

Hub Installation and Bearing Adjustment



Hub Installation and Bearing Adjustment

Scope: This service procedure is intended to provide general instructions for reinstallation of a hub onto an axle after removal for any service requirements. Oil is the recommended wheel-end lubricant in this procedure but alternatively grease may be used. See the TMC documents listed below for lubrication and installation recommendations.

Reference Documents Available Upon Request from Walther EMC:

TMC RP 622*Wheel Seal and Bearing Removal, Installation and Maintenance*

TMC RP 618*Wheel Bearing Adjustment Procedures*

TMC RP 644*Wheel End Conditions Analysis Guide*

TMC RP 631A*Recommendations for Wheel End Lubrication*

SAE J2535**Setting Preload in Heavy-Duty Wheel Bearings*

* SAE documents only available on www.sae.org.

Hub Preparation Prior to Installation

- Insure that hub cavity is free of any debris.
- Check seal bore for any nicks and/or dents.
- Remove nicks or dents with a fine grade emery cloth. (Image A)
- Check the axle seal journal for any nicks and/or dents.
- If there are nicks on the axle seal journal, carefully smooth them with a fine grade emery cloth and clean entire spindle.



Seal Installation

- Select the correct new seal for the wheel-end bearing lubrication, oil or grease, used in the application.
- If bearing cones are being reused, make sure that they are clean and show no visible signs of wear, pitting or damage.
- Follow the seal manufacturer's recommendation for installing either the axle-mounted seal or the hub-mounted seal.

The following companies' Web sites may be consulted for information on seals:

Stemco, LLCwww.stemco.com

Federal Mogulwww.federal-mogul.com

SKF Sealing Solutionswww.vsm.skf.com

Installation of Non-Driven Hubs

Slide the hub assembly onto the spindle with the outer cone in place to help guide the hub onto the spindle without damaging the seal.

For adjustment of wheel bearing endplay with standard bearings and axle nuts, refer to TMC's RP 618 which is available upon request from Walther EMC. For adjustment of non-standard bearing systems (e.g., Advantage, Pre-Set, LMS etc.) follow the manufacturer's recommendations.

Install the hubcap using a crisscross tightening sequence ((Image C)). The 5/16"-18 hub cap bolts require 12-16 ft-lbs of torque.

Image C



Install hubcap using a crisscross tightening sequence

Fill the hub with the OEM recommended oil through the hubcap or through the fill hole in the hub if there is one (Image B). Use the "oil level" mark on the face of the hubcap to judge the proper amount of oil fill.



Fill the hub with lubricant through the hole in the hubcap

Installation of Drive Hubs

With the hub in a supported horizontal orientation, fill the cavity to near overflow with the in-service rear axle lubricant.

Slide the supported hub assembly onto the spindle with the outer cone in place to help guide the hub onto the spindle without damaging the seal.

For adjustment of wheel bearing endplay with standard bearings and axle nuts, refer to TMC's RP 618 for recommendations. For adjustment of non-standard bearing systems (e.g., Advantage, Pre-Set, LMS etc.) follow the manufacturer's recommendations.



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www.waltheremc.com

Bearing Cup / Wheel Bolt Removal and Installation



Bearing Cup Removal and Installation

Scope: This service procedure is intended to provide instructions for removal and installation of bearing cups in ferrous wheel hubs. To understand the conditions for replacement of bearing cups and cones please read TMC's recommended practice RP 644 which is available upon request from Walther EMC.

Removal

After disassembling the hub assembly from the axle end, remove the seal and the inner and outer bearing cones. Clean the hub assembly thoroughly.

Use a mild steel drift punch or cup driver to drive out the bearing cup. Alternate the location of impact on the cup by 180 degrees and/or 90 degrees. (*Image A*)

Inspection of the Bearing Bores

Inspect the bearing bores and bearing cup stop for damage. If there is evidence of cup spinning (*Image B*), the hub should not be reused. Use an emery cloth to remove minor burrs or raised areas. (*Image C*)



Image A

Remove cups with a mild steel drift punch

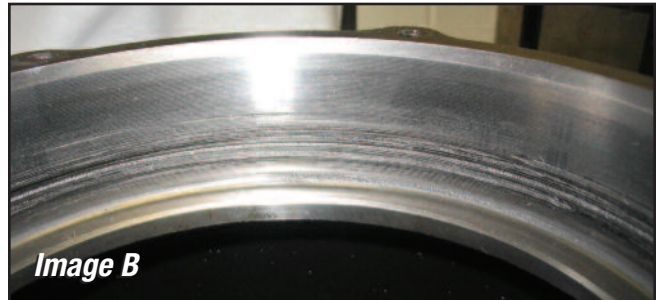


Image B

Hub damage due to cup spinning

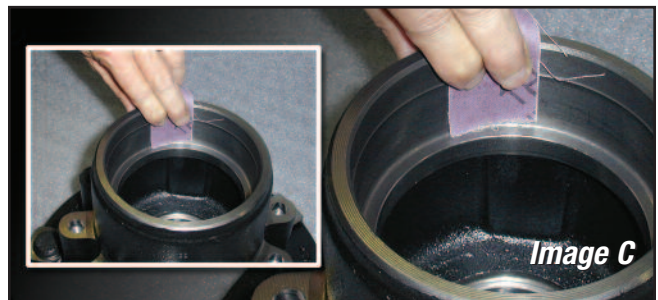


Image C

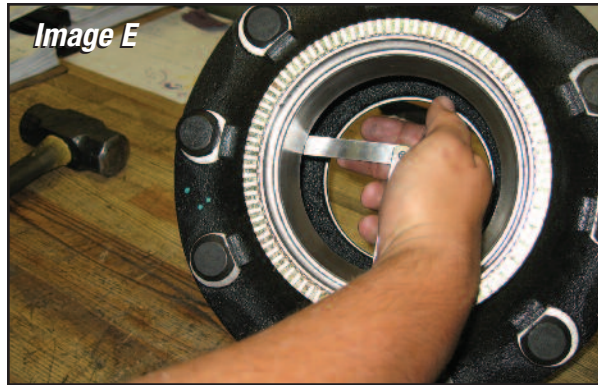
Use emery cloth to remove minor burrs or raised areas

Installation

If a cup driver and a press are available, they are the best tools to use to install bearing cups. If a press is not available, impact on a cup driver is acceptable. (*Image D*)



Install by impacting the cup driver



Check for gap between cup and bearing stop

Use a 0.004" or smaller feeler gage to check for a gap between the cup and the bearing cup stop. The feeler gage should not fit between the cup and the stop. (*Image E*) Inspect the bearing surface for any damage, which might have occurred during installation. There should be no scoring of the new bearing cup surface.

Wheel Bolt Removal and Installation

Scope: This service procedure is intended to provide instructions on removing and replacing M22 wheel bolts in ferrous wheel hubs. Reasons for replacing wheel bolts include heavily corroded threads, damaged threads or broken wheel bolts.

Removal

Place inboard hub face on a surface softer than the hub material; wood is a good choice. Use a hammer to remove the selected wheel bolts. (*Image F*) Stabilize the hub during impact.

Inspection of the Wheel Bolt Hole

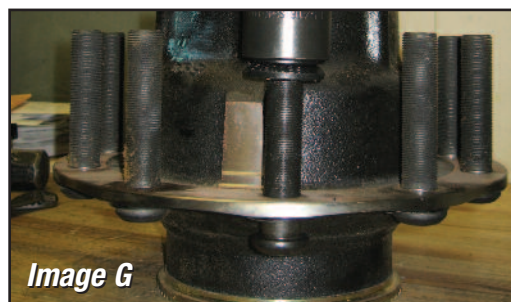
Examine the condition of the wheel bolt hole. If the wheel bolts have serrations, which dig into the inner diameter (ID) of the wheel bolt hole, be sure that the indications of the serrations in the holes are well defined. If the ID of the wheel bolt hole is significantly damaged (marred or out-of-round, i.e. serrations do not have metal to embed in for the entire diameter of the bolt serrations) replace the hub. Some hubs do not use serrated bolts. On a hub using non-serrated or smooth-shank bolts, the holes should be smooth and perfectly round.

Installation

Insert a new matching wheel bolt in a wheel bolt hole and use a two-piece M22 flange nut to draw the wheel bolt into the hole until the head of the bolt is seated on inboard surface of the wheel bolt boss. (*Image G*)

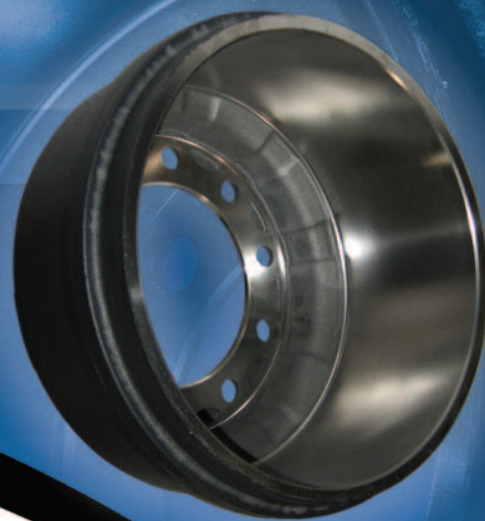


Use a hammer to remove the wheel bolts



Use an M22 flange nut to install wheel bolt

Brake Drum and Disc Wheel Installation



STEP 1: Cleaning the Hub and Brake Drum

Prior to installing the brake drum on the hub, remove any corrosion or material build-up which would prevent sure seating of the brake drum on the pilots and hub flange. The mounting surfaces of the hub and brake drum should be free of dirt, corrosion and debris. Use a wire brush to clean all mating surfaces. On the hub, pay particular attention to removal of rust, dirt and debris from the corners where the pilots meet the bolt flange.

STEP 2: Rotating the Hub

Rotate the hub so that one of the wheel pilots is at the twelve o'clock position (shown right).

Slide the brake drum over the wheel bolts taking care not to damage the threads and over the brake linings. Ensure that the drum goes over and onto the drum pilot on the hub and that the drum can be seated flat to the hub mounting flange.

If the brake drum is not seated properly, there is a risk that it will not seat flat to the mounting flange. The resulting runout of the braking surface will likely fail the brake drum if it is not seated flat on the mounting flange.



STEP 3: Position the Wheels

Position the wheel(s) over wheel bolts being careful not to damage the threads. Reset the wheel onto the 12 o'clock wheel pilot, and start one or two two-piece flange nuts to secure the wheel(s) and drum in position. Tighten the twelve o'clock nut to 50 ft-lbs.

Examine the twelve o'clock pilot to determine that the wheel and drum are seated flat. The coining of the brake drum pilot is shown to the right, which results from not mounting the brake drum over the pilot and flush with the mounting flange of the hub.



Torque the two-piece flange nuts with the tightening sequence and torque values on the back of this page.

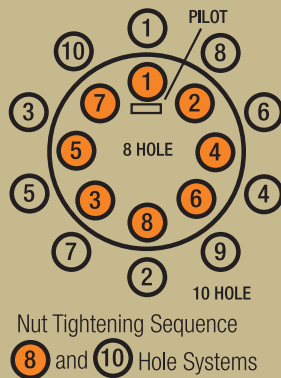
See next page for:

***Brake Drum Seating Diagrams
Wheel nut torque and tightening sequence***

Wheel Nut Torque / Tightening Sequence



WARNING

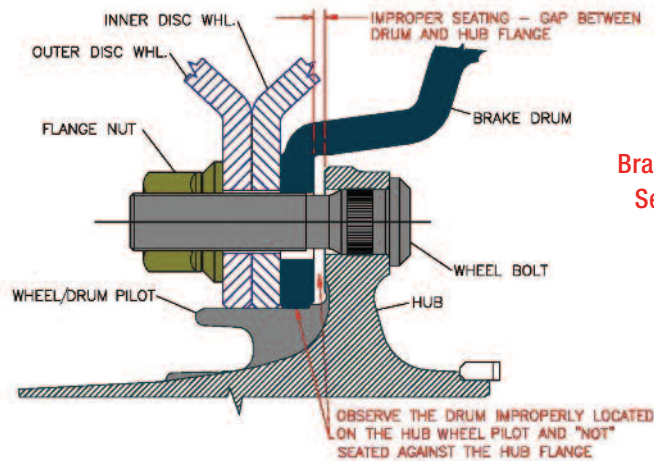


Failure to follow these directions may result in wheel loss, which can lead to property damage, injury or death. Refer to the product service or owner's manual for additional information.

This vehicle is equipped with hub-piloted disc wheels, flange nuts, and **M22 x 1.5** studs. Tighten to 50 ft-lbs torque in the sequence shown and then torque to **450-500 ft-lbs oiled*** using the same tightening sequence. Retorque between 50-100 miles after installation and at every regularly scheduled service interval.

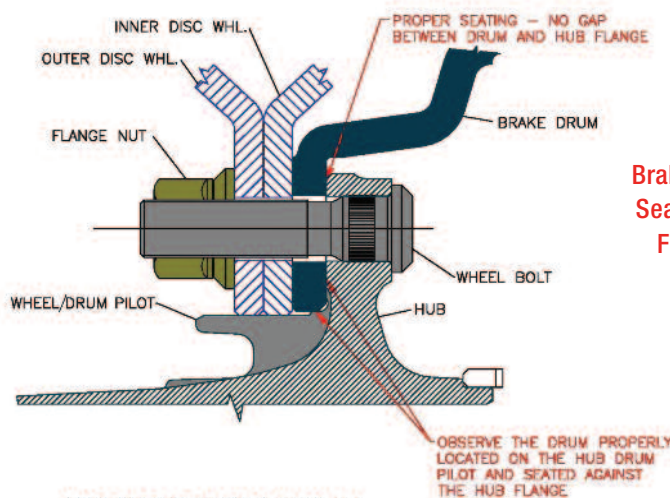
*Oiled – Apply two drops of oil to a point between the nut and flange and two drops to the two or three threads at the end of each stud.

Brake Drum Seating on Mounting Flange and Pilot



Brake Drum Improperly Seated on Mounting Flange and Pilot

NOTE: WHEEL STUD MAY OR MAY NOT ALIGN WITH A WHEEL PILOT AT 12 O'CLOCK



Brake Drum Properly Seated on Mounting Flange and Pilot

NOTE: WHEEL STUD MAY OR MAY NOT ALIGN WITH A WHEEL PILOT AT 12 O'CLOCK

Brake Drum and Disc Wheel Installation

Drum and Rotor Replacement Guidelines

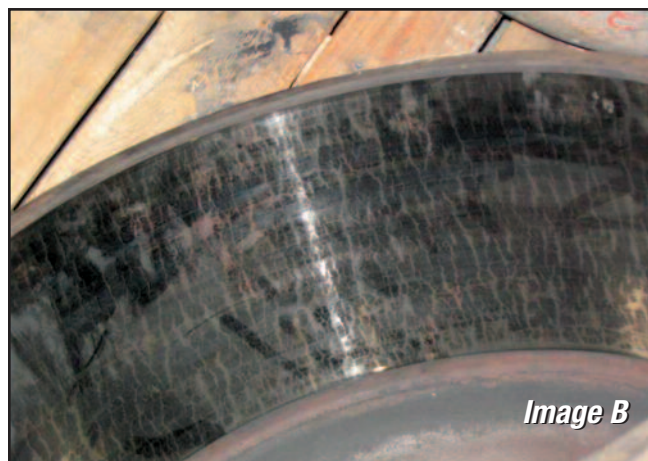


The following conditions signal the replacement of a brake drum or rotor:

- Brake surface diameter at or above max allowed diameter for a drum. The maximum diameter is cast on the outboard region of the brake drum. The drum should be replaced when it reaches this diameter.
- Brake surface width dimension less than or equal to the minimum allowed thickness for the rotor. The minimum thickness allowed will be cast or stamped on the rotor. The rotor should be replaced when it reaches the minimum thickness.
- Martensite formation on the brake surface. Martensite is characterized by localized black spots on the braking surface. (*Image B*)
- Scored drum brake surface, which cannot be turned without exceeding the max allowed diameter.
- Scored rotors.
- Cracked drum or rotor. (*Image A*)
- Heavy heat checking on the brake drum surface or on the rotor brake surface. (*Image B*)
- Walther EMC does not recommend turning, resurfacing or machining brake drums or rotors.



Cracked brake drum



Heat checking and martensite on the brake surface

Rotor Replacement on Hub/Rotor Assemblies



Walther EMC hub and rotor assemblies are bolted together with Grade 8 hex bolts or Grade 8 flanged hex bolts; therefore, when using new fasteners be certain to use Grade 8 fasteners that are the same length as the original equipment fasteners.

When using a hex bolt, always place a hardened washer of the appropriate diameter under the hex head of the fastener. The table below provides the proper torque ranges for the fasteners used in Walther EMC hub and rotor assemblies:

Thread Size	Torque Requirement (lb-ft)	
	Min	Max
9/16-12	125	150
9/16-18	135	160
3/4-10	320	345

WARNING

Walther EMC does not recommend turning, resurfacing or machining brake rotors.

