

Spicer® Drive Axles

SPICER®



Service Manual

Spicer® Drive Axles

AXSM-0050

September 2007

GdJWf® Wheel Reduction Axle Service and Maintenance Instructions

Introduction

Dana Corporation, Axle & Brake Division, presents this publication to aid in maintenance and overhaul of Spicer WheelReduction drive axles.

This manual covers the nine axle models listed to the right. Their design is generally common, with differences in load capacity. Capacity variations are achieved by combining basic differential carrier assemblies in different axle housings, axle shafts and hub reduction equipment.

The majority of the instructions in this manual relate only to the wheel hub. For instructions concerning non-hub components, it may be necessary to reference additional service manuals.

For driveline information or axle mounting, refer to vehicle manufacturer's literature.

Model No.

WR3

WR3N

WR3D

WR5

WR5D

WR7

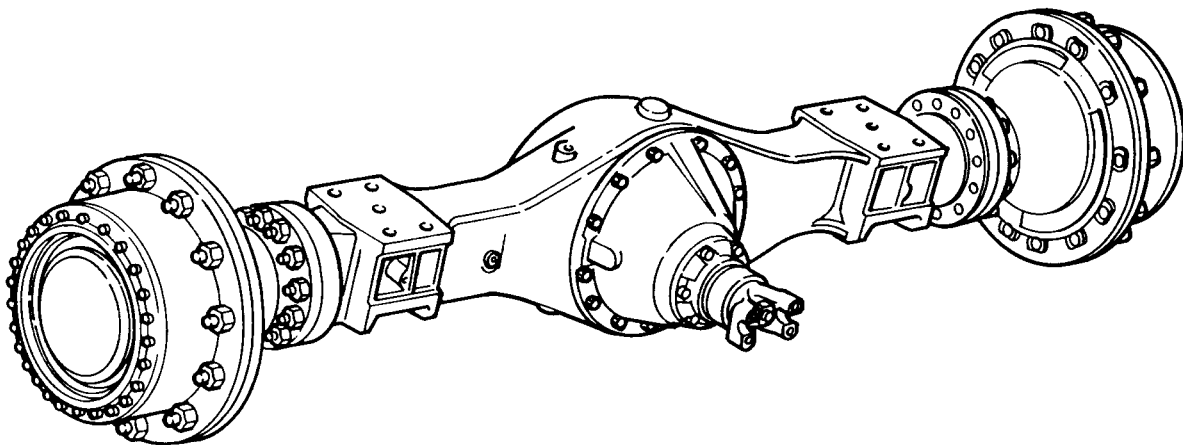
WR7D

WR10

WR10D

WR12

WR12D



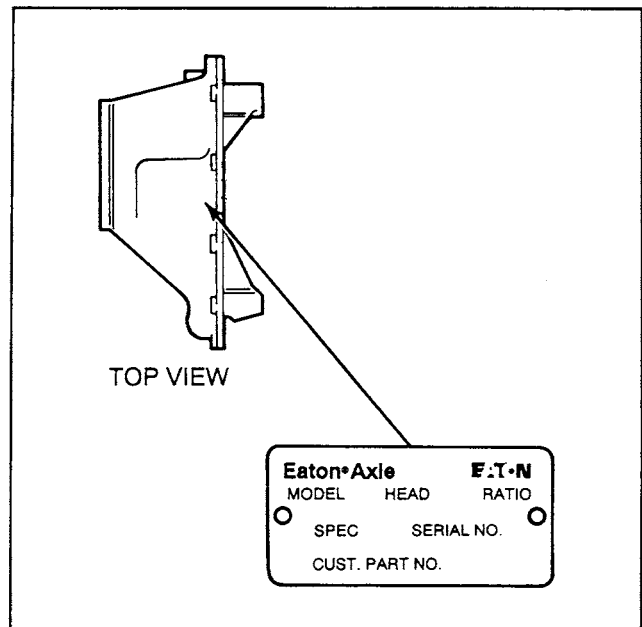
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GdJWf® Wheel Reduction Axle Service and Maintenance Instructions

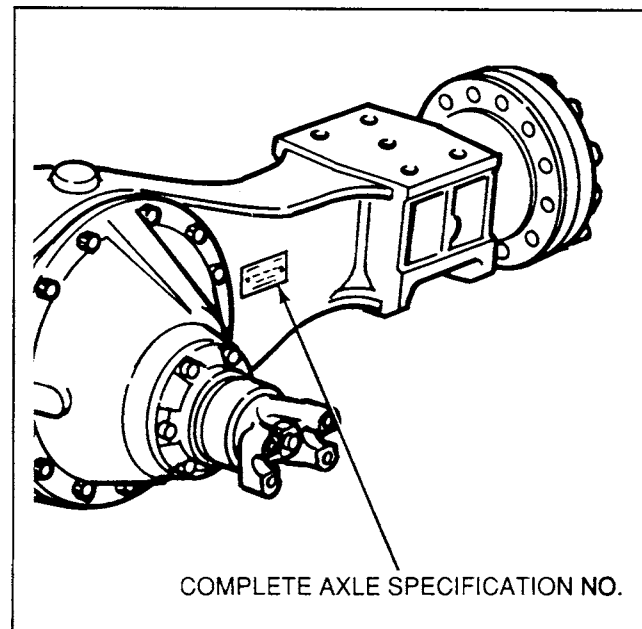
Axle and Carrier Assembly Model Identification

Differential carrier identification is either stamped on the carrier itself or on a metal tag affixed to the carrier. Location on the carrier is the same.



Axle Specification Number

The complete axle is identified by the specification number stamped on the side of the axle housing or metal tag affixed to axle housing. This number identifies all component parts of the axle as built by Spicer, including special OEM requirements such as yoke or flange.

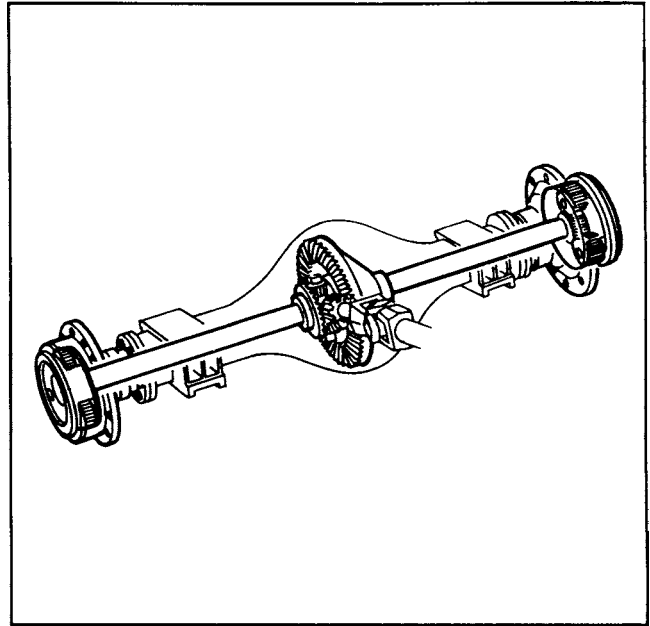


GdJWf® Wheel Reduction Drive Axles

Description and Operation

Spicer wheel reduction drive axles described in this publication have a base single reduction axle combined with wheel reduction hubs. These units are designed for off-highway construction, agriculture and timber applications.

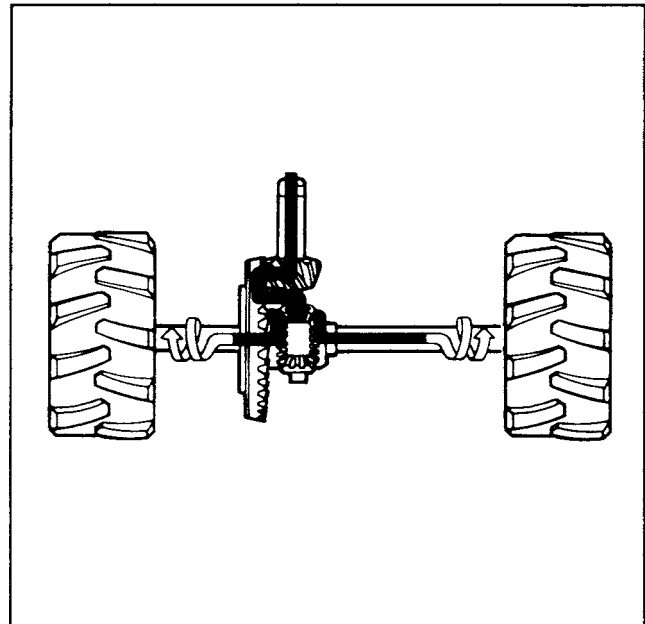
This type of axle provides a vehicle with superior traction and towing capabilities. This is accomplished through a planetary gear systems contained in the wheel hubs reducing wheel rpm and increasing torque.



Power Flow and Torque Distribution

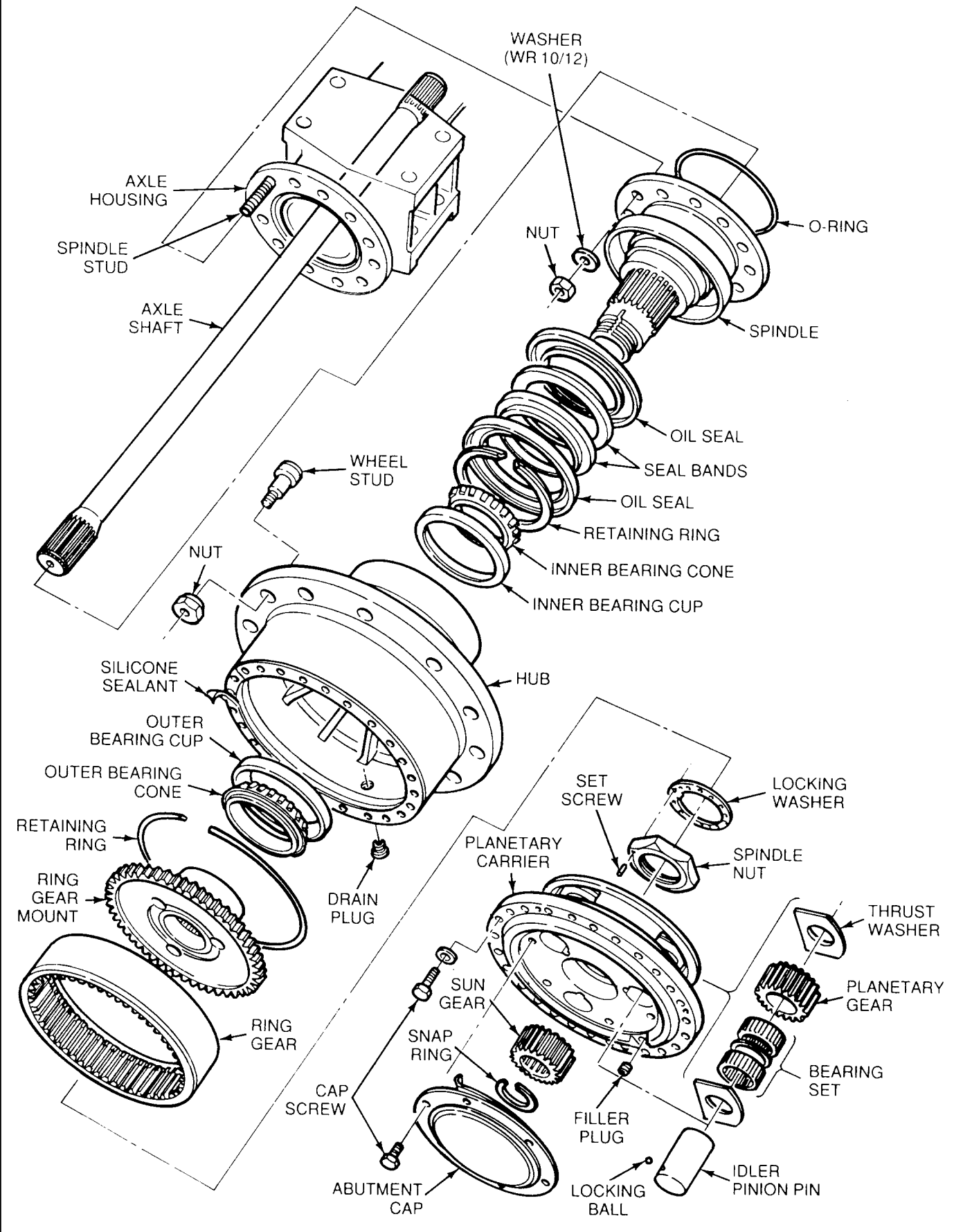
Torque (power flow) from the vehicle driveline is transmitted to the differential through the primary drive pinion, ring gear and differential. The gearing and differential design depends on the particular axle model. The primary gearing design can be spiral bevel or hypoid. The differential design can be open, automatic locking or manual locking. The differential transmits torque to the axle shafts which drive a planetary gear system within the wheel hub. The planetary carrier rotates against a fixed gear and drives the wheel hub.

Differential gear ratios range from 3.08:1 to 7.17:1. Hub assembly ratio is either 4.2:1 or 4.5:1 depending on the axle model.

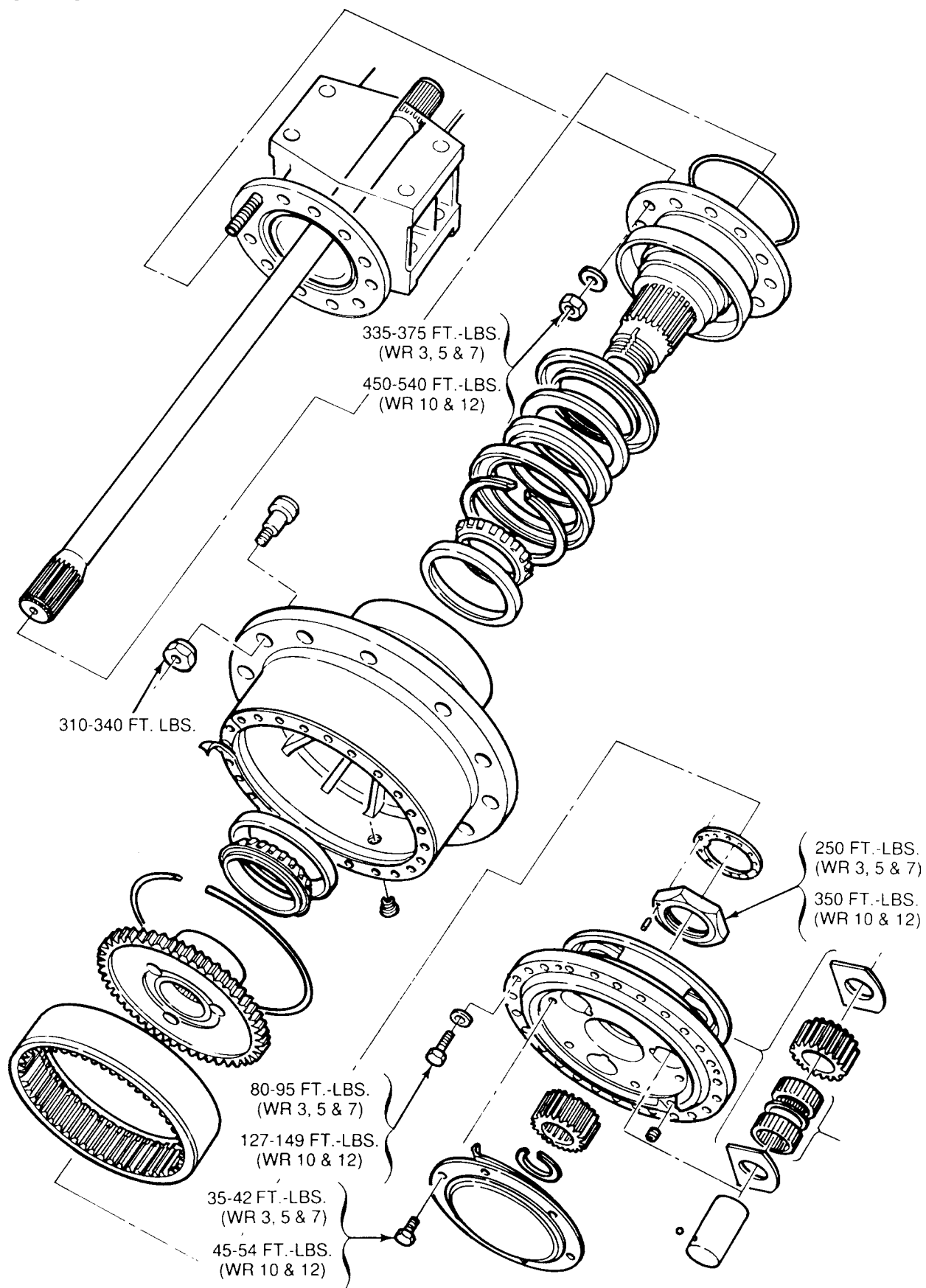


Wheel Reduction Hub Assembly

Part Nomenclature



Torque Specifications



Lubrication

The ability of a drive axle to deliver quiet, trouble-free operation over a period of years is largely dependent upon the use of good quality gear lubricants in correct quantities. The most satisfactory results can be obtained by

following the directions contained in this manual. The following lubrication instructions represent the most current recommendations from the Dana Corporation, Axle & Brake Division.

Approved Lubricants

General

Gear lubricants acceptable under military specification (MILSPEC) MIL-L-2105D (Lubricating Oils, Gear Multipurpose) are approved for use in Spicer Drive Axles. The MIL-L-2105D specification defines performance and viscosity requirements for multigrade oils. It supersedes both MIL-L-2105B, MIL-L-2105C and cold weather specification MIL-L-10324A. This specification applies to both petroleum-based and synthetic-based gear lubricants if they appear on the most current "Qualified Products List" (QPL-2105) for MIL-L-2105D.

NOTE: The use of separate oil additives and/or friction modifiers are not approved for use in Spicer Drive Axles.

Synthetic Based

Synthetic-based gear lubricants exhibit superior thermal and oxidation stability, and generally degrade at a lower rate when compared to petroleum-based lubricants. The performance characteristics of these lubricants include extended change intervals, improved fuel economy, better extreme temperature operation, reduced wear and cleaner component appearance. The family of Spicer gear lubricants represent a premium quality synthetic lube that fully meets or exceeds the requirements of MIL-L-2105D. These products available in both 75W-90 and 80W-140, have demonstrated superior performance in comparison to others qualified under the MILSPEC, as proven by extensive laboratory and field testing.

Lube Sampling and Condition Monitoring

For information, contact your local Spicer representation at phone numbers listed on the back cover of this manual.

Make-up Lube

Maximum amount of non-synthetic make-up lube is 10%.

Viscosity/Ambient Temperature Recommendations

The following chart lists the various SAE Grades covered by MIL-2105D and the associated ambient temperature range for each. Those SAE Grades shown with an asterisk (*) are available in the Spicer family of synthetic gear lubricants.

The lowest ambient temperatures covered by this chart are -40°F and -40°C. Lubrication recommendations for those applications that consistently operate below this temperature range, must be obtained through the Dana Corporation, Axle & Brake Division.

Grade	Ambient Temperature Range
75W	-40°F to -15°F (-40°C to -26°C)
75W-80	-40°F to 80°F (-40°C to 27°C)
75W-90*	-40°F and above (-40°C and above)
80W-90	-15°F to 100°F (-26°C to 38°C)
80W-140*	-15°F and above (-26°C and above)
85W-140	10°F and above (-12°C and above)

Lube Change Intervals—Axle housing

General

The initial lubricant change is one of the most important factors in axle component life and durability, because of the elimination of break-in contaminants. These contaminants are primarily metal from initial break-in wear of rotating components, and silicon from the sand used in manufacture of cast components.

For either a new or rebuilt drive axle, the lubricant should be changed from both the axle and wheel end assemblies within the first 50 hours of operation. Subsequent lubricant changes should be based on a combination of the intervals stated in the following chart and user judgment based heavily on the application and operating environment.

NOTE: At both the initial and all subsequent lubricant changes, Spicer recommends cleaning the magnetic filler plug and drain plugs, and cleaning the breather.

Guidelines—Lube Change Intervals for Drive Axles		
Lubricant Type	Hours of Service	Maximum Change Interval
Petroleum Based	500	Yearly
Synthetic Based	1000	Yearly
Spicer™ Synthetic	1250	Yearly

Drive Pinion Seal

The drive pinion requires **DAILY** greasing through the grease fitting on the drive pinion oil seal.

Lubrication

Changing Differential Lubrication

Draining

Drain when the lube is at normal operating temperature. It will run freely and minimize the time necessary to fully drain the axle.

1. Unscrew the magnetic drain plug on the underside of the axle housing and allow the lube to drain into a suitable container.
2. Inspect drain plug for large quantities of metal particles. After initial oil change, this condition is a sign of damage or extreme wear in the axle. Inspection of the entire unit may be warranted.
3. Clean the drain plug and replace it, along with an O-Ring (WR10/12) or sealant (WR3, 5 and 7), after the lube has drained completely.

IMPORTANT: Used lubricants are dangerous environmental pollutants. Dispose of all lubricants properly.

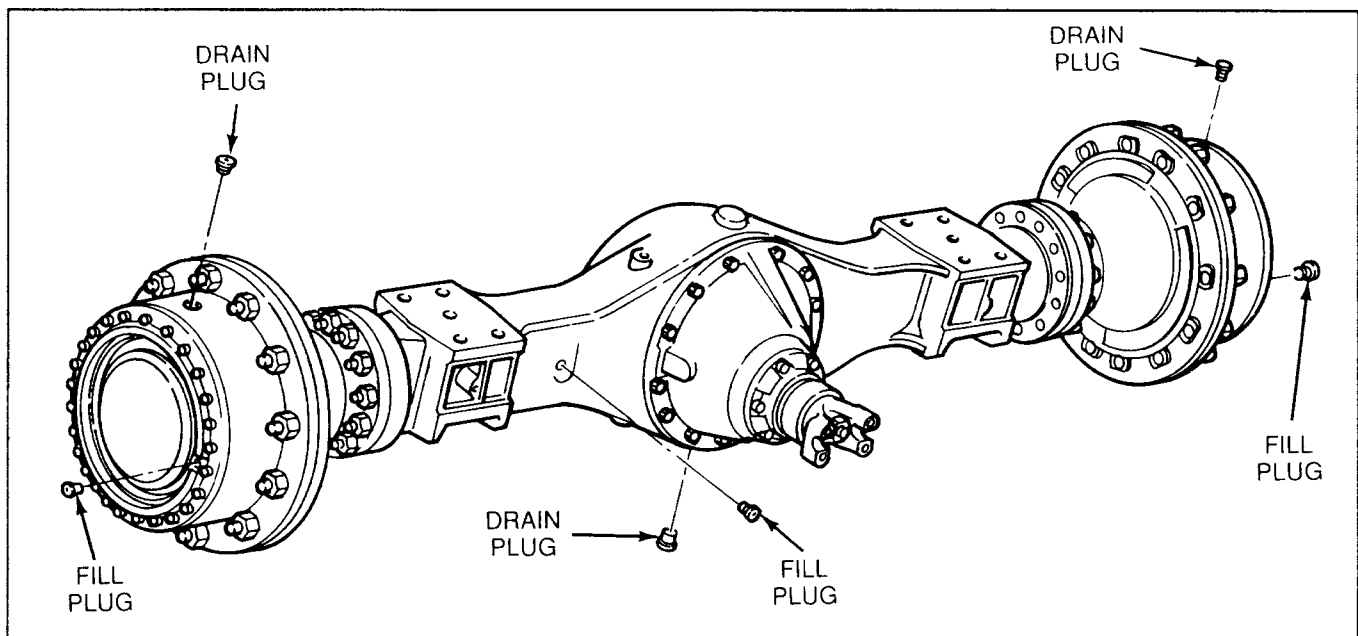
Filling

1. Remove the filler hole plug from right side of housing.
2. Fill the axle with approved lubricant until level with the bottom of the filler hole.

NOTE: Lube fill capacities in the following chart are good guidelines, but the actual capacity will vary somewhat. Always use the filler hole as the final reference. If lube is level with the bottom of the hole, the axle is properly filled.

Lube Capacities

	WR3	WR5	WR7	WR10/12
Gallons	6	6.5	8	10
Liters	23	25	30	38



Changing Differential Lubrication

Draining

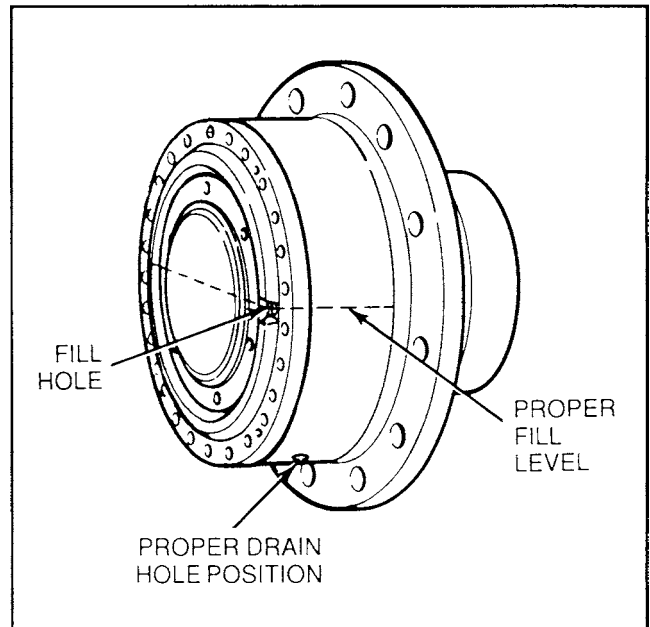
Drain when the lube is at normal operating temperature. It will run freely and minimize the time necessary to fully drain the axle.

1. Make sure the drain plug is at the bottom most position on the axle being serviced.
2. Unscrew the magnetic drain plug and allow the lube to drain into a suitable container.
3. Clean the drain plug.
4. Install drain plug and O-Ring (WR10 and 12) or sealant (WR3, 5 and 7).

IMPORTANT: Used lubricants are dangerous environmental pollutants. Dispose of all lubricants properly.

Filling

1. Remove the filler hole plug from the front of the planetary gear housing. Make sure that the filler hole is in a horizontal line with the center of the wheel hub.
2. Fill the wheel hub with approved lubricant until level with the bottom of the filler hole.
3. Install fill plug and O-Ring (WR10 and 12) or sealant (WR3, 5 and 7).



Cleaning, Inspection, Replacement

As the drive axle is disassembled, set all parts aside for thorough cleaning and inspection. Careful inspection will help determine whether

parts should be reused. Often, the causes of premature wear or drive axle failure also can be discovered.

Cleaning

The differential carrier assembly may be steam-cleaned while mounted in the housing as long as all openings are tightly plugged. Once removed from its housing, do not steam clean differential carrier or any components. Steam cleaning at this time could allow water to be trapped in cored passages, leading to rust, lubricant contamination, and premature component wear. The only proper way to clean the assembly is to disassemble it completely. Other methods will not be effective except as preparatory steps in the process. Wash steel parts with ground or polished surfaces in solvent. There are many suitable commercial solvents available.



WARNING: GASOLINE IS NOT AN ACCEPTABLE SOLVENT BECAUSE OF ITS EXTREME COMBUSTIBILITY. IT IS UNSAFE IN THE WORKSHOP ENVIRONMENT.

Wash castings or other rough parts in solvent or clean in hot solution tanks using mild alkali solutions. If a hot solution tank is used, make sure parts are heated thoroughly, before rinsing.

Rinse thoroughly to remove all traces of the cleaning solution. Dry parts immediately with clean rags.

Lightly oil parts if they are to be reused immediately. Otherwise, coat parts with oil and wrap in corrosion resistant paper. Store parts in a clean, dry place.

Inspection

Inspect steel parts for notches, visible steps or grooves created by wear. Look for pitting or cracking along gear contact lines. Scuffing, deformation or discoloration are signs of excessive heat in the axle, usually related to low lubricant levels or improper lubrication practices.

Before reusing a gear set, inspect teeth for signs of excessive wear. Check tooth contact pattern for evidence of incorrect adjustment (see Adjustment Section for correct pattern).

Inspect machined surfaces of cast or malleable parts. They must be free of cracks, scoring, and wear. Look for elongation of drilled holes, wear on surfaces machined for bearing fits and nicks or burrs in mating surfaces.

Inspect fasteners for rounded heads, bends, cracks or damaged threads.

The axle housing should be examined for cracks or leaks. Also look for loose studs or cross-thread holes.

Inspect machined surfaces for nicks or burrs.

Repair and Replacement

IMPORTANT: To get maximum value from an axle rebuild, replace lower cost parts, such as thrust washers, seals, etc. These items protect the axle from premature wear or loss of lubricants. Replacing these parts will not increase rebuild cost significantly.

It is also important to replace any part that display signs heavy wear even if it is not cracked or broken. A significant portion of a worn part's useful life has been expended. If it were to fail later, the cost of repairing the resulting damage to the axle would be far greater than the cost of the part.

Steel Parts—Gear sets, input and output shaft, differential parts, pinion pins, and bearings are not repairable. Worn or damaged parts should be discarded without hesitation. Also discard mating parts in some cases. Gear sets, for example, must be replaced in sets. The ring and pinion gearing must be changed in matched sets. Spur and differential gearing can be serviced separately.

Miscellaneous Parts—Seals and washers are routinely replaced. None of these parts can be reused if damaged. Fasteners using self-locking nylon "patches" may be reused if not damaged. But, they should be secured by placing a few drops of Loctite 277 on the threaded surface of the hole and then carefully torqued during installation.

Axle Housing—Repairs are limited to removal of nicks or burrs on machined surfaces and the replacement of loose or broken studs.



CAUTION: ANY DAMAGE THAT AFFECTS THE ALIGNMENT OR STRUCTURAL INTEGRITY OF THE HOUSING REQUIRES HOUSING REPLACEMENT. REPAIR BY WELDING OR STRAIGHTENING SHOULD NOT BE ATTEMPTED. THIS PROCESS CAN AFFECT THE HOUSING HEAT TREATMENT AND CAUSE IT TO FAIL COMPLETELY WHEN UNDER LOAD.

Silicone Rubber Gasket Compound—For more effective sealing, Spicer uses silicone rubber gasket compound to seal most metal-to-metal mating surfaces.

Spicer includes gasket compound and application instructions in many repair kits.

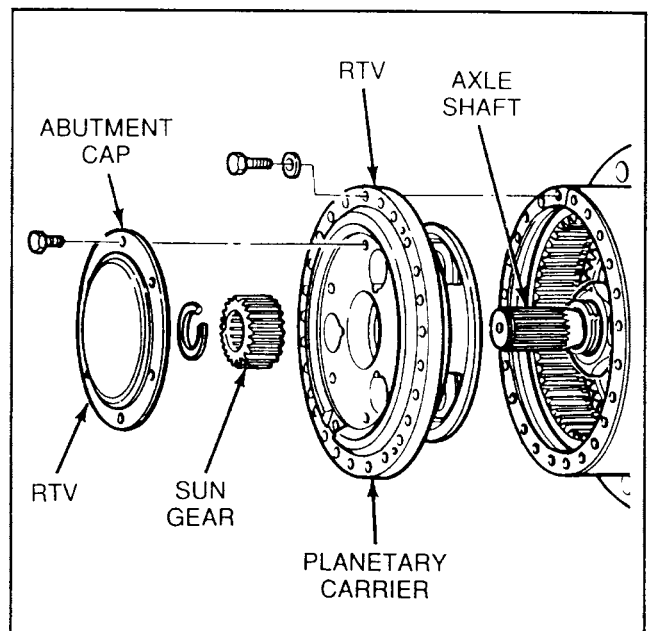
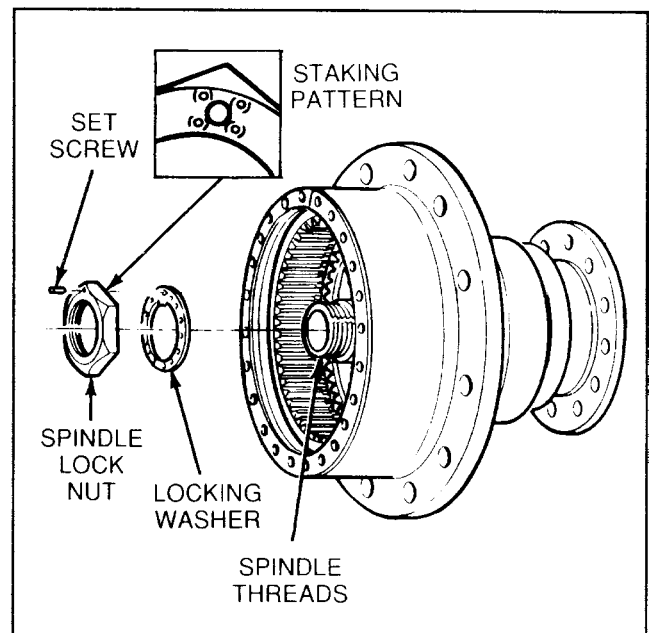
It is recommended that this compound be used in place of conventional gaskets. The compound will provide a more effective seal against lube seepage and is easier to remove from mating surfaces when replacing parts. Mating surfaces must be clean and free of oil for maximum sealing effectiveness.

Adjustments

Wheel Bearing Adjustment

Wheel bearings should be adjusted at regular intervals using the following procedure:

1. Drain wheel hub lube per instructions in this manual.
2. Remove the planetary carrier assembly.
3. Remove the sun gear and axle shaft assembly.
4. Remove set screw spindle lock nut and washer.
5. Clean spindle threads carrier abutment threads and hub threads of Loctite. Clean all sealing surfaces.
6. Visually inspect spindle for damage or wear. Inspect the nut and spindle threads for damage. Apply a light coat of oil to the spindle threads. Inspect doweled washer and replace if damaged.
7. Install washer on spindle against ring gear support.
8. Install nut on spindle with stepped diameter against washer. Torque nut to 250 ft.-lbs. (350 ft.-lbs. on WR10 and 12 models).
9. Rotate hub 360° in both directions while hitting hub or ring gear support with a soft mallet.
10. Re-torque to 250 ft.-lbs. (350 ft.-lbs. on WR10 and 12 models) and repeat Step 9 until 250 ft.-lbs. (350 ft.-lbs. WR10/12) does not advance the nut.
11. Install one (1) new 126900 set screw (207357 on WR10 and 12 models) in nut, with dog point engaging washer hole. If the set screw is being reused coat with Loctite 277 or equivalent before installing. The set screw is advanced completely when one internal thread of set screw hole is showing.
 - If set screw does not align with washer hole, tighten the spindle nut until the next hole aligns. Do not exceed 350 ft.-lbs. (450 ft.-lbs. on WR10/12).
12. Stake set screw in place with a center punch at four (4) places around set screw hole thread.
13. Install sun gear and axle shaft assembly.
14. Install planetary carrier with RTV on flange. Apply Loctite 277 or equivalent to bolts. Torque bolts to 75-85 ft.-lbs. (149-179 ft.-lbs. on WR10 and 12 models).
15. Install Apply abutment cap with RTV on flange. Loctite 277 to bolts. Torque bolts to 35-40 ft.-lbs. (45-54 on WR10/12).



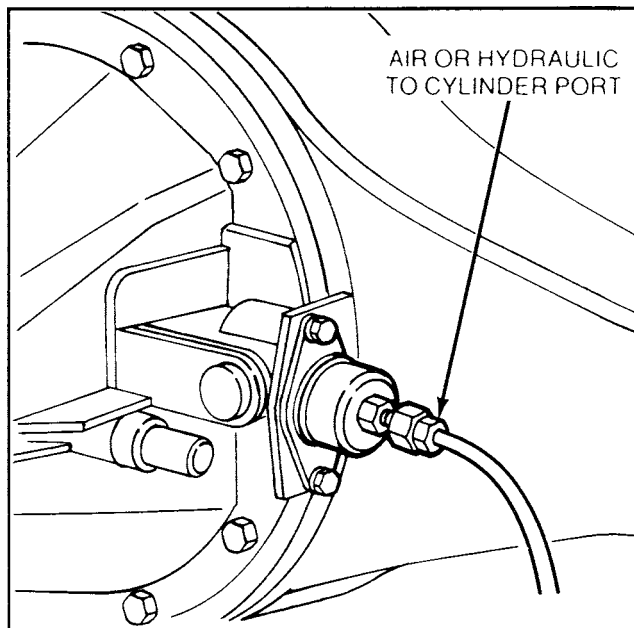
Wheel Differential Lock (Optional Equipment)

Removal

Axle models identified with a "D" suffix are equipped with a manual locking differential. Special methods are required to remove the differential carrier from the axle housing.

IMPORTANT: When removing axle shafts, identify left and right shaft location for reference during reassembly.

1. Drain axle lubricant and disconnect driveline, following instructions for your specific axle.
2. Disconnect lead wires at optional selector switch (if installed) and hydraulic line at shift cylinder.
3. To facilitate removal of the differential carrier assembly, the Differential Lock should be engaged and held in the engaged position. This can be accomplished by one of two methods:



Air Pressure Engagement

Using an auxiliary air line, apply 80-120 psi air pressure to shift cylinder air port to engage clutch.

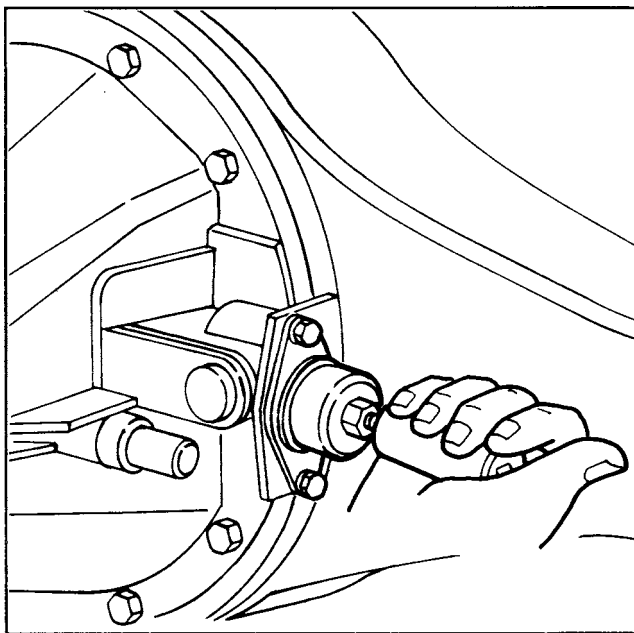
Manual Engagement

Install an 3/4-16 UNF bolt over 1.5" (38mm) long, in the cylinder hydraulic port to manually engage the clutches.

NOTE: Hand-tighten the bolt... over-torquing may cause damage to the shift unit. To facilitate hand-tightening, coat bolt threads with axle lube.

NOTE: With either method, the axle shaft may have to be rotated to permit the clutch to become engaged.

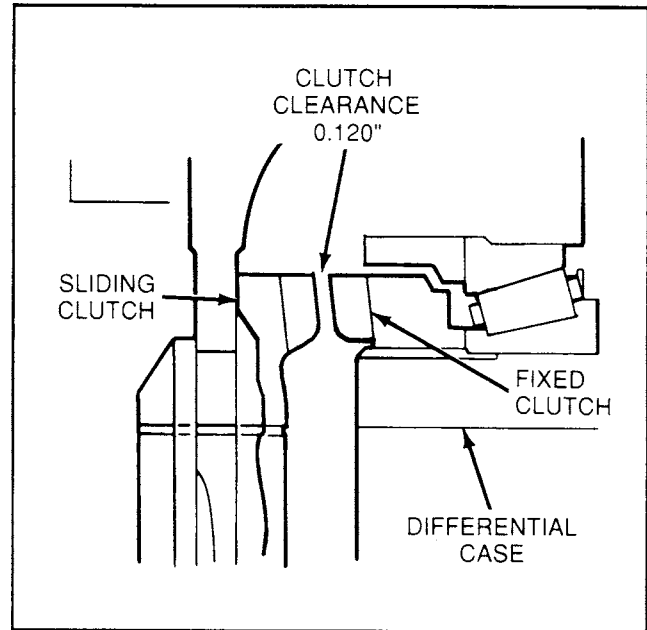
4. Continue removing differential carrier assembly following instructions for your specific axle.



Wheel Differential Lock (Optional Equipment)

Assembling

1. Assemble head without differential lock components exactly as the standard "S" model.
2. Adjust pattern on the head tester using standard procedures.
3. Install the fixed clutch on the flanged differential case splined hub and fit the retaining snap ring.
4. Install the snap ring on the pushrod.
5. Assemble shift fork, spring pin, sliding clutch, and capscrew.
6. Assemble the pushrod through the carrier, shift fork assembly, actuator, and return spring in proper order and orientation per the assembly drawing.
7. Apply a small amount of RTV sealant to the shift cylinder flange to serve as a seal between the shift unit and the carrier. Install the shift cylinder assembly over the pushrod orienting the cylinder so that the breather port is facing up as the axle will be installed in the vehicle. Compress the assembly to keep the pushrod piloted in the carrier. The spring force is higher for the hydraulic shift than the air shift version so expect higher forces to compress the assembly. Tighten the two shift cylinder mounting screws (longer than those used on the air shift unit) to 28-35 ft.-lbs.
8. Adjust the shift fork position using the following procedure:
 - Fit a dummy shaft through the sliding clutch into the differential side gears.
 - Place a 0.120 in. feeler gauge between the tips of the curvic clutch teeth and slide the shift fork along the push rod to set clutch clearance at 0.120 in. as shown in the illustration
 - Tighten shift fork capscrew to 26-30 ft.-lbs.



Assembling (Continued)

- Check operation of differential lock by connecting high pressure air or hydraulic line of 140 psi supply to shift cylinder. If this is not possible, use a 0.75-16 UNF bolt (but do not over torque) to manually engage the clutches. When the fork is adjusted correctly, curvic teeth should be fully engaged with the fork free to float. The shift assembly should disengage freely.
 - Recheck the .120 in. gap with the shift cylinder fully disengaged. If not proper, readjust using the above procedure.
 - Install the pipe plug.
9. Install the indicator switch, making sure that the plastic sealing washer is under the switch. Tighten to 10-12 ft.-lbs. torque.

10. To more easily drop the head into the housing the differential lock clutches should be engaged with a 0.75-16 UNF bolt.



CAUTION: TURN THE BOLT INTO THE PORT ONLY ENOUGH TO ENGAGE THE CLUTCHES—OVER TORQUING MAY CAUSE DAMAGE TO THE SHIFT UNIT.

This bolt may be left in until axle shipment to make axle shaft installation easier. Upon shipment of the axle, remove the bolt and replace with the plug that came with the shift unit.

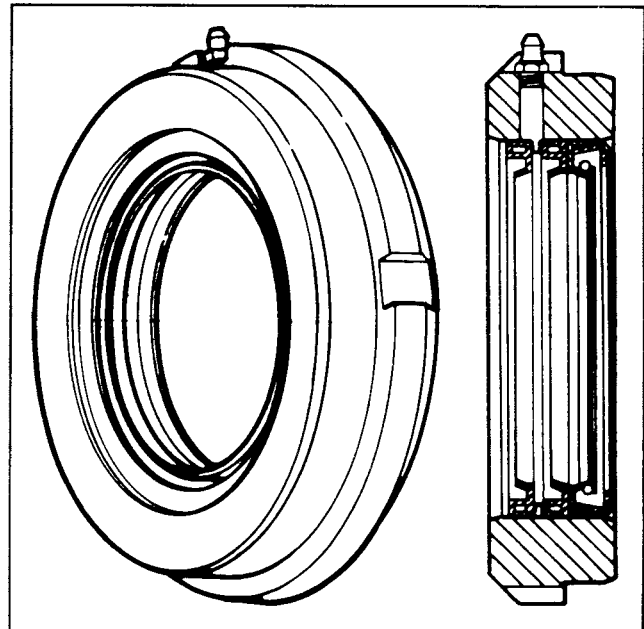
Drive Pinion Oil Seal

Removal

1. Remove input yoke according to the instructions in the appropriate head service manual.
2. Pry out oil seal assembly by inserting screw drivers into notches between seal assembly and bearing cage.
3. Remove three seals.

Installation

1. Install three seals
2. Position oil seal assembly in bearing cage with notches at top and bottom positions and grease fitting at the 9:00 o'clock position
3. Drive oil seal assembly into bearing cage.
4. Install input yoke per head service manual instructions.



Wheel Hub

Removal

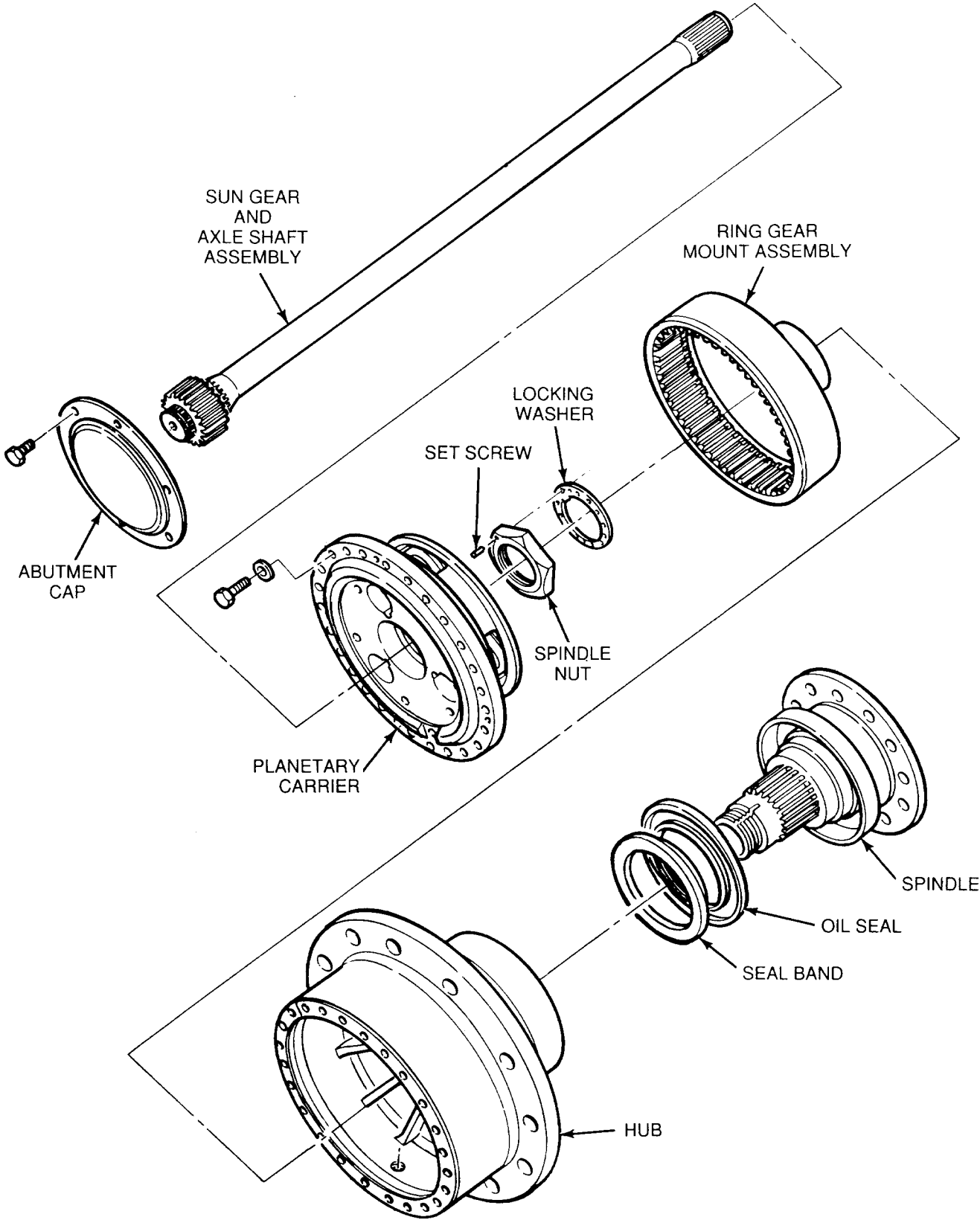
1. Drain wheel hub lube by following the procedure in this manual.
2. Remove abutment cap by removing capscrews.
3. Pull sun gear and axle shaft assembly out of axle housing.
 - A steel rod with a 1/2" thread can be installed into the axle shaft to aid in pulling the axle shaft.
4. Pull wheel hub capscrews.
5. Remove planetary carrier assembly from wheel hub.
 - Capscrews can be installed in unused planetary carrier holes to "jack" carrier out of hub.
6. Remove set screw, spindle nut and washer.



WARNING: THE SPINDLE NUT SECURES THE RING GEAR MOUNT ASSEMBLY AND WHEEL HUB TO THE AXLE HOUSING. MAKE SURE THESE ITEMS ARE PROPERLY SUPPORTED BEFORE REMOVING SPINDLE NUT.

7. Pull ring gear mount assembly off of spindle.
8. Remove wheel hub assembly from axle housing.
9. Remove oil seal and seal band from end of axle housing.

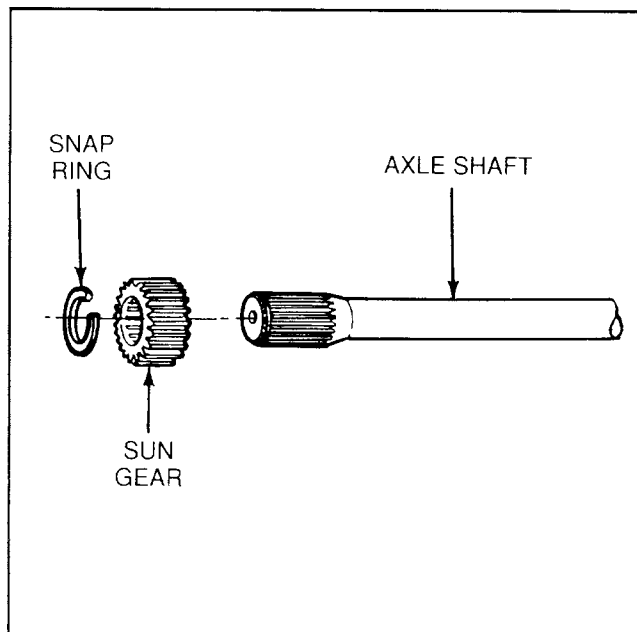
Removal



Wheel Hub Components Disassembly

Sun Gear and Axle Shaft

1. Disengage snap ring at wheel end of axle shaft.
2. Pull sun gear off axle shaft spine.



Planetary Carrier

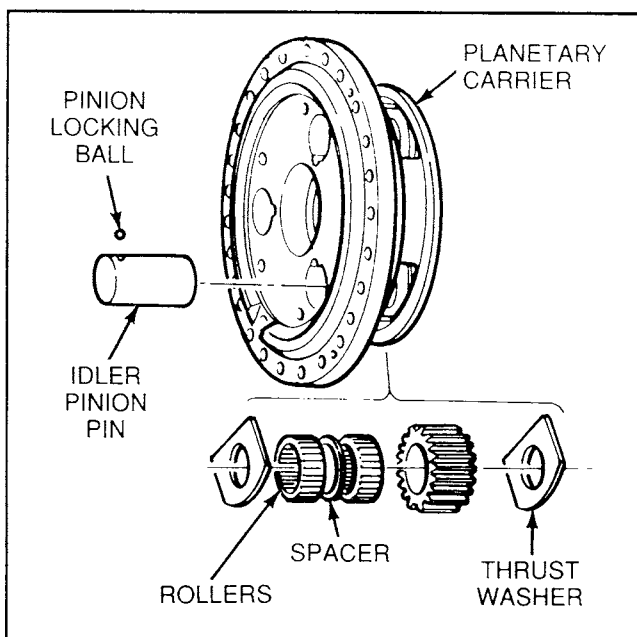
1. Drive idler pinion pin out of planetary carrier using a brass hammer or drift. Drive pin from back of planetary carrier out through the front (locking ball end of pin should emerge from carrier first).



CAUTION: THE IDLER PINION PIN IS HARDENED STEEL AND SHOULD NOT BE STRUCK BY A STEEL HAMMER.

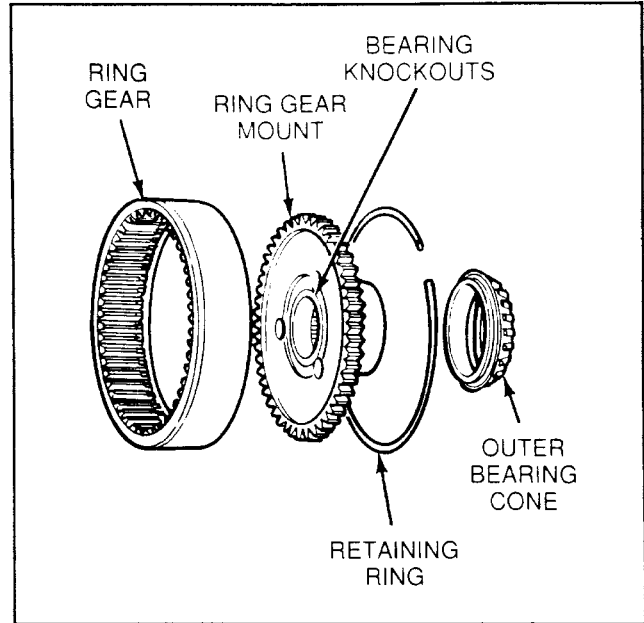
2. Remove pinion locking ball from idler pinion pin.
3. Remove thrust washers from planetary carrier.
4. Remove planetary gear from carrier.
5. Remove bearing rollers and spacer from inside planetary gear.

NOTE: The WR10 and 12 models have two locking balls



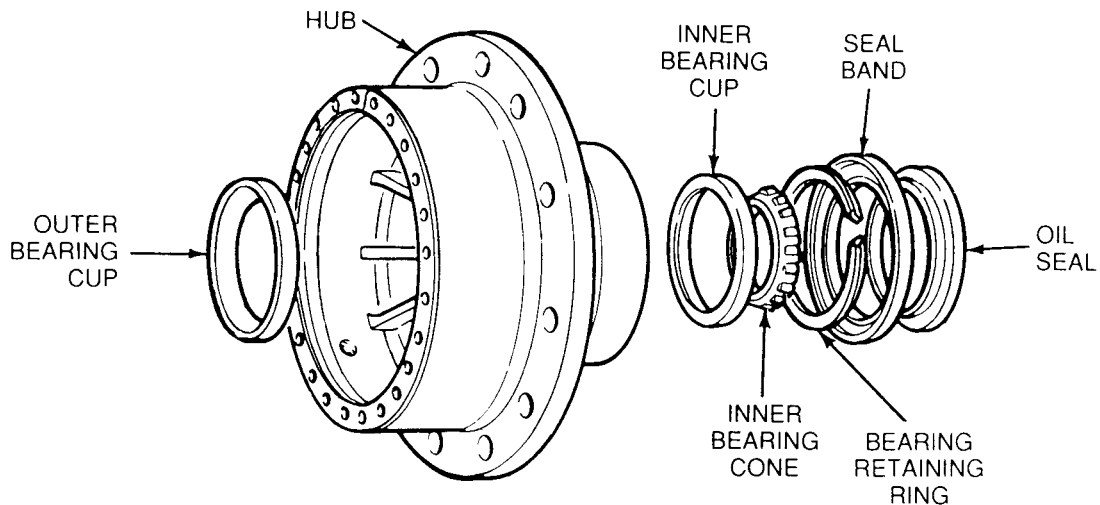
Ring Gear and Mount

1. Disengage ring gear retaining ring.
2. Slide ring gear off ring gear mount.
3. Pull outer bearing cone off ring gear mount sleeve.
 - A drift can be used to drive dearing off of mount through holes in mount.



Wheel Hub

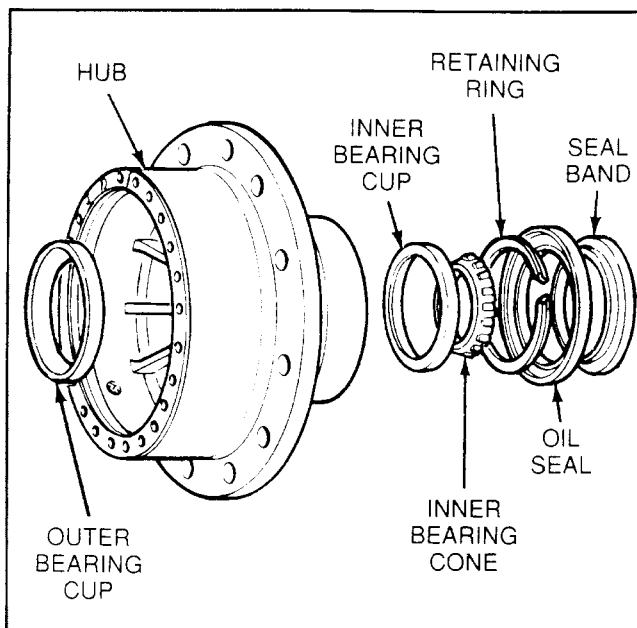
1. Pull outer bearing cup out of hub.
2. Pull oil seal and seal band out of hub.
3. Disengage inner bearing retaining ring.
4. Remove inner bearing cone out of hub.
5. Drive inner bearing cup out of hub.



Wheel Hub Components Assembly

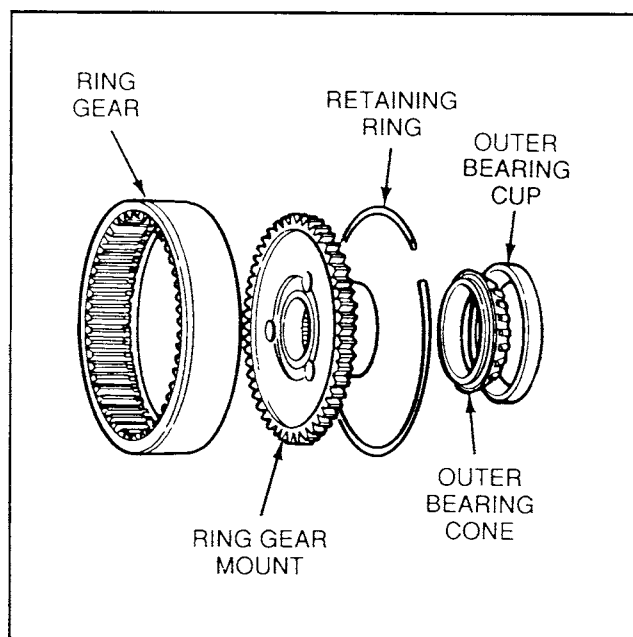
Wheel Hub

1. Press inner bearing cup into hub.
2. Press outer bearing cup into hub.
3. Install bearing cone and retaining ring.
4. Install oil seal and seal band into hub.



Ring Gear and Mount

1. Slide ring gear onto ring gear mount.
2. Install ring gear retaining ring.
3. Press outer bearing cone onto ring gear mount.



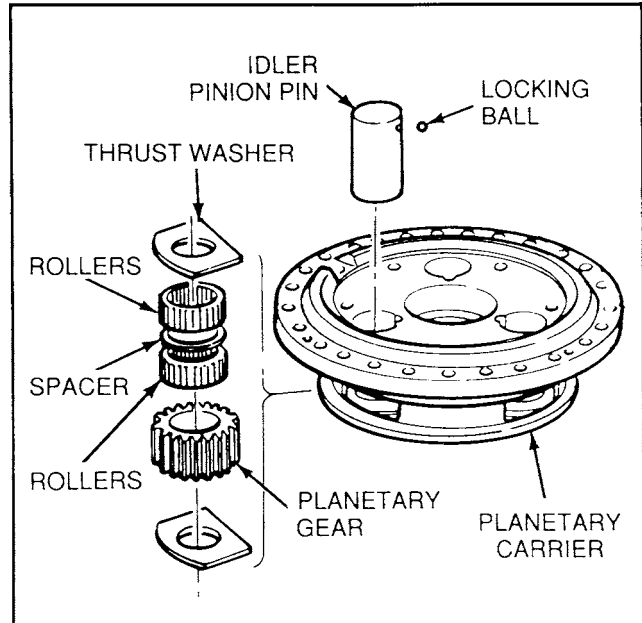
Planetary Carrier

1. Slide bearing spacer into planetary gear.
2. Install 48 bearing rollers (24 on each side of spacer) into planetary gear. Pack gear with grease to hold rollers in place.
 - WR3 has caged roller assembly without spacer.
3. Position the planetary carrier on a sturdy flat surface with filler hole side up.
4. Place 2 thrust washers (one on each side of gear) and planetary gear in planetary carrier. The curved ends of the thrust washers must face the outside edge of carrier.
5. Position idler pinion pin in planetary carrier hole above gear, bearing and thrust washer assembly. The pin end with lock ball detente should be away from the carrier. The lock ball detente should also be aligned with the notch in the carrier.
6. Use a brass hammer or drift to drive idler pinion pin into planetary carrier and through thrust washers, planetary gear and bearing. Only drive 3/4 of pin length into carrier.



CAUTION: THE IDLER PINION PIN IS HARDENED STEEL AND SHOULD NOT BE STRUCK BY A STEEL HAMMER.

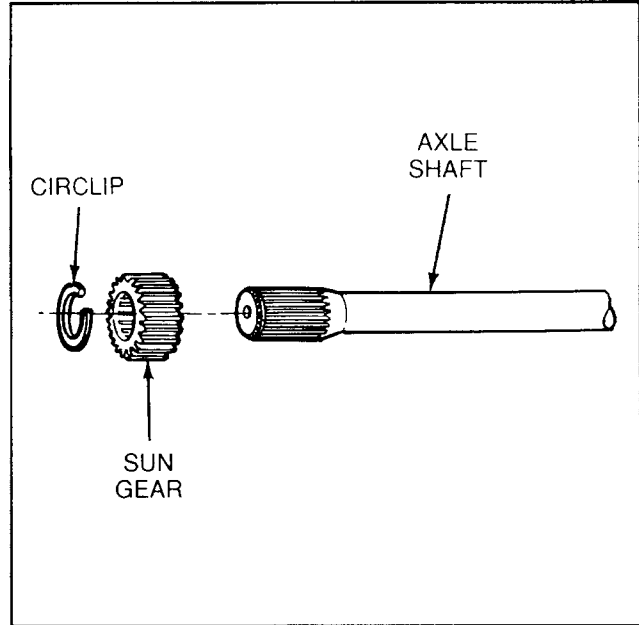
7. Install pinion locking ball (two per pin on WR10/12) in detente on pinion pin.
8. Drive pinion pin completely into planetary housing and flush with abutment cap surface. Make sure locking ball and bottom thrust washer are properly aligned before driving in pin.
9. Repeat this procedure for each planetary gear.



Wheel Hub Components Assembly

Sun Gear and Axle Shaft

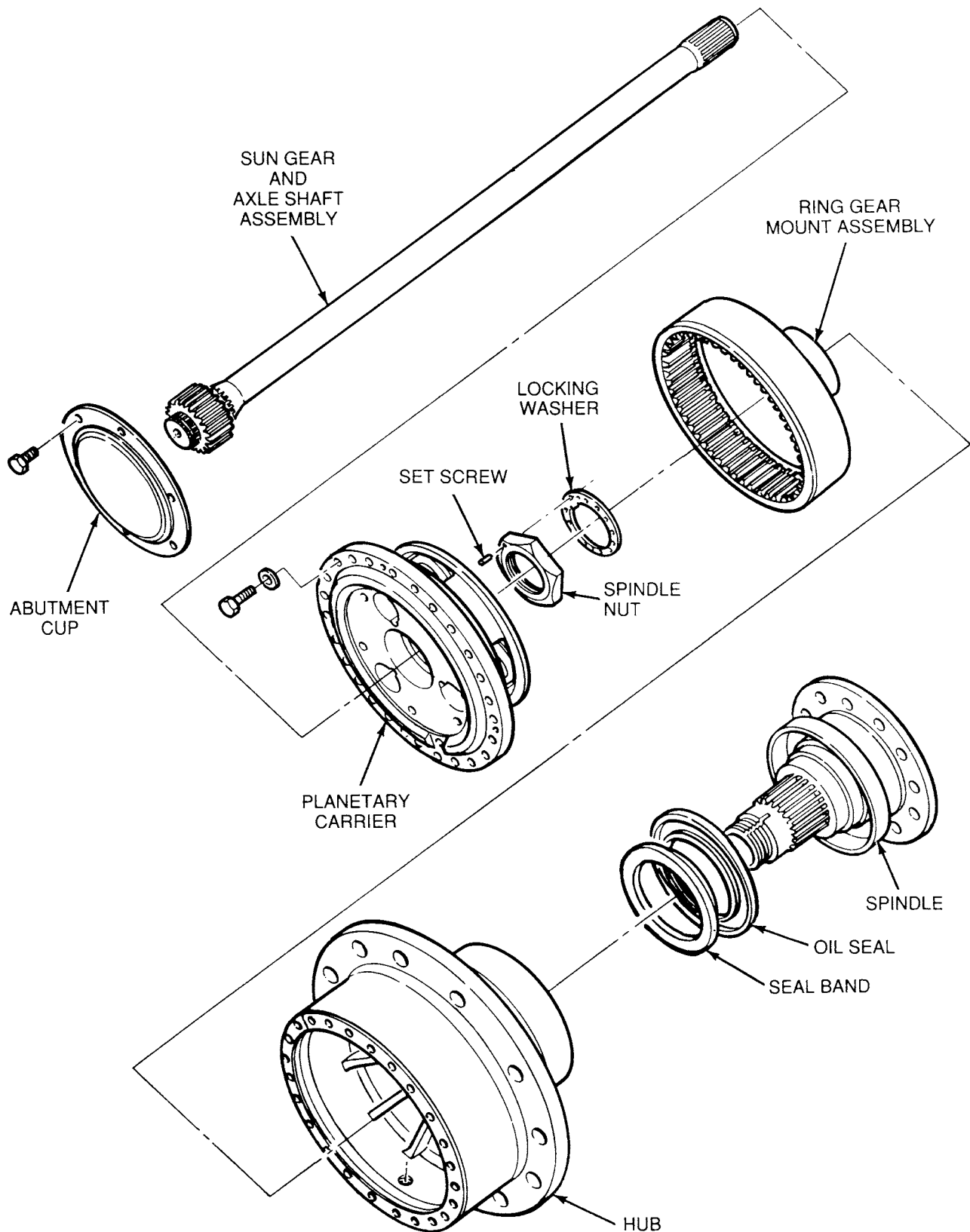
1. Slide sun gear onto splines at wheel end of axle shaft.
 - The part number side of gear should be away from shaft.
 - On "D" model axles, ensure that the double or long spline shaft end is installed in the differential lock cylinder side.
2. Install snap ring onto end of axle shaft.



Wheel Hub Installation

1. Install oil seal and seal band onto spindle.
2. Install wheel hub assembly on spindle.
3. Install ring gear mount assembly into hub.
4. Install washer on spindle against ring gear support.
5. Install nut on spindle with stepped diameter against washer. Torque nut to 250 ft.-lbs. (350 ft.-lbs. on WR10 and 12 models).
6. Rotate hub 360° in both directions while hitting hub or ring gear support with a soft mallet.
7. Re-torque to 250 ft.-lbs. (350 ft.-lbs. on WR10 and 12 models) and repeat steps 5 and 6 until 250 ft.-lbs. (350 ft.-lbs. WR10/12) does not advance the nut.
8. Install one (1) 126900 set screw (207357 on WR10 and 12 models) in nut, with dog point engaging washer hole. If set screw is being reused, coat with Loctite 277 or equivalent. The set screw is advanced completely when one internal nut thread is showing.
 - If set screw does not align with washer hole, tighten spindle nut until next hole aligns. Do not exceed 350 ft.-lbs. (450 ft.-lbs. WR10/12).
9. Stake set screw in place with a center punch at four (4) places around internal nut thread.
10. Install sun gear and axle shaft assembly.
 - A steel rod with a 1/2" thread can be inserted into the end of the axle shaft and used to aid shaft installation.
11. Install planetary carrier with RTV on flange. Apply Loctite 277 to bolts. Torque bolts to 80-95 ft.-lbs. (127-149 ft.-lbs/ pm WR10 and 12 models).
12. Install abutment cap with RTV on flange. Apply Loctite 277 to bolts. Torque bolts to 35-42 ft.-lbs. (45-54 on WR10/12).

Wheel Hub Installation—Continued



Wheel Hub Components Assembly

Head/Model Cross Reference Chart

Axle Model	Head Model	Head Parts Book	Head Service Manual	Pinion Shaft Spline		
				# Teeth	Type	Diameter
WR3	13100	EA-90	EA-43	10	SQ	1.50"
WR3N	13100	EA-90	EA-43			
WR5D	1504D	EA-93	—	34	INV	1.75"
WR5	15100	EA-90	EA-43	10	SQ	1.50"
WR3D	1504D	EA-93	—	34	INV	1.75"
WR7	16144	EA-90	EA-43	10	SQ	1.75"
	21065S	EA-93	EA-48			
WR7D	21065D	—	—	39	INV	2.00"
WR10	RS402	EA-89	EA-41			
	21065S	EA-93	EA-48			
WR10D	21065D	—	—	41	INV	2.10"
WR12	230705	EA-94	EA-48			
WRRD	23075D	EA-94 sup.	—			

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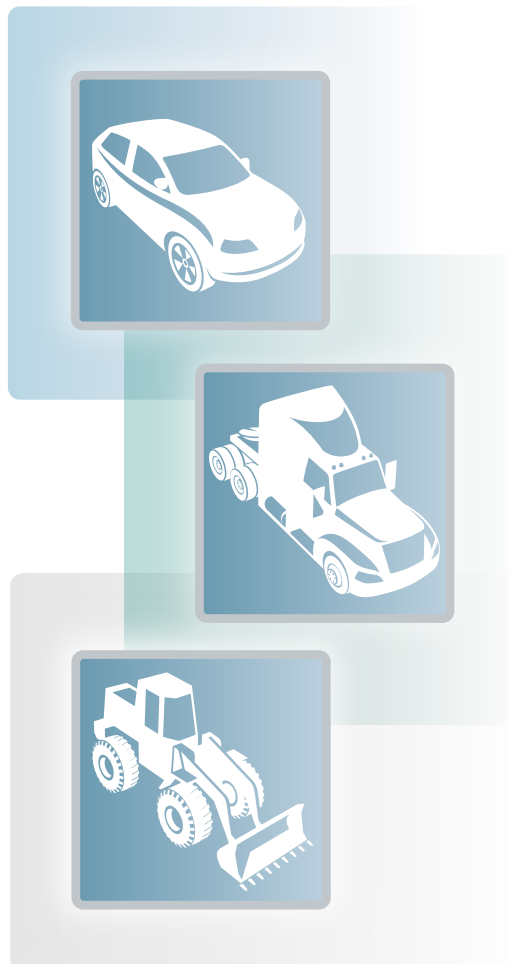
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