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SERVICE BULLETIN

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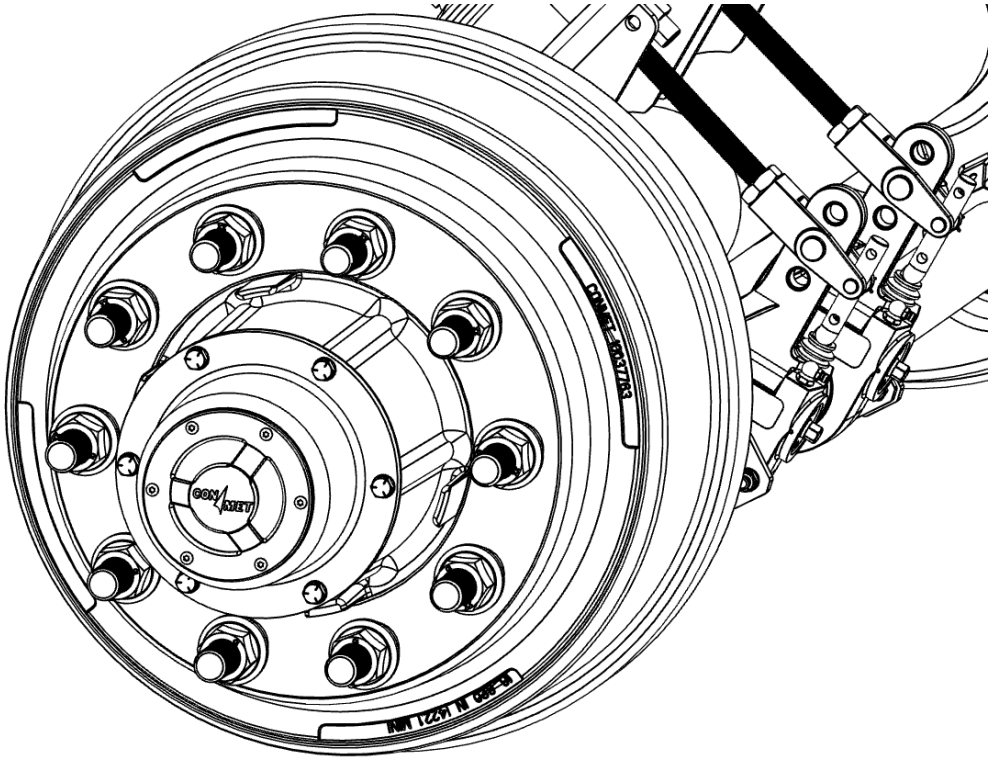
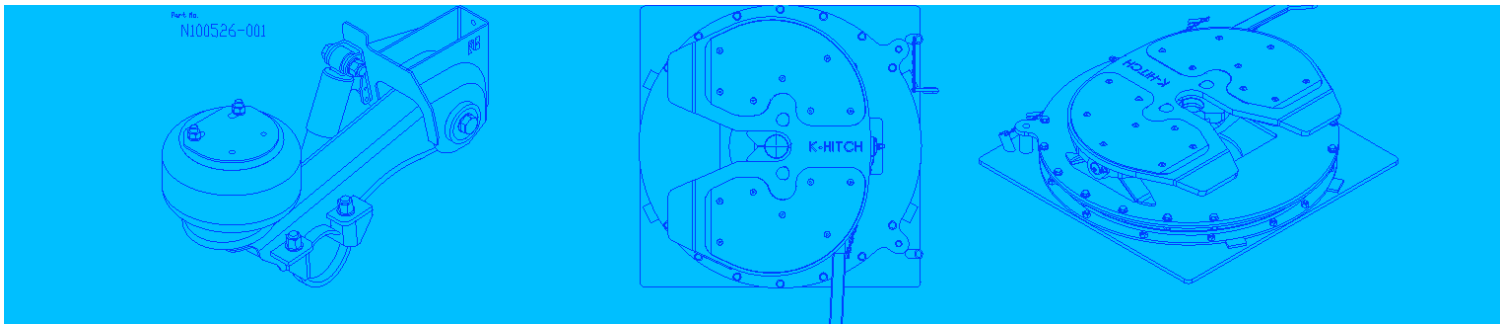
Revision : Rev A **Reference Documents :** KPM-002-0519 Rev 1

CONDENSED - CONMET SERVICE MANUAL





SCOPE

This is a condensed version of the full ConMet Service Manual available from the ConMet website; ConMet_HubServiceManual_10084476 .

FUWA K-Hitch only supply the ConMet Preset Plus, trailer product into the Australian market, this document only covers in service recommendations for this product.

SERVICE RECOMMENDATIONS

The following are the recommended service instructions for the ConMet Preset Plus wheel end for FUWA K-Hitch axles in the Australian market.

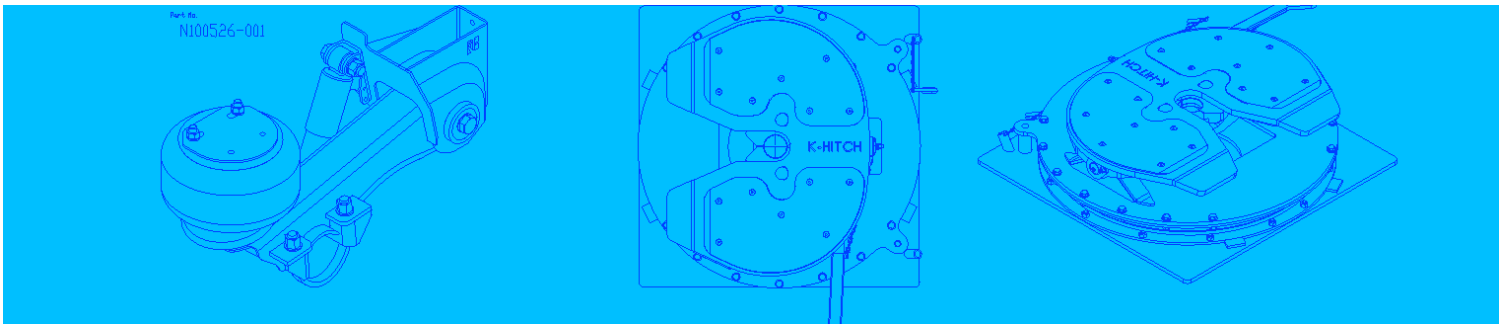
Service Schedule

Service intervals

Inspection results by the driver *(pre-trip, in routs with temperature check)* and the normal preventative maintenance *(monthly or 6,000 km and quarterly or 25,000km)* will indicate whether further service work is required. Follow the following instructions *(if necessary, check the full ConMet service manual for more details)*. The semifluid must be checked every 100,000 km or annually.

Lubrication Analysis

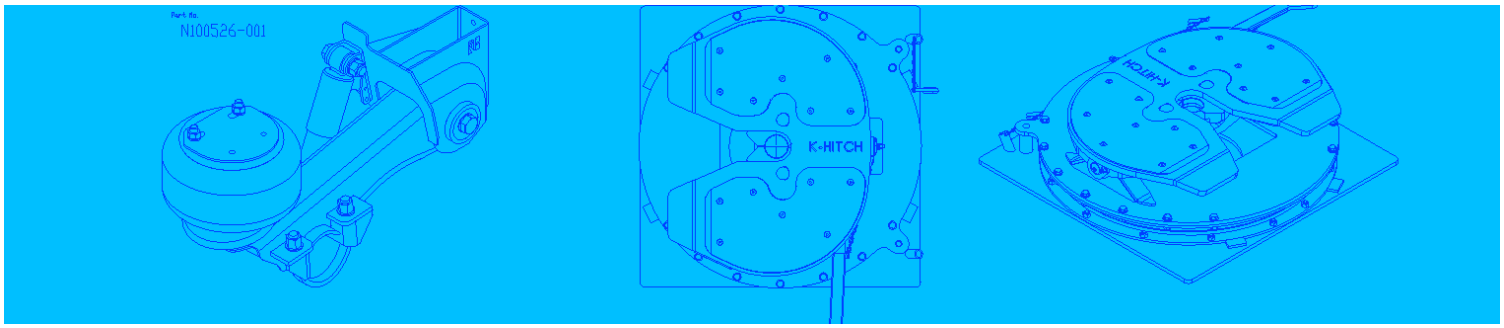
Beyond the recommended visual inspection (also use of a magnet), develop a lubrication testing and replacement program. This program will depend on vehicle application. The lubricant supplier should be consulted for additional lubricant inspection and testing recommendations.

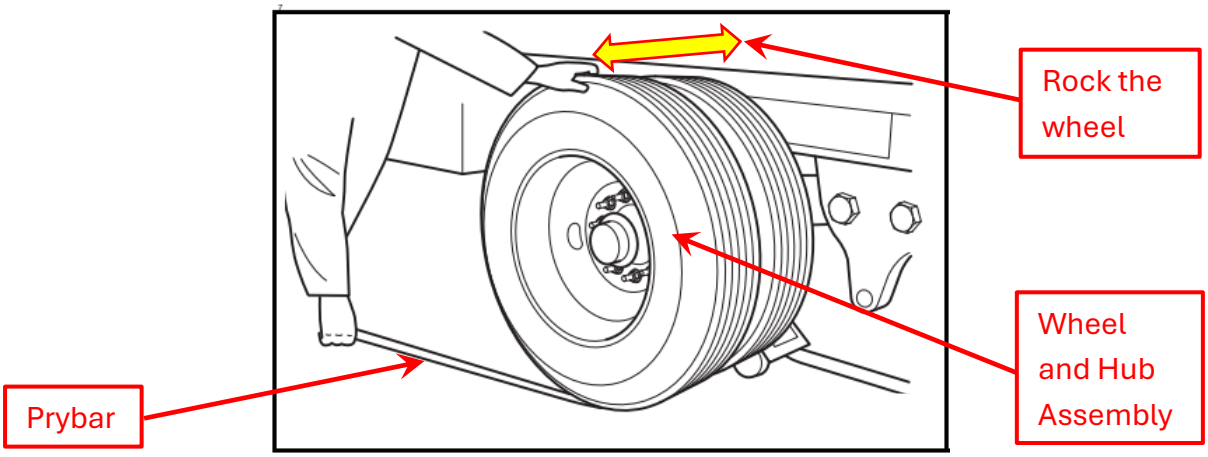


Service Checklist

During any routine preventative maintenance on the vehicle or axle (see your OEM guidelines and associated federal regulations) inspect the following items:

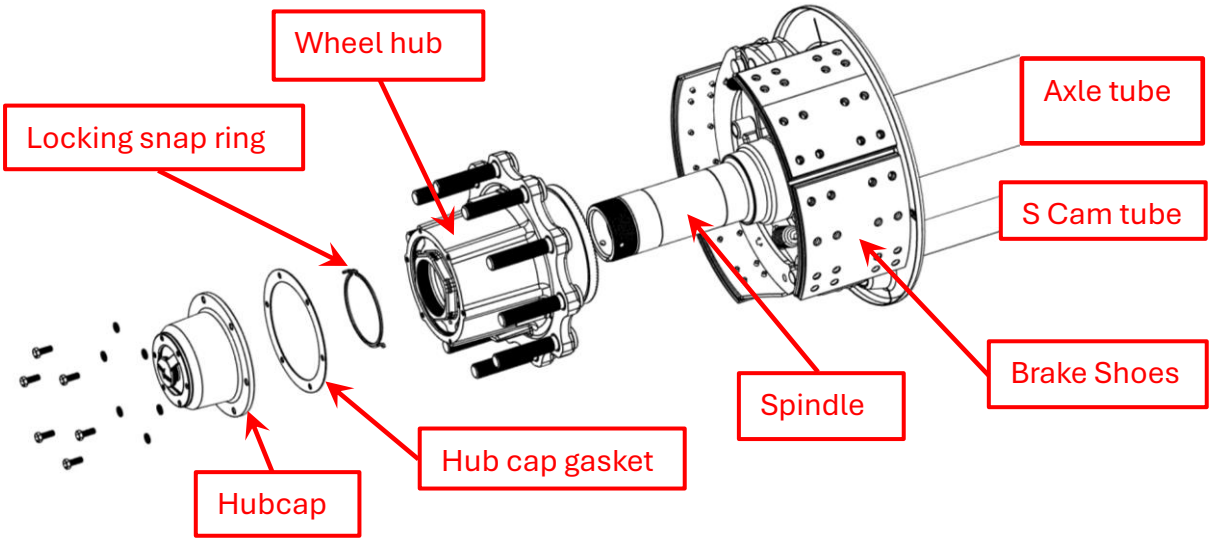
1) Check for loose, damaged or missing fasteners on the wheel and hub cap. Rust or dark streaks coming from the wheel bolts may be a sign of improper wheel bolt torque.
2) Check for loose, damaged or missing hub caps.
3) Check for lubricant leaks at:
    - Hubcap
    - Lubricant fill plug, in the hub
    - Rear hub seal, indicated by lubricant on the hub, brake components or inside of the wheel.
4) Check the lubricant condition. Lubricant that is darkened, milky, shows water in it or has large metallic particles in it is indicative of contamination or a part failure and must be replaced. Contaminated lubricant may be an indication of a leaking seal that should be replaced. Hubs filled with semi-fluid grease, inspect annually or every 100,000 km. Remove the hub cap and inspect the lubricant condition. If the lubricant has a dry and caked appearance, remove the wheel end and clean and inspect all the components. Replace damaged or worn components as necessary. Refill the hub with new semi-fluid grease, in the correct quality.
5) For a proper bearing assessment, lift and support the axle. Rotate the wheel and check if it rotated freely and smoothly. Listen to any sound of rough bearing operation or feel for any vibrations. If in doubt remove the wheels *(and the drum)* and check it with the hub only. To check the end play performing a simple wheel movement check initially as illustrated below, use a dial indicator the tolerance is 0.025-0.127 mm *(0.001” – 0.005”)* to confirm the wheel bearing end float.



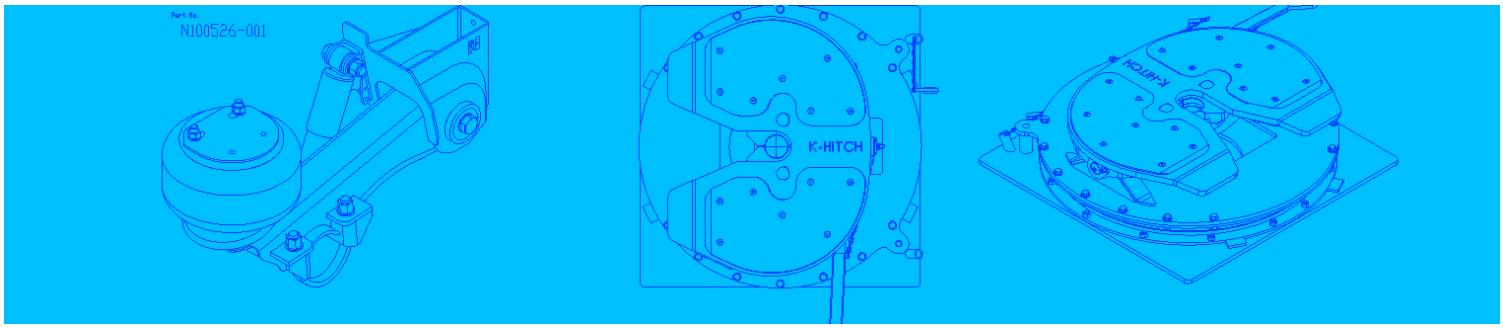


Hub Removal

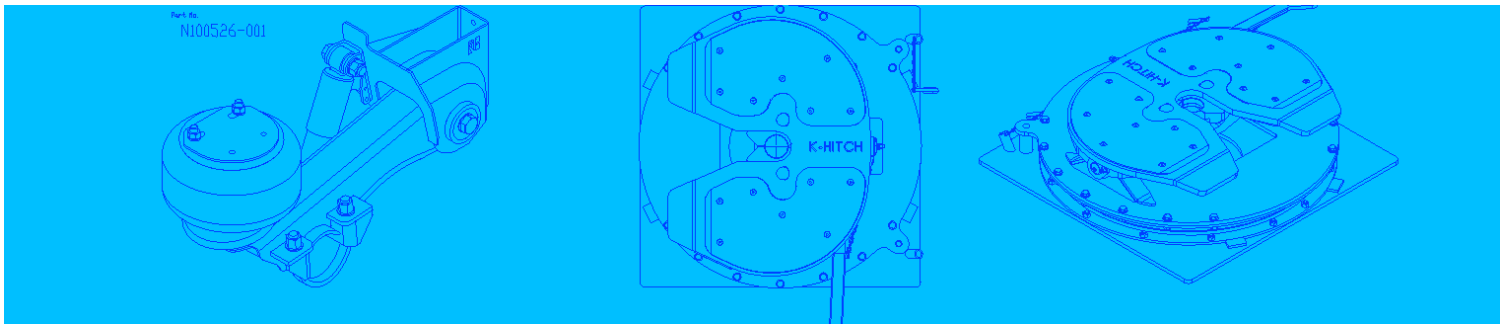
Follow all safe work practices, company policies and manual handling techniques to maintain your own safety and the safety of your teammates.



To ensure optimum wheel hub performance, ConMet recommends that only approved PreSet Plus service parts be used to replace all critical components of the system as illustrated above.

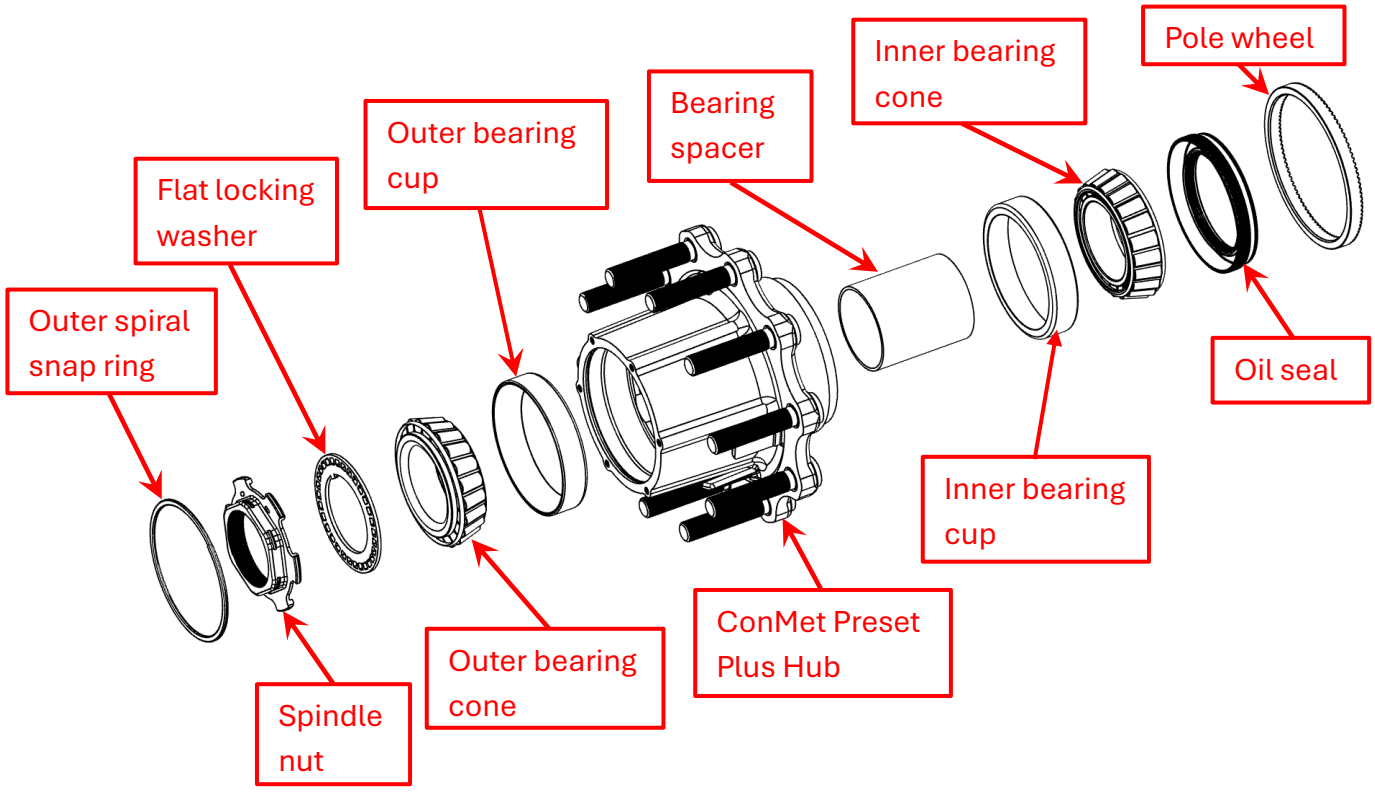


1) Park the vehicle on a level surface. Block the wheels to prevent the vehicle from moving.
2) Raise the axle until the tires are off the floor.
3) Place safety stands under the trailer frame or under each axle spring seat.
4) Remove the tire and wheel assembly using procedures specified by the wheel manufacturer and following manual handling techniques.
5) If the axle is equipped with spring brake chambers, carefully compress and lock the springs *(Caged)* so that they cannot activate.
6) For drum brakes, remove the brake drum using manual handling techniques and careful not to damage the wheel studs or brake components *(The slack adjusters may need to be backed off)*. For disc brakes, carefully remove calliper per manufacturers recommended procedure.
7) Place a container under the hubcap, to receive the draining oil, then remove the hubcap. **Do not** reuse the oil. Correctly dispose of the lubricant.
8) Remove the red locking ring *(Use caution not to damage the locking ring)*. **NOTE** Do not remove the outer spiral snap ring that holds the spindle nut in the hub.
9) Use a breaker bar to loosen the spindle nut. PreSet Plus spindle nut installation torque is 678 Nm *(500 ft-lbs)* for trailer hubs.
10) After the spindle nut is initially loosened with a breaker bar, loosen the spindle nut to remove the hub from the spindle. The outer spiral snap ring will act as a hub puller and will aid in removal of the hub from the spindle. **NOTE** Do not exceed 68 Nm *(50 ft-lbs)* of torque when removing the hub from the spindle. If the hub will not come off the spindle without exceeding this torque value, remove the spiral snap ring and the spindle nut assembly and use a conventional hub puller to remove the hub from the spindle.
11) Support the hub and follow manual handling techniques, then carefully slide the hub off the spindle. *(Remove and save the outer bearing cone if using a conventional hub puller)*
    - If the hub is difficult to remove because the seal is stuck on the spindle, use a mechanical puller to remove the hub.
    - If part of the seal remains on the spindle, carefully remove the part of the seal that remains on the spindle.
12) Place the hub on its outboard end on a clean area that can capture the semi fluid that may leak from the wheel hub assembly.

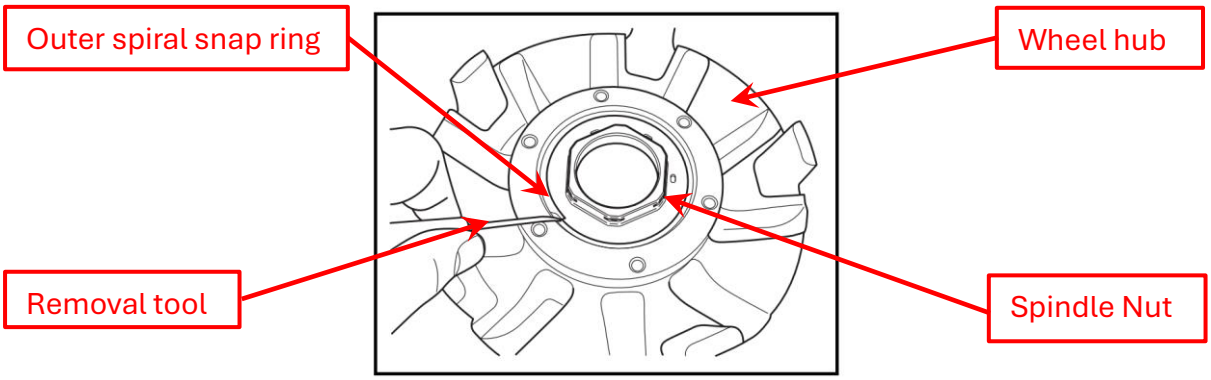


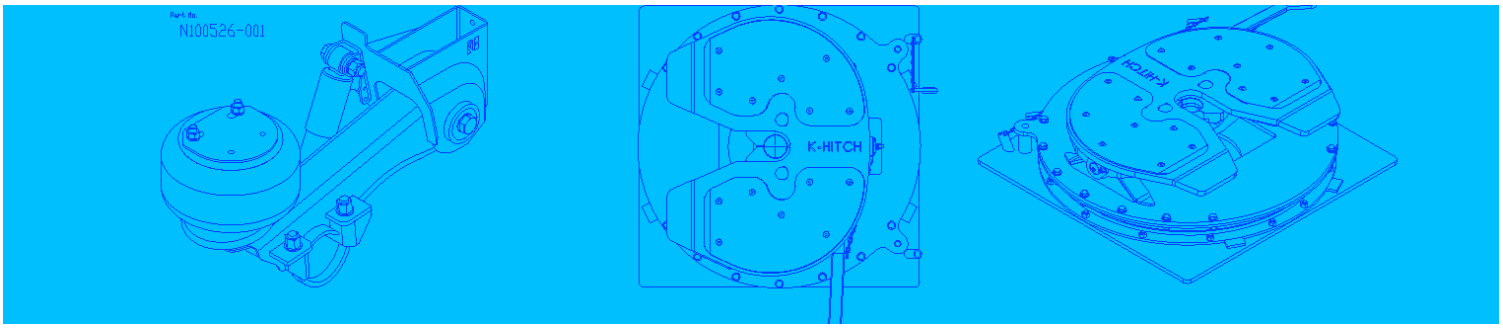
Hub Disassembly

Below is an exploded view of the ConMet Preset Plus hub assembly for reference.



1) Remove the oils seal from the back of the wheel hub with an appropriate seal removing tool. *(**Caution**: Do not damage the oil seal cavity with the tool)*
2) Remove the inner bearing cone and bearing spacer.
3) Turn the wheel hub over and remove the outer spiral snap ring as illustrated below.





4) Remove the spindle nut
5) Remove the flat locking washer.
6) Remove the outer bearing cone.
7) Place all of the wheel hub components neatly in order for cleaning and inspecting.

Hub Component Cleaning

Use a clean filtered solvent to clean the hub and all wheel end components.

CAUTION: Do NOT clean ground or polished parts in a hot solution tank or with water, steam or alkaline solutions. These solutions will cause corrosion of the parts.

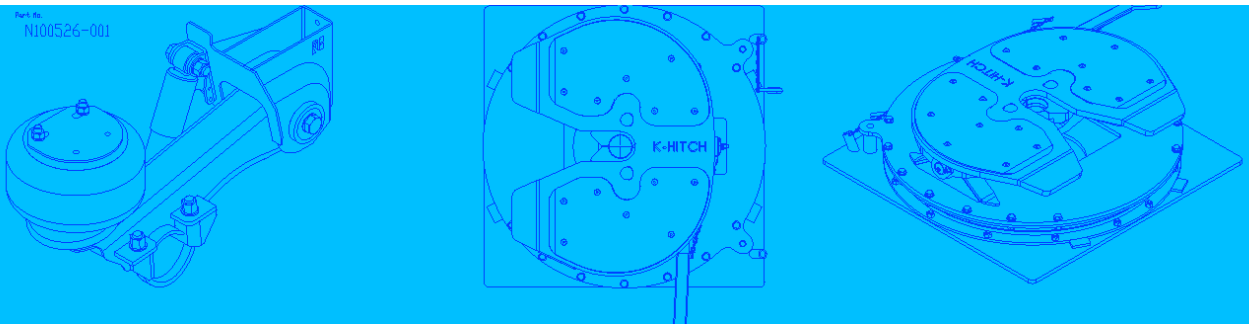
Parts must be dried immediately after cleaning. Dry parts with clean paper towels or rags, or compressed air. Do not dry bearings by spinning with compressed air.

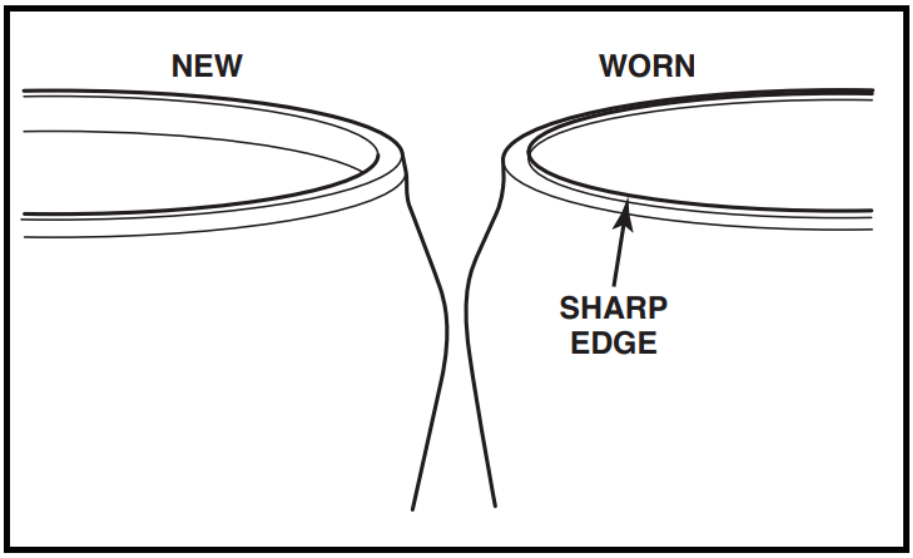
1) Clean the wheel bearing cups and cones, spindle bearing and seal journals on the spindle and hub. *(Be sure to clean the full length of the seal journal on the spindle)*
2) Apply a light oil to cleaned and dried parts that are not damaged and are to be immediately assembled. If the parts are to be stored, apply a good corrosion preventative to all surfaces.

Hub Component Inspection

The components should be organised in order in an area with appropriate lighting to perform the visual inspection.

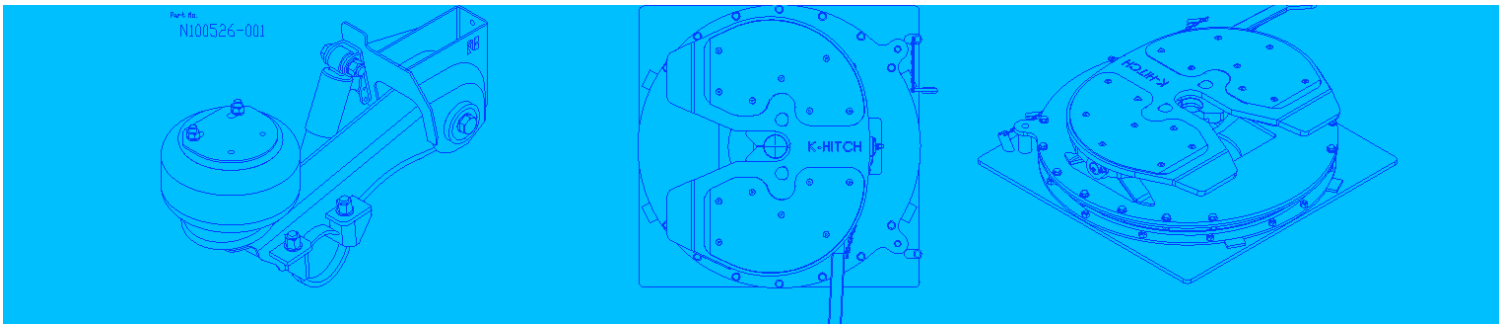
1) Visually inspect the bearing cups and cones for any wear or damage. Reference materials for proper bearing inspection procedures are available from your local bearing supplier.
2) Bearing spacers should be visually inspected for signs of wear or damage. Carefully inspect the machined ends of the bearing spacer. Wear to the bearing spacer can appear as a sharp ring of standing metal at either edge of the machined surfaces *(see illustration below)*. Replace the spacer if it has visible wear evidenced by a raised edge on the machined end.





Bearing Spacer – Condition Comparison

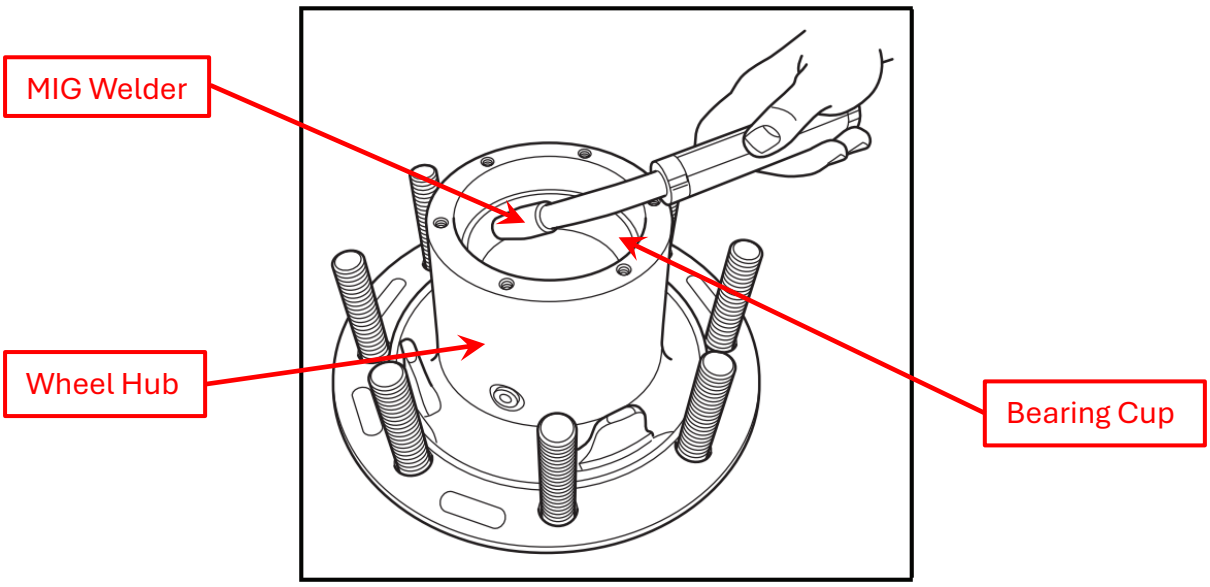
3) Inspect the wheel studs. replace all wheel studs that have damaged or distorted threads, are broken or bent, or are badly corroded. Also, replace both studs adjacent to the damaged stud. If two or more studs have damage, replace all the studs in the hub. Broken studs are usually an indication of excessive or inadequate wheel nut torque.
4) Inspect the drum pilots, wheel pilots, and mounting face on the hub for damage. A damaged drum pilot is usually caused by improper drum mounting. A damaged wheel pilot could be the result of inadequate wheel nut torque, allowing the wheels to slip in service. Also, inspect other surfaces of the hub for signs of cracks or damage.
5) Inspect the wheels and brake drum for damage and to check that they are with in dimensional tolerance.
6) Inspect the hub pole ring, if the pole ring is damaged *(for example, if it is dropped, bent, chipped or dinged)*, it must be replaced.



Hub Component Replacement

Replacing bearing cups

If the bearing cup must be removed from an aluminium hub, remove it by welding a large bead around the bearing surface of the steel cup, letting the assembly cool, and lifting the bearing cup out *(see illustration below)*.



Removing Bearing Cups

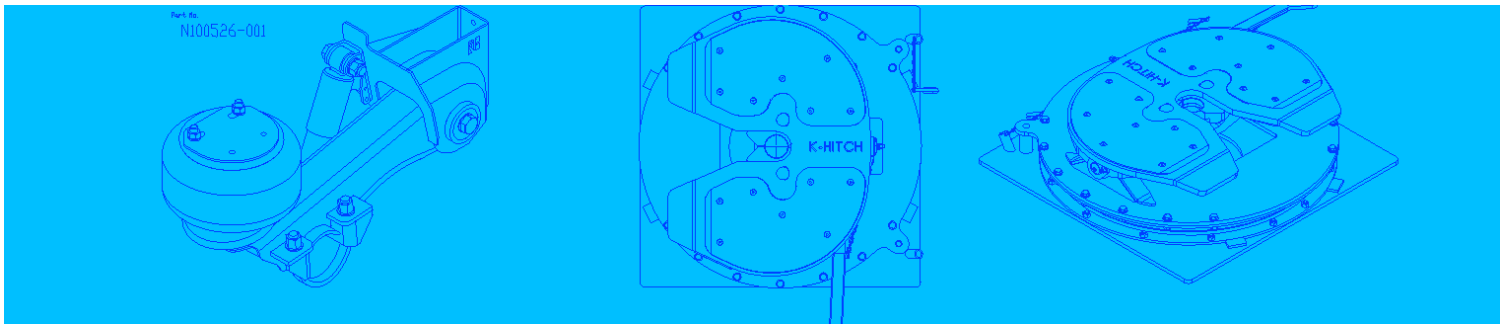
CAUTION: Ensure welding splatter does not damage the aluminium wheel hub or other components

Inspect the bearing cup bore for evidence of cup rotation or spun cups. If evidence of cup rotation exists, replace the hub.

To install a new cup in an aluminium hub, it is recommended that the hub be heated in boiling water 100°C *(212°F)* or in an oven at a temperature not to exceed 149°C *(300°F)*.

Cool the cup in a freezer to 0°C *(32°F)* or below, will further ease installation of the new bearing cup.

Remove the aluminium hub from the oven or water and carefully drop in the new bearing cup being certain it is fully seated. If the cup is loose, allow a few seconds for it to heat up and secure itself before moving the hub. Use a 0.0254 mm *(0.001")* to 0.0508 mm *(0.002")* feeler gauge to ensure the cup is fully seated against the shoulder of the bearing bore.



Replacing Wheel Studs

Place the clean hub in a shop press with the hub supported evenly around and adjacent to the stud being removed.

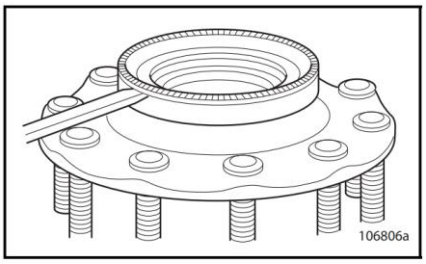
Press the stud out of the hub.

To install a new stud, turn the hub over and support the hub evenly around and adjacent to the stud being installed.

Carefully press the new stud all the way into the hub. Be sure the stud is fully seated and that the stud head is not embedded into the hub.

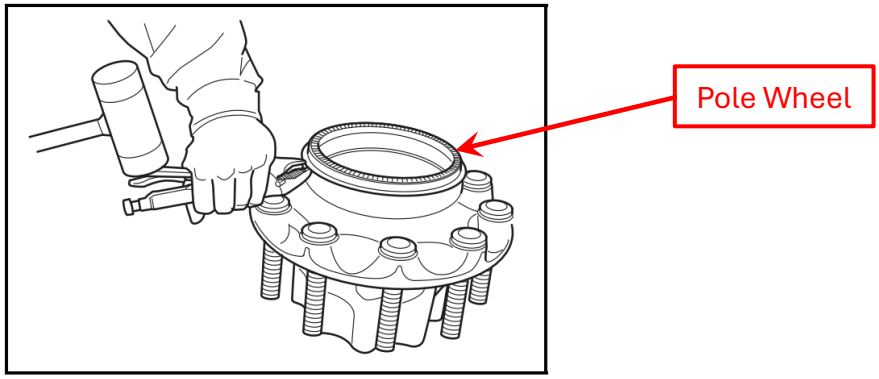
Replacing the Pole Ring

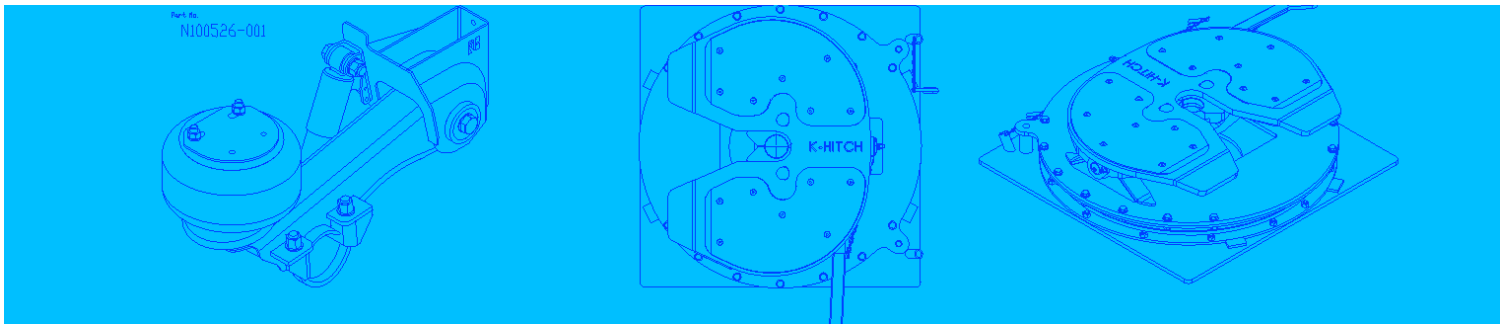
For a machined metal tone ring, carefully remove using a chisel *(wear PPE)*, making sure not to damage the hub *(see illustration below)*.



Reinstall by pressing the new pole ring onto the hub until it bottoms out. Pole ring should have less the 0.2032 mm *(0.008")* run out.

Stamped steel trailer tone rings can be removed by gripping the ring with a pair of locking pliers and prying against the head of a wheel stud to lift the ring off the hub. Work around the ring to prevent cocking *(see illustration below)*

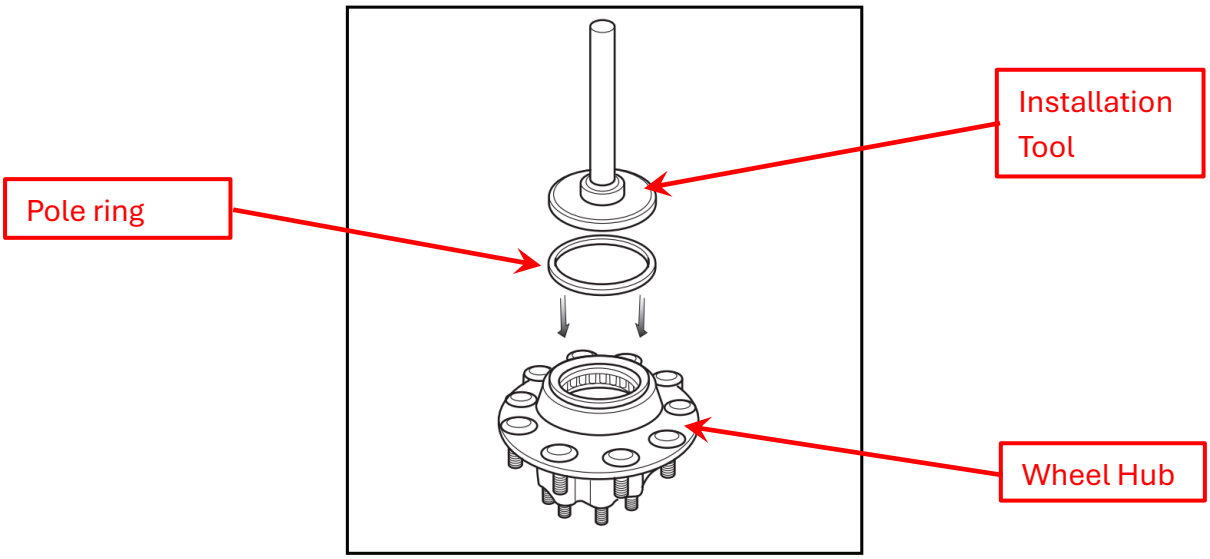




Thoroughly clean and degrease the pole ring seat on the hub with a non-flammable solvent.

Place the hub in a press and place the pole ring on the hub ring seat.

Using ConMet pole ring installation tool, centre the tool over the pole ring. Each type of ring fits a corresponding diameter on the tool *(see illustration below)*.



Press the pole ring on the hub. If a press is not available, drive the pole ring on with a hammer or mallet until the ring seats on the hub (see figure 76). A swift initial blow with an 3.5 kg *(8-lb.)* hammer may be necessary to start the ring onto the hub.

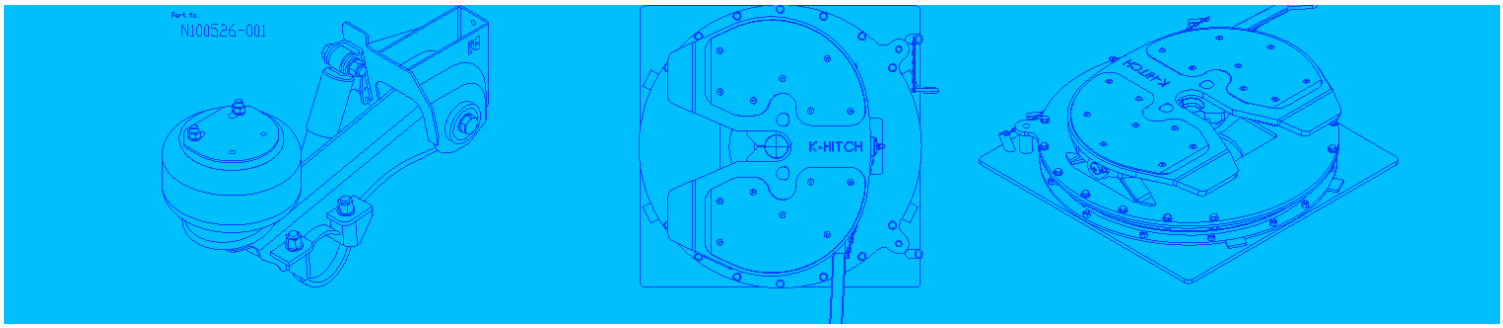
Inspect the pole ring to ensure proper seating. If the pole ring is not completely seated, continue to drive the pole ring with the pole ring installation tool until it is completely seated.

Pole ring should have less the 0.2032 mm *(0.008")* run out.

For bolt on pole rings remove and discard the fasteners holding the pole ring on the hub.

Thoroughly clean and degrease the pole ring seat on the hub with a non-flammable solvent.

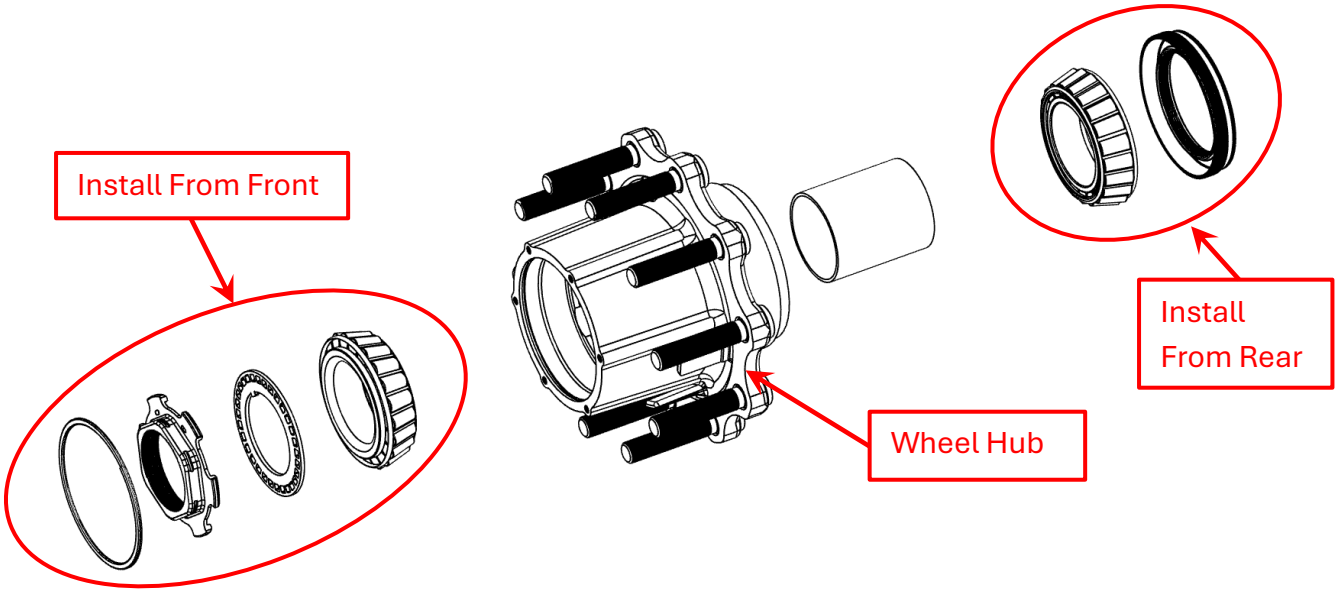
Install the new pole ring using the new fasteners included with the pole ring. Torque the fasteners to the torque specifications, #8-32 fastener 2-2.5 Nm *(8-22 in-lbs)*, ¼"-20 fastener 14-15 Nm *(125-135 in-lbs)*.



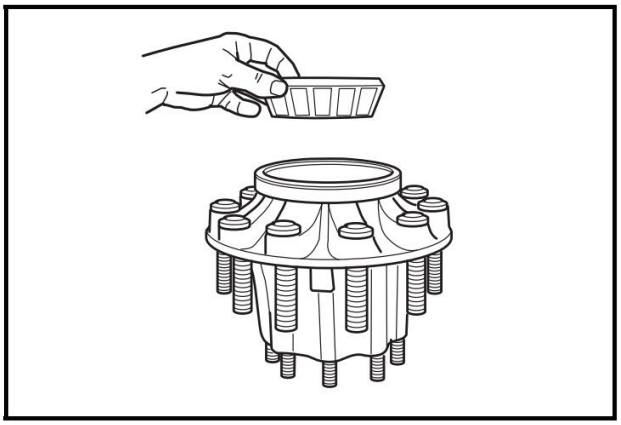
Hub Reassembly

FUWA recommend using only genuine ConMet spare parts for the re assembly of the hub to ensure correct operation and long service life.

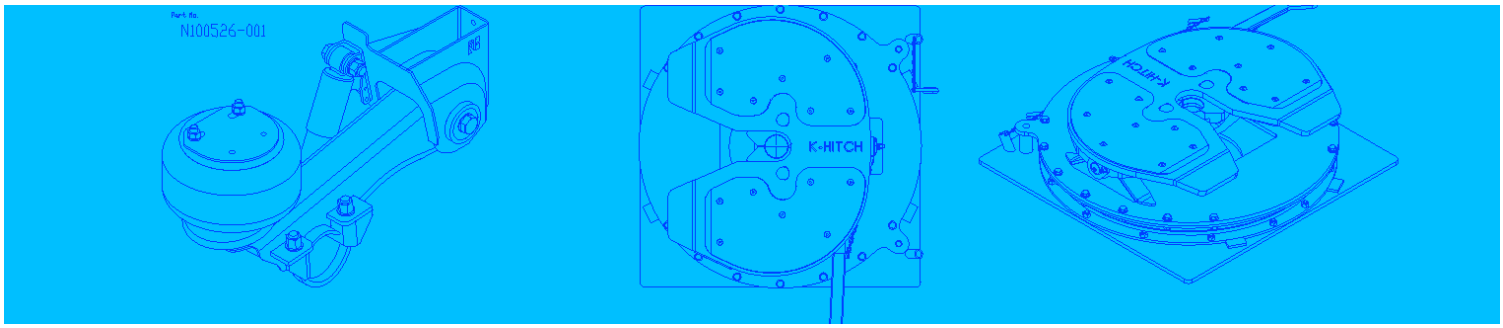
Work in a well lit and clean environment to stop dirt ingress into the hub assembly.



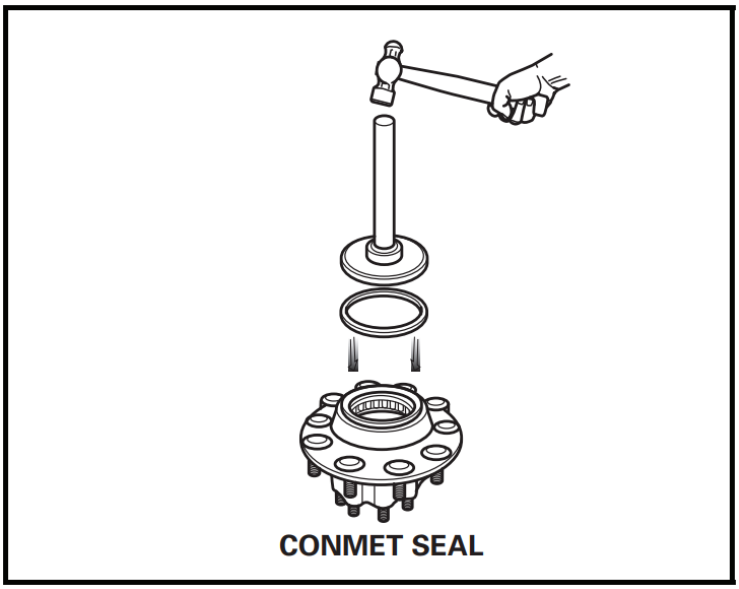
1) Place the hub on a firm work bench with the hub cap facing down.
2) Lubricate the inner bearing cone with the same lubricant as will be used in the hub and install it into the inner bearing cup *(see illustration below)*.



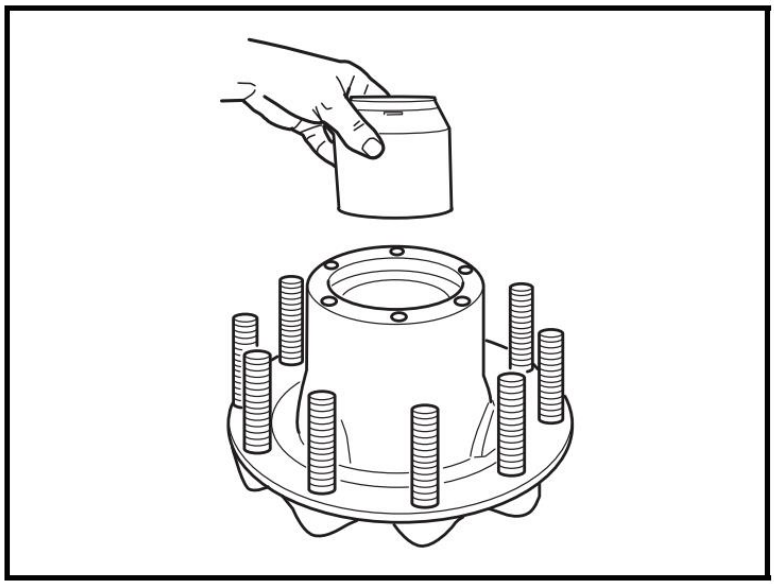
3) Use a clean applicator to lightly lubricate the seal bore of the hub with the semi fluid lubricant.
4) Position the new seal into the hub bore. Use a ConMet seal installation tool or flat plate and a small mallet to install the seal.

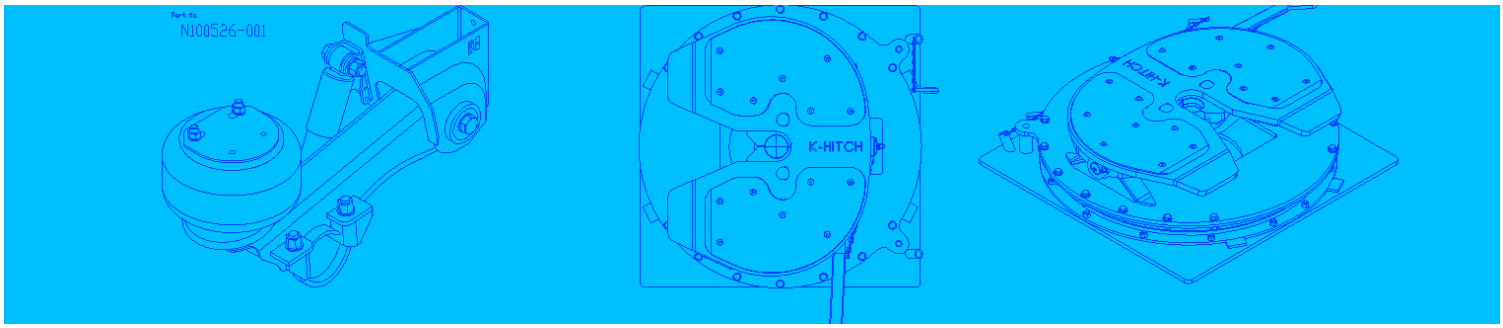


5) When installing the ConMet seal, tap the adapter plate of the installation tool or flat plate around the outer edge to position the seal. Drive the wheel seal into place *(see illustration below)*.

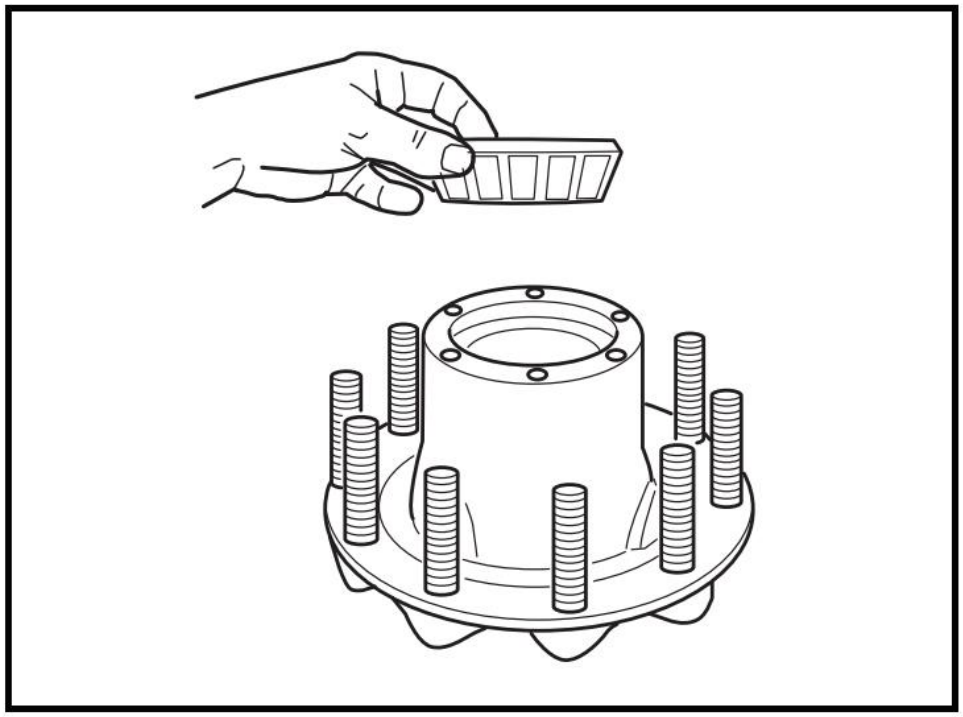


6) Check to be certain the seal is uniformly bottomed out in hub bore and that the seal inner diameter and the inner bearing turn freely.
7) Lubricate the inner diameter of the seal with a light film of the same lubricant as will be used in the hub.
8) Turn the hub over, and place it seal end down. Install a bearing spacer. If the spacer has a tapered end *(TN Tapered Spindle)*, it should face towards the outboard end of the hub *(see illustration below)*.

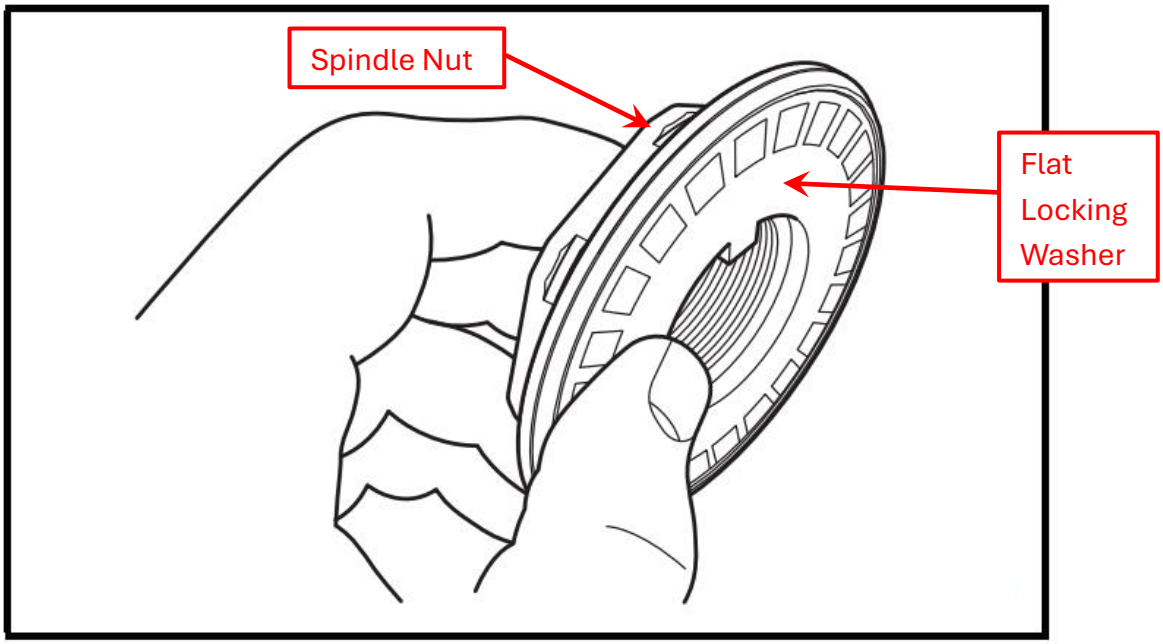


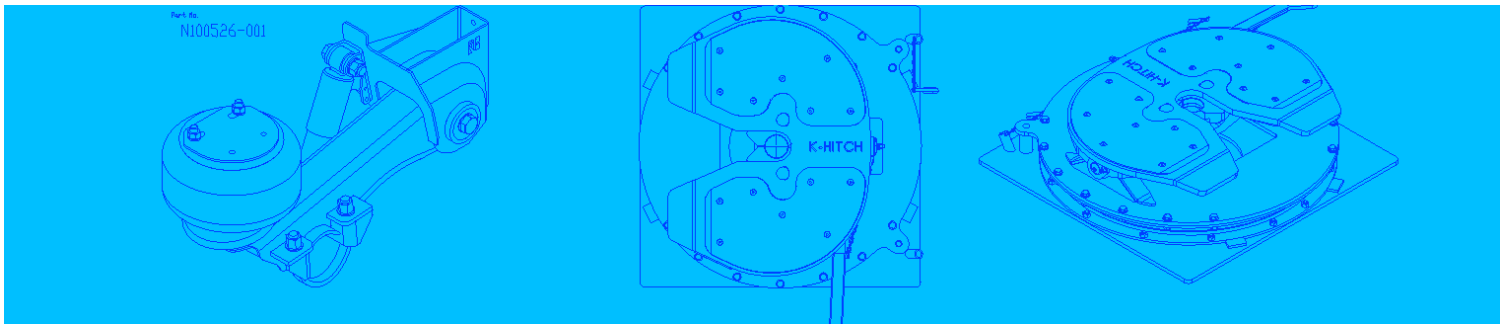


9) Lubricate the outer bearing cone with the same lubricant as will be used in the hub and install it into the hub assembly *(see illustration below)*.

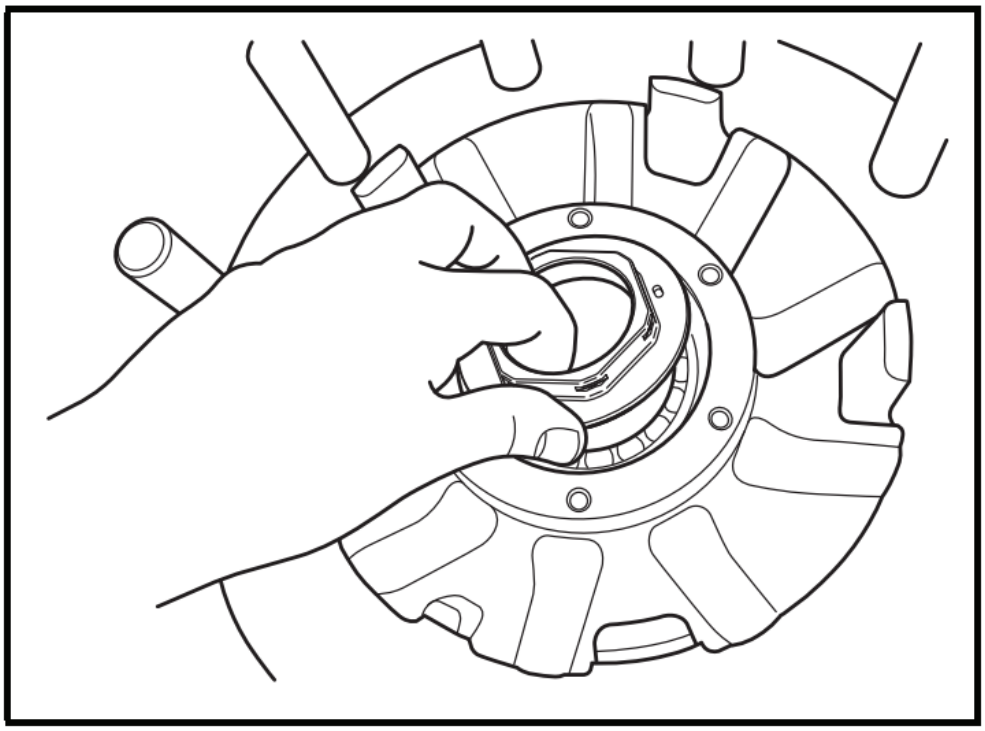


10) Seat the flat locking washer into the back of the spindle nut *(see illustration below)*.

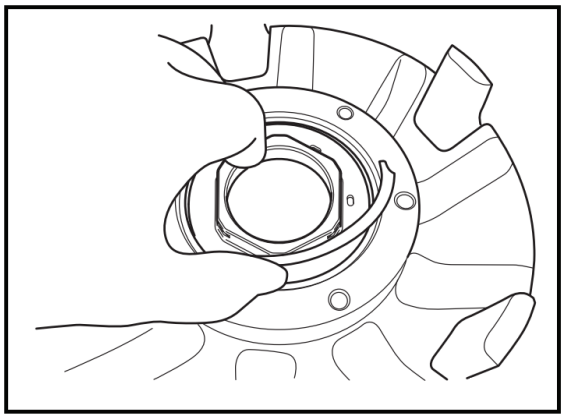


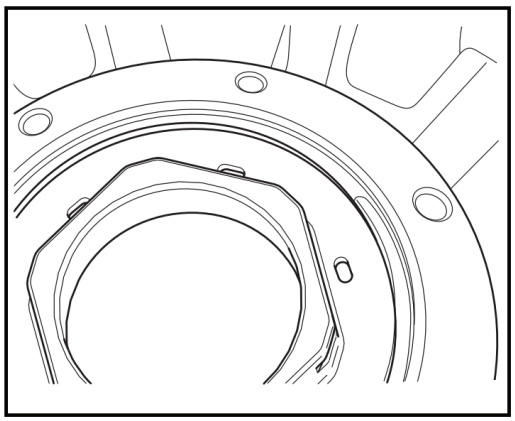


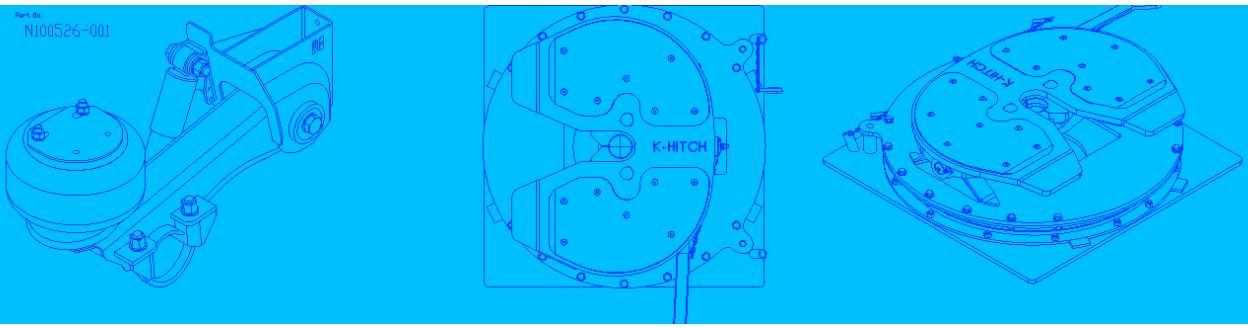
11) Position the spindle nut and washer against the outer bearing *(see illustration below)*.



12) Install the spiral snap ring into the snap ring groove in the hub. Make sure that the snap ring is fully seated into the groove in the hub *(see illustrations below)*.

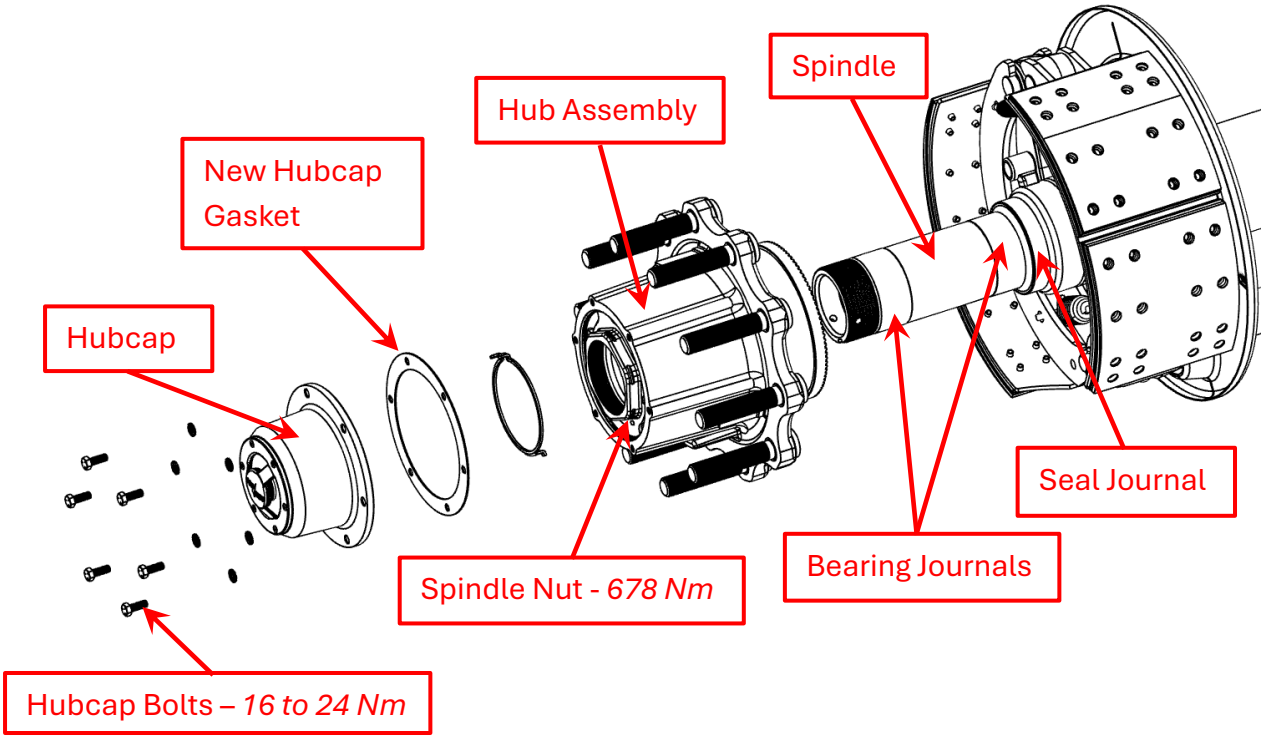




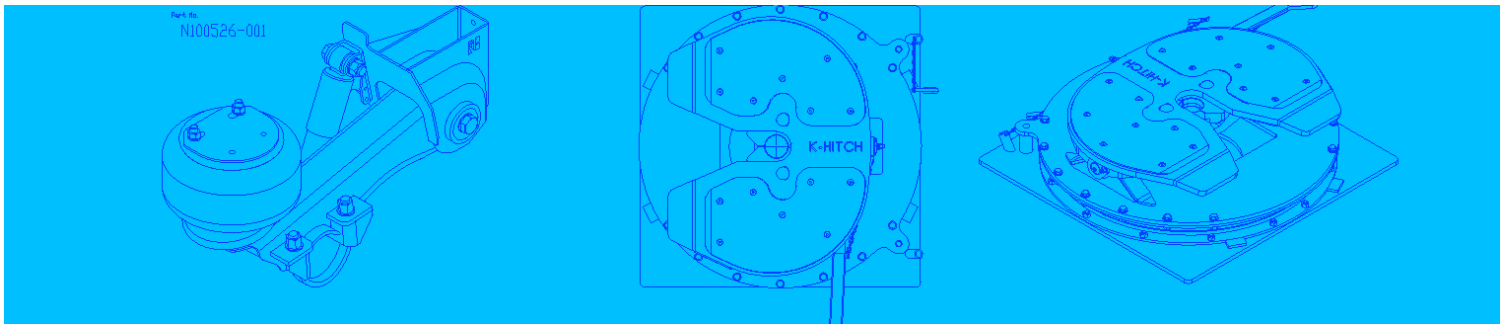


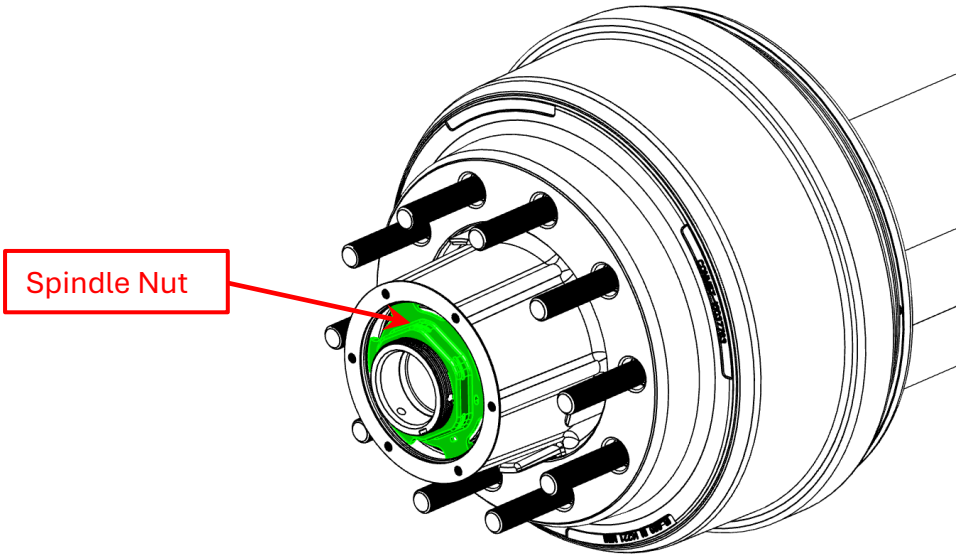
Hub Installation

Follow all safety protocols, use PPE and follow all manual handling procedures.

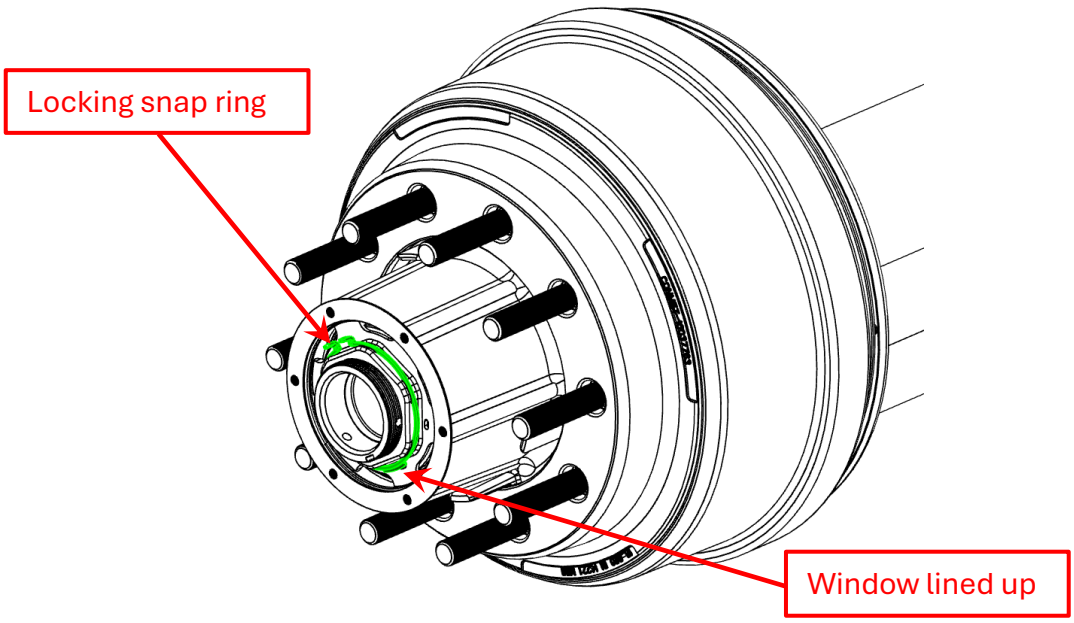


1) Clean the spindle to remove any lubricant, corrosion prevention coating, foreign material, or surface rust that may be present.
2) Lubricate the bearing journals on the spindle and the inside diameter of the bearing cones with semifluid lubricant that will be used in the wheel end. **CAUTION**: Do not coat the seal journal on the spindle.
3) Lubricate the inside diameter of the seal with the same lubricant that will be used in the wheel end.
4) If present, remove the red locking snap ring from the spindle nut. Verify that the bearing spacer is in proper alignment. Align the key on the flat locking washer with the keyway on the spindle as the hub is carefully placed onto he spindle. Use a smooth firm motion and place the hub onto the spindle. When the threads on the nut engage the threads on the spindle, rotate the hub whilst the spindle nut is turned in a clockwise direction until the spindle nut is fully engaged.
5) Torque the spindle nut to the recommended torque setting of 678 Nm *(500 ft-lbs)*, using a 4" single hex impact socket. Rotate the hub whilst incrementally tightening the spindle nut.

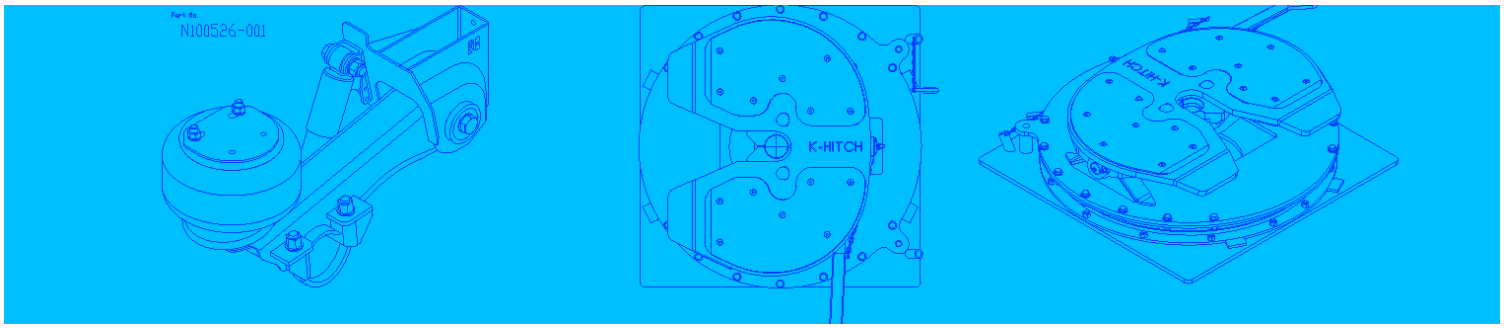




6) Visually examine the three holes in the face of the spindle nut. One of the holes will line up with the holes in the flat locking washer. Install the tab of the red locking snap ring through the hole in the nut and washer that are aligned. Spread the locking ring, push it over the spindle nut and into the machined grooves in the spindle nut. **CAUTION:** not to bend the locking ring permanently. If the locking ring is damaged or bent, replace it with a new one.



7) Install the hub cap or drive axle with a new gasket. Torque the hub cap bolts in a star pattern to 16 – 24 Nm *(12 to 18 ft-lbs)*.

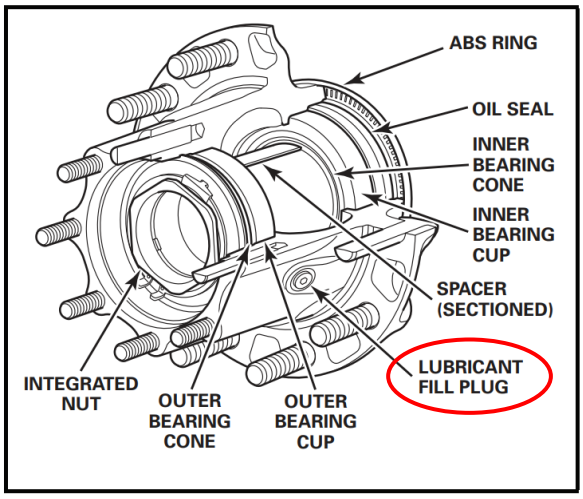


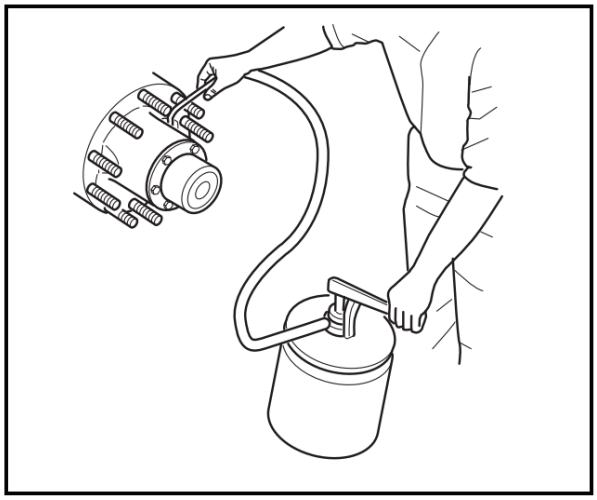
Lubrication

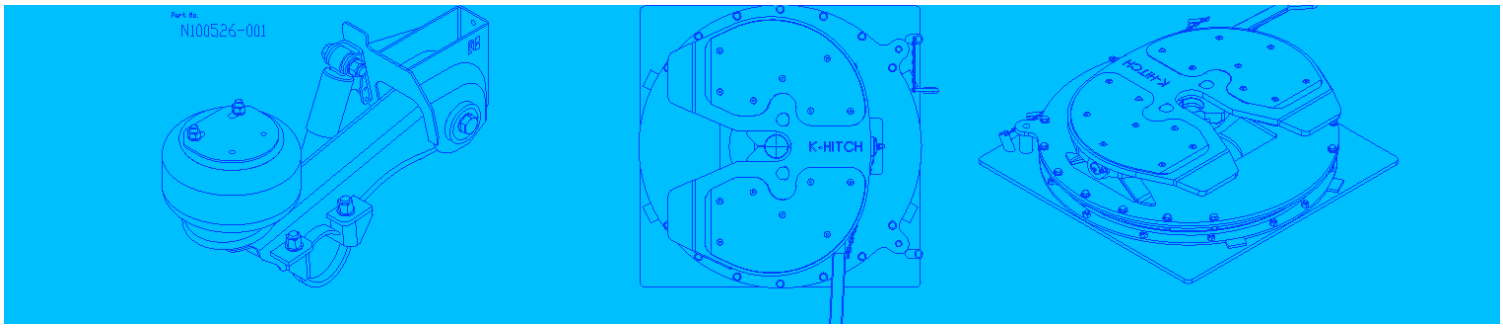
Use only approved lubricants in the ConMet wheel hub, Mobilith SHC 007 *(Mobil) (Part Number: 133680-1L, 1,000 ml)*.

Failure to fill and maintain the hub with the correct amount of semi-fluid grease may cause premature failure of the wheel hub system, bearing failure and possible loss of the wheel.

1) Remove the fill hole plug. *(Wheels must be removed)*
2) Loosen the hubcap bolts to allow air to escape while the hub is being filled.
3) Fill the hub with the OEM recommended amount of semi-fluid grease *(see table the next page)* through the fill hole in the hub *(see illustrations below)*.







4) Retorque the hubcap bolts to 16 – 24 Nm *(12-18 ft-lbs)* in a star pattern.
5) Reinstall and tighten the fill plug to 27 – 34 Nm *(20-25 ft-lbs)*.

Axle Model	Hub Type	Material	Brake Type	Casting Number	No. Of Studs	Volume per Hub (Liter)
KF22	TP	Aluminum	Drum	10033028 10086499	10	**1.22**
		Iron		10033241 10083939	10	**1.03**
KF23		Aluminum	Disc	10016225	10	**1.22**
		Iron		10083549	10	**1.62**
KF67			Drum	10025633	10	**1.03**
KF22	TN	Iron	Drum	10033293 10083937	10	**0.680**

Table of Semi-Fluid Recommended Fill Volumes

Torque Settings

Below is a quick reference table of the torque settings that may be required during the servicing of the ConMet wheel end.

Axle Torque Settings		
Description	**Nm**	**ft-lbs**
Spindle Nut (M88x2) *{Whilst turning the hub}*	678	500
Hub Cap Retaining Bolts (5/16" UNC)	16 to 24	12 to 18
Wheel Studs (M22x1.5)	615 to 675	454 to 498
Maximum spindle nut unwinding torque	68	50
Fill Plug	27 to 34	20 to 25
Dust Cover Bolts (M8x1.25)	20 to 25	12 to 16
Camshaft Bushing Bolt/Nut (M8x1.25)	20 to 25	14 to 18
Brake Chamber Mounting Nut (5/8" UNF)	85 - 125	109 to 170
Anchor Stud Nut (M10.1.5)	25	19