


TITLE: Bearing Inspection and Replacement or Repacking – Medium Duty		
AFFECTED SITE(s): VARIOUS		DEPARTMENT(s): Quality
Written By: Tim Cart	Approved By: John Jurek	Revision Date: 2/22/19

PURPOSE:

To remove, inspect, and replace or repack bearings.

MATERIALS:

- 1) Torque wrench
- 2) Socket wrench
- 3) Sockets
- 4) Impact gun or breaker bar
- 5) Hammer or mallet
- 6) Chisel
- 7) Towel
- 8) Lithium-based grease (see Appendix A)
- 9) Appropriate replacement seal (see Appendix C)
- 10) Hub or gear puller.
- 11) Seal Removal Tool
- 12) Safety equipment including (but not limited to): safety glasses and steel-toed shoes
- 13) PERMATEX® High-Temp Red RTV Silicone Gasket or similar sealant

Bearing Inspection and Replacement or Repacking	
<p>Safety Note:</p> <p>Secure the trailer/axle according to the Dexter Medium Duty 9K-15K Complete Service Manual (LIT-006-00) instructions.</p> <p style="color: red; font-weight: bold;">Do not jack the trailer up on the axle tube.</p>	
1. Identify unit(s) needing to be inspected based on production dates provided by Dexter.	No photo
2. Raise and support the trailer (or loose axle). <u>NOTE:</u> Elevate and support the trailer unit per manufacturers' instructions.	No photo
3. Remove the wheel nuts with an impact gun or breaker bar and socket, and remove the tire and wheel.	

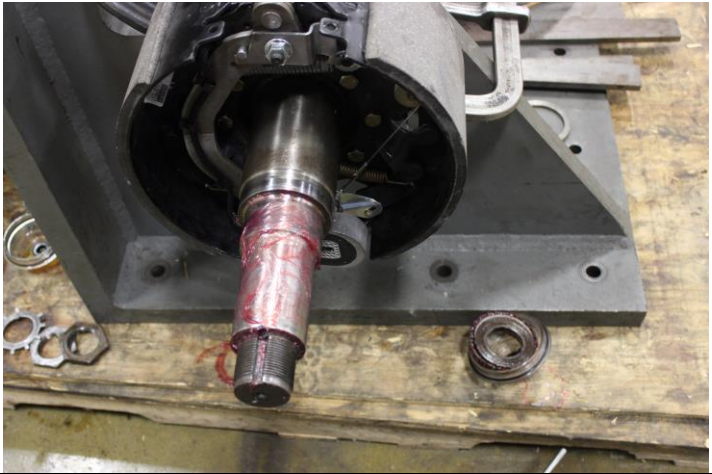

4. Remove cap by unscrewing counter-clockwise while holding the hub stationary.



5. Remove the hub (or hub & drum) from the spindle using a hub puller.

- (i) Bend the locking tang away from the outer spindle nut and remove the spindle nut.
- (ii) Remove the tang washer and unscrew the inner spindle nut (counter-clockwise) and remove spindle washer.
- (iii) Remove the hub from the spindle using a hub or gear puller.



<p>6. Inspect the magnets, shoes, and linings for contamination.</p> <p><u>Caution:</u> Brake linings or magnets must be replaced if covered with grease or oil. Do not try to clean contaminated parts.</p>	<p>No photo</p>
<p>7. Inspect spindle for damage.</p> <p>(i) Clean the spindle with a towel.</p> <p>(ii) Feel for any spindle or seal journal damage by hand.</p> <p><u>NOTE:</u> If the seal journal or spindle is damaged, the axle must be replaced.</p>	 A photograph showing a close-up of a metal spindle assembly. The spindle is a long, cylindrical metal shaft with a threaded end. It is surrounded by various components, including a bearing housing and a seal. The assembly is mounted on a metal base. The spindle has some red markings on it.
<p>8. If a complete hub kit is supplied (with bearing cups, grease and seals) skip to step 15</p>	<p>No photo</p>
<p>9. Remove the seal from the drum using a seal puller. Ensure seal journal is not damaged during seal removal, and discard seal.</p> <p><u>NOTE:</u> If axle is oil lube skip step 10.</p>	 A photograph showing a person's hands using a black seal puller tool to remove a seal from a metal drum. The drum is a large, cylindrical metal component with several small holes around its inner rim. The seal is a dark, circular component located in the center of the drum. The person is using the tool to pry the seal out of the drum.

10. Remove and inspect bearing grease packing.

Adequate grease:

- A. Grease must be between rollers
- B. A 1/4" bead of grease must be visible opposite the filling side
- C. Exterior of rollers coated with grease

If bearing is less than adequately greased, proceed to step 10.

If bearing is adequately greased, skip step 10 and move to step 11.

Adequate Grease



NOTE: Example only, actual bearing used in medium duty application will be much larger.

11. Inspect bearings for damage or discoloration.

- (i) Clean bearing cone and the inside of the hub and drum with a towel and suitable solvent.

NOTE: Bearing should be as clean as possible to prevent contaminating new grease.

- (ii) Inspect both bearing cups and cones for any damage such as pitting, spalling, or corrosion (see Appendix D for example photos).

NOTE: If damage is observed, contact Dexter Service and Warranty for replacement hub and bearing cones. Please have axle serial number available during communication.

574-295-7888

Ask to speak with Customer Service

- (iii) Repack the bearing cone with appropriate grease (Appendix A) using one of the following methods:

- By hand (Appendix E)
- Using a bearing packer (see packer manufacturer instructions).

- (iv) Verify the area between rollers is completely full of grease and the entire outside of the bearing is covered with grease.

NOTE: See step 10 for adequate bearing grease packing.

(i)



(ii)



Serial Number (S/N) found on center of axle beam, S/N circled below



NOTE: Photos are provided as examples only. Actual experience will vary.

WARNING: If a bearing shows wear/damage, the hub assembly and bearing cones must be replaced.

12. Clean the brake drum using a brake cleaner and a towel.

Caution: The brake cleaner may be highly flammable. Take necessary precautions.



13. Re-install inner bearing.

NOTE: Ensure outer bearing is adequately greased per step 9 if axle is grease lube.



14. Install a new seal using a hammer and a block of wood or flat piece of steel set on top of the seal (installation instructions in Appendix F).



15. Carefully remount the hub (or hub & drum) onto the spindle by hand.

Caution: Do not force the hub or hub and drum onto the spindle. When hub and drum are properly aligned with spindle, it will install with minimal resistance.

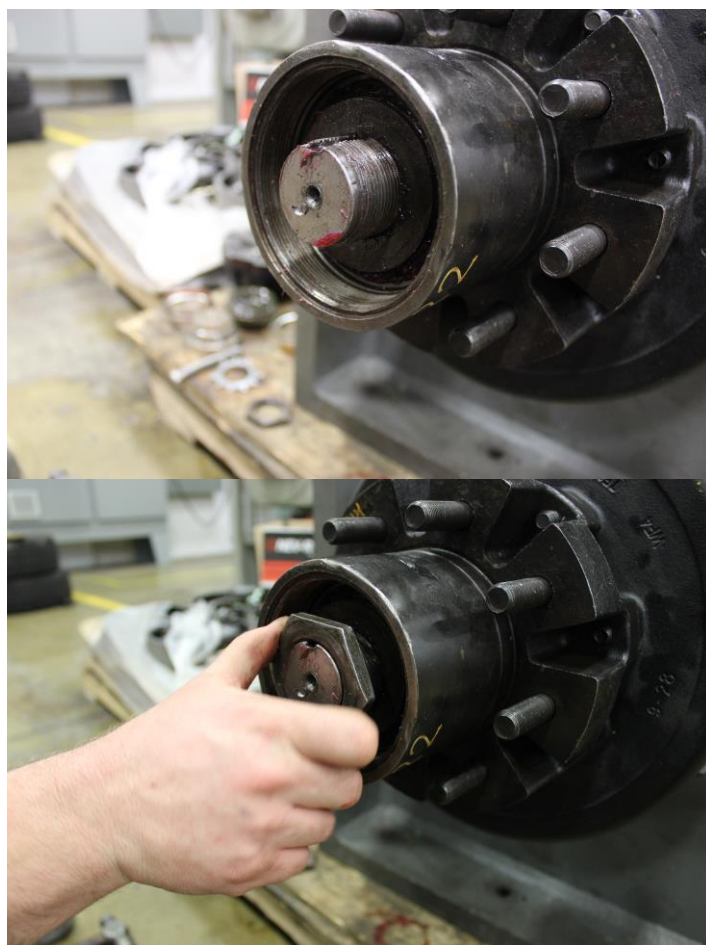


16. Fill 1/3 to 1/2 of the hub cavity with grease and install the outer bearing.

NOTE: Ensure outer bearing is adequately greased per step 10.

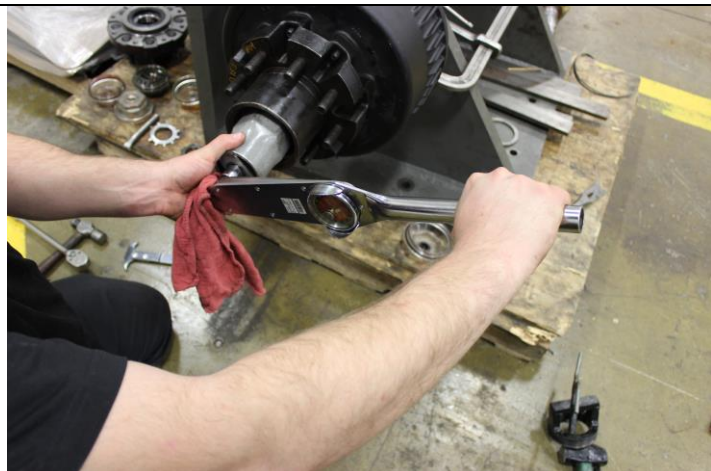


17. Install spindle washer and inner spindle nut onto spindle



18. Rotate hub assembly slowly while tightening the inner spindle nut to 100 lb-ft. to set the bearing.

NOTE: Spinning the hub will seat and properly align the bearing cups.



19. Loosen the inner spindle nut to remove torque (free rotation). Do not rotate the hub.

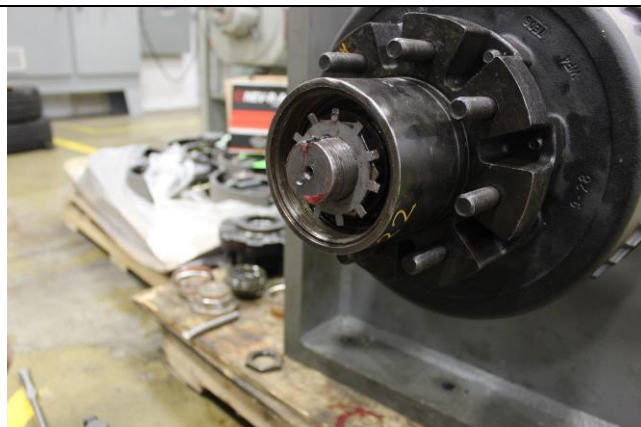





20. Torque the inner spindle nut to 24 in-lb.




21. Install medium duty spindle torque retention system

- (i) Install tang washer and outer jam nut.
- (ii) Bend two tangs over inner spindle nut.
- (iii) Torque outer spindle nut to 155 – 195 ft-lb., ensuring that the inner spindle nut does not turn.
- (iv) Bend two tangs over flats on outer jam nut to secure.



<p>22. Check the cap for damage or foreign objects. Replace the cap if necessary.</p>	<p>No photo</p>
<p>22. Install cap by turning clockwise. Ensure plug and O-ring are installed in cap before installation. Torque cap to 20 – 30 ft-lb.</p>	
<p>24. Pull and push the hub assembly towards and away from you to check for excessive end play.</p> <p>NOTE: Very slight wheel end play is acceptable. Any excessive end play may be corrected by re-torquing the spindle nut (steps 17-19).</p>	
<p>25. Rotate hub slowly forwards and backwards. The wheel assembly should turn freely and smoothly.</p> <p>NOTE: Re-adjusting the brake may correct any dragging.</p>	

<p>26. If axle is oil lube remove oil plug and fill hub with approved oil (see Appendix B) to the visible fill line on cap.</p>	<p>No photo</p>
<p>27. Remount the tire and wheel by tightening the wheel nuts with a torque wrench and socket to manufacturer's recommended specifications.</p>	
<p>28. Remove the jacks, lower the trailer to the ground, and re-torque wheel fasteners.</p>	<p>No photo</p>

Level	Date	Reason for change	Writer(s)	Approval
A	2/22/19	New Issue	TGC	JRJ

APPENDIX A: Approved Grease

Recommended Wheel Bearing Lubrication Specifications

Grease

Thickener Type	Lithium Complex
Dropping Point	215°C (419°F) Minimum
Consistency	NLGI No. 2
Additives	EP, Corrosion & Oxidation Inhibitors
Viscosity Index	80 Minimum

Approved Grease Sources

Chem Arrow	Arrow 2282
Chevron Texaco	Chevron Ulti-Plex Grease EP #2 Texaco Starplex Moly MPGM #2
Citgo	Lithoplex MP #2 Lithoplex CM #2 Mystik JT-6 Hi-Temp Grease #2
ConocoPhillips/ 76 Lubricants/Kendall	Multiplex RED #2 L427 Super Blu Grease
Dexter Company	Lithoplex Red MP #2
Exxon/Mobil Company	Ronex, MP Mobilith AW 2 Mobil I Synthetic Grease
Fuchs	Renolit Uniwrl 2
Great Plains Lubricants	Lithium Complex EP #2
Oil Center Research of Oklahoma	Liquid-O-Ring No, 167L
Pennzoil-Quaker State Company	Synthetic Red Grease
Royal Mfg. Company	Royal 98 Lithium Complex EP #2
Shell	Gadus S3 V220C Gadus S5 V220 Rotella Heavy Duty Lithium Complex #2
Valvoline	Valvoline Multi-Purpose GM Valvoline DuraBlend

APPENDIX B: Approved Oil

Oil

SAE 90, SAE 80W-90, SAE 75W-90

Approved Oil Sources

Ashland Oil	Valvoline Dura Blend Valvoline Power Lube
CITGO Petroleum Co.	CITGO Premium Gear Oil MP Mystik JT-7 Mystik Power Lube
Conoco	Universal Gear Lubricant 80W-90
Exxon Company USA	Gear Oil GX 80W-90
Industrial Oils Unlimited	Super MP Gear Oil 80W-90
Kendall Refining Co.	Kendall NS-MP Hypoid Gear Lube
Lubriplate Division/ Fiske Brothers Refining	Lubriplate APG 90
MFA Oil Company	Multi-Purpose Gear Oil 80W-90
Mobil Oil Corporation	Mobilube SHC Mobil 1 Synthetic Gear Lube
Phillips 66 Petroleum	Superior Multi-Purpose Gear Oil Philguard Gear Oil Philsyn Gear Oil
Pennzoil Products Co.	Gear Plus 80W-90 GL-5 Gear Plus Super 75W-90 Gear Plus Super EW 80W-90 Multi-Purpose 4092 Gear Lube
Oil Center Research	Liquid-O-Ring 750 GX
Sun Refining and Marketing Company	Sonoco Ultra Sonoco Dura Gear
Shell Oil Company	Spirax A Spirax G Spirax HD Spirax S
Texaco Oil Company	Multigear EP Multigear SS
Troco Division/ Royal Manufacturing	Multigear Select Gear Oil
Union Oil Company	Unocal MP Gear Lube 76 Triton Syn Lube EP

APPENDIX C: Seal Replacement Reference

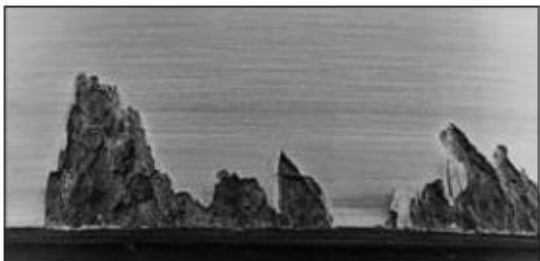
Axle	Part Number	Kit Number
9K	010-051-02	K71-387-00
10K GD	010-051-02	K71-387-00
10K HD	010-056-00	K71-388-00
12K	010-056-00	K71-388-00
15K	010-056-00	K71-388-00

APPENDIX D: Bearing Damage Example Photos

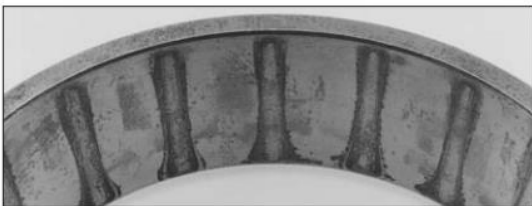
Pitting:



Spalling:



Corrosion:



Scoring/Peeling:



NOTE: Bearing damage pictures taken from Timken Bearing Damage Analysis Reference Guide online 10/31/2018.

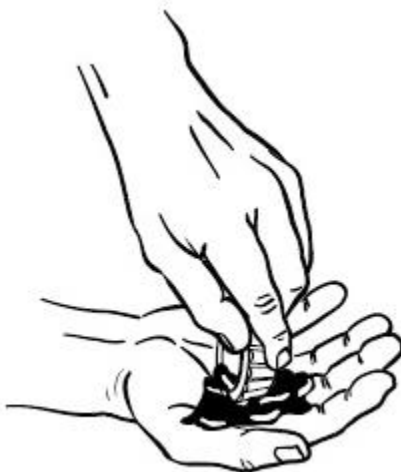
APPENDIX E: Dexter's Service Manual Bearing Lubrication – Grease, By Hand

CAUTION

Do not mix Lithium, calcium, sodium or barium complex greases due to possible compatibility problems. When changing from one type of grease to another, it is necessary to ensure all the old grease has been removed.

Along with bearing adjustment, proper lubrication is essential to the proper function and reliability of your trailer axle. Bearings should be lubricated every 12 months or 12,000 miles. The method to repack bearing cones is as follows:

1. Place a quantity of grease into the palm of your hand.
2. Press a section of the widest end of the bearing into the outer edge of the grease pile closest to the thumb forcing grease into the interior of the bearing.
3. Repeat this while rotating the bearing from roller to roller.
4. Continue this process until you have the entire bearing completely filled with grease.



APPENDIX F: Seal Replacement

1. Pry the seal out of the hub with a seal removal tool or a screwdriver. Never drive the seal out with the inner bearing as you may damage the bearing.
2. Apply a sealant similar to PERMATEX® High-Temp Red RTV Silicone Gasket to the outside of the seal. Use only enough to provide a thin coat to prevent any excess from contaminating the rubber lip(s) of the seal. It is okay to apply a slight amount of lube to the inner rubber lip(s) to aid with installing onto the spindle. Note: No sealant should be used if the outside of the seal is rubber coated. For these types of seals, it is recommended to apply a thin coat of oil to the outside rubber.
3. Clean the seal journal of the spindle to inspect for nicks or roughness. Use a file to remove any burrs from the leading edge or shoulder area. Clean the journal area with very fine emery cloth. Any presence of deep gouges or scratches in this area may cause seal failure allowing lubricant to leak out of the hub.
4. Clean the seal bore in the hub and inspect for any nicks, gouges, or scratches that may prevent the seal from retaining the bearing lubricant inside the hub.
5. Orient the seal properly. Many oil bath seals will be marked OIL SIDE on the side of the seal that should be facing into the hub after installation. This marking should not be visible after seal installation.
6. Install new seal into place using a seal driver or seal installation tool of proper size. It is important that any seal installation tool contact the outer ring of the seal casing. If no seal driver is available, use a clean block of wood. It is critical that the seal be driven in evenly and straight. NEVER hammer directly on the seal.
7. The seals will be pressed flush to the back surface of the hub in the 9K-10K General Duty axle product line. The seals in the 10K through 15K axles need to be installed so that the airside face of the seal is approximately 11/16" from the inner bearing cone. It is NEVER necessary to bottom out the seal for proper installation. Driving the seal in too deep may damage the seal and may come in contact with the inner bearing preventing it from rotating freely.
8. Proper installation will maintain the seal flatness in the hub within .010". A seal that is cocked too much inside the hub will be more likely to leak.