk if exposed to skin or lungs. When converting from one grease to another, make sure all old grease is removed completely prior to applying new grease.

Hand-pack inner bearing cone as follows:

1. If previously removed inner bearing cone is in reusable condition, place a generous amount of grease into the palm of your hand (Fig. 9).

NOTE: Select an appropriate grease that is temperature-rated for the wheel's application. Reference Recommended Wheel Bearing Grease Specifications and Approve Sources - Bearing Grease charts.

- A. If previously removed inner bearing cone cannot be reused, obtain a new inner bearing cone. Refer to the Components pages for part numbers.
- B. Place a generous amount of grease into the palm of your hand (Fig. 9).

Fig. 9



Recommended Wheel Bearing Grease Specifications	
Thickener Type	Lithium Complex
Dropping Point	230°C (446°F) Minimum
Consistency	NLGI No. 2
Additives	EP, Corrosion, & Oxidation Inhibitors
Base Oil	Solvent Refined Petroleum Oil
Base Oil Viscosity	@40°C (104°F) 150cSt (695 SUS) Minimum
Viscosity Index	80 Minimum
Pour Point	-10°C (14°F) Minimum

Approved Sources - Bearing Grease	
Mobil Oil	Mobilgrease HP
Exxon/Standard	Ronex MP
Kendall Refining Co.	Kendall L-427
Ashland Oil Co.	Valvoline Val-plex EP Grease
Pennzoil Prod. Co.	Premium Wheel Bearing Grease 707L

NOTE: Select appropriate grease that is temperature-rated for the wheel's application.

1. Press widest end of bearing into the outer edge of the grease pile, forcing grease into the inner area of the bearing between two adjacent rollers (Fig. 9). A bearing packer is recommended, but if one is unavailable, hand packing is appropriate.
2. Repeat this process while turning bearing from roller to roller until all rollers are coated.
3. Apply a light coat of grease into the bearing cup surface (race).
4. Place a small amount of grease into the cup and install new grease-packed bearing cone into the cup.

Lippert recommends replacing the grease seal whenever bearing packing is required.

Install a new grease seal into the hub seal bore, to capture the inner bearing cone, as follows:

1. Place the new grease seal into the seal bore.
 - A. Apply a light film of sealant onto the outer rim of the seal.
 - B. Make sure seal is set square to the hub seal bore before pressing the seal all the way in or the seal may become damaged.
2. Use a clean block of wood and hammer to drive the seal into the seal bore (Fig. 10).
 - A. Place the wood block evenly across the seal.
 - B. Hold the wood block firmly in-place as you begin to tap the seal squarely into the seal bore with the hammer.
 - C. Continue to tap the seal inward until the seal's outer face is flush to the hub's seal bore face.

Fig. 10



⚠ CAUTION

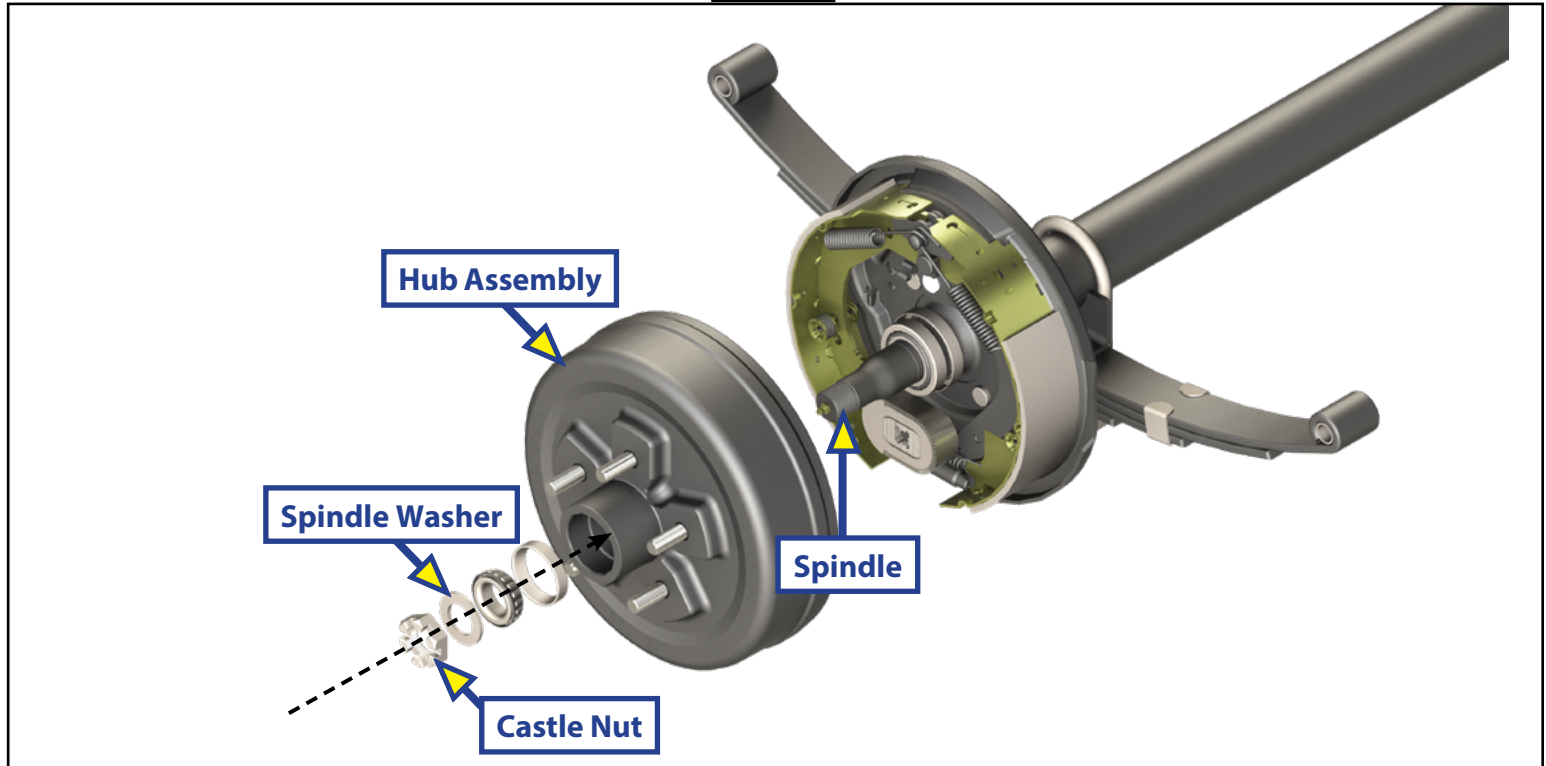
Make sure the oil seal is properly oriented during part installation. Most oil seals have one side marked "AIR SIDE." This side MUST face outwards and not towards the bearing or component failure will occur. Make sure when installing a new oil seal the side marked "AIR SIDE" is facing outward, away from the bearing cone.

Hub Replacement

NOTE: Wipe all grease from spindle with a lint free towel prior to hub installation to prevent brake contamination after hub install.

1. With the inner grease seal now in place, reinstall the hub assembly over the brake assembly.

Fig. 11



2. Pack the outer bearing just before installation to avoid possible contamination from setting it down on a workbench or from other environmental factors. Pack the outer bearing in the same manner as the inner bearing (Fig. 9).
3. Place hub, bearing, washers and castle nut back on axle spindle in the reverse order from which they were removed (Fig. 11). Be sure to wipe away any excess grease. Castle nut should be torqued to 55 ft.-lbs. Hub will rotate during this process.
4. Loosen castle nut to back off the torque.
5. Tighten castle nut finger tight until snug.
6. Insert new cotter pin (Fig. 12). If cotter pin does not line up with hole, back castle nut up slightly until pin can be inserted.
7. Bend cotter pin over to lock nut in place (Fig. 13). Nut should be free to move with only the cotter pin keeping it in place.

Fig. 12

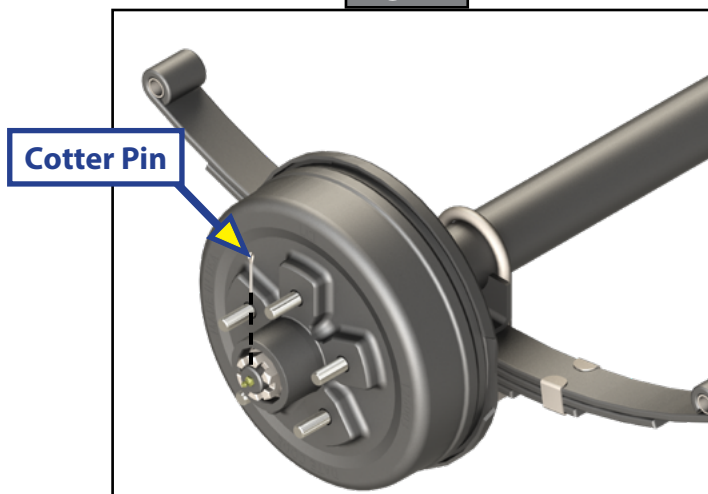
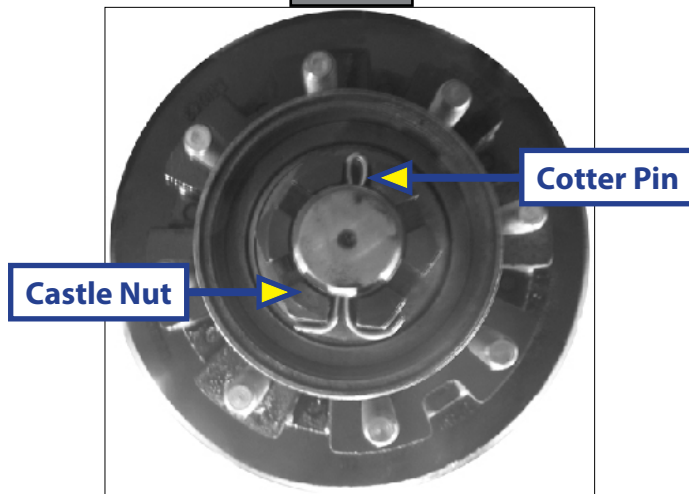


Fig. 13



8. Re-install dust cap into the hub assembly (Fig. 14).
9. Re-install the wheel onto the hub assembly (Fig. 15).
10. Re-install the lug nuts onto the hub studs (Fig. 16) per the Wheel Torque Requirements Chart.

Fig. 14

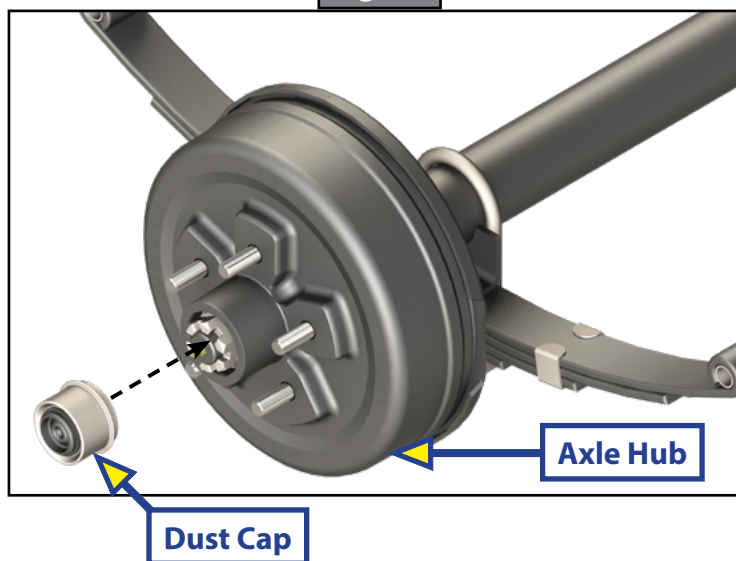


Fig. 15

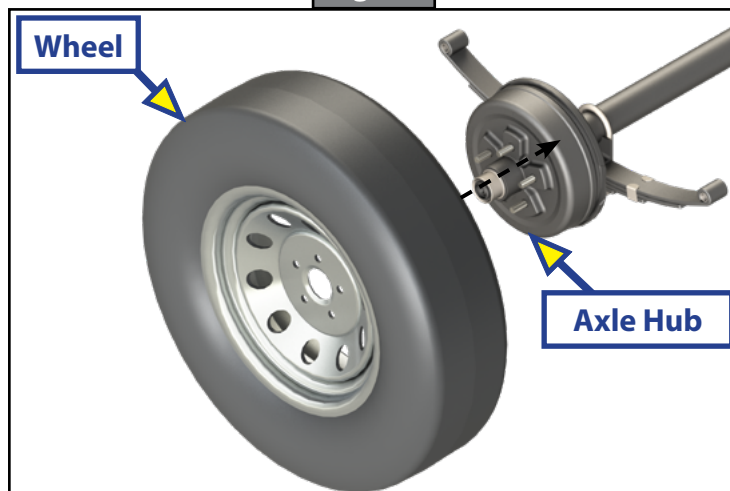
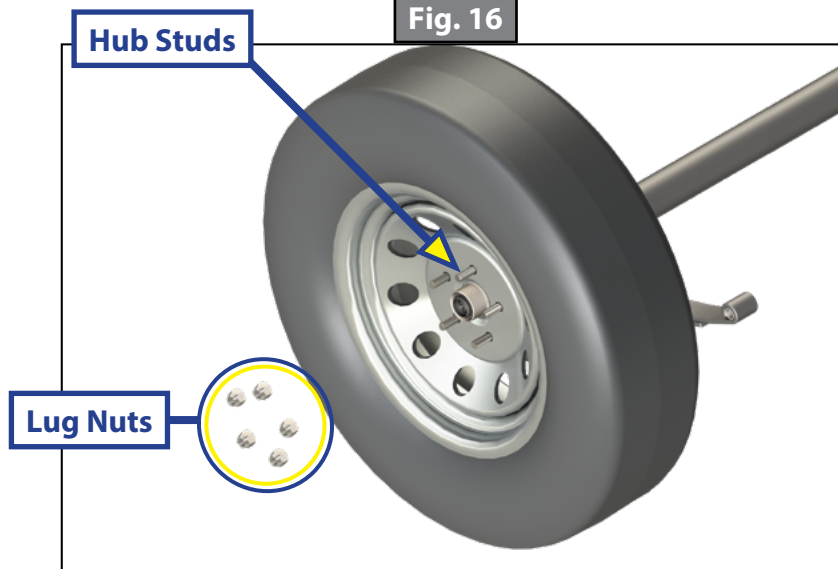


Fig. 16



Wheel Torque Requirements

It is extremely important to apply and maintain proper wheel mounting torque limits on your trailer axle. Use of torque wrenches will ensure proper torque limits are applied to wheel mounting lug nuts. Use no other method to torque wheel lug nuts.



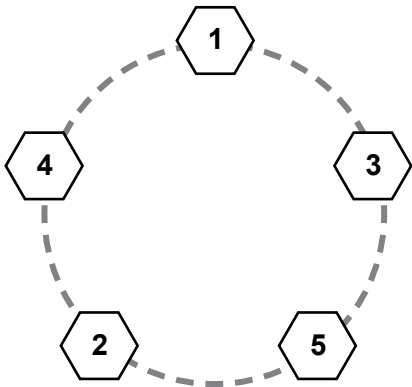
Proper and accurate torque must be maintained to prevent wheels from loosening, studs from cracking and/or breaking or other possible hazardous breakage that may result in death, serious personal injury, severe product or property damage.

Make sure wheel fasteners match the cone angle of the wheel (usually 60° or 90°) being serviced. Attach new wheel to the axle hub as follows:

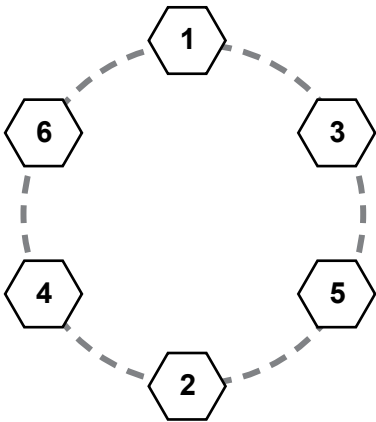
- 1. Start all bolts or nuts by hand to prevent cross-threading.
- 2. Continue to hand-tighten wheel lug nuts in the sequential pattern shown in Figure 17.
- 3. After wheel lug nuts are fully hand-tightened, torque nuts in stages in the sequential pattern shown in Figure 17.
 - A. Torque wheel lug nuts to the torque values listed in the Wheel Torque Requirement Chart.
- 4. Wheel lug nuts should be torqued before first road use and after each wheel removal.
 - A. Check and re-torque wheel lug nuts after 10, 25 and 50 miles. A periodic check during regular service is recommended.

Wheel Torque Requirement Chart				
Wheel Size	Stud Size	Torque Sequence		
		1st Stage	2nd Stage	3rd Stage
14"	1/2"	20-25 ft-lbs	50-60 ft-lbs	90-120 ft-lbs
15"	1/2"	20-25 ft-lbs	50-60 ft-lbs	90-120 ft-lbs
16"	1/2"	20-25 ft-lbs	50-60 ft-lbs	90-120 ft-lbs
16.5"	1/2"	20-25 ft-lbs	50-60 ft-lbs	90-120 ft-lbs
14.5" Demount	1/2"	Tighten sequentially to 85-95 ft-lbs		
16"	9/16"	20-25 ft-lbs	60-70 ft-lbs	120-130 ft-lbs
16.5"	9/16"	20-25 ft-lbs	60-70 ft-lbs	120-130 ft-lbs
16" Dual and 17.5" Cone Nut	5/8"	50-60 ft-lbs	100-120 ft-lbs	190-210 ft-lbs
16" Dual and 17.5" Flange Nut	5/8"	50-60 ft-lbs	150-200 ft-lbs	275-325 ft-lbs
17.5" Dual Flange Nut	M22	50-100 ft-lbs	250-300 ft-lbs	450-500 ft-lbs

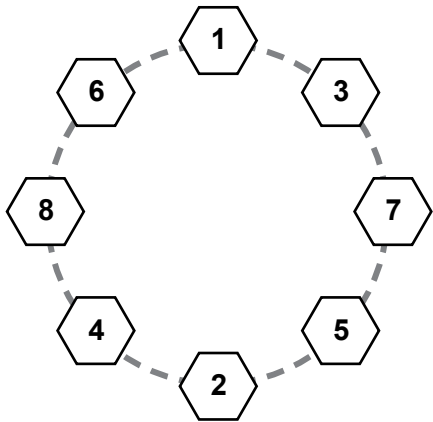
Fig. 17



5 Lug



6 Lug



8 Lug



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