



America's Premier Trailer Manufacturer

May 3, 2004

Subject: EA03-022 Question # 1

For each Strick trailer that was sold to Estes Express, and referred to in invoice #775762 dated September 6, 2000 (Attachment #1, Estes Warranty Invoice), identify each such trailer by:

- a. The Vehicle Identification Number (VIN);
- b. Model name of the trailer;
- c. Build date of the trailer;
- d. Name or location of the manufacturing plant that built the trailer;
- e. Type grease used by Strick in lubricating the wheel-end hub units;
- f. The Wheel-End Lubrication Fill Criteria for each wheel-end unit; and
- g. Type and brand of wheel-end hub unit used in the trailer assembly.

The above question, items a through g have been answered and are on the attached disc identified as "Trailers Sold to Estes Express."

RECEIVED
NVS-215
JUN MAY 21 P 3 35
OFFICE OF
DEFECTS INVESTIGATION

27634

INVOICE # 775762

TO: STRICK TRAILER
 FROM: ESTES EXPRESS
 DATE: 09-06-00
 REF. P.O. # 20142
 ATTN: JERRY CLONTZ

THIS INVOICE IS FOR STRICK TRAILERS THAT WE HAD TO PULL HUB CAP
 AND THE OUTER BEARING TO CHECK THE LEVEL OF THE GREASE. WE
 ADDED GREASE TO SOME AND HAD TO REPLACE THE BEARINGS AND
 SEALS ON SOME.

UNIT # 533329 AND VIN# 1S12E853XD429282 THRU
 UNIT # 533828 AND VIN# 1S12E853XXD437335

1.5 HR. X \$25.00 = \$37.50 X 500 UNITS = \$18,750.00
 LUBE COST = 2.91 PER LB X 1.5 = \$4.36 X 4WHEELS = \$17.44 X 500 = \$8,720.00

UNITS WITH EXTRA WORK PARTS

533766—1S12E853XD437273	\$59.64
533699—1S12E853XD437206	\$62.32
533453—1S12E853XD436294	\$123.34
533362—1S12E853XD429315	\$173.64
533418—1S12E853XD429371	\$62.32
533792—1S12E853XD437299	\$62.84
	\$344.10

LABOR $75 \times \$25.00 = 18.75 \times 6 = \112.50
 \$636.60

TOTAL INVOICE = \$28,670.70

PLEASE MAKE CHECK PAYABLE TO ESTES EXPRESS LINES
 3901 WEST BROAD STREET
 RICHMOND, VA. 23230-3962
 ATTN: KENNY TURNER

20142

WARRANTY	
ADJ. NO.	CHARGE
29142	28,670.70
APPROVED BY:	DATE
	9/29/00

24

142

6734

NATSA #1

parts 2, F, 6

04/21/04

Single Level Bill With Notes

Page 0

Parent Item: 25523

SEAL, INST, GRSE, 824, 1HK24, 79H24, 79H7, 1H 1000000000000000
 STEMCO 349-4075 HUBCAP (SCREW ON)
 TEXACO GRSE
 STEMCO GASKET 330-3077
 SEAL# 307-0723

ESTES

- A) BEARINGS MUST BE PACKED WITH A PRESSURE PACKER
- B) HUB CAVITY FILLED IN STATIC POSITION. FILL CAVITY STARTING AT REAR UNTIL GREASE LEVEL REACHES 3:00 - 9:00 POSITION.
- C) APPLY A THIN FILM OF GREASE TO THE WALLS OF THE CAP. CARE MUST BE TAKEN TO AVOID COVERING THE VENT. THIS CAN CAUSE A SEAL FAILURE.
- D) APPLY A THIN FILM OF GREASE TO THE SPINDLE PRIOR TO INSTALLING THE INNER AND OUTER BEARINGS.
- E) APPLY A THIN FILM OF GREASE TO THE AXLE NUTS PRIOR TO INSTALLING THE CAP

Ballon No.	Part No.	Qty	U/M	Description	P=Buy M=Make	Rev
1	24951	4.00	EA	SEAL, OIL, STEMCO, GUARDIAN, #307-0723, TP	P	
2	22211	4.00	EA	HUBCAP, STEMCO, 349-4075, GRSE, SCREW, TP	* P	
				SCREW ON CAP FOR TP AXLE COMES WITH GASKET (19265)		
4	00153	10.00	CSB	GRSE, LUB, G0034, TEXACO, 1916*00, SYNTHETIC	* P	
	D200005	0.00	EA	SEAL, INST, SYN, GRSE	P A	

THE ATTACHED INFO IS THE SAME

FOR BOTH ESTES ORDERS OSD06651 AND OSD06798

Edit List
TEXT FOR ITEM: 22475

Notes

- 1 HBDM, OB, HBPLTD, DYTIN, 1415502463X10, ESTES*
- 2 FOR TP AXLE, ESTES RED, 14-15502-463X10
- 3 WITH FLANGE NUTS AND DRUM IS TO BE
- 4 PAINTED ESTES RED AND ABS PREPPED
- 5 WITH (2) FLANGE NUTS
- 6 CHANGED PART#14-15593-085 TO ADD FLANGE
- 7 NUTS

HUB # 0415502
FOR 'P' SPINDLE

Quit Edit List
TEXT FOR ITEM: 21985

#. Notes

- 1 HBDM, OB, HBPLTD, DYTIN, 1415502462X10, ESTES*
- 2 FOR TP AXLE, ESTES RED, 14-15502-462X10
- 3 WITH FLANGE NUTS AND DRUM IS TO BE
- 4 PAINTED ESTES RED
- 5 WITH (2) FLANGE NUTS
- 6 PART# WAS 14-15502-455 CHANGE WAS TO ADD
- 7 FLANGE NUTS.

HUB # 0415502
FOR 'P' SPINDLE



America's Premier Trailer Manufacturer

May 3, 2004

Subject: EA03-022 Question # 2

For each Strick built in the same time period as the ones sold to Estes Express (referred to in Attachment #1, Estes Warranty Invoice), but sold to other purchasers and or Fleets, identify each such trailer by:

- a. VIN;
- b. Model name of the trailer;
- c. Build date of the trailer;
- d. Name of the Purchaser or Purchasing Fleet (and Fleet contact person), address and telephone number;
- e. Name or location of the manufacturing plant that built the trailer;
- f. Type and brand of grease used by Strick in lubricating the wheel-end hub units;
- g. The Wheel-End Lubrication Fill Criteria for each wheel-end unit; and
- h. Type and brand of hub unit used in the trailer;

The above question, items a through h have been answered and are on the attached disc identified as "Trailers Built A"



'America's Premier Trailer Manufacturer'

Subject: EA03-022 Question #3

After the Estes Express Invoice (#775762) matter was resolved what changes concerning the wheel-end assembly, of the subject vehicles were implemented on the assembly line at each plant.

The Estes Express Invoice #775762 was dated in or about September of 2000. Strick had used a pump to install the grease with assembly personnel utilizing the template to determine conformity to the TMC recommended fill level.

Sometime ago the pump being utilized was equipped to produce a metered reading thus confirming the correct amount of grease being installed so as to conform with the applicable TMC Recommended Practice. Pumps are calibrated the pumps on each order using the 3-'clock / 9-o'clock template that covers the face of the hub opening measuring the quantity of grease installed to be a 50% fill level. No record has been found showing the date when the use of the metered calibration was commenced. Fill levels were not affected by the change in procedure, merely the method of determining the accuracy of the fill.



America's Regular Trailer Manufacturer

May 3, 2004

Subject: EA03-022 Question # 4

In its January 29, 2004 response, Strick states that 5 trailers (see VINs listed below) were built in December 2003 using Mobilith SHC 007 grease to lubricate the wheel-end units. Provide the criteria (written instruction) used on these trailers to include a detailed explanation of the amount of grease installed, how that amount is determined, plant equipment used, calibration/adjustment of equipment, and what quality assurance provisions were incorporated.

500206

500207

500208

500209

500210

Attached is a copy of the RP631A procedure for wheel end Lubrication from the TMC Recommended Practice. Strick follows this practice as a written procedure for all wheel ends.

Strick uses a metered gauge to fill the wheel end. In order to determine the correct amount a sleeve with a half moon cut in it is held over the hub cavity. The half moon cut will fit around the axle spindle holding the sleeve at a height to achieve the 3 and 9 o'clock or 50% fill level. The bearings are lubricated before installing them in the hub using a metered pump. After the bearings are installed the sleeve is held in place. The same pump will then be used to fill the hub cavity to the 3 and 9 o'clock or 50 % fill level. After the fill level is confirmed, the reading on the pump is noted and the same amount is pumped into all other wheel ends on the order. The same amount is pumped into a container to be weighed. This is how the engineering department records the amount in pounds to be entered on the bill of

material for future builds using the same components. The amount in pounds is used so purchasing can determine the total amount required for the order.

Attached is EA03-022-4A Grease Pump Calibration. Msg:

This attachment will supply the type and brand of equipment used to fill the wheel-ends with lubrication. It also outlines out quality assurance process used to calibrate and determine the correct amount of lubrication.

Jerry Clontz

From: Jerry Clontz [jclontz@stricktrlr.com]
Sent: Tuesday, May 04, 2004 8:59 AM
To: jclontz@stricktrlr.com
Subject: EA03-022-4A Grease Pump Calibration

-----Original Message-----

From: Jim Jackson [mailto:jjackson@stricktrlr.com]
Sent: Monday, May 03, 2004 2:59 PM
To: Clontz (E-mail)
Subject: Grease Pump

Here you go...straight from the bogie line:

- 1) Brand name: Graco
- 2) Model nbr: 203857
Serial nbr: 427742
Series: H98L
- 3) Calibration:
 - a) Find amount to be used from BOM.
 - b) Weight of dry bearings
 - c) Weight of grease packed bearings
 - d) Subtract diff between bearings
 - e) Subtract bearing grease from amount on BOM then divide by (4)
to determine amount for each wheel end hub.
- 4) A template is used to insure hub is filled to the 3-o'clock/9-o'clock position
- 5) Quality assurance: Periodic spot check and repeat item #3 if necessary or change in hub vendor or style.

J3

TMC Recommended Practice

RP 631A

VMRS 018

RECOMMENDATIONS FOR WHEEL END LUBRICATION

PREFACE

The following Recommended Practice is subject to the Disclaimer at the front of TMC's *Recommended Maintenance Practices Manual*. Users are urged to read the Disclaimer before considering adoption of any portion of this Recommended Practice.

PURPOSE AND SCOPE

The purpose of this Recommended Practice is to offer equipment users recommendations and operational considerations for selecting lubricants for use in wheel end applications.

This Recommended Practice applies to Class 3-8 trucks, buses, tractors, and trailers designed for on-highway applications.

This Recommended Practice applies to only "traditionally" equipped axles and hubs. This Recommended Practice defines "traditionally" equipped axles and hubs as wheel ends equipped with two single row, widespread, tapered roller bearing assemblies which are manually adjusted.

This Recommended Practice addresses two categories of wheel ends: driven and non-driven. Non-driven wheel ends include steer, dolly, trailer, pusher and tag axles. (See Figures 1 and 2).

The lubricant used in the wheel ends can be either petroleum-based or synthetic-based oils or greases.

REFERENCE

For additional information on wheel bearing adjustment, installation and maintenance, refer to TMC:

- RP 618, *Wheel Bearing Adjustment Procedures*.
- RP 622, *Wheel Seal and Bearing Removal, Installation, and Maintenance*.

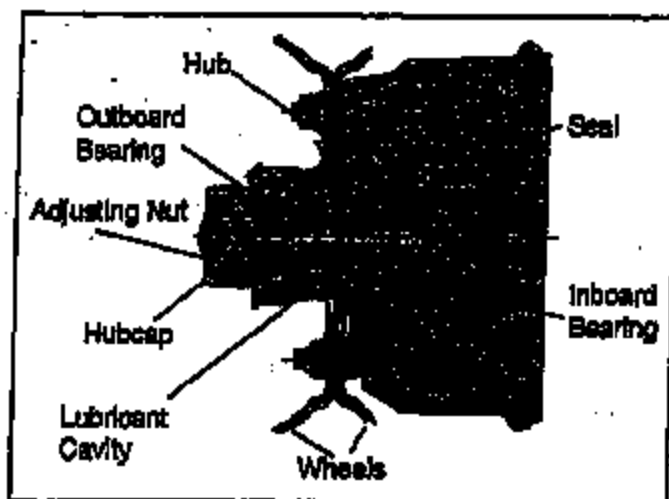


Fig. 1: Non-Drive Wheel End

Other relevant TMC Recommended Practices include:

- RP 624, *Lubricant Fundamentals*.
- RP 708, *Hubcap Standardization — Bolted-On Type*.

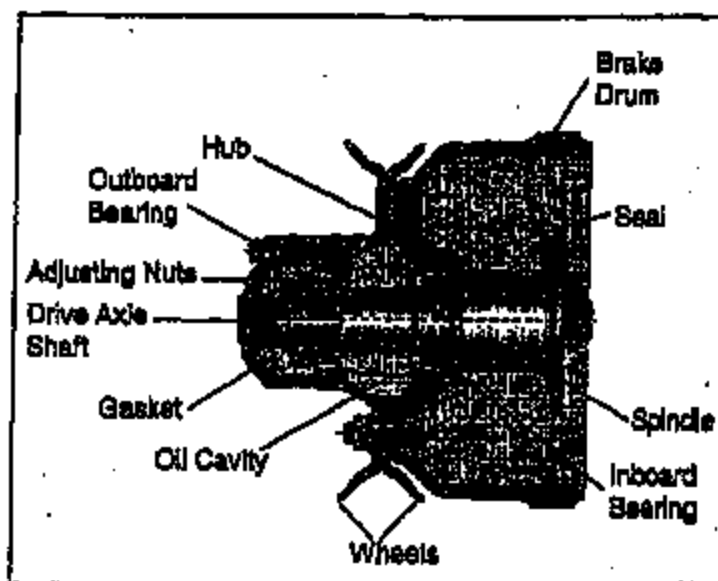


Fig. 2: Drive Axle Wheel End

Fleet managers should also reference original equipment manufacturer (OEM) maintenance and service manuals as appropriate.

NON-DRIVEN AXLE LUBRICANT CONSIDERATIONS

Non-driven wheel ends can be lubricated effectively with either oil or grease, depending on the fleet application. Both lubricating substances use oil as the lubricating medium. (Refer to RP 624, *Lubricant Fundamentals* for details.)

A. Non-Driven Oil-Lubricated Wheel Ends

Inspection and Preparation

Clean and inspect the wheel and components including all bearings, hubcaps, hub and bearing cups, axle spindle, and fasteners, removing all contaminants and lubricant residue. Replace seal, hubcap gasket, and all questionable parts. For detailed procedures, refer to TMC RP 622.

Component Lubrication

Pre-lubricate the inner and outer wheel bearing cones with clean lubricant of the same type used in the hub assembly.

CAUTION: Failure to lubricate bearing correctly, and maintain proper lubrication, may result in bearing damage. For additional information, refer to TMC RP 618 and RP 622.

CAUTION: In oil bath systems, do not pack bearings with grease before installation. Grease will temporarily restrict or prevent the proper circulation of lubricant and may contribute to wheel seal failure.

Hub Fill Procedures: Oil

Install the wheel seals as documented in RP 622. Apply lubricant to the bearing journals and bearing cones. Use the same lubricant that will be used to lubricate the system. This will help inhibit fretting corrosion and make assembly easier. Use lifting equipment to align the hub assembly with the spindle taking care not to damage the seal and spindle threads. While the hub is supported/suspended, fill the hub cavity with clean oil and push the hub into position, or push the hub into position and then fill the hub cavity.

Install the outer bearing, and adjusting nut systems. Adjust wheel bearings using TMC RP 616 or OEM Maintenance Manual. Verify end play (0.001" to 0.005") with a dial indicator.

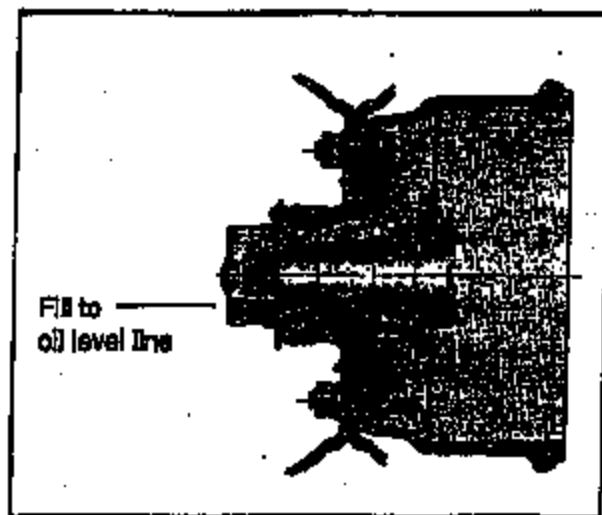


Fig. 3: Lubrication Fill Oil (Static)

Hubcap Considerations: Oil

Select the proper vented, bolt-on or threaded hubcap for the application and follow hubcap suppliers' instructions for proper attachment to the wheel hub. Fill wheel end assembly through the fill port with the same oil. Allow time for the oil to seep through the outer bearing and fill the hub cavity. Continue to add oil until the oil reaches the oil fill line as indicated on the hubcap. (See Figure 3.)

NOTE: For hubcaps with side fill plugs, do not allow the oil to go past the centerline or vent hole.

CAUTION: Overfilling or underfilling a wheel hub with lubricant may result in premature component failure.

Install center fill or side fill plug. Torque side fill plug to hubcap manufacturer's specifications. Clean-up any over spills that would give the appearance of a leaking hubcap.

B. Non-Driven Grease-Lubricated Wheel Ends

NOTE: Semi-fluid greases are NLGI 000 and 00. NLGI 0 is a soft grease. All three grades listed above are treated as semi-fluid greases in this RP. Hard greases are defined as NLGI 1, 2, and 3 consistencies in this RP.

Inspection and Preparation

Clean and inspect the wheel end components including all bearings, hubcaps, hub and bearing cups, axle spindle, and fasteners, removing all contaminants and lubricant residue. Replace seal, hubcap

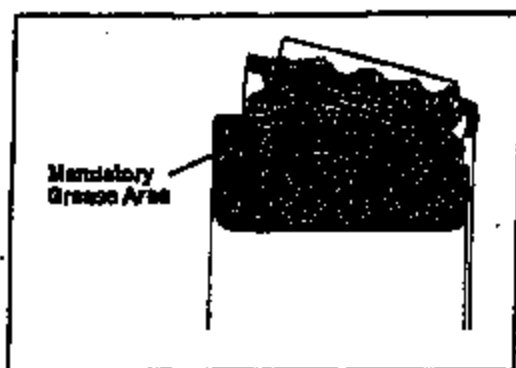


Fig. 4: Packing of Bearing Cone

gasket, and all questionable parts. For detailed procedures, refer to TMC RP 822.

NOTE: If retrofitting an oil or grease system with a semi-fluid grease, be sure to note the need for special cleaning instructions, fill procedures and equipment (i.e., vented hubcap).

Component Lubrication

Pack the inner and outer wheel bearing cones full with grease. Work the grease into the bearing in the direction of the arrow shown in Figure 4 by machine or hand such that the grease goes under the bearing cage toward the cone rib and roller ends.

For corrosion prevention, place a light film of grease on all metal components, including the hubcap. Wipe off the excess grease. Install the wheel seals as described in TMC RP 822.

CAUTION: Failure to lubricate bearing correctly and maintain proper lubrication may result in bearing damage. For detailed procedures, refer to TMC RP 818 and RP 822.

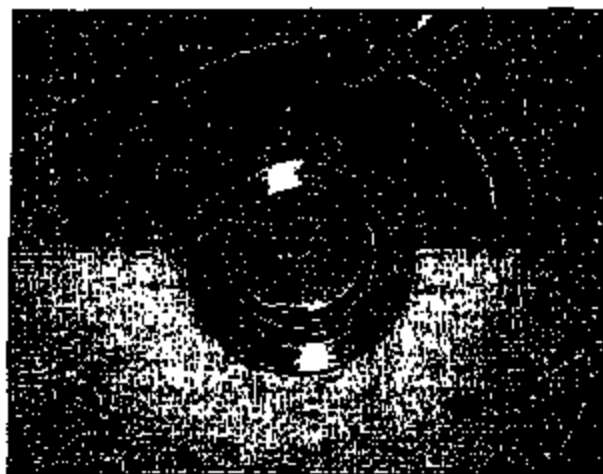


Fig. 5: Semi-Fluid Grease Top Off Procedure

WARNING: If grease packing is done by hand, appropriate protection — such as gloves and clothing — should be worn to minimize skin contact with the grease.

CAUTION: Overfilling or underfilling a wheel hub with lubricant may result in premature component failure.

Hub Fill Procedures: Semi-fluid Grease

If tires are not mounted, install the hub on the spindle. Take care to not damage the seal. Use lifting equipment to align the hub assembly with the spindle taking care to not damage the seal and spindle threads and push the hub assembly into position.

With the hub supported, before installing the outer bearing cone, begin filling from the bottom of the hub cavity. Top-off by placing the pump nozzle above the spindle, and continue pumping grease into the hub cavity. (See Figure 5.)

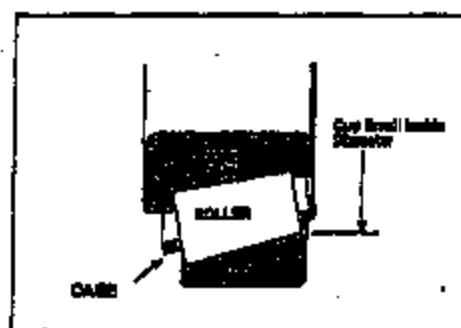


Fig. 5B: Tapered Bearing Nomenclature

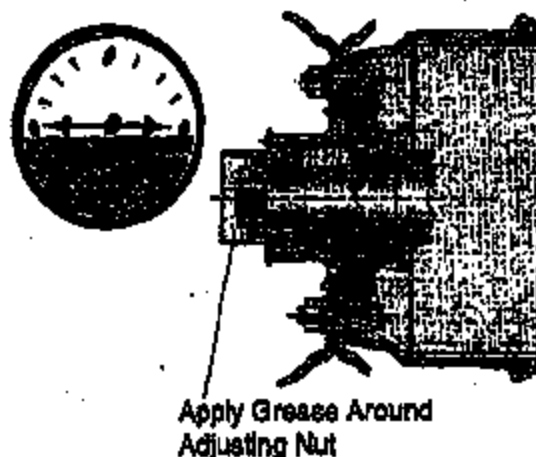
Fig 5A: Lubrication Fill
Semi-Fluid Grease (No. 00)



Fig. 5C: Using Template to Hold Lubricant

The grease fill amount should be to a 3 o'clock and 9 o'clock level. This represents 50 percent hub cavity fill. (See Figures 5A and 5B.)

NOTE: A template may be used to hold the lubricant in place while filling the hub cavity. (See Figures 5 and 5C.)

CAUTION: Make sure that there are no air-pockets trapped under the grease. If pumping equipment is used, ensure the pump does not aerate the grease. Aeration of the grease may result in underfilling.

Install the outer bearing, washers and adjusting nuts. Adjust wheel bearings per TMC's RP 818 or per OEM

Maintenance Manual. Verify end play (0.001" to 0.005") with a dial indicator. Before installing the hubcap, apply a coating of grease around the wheel bearing adjustment nut(s).

Hubcap Considerations: Semi-fluid Grease
Use an appropriate tamper-proof, vented hubcap. These hubcaps prevent gear oils from being accidentally added to grease-filled wheel ends.

NOTE: Because of the hubcap's special venting capability and the properties of the semi-fluid grease, do not fill the hubcap with grease.

NOTE: If a metal hub cap is used, it is necessary to coat the interior surfaces with a film of grease. Use special care not to cover the vent with grease.

Hub Fill Procedures: Hard Grease
Before installing the hub, pack grease into the hub cavity. Fill the circumference of the hub cavity using the bearing races as the proper level guide. (See Figure 5.)

Use lifting equipment to align the hub assembly with the spindle taking care to not damage the seal and spindle threads. Push the hub assembly into position.

Install the outer bearing, washers and adjusting nuts. Adjust wheel bearings per TMC's RP 818 or OEM Maintenance Manual. Verify end play (0.001" to

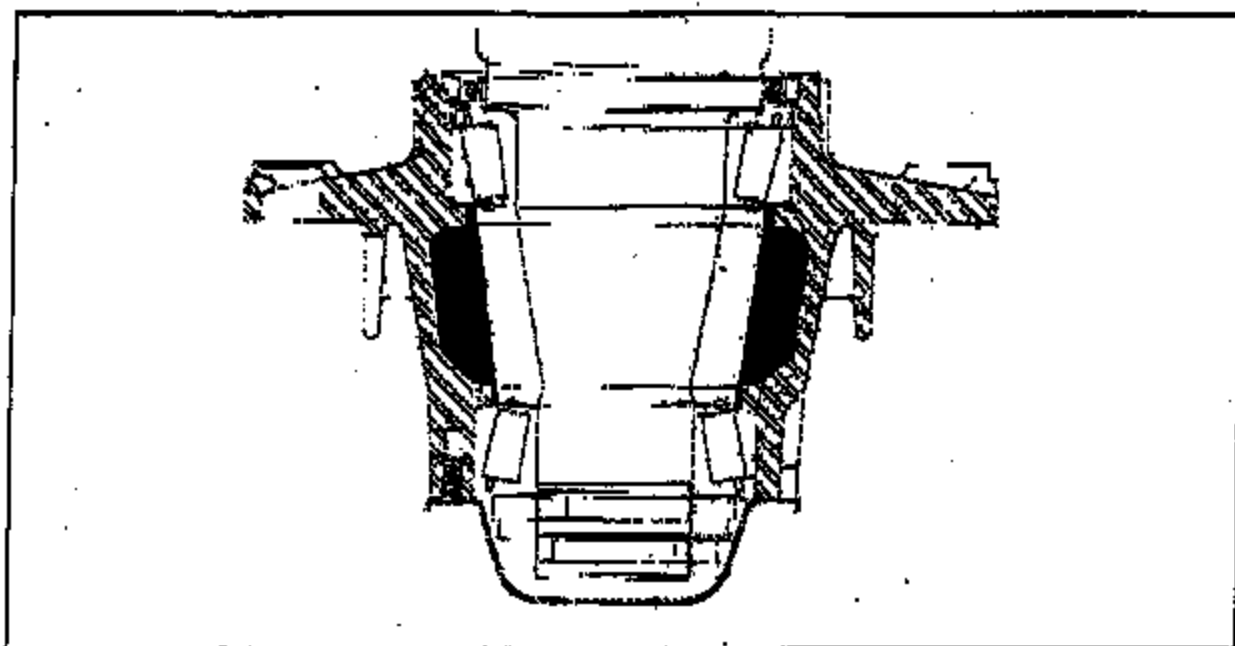


Fig. 6: Lubrication Fill Greases (Nos. 1, 2, & 3)

0.005") with a dial indicator. Apply a coating of grease around the adjusting nut(s).

Hubcap Considerations: Hard Grease

Use an appropriate tamper-proof, hubcap. These hubcaps prevent gear oil from being accidentally being added to grease-filled wheel ends. Follow the recommendation of the seal supplier to determine if the hubcap should be vented or non-vented.

NOTE: If a metal hub cap is used, it is necessary to coat the interior surfaces with a film of grease. Use special care not to cover the vent with grease.

DRIVEN AXLE LUBRICANT WHEEL END CONSIDERATIONS

NOTE: In this Recommended Practice, all driven axles are oil lubricated.

Inspection and Preparation

If the wheel end is disassembled, clean and inspect the wheel end components including all bearings, axle shafts, hub and bearing cups, axle, and fasteners, removing all contaminants and lubricant residue. Replace seal, axle flange gasket, and all questionable parts. For detail procedures, refer to TMC RP 622.

Component Lubrication

Pre-lubricate the inner and outer wheel bearing cones with clean lubricant of the same type used in the axle reservoir.

CAUTION: Failure to lubricate bearing correctly and maintain proper lubrication may result in bearing damage. For additional information refer to TMC RP 616 and RP 622.

CAUTION: In oil bath systems, do not pack bearings with grease before installation. Grease will temporarily restrict or prevent the proper circulation of lubricant and may contribute to wheel seal failure.

Hub Fill Procedures: Oil

Install the wheel seals, as documented in RP 622. Fill hub cavity with oil. Use lifting equipment to align the hub assembly with the spindle taking care to not damage the seal and spindle threads. Push the hub assembly into position.

While the hub is supported, fill the hub cavity with clean oil and push into position or push into position and then fill the hub cavity.

Install the outer bearing, washers and adjusting nuts. Adjust wheel bearings per TMC's RP 618 or OEM Maintenance Manual. Verify end play (0.001" to 0.005") with a dial indicator.

Install the flanged drive axle shaft with a new axle flange gasket. Torque flange nuts to axle manufacturer's specification. Clean-up any over spills that would give the appearance of a leaking system.

Oil is supplied directly to the wheel ends at assembly and through the axle tube during operation. To achieve final fill level, each end of the drive axle must be raised a minimum of eight inches for one minute to move the lubricant into the opposite wheel end. Recheck the main sump for the proper oil level and top off the lubricant level, if required. The oil fill level is always to the bottom of the fill plug or hole in the axle reservoir.

CAUTION: Do not pack the drive axle wheel bearings with grease when the wheel ends will be lubricated with oil from the axle differential. (See RP 622 and RP 618.)

NOTE: Always check the axle breather to be sure it is operating properly and completely free of dirt and debris.

MAINTENANCE AND INSPECTION REQUIREMENTS

The following inspection criteria are intended for units whose vocation is strictly on-highway use only. The inspection criteria are not intended for unitized or pre-set wheel ends, refer to system manufacturer for inspection and service recommendations.

These recommendations depend on the proper assembly of the system, including the proper lubricant fill level.

A. OIL LUBRICATED WHEEL ENDS INSPECTION CRITERIA

Level 1—Simple Inspection (Pre-Trip/In-Service)
Walk around vehicle and check wheel-ends for obvious signs of lubricant leakage, such as hubcap gasket and wheel seal areas, oil soaked brake linings. Check for broken or missing components. Any seepage is reason for further inspection and appropriate action.

Take appropriate action if leaks or oil soaked brake linings are noted.

NOTE FOR DRIVERS: After making an en route stop, walk around the unit and feel the hubs. If there is any significant differences in temperatures or excessive temperature, contact your maintenance department. When feeling hubs for temperature, seasonal influences should be taken into consideration.

If wheel-ends are equipped with a sight glass on the hubcaps, check to ensure the oil is at the proper fill level.

NOTE: Oil residue may be present at the vent area. This is an indicator that the system is venting properly. This should not be construed as system leakage.

Level 2—100,000 miles or Annual Inspection:
For non-driven axles check lubricant level and condition. If lubricant is contaminated replace old lubricant with the same type lubricant. If lubricant condition is good and level is low, fill to the proper level. Check for any signs of leakage at the seal or hubcap gasket areas. Check for oil soaked brake linings.

For driven axles, check for any signs of leakage at the seal or axle flange gasket areas. Also check for leaks at hub fill hole if so equipped. Check for oil soaked brake linings.

Take appropriate action if leaks or oil soaked brake linings are noted.

B. GREASE LUBRICATED WHEEL ENDS INSPECTION CRITERIA

Level 1—Simple Inspection (Pre-Trip/in-Service)
Walk around vehicle and check wheel-ends for obvious signs of lubricant leakage, such as hubcap gasket and wheel seal areas, grease soaked brake linings. Check for broken or missing components. Any seepage is reason for further inspection and appropriate action.

NOTE FOR DRIVERS: After making an en route stop, walk around the unit and feel the hubs. If there is any significant differences in temperatures or excessive temperature contact the maintenance department. When feeling hubs for temperature, seasonal influences should be taken into consideration.

Level 2—Detailed External Inspection
(Conducted at PM or at least annually)
Check wheel-ends for obvious signs of lubricant leakage, such as hubcap gasket and wheel seal areas, grease soaked brake linings. Any seepage is

reason for further inspection and appropriate action.

Raise the vehicle and check for smooth rolling of wheels. Check for signs of excessive end play in the wheel-end. This does not include removal of the hub cap.

NOTE: Leaking grease may not spread over the hub and brake components as with hubs filled with oil. When inspecting for grease leaks the inspection must be done very carefully with the aid of a bright beam of light from a flashlight or droplight.

NOTE: Some grease seals will purge very small amounts of grease in normal operation.

If there is seepage around the hubcap flange area, take appropriate action to eliminate seepage as directed by your maintenance instructions.

If leakage in the seal area is found, remove the wheel end and replace the hubcap gasket, seal and lubricant. Inspect the spindle and bearings for damage and replace if needed. Anything abnormal requires Level 3 inspection.

CAUTION: A clogged vent can damage the wheel seal allowing internal pressure build up in the wheel end.

Level 3—Lube Level Inspection (Per OEM Recommendation)

When using grease in a wheel-end the only method to accurately check the lubricant level is by pulling the outer bearing. If using a hard grease, there is no need for a Level 3 inspection.

CAUTION: Failure to remove the outer bearing may provide a false lubricant level reading.

To verify proper lube level the following procedures need to be performed.

1. Before performing any maintenance on the vehicle take appropriate action to ensure the vehicle is safely secured.
2. Remove hubcap, hubcap gasket and inspect hubcap for adequate venting capabilities.
3. Verify wheel-bearing end play for conformance to RP 615.
4. Record end play measurements.

CAUTION: Apply the parking brake, if axle is equipped. This will ensure that the wheel/hub

assembly is supported and held steady during removal of the spindle nut and outer bearing. This will eliminate the possibility of spindle, bearing or seal damage due to the cooking or slipping of the wheel-hub assembly.

CAUTION: Care should be taken so the wheel-end assembly is properly supported.

5. Remove adjusting nuts.
6. Remove outer bearing.
7. While maintaining proper support to the wheel-end or hub, visually check lube level. In a semi-fluid grease system, if the lubricant flows out of the hub cavity, the hub cavity should be refilled to the 3 o'clock and 9 o'clock level. This represents 50 percent hub cavity fill. (See Figures 5 and 6A.)

In a semi-fluid grease system, if the grease doesn't flow, inspect lubricant condition in the hub cavity. Go to Level 4 inspection if abnormal conditions are noted. If no abnormal conditions are noted, add grease until it flows out of the hub cavity.

NOTE: If changing grease types or brands, contact your lubricant supplier to insure compatibility.

8. Clean bearing and inspect for wear and damage. When reassembling industry standard wheel-ends, assemble per RP 616.

NOTE: Manufacturer is defined as the final assembler of the product or the particular system supplier.

Level 4—Wheel-end Disassembly Inspection (Complete System Tear-down)

If any abnormal conditions are found during inspection Levels 1, 2, or 3, remove wheel-end for inspection.

Lube change intervals as determined by the manufacturer dictate when Level 4 service is performed.

NOTE: Manufacturer is defined as the final assembler of the product or the particular system supplier.

When reassembling industry standard wheel-ends, assemble per RP 622 and RP 616. Seals and gaskets must be replaced.

Failed Component Analysis

Save prematurely failed parts and lube samples for analysis. The lubricant sample collected should be at least four ounces. A similarly sized new lubricant sample (not previously used) is also required. This will aid in supplier assisted detection and prevention of premature failures. The components' history of usage should also be provided (i.e., vehicle's vocation, mileage, maintenance records, and history of inspection and repair/replacement of components such as seals, seal wear rings, lubricant, bearings, etc.).

OPERATIONAL CONSIDERATIONS FOR LUBRICANTS

Service interval ranges from 100,000 miles to five years in over-the-road service, depending on axle type, manufacturer recommendations, and lubricant performance. Mineral oil based lubricants have lower initial costs than synthetics lubricants, but need to be changed more frequently in some equipment. When choosing a lubricant, the fleet needs to consider:

- the manufacturer's recommendation for the axle make and model in service.
- the fleet savings associated with extended service intervals.
- the total cost of the lubricant.

NOTE: Because seal performance may vary when switching lubricants, consult your seal supplier for compatibility concerns.



America's Premier Trailer Manufacturer

Subject: EA03-022 Question # 5

Identify the Strick Employee(s) and/or agent(s), by name, title, address and phone number, who authorizes any changes in the installation of lubrication in wheel-end units and wheel-end lubrication fill criteria of the subject trailers. Describe how the changes authorized by such a Strick employee and/or agent, are implemented. If any change by such an employee is stated in writing, produce a copy of that writing. Provide copies of any quality control procedures used by Strick's to ensure proper fill levels were reached during assembly of subject vehicles.

The person authorized to make changes in the installation of lubrication in wheel-ends units and wheel-end lubrication fill criteria of the subject trailers and all trailers is:

**Jim Jackson
Engineering Manager
Strick Corporation
301 N. Polk Street
Monroe, IN 46772
Telephone (260) 692-8121**

The changes are sent via e-mail to production managers on the floor and a copy of the latest TMC practice is posted in the work area. There is a copy of the TMC recommended practice attached to this response. There were no copies of e-mails available to furnish with this response. Attached is a copy of the Key Quality Items for the work area where the lubrication in the subject wheel-ends is installed.

Bogie – Key Quality Items

1. Axles

- Confirm that seats/saddles are spaced apart properly. Spring centers.
- If axle is supplied with a centering hole, the hole must be on top.
- Confirm that brake angle is correct. A rule of thumb is that the tire rotates the same direction as the cam.
- Ensure seals are installed and seated using the proper tool. Ensure tools are in good condition (no wear rings)
- Install lube to wheel ends using Strick / TMC recommended fill level.
- Adjust bearings to 0.001".

2. Suspensions

- Confirm that manufacturers recommended torque values are met.
- Confirm that the mounting height or ride height is correct.
- Confirm lock pins are engaged and release handle is locked properly.
- Confirm bogie rail clamps are installed and tightened to proper torque values.
- For air ride suspensions:
 - Confirm that air bags fill properly.
 - Ensure the height control valve works properly.
 - If equipped with a dump valve, confirm that the system dumps and that the height control valve works properly.
 - Ensure that the "anti-walk" devices such as, Sarclok and EDL, function per the manufacturer's recommendations.
 - Ensure all supplier installed components are set to proper torque and correctly installed.

3. Brake Systems

- Ensure that the system is free of leaks.
- Ensure that the valves work properly and that the ABS system is functioning per the manufacturer's recommendations.
- Confirm that the hoses and tubing are held firmly and separated sufficiently to prevent chaffing.
- Confirm that tubing and hoses are not kinked.
- Confirm that slack adjusters are installed and adjusted per the manufacturer's recommendations.
- Confirm air hose from trailer floor to front of bogie has ample clearance to clear front side of spring hangers during use of trailer.

4. Alignment

- Align spring and air suspensions to the manufacturer's recommendations.

Item #	Quality Item Checked	Wt of Insp	Inspection Results	Corrective Action Needed
1	Wheel Ends Torques and assembly			
2	Pro Torque Installation			
3	Roof Installation			
4	King Pin Welds			
5	Alignment			
6	Rear Frame Weld and Diagonal Measurement			
7	Oil Seal Installation			
8	Oil door adjustment			
9	Wheel and lubrication installation procedures and tire levels. TMC Recommended practices being followed.			
10	Air lines from floor to boogie			
11	Caulk of Front wall corner sheets and inside trailer			
12	Caulk of Bottom rail			
13	Caulking of corner casing			
14	Check customer unit numbers			
15	Check for light leaks			

16	Check tape installation in roof install			
17	Check rivet spacing on roof installation to not exceed 2 inch centers			
18	Check full door inst. for hanger proof process			
19	Torque Arm Bolt Torque			
20				
21				
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TMC Recommended Practice

RP 831A

VMRS 018

RECOMMENDATIONS FOR WHEEL END LUBRICATION

PREFACE

The following Recommended Practice is subject to the Disclaimer at the front of TMC's *Recommended Maintenance Practices Manual*. Users are urged to read the Disclaimer before considering adoption of any portion of this Recommended Practice.

PURPOSE AND SCOPE

The purpose of this Recommended Practice is to offer equipment users recommendations and operational considerations for selecting lubricants for use in wheel end applications.

This Recommended Practice applies to Class 3-8 trucks, buses, tractors, and trailers designed for on-highway applications.

This Recommended Practice applies to only "traditionally" equipped axles and hubs. This Recommended Practice defines "traditionally" equipped axles and hubs as wheel ends equipped with two single row, widespread, tapered roller bearing assemblies which are manually adjusted.

This Recommended Practice addresses two categories of wheel ends: driven and non-driven. Non-driven wheel ends include steer, dolly, trailer, pusher and tag axles. (See Figures 1 and 2).

The lubricant used in the wheel ends can be either *petroleum-based* or *synthetic-based* oils or greases.

REFERENCE

For additional information on wheel bearing adjustment, installation and maintenance, refer to TMC:

- RP 618, *Wheel Bearing Adjustment Procedures*.
- RP 622, *Wheel Seal and Bearing Removal, Installation, and Maintenance*.

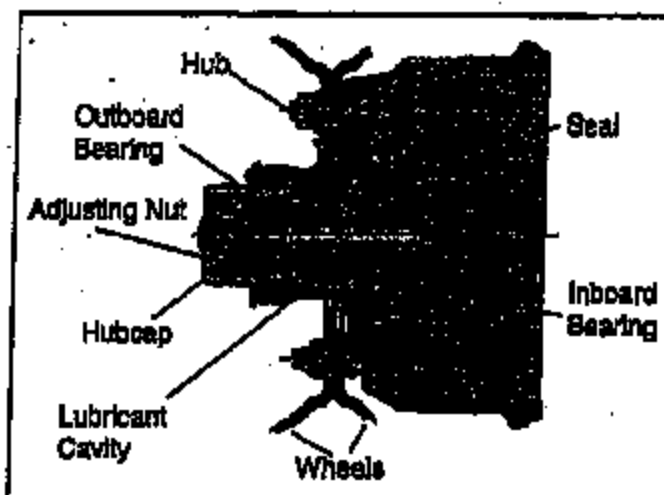


Fig. 1: Non-Drive Wheel End

Other relevant TMC Recommended Practices include:

- RP 624, *Lubricant Fundamentals*.
- RP 708, *Hubcap Standardization — Bolted-On Type*.

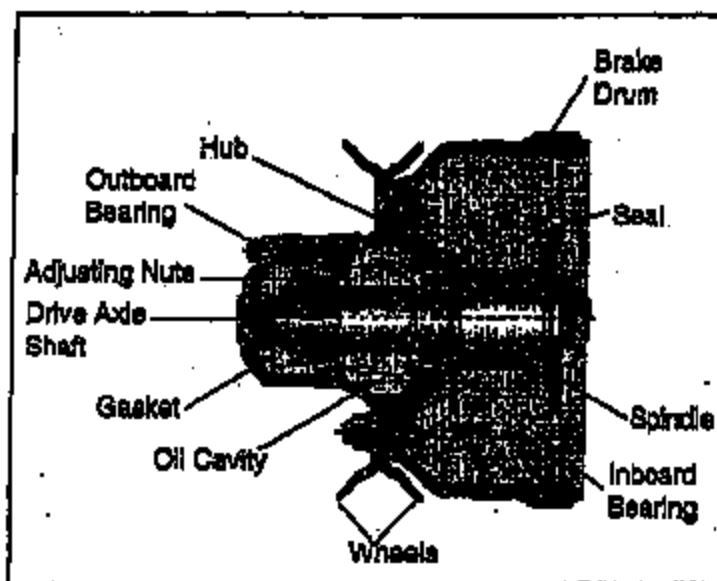


Fig. 2: Drive Axle Wheel End

Fleet managers should also reference original equipment manufacturer (OEM) maintenance and service manuals as appropriate.

NON-DRIVEN AXLE LUBRICANT CONSIDERATIONS

Non-driven wheel ends can be lubricated effectively with either oil or grease, depending on the fleet application. Both lubricating substances use oil as the lubricating medium. (Refer to RP 624, *Lubricant Fundamentals* for details.)

A. Non-Driven Oil-Lubricated Wheel Ends

Inspection and Preparation

Clean and inspect the wheel end components including all bearings, hubcaps, hub and bearing cups, axle spindle, and fasteners, removing all contaminants and lubricant residue. Replace seal, hubcap gasket, and all questionable parts. For detailed procedures, refer to TMC RP 622.

Component Lubrication

Pre-lubricate the inner and outer wheel bearing cones with clean lubricant of the same type used in the hub assembly.

CAUTION: Failure to lubricate bearing correctly, and maintain proper lubrication, may result in bearing damage. For additional information refer to TMC RP 618 and RP 622.

CAUTION: In oil bath systems, do not pack bearings with grease before installation. Grease will temporarily restrict or prevent the proper circulation of lubricant and may contribute to wheel seal failure.

Hub Fill Procedures: Oil

Install the wheel seals as documented in RP 622. Apply lubricant to the bearing journals and bearing cones. Use the same lubricant that will be used to lubricate the system. This will help inhibit fretting corrosion and make assembly easier. Use lifting equipment to align the hub assembly with the spindle taking care not to damage the seal and spindle threads. While the hub is supported/suspended, fill the hub cavity with clean oil and push the hub into position, or push the hub into position and then fill the hub cavity.

Install the outer bearing, and adjusting nut systems. Adjust wheel bearings using TMC RP 618 or OEM Maintenance Manual. Verify end play (0.001" to 0.005") with a dial indicator.

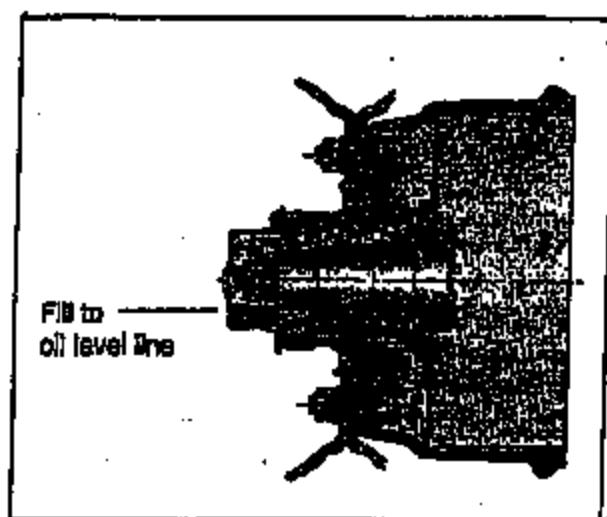


Fig. 3: Lubrication Fill Oil (Static)

Hubcap Considerations: Oil

Select the proper vented, bolt-on or threaded hubcap for the application and follow hubcap suppliers' instructions for proper attachment to the wheel hub. Fill wheel end assembly through the fill port with the same oil. Allow time for the oil to seep through the outer bearing and fill the hub cavity. Continue to add oil until the oil reaches the oil fill line as indicated on the hubcap. (See Figure 3.)

NOTE: For hubcaps with side fill plugs, do not allow the oil to go past the centerline or vent hole.

CAUTION: Overfilling or underfilling a wheel hub with lubricant may result in premature component failure.

Install center fill or side fill plug. Torque side fill plug to hubcap manufacturer's specifications. Clean-up any over spills that would give the appearance of a leaking hubcap.

B. Non-Driven Grease-Lubricated Wheel Ends

NOTE: Semi-fluid greases are NLGI 000 and 00. NLGI 0 is a soft grease. All three grades listed above are treated as semi-fluid greases in this RP. Hard greases are defined as NLGI 1, 2, and 3 consistencies in this RP.

Inspection and Preparation

Clean and inspect the wheel end components including all bearings, hubcaps, hub and bearing cups, axle spindle, and fasteners, removing all contaminants and lubricant residue. Replace seal, hubcap

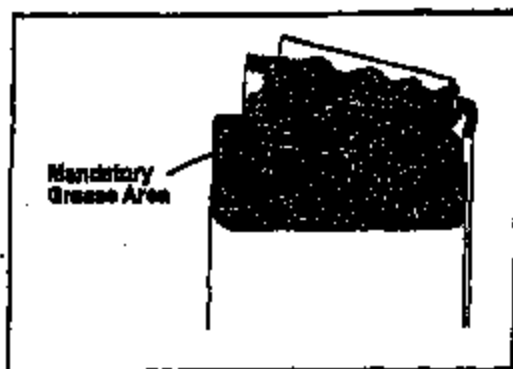


Fig. 4: Packing of Bearing Cone

gasket, and all questionable parts. For detailed procedures, refer to TMC RP 622.

NOTE: If retrofitting an oil or grease system with a semi-fluid grease, be sure to note the need for special cleaning instructions, fill procedures and equipment (i.e., vented hubcap).

Component Lubrication

Pack the inner and outer wheel bearing cones full with grease. Work the grease into the bearing in the direction of the arrow shown in Figure 4 by machine or hand such that the grease goes under the bearing cage toward the cone rib and roller ends.

For corrosion prevention, place a light film of grease on all metal components, including the hubcap. Wipe off the excess grease. Install the wheel seals as described in TMC RP 622.

CAUTION: Failure to lubricate bearing correctly and maintain proper lubrication may result in bearing damage. For detailed procedures, refer to TMC RP 618 and RP 622.

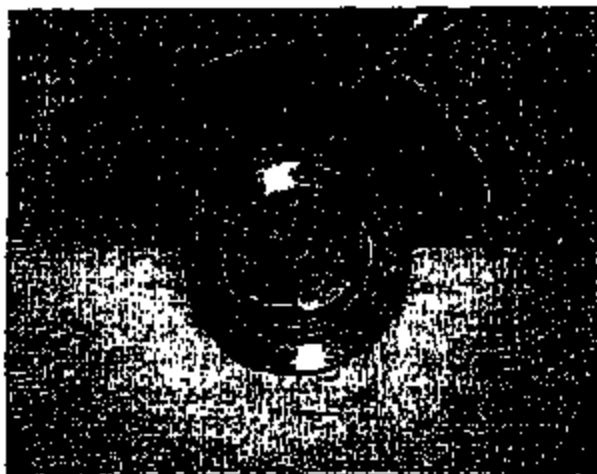


Fig. 5: Semi-Fluid Grease Top Off Procedure

WARNING: If grease packing is done by hand, appropriate protection — such as gloves and clothing — should be worn to minimize skin contact with the grease.

CAUTION: Overfilling or underfilling a wheel hub with lubricant may result in premature component failure.

Hub Fill Procedures: Semi-Fluid Grease

If tires are not mounted, install the hub on the spindle. Take care to not damage the seal. Use lifting equipment to align the hub assembly with the spindle taking care to not damage the seal and spindle threads and push the hub assembly into position.

With the hub supported, before installing the outer bearing cone, begin filling from the bottom of the hub cavity. Top-off by placing the pump nozzle above the spindle, and continue pumping grease into the hub cavity. (See Figure 5.)

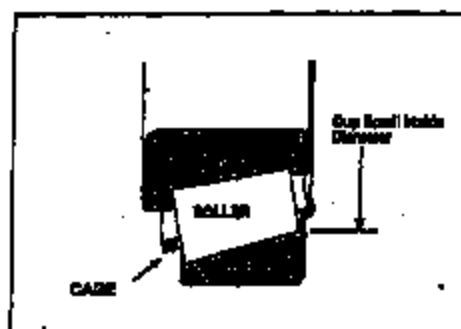


Fig. 5B: Tapered Bearing Nomenclature

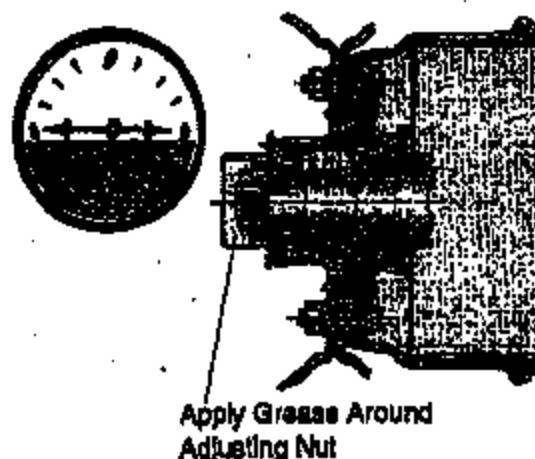
Fig 5A: Lubrication Fill
Semi-Fluid Grease (No. 00)



Fig. 5C: Using Template to Hold Lubricant

The grease fill amount should be to a 3 o'clock and 9 o'clock level. This represents 50 percent hub cavity fill. (See Figures 5A and 5B.)

NOTE: A template may be used to hold the lubricant in place while filling the hub cavity. (See Figures 5 and 5C.)

CAUTION: Make sure that there are no air-pockets trapped under the grease. If pumping equipment is used, ensure the pump does not aerate the grease. Aeration of the grease may result in underfilling.

Install the outer bearing, washers and adjusting nuts. Adjust wheel bearings per TMC's RP 618 or per OEM

Maintenance Manual. Verify end play (0.001" to 0.005") with a dial indicator. Before installing the hubcap, apply a coating of grease around the wheel bearing adjustment nut(s).

Hubcap Considerations: Semi-fluid Grease

Use an appropriate tamper-proof, vented hubcap. These hubcaps prevent gear oils from being accidentally added to grease-filled wheel ends.

NOTE: Because of the hubcap's special venting capability and the properties of the semi-fluid grease, do not fill the hubcap with grease.

NOTE: If a metal hub cap is used, it is necessary to coat the interior surfaces with a film of grease. Use special care not to cover the vent with grease.

Hub Fill Procedures: Hard Grease

Before installing the hub, pack grease into the hub cavity. Fill the circumference of the hub cavity using the bearing races as the proper level guide. (See Figure 5.)

Use lifting equipment to align the hub assembly with the spindle taking care to not damage the seal and spindle threads. Push the hub assembly into position.

Install the outer bearing, washers and adjusting nuts. Adjust wheel bearings per TMC's RP 618 or OEM Maintenance Manual. Verify end play (0.001" to

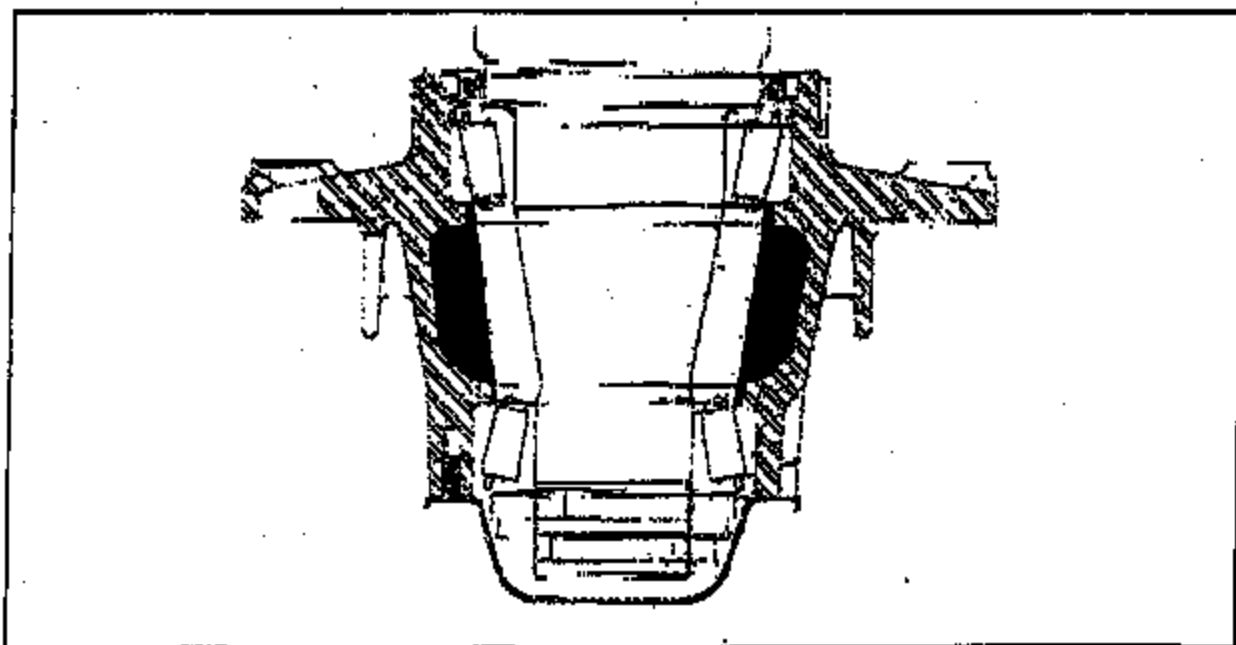


Fig. 6: Lubrication Fill Greases (Nos. 1, 2, & 3)

0.005") with a dial indicator. Apply a coating of grease around the adjusting nut(s).

Hubcap Considerations: Hard Grease

Use an appropriate tamper-proof, hubcap. These hubcaps prevent gear oils from being accidentally being added to grease-filled wheel ends. Follow the recommendation of the seal supplier to determine if the hubcap should be vented or non-vented.

NOTE: If a metal hub cap is used, it is necessary to coat the interior surfaces with a film of grease. Use special care not to cover the vent with grease.

DRIVEN AXLE LUBRICANT WHEEL END CONSIDERATIONS

NOTE: In this Recommended Practice, all driven axles are oil lubricated.

Inspection and Preparation

If the wheel end is disassembled, clean and inspect the wheel end components including all bearings, axle shafts, hub and bearing cups, axle, and fasteners, removing all contaminants and lubricant residue. Replace seal, axle flange gasket, and all questionable parts. For detail procedures, refer to TMC RP 622.

Component Lubrication

Pre-lubricate the inner and outer wheel bearing cones with clean lubricant of the same type used in the axle reservoir.

CAUTION: Failure to lubricate bearing correctly and maintain proper lubrication may result in bearing damage. For additional information refer to TMC RP 618 and RP 622.

CAUTION: In oil bath systems, do not pack bearings with grease before installation. Grease will temporarily restrict or prevent the proper circulation of lubricant and may contribute to wheel seal failure.

Hub Fill Procedures: Oil

Install the wheel seals, as documented in RP 622. Fill hub cavity with oil. Use lifting equipment to align the hub assembly with the spindle taking care to not damage the seal and spindle threads. Push the hub assembly into position.

While the hub is supported, fill the hub cavity with clean oil and push into position or push into position and then fill the hub cavity.

Install the outer bearing, washers and adjusting nuts. Adjust wheel bearings per TMC's RP 618 or OEM Maintenance Manual. Verify end play (0.001" to 0.005") with a dial indicator.

Install the flanged drive axle shaft with a new axle flange gasket. Torque flange nuts to axle manufacturer's specification. Clean-up any overspills that would give the appearance of a leaking system.

Oil is supplied directly to the wheel ends at assembly and through the axle tube during operation. To achieve final fill level, each end of the drive axle must be raised a minimum of eight inches for one minute to move the lubricant into the opposite wheel end. Recheck the main sump for the proper oil level and top off the lubricant level, if required. The oil fill level is always to the bottom of the fill plug or hole in the axle reservoir.

CAUTION: Do not pack the drive axle wheel bearings with grease when the wheel ends will be lubricated with oil from the axle differential. (See RP 622 and RP 618.)

NOTE: Always check the axle breather to be sure it is operating properly and completely free of dirt and debris.

MAINTENANCE AND INSPECTION REQUIREMENTS

The following inspection criteria are intended for units whose vocation is strictly on-highway use only. The inspection criteria are not intended for unitized or pre-set wheel ends, refer to systems manufacturer for inspection and service recommendations.

These recommendations depend on the proper assembly of the system, including the proper lubricant fill level.

A. OIL LUBRICATED WHEEL ENDS INSPECTION CRITERIA

Level 1—Simple Inspection (Pre-Trip/In-Service)
Walk around vehicle and check wheel ends for obvious signs of lubricant leakage, such as hubcap gasket and wheel seal areas, oil soaked brake linings. Check for broken or missing components. Any seepage is reason for further inspection and appropriate action.

Take appropriate action if leaks or oil soaked brake linings are noted.

NOTE FOR DRIVERS: After making an en route stop, walk around the unit and feel the hubs. If there is any significant differences in temperatures or excessive temperature, contact your maintenance department. When feeling hubs for temperature, seasonal influences should be taken into consideration.

If wheel-ends are equipped with a sight glass on the hubcaps, check to ensure the oil is at the proper fill level.

NOTE: Oil residue may be present at the vent area. This is an indicator that the system is venting properly. This should not be construed as system leakage.

Level 2—100,000 miles or Annual Inspection:
For non-driven axles check lubricant level and condition. If lubricant is contaminated replace old lubricant with the same type lubricant. If lubricant condition is good and level is low, fill to the proper level. Check for any signs of leakage at the seal or hubcap gasket areas. Check for oil soaked brake linings.

For driven axles, check for any signs of leakage at the seal or axle flange gasket areas. Also check for leaks at hub fill hole if so equipped. Check for oil soaked brake linings.

Take appropriate action if leaks or oil soaked brake linings are noted.

B. GREASE LUBRICATED WHEEL ENDS INSPECTION CRITERIA

Level 1—Simple Inspection (Pre-Trip/In-Service)
Walk around vehicle and check wheel-ends for obvious signs of lubricant leakage, such as hubcap gasket and wheel seal areas, grease soaked brake linings. Check for broken or missing components. Any seepage is reason for further inspection and appropriate action.

NOTE FOR DRIVERS: After making an en route stop, walk around the unit and feel the hubs. If there is any significant differences in temperatures or excessive temperature contact the maintenance department. When feeling hubs for temperature, seasonal influences should be taken into consideration.

Level 2—Detailed External Inspection (Conducted at PM or at least annually)
Check wheel-ends for obvious signs of lubricant leakage, such as hubcap gasket and wheel seal areas, grease soaked brake linings. Any seepage is

reason for further inspection and appropriate action.

Raise the vehicle and check for smooth rolling of wheels. Check for signs of excessive end play in the wheel-end. This does not include removal of the hub cap.

NOTE: Leaking grease may not spread over the hub and brake components as with hubs filled with oil. When inspecting for grease leaks the inspection must be done very carefully with the aid of a bright beam of light from a flashlight or droplight.

NOTE: Some grease seals will purge very small amounts of grease in normal operation.

If there is seepage around the hubcap flange area, take appropriate action to eliminate seepage as directed by your maintenance instructions.

If leakage in the seal area is found, remove the wheel end and replace the hubcap gasket, seal and lubricant. Inspect the spindle and bearings for damage and replace if needed. Anything abnormal requires Level 3 inspection.

CAUTION: A clogged vent can damage the wheel seal allowing internal pressure build up in the wheel end.

Level 3—Lube Level Inspection (Per OEM Recommendation)

When using grease in a wheel-end the only method to accurately check the lubricant level is by pulling the outer bearing. If using a hard grease, there is no need for a Level 3 inspection.

CAUTION: Failure to remove the outer bearing may provide a false lubricant level reading.

To verify proper lube level the following procedures need to be performed.

1. Before performing any maintenance on the vehicle take appropriate action to ensure the vehicle is safely secured.
2. Remove hubcap, hubcap gasket and inspect hubcap for adequate venting capabilities.
3. Verify wheel-bearing end play for conformance to RP 618.
4. Record end play measurements.

CAUTION: Apply the parking brake, if axle is equipped. This will ensure that the wheel/hub

assembly is supported and held steady during removal of the spindle nut and outer bearing. This will eliminate the possibility of spindle, bearing or seal damage due to the cocking or slipping of the wheel-hub assembly.

CAUTION: Care should be taken so the wheel-end assembly is properly supported.

5. Remove adjusting nuts.
6. Remove outer bearing.
7. While maintaining proper support to the wheel-end or hub, visually check lube level. In a semi-fluid grease system, if the lubricant flows out of the hub cavity, the hub cavity should be refilled to the 3 o'clock and 9 o'clock level. This represents 50 percent hub cavity fill. (See Figures 5 and 5A.)

In a semi-fluid grease system, if the grease doesn't flow, inspect lubricant condition in the hub cavity. Go to Level 4 inspection if abnormal conditions are noted. If no abnormal conditions are noted, add grease until it flows out of the hub cavity.

NOTE: If changing grease types or brands, contact your lubricant supplier to insure compatibility.

8. Clean bearing and inspect for wear and damage. When reassembling industry standard wheel-ends, assemble per RP 618.

NOTE: Manufacturer is defined as the final assembler of the product or the particular system supplier.

Level 4—Wheel-end Disassembly Inspection (Complete System Tear-down)

If any abnormal conditions are found during inspection Levels 1, 2, or 3, remove wheel-end for inspection.

Lube change intervals as determined by the manufacturer dictate when Level 4 service is performed.

NOTE: Manufacturer is defined as the final assembler of the product or the particular system supplier.

When reassembling industry standard wheel-ends, assemble per RP 622 and RP 618. Seals and gaskets must be replaced.

Failed Component Analysis

Save prematurely failed parts and lube samples for analysis. The lubricant sample collected should be at least four ounces. A similarly sized new lubricant sample (not previously used) is also required. This will aid in supplier assisted detection and prevention of premature failures. The components' history of usage should also be provided (i.e., vehicle's vocation, mileage, maintenance records, and history of inspection and repair/replacement of components such as seals, seal wear rings, lubricant, bearings, etc.).

OPERATIONAL CONSIDERATIONS FOR LUBRICANTS

Service interval ranges from 100,000 miles to five years in over-the-road service, depending on axle type, manufacturer recommendations, and lubricant performance. Mineral oil based lubricants have lower initial costs than synthetic lubricants, but need to be changed more frequently in some equipment. When choosing a lubricant, the fleet needs to consider:

- the manufacturer's recommendation for the axle make and model in service.
- the fleet savings associated with extended service intervals.
- the total cost of the lubricant.

NOTE: Because seal performance may vary when switching lubricants, consult your seal supplier for compatibility concerns.



'America's Premier Trailer Manufacturer'

Subject: EA03-022 Question # 6

Describe, in detail, the information Strick uses to train its employees in the installation of grease and/or lubrication in a wheel-end unit. Produce any and all documents related to such training, including but not limited to, written instructions, internal procedures guidelines, and reference manuals.

The Bogle Team Leader will give hands on training to all personnel in the work area for the installation of lubrication and the fill criteria. The following items are reviewed during training for each team member.

- a) Bogle Key Quality Items (copy attached)**
- b) TMC Recommended Practice (copy attached)**

I am the warranty Manager for Strick and conduct visual quality process inspection of this area during my visits to the plant. I am usually at the plant twice per month.

**Jerry Clontz
Strick Warranty Manager
PO Box 574
1012 South Skyland
MT. Pleasant NC 28124
Telephone (704) 436-2442**

We also have included this subject to be in our quarterly training done off site this year. The wheel-end unit will be a separate topic given by an outside supplier (Starn co) on June 17th.

Strick has a Key quality item check list that is review weekly by someone from our engineering department. A copy of this form is attached.

Bogie – Key Quality Items

1. Axles

- Confirm that seats/saddles are spaced apart properly. Spring centers.
- If axle is supplied with a centering hole, the hole must be on top.
- Confirm that brake angle is correct. A rule of thumb is that the tire rotates the same direction as cam.
- Ensure seals are installed and seated using the proper tool. Ensure tools are in good condition wear rings)
- Install lube to wheel ends using Strick / TMC recommended fill level.
- Adjust bearings to 0.001".

2. Suspensions

- Confirm that manufacturers recommended torque values are met.
- Confirm that the mounting height or ride height is correct.
- Confirm lock pins are engaged and release handle is locked properly.
- Confirm bogie rail clamps are installed and tightened to proper torque values.
- For air ride suspensions:
 - Confirm that air bags fill properly.
 - Ensure the height control valve works properly.
 - If equipped with a dump valve, confirm that the system dumps and that the height control valve works properly.
 - Ensure that the "anti-walk" devices such as Surelok and HDL, function per the manufacturer recommendations.
 - Ensure all supplier installed components are set to proper torque and correctly installed.

3. Brake Systems

- Ensure that the system is free of leaks.
- Ensure that the valves work properly and that the ABS system is functioning per the manufacturer recommendations.
- Confirm that the hoses and tubing are held firmly and separated sufficiently to prevent chaffing.
- Confirm that tubing and hoses are not kinked.
- Confirm that slack adjusters are installed and adjusted per the manufacturer's recommendations.
- Confirm air hose from trailer floor to front of bogie has ample clearance to clear front side of spring hangers during use of trailer.

4. Alignment

- Align spring and air suspensions to the manufacturer's recommendations.

TMC Recommended Practice

RP 831A

VMRS 018

RECOMMENDATIONS FOR WHEEL END LUBRICATION

PREFACE

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This Recommended Practice applies to only "traditionally" equipped axles and hubs. This Recommended Practice defines "traditionally" equipped axles and hubs as wheel ends equipped with two single row, widespread, tapered roller bearing assemblies which are manually adjusted.

This Recommended Practice addresses two categories of wheel ends: driven and non-driven. Non-driven wheel ends include steer, dolly, trailer, pusher and tag axles. (See Figures 1 and 2).

The lubricant used in the wheel ends can be either petroleum-based or synthetic-based oils or greases.

REFERENCE

For additional information on wheel bearing adjustment, installation and maintenance, refer to TMC:

- RP 818, *Wheel Bearing Adjustment Procedures*.
- RP 622, *Wheel Seal and Bearing Removal, Installation, and Maintenance*.

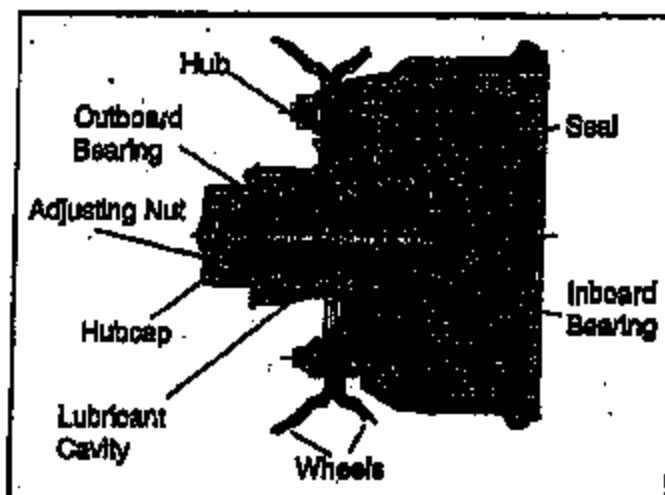


Fig. 1: Non-Drive Wheel End

Other relevant TMC Recommended Practices include:

- RP 824, *Lubricant Fundamentals*.
- RP 709, *Hubcap Standardization — Bolted-On Type*.

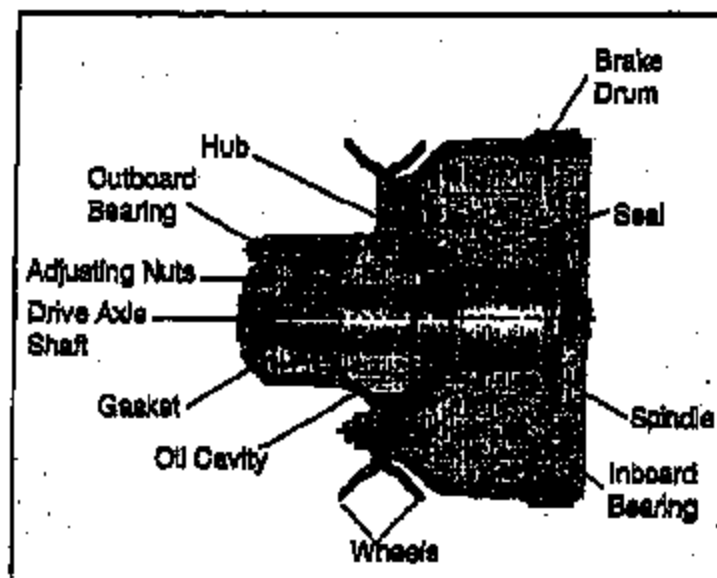


Fig. 2: Drive Axle Wheel End

Fleet managers should also reference original equipment manufacturer (OEM) maintenance and service manuals as appropriate.

NON-DRIVEN AXLE LUBRICANT CONSIDERATIONS

Non-driven wheel ends can be lubricated effectively with either oil or grease, depending on the fleet application. Both lubricating substances use oil as the lubricating medium. (Refer to RP 624, *Lubricant Fundamentals* for details.)

A. Non-Driven Oil-Lubricated Wheel Ends

Inspection and Preparation

Clean and inspect the wheel end components including all bearings, hubcaps, hub and bearing cups, axle spindle, and fasteners, removing all contaminants and lubricant residue. Replace seal, hubcap gasket, and all questionable parts. For detailed procedures, refer to TMC RP 622.

Component Lubrication

Pre-lubricate the inner and outer wheel bearing cones with clean lubricant of the same type used in the hub assembly.

CAUTION: Failure to lubricate bearing correctly, and maintain proper lubrication, may result in bearing damage. For additional information refer to TMC RP 618 and RP 622.

CAUTION: In oil bath systems, do not pack bearings with grease before installation. Grease will temporarily restrict or prevent the proper circulation of lubricant and may contribute to wheel seal failure.

Hub Fill Procedures: Oil

Install the wheel seals as documented in RP 622. Apply lubricant to the bearing journals and bearing cones. Use the same lubricant that will be used to lubricate the system. This will help inhibit fretting corrosion and make assembly easier. Use lifting equipment to align the hub assembly with the spindle taking care not to damage the seal and spindle threads. While the hub is supported/suspended, fill the hub cavity with clean oil and push the hub into position, or push the hub into position and then fill the hub cavity.

Install the outer bearing, and adjusting nut systems. Adjust wheel bearings using TMC RP 618 or OEM Maintenance Manual. Verify end play (0.001" to 0.005") with a dial indicator.

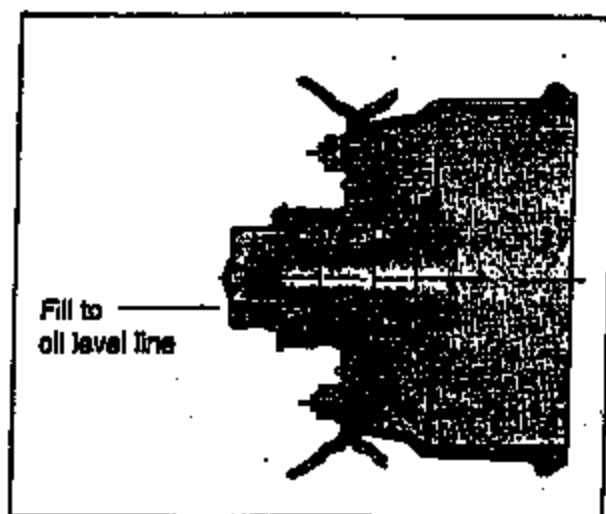


Fig. 3: Lubrication Fill Oil (Static)

Hubcap Considerations: Oil

Select the proper vented, bolt-on or threaded hubcap for the application and follow hubcap suppliers' instructions for proper attachment to the wheel hub. Fill wheel end assembly through the fill port with the same oil. Allow time for the oil to seep through the outer bearing and fill the hub cavity. Continue to add oil until the oil reaches the oil fill line as indicated on the hubcap. (See Figure 3.)

NOTE: For hubcaps with side fill plugs, do not allow the oil to go past the centerline or vent hole.

CAUTION: Overfilling or underfilling a wheel hub with lubricant may result in premature component failure.

Install center fill or side fill plug. Torque side fill plug to hubcap manufacturer's specifications. Clean-up any over spills that would give the appearance of a leaking hubcap.

B. Non-Driven Grease-Lubricated Wheel Ends

NOTE: Semi-fluid greases are NLGI 000 and 00. NLGI 0 is a soft grease. All three grades listed above are treated as semi-fluid greases in this RP. Hard greases are defined as NLGI 1, 2, and 3 consistencies in this RP.

Inspection and Preparation

Clean and inspect the wheel end components including all bearings, hubcaps, hub and bearing cups, axle spindle, and fasteners, removing all contaminants and lubricant residue. Replace seal, hubcap

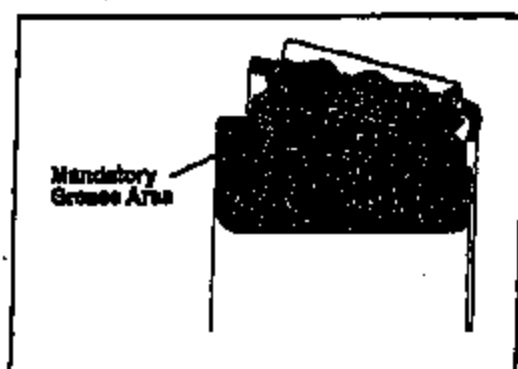


Fig. 4: Packing of Bearing Cone

gasket, and all questionable parts. For detailed procedures, refer to TMC RP 622.

NOTE: If retrofitting an oil or grease system with a semi-fluid grease, be sure to note the need for special cleaning instructions, fill procedures and equipment (i.e., vented hubcap).

Component Lubrication

Pack the inner and outer wheel bearing cones full with grease. Work the grease into the bearing in the direction of the arrow shown in Figure 4 by machine or hand such that the grease goes under the bearing cage toward the cone rib and roller ends.

For corrosion prevention, place a light film of grease on all metal components, including the hubcap. Wipe off the excess grease. Install the wheel seals as described in TMC RP 622.

CAUTION: Failure to lubricate bearing correctly and maintain proper lubrication may result in bearing damage. For detailed procedures, refer to TMC RP 618 and RP 622.

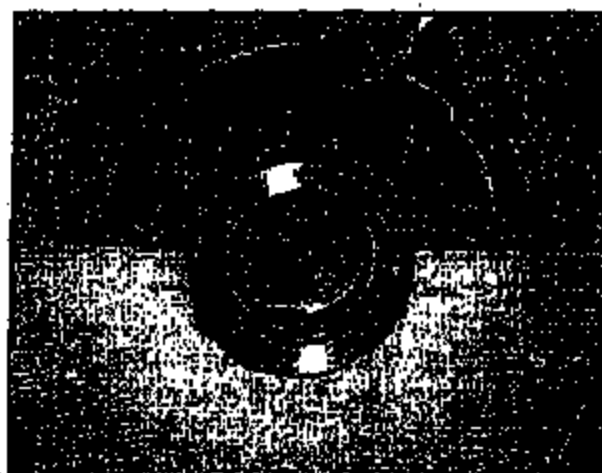


Fig. 5: Semi-Fluid Grease Top Off Procedure

WARNING: If grease packing is done by hand, appropriate protection — such as gloves and clothing — should be worn to minimize skin contact with the grease.

CAUTION: Overfilling or underfilling a wheel hub with lubricant may result in premature component failure.

Hub Fill Procedure: Semi-fluid Grease

If tires are not mounted, install the hub on the spindle. Take care to not damage the seal. Use lifting equipment to align the hub assembly with the spindle taking care to not damage the seal and spindle threads and push the hub assembly into position.

With the hub supported, before installing the outer bearing cone, begin filling from the bottom of the hub cavity. Top-off by placing the pump nozzle above the spindle, and continue pumping grease into the hub cavity. (See Figure 5.)

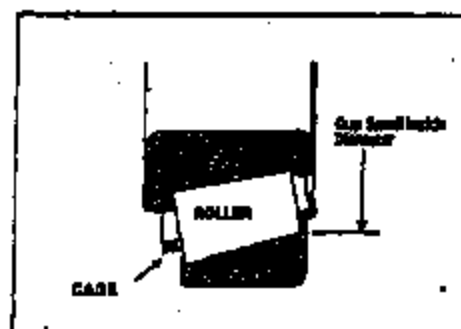
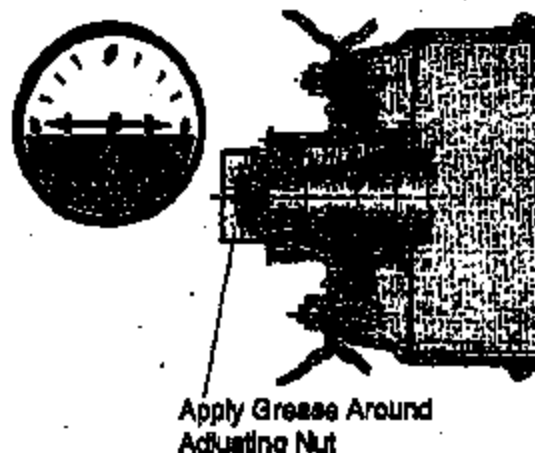


Fig. 5B: Tapered Bearing Nomenclature

Fig 5A: Lubrication Fill
Semi-Fluid Grease (No. 00)

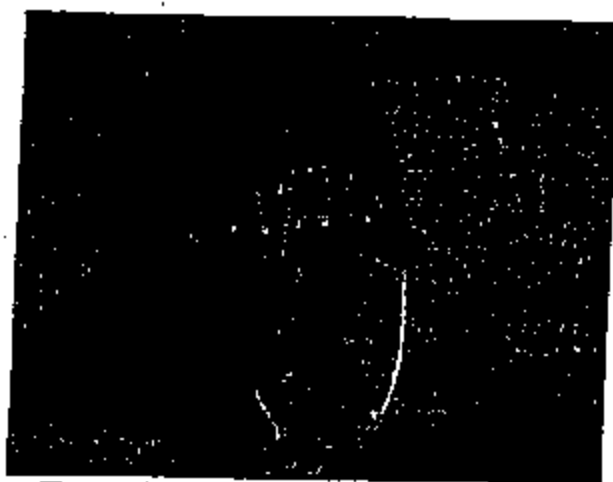


Fig. 5C: Using Template to Hold Lubricant

The grease fill amount should be to a 3 o'clock and 9 o'clock level. This represents 50 percent hub cavity fill. (See Figures 5A and 5B.)

NOTE: A template may be used to hold the lubricant in place while filling the hub cavity. (See Figures 5 and 5C.)

CAUTION: Make sure that there are no air-pockets trapped under the grease. If pumping equipment is used, ensure the pump does not aerate the grease. Aeration of the grease may result in underfilling.

Install the outer bearing, washers and adjusting nuts. Adjust wheel bearings per TMC's RP 618 or per OEM

Maintenance Manual. Verify end play (0.001" to 0.005") with a dial indicator. Before installing the hubcap, apply a coating of grease around the wheel bearing adjustment nut(s).

Hubcap Considerations: Semi-fluid Grease
Use an appropriate tamper-proof, vented hubcap. These hubcaps prevent gear oils from being accidentally added to grease-filled wheel ends.

NOTE: Because of the hubcap's special venting capability and the properties of the semi-fluid grease, do not fill the hubcap with grease.

NOTE: If a metal hub cap is used, it is necessary to coat the interior surfaces with a film of grease. Use special care not to cover the vent with grease.

Hub Fill Procedures: Hard Grease
Before installing the hub, pack grease into the hub cavity. Fill the circumference of the hub cavity using the bearing races as the proper level guide. (See Figure 6.)

Use lifting equipment to align the hub assembly with the spindle taking care to not damage the seal and spindle threads. Push the hub assembly into position.

Install the outer bearing, washers and adjusting nuts. Adjust wheel bearings per TMC's RP 618 or OEM Maintenance Manual. Verify end play (0.001" to

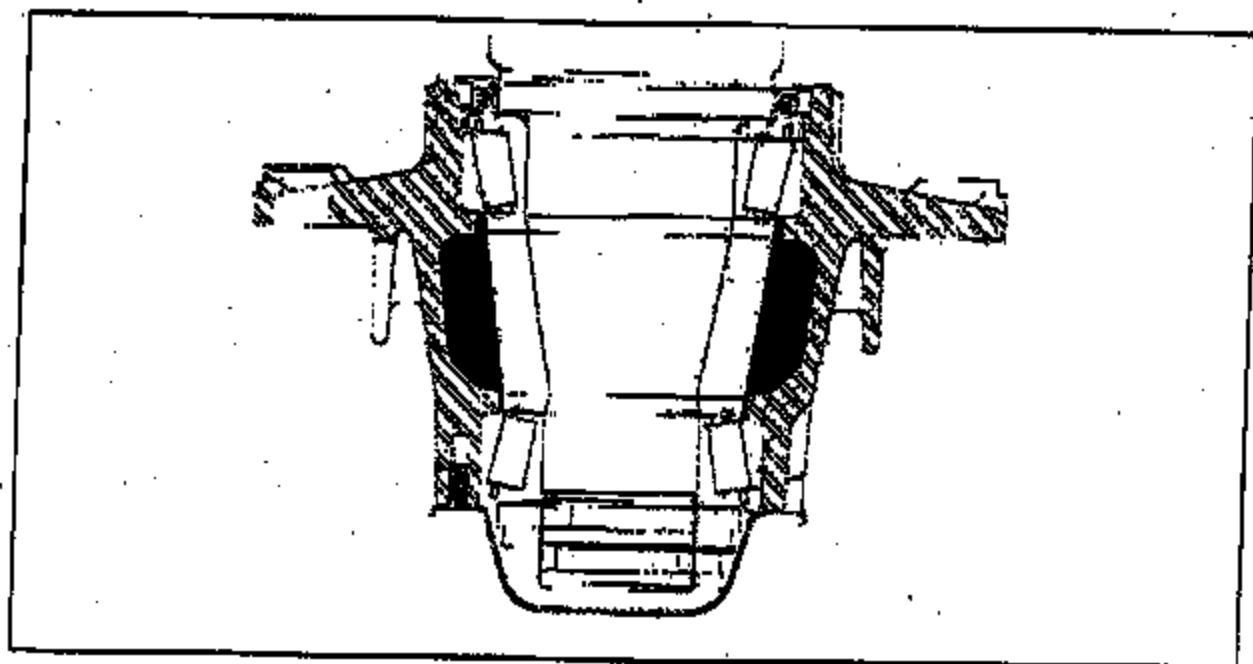


Fig. 6: Lubrication Fill Greases (Nos. 1, 2, & 3)

0.005") with a dial indicator. Apply a coating of grease around the adjusting nut(s).

Hubcap Considerations: Hard Grease

Use an appropriate tamper-proof, hubcap. These hubcaps prevent gear oils from being accidentally being added to grease-filled wheel ends. Follow the recommendation of the seal supplier to determine if the hubcap should be vented or non-vented.

NOTE: If a metal hub cap is used, it is necessary to coat the interior surfaces with a film of grease. Use special care not to cover the vent with grease.

DRIVEN AXLE LUBRICANT WHEEL END CONSIDERATIONS

NOTE: In this Recommended Practice, all driven axles are oil lubricated.

Inspection and Preparation

If the wheel end is disassembled, clean and inspect the wheel end components including all bearings, axle shafts, hub and bearing cups, axle, and fasteners, removing all contaminants and lubricant residue. Replace seal, axle flange gasket, and all questionable parts. For detail procedures, refer to TMC RP 822.

Component Lubrication

Pre-lubricate the inner and outer wheel bearing cones with clean lubricant of the same type used in the axle reservoir.

CAUTION: Failure to lubricate bearing correctly and maintain proper lubrication may result in bearing damage. For additional information refer to TMC RP 618 and RP 822.

CAUTION: In oil bath systems, do not pack bearings with grease before installation. Grease will temporarily restrict or prevent the proper circulation of lubricant and may contribute to wheel seal failure.

Hub Fill Procedures: Oil

Install the wheel seals, as documented in RP 822. Fill hub cavity with oil. Use lifting equipment to align the hub assembly with the spindle taking care to not damage the seal and spindle threads. Push the hub assembly into position.

While the hub is supported, fill the hub cavity with clean oil and push into position or push into position and then fill the hub cavity.

Install the outer bearing, washers and adjusting nuts. Adjust wheel bearings per TMC's RP 618 or OEM Maintenance Manual. Verify end play (0.001" to 0.005") with a dial indicator.

Install the flanged drive axle shaft with a new axle flange gasket. Torque flange nuts to axle manufacturer's specification. Clean up any over spills that would give the appearance of a leaking system.

Oil is supplied directly to the wheel ends at assembly and through the axle tube during operation. To achieve final fill level, each end of the drive axle must be raised a minimum of eight inches for one minute to move the lubricant into the opposite wheel end. Recheck the main sump for the proper oil level and top off the lubricant level, if required. The oil fill level is always to the bottom of the fill plug or hole in the axle reservoir.

CAUTION: Do not pack the drive axle wheel bearings with grease when the wheel ends will be lubricated with oil from the axle differential. (See RP 822 and RP 618.)

NOTE: Always check the axle breather to be sure it is operating properly and completely free of dirt and debris.

MAINTENANCE AND INSPECTION REQUIREMENTS

The following inspection criteria are intended for units whose vocation is strictly on-highway use only. The inspection criteria are not intended for unitized or pre-set wheel ends, refer to systems manufacturer for inspection and service recommendations.

These recommendations depend on the proper assembly of the system, including the proper lubricant fill level.

A. OIL LUBRICATED WHEEL ENDS INSPECTION CRITERIA

Level 1—Simple Inspection (Pre-Trip/In-Service)
Walk around vehicle and check wheel ends for obvious signs of lubricant leakage, such as hubcap gasket and wheel seal areas, oil soaked brake linings. Check for broken or missing components. Any seepage is reason for further inspection and appropriate action.

Take appropriate action if leaks or oil soaked brake linings are noted.

NOTE FOR DRIVERS: After making an en route stop, walk around the unit and feel the hubs. If there is any significant differences in temperatures or excessive temperature, contact your maintenance department. When feeling hubs for temperature, seasonal influences should be taken into consideration.

If wheel-ends are equipped with a sight glass on the hubcaps, check to ensure the oil is at the proper fill level.

NOTE: Oil residue may be present at the vent area. This is an indicator that the system is venting properly. This should not be construed as system leakage.

Level 2—100,000 miles or Annual Inspection:
For non-driven axles check lubricant level and condition. If lubricant is contaminated replace old lubricant with the same type lubricant. If lubricant condition is good and level is low, fill to the proper level. Check for any signs of leakage at the seal or hubcap gasket areas. Check for oil soaked brake linings.

For driven axles, check for any signs of leakage at the seal or axle flange gasket areas. Also check for leaks at hub fill hole if so equipped. Check for oil soaked brake linings.

Take appropriate action if leaks or oil soaked brake linings are noted.

B. GREASE LUBRICATED WHEEL ENDS INSPECTION CRITERIA

Level 1—Simple Inspection (Pre-Trip/In-Service)
Walk around vehicle and check wheel-ends for obvious signs of lubricant leakage, such as hubcap gasket and wheel seal areas, grease soaked brake linings. Check for broken or missing components. Any seepage is reason for further inspection and appropriate action.

NOTE FOR DRIVERS: After making an en route stop, walk around the unit and feel the hubs. If there is any significant differences in temperatures or excessive temperature contact the maintenance department. When feeling hubs for temperature, seasonal influences should be taken into consideration.

Level 2—Detailed External Inspection
(Conducted at PM or at least annually)
Check wheel-ends for obvious signs of lubricant leakage, such as hubcap gasket and wheel seal areas, grease soaked brake linings. Any seepage is

reason for further inspection and appropriate action.

Raise the vehicle and check for smooth rolling of wheels. Check for signs of excessive end play in the wheel-end. This does not include removal of the hub cap.

NOTE: Leaking grease may not spread over the hub and brake components as with hubs filled with oil. When inspecting for grease leaks the inspection must be done very carefully with the aid of a bright beam of light from a flashlight or drop light.

NOTE: Some grease seals will purge very small amounts of grease in normal operation.

If there is seepage around the hubcap flange area, take appropriate action to eliminate seepage as directed by your maintenance instructions.

If leakage in the seal area is found, remove the wheel end and replace the hubcap gasket, seal and lubricant. Inspect the spindle and bearings for damage and replace if needed. Anything abnormal requires Level 3 inspection.

CAUTION: A clogged vent can damage the wheel seal allowing internal pressure build up in the wheel end.

Level 3—Lube Level Inspection (Per OEM Recommendation)

When using grease in a wheel-end the only method to accurately check the lubricant level is by pulling the outer bearing. If using a hard grease, there is no need for a Level 3 inspection.

CAUTION: Failure to remove the outer bearing may provide a false lubricant level reading.

To verify proper lube level the following procedures need to be performed.

1. Before performing any maintenance on the vehicle take appropriate action to ensure the vehicle is safely secured.
2. Remove hubcap, hubcap gasket and inspect hubcap for adequate venting capabilities.
3. Verify wheel-bearing end play for conformance to RP 615.
4. Record end play measurements.

CAUTION: Apply the parking brake, if axle is equipped. This will ensure that the wheel/hub

assembly is supported and held steady during removal of the spindle nut and outer bearing. This will eliminate the possibility of spindle, bearing or seal damage due to the cocking or slipping of the wheel-hub assembly.

CAUTION: Care should be taken so the wheel-end assembly is properly supported.

5. Remove adjusting nuts.
6. Remove outer bearing.
7. While maintaining proper support to the wheel-end or hub, visually check lube level. In a semi-fluid grease system, if the lubricant flows out of the hub cavity, the hub cavity should be refilled to the 3 o'clock and 9 o'clock level. This represents 50 percent hub cavity fill. (See Figures 5 and 5A.)

In a semi-fluid grease system, if the grease doesn't flow, inspect lubricant condition in the hub cavity. Go to Level 4 Inspection if abnormal conditions are noted. If no abnormal conditions are noted, add grease until it flows out of the hub cavity.

NOTE: If changing grease types or brands, contact your lubricant supplier to insure compatibility.

8. Clean bearing and inspect for wear and damage. When reassembling industry standard wheel-ends, assemble per RP 818.

NOTE: Manufacturer is defined as the final assembler of the product or the particular system supplier.

Level 4—Wheel-end Disassembly Inspection (Complete System Tear-down)

If any abnormal conditions are found during inspection Levels 1, 2, or 3, remove wheel-end for inspection.

Lube change intervals as determined by the manufacturer dictate when Level 4 service is performed.

NOTE: Manufacturer is defined as the final assembler of the product or the particular system supplier.

When reassembling industry standard wheel-ends, assemble per RP 822 and RP 818. Seals and gaskets must be replaced.

Failed Component Analysis

Save prematurely failed parts and lube samples for analysis. The lubricant sample collected should be at least four ounces. A similarly sized new lubricant sample (not previously used) is also required. This will aid in supplier assisted detection and prevention of premature failures. The components' history of usage should also be provided (i.e., vehicle's vocation, mileage, maintenance records, and history of inspection and repair/replacement of components such as seals, seal wear rings, lubricant, bearings, etc.).

OPERATIONAL CONSIDERATIONS FOR LUBRICANTS

Service interval ranges from 100,000 miles to five years in over-the-road service, depending on axle type, manufacturer recommendations, and lubricant performance. Mineral oil based lubricants have lower initial costs than synthetic lubricants, but need to be changed more frequently in some equipment. When choosing a lubricant, the fleet needs to consider:

- the manufacturer's recommendation for the axle make and model in service.
- the fleet savings associated with extended service intervals.
- the total cost of the lubricant.

NOTE: Because seal performance may vary when switching lubricants, consult your seal supplier for compatibility concerns.

Item #	Quality Item Checked	Wk of Insp	Inspection Results	Corrective Action Needed
1	Wheel Ends Torques and assembly			
2	Pro Torque Installation			
3	Roof Installation			
4	King Pin Welds			
5	Alignment			
6	Rear Frame Weld and Diagonal Measurement			
7	Oil Seal Installation			
8	Oil door adjustment			
9	Wheel-end lubrication Installation procedures and fill levels. TMC Recommended practices being followed.			
10	Air lines from floor to bogie			
11	Caulk of Front wall corner sheets and inside trailer			
12	Caulk of Bottom rail			
13	Caulking of corner casting			
14	Check customer unit numbers			
15	Check for light leaks			

16	Check tape installation in roof install			
17	Check rivet spacing on roof installation to not exceed 2 inch centers			
18	Check full door inst. for tamper proof process			
19	Torque Arm Bolt Torque			
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"America's Premier Trailer Manufacturer"

Subject: EA03-022 Question # 7

Describe, in detail, Strick's current installation procedures/methods for lubricating wheel-end units with Mobilith SHC 007. Identify the current wheel-end lubrication fill criteria, used by Strick, for Mobilith SHC 007. What percentage of the wheel-end hub cavity is filled with Mobilith SHC 007 by Strick (i.e., fifty percent of the wheel-end hub cavity is filled with Mobilith SHC 007)? Are the installation procedures and quantity of lubrication used, different when Strick installs Chevron, Kendall, Texaco or other types of grease into a wheel-end unit? If so, describe Strick's current installation procedures/methods and fill criteria for lubricating wheel-end units with each of the other grease types.

The current installation procedure for lubricating wheel-ends with Mobilith SHC 007 is as follows: The inner and outer bearings are packed with Mobilith SHC 007 lubrication then installed into the hub races. Depending on the brand seal the inner bearing is either installed in the hub bore or on the axle spindle. The hub is then aligned and slid onto the axle spindle. The gage is inserted over the face of the hub opening and the hub cavity is filled with the Mobilith SHC 007 to 3 o'clock and 9 o'clock for a 50% fill level of the hub cavity.

The installation procedures and quantity (50% fill level) of grease used is the same for Chevron, Kendall, Texaco or any other brand of grease used in the Strick plant. Installation procedures and quantity of our fill level of grease is determined by the construction and configuration of the equipment and parts and components thereof so as to conform with the applicable TMC Recommended Practice.



"America's Premier Trailer Manufacturer"

Subject: EA03-022 Question # 8

Strick's June 6, 1998 letter (copy attached) to its customers regarding Mobilith SHC 007. Paragraph 3 states,

"While we want to attempt to meet the requirements of our customers and recognize that changes can be positive, we do not recommend and have not recommended grease as a wheel-end lubricant in the production of new trailers. We recommend 90-weight gear oil for wheel-end lubrication which is the Strick standard and has been for many years. In view of the growing evidence that Mobilith SHC 007 will not meet our customer's expectations, if you wish us to continue to use this product, or other synthetic lubricants, on new production, we will need written direction from you as to how much lubrication to install. We do not want to hold ourselves out as experts."

Explain why Strick continues to use Mobilith SHC 007 grease for its wheel-ends after finding that the grease will not meet its customer's expectations. What changes have you implemented to prevent failures, which in the past resulted in wheel separations and wheel-end fires?

The industry has received recommended proper procedures to follow when using grease filled wheel-ends from the TMC. These recommendations resulted in modifications in the maintenance procedures to be utilized for the inspection of grease filled wheel ends. At the time that Mobilith SHC 007 was first introduced to the industry, the supplier of that product claimed that it could be utilized in a maintenance free fashion for a five year period. Thus, equipment operators were apparently led to believe that the product could be utilized free of maintenance for five years. That supplier now apparently agrees with the recommendation of the TMC that wheel ends must be opened up and inspected for lubrication levels once a year or 100 K. miles, whichever comes first. Strick adheres to the recommended TMC procedures and informs its customers that grease filled wheel-ends are not maintenance free. Strick builds equipment to conform with the specifications determined and agreed to by the buyer which includes the type of lubrication to be utilized in the process. Strick assembles the wheel-end components to the industry standards and follows the recommended practice for wheel-end lubrication from TMC when filling the wheel-ends with lubrication. Strick uses gauges and pumps to confirm that we are achieving the required 50% fill level.


STRICK CORPORATION
STRICK FINANCE CO.

225 Lincoln Highway
 Fairless Hills
 Pennsylvania, USA
 19030-0009
 215.949.1600

Dear Valued Customer:

In the past few months, several of our customers have reported unexpected problems with wheel ends using Mobilith SHC007 synthetic grease. We have become aware of instances where an inadequate amount of grease reaching the bearings has apparently led to bearing failure. The purpose of this letter is to share some information with you and to request your attention to this matter in order to prevent problems with your wheel ends.

1. When the matter was first brought to our attention we reviewed our processes to confirm that we have been installing a consistent amount of grease in accordance with the manufacturer's recommendations. Our review disclosed that we have at least eight different documents on file from Mobil each of which has slightly different instructions. In view of this, while we believe that we have followed the manufacturer's recommendations, we must note that these recommendations have changed over time. We also wish to note that our standard axle manufacturer has different installation instructions than Mobil recommends.
2. In the course of investigating this situation, we came to understand that some customers have not been checking lubricant levels in their wheel ends. We want to advise you that Mobil has now published service and inspection intervals and procedures for wheel ends using their product that must be followed. We understand that they require inspection about every 100,000 miles. We also note that there is evidence that some components of the product dissipate to some degree.
3. While we want to attempt to meet the requirements of our customers and recognize that changes can be positive, we do not recommend and have not recommended grease as a wheel end lubricant in the production of new trailers. We recommend 90 weight gear oil for wheel end lubrication, which is the Strick standard and has been for many years. In view of the growing evidence that Mobilith SHC 007 will not meet our customer's expectations, if you wish us to continue to use this product or other synthetic lubricants, on new production we will need written direction from you as to how much lubrication to install. We do not want to hold ourselves out as experts.

We intend to continue to support all our customers' efforts to learn more about this and other new lubrication products that are available on the market. If you have comments or questions regarding this issue please let us know and we will try to help you find expert answers.

Sincerely,

Ronald L. Zubko

Ronald L. Zubko

WAN DIVISION

1 North Park Street
 Monroe, Indiana
 46772-0277
 215.952.4121
 or 215.972.6622



"America's Premier Trailer Manufacturer"

Subject: EA03-022 Question # 9

Transport America purchased 255 trailers (Strick's order number 20MO6926B) from Strick. Strick built these trailers during the period of April 1999 to June 1999. State the wheel-end lubrication and the lubrication fill criteria used by Strick to lubricate the individual wheel-end units of those trailers. How does it differ from the Estes trailers included in invoice #775762?

Transport America specified the installation of Mobilith SHC 007 grease. This required 2 lbs. of grease to fill each wheel-end to the 50 % fill level. The Transport America trailers were mfg. with TN (Tapered) style axle ends.

The Estes trailers used Texaco grease. It took 2.5 lbs. of grease to fill each wheel-end to the 50 % fill level. The Estes trailers were mfg. With TP (parallel) style axle ends as specified.

The quantity of grease required to meet the TMC recommendations for filled level vary depending on the type of equipment and construction of the components.



"America's Premier Trailer Manufacturer"

Subject: EA03-022 Question # 10

When the Estes invoice #775762 was paid, were other owners of trailers built in that same time era notified of a possible low fill condition, that could result in a premature failure, possibly resulting in a wheel separation or a wheel-end fire?

Estes invoice #775762 reflects a sales concession made to Estes in order to assist that customer in changing the brand of grease on the particular vehicles involved. During maintenance inspections it was revealed that the wheel-end grease level was low on a number of vehicles. This low fill condition was not shown to have been caused or originated by or during the original installation of lubrication at the time of the manufacturing process. While there were low levels of grease found in some of the wheel hubs, it was also found upon installation of replacement grease that there were leaking oil seals.

Other owners were not notified as the presence of leaking oil seals should be apparent upon normal and regular inspections which should occur if the equipment was properly maintained.



Strick's Service, Training, and Support

Subject: EA03-022 Question #11

Provide a dated copy of Strick's record retention policy relative to warranty, customer/fleet complaints, product/process testing, plant production, plant maintenance, and production materials.

See attached.

Record Retention Guidelines

Minimum 1 year	(after resolution) Records of complaints and legal actions
Minimum 2 years	Time cards, schedules, pay rates and other basic earnings records
Minimum 3 years	Expired insurance policies and personnel records of terminated employees
Minimum 4 years	Former employees' names, addresses and social security numbers
Minimum 5 years	Documents related to job related injuries and illnesses
Minimum 6 years	Attendance records, computer records
Minimum 7 years	Expired contracts, vendor invoices, vacation and sick leave records, cancelled stock and bond certificates, tax records, accounting records, payroll records, human resources records
Minimum 10 years	State income/franchise tax returns, federal income tax workpapers, state income tax workpapers
Permanent	Legal documents, litigation, and related correspondence; insurance records; federal tax returns, sales orders



"America's Premier Trailer Manufacturer"

Subject: EA03-022 Question # 12

Provide Strick's assessment of the alleged defect (i.e., wheel separations, wheel-end unit fires), including:

- a. the causal or contributory factor(s);
 - b. the failure mechanism(s);
 - c. the failure mode(s);
 - d. the risk to motor vehicle safety that it poses;
 - e. what warning sign(s), if any, would the operator of a subject vehicle have; and
 - f. what warning sign(s), if any, would other vehicles, when operating in the vicinity of a subject vehicle, have when the wheel-end unit of the subject vehicle was about to fail?
-
- a) The contributing factor/s are not enough lubrication remaining in the hub to properly lubricate the bearing surface.
 - b) The failure mechanism could well result from improper inspections or failure to conduct inspections as required of wheel-ends to maintain appropriate lubrication levels. Oil seals which leak and are not detected as a result of the lack of maintenance and accompanying inspections could lead to failure.
 - c) Leaking seals are to be expected and anticipated while equipment is in service. Accordingly, if not properly serviced, grease levels become very low and will not properly lubricate the bearings as required.
 - d) Improperly lubricated wheel-ends can cause bearing failure and a possible wheel-end separation from the axle.
 - e) A warning sign would be leaking seals, and during the annual or 100 K mile inspection of the wheel-ends or the presence of low grease levels upon removing the outer bearing for inspection.
 - f) Warning signs for other vehicles when operating in the vicinity would be possible smoke coming from the over heated wheel-end. They may detect wobble or signs of the wheel-end being loose.