



This Field Service Bulletin replaces bulletin "V-Stay Carrier Bolt, Replacement", (USA78582) PV729-FSB652-005_M, dated 04/2017.

Date	Group	No.	Release	Page
10.2017	652	005	02	1(37)

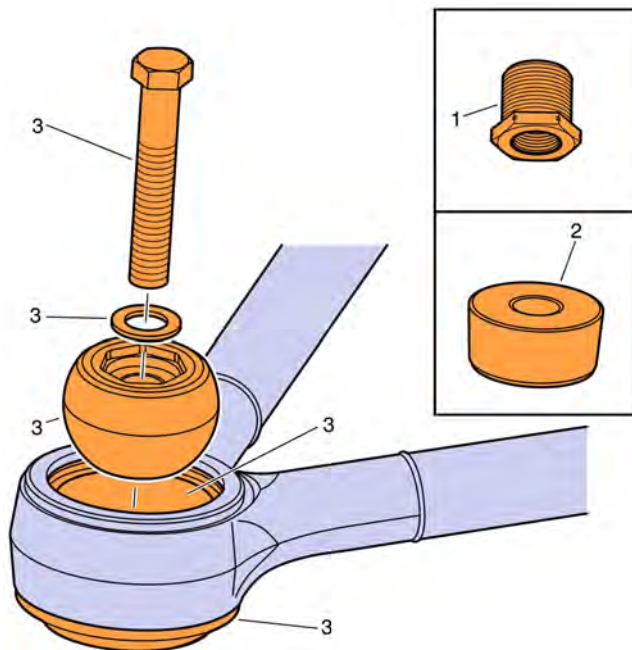
V-Stay Carrier Bolt, Replacement
CHU, CXU, GU, TD, LEU, LR, MRU

FSB 652-005, V-Stay Carrier Bolt, Replacement

October (2017)

On some MACK CHU, CXU, GU, TD, LEU, LR, and MRU trucks built from 01/14/2013 and 01/20/2017, the V-Stay carrier bolt hole in the mRide suspension may become stripped, causing the V-Stay torque rod bolt to pull free from the carrier housing. The carrier housing to V Stay rod connection must first be checked for proper engagement using a new tapered v stay rod end or drill guide. After this check the housing will either need to be replaced or will require drilling, tapping, and installation of a new threaded insert into the stripped bolt hole from inside the carrier housing. After installation of the new insert, an overhaul of the V-Stay pivot ball, V-Stay carrier bolt, and washer is required to secure the V-Stay torque rod to the carrier housing. Follow the replacement procedures outlined in this Field Service Bulletin (FSB).

Note: This bulletin does not apply to MACK Trucks Australia.



W6115013

Required Parts

mRide Repair Kit 85151123 Contents, (Two Kits Required Per Chassis)			
Item #	Description	Part Number	Qty
1	Threaded Insert, 1-1/8*12 OD*1.5 ID	22945401	1
2	Drill Guide	85150354	1
3	Ball Joint Overhaul Kit	85151122	1
4	26.6 mm (1 3/64 in) Drill Bit (Locally Source Tools)	N/A	1
5	1 1/8 in – 12 Fine Thread Tap (Locally Source Tools)	N/A	1
6	25.4 mm (1 in) Tapered Reamer (Locally Source Tools)	N/A	1

Decommissioning the Truck for Repair

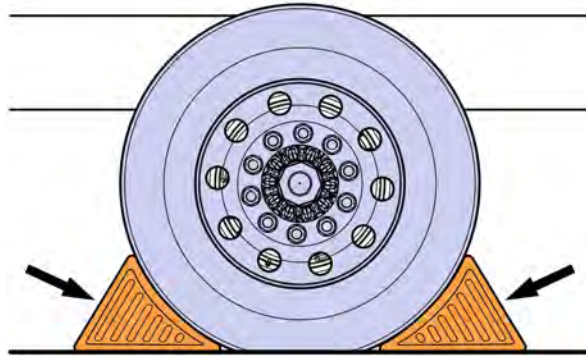
You must read and understand the precautions and guidelines in Service Information, group 60, "General Safety Practices, Steering, Front Axle, & Suspension" before performing this procedure. If you are not properly trained and certified in this procedure, ask your supervisor for training before you perform it.

NOTE: Information is subject to change without notice. Illustrations are used for reference only and can differ slightly from the actual vehicle being serviced. However, key components addressed in this information are represented as accurately as possible.

DANGER

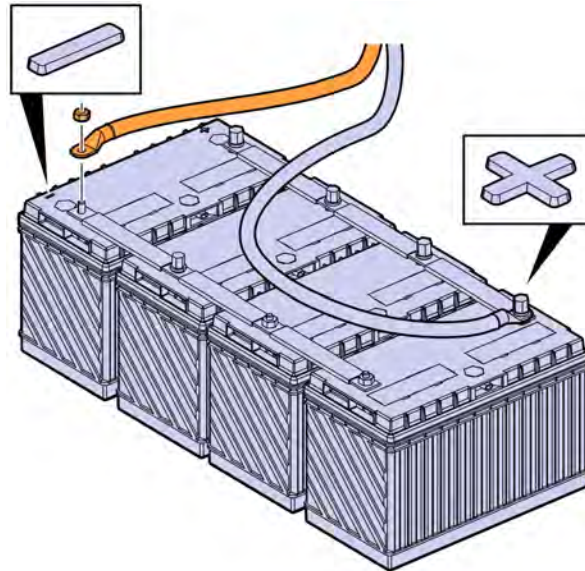
Do not attempt to repair or service this vehicle without having sufficient training, the correct service literature and the proper tools. Failure to follow this could make the vehicle unsafe and lead to serious personal injury or death.

- 1 Park the vehicle on a level surface.
- 2 Apply the parking brake.
- 3 Place the transmission in neutral or park.
- 4 Install the wheel chocks on the rear wheels.



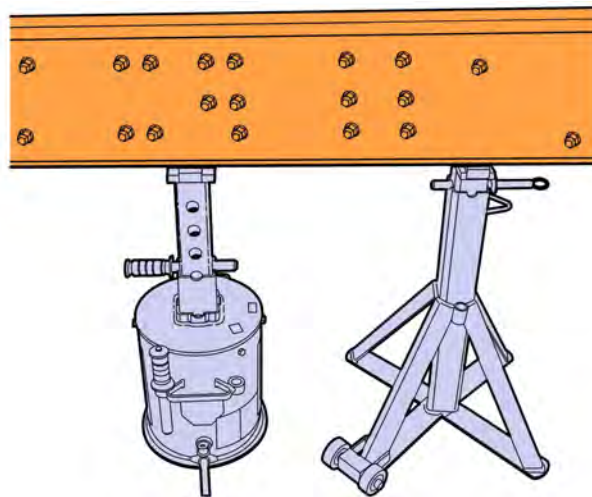
W7086748

- 5 Disconnect the cable from the battery's negative terminal.



W3086747

- 6 Using a jack, lift the front left and right sides of the truck by the frame and support the frame with jack stands.



W7113454

- 7 With all of the weight removed from the drive axles, lift and support the drive axle assemblies.

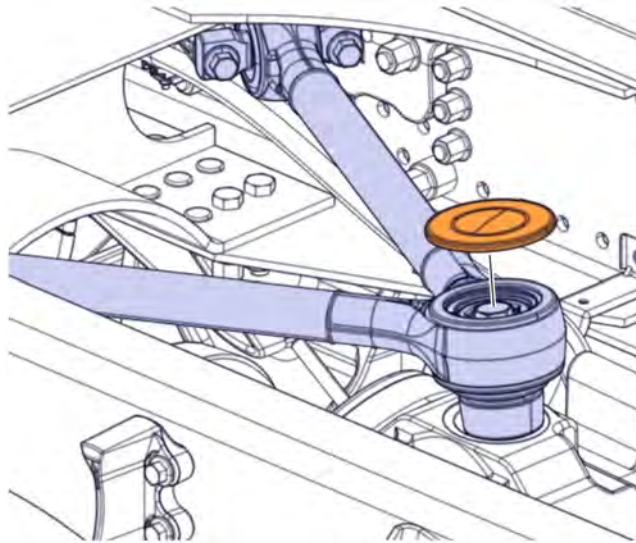


DANGER

Position a suitable jack under the axle housing pinion to prevent the axle from rolling over.

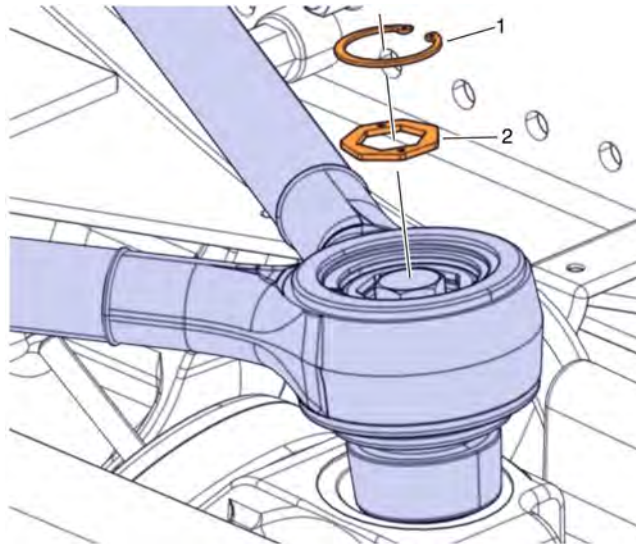
V-Stay Carrier Bolt, Removal

- 1 If applicable, cut any plastic cable ties and remove them from the V-Stay torque rod.
- 2 Remove the dust cap from the apex of the V-Stay torque rod.



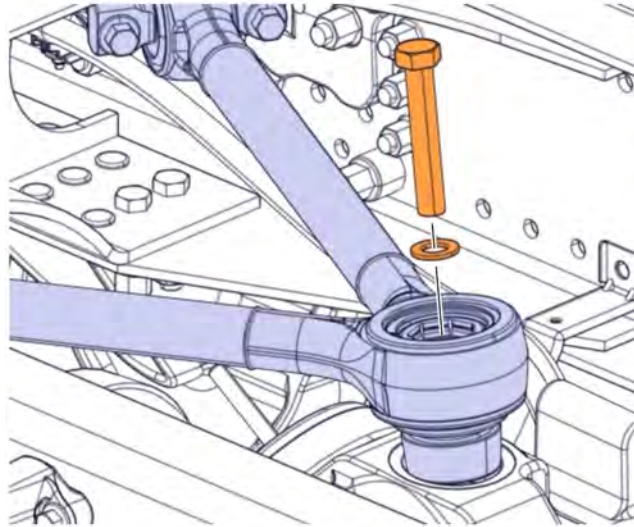
W6115014

- 3 Remove the C-clip (1) and retainer (2) from the V-Stay torque rod apex.



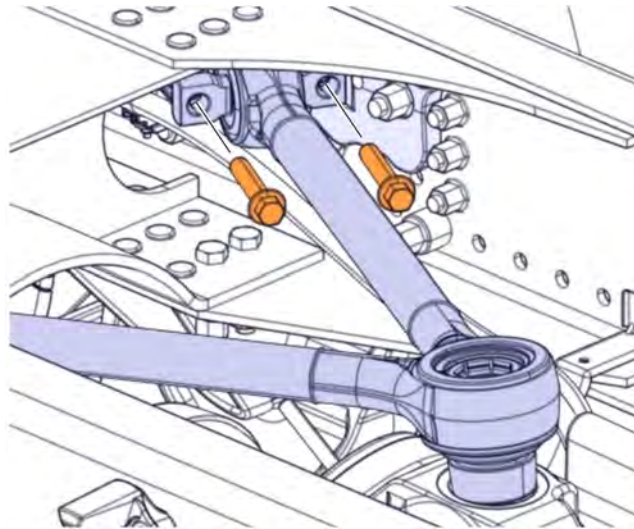
W6115015

- 4 Remove the V-Stay torque rod pivot bolt and washer.




W6115017

- 5 Remove the four fasteners securing the two ends of the V-Stay torque rod to the two anchorage brackets.

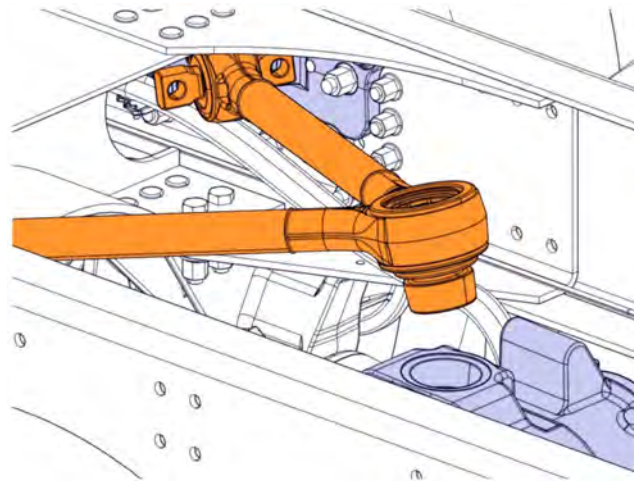


W6115016

- 6 Jack up the right side of the axle. With assistance, carefully remove the V-Stay torque rod from the vehicle.

	CAUTION
The V-Stay torque rod is heavy, so use assistance to remove it from the vehicle.	

Note: Clean and store the V-Stay torque rod for V-Stay overhaul.

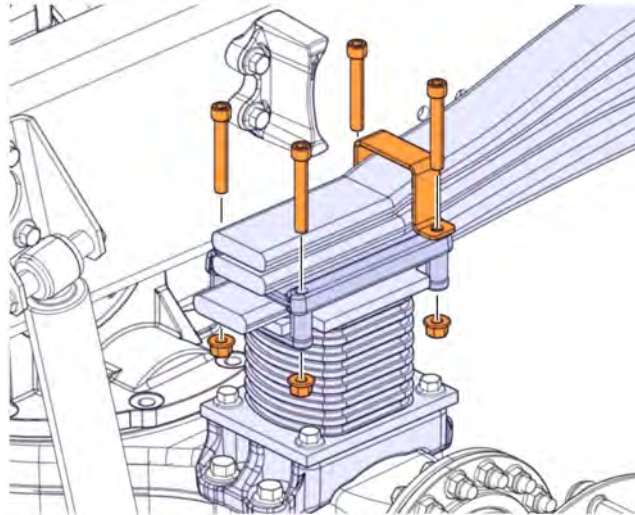


W6115019

- 7 After removing V-Stay torque rod from vehicle, use a new V-Stay tapered stub or drill guide to check for 60% taper engagement with the top of carrier housing. Follow the steps in the table below for checking 60% taper engagement.

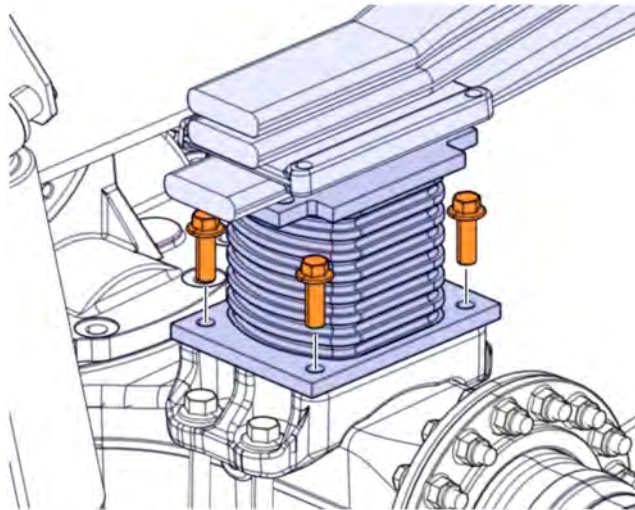
Checking for 60% Taper Engagement	
Steps	Procedure
1	Clean and dry taper of carrier assembly.
2	Apply Prussian Blue or white lithium grease to the outside diameter of V-Stay tapered stub or drill guide.
3	Carefully place V-Stay tapered stub or drill guide straight down into housing all the way in taper until it stops.
4	Pull the V Stay tapered stub or drill guide straight up from carrier housing.
5	Look for 60% or more taper engagement based on amount (witness marking) of Prussian Blue or white lithium transferred to carrier taper.
6	If less than 60%, a new housing will be required.

- 8 Jack up the right side of the affected axle and remove the tire and wheel assemblies.
 - 9 Remove the spring plate fasteners at the rubber cushion (Right Rear or Right Front).
- Note:** For the rear-rear carrier repair, remove the **Rear** rubber cushion only. For the forward-rear carrier repair, remove the **Front** rubber cushion only.



W6115020

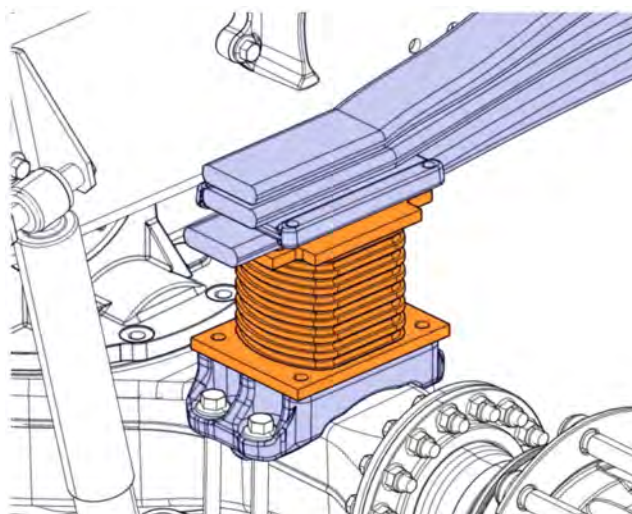
- 10 Remove the four fasteners securing the rubber spring to the axle mounted top plate seat.



W6115021

11 Remove the rubber spring.

Note: Raise the frame or lower the axle housing to relieve pressure from the rubber spring and gain access to the pinion bearing carrier.



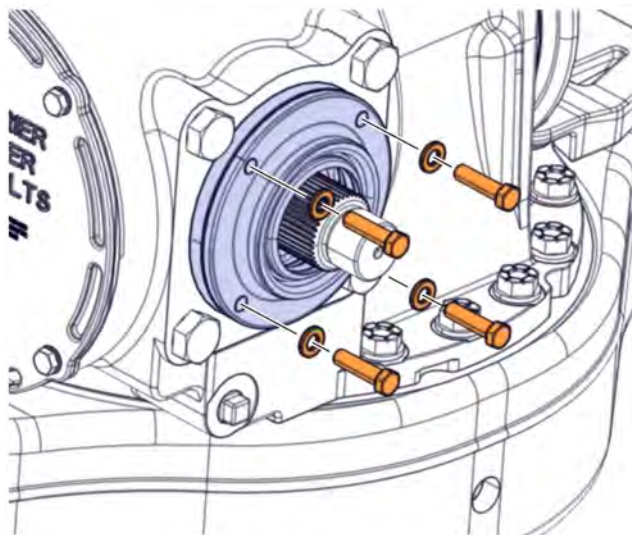
W6115023

12 Remove the inter-axle drive shaft when performing a repair on the rear-rear Carrier.

Remove both driveshafts when performing a repair on the **Front** Carrier.

13 Remove the fasteners securing the through shaft flange assembly.

Note: The front differential is shown.

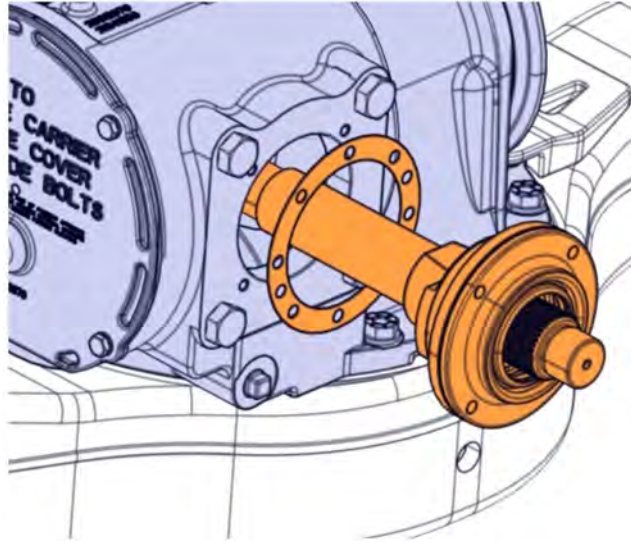


W6115024

14 If applicable, remove the through shaft assembly.

Note: Inspect the seals and gaskets for damage. Replace the seals or gaskets if necessary.

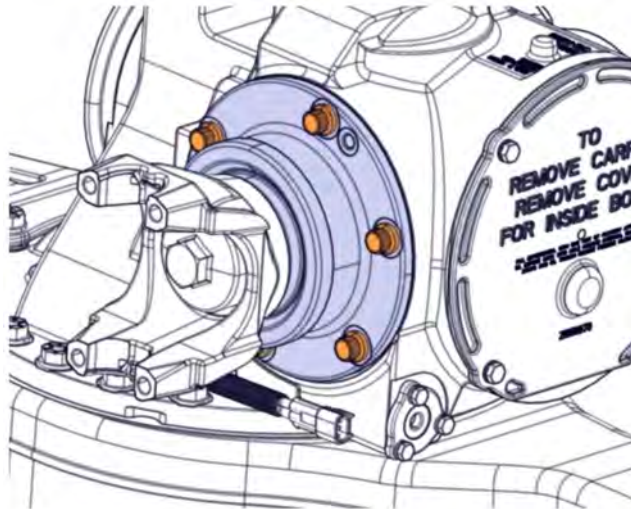
Note: The front differential is shown.



W6115025

15 Remove the fasteners securing the bevel pinion flange assembly.

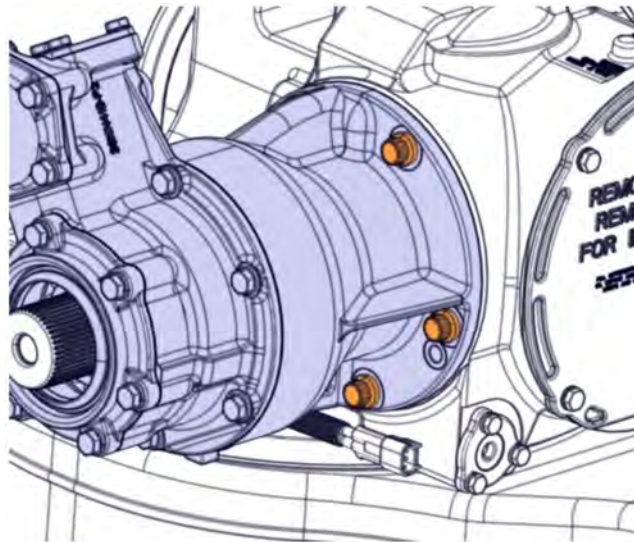
Note: The rear differential is shown.



W6115026

16 If applicable, remove the fasteners securing the power divider assembly.

Note: The front differential is shown.



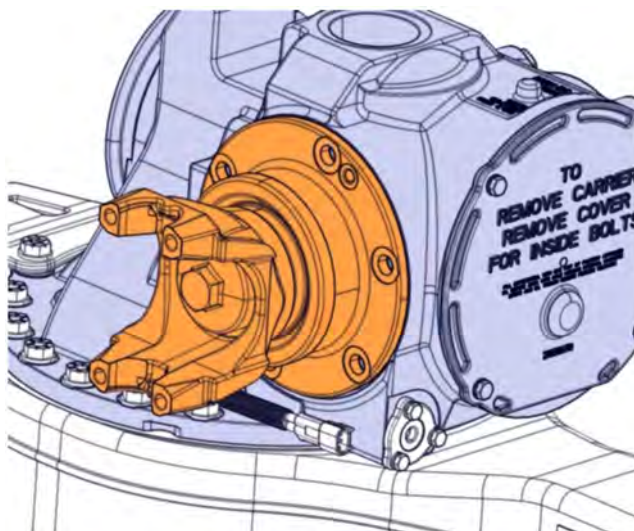
W6115028

17 Remove the rear bevel pinion carrier assembly.

Note: Record the shim orientation for installation.

Note: Inspect the seals and gaskets for damage. Replace the seals or gaskets if necessary.

Note: The rear differential is shown.



W6115029

18 If applicable, disconnect the air line to the power divider.

19 With help, if applicable, remove the power divider assembly.

Note: Record the shim orientation for installation.

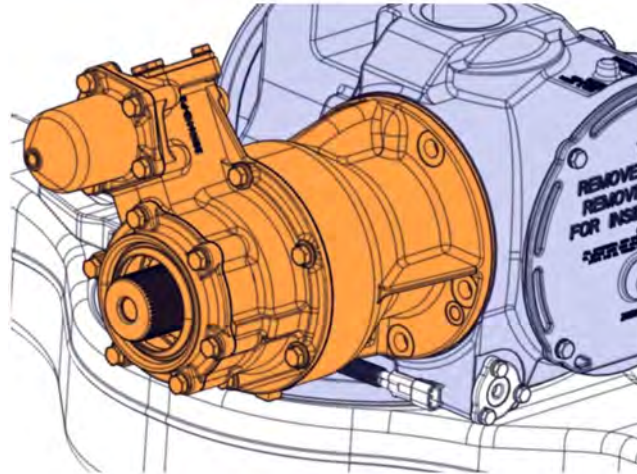


WARNING

Heavy component, the use of a suitable lifting device may be required.

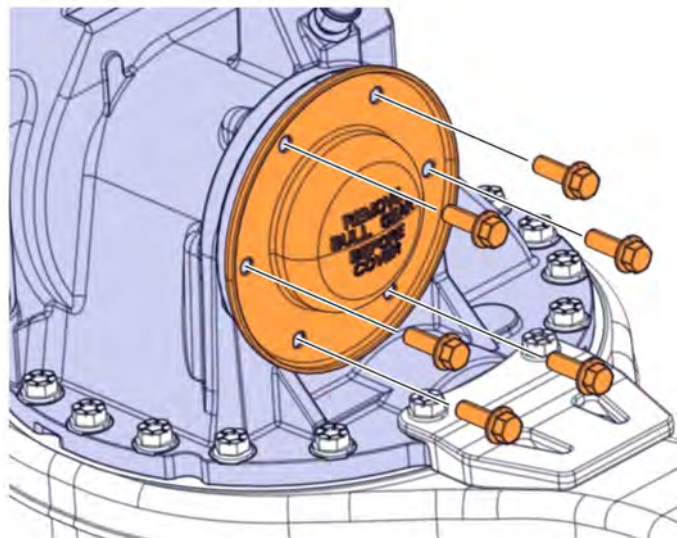
Note: Inspect the seals and gaskets for damage. Replace the seals or gaskets if necessary.

Note: The front differential is shown.



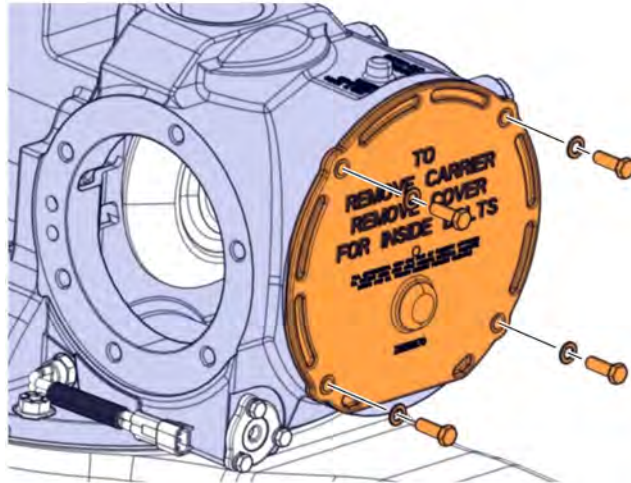
W6115030

20 Remove the right side cover from the right side of the carrier.



W6115032

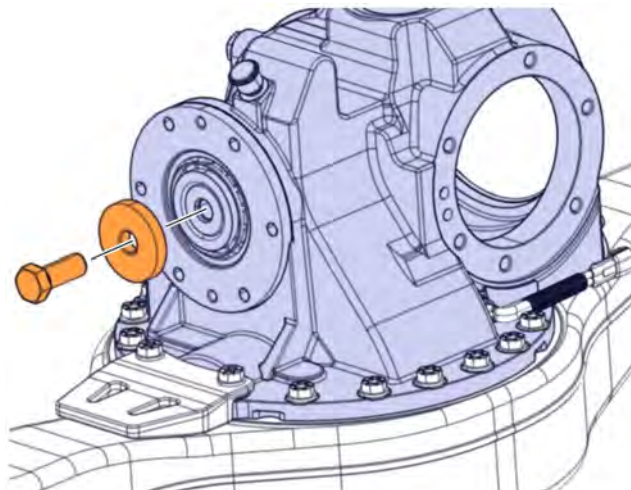
21 Remove the left side cover from the left side of the carrier.



W6115033

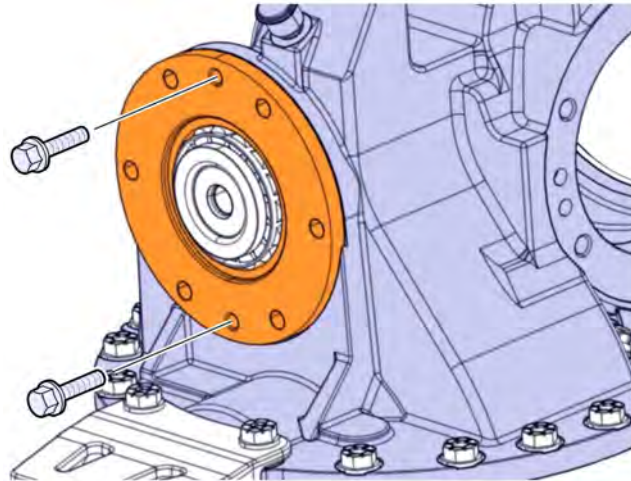
22 Remove the pinion shaft bolt and washer as shown.

Note: It may be necessary to lower the axle housing to provide clearance while working under the frame rail.



W6115034

23 Install the two removal fasteners into the threaded holes in the plate of the pinion bearing carrier assembly to aid in the removal of the pinion bearing carrier assembly.

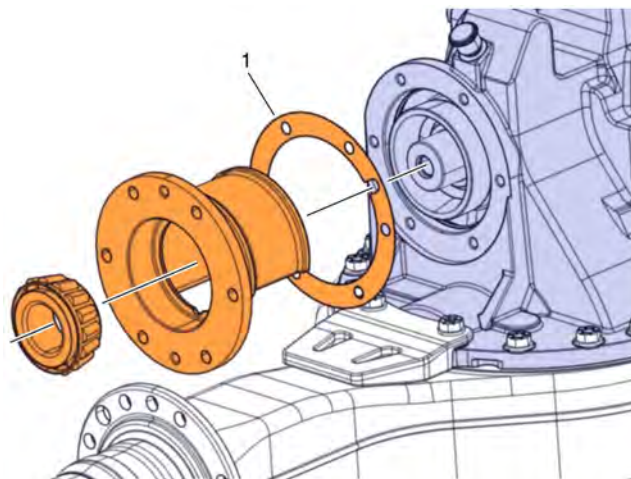


W6115041

24 Remove the pinion shaft carrier assembly by turning the bolts clockwise, and pushing the plate outwards.

Note: Record the shim orientation for installation.

Note: Inspect the seals and gaskets for damage. Replace the seals or gaskets if necessary.



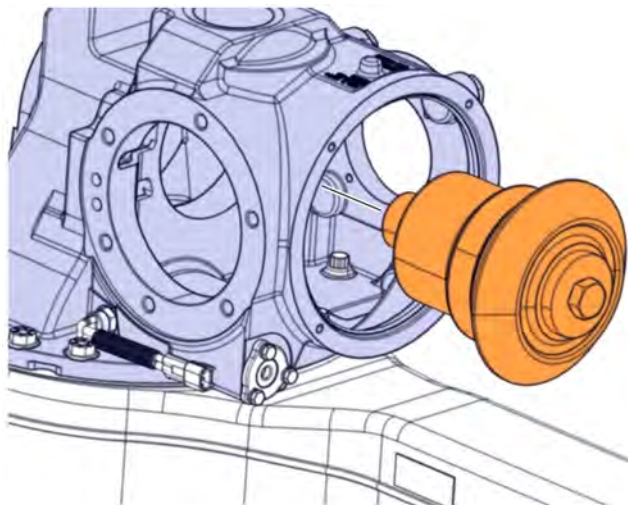
W6115043

25 Remove the helical pinion assembly.



WARNING

Heavy component, the use of a suitable lifting device may be required.



W6115045

26 Position a magnetic tray and shop towels inside the side opening of the axle housing to catch any debris while drilling.

27 Install the drill guide (part number 85150354) into the top of the carrier housing V-Stay apex socket.

Note: Ensure the drill guide is fully seated and level on the V-Stay carrier housing before drilling.

Note: Remove the drill guide between operations to clean any debris under the guide and ensure the guide has a consistent fit inside the carrier housing.

Note: Keep the drill straight and level to ensure the drill hole and tap is straight inside the carrier housing.

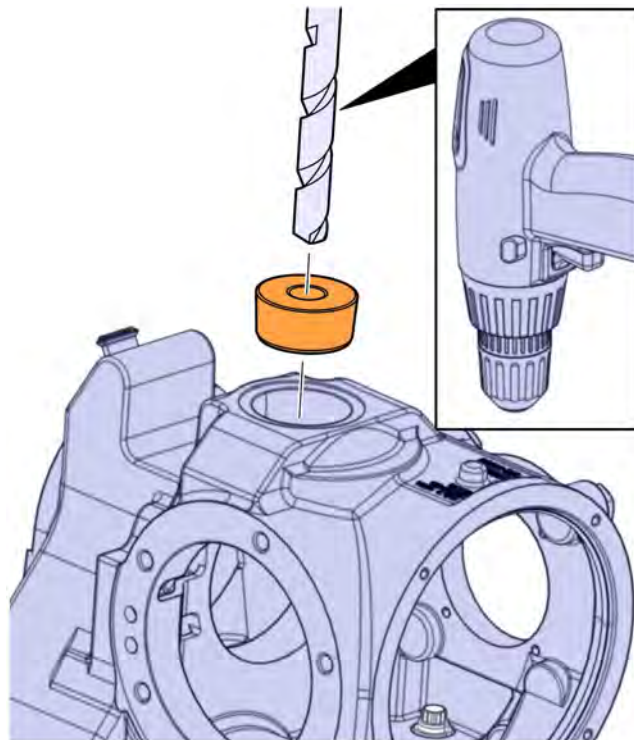
28 Ream the hole to 25.4 mm (1 in).

29 Drill hole the to 26.6 mm (1 3/64 in).

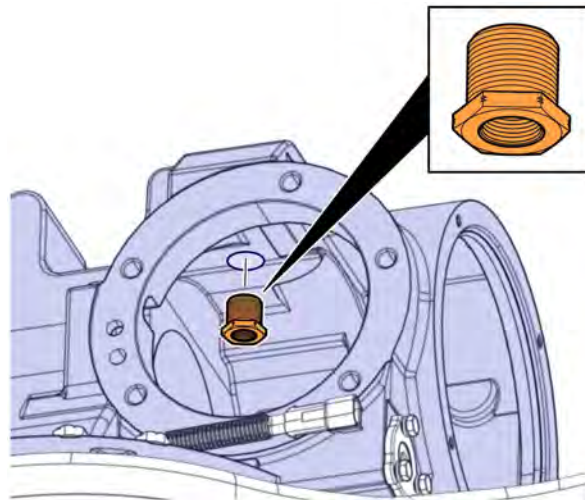
30 Tap the hole to 1 1/8"-12 Fine thread.

Note: The drill guide must be removed before tapping. The tap will not fit inside the guide.

Note: After drilling and tapping the axle housing, remove and clean any debris that may have fallen during drilling. Remove the magnetic tray and rags.



- 31 Clean the newly cut axle housing threads free of oil and any contamination.
- 32 Install the threaded insert (part number 22945401) into the axle housing.
- 33 Tighten the insert to 135 Nm (100 ft-lb).



W6115047

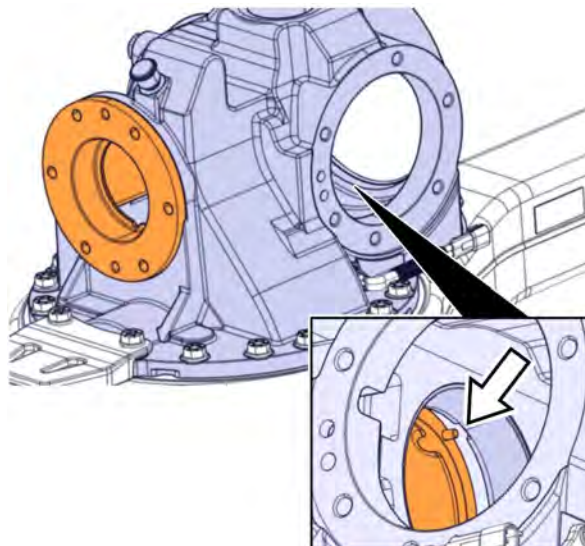
- 34 Install the pinion shaft carrier assembly and previously removed shims as recorded.



CAUTION

Ensure the alignment pin aligns with the notch in the bearing race before further assembly to prevent damage to the carrier and bearings.

Note: Ensure the bearing race is installed properly inside the carrier housing.



W6115048

35 Ensure the helical pinion assembly is clean and free of any debris before installation.

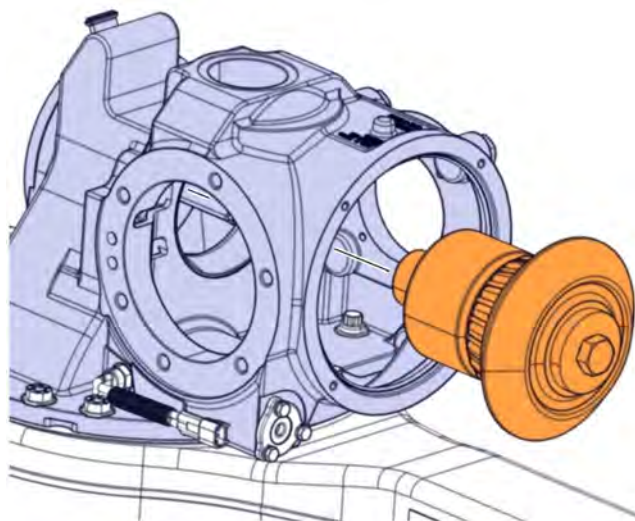
Note: Apply a thin film of lubrication axle gear oil before installation.

36 Install the helical pinion assembly.



WARNING

Heavy component, the use of a suitable lifting device may be required.

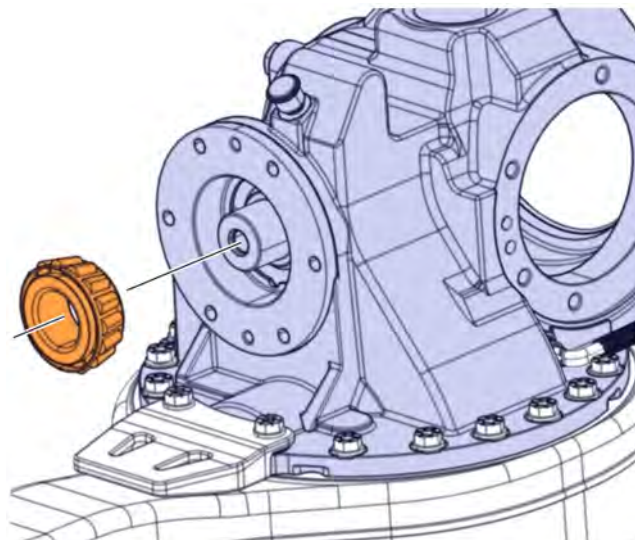


W6115049

37 Ensure the pinion shaft bearing is clean and free of any debris before installation.

Note: Apply a thin film of lubrication axle gear oil before installation.

38 Install the pinion shaft bearing.

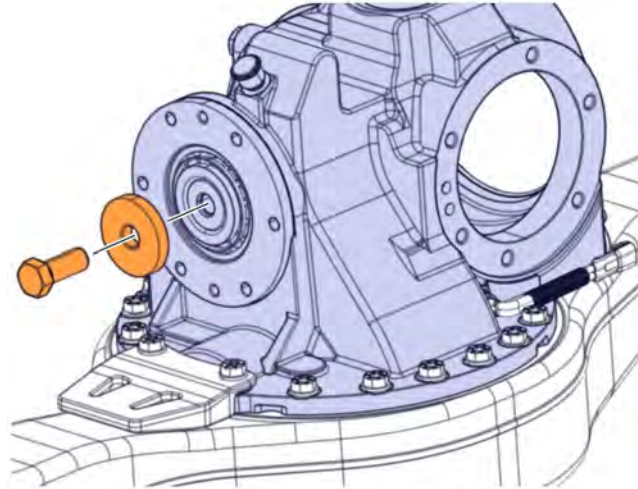


W6115052

39 Install the pinion shaft bolt and washer.

Note: Apply a coat of thread locker to the pinion shaft bolt before installation.

40 Tighten the bolt to 475 ± 67 Nm (350 ± 49 ft-lb).



W6115034

41 Check helical pinion gear clearance at the newly installed insert.

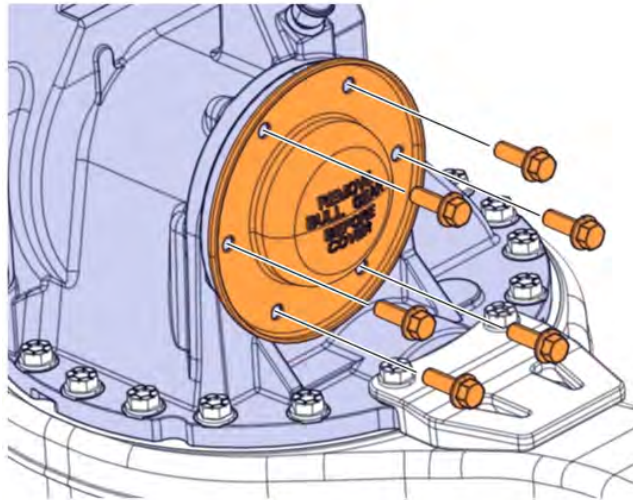
42 Clean underside of right side cover where the cover meets the retainer. Remove all old silicone to ensure a good seal when new silicone is applied.

43 Apply a layer of silicone to the underside of cover.

44 Install the cover and fasteners.

Note: Apply a coat of thread locker to the cover fasteners before installation.

45 Tighten the fasteners to 95 ± 11 Nm (70 ± 8 ft-lb).

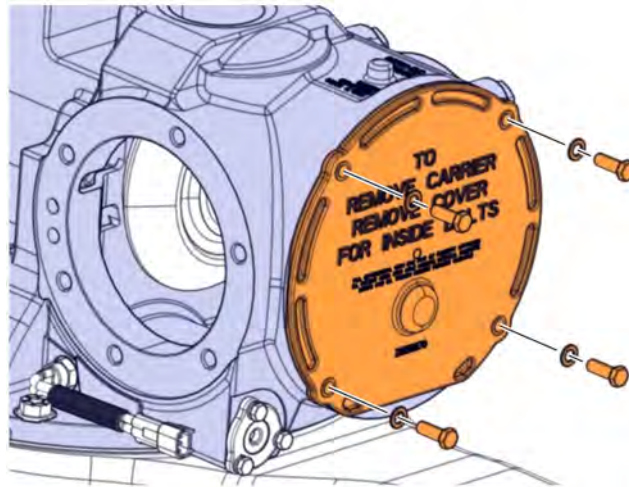


W6115032

46 Install the left side cover and fasteners.

Note: Apply a coat of thread locker to the cover fasteners before installation.

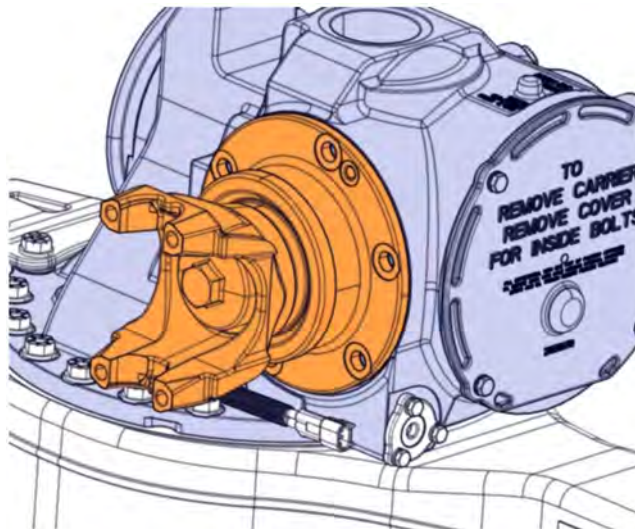
47 Tighten the fasteners to 41 ± 8 Nm (30 ± 5 ft-lb).



W6115033

48 With help, install the rear bevel pinion carrier assembly and shims as previously recorded.

Note: Rear differential shown.



W6115029

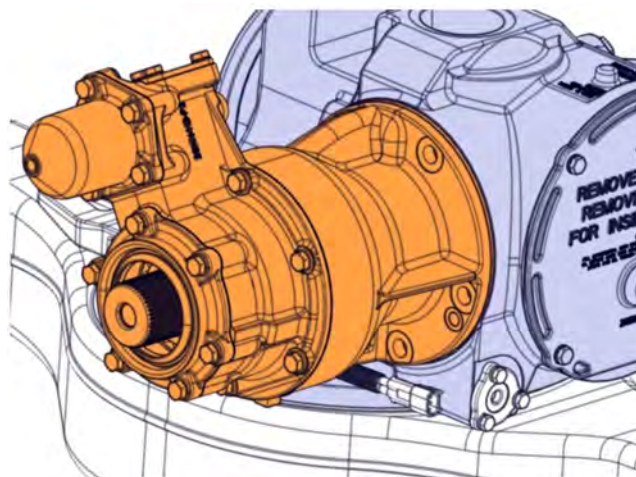
49 With help, if applicable, install the power divider assembly with the shims as previously recorded.



WARNING

Heavy component, the use of a suitable lifting device may be required.

Note: Front differential shown.



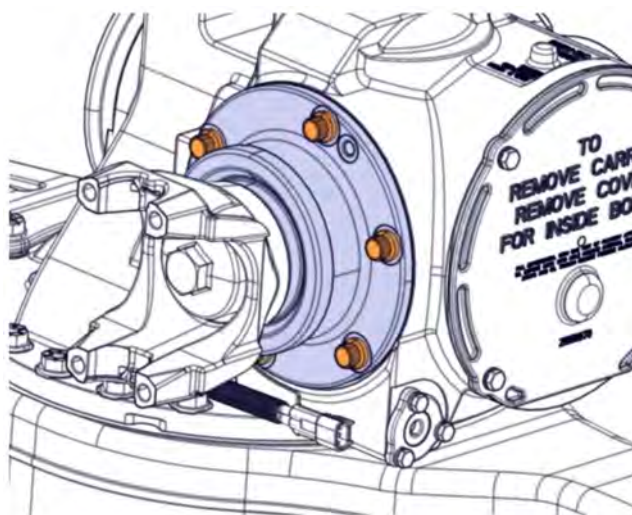
W6115030

50 Connect the air line to the power divider.

51 Install the fasteners securing the bevel pinion flange.

52 Tighten the fasteners to 262 ± 27 Nm (262 ± 19 ft-lb)

Note: Rear differential shown.

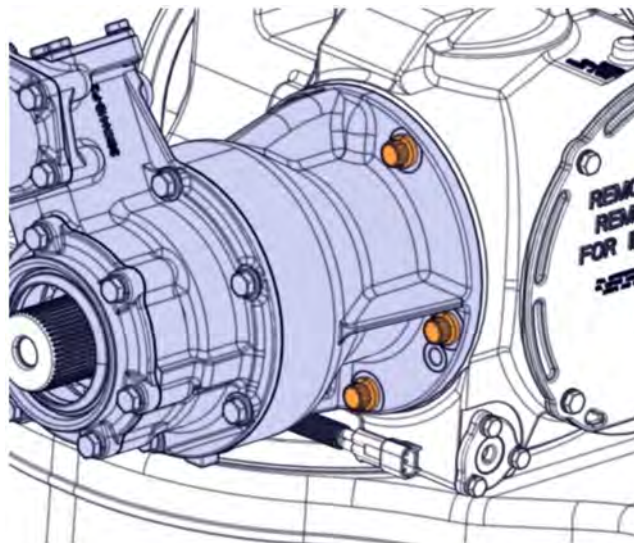


W6115026

53 If applicable, install the fasteners securing the power divider.

54 Tighten the fasteners to 262 ± 27 Nm (262 ± 19 ft-lb)

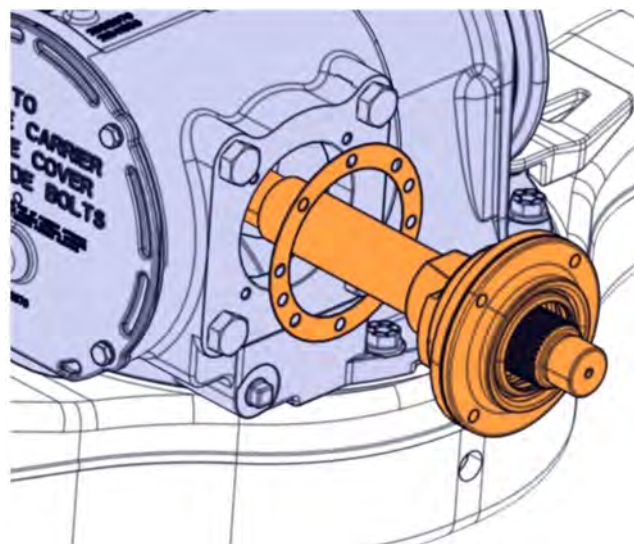
Note: Front differential shown.



W6115028

55 Install the Interaxle flange assembly.

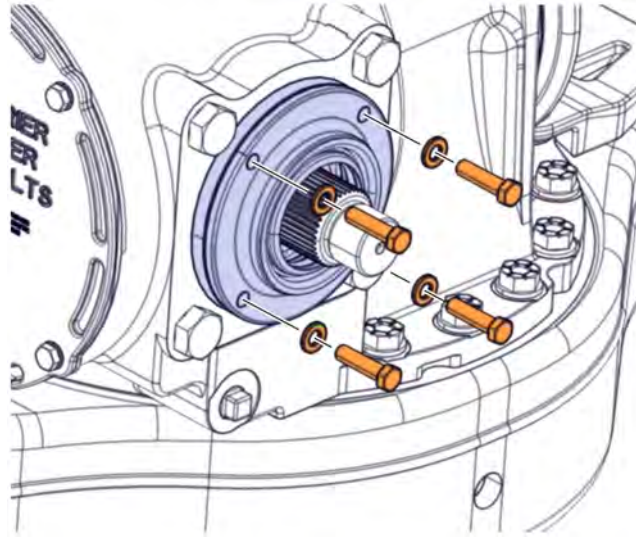
Note: The power divider wedges are lubricated via the through-shaft bearing retainer and the bevel pinion. When the through-shaft bearing retainer is installed, ensure that the oil inlet is located on top. If the retainer is not rotated with the oil inlet in the top position, the inter-axle power divider will be damaged due to a lack of lubricant.



W6115025

56 Install the fasteners securing the Interaxle flange assembly.

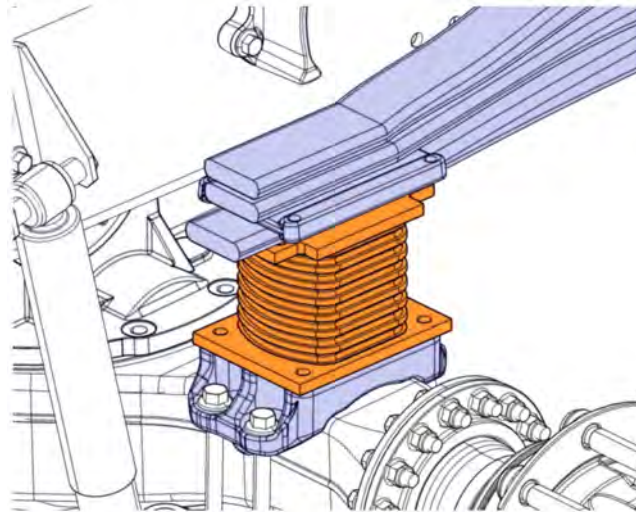
57 Tighten the fasteners to 41 ± 4 Nm (30 ± 3 ft-lb).



W6115024

58 Install The driveshaft(s) to the differential. Tighten the fasteners to 169 ± 7 Nm (125 ± 5 ft-lb).

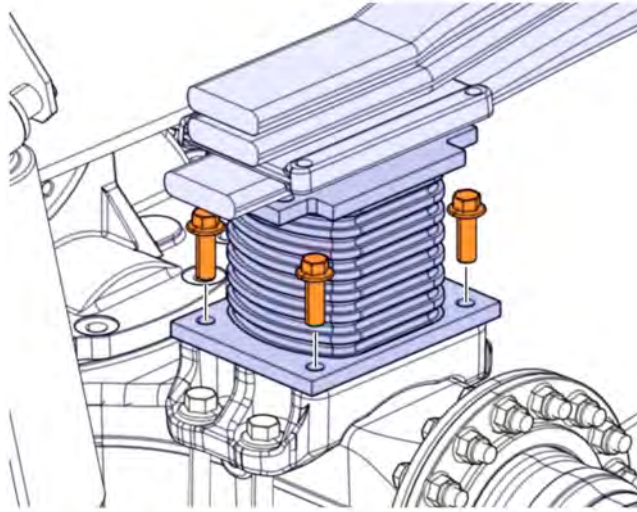
59 Install the rubber spring into position.



W6115023

60 Install the fasteners securing the rubber spring to the top axle seat plate.

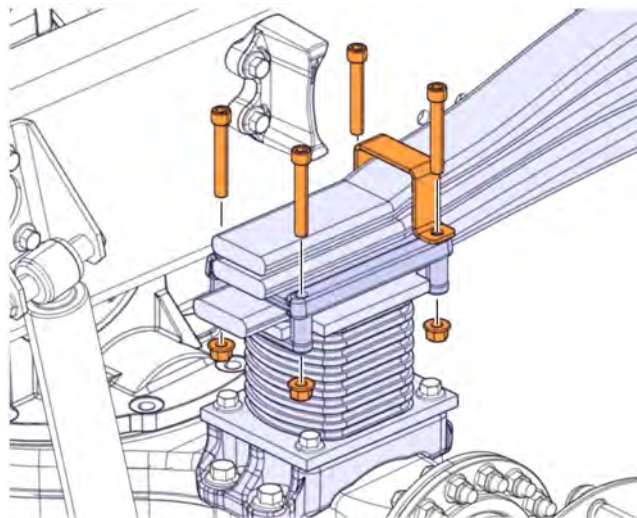
61 Tighten the fasteners to 175 ± 30 Nm (129 ± 22 ft-lb).



W6115021

62 Install the spring plate bolt fasteners at the rubber cushion on both axes.

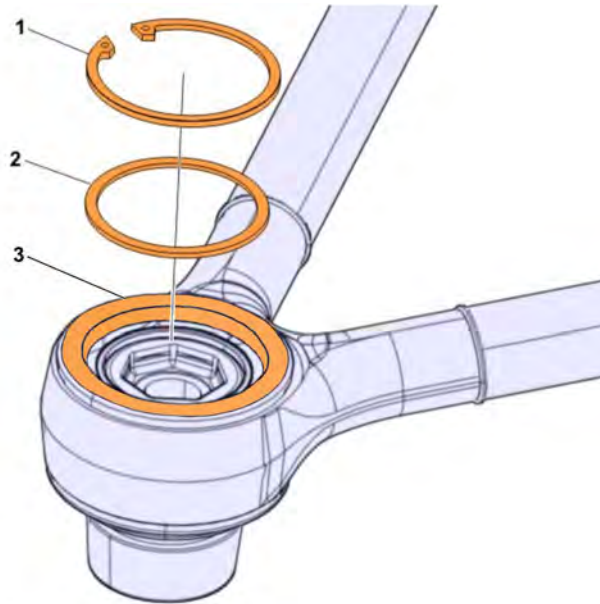
63 Tighten the fasteners to 85 ± 15 Nm (63 ± 11 ft-lb).



W6115020

V-Stay Torque Rod, Overhaul

- 1 With assistance, position the V-Stay torque rod on a suitable table or work bench.
- 2 Remove the snap ring (1) securing the V-Stay pivot ball and bushing assembly.
- 3 Remove the tension ring (2) and upper pivot ball bushing (3).

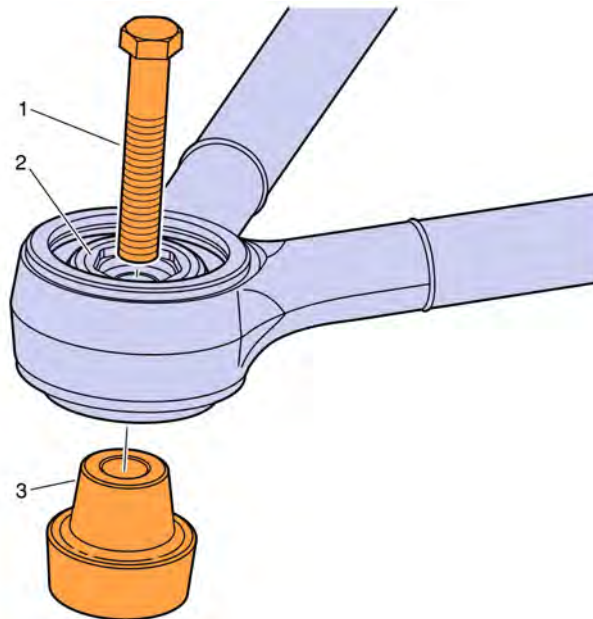


W6092443

- 4 With assistance as needed and a press to secure the pivot stud, remove the V-Stay pivot stud (3) from the V-Stay pivot ball (2) using the M27 removal fastener (1).

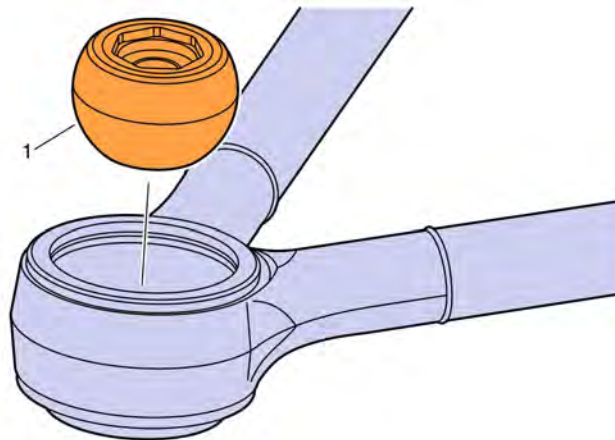
Note: Use hand tools when turning the M27 removal fastener to prevent cross threading or stripping the pivot stud.

Note: Clean and store the V-Stay pivot stud for reuse.



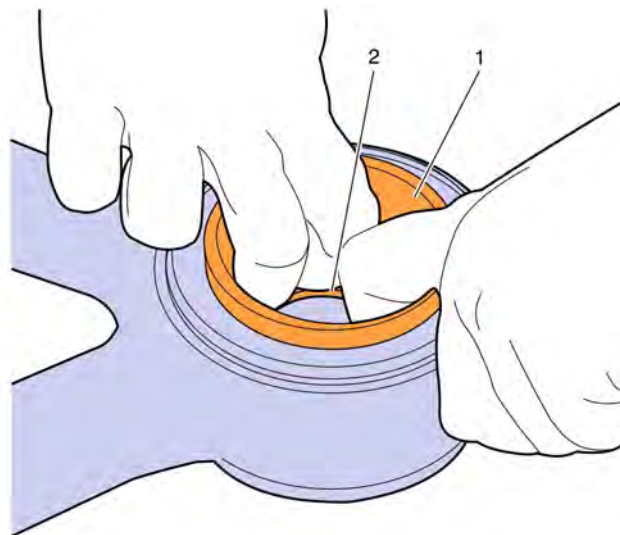
W6115059

- 5 Remove the V-Stay pivot ball (1) and discard.



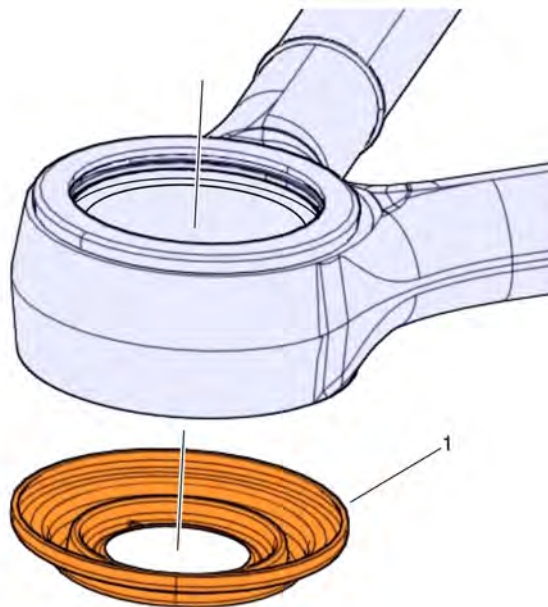
W6115062

- 6 Remove the pivot ball bushing (1) and lower tension ring (2).



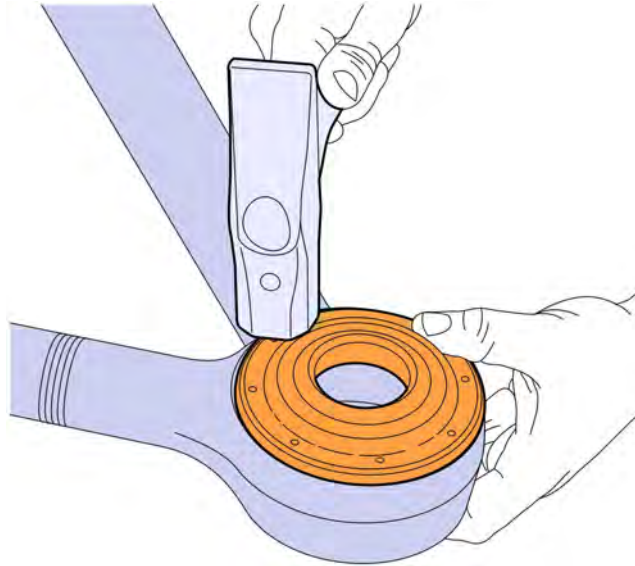
W6115060

- 7 Remove the lower pivot ball dust boot (1) from the V-Stay torque rod.



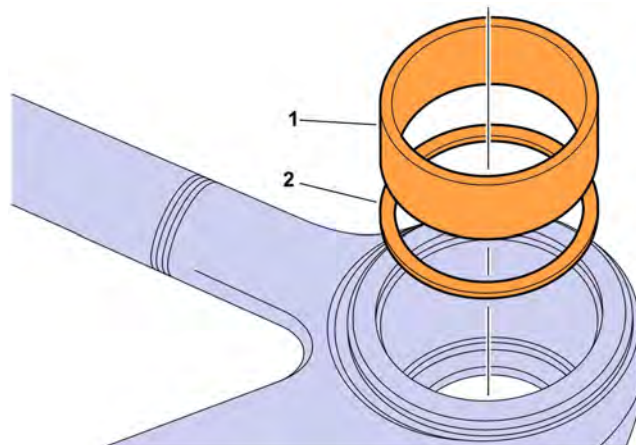
W6115061

- 8 Clean V-Stay pivot ball area of any debris.
- 9 Install the replacement lower pivot ball dust boot to the V-Stay torque rod as shown.



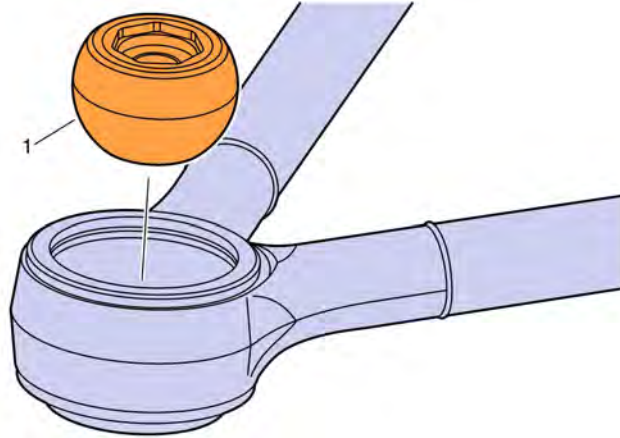
W6081967

- 10 Brush on a liberal amount of Mobil XHP 222 lithium grease (or equivalent) on all interior component parts of the V-Stay apex joint during assembly. Reassemble the replacement lower pivot ball bushing (1) and lower tension ring (2).



W6081968

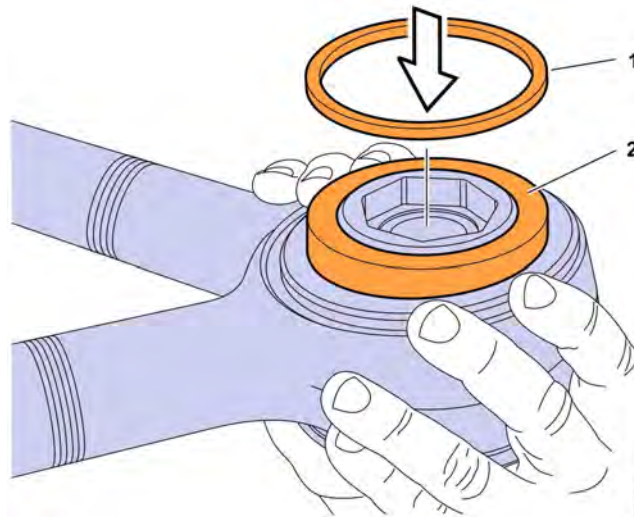
11 Using a liberal amount of Mobil XHP 222 lithium grease (or equivalent), reassemble the replacement V-Stay pivot ball into position.



W6115062

12 Using a liberal amount of Mobil XHP 222 lithium grease (or equivalent), reassemble the replacement, tension ring (1), pivot ball and pivot ball bushing (2) inside the V-Stay torque rod.

Note: Use a press and assistance as necessary to ease reassembly.



W6081970

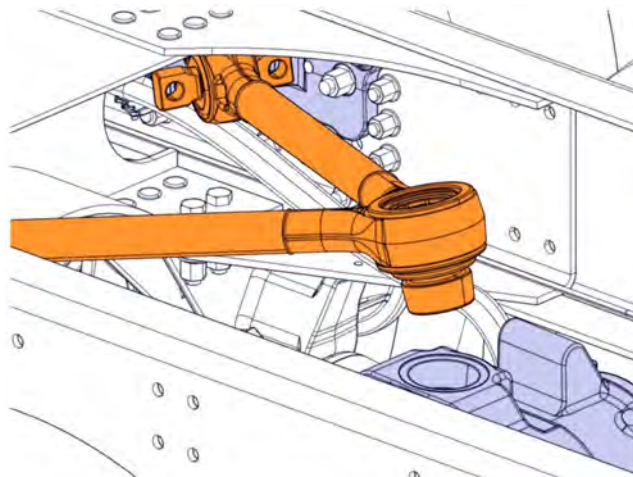
13 Using snap ring pliers, assemble the snap ring into position.



W6081971

V-Stay Carrier Bolt, Installation

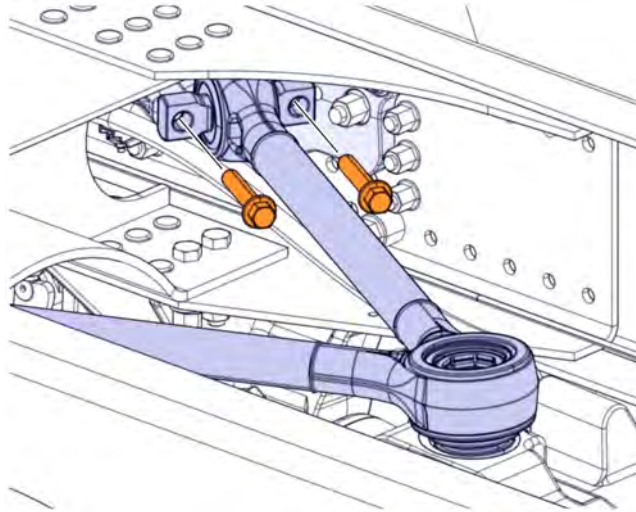
- 1 Ensure the carrier housing and V-Stay torque rod surface is clean and free of debris.
- 2 With assistance or a suitable lifting device, move the V-Stay torque rod in place with the pivot stud in position on the differential carrier and V-Stay torque rod arms on the mounting brackets.



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- 3 Hand start the V-Stay frame anchorage fasteners as shown. Use the jack under the front axle to aid in installation of the V-Stay pivot bolt.

Note: Hand start all of the fasteners to avoid any damage to the threads.



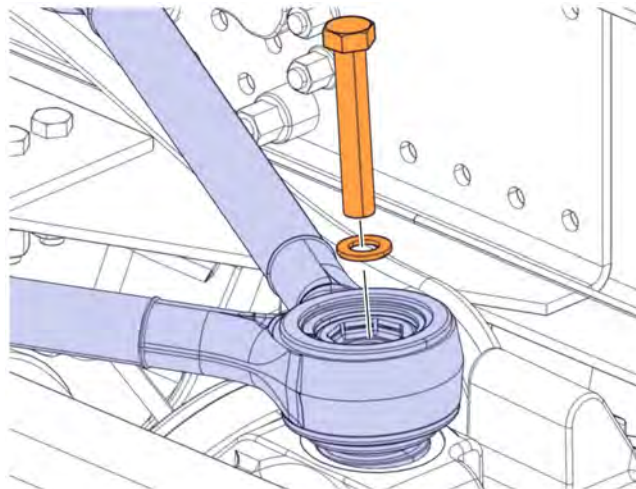
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- 4 Install the new replacement carrier bolt (part number 984210) and washer (part number 994884) into the pivot ball.

Note: It may be necessary to rotate the pivot ball slightly to aid in aligning the bolt with the newly installed insert.

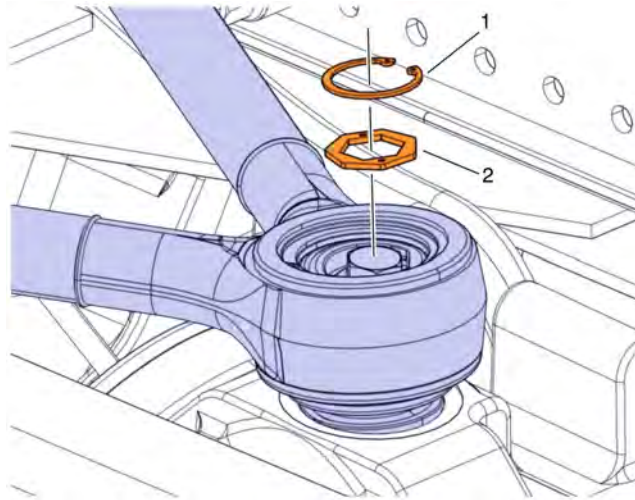
Note: Ensure the washer is properly seated in the cutout in the top of the pivot ball.

- 5 Tighten the pivot ball fastener to 610 ± 100 Nm (449 ± 73 ft-lb).



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- 6 Tighten the V-Stay torque rod M14 fasteners to 175 ± 30 Nm (129 ± 22 ft-lb) or M16 fasteners to 275 ± 45 Nm (203 ± 33 ft-lb)
- 7 Install retainer so the hex portion fit over the head of the M20 bolt. If the position of the retainer does not fit over the M20 bolt, rotate the retainer clockwise to the next position of the seven sided feature. Repeat this process until all seven points of retainer have been tried or the retainer fits over the hex head of the bolt. If none of these positions capture the hex head of bolt, turn the retainer over and repeat the process until the hex is captured.
- 8 Install the snap ring to hold the retainer in place.



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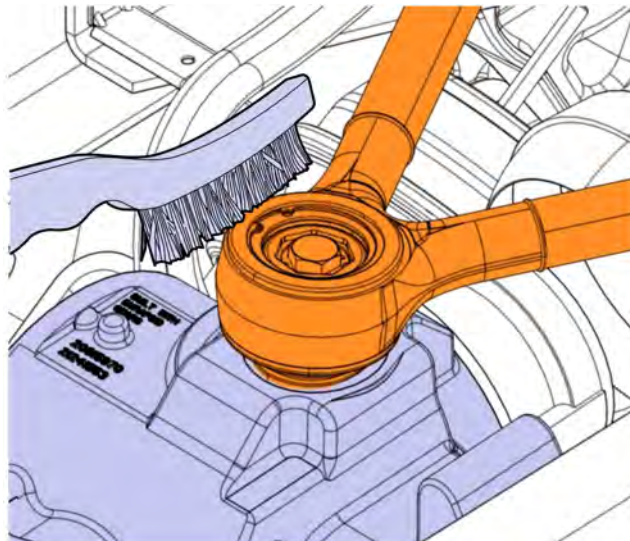
- 9 Brush a liberal amount of lithium grease (XHP 222) onto all internal parts of the V-torque rod apex joint.

10 Verify the type of V-Stay dust cap design used on the V-Stay rod.

Note: Install dust cap (**Four Dimple Design**), following steps (11 through 13 and 17).

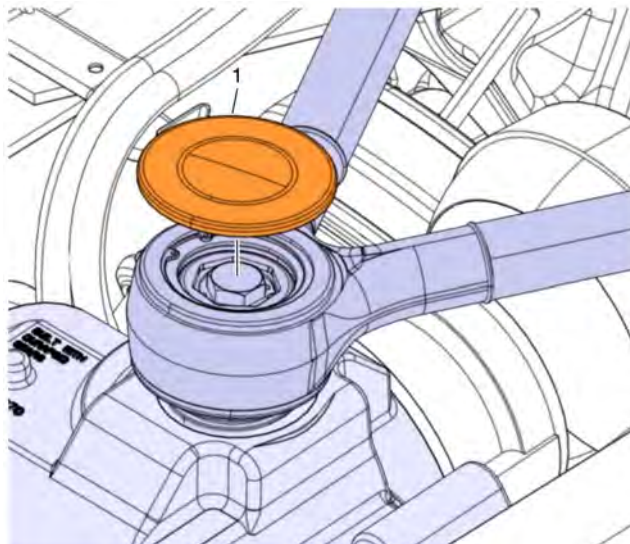
Note: Install dust cap (**Non Dimple Design**), following steps (11 through 17).

11 Clean the mating surfaces of the V-Stay rod pivot joint cover area, and ensure the center apex joint is free of any debris.



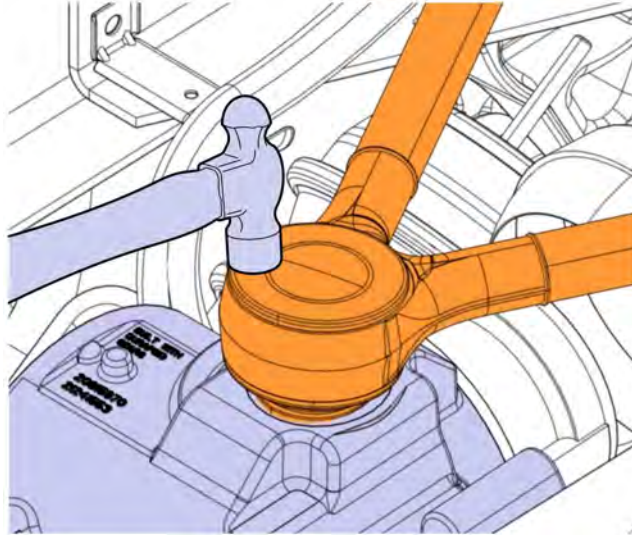
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12 Position the V-Stay dust cap onto the V-Stay rod apex joint.



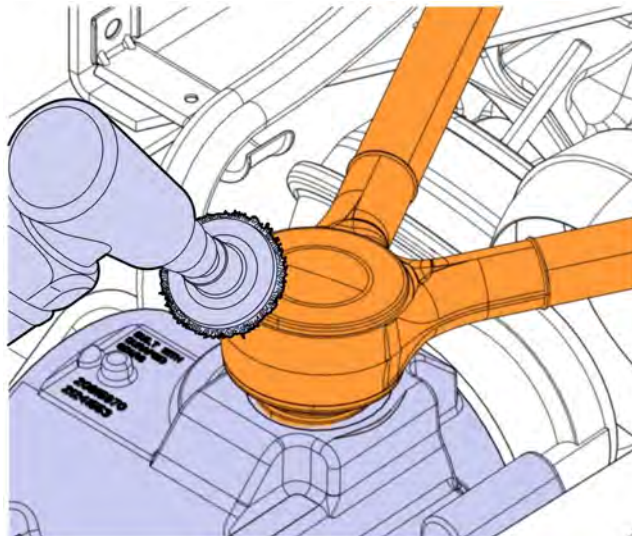
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13 Using a dead blow hammer, tap on dust cap until it seats.



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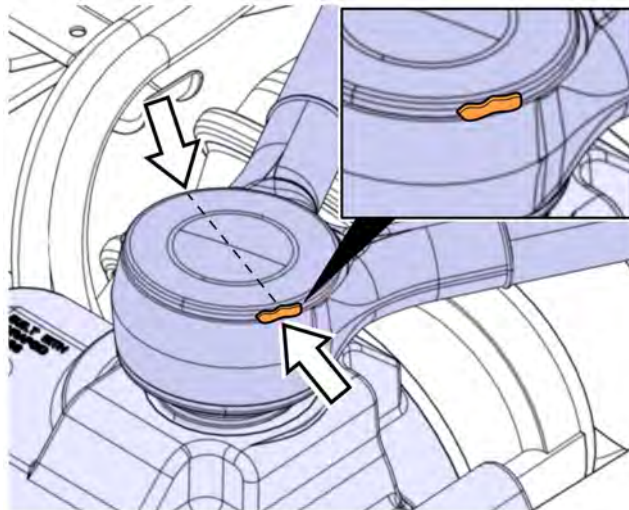
14 Clean and prep the areas to be tack welded by removing any paint or contamination where the dust cap meets the V-Stay torque arm.



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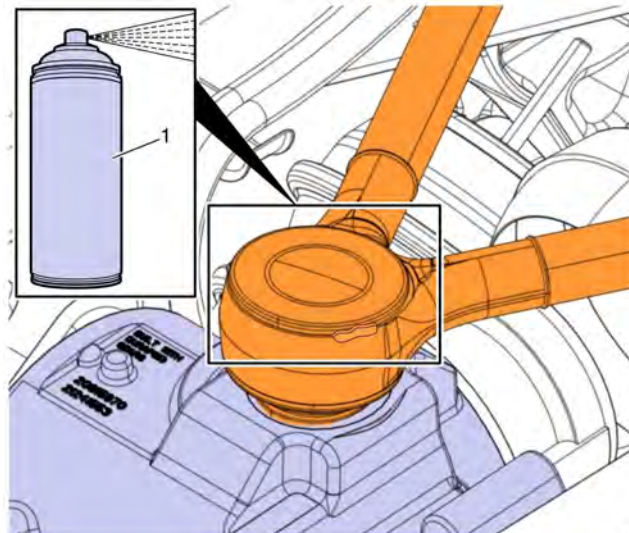
15 Using safe welding practices, tack weld the V-Stay cap in a minimum of 2 places 180° apart. After spot welding the cap clean any welding slag.

Note: For Safe Welding Practices, refer to Service Bulletin (SB) PV776–88944824 (FG 303–03).



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16 Using suitable methods, prep and paint the tack welds, cap, and V-Stay torque rod to prevent any rusting.

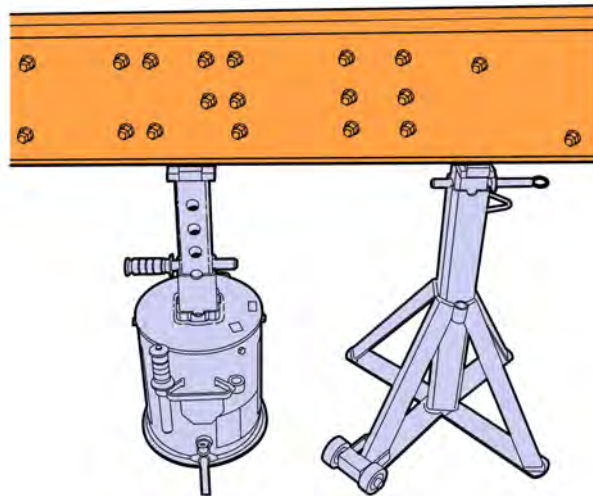


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17 If applicable, install any previously removed cable ties used to secure any air lines or wiring.

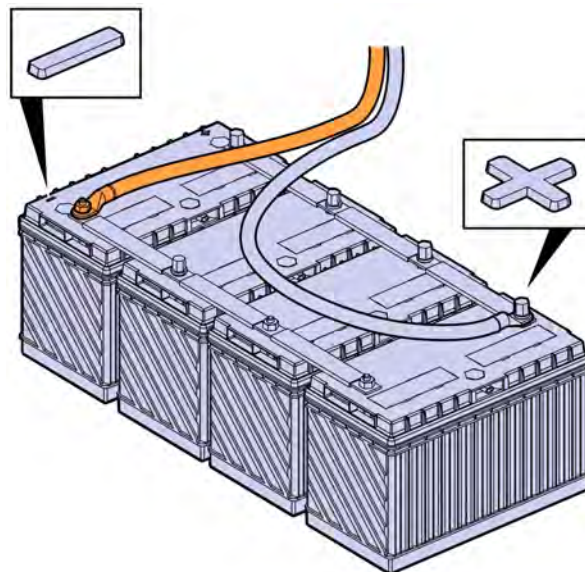
Commissioning the Truck for Operation

- 1 Remove the support from the rear axle assemblies.
- 2 Using a jack, lift the frame and remove the jack stands.
- 3 Remove the jack.



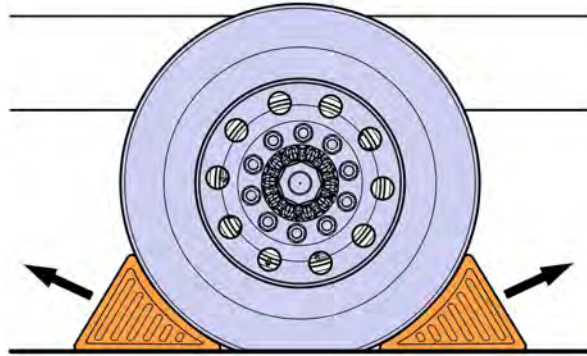
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- 4 Ensure the rear axle is level. Check the rear axle housing for contamination. If required, change rear axle housing gear oil or top off as needed.
- 5 Connect the cable to the battery's negative terminal.



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6 Remove the wheel chocks from the rear wheels.



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Reimbursement

This repair may be eligible for reimbursement if a product failure was experienced within time and mileage limits of the applicable Warranty coverage. Reimbursement is obtained via the normal claim handling process.	UCHP Reimbursement
Claim Type (used only when uploading from the Dealer Bus. Sys.)	01
Labor Code	
Primary Labor Code (V-Stay Carrier Bolt, Replacement and Overhaul)	6521-03-09-03 5.7 hrs.
Causal Part	21180686, 21180684

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