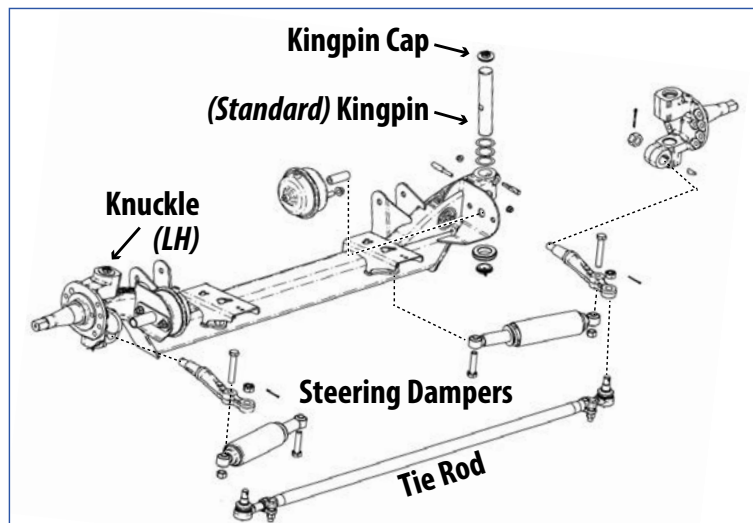




RSS-233/RSS-232 KINGPIN – SERVICE PARTS GUIDE

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RIDEWELL SUSPENSIONS
The Engineered Suspension Company

PART NO:

SUSP. NO:

SERIAL NO:

GROSS AXLE WEIGHT RATING CERTIFICATION IS PER THE FINAL STAGE MANUFACTURER OR ALTERER.

THIS PRODUCT MAY BE COVERED UNDER ONE OR MORE PATENTS, ADDITIONAL PATENTS MAY BE PENDING.

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(800) 641-4122

Suspension Identification Tag

A (606-) **Installation/Assembly Number** is listed as the **Part Number** when other components are factory installed onto the suspension.

The **Suspension Number** and **Serial Number** on the Suspension ID Tag refer to the model and the date of manufacture of an individual suspension system.

Please refer to suspension number/part number and serial number when contacting the Ridewell Customer Service Department for replacement parts/warranty information.



Scan the QR-Code or double-click the image to view the Ridewell Installation and Service Manual support page.

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Auxiliary Axle – Self-Steering Option

Self-steering auxiliary axle suspensions are designed to steer only in the forward direction. The suspension must be raised off the ground or locked into a non-steering mode during reverse travel to avoid damage.

Ridewell Suspensions strongly recommends the use of automated systems that raise/lock the liftable axle during reverse travel.

If an automated system is not installed, the installation of a visual/audible indicator to assist the driver in manual operation of the lift-in-reverse system is strongly recommended.

The driver should use caution when maneuvering in reverse with the steering lock engaged. The driver should maintain slow maneuvering speeds and avoid extreme turns.

CAUTION Failure to lift the suspension and-or engage the steering-lock during reverse travel can cause component damage and void the warranty.

Notes and Cautions

All work should be completed by a trained technician using the proper tools and safe work procedures.

This guide uses two types of service notes defined as:

“NOTE:” Provides instructions or procedures to complete tasks and ensure the suspension functions properly.

CAUTION Indicates a hazardous situation or unsafe practice that, if not avoided, could result in equipment damage and serious injury.

Kingpin Identification (Standard or Kaiser Kingpin)

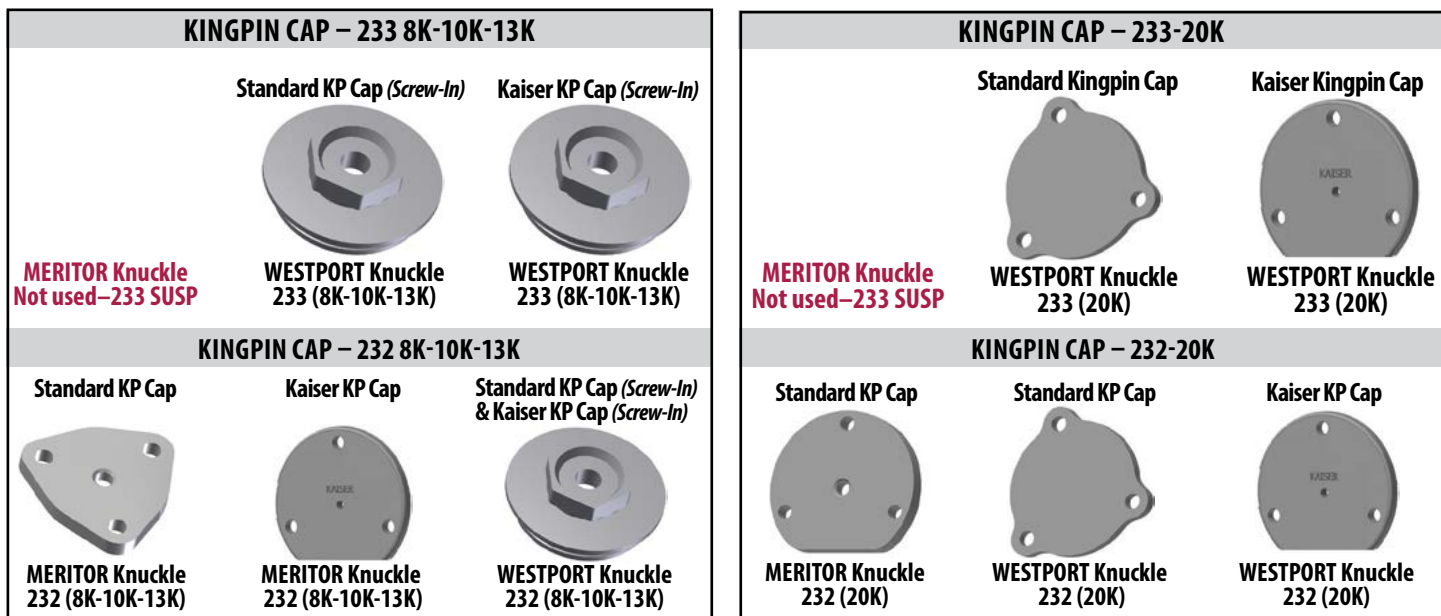


Figure 1.
233-13K(S) Drum Brake Axle Components (Reference only)
Kaiser Kingpin; Westport Knuckle.

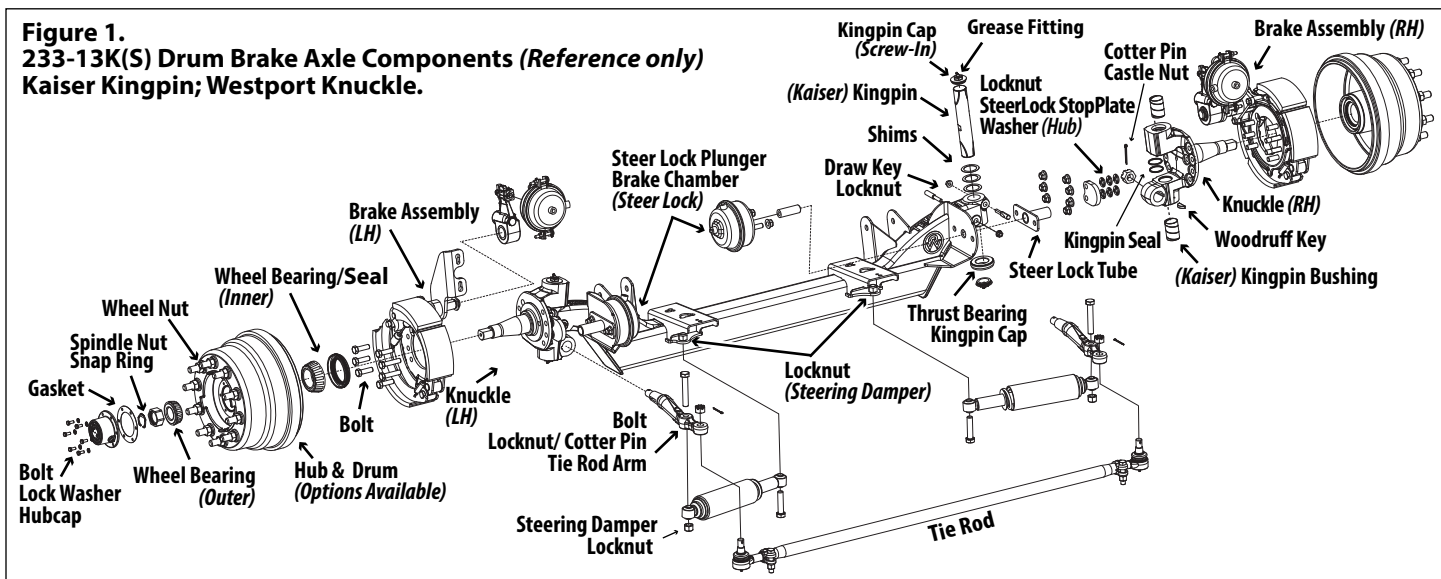
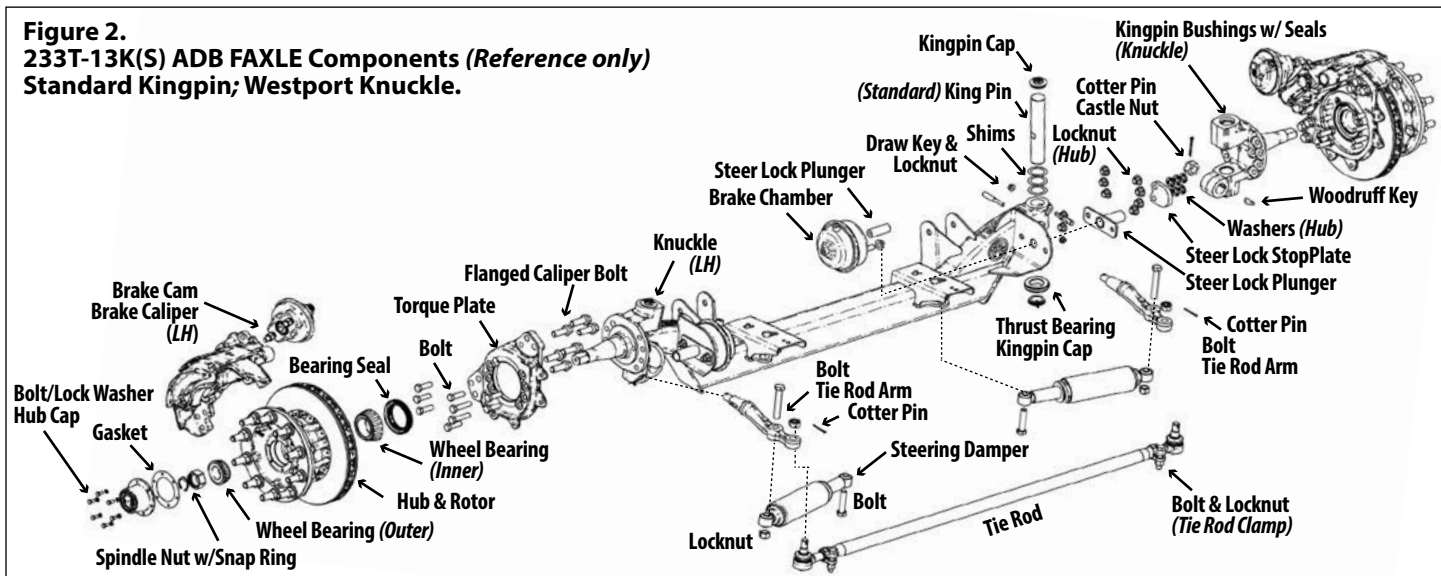
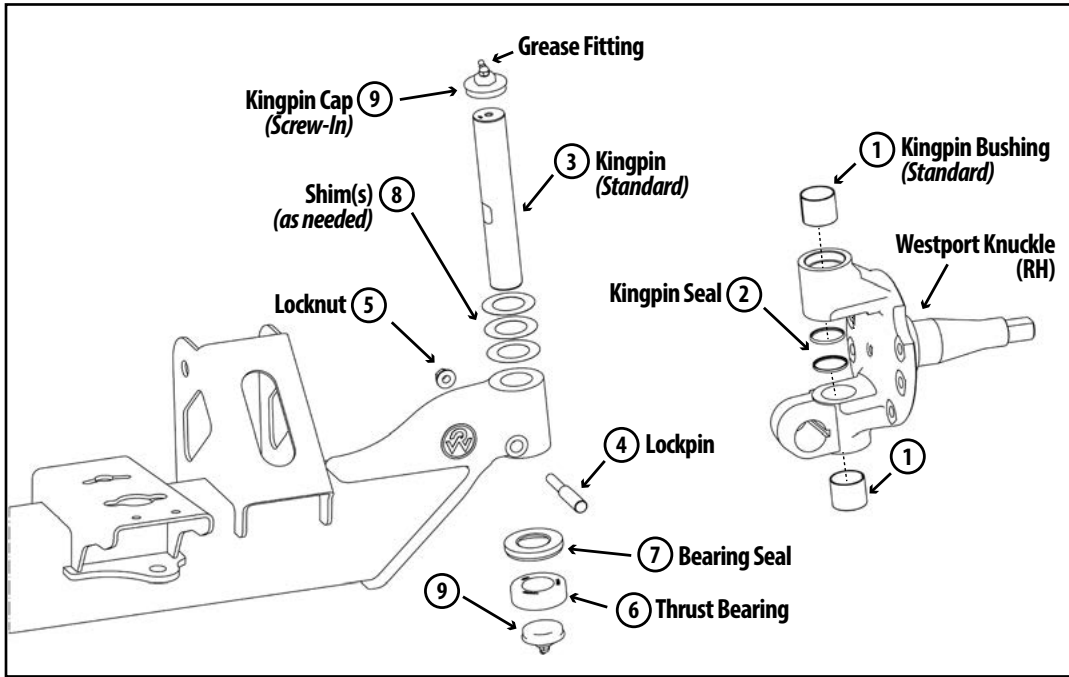


Figure 2.
233T-13K(S) ADB FAXLE Components (Reference only)
Standard Kingpin; Westport Knuckle.





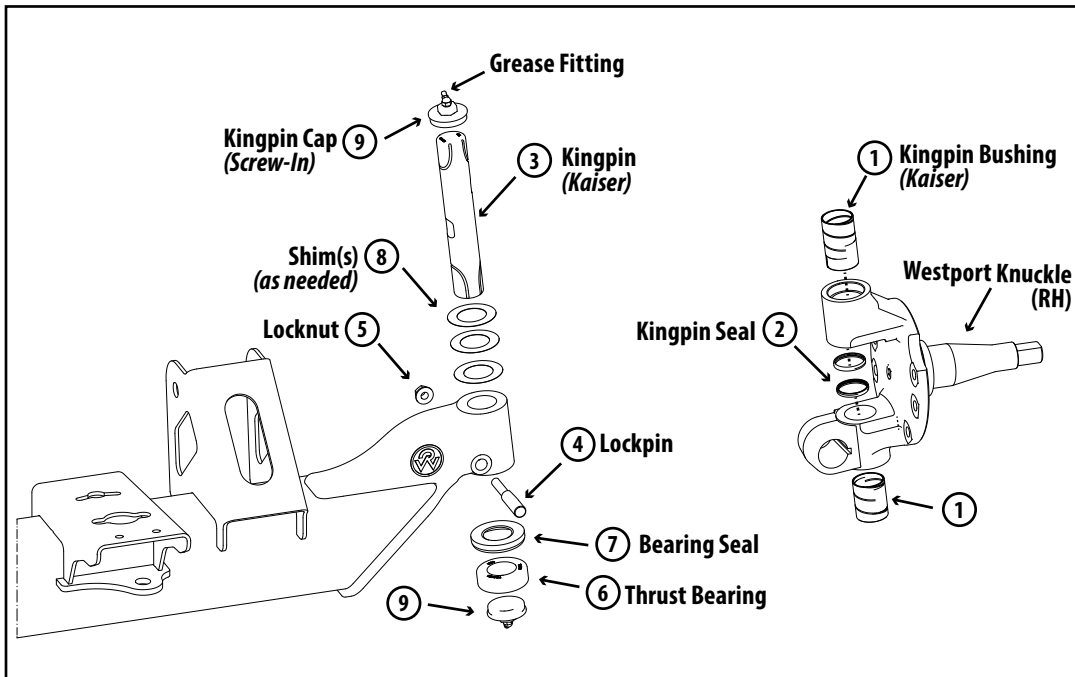
Standard Kingpin (Screw-In Cap)



WESTPORT Knuckle
RSS-233 (8K-10K-13K)

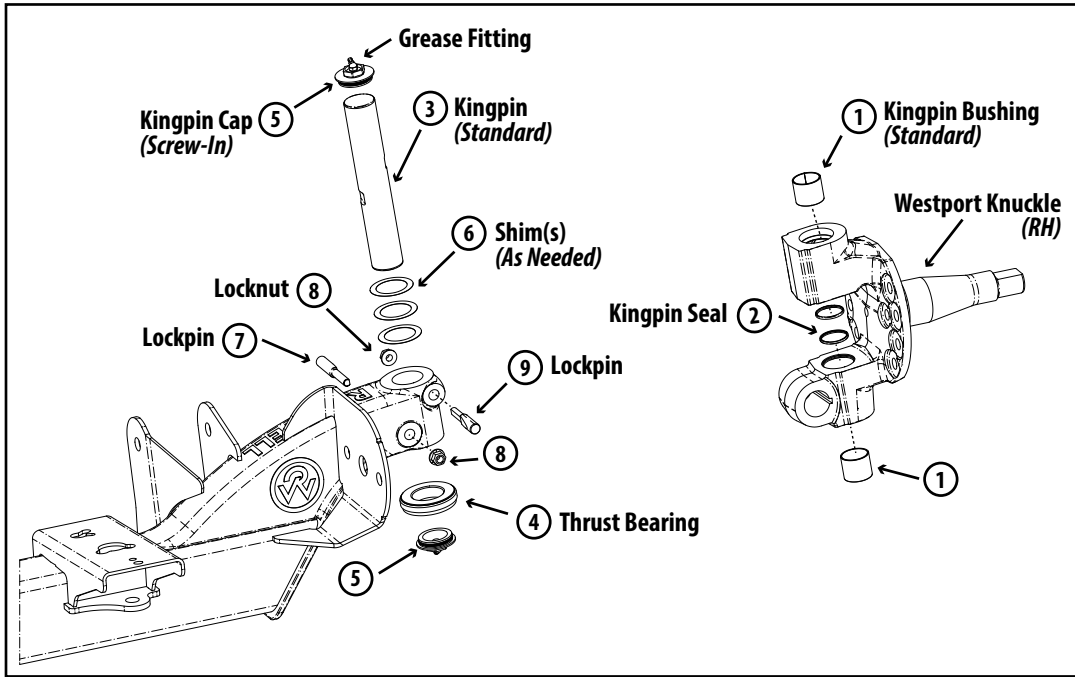
233-8K TRUCK – STANDARD KINGPIN KIT (WESTPORT KNUCKLE)

Diagram No.	QTY/Axle	Part Number	
	(1)	1660534 – (Standard) Kingpin Replacement Kit– Westport Knuckle	
Included in Replacement Kit	1	4	1660545 KINGPIN BUSH WSTPT 8K (<i>Pg 16-Standard kingpin install-Bore reaming required</i>)
	2	4	1660544 SEAL KINGPIN WSTPT 8K
	3	2	1660469 KINGPIN FC/8K WP #143660-0013 (1.5" OD)
	4	2	1660139 LOCK PIN .44/20 3.88" 13.2
	5	2	1150001 L'NUT 7/16" 20NF FL T-L GR5(B)
	6	2	1660473 BRNG ASY T-149 FC/8K (THRUST)
	7	2	1660474 KINGPIN BRNG SEAL T-149 FC
	8	2	1660475 SHIM KINGPIN-.005"THK "FC"
		2	1660476 SHIM KINGPIN-.010"THK "FC"
2		1660477 SHIM KINGPIN-.015"THK "FC"	
9	4	1660472 KINGPIN CAP FC/8K SCREW IN	



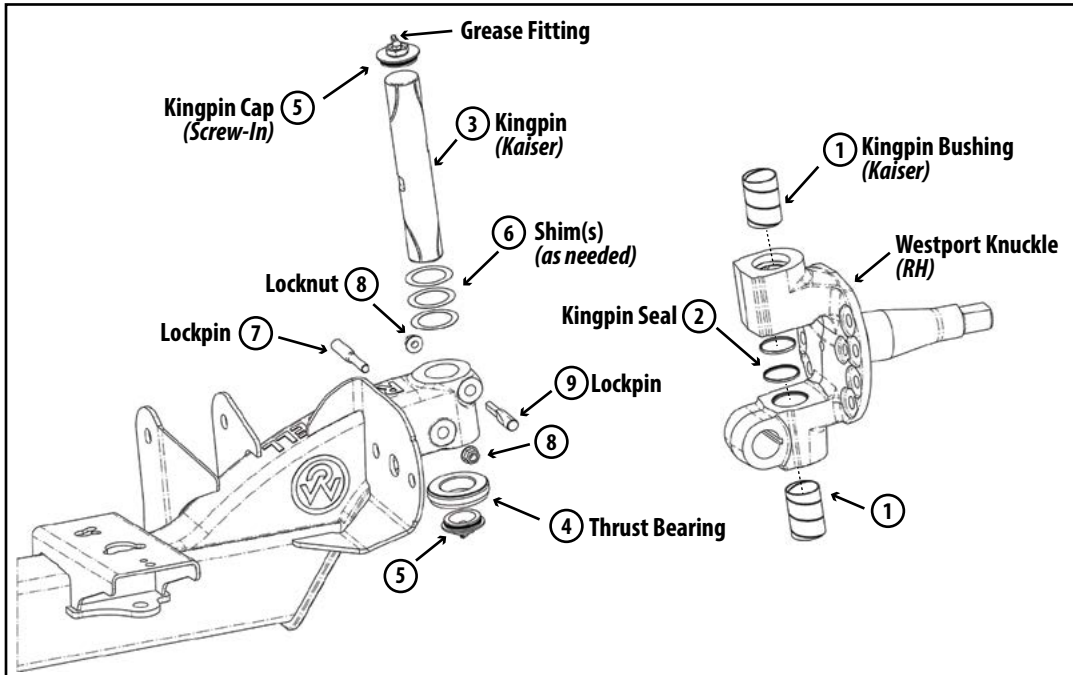
233- 8K TRUCK – KAISER KINGPIN KIT (WESTPORT KNUCKLE)

Diagram No.	QTY/Axle	Part Number	Item Description
	(1)	1660533 – (Kaiser) Kingpin Replacement Kit – Westport Knuckle	
Included in Replacement Kit	1	4	1660483 KINGPIN BUSH KAI 8K FC (<i>Pg 18-Kaiser kingpin installation-No bore reaming</i>)
	2	4	1660484 SEAL KINGPIN KAI 8K FC
	3	2	1660482 KINGPIN FC SER. KAI 8K (1.5" OD)
	4	2	1660139 LOCK PIN .44/20 3.88" 13.2 (Draw Key)
	5	2	1150001 L'NUT 7/16" 20NF FL T-L GR5(B)
	6	2	1660473 BRNG ASY T-149 FC/8K (THRUST)
	7	2	1660474 KINGPIN BRNG SEAL T-149 FC
	8	2	1660475 SHIM KINGPIN-.005"THK "FC"
		2	1660476 SHIM KINGPIN-.010"THK "FC"
2		1660477 SHIM KINGPIN-.015"THK "FC"	
9	4	1660472 KINGPIN CAP FC/8K SCREW IN	



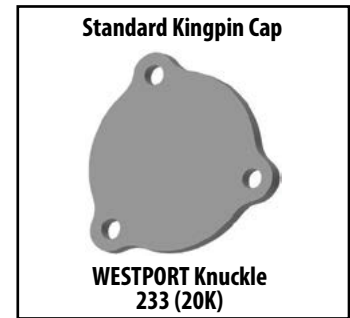
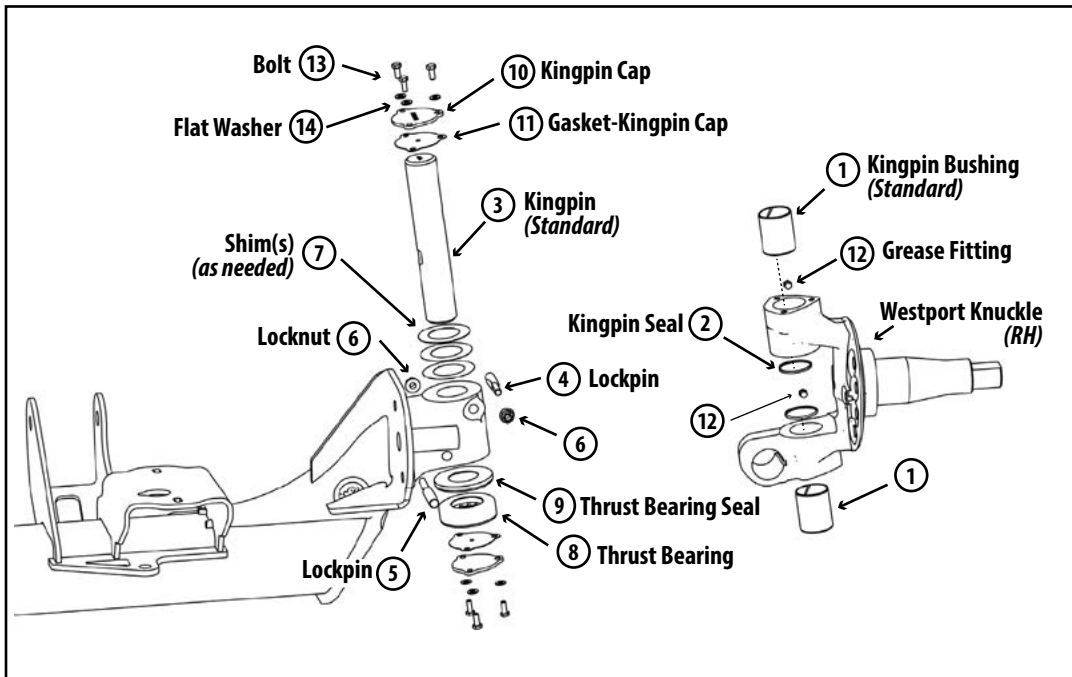
233-10K OR 13K TRUCK/TRAILER – STANDARD KINGPIN KIT (WESTPORT KNUCKLE)

Diagram No.	QTY/Axle	Part Number	Item Description	
	(1)	1660317 – (Standard) Kingpin Replacement Kit – Westport Knuckle		
Included in Replacement Kit	1	4	1660241 KINGPIN BUSH FF/FG <i>(Pg 16-Standard kingpin install-Bore reaming required)</i>	
	2	4	1660131 SEAL ASY KINGPIN FG-941	
	3	2	1660135 KINGPIN FF/FG 13K (1.8" OD)	
	4	2	1660009 BRNG ASY T1822S 12/16K THRUST	
	5	4	1660014 KINGPIN CAP 12/16K SCREW IN	
	6	2	1660136	SHIM - KINGPIN .005" FF/FG
		2	1660137	SHIM - KINGPIN .010" FF/FG
		2	1660138	SHIM - KINGPIN .015" FF/FG
	7	2	1660139	LOCK PIN .44/20 3.88" 13.2
8	4	1150001	L'NUT 7/16" 20NF FL T-L GR5 (B)	
9	2	1660216	LOCK PIN .44/20 3.18"	



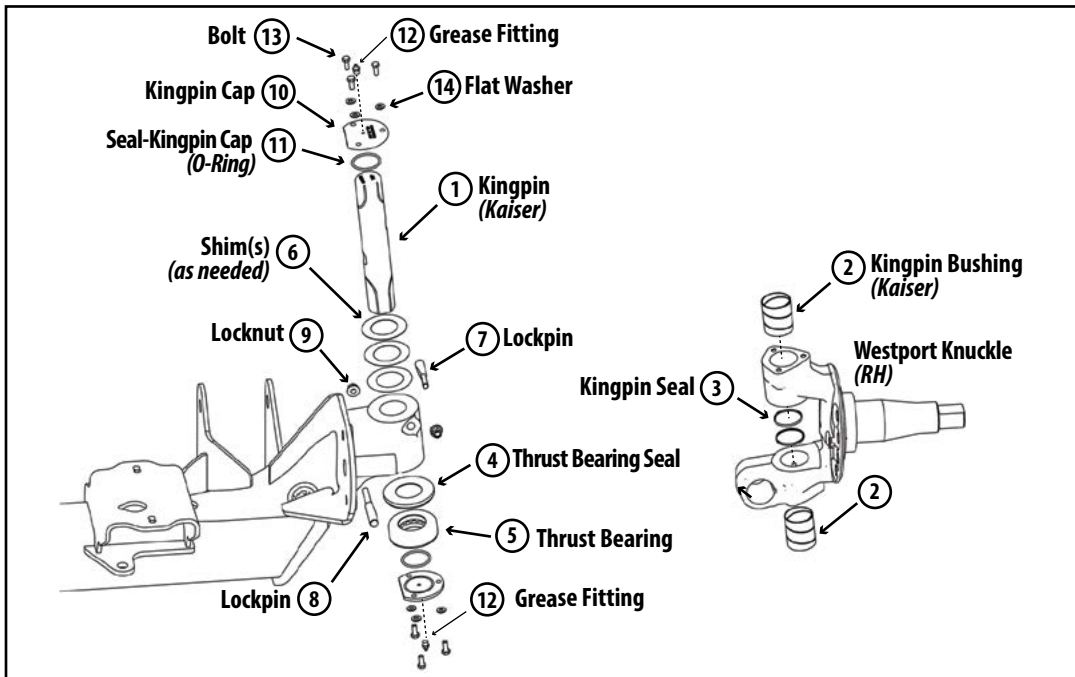
233-10K OR 13K TRUCK/TRAILER – KAISER KINGPIN KIT (WESTPORT KNUCKLE)

Diagram No.	QTY/Axle	Part Number	Item Description
	(1)	1660319 – (Kaiser) Kingpin Replacement Kit – Westport Knuckle	
Included in Replacement Kit	1	4	1660322 KINGPIN BUSH KAI 13K <i>(Pg 18-Kaiser kingpin installation-No bore reaming)</i>
	2	4	1660131 SEAL ASY KINGPIN FG-941
	3	2	1660314 KINGPIN FF/FG KAI #10M21-3 (1.8" OD)
	4	2	1660009 BRNG ASY T1822S 12/16K THRUST
	5	4	1660014 KINGPIN CAP 12/16K SCREW IN
	6	2	1660136 SHIM - KINGPIN .005" FF/FG
		2	1660137 SHIM - KINGPIN .010" FF/FG
		2	1660138 SHIM - KINGPIN .015" FF/FG
	7	2	1660139 LOCK PIN .44/20 3.88" 13.2
8	4	1150001 L'NUT 7/16" 20NF FL T-L GR5 (B)	
9	2	1660216 LOCK PIN .44/20 3.18"	



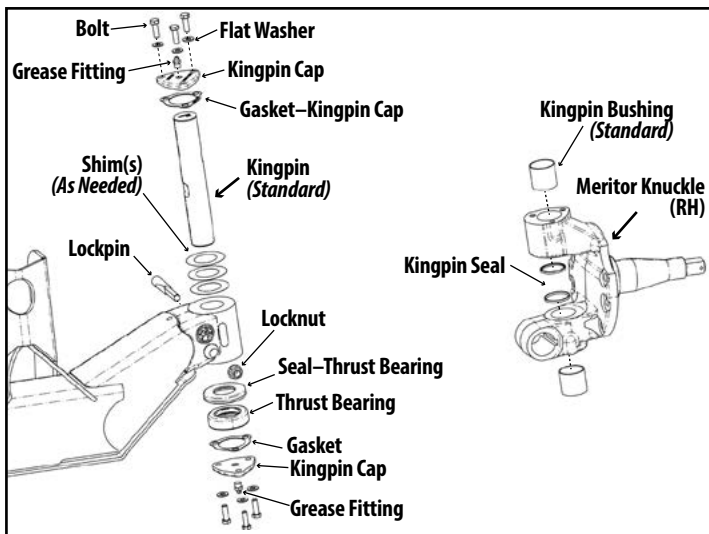
233-20K TRUCK/TRAILER – STANDARD KINGPIN KIT (WESTPORT KNUCKLE)

Diagram No.	Qty/Axle	Part Number	Item Description
	(1)	1660324 – (Standard) Kingpin Replacement Kit– Westport Knuckle	
Included in Replacement Kit	1	4	1660323 KINGPIN BUSH WSTPT 20K <i>(Pg 16-Standard kingpin install-Bore reaming required)</i>
	2	4	1660316 SEAL ASY KINGPIN FL-941
	3	2	1660221 KINGPIN FL943 WP #143660-0006
	4	2	1660216 LOCK PIN .44/20 3.18"
	5	2	1660217 LOCK PIN .44/20 4.75"
	6	4	1150001 L'NUT 7/16" 20NF FL T-L GR5(B)
	7	2	1660218 SHIM KINGPIN-.005"THK FL-943
			1660219 SHIM KINGPIN-.015"THK FL-943
			1660220 SHIM KINGPIN-.030"THK FL-943
	8	2	1660224 BRNG ASY T-208 FL-943 (THRUST)
	9	2	1660225 KINGPIN BRNG SEAL T-208 FL
	10	4	1660222 KINGPIN CAP WP 20K
	11	4	1660223 KINGPIN CAP GSKT WP 20K
	12	4	1660134 GREASE FITTING 1/8"(FF/FG)
13	12	1140064 HEX HEAD CAP SCREW 5/16" 18NC GR8 3/4" LGTH	
14	12	1160004 FLAT WASHER 5/16" SAE PLTD	



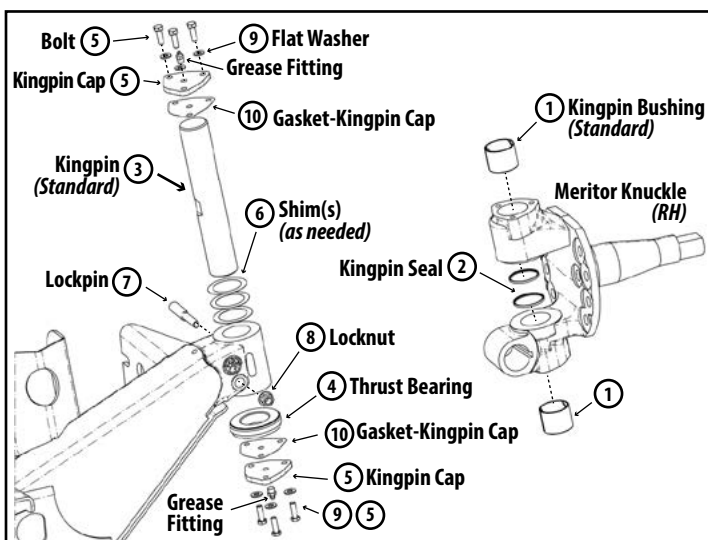
233-20K TRUCK/TRAILER – KAISER KINGPIN KIT (WESTPORT KNUCKLE)

Diagram No.	Qty/Axle	Part Number	Item Description
	(1)	1660325 – (Kaiser) Kingpin Replacement Kit– Westport Knuckle	
Included in Replacement Kit	1	2	1660231 KINGPIN FL SER. KAI 20K
	2	4	1660315 KINGPIN BUSH KAI 20K <i>(Pg 18-Kaiser kingpin installation-No bore reaming)</i>
	3	4	1660316 SEAL ASY KINGPIN FL-941
	4	2	1660225 KINGPIN BRNG SEAL T-208 FL
	5	2	1660224 BRNG ASY T-208 FL-943 (THRUST)
	6	2	1660218 SHIM KINGPIN-.005"THK FL-943
		2	1660219 SHIM KINGPIN-.015"THK FL-943
		2	1660220 SHIM KINGPIN-.030"THK FL-943
	7	2	1660216 LOCK PIN .44/20 3.18"
	8	2	1660217 LOCK PIN .44/20 4.75"
	9	4	1150001 L'NUT 7/16" 20NF FL T-L GR5(B)
	10	4	1660232 KINGPIN CAP FL SER KAI 20K
	11	4	1660233 O-RING CAP SEAL FL SER. KAI
	12	4	1660134 GREASE FITTING 1/8"(FF/FG)
13	12	1140064 HEX HEAD CAP SCREW 5/16" 18NC GR8 3/4" L	
14	12	1160004 FLAT WASHER 5/16"	



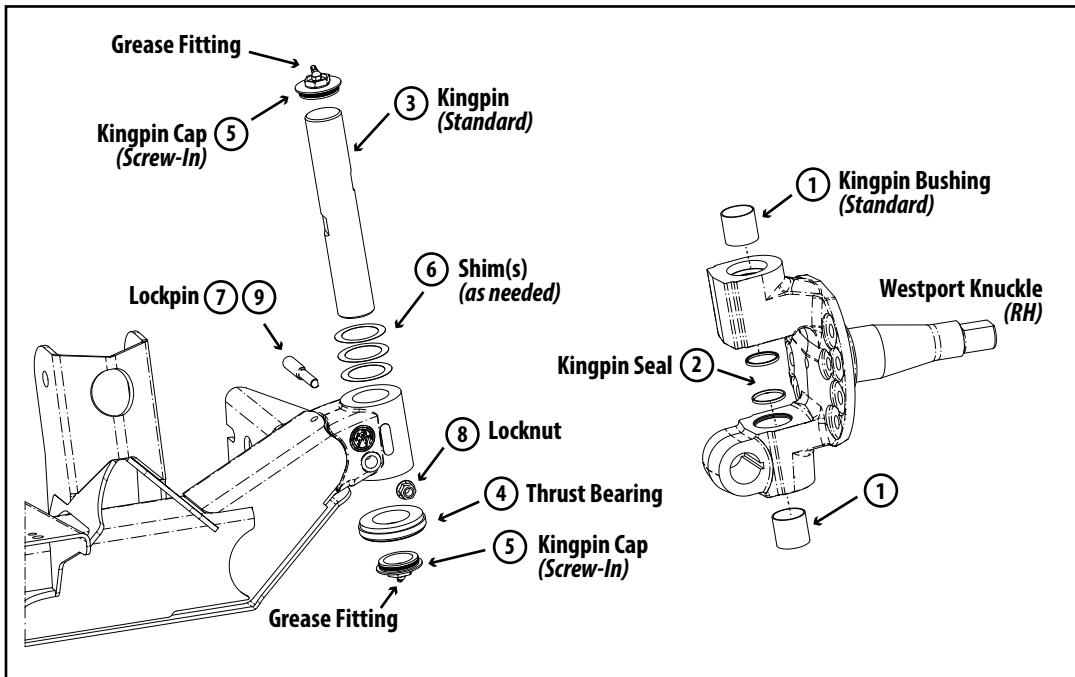
232-8K TRUCK – STANDARD KINGPIN KIT (MERITOR KNUCKLE)

Diagram No.	QTY/Axle	Part Number	Item Description
	(1)	1660170 – (Standard)	Kingpin Replacement Kit (FC-941) – Meritor Knuckle
—			Meritor #R201318 (Pg 16-Standard kingpin install-Bore reaming required)



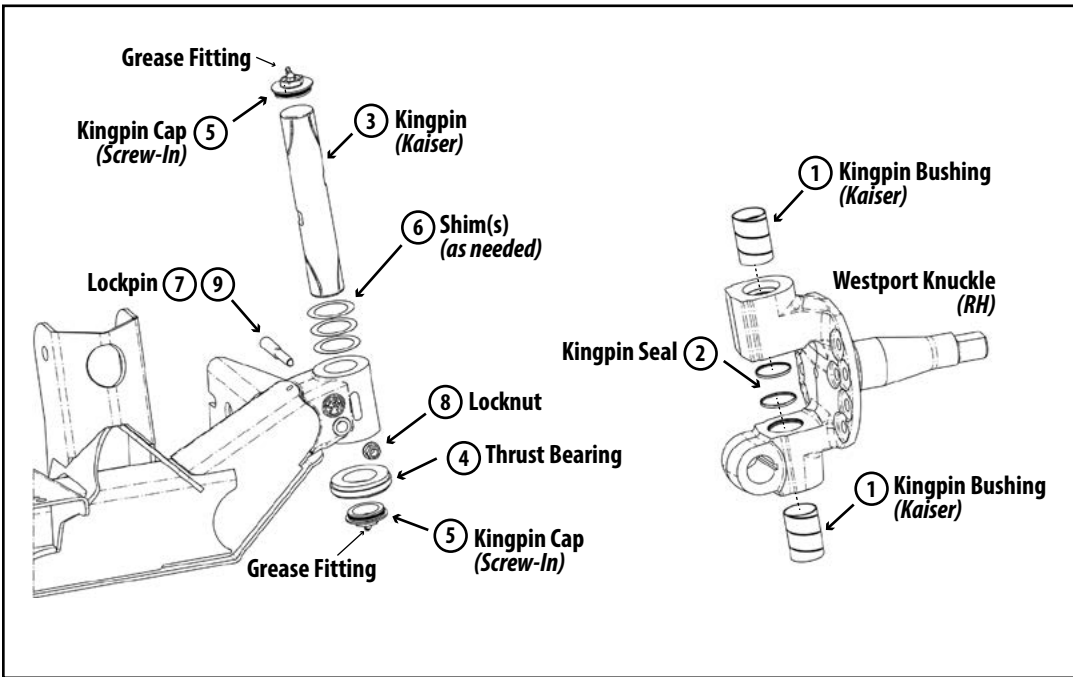
232-10K OR 13K TRUCK/TRAILER – STANDARD KINGPIN KIT (MERITOR KNUCKLE)

DGM No.	QTY/Axle	Part Number	Item Description	
	(1)	1660106 – (Standard)	Kingpin Replacement Kit – Meritor Knuckle	
Included in Replacement Kit	1	4	1660241 KINGPIN BUSH FF/FG R210088 (Pg 16-Standard kingpin install-Bore reaming required)	
	2	4	1660131 SEAL ASY KINGPIN FG-941	
	3	2	1660135 KINGPIN FF/FG STEMCO 105.21.03	
	4	2	1660009 THRUST BRNG ASY T1822S 12/16K	
	5	2	1660133 KINGPIN CAP KIT FG-941 MERITOR (2297T 4752S; TWO CAPS; SIX HHCS)	
	6	2	1660136	SHIM - KINGPIN .005" FF/FG
		2	1660137	SHIM - KINGPIN .010" FF/FG
		2	1660138	SHIM - KINGPIN .015" FF/FG
	7	2	1660139	LOCK PIN .44/20 3.88" 13.2
	8	2	1150001	L'NUT 7/16" 20NF FL T-L GR5 (B)
9	12	1160004	FLAT WASHER - 5/16" SAE PLTD	
10	4	1660132	GSKT KINGPIN CAP FG-941	



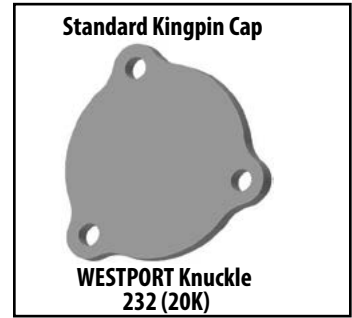
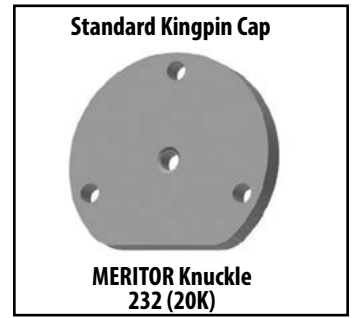
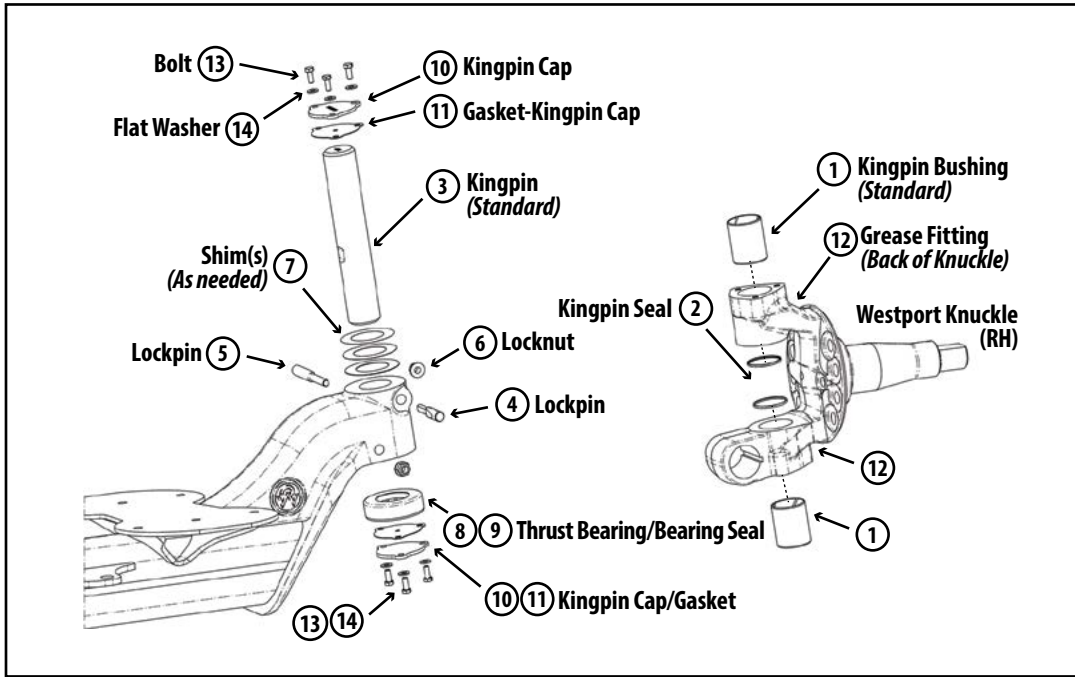
232-10K OR 13K TRUCK/TRAILER — STANDARD KINGPIN KIT (WESTPORT KNUCKLE)

Diagram No.	QTY/Axle	Part Number	Item Description
	(1)	1660317– (Standard) Kingpin Replacement Kit – Westport Knuckle	
Included in Replacement Kit	1	4	1660241 KINGPIN BUSH FF/FG R210088 (<i>Pg 16-Standard kingpin install-Bore reaming required</i>)
	2	4	1660131 SEAL ASY KINGPIN FG-941
	3	2	1660135 KINGPIN FF/FG STEMCO 105.21.03
	4	2	1660009 BRNG ASY T1822S 12/16K THRUST
	5	4	1660014 KINGPIN CAP 12/16K SCREW IN
	6	2	1660136 SHIM - KINGPIN .005" FF/FG
		2	1660137 SHIM - KINGPIN .010" FF/FG
		2	1660138 SHIM - KINGPIN .015" FF/FG
	7	2	1660139 LOCK PIN .44/20 3.88"
8	4	1150001 L'NUT 7/16" 20NF FL T-L GR5 (B)	
9	2	1660216 LOCK PIN .44/20 3.18"	



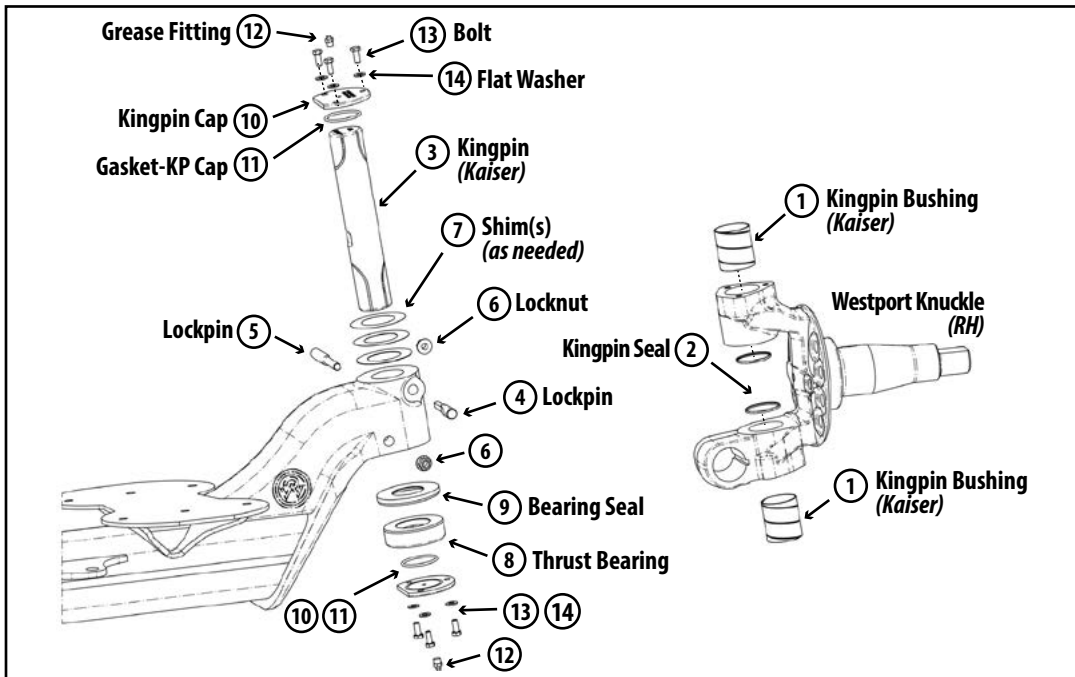
232-10K OR 13K TRUCK/TRAILER – KAISER KINGPIN KIT (MERITOR OR WESTPORT KNUCKLE)

Diagram No.	QTY/Axle	Part Number	Item Description
	(1)	1660261 – (Kaiser) Kingpin Replacement Kit FG-941 – Meritor Knuckle	
			#KG931-R (Pg 18-Kaiser kingpin installation-No bore reaming)
	(1)	1660319 – (Kaiser) Kingpin Replacement Kit – Westport Knuckle	
Included in Replacement Kit	1	4	1660322 KINGPIN BUSH KAI 13K (Pg 18-Kaiser kingpin installation-No bore reaming)
	2	4	1660131 SEAL ASY KINGPIN FG-941
	3	2	1660314 KINGPIN FF/FG KAI #10M21-3 (1.8" OD)
	4	2	1660009 THRUST BRNG ASY T1822S 12/16K
	5	4	1660014 KINGPIN CAP 12/16K SCREW IN
	6	2	1660136 SHIM - KINGPIN .005" FF/FG
		2	1660137 SHIM - KINGPIN .010" FF/FG
		2	1660138 SHIM - KINGPIN .015" FF/FG
	7	2	1660139 LOCK PIN .44/20 3.88" 13.2
8	4	1150001 L'NUT 7/16" 20NF FL T-L GR5(B)	
9	2	1660216 LOCK PIN .44/20 3.18"	



232-20K TRUCK/TRAILER – STANDARD KINGPIN KIT (MERITOR OR WESTPORT KNUCKLE)

Diagram No.	QTY/Axle	Part Number	Item Description
	(1)	1660326 – (Standard) Kingpin Replacement Kit FL-941 – Meritor Knuckle	
			Meritor #R201312 (Pg 16-Standard kingpin install-Bore reaming required)
	(1)	1660324 – (Standard) Kingpin Replacement Kit – Westport Knuckle	
Included in Replacement Kit	1	4	1660323 KINGPIN BUSH WSTPT 20K FL(Pg 16-Standard kingpin install-Bore reaming required)
	2	4	1660316 SEAL ASY KINGPIN FL-941
	3	2	1660221 KINGPIN FL943 WP #143660-0006 (2" OD)
	4	2	1660216 LOCK PIN .44/20 3.18"
	5	2	1660217 LOCK PIN .44/20 4.75"
	6	4	1150001 L'NUT 7/16" 20NF FL T-L GR5(B)
	7	2	1660218 SHIM KINGPIN-.005"THK FL-943
			1660219 SHIM KINGPIN-.015"THK FL-943
			1660220 SHIM KINGPIN-.030"THK FL-943
	8	2	1660224 BRNG ASY T-208 FL-943 (THRUST)
	9	2	1660225 KINGPIN BRNG SEAL T-208 FL
	10	4	1660222 KINGPIN CAP WP 20K
	11	4	1660223 KINGPIN CAP GSKT WP 20K
	12	4	1660134 GREASE FITTING 1/8"(FF/FG)
13	12	1140064 HEX HEAD CAP SCREW 5/16" 18NC GR8 3/4" LGTH	
14	12	1160004 FLAT WASHER 5/16" SAE PLTD	



232-20K TRUCK/TRAILER – KAISER KINGPIN KIT (MERITOR OR WESTPORT KNUCKLE)

Diagram No.	QTY/Axle	Part Number	Item Description
	(1)	1660189 – (Kaiser) Kingpin Replacement Kit – Meritor Knuckle	
			<i>Meritor #KH931-L (Pg 18-Kaiser kingpin installation-No bore reaming)</i>
	(1)	1660325 – (Kaiser) Kingpin Replacement Kit – Westport Knuckle	
Included in Replacement Kit	1	4	1660315 KINGPIN BUSH KAI 20K FL <i>(Pg 18-Kaiser kingpin installation-No bore reaming)</i>
	2	4	1660316 SEAL ASY KINGPIN FL-941
	3	2	1660231 KINGPIN FL SER. KAI 20K (2" OD)
	4	2	1660216 LOCK PIN .44/20 3.18"
	5	2	1660217 LOCK PIN .44/20 4.75"
	6	4	1150001 L'NUT 7/16" 20NF FL T-L GR5 (B)
	7	2	1660218 SHIM KINGPIN-.005"THK FL-943
		2	1660219 SHIM KINGPIN-.015"THK FL-943
		2	1660220 SHIM KINGPIN-.030"THK FL-943
	8	2	1660224 BRNG ASY T-208 FL-943 (THRUST)
	9	2	1660225 KINGPIN BRNG SEAL T-208 FL
	10	4	1660232 KINGPIN CAP FL SER KAI 20K
	11	4	1660233 O-RING CAP SEAL FL SER. KAI
	12	4	1660134 Grease Fitting 1/8"(FF/FG)
13	12	1140064 Hex Head Cap Screw 5/16" 18NC GR8 3/4" Lgth	
14	12	1160004 Flat Washer 5/16" SAE PLTD	

230 TRUCK/TRAILER SUSPENSION – STANDARD KINGPIN KIT (SCREW-IN CAP)

Diagram No.	QTY/Axle	Part Number	Item Description
—	(1)	1667325B034 – (Standard) Kingpin Replacement Kit	

(Pg 16-Standard kingpin install-Bore reaming required)

Recommended Service Intervals

Ridewell Suspensions recommends minimum service intervals for standard duty, on-highway usage suspension applications. More frequent service intervals are recommended for off-highway/heavier duty applications.

Daily/Pre-Trip Inspections

- ___ Visually inspect suspension for damage/excessive wear.
- ___ Check for loose/missing fasteners. Check for irregular movement in suspension system components.
- ___ Check tires for proper inflation, damage or excessive wear.
- ___ Check wheel-ends for obvious signs of lubricant leakage. Check for missing components.
- ___ Make sure air controls are operating properly. Drain all moisture from air reservoirs.

First 6,000 miles of use

- ___ Torque all fasteners to specifications (ENG Drawing).

Every 12,000 miles of use

- ___ Lubricate Brake Cam and Slack Adjuster.
- ___ Grease kingpin thrust bearings. Apply grease in upper and lower grease fittings until new grease is visible at the purge location. Wipe excess grease from purge areas.
- ___ Inspect steering damper for damage/wear.
- ___ Inspect air springs for damage/excessive wear. Torque bolts/nuts to specifications. (ENG Drawing).
- ___ Check air system for leaks.

First 50,000 miles of use

- ___ Check wheel-end/knuckle for excessive play.
- ___ Inspect tie-rod and tie-rod ends for excessive damage/wear. Lubricate tie-rod ends. Verify tie-rod boot is in place and completely over end of tie-rod. Replace entire tie-rod end if boot is damaged.
- ___ Check pivot bushings for wear.
- ___ Torque all suspension bolts/nuts to spec. (ENG Drawing).
- ___ Check (reverse) steer lock operation (if equipped).
- ___ Verify operation of manual/automatic lift-in-reverse control system (if equipped).

Annual/100,000 Miles Inspection

- ___ Inspect pivot connections for worn bushings/wear washers. Replace if necessary. Torque pivot hardware to specifications (ENG Drawing).
- ___ Check lubrication level in wheel-ends. Refill/Replace as needed. (TMC RP 631-Wheel End Lubrication Procedure)
- ___ Check hanger and A/SPG mounting plate connections.
- ___ Check air system for leaks.
- ___ Test air tank pressure protection valve if equipped.
- ___ Check brakes/brake chambers for damage/function.

CAUTION Failure to exhaust all pressure from the air system before vehicle work can cause serious injury.

CAUTION Failure to torque suspension components to specifications can result in suspension failure and void the warranty.

Wheel-Toe Setting

Wheel-toe is the relationship of the distance between the front of the tires and the distance between the rear of the tires on the same axle. When front distance is less than the rear distance, the wheels are in a “toe-in” (positive toe) condition.

Check Wheel Toe Setting

The correct setting for the RSS-233 suspension should be a positive toe-in between 1/32” and 3/32”.

1. Deflate the air springs.
2. Lift axle enough for tires to rotate freely. Support with jack stands to ensure axle is level.
3. Position tires to point straight ahead. Spin each tire. Use a piece of chalk to mark a line on the center tread all the way around each tire.
4. Use a tape measure to measure the distance between the center mark at the front and the rear of the tires.
5. Subtract the distance measured at the front of the tires from the distance measured at the rear of the tires to obtain the wheel toe setting (between 1/32” and 3/32”).

Adjust Wheel Toe

1. Loosen the clamps on both ends of the tie rod. Twist the tie rod forward/backward to move the front of the tires towards or away from each other (increase/decrease toe-in setting).
2. Continue rotating the tie rod until the proper toe-in setting is achieved.
3. Torque tie-rod clamps to 60-80 ft-lb (81-108 N-m).

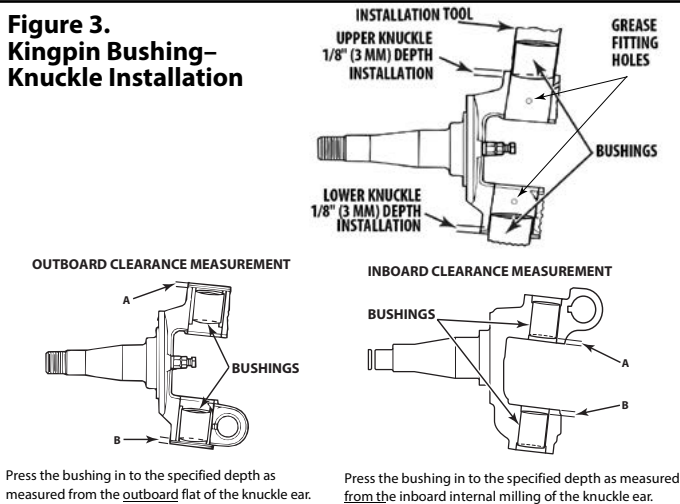
Refer to these Technology & Maintenance Council (TMC) Recommended Procedures for additional information:

RP 609	Self-Adjusting/Manual Brake Adjuster Removal, Installation and Maintenance
RP 618	Wheel Bearing Adjustment Procedure
RP 619	Air System Inspection Procedure
RP 622	Wheel Seal and Bearing Maintenance
RP 631	Wheel End Lubrication Procedures
RP 643	Air Ride Suspension Maintenance Guidelines
RP 645	Tie-Rod End Inspection/Maintenance
RP 651	Steer Axle Maintenance Guidelines

Available Wheel-End Lubricants

Lubricant Type	Part No.	Item Description
Mineral Oil	380008G	(CITGO) MP GearOil 631310001-80W-90
Synthetic Oil	1980006	(SHELL) Synthetic API GI-5 75W-90 Oil
Synthetic Hard-Pack Grease	1980007	(CITGO) Synthetic Grease

Figure 3.
Kingpin Bushing–
Knuckle Installation



233/232 Model	Msrmt Reference	Top Depth (A)	Bottom Depth (B)
10K/13K	Outboard	0.352-0.382"	0.352-0.382"
20K	Inboard	0.135-0.165"	0.135-0.165"

Kingpin bushings should be replaced on both sides of the axle at the same time.

Top Bushing

Place the new bushing into the upper knuckle bore. Use a bushing installation tool, if needed, to start the bushing straight into the upper bore. Press top bushing to the depth indicated for the suspension.

NOTE: Bushing hole for grease must be aligned with grease fitting hole in knuckle side (Figure 3).

Bottom Bushing

Turn the knuckle over so that the bottom of the knuckle is UP. Place the new bushing into the lower knuckle bore. Use a bushing installation tool, if needed, to start the bushing straight into the lower bore. Press bottom bushing to the depth indicated for the suspension.

NOTE: Bushing hole for grease must be aligned with grease fitting hole in knuckle side (Figure 3).

Both the top and bottom bushing must be reamed before installing kingpin seals.

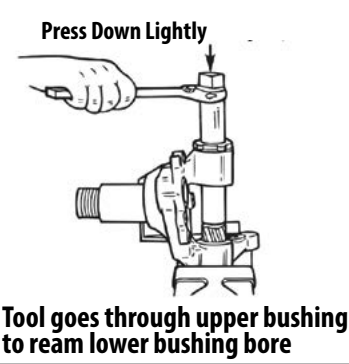
Ream the bushings:

Do not hone or burnish bushings before reaming. Use a fixed-size reamer tool to ream kingpin bushings.

Place the knuckle into a vise with brass jaws. Slide the pilot of the reamer through the top bushing until the reamer blades touch the bushing.

Rotate the reamer tool with a light DOWNWARD pressure. Continue rotating the tool until the top bushing is reamed out. Do not allow the reamer tool to drop through onto the bottom bushing.

Figure 4.
Reaming Kingpin Bushings



Guide the pilot of the reamer into the bottom bushing until the reamer blades touch the bushing. Rotate the reamer with a light DOWNWARD pressure until the bottom bushing is reamed out (Figure 4).

Slide the reamer out of the bottom bushing.

NOTE: Rotate the reamer tool in the opposite cutting direction if the tool must be removed through the top bushing.

Clean all material from inside of the bushings.

Steering Knuckle - Kingpin Seal Installation

Place the top of the knuckle into a vise with brass jaws. The bottom of the knuckle must be TOWARD you. Place the kingpin seal into the bottom of the top knuckle bore. The lip of the seal must be AWAY from the bore (Figure 5).

Place the knuckle end cap on top of the seal. Slide the kingpin through the opposite knuckle bore. Use the kingpin to install the seal. The bottom of the seal must touch the bushing.

Turn the knuckle over in the vise. The jaws of the vise must hold the bottom of the knuckle, and the top of the knuckle must be towards the installer. Place the seal into the top of the bottom knuckle bore.

The seal lip must be AWAY from the bore (Figure 5).

Place endcap for the knuckle on top of the seal. Slide kingpin through the opposite knuckle bore. Use kingpin to install the seal (Figure 6).

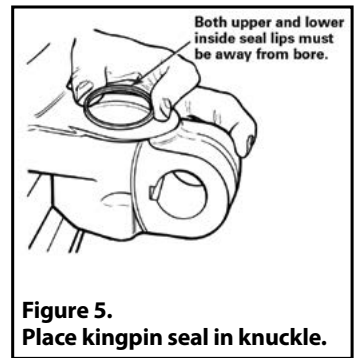


Figure 5.
Place kingpin seal in knuckle.

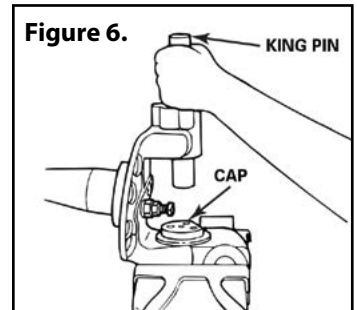


Figure 6.

Steering knuckle installation

Clean the bores of the knuckle and the axle beam.

CAUTION Use a brass or leather mallet for assembly/disassembly procedures. Do not hit steel parts with a steel hammer. Pieces of the steel part can break off.

Install the seal onto thrust bearing. The surface with the inner diameter seal must be on top. The surface with outer diameter seal must be on bottom (Figure 7).

- Cover-type seals:
Install seal over the open end of the bearing.
- Flat-type seals:
Install seal over the closed part of the bearing.

Install the seal and thrust bearing assembly on the inner knuckle. The seal faces upward towards beam; top inner diameter contacts the bottom of the beam.

NOTE: One-piece thrust bearing with an integrated grease seal is completely interchangeable with two-piece design. It has a specified top and bottom orientation.

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Standard Kingpin Replacement Procedure (Continued from previous page)

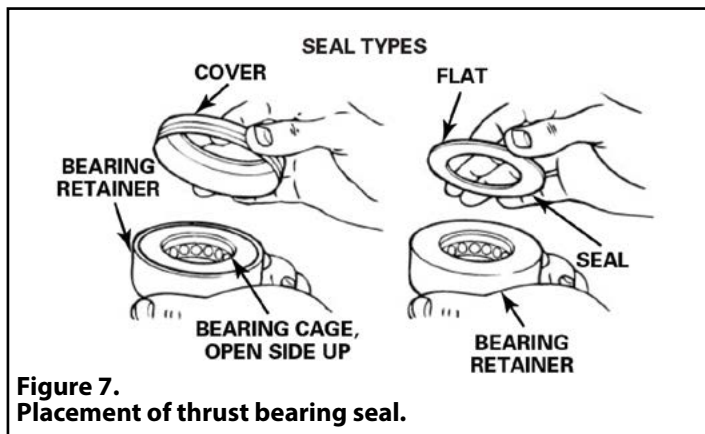


Figure 7.
Placement of thrust bearing seal.

Install Shims

Inspect the shims for damage before installation.

- Replace damaged shims with the same size shims or a combination of sizes that allow the least amount of knuckle-end play.
- If a new shim pack is required, select the number of shims for installation that provide the least amount of knuckle-end play.
- Place the shims on top of the axle beam bore machined surface. Align the shims for kingpin installation.

CAUTION Shims have sharp edges. Wear gloves to install.

Place the knuckle onto the axle beam. Place a pry bar between the steering arm boss and the axle beam. Lift the knuckle and slide the shim pack between the top of the beam and the knuckle (Figure 8). Align all the bores.

NOTE: If the bores are not aligned, the parts will be damaged when kingpin is installed. Remove pry bar.

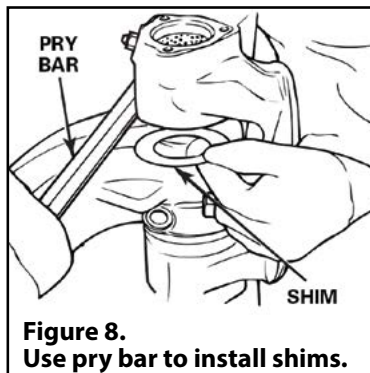
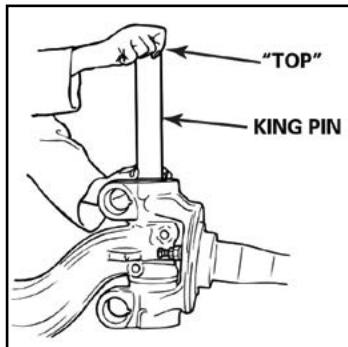


Figure 8.
Use pry bar to install shims.

Install kingpin

Apply multi-purpose grease onto the bottom half of the kingpin before installing.



Verify "TOP" is stamped on the top of kingpin. Rotate the kingpin so that the two draw key slots of the pin correctly align with the draw key slots in the knuckle.

Install the kingpin into the TOP of the knuckle and through the area where the shims are located. Do not force the pin through the top bushing. If required,

use a hammer and a brass drift to apply direct force to the kingpin for seating it into the lower knuckle bore.

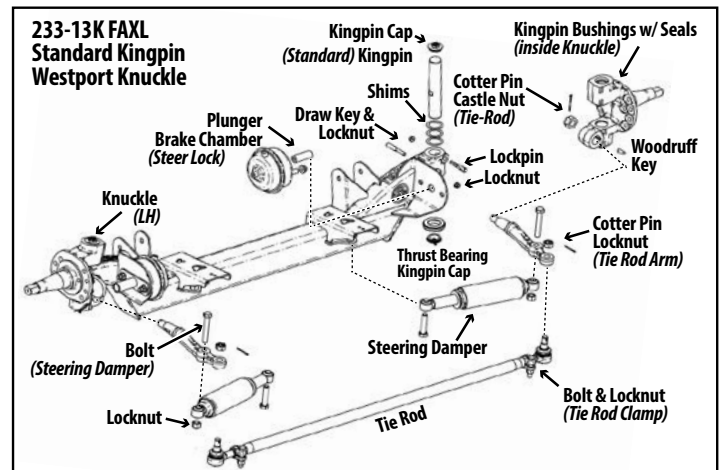
Seat the top draw key into the front of the beam. Seat the bottom draw key into the back of the beam by striking it with a hammer and drift.

The keys must align with the slots of the kingpin. Check the knuckle end play before installing or tightening locknuts.

Install the draw key locknut(s). Torque draw key locknut(s) to 30-45 ft-lbs.

Install new gaskets and caps on the top and bottom of the kingpin.

- Meritor kingpin caps:
Install bolts and washers. Torque to 20-30 ft-lbs.
- Westport caps:
Install threaded cap and gaskets. Torque to 70-90 ft-lbs.
- Install kingpin cap grease fittings. Torque to 10 ft-lbs.



Assemble the Tie-Rod

Place a Woodruff key into the tie-rod arm. Attach arm to the axle knuckle with nuts.

- Torque 233 8K/13K (1" nuts) to 550-1025 ft-lbs.
- Torque 233 20K (1 1/4" nuts) to 775-1450 ft-lbs.

Tighten nut slightly, if necessary, to align the holes. Install a 3/16" x 2-1/4" cotter pin.

If removed, install the cross tube into the tie-rod ends to the position marked during removal. Thread the ends equally into the cross tube to the required length and secure with clamp and bolts.

NOTE: The tie-rod cross tube has right-hand threads on one end and left-hand threads on the other end.

Attach tie-rod ends through the tapered holes of tie-rod arms with 7/8" nuts. Torque nuts to 160-300 ft-lbs.

Tighten nut slightly, if necessary, to align the holes. Install a 9/64" x 1-3/4" cotter pin.

Adjust tie-rod length to attain wheel toe-in between 1/32" and 3/32" (See page 17). Torque clamp bolts at tie-rod end to 40-60 ft-lbs.

NOTE: Toe-in is the negative difference in measurement across the inside of each hub, at the leading edge compared to the trailing edge.

Lubrication

Grease top and bottom of knuckles until grease appears near axle to knuckle interface. Grease camshaft support tube until grease appears at slack adjuster.

Refer to Meritor, Inc. Publication "Maintenance Manual 2-Front Non-Drive Steer Axles" for additional information.

Kaiser Kingpin Bushing Installation Procedure

Kaiser kingpin bushings do not require inside of bushing (bore) be reamed after installation (Fig 9).

1. Drive out the bushings and bushing seals from the axle-knuckle with a bushing driver and a brass/dead-blow hammer.
NOTE: Do NOT use a punch or chisel, this could result in damaging the spindle eyes.
2. Use a brake hone that is attached to a hand drill to lightly scrape the axle spindle eye until smooth. Install two (2) lip seals in each kingpin assembly:
 - One lip seal is placed at the bottom of the top spindle bore (near the axle).
 - One lip seal is placed at the top of the bottom spindle bore (near the axle). Lip opening of the rubber seal should face the axle eye.
3. Place a kingpin seal on the end of the bushing driver with beveled edge of seal facing out.
NOTE: Metal part of the lip seal should be placed against the metal of the installation tool (bushing driver).
4. Use a brass hammer or dead-blow hammer to drive the seal into spindle eye until the driver and seal are flush with the bottom of the spindle eye.
Seal should be positioned far enough into the spindle bore to accommodate the bushing, but should not extend out of the bore.
The lip seal is properly installed when it is in the correct position with the seal lip opening facing the appropriate direction. This will allow grease to pass through the seal during greasing, but will prevent dirt, grit, and water from entering the bushing area.
5. Wipe a small amount of grease into each spindle bore. Hold the spiral steel bushing in one hand, tilted slightly, and insert into the bore.
Turn the bushing in a clockwise direction to twist the spiral bushing into the spindle eye. Install the bushing as far into the spindle bore as you can by hand.
6. Grip bushing wall with a "T" wrench (recommended) or narrow-nose pliers about 1" away from the tip. Continue the clockwise rotation until the bushing is within 1/8" of the bushing bore surface.
7. Tap bushing down flush to surface with a brass mallet, starting at heaviest part of the wrap and tapping clockwise around the bushing until bushing is in position.

Axle-Knuckle Installation

1. Check kingpin fit in both the top and bottom bore of the knuckle.
Slide the kingpin through both knuckle bores to test spindle alignment (Figure 10).
2. The spindle should be replaced if the kingpin will not go into and through both spindle eyes.

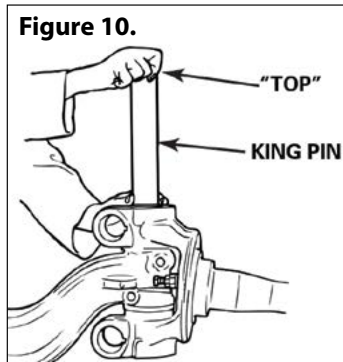
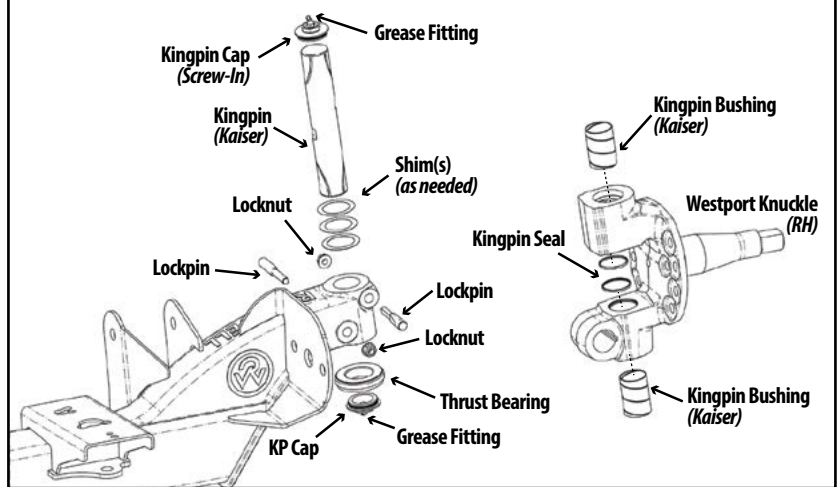


Figure 9.
233-13K axle w/ Westport knuckle; Kaiser kingpin (Reference Only)



3. Pack thrust bearing with grease before installation.
4. Select number of shims to give the least amount of end-play in the knuckle. Shim thicknesses are .005", .010" and .015" (.030" thickness for 20K axles).
5. Verify the word "TOP" on top of kingpin is facing towards the end of the spindle (Figure 10).
Place kingpin into the top of the spindle eye. Slide the kingpin through until approximately 1/2-inch of the kingpin comes out the bottom of the eye.
Place shim(s) onto the bottom of the kingpin.
6. Carefully place the knuckle with kingpin and shim(s) onto the axle. Let the kingpin drop into the bottom hole. Push kingpin down through the knuckle until it is flush with the bottom of the axle.
7. Using the palm of the hand, install the thrust bearing with the open side down.
If the bearing cannot be installed, take the axle-knuckle assembly apart and remove the 0.005" shim(s) from the bottom of the kingpin.
If the bearing can easily be installed with fingers, take the assembly apart and add a 0.005" shim to the stack.
8. Install lockpin(s). Make sure the flat side of the lockpin is facing the kingpin. Install nuts and washers. Torque the lockpin locknut to 30-45 ft.lb.
9. Install the top and bottom kingpin cap and tighten.

Lubrication

1. Attach grease gun to the top grease fitting (top of cap). Move the spindle from side-to-side while pumping grease into the fitting until grease comes out between spindle and axle.
If the spindle does not move smoothly, there may be too many shims installed or the thrust bearing may have been damaged.
2. Attach grease gun to the bottom cap grease fitting. Move the spindle from side-to-side while pumping grease into the fitting until grease comes out the top of the bearing.

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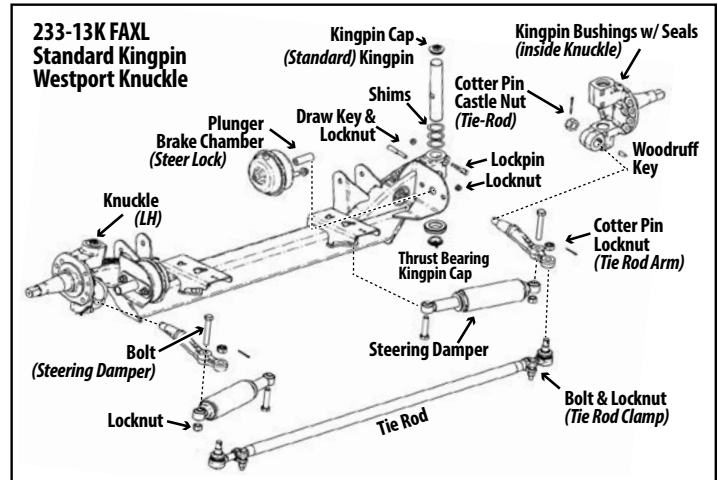
Kaiser Kingpin Replacement Procedure (Continued from previous page)

Assemble the Tie-Rod

1. Place a Woodruff key into the tie-rod arm. Attach arm to the knuckle with nuts.
 - 1.1. Torque 233 8K/13K (1" nuts) to 550-1025 ft-lbs.
 - 1.2. Torque 233 20K (1 1/4" nuts) to 775-1450 ft-lbs.
2. Tighten nut slightly, if necessary, to align the holes. Install a 3/16" x 2-1/4" cotter pin.
3. If removed, install the cross tube into the tie-rod ends to the position marked during removal. Thread the tie-rod ends into the cross tube to the required length and secure with clamp and bolts.

NOTE: Tie-Rod cross tube has right-hand threads on one end and left-hand threads on the other end.
4. Attach tie-rod ends through the tapered holes of tie-rod arms with 7/8" nuts. Torque nuts to 160-300 ft-lbs. Tighten nut slightly, if necessary, to align the holes. Install a 9/64" x 1-3/4" cotter pin.
5. Adjust the tie-rod length to attain wheel toe-in between 1/32" and 3/32" (See page 17). Torque the clamp bolts at each tie-rod end to 40-60 ft-lbs.

NOTE: Toe-in is the negative difference in measurement across the inside of each hub, at the leading edge compared to the trailing edge.



CAUTION Failure to torque components to specifications can result in suspension failure and void the warranty.

Terms and coverage in this warranty apply only to the United States and Canada.

Ridewell Suspensions warrants the suspension systems manufactured by it to be free of defects in material and workmanship. Warranty coverage applies only to suspensions that have been properly installed, maintained and operated within the rated capacity and recommended application of the suspension. The responsibility for warranty coverage is limited to the repair/replacement of suspension parts. The liability for coverage of purchased components for suspensions is limited to the original warranty coverage extended by the manufacturer of the purchased part.

All work performed under warranty must have prior written approval from the Ridewell warranty department. Ridewell has the sole discretion and authority to approve or deny a claim and authorize the repair or replacement of suspension parts. All parts must be held until the warranty claim is closed.

Parts that need to be returned for warranty evaluation will be issued a Returned Materials Authorization (RMA). Parts must be returned to Ridewell with the transportation charges prepaid. The charges for parts transportation will be reimbursed if the warranty claim is approved.

This non-transferable warranty is in lieu of all other expressed or implied warranties or representations, including any implied warranties of merchantability or fitness or any obligations on the part of Ridewell. Ridewell will not be liable for any business interruptions, loss of profits, personal injury, any costs of travel delays or for any other special, indirect, incidental or consequential losses, costs or damages.

Contact the Ridewell Warranty Dept. at 417.833.4565 - Ext. 135, for complete warranty information.