Service Manual: REAR DRIVELINE MODULE

OPERATION > OPERATION

The primary benefits of All Wheel Drive (AWD) with a Rear Drive Unit (RDU) are:

- Superior straight line acceleration, and cornering on all surfaces.
- Better traction and handling under adverse conditions, resulting in improved hill climbing ability and safer driving.

The AWD system intelligently anticipates/selects front, or AWD in varying torque splits based on conditions, driving style and on a host of "triggers" such as:

- Input to vehicle switches/interfaces such as gear selection; ESC button actuation; wiper settings; and temperature settings
- Environmental influences such as surface grade; vehicle speed; launch characteristics; and relating ESC events
- Dynamic factors including wheel slip; detection of understeer/oversteer; steering angle rate; and acceleration/deceleration rates

Based on all these inputs and more, the system is capable of anticipating, and then delivering infinitely variable amounts of torque combinations between the front and rear driven wheels at launch, all in milliseconds and without driver intervention or feedback.

DIAGNOSIS AND TESTING > REAR DRIVE UNIT (RDU) OPERATION

Driveline module operation requires a relatively straight-forward diagnosis. Refer to the following chart:

CONDITION	POSSIBLE CAUSES	CORRECTION
No All Wheel Drive (AWD) in forward or reverse directions, propeller shaft turning.	1. Check Drivetrain Control Module (DTCM) for DTC's.	1. Review DTCM diagnosis and testing article.
	2. Rear Driveline Unit (RDU) failure.	2. Diagnose and repair or replace as necessary.
No AWD in forward or reverse directions, propeller shaft not turning.	1. Check DTCM for DTC's.	1. Review DTCM diagnostic and testing article.
	2. Power Transfer Unit (PTU) component failure.	2. Diagnose and repair or replace as necessary.
Vibration at all speeds, continuous torque transfer.	1. Mis-matched tires, worn tires on front axle.	1. Replace worn or incorrect (mis-matched) tires with same make and size.

DIAGNOSIS AND TESTING > REAR DRIVE UNIT (RDU) NOISE

Different sources can be the cause of noise that the RDU assembly is suspected of making. Refer to the following causes for noise diagnosis.

DIAGNOSIS AND TESTING > REAR DRIVE UNIT (RDU) NOISE > REAR DRIVELINE UNIT (RDU) ASSEMBLY NOISE

The most important part of RDU service is properly identifying the cause of failures and noise complaints. The cause of most RDU failures is relatively easy to identify. The cause of RDU noise is more difficult to identify.

If vehicle noise becomes intolerable, every effort should be made to isolate the noise. Many noises that are reported as coming from the RDU may actually originate at other sources. For example:

- Tires
- Road surfaces
- Wheel bearings
- Engine
- Transmission
- Exhaust
- Propeller shaft (vibration)
- Vehicle body (drumming)

RDU noises are normally divided into two categories: gear noise or bearing noise. A thorough and careful inspection should be completed to determine the actual source of the noise before replacing the RDU. Other sources of noise from the rear RDU are the actuator and low fluid level.

The rubber mounting bushings help to dampen-out RDU noise when properly installed. Inspect to confirm that no metal contact exists between the RDU case and the body or suspension cradle. The complete isolation of noise to one area requires expertise and experience. Identifying certain types of vehicle noise baffles even the most capable technicians. Often such practices as:

- Increase tire inflation pressure to eliminate tire noise.
- Listen for noise at varying speeds with different driveline load conditions.
- Swerving the vehicle from left to right to detect wheel bearing noise.

All RDU assemblies produce noise to a certain extent. Slight carrier noise that is noticeable only at certain speeds or isolated situations should be considered normal. Carrier noise tends to peak at a variety of vehicle speeds. The actuator may be audible in certain situations that may be normal. Noise is **NOT ALWAYS** an indication of a problem within the carrier or RDU components.

DIAGNOSIS AND TESTING > REAR DRIVE UNIT (RDU) NOISE > TIRE NOISE

Tire noise is often mistaken for driveline module noise. Tires that are unbalanced, worn unevenly or are

worn in a saw-tooth manner are usually noisy. They often produce a noise that appears to originate in the driveline module.

Tire noise changes with different road surfaces, but driveline module noise does not. Inflate all four tires with approximately 20 psi (138 kPa) more than the recommended inflation pressure (for test purposes only). This will alter noise caused by tires, but will not affect noise caused by the differential. Rear axle noise usually ceases when coasting at speeds less than 30 mph (48 km/h); however, tire noise continues, but at a lower frequency, as the speed is reduced.

After test has been completed lower tire pressure back to recommended pressure.

DIAGNOSIS AND TESTING > REAR DRIVE UNIT (RDU) NOISE > GEAR NOISE (DRIVE PINION AND RING GEAR)

Abnormal gear noise is rare and is usually caused by scoring on the ring gear and drive pinion. Scoring is the result of insufficient or incorrect lubricant in the carrier housing.

Abnormal gear noise can be easily recognized. It produces a cycling tone that will be very pronounced within a given speed range. The noise can occur during one or more of the following drive conditions:

- Drive
- Road load
- Float
- Coast

Abnormal gear noise usually tends to peak within a narrow vehicle speed range or ranges. It is usually more pronounced between 30 to 40 mph (48 to 64 km/h) and 50 to 60 mph (80 to 96 km/h). When objectionable gear noise occurs, note the driving conditions and the speed range.

DIAGNOSIS AND TESTING > REAR DRIVE UNIT (RDU) NOISE > BEARING NOISE (DRIVE PINION AND DIFFERENTIAL)

Defective bearings produce a rough growl that is constant in pitch and varies with the speed of vehicle. Being aware of this will enable a technician to separate bearing noise from gear noise.

Drive pinion bearing noise that results from defective or damaged bearings can usually be identified by its constant, rough sound. Drive pinion front bearing is usually more pronounced during a coast condition. Drive pinion rear bearing noise is more pronounced during a drive condition. The drive pinion bearings are rotating at a higher rate of speed than either the differential side bearings or the axle shaft bearing.

Differential side bearing noise will usually produce a constant, rough sound. The sound is much lower in frequency than the noise caused by drive pinion bearings.

Bearing noise can best be detected by road testing the vehicle on a smooth road (black top). However, it is easy to mistake tire noise for bearing noise. If a doubt exists, the tire treads should be examined for irregularities that often causes a noise that resembles bearing noise.

DIAGNOSIS AND TESTING > REAR DRIVE UNIT (RDU) NOISE > ENGINE AND TRANSMISSION NOISE

Sometimes noise that appears to be in the driveline module assembly is actually caused by the engine or the transmission. To identify the true source of the noise, note the approximate vehicle speed and/or RPM when the noise is most noticeable. Stop the vehicle next to a flat brick or cement wall (this will help reflect the sound). Place the transmission in **NEUTRAL** . Accelerate the engine slowly up through the engine speed that matches the vehicle speed noted when the noise occurred. If the same noise is produced, it usually indicates that the noise is being caused by the engine or transmission.

SPECIFICATIONS > TORQUE SPECIFICATIONS

RDM TORQUE SPECIFICATIONS

DESCRIPTION	N.m	Ft. Lbs.	In. Lbs.	NEW FASTENER*
Rear Drive Unit (RDU) Mounting Bolts	90 + 45°	66 + 45°	-	-
Center Bearing Support Bolts	50	37	-	X
***NEW FASTENER:** Do not reuse these fasteners. If removed, a new fastener must be installed and tightened to specifications.				

RDM SPECIFICATIONS

DESCRIPTION	SPECIFICATION
DIFFERENTIAL FLUID FILL CAPACITY	0.6 Liters

SPECIAL TOOLS > SPECIAL TOOLS

Tool (EMEA)	Tool (NAFTA)	Name	Function
2000043000	*	Axle Support Fixture	Support Axle
2000043400	*	Adjustable Bracket	Support Axle
2019500030	*	Elastic Ring Spreader	Removing Rear Drive Shaft
*Tool not available for NAFTA. Use a commercially available tool or contact Mopar Essential Tools to order the custom EMEA tool.			

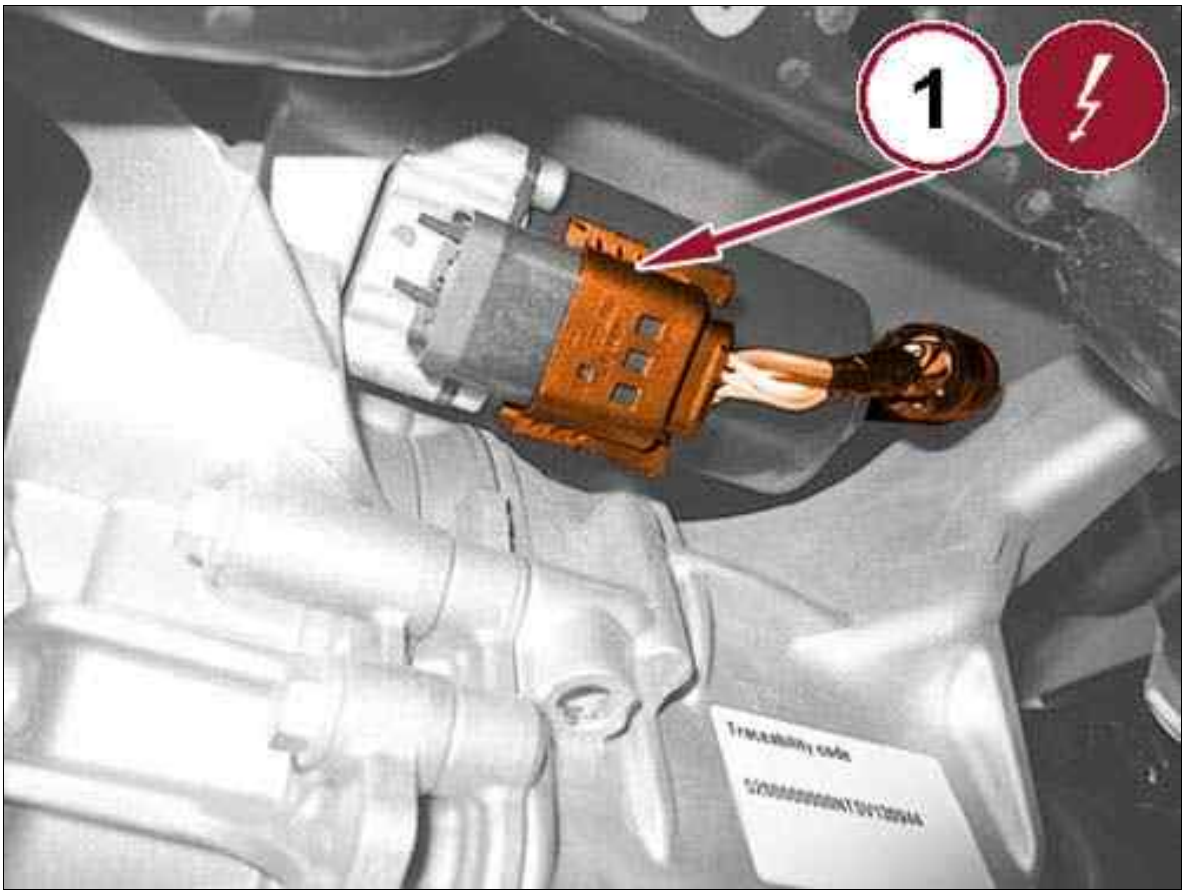
REMOVAL AND INSTALLATION > REMOVAL AND INSTALLATION > REMOVAL

CAUTION:

Propeller shaft installation is a two-person operation. Never allow propeller shaft to hang from the center bearing, or while only connected to the transmission or rear axle flanges. A helper is required. If a propeller shaft section is hung unsupported, damage may occur to the shaft, coupler, and/or center bearing from over-angulation. This may result in driveline vibrations and/or component failure.

1. Raise and support the vehicle. Refer to HOISTING, STANDARD PROCEDURE .
2. Remove the muffler. Refer to MUFFLER, EXHAUST, REMOVAL AND INSTALLATION .
3. Remove both rear tires and wheels. Refer to REMOVAL AND INSTALLATION .
4. Remove the rear suspension knuckles with hub and bearings. Refer to KNUCKLE, REAR, REMOVAL AND INSTALLATION .
5. Remove both rear halfshafts. Refer to REMOVAL AND INSTALLATION .
6. Remove the rear stabilizer bar. Refer to STABILIZER BAR, REAR SUSPENSION, REMOVAL AND INSTALLATION .

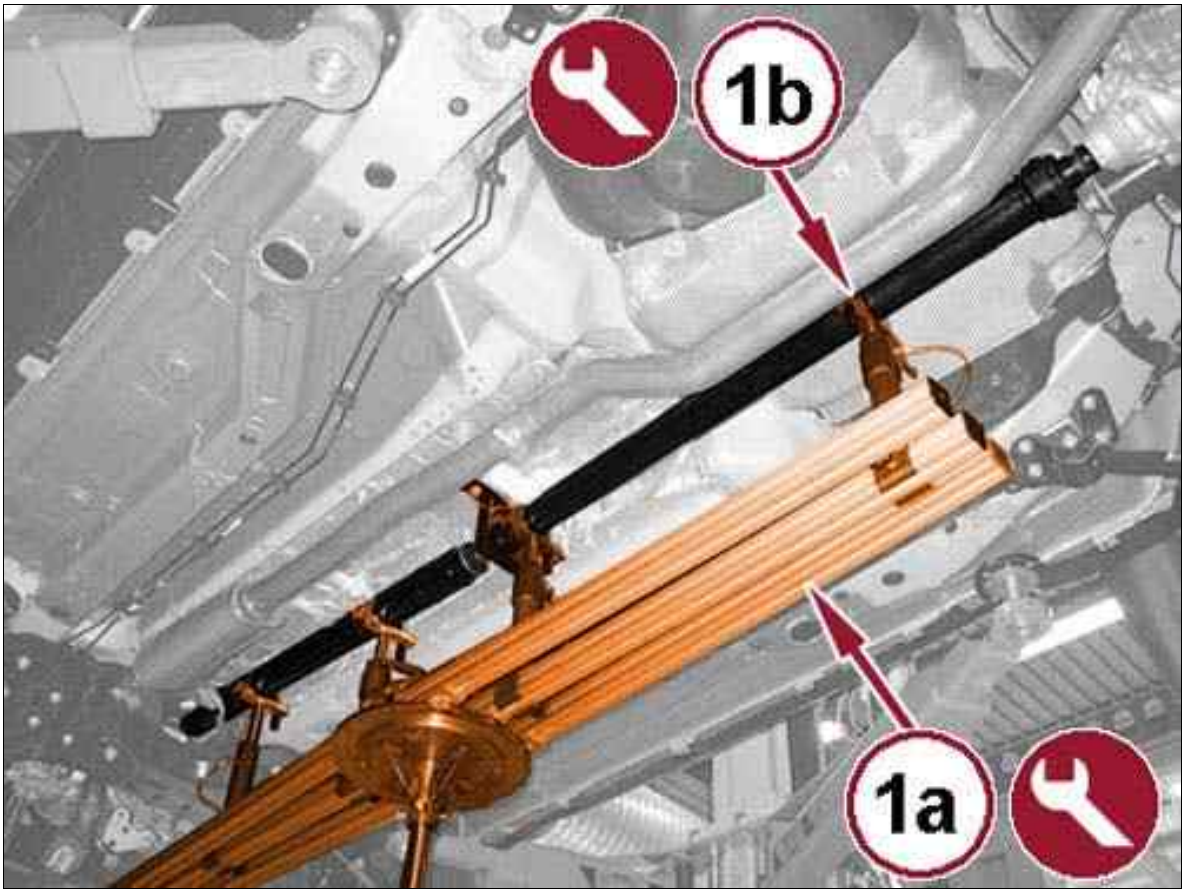
Fig 1: Differential Actuator Connector



Courtesy of CHRYSLER GROUP, LLC

7. Disconnect the electrical connector (1) of the differential actuator.

Fig 2: Positioning Support Tools Under Propeller Shaft



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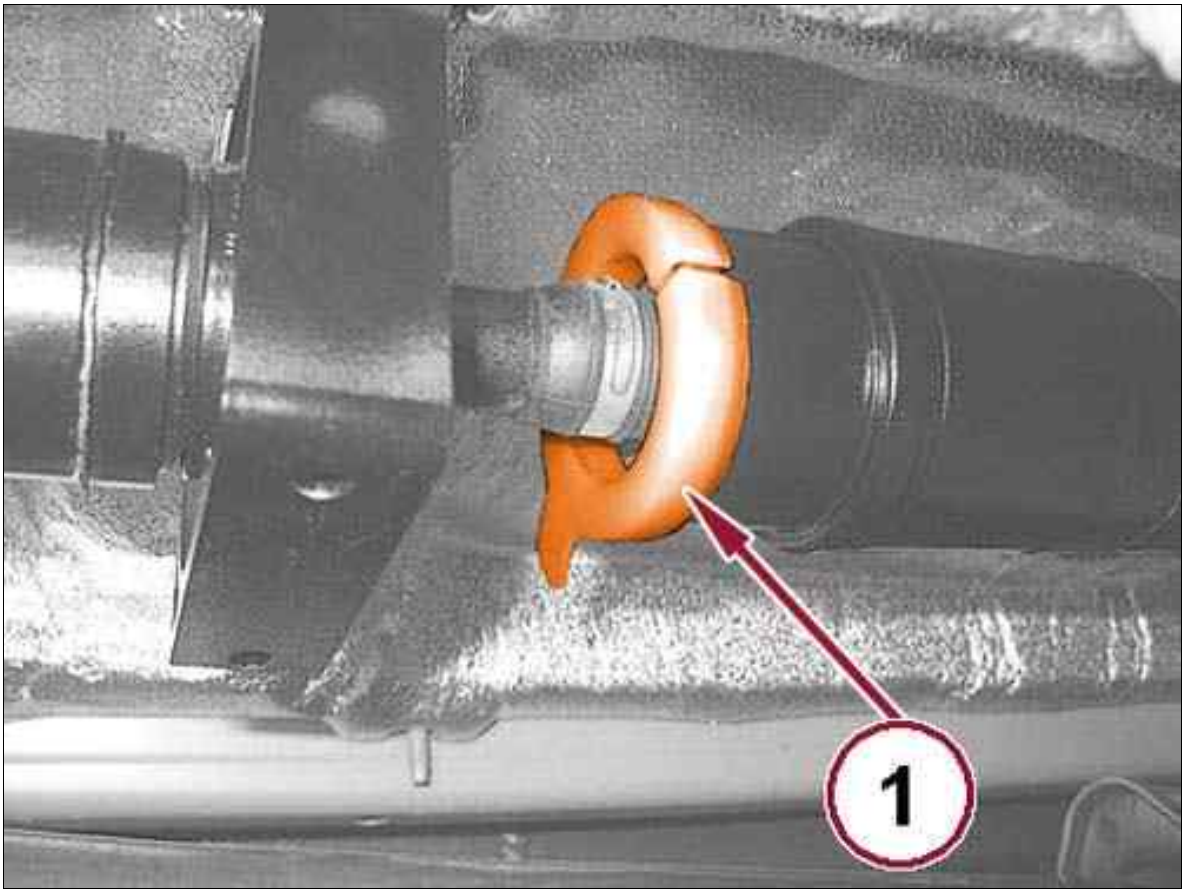
> *NOTE:*
>
> *Protect the propeller shaft coating with a suitable duct tape to prevent any scratches caused by the propeller shaft support tools.*

8. Position support tools 2000043000 (1b) and 2000043400 (1a) under the propeller shaft.

Fig 3: Protective Sleeve



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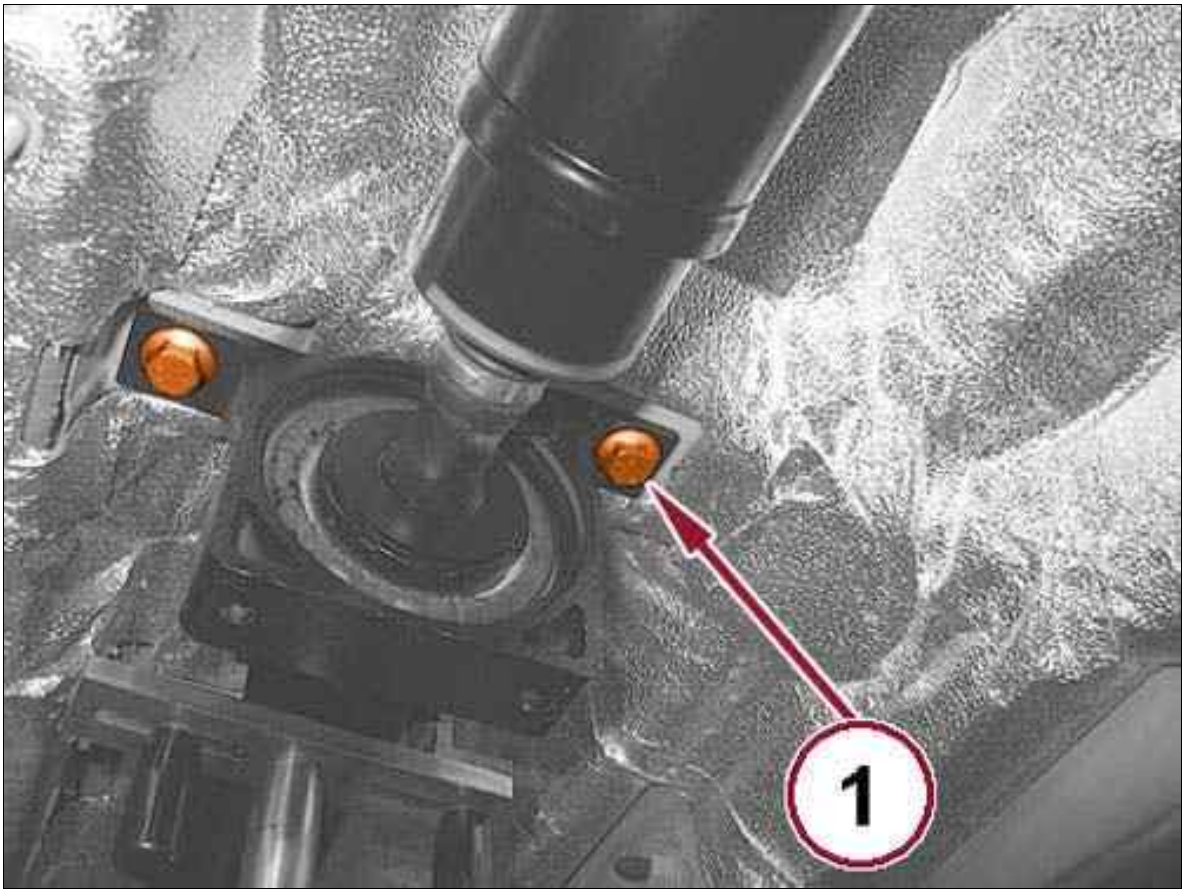
> ⚠ *CAUTION:*
>
> *Do not allow the propeller shaft to hang from the vehicle unsupported. Damage may occur to the joint, boot, and center bearing from over-angulation.*

9. Install the protective sleeve (1) at the center propeller shaft joint to protect the boot as shown in illustration.

> *NOTE:*
>
> *The protective sleeve is provided in the parts package with the dust cover and snap rings for the propeller shaft.*

Fig 4: Propeller Shaft Center Support Bolts



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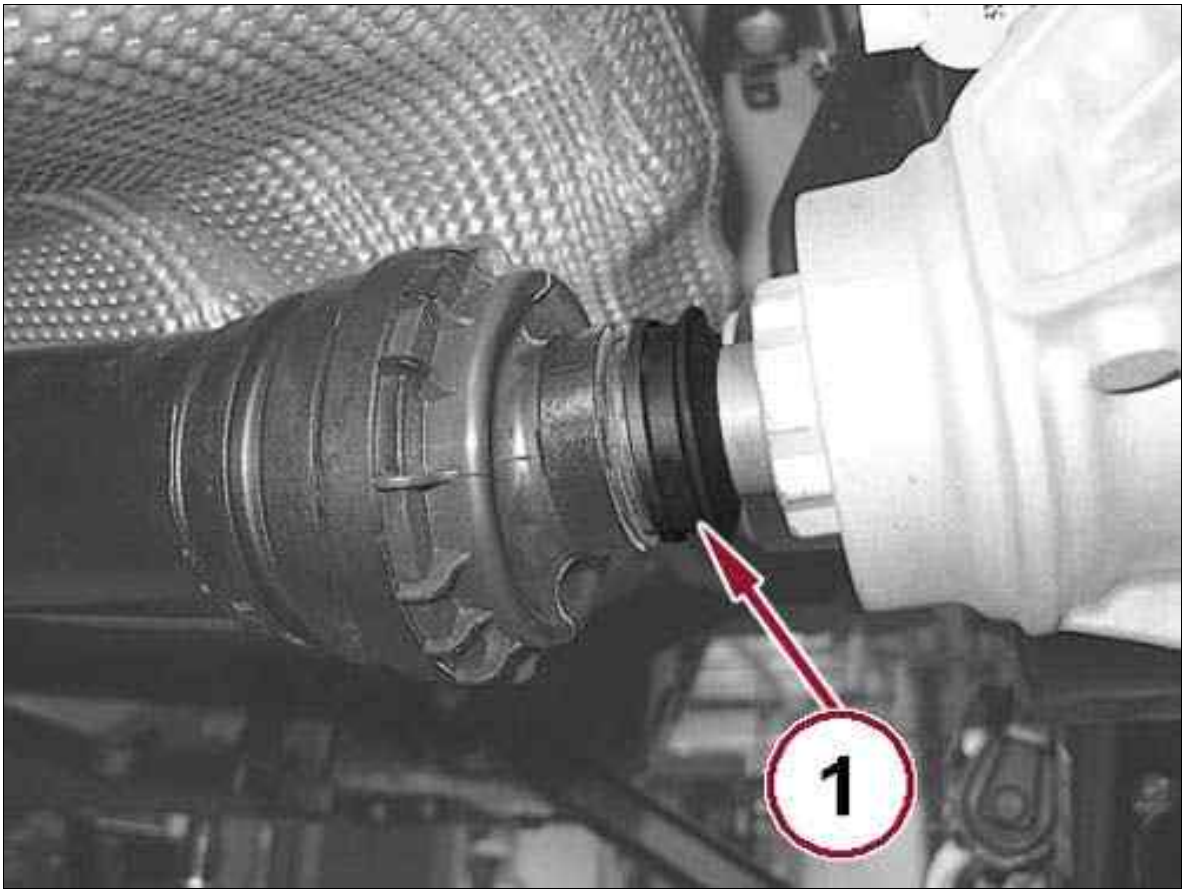
10. Remove the propeller shaft center support bolts (1).

Fig 5: Dust Cover



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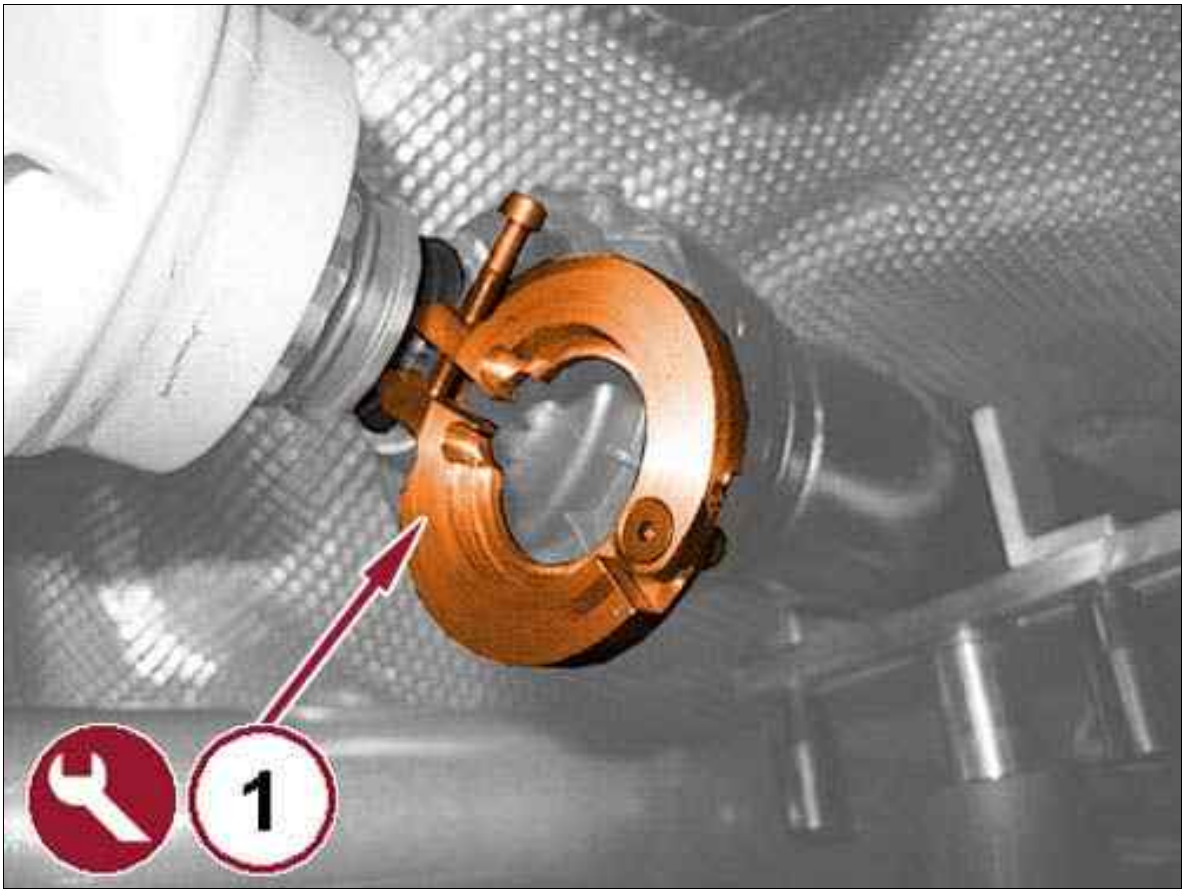
NOTE:

The dust cover must be replaced every time the propeller shaft is removed.

11. Slide the dust cover (1) at the rear of the propeller shaft towards the differential to access the snap ring.

Fig 6: Opening Propeller Shaft Snap Ring



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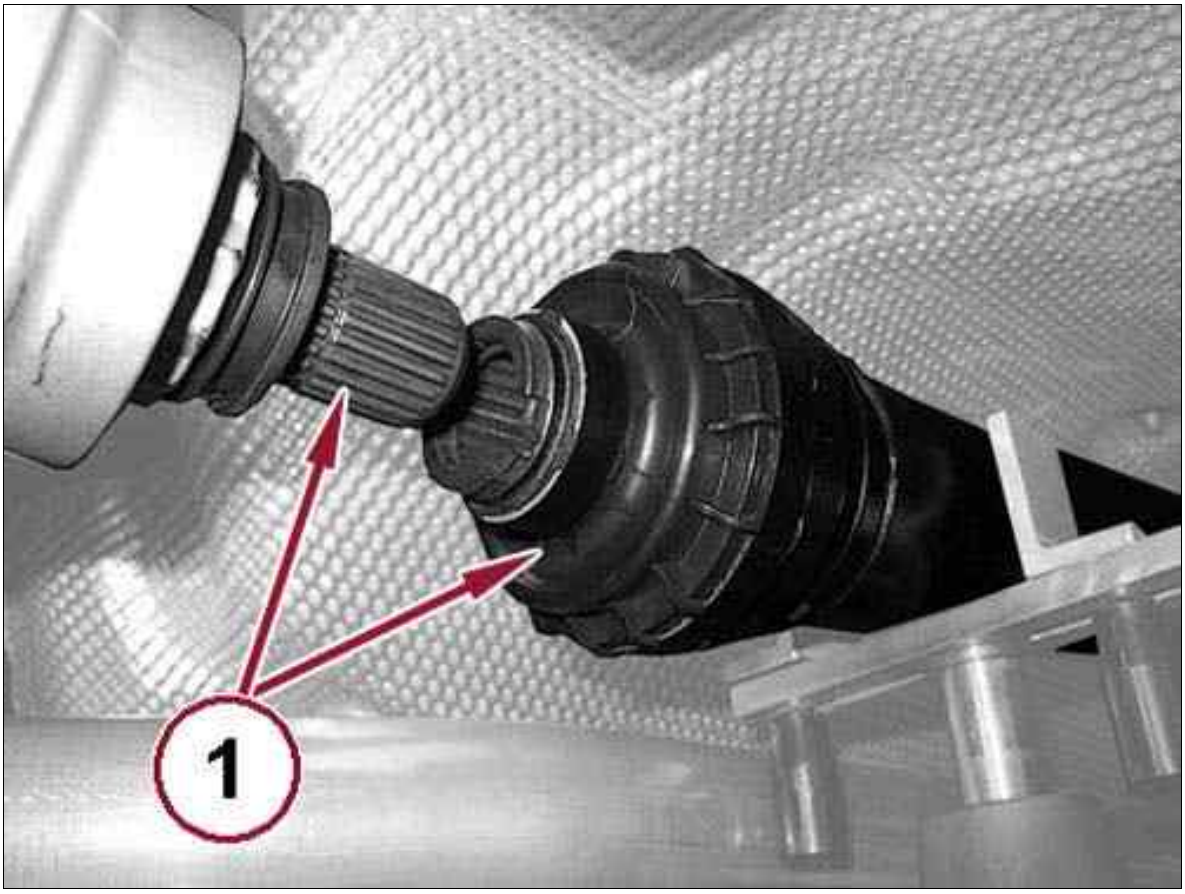
NOTE:

The snap ring must be replaced every time the propeller shaft is removed.

12. Use tool 2019500030 (1) to open propeller shaft snap ring at the Rear Driveline Unit (RDU).

Fig 7: Propeller Shaft & Pinion



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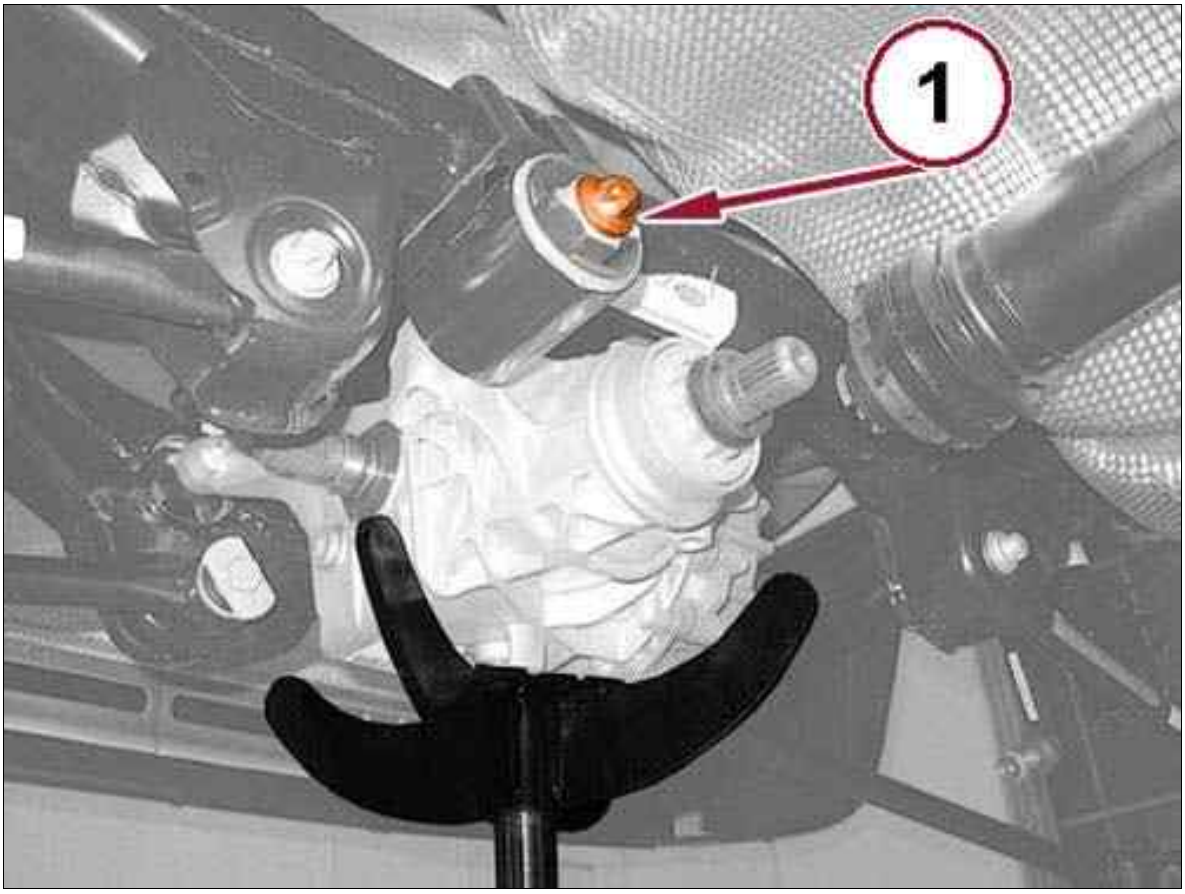
13. Disconnect the propeller shaft from the pinion of the RDU (1).
14. Remove the tool 2019500030.

Fig 8: Front RDU Mounting Bolt



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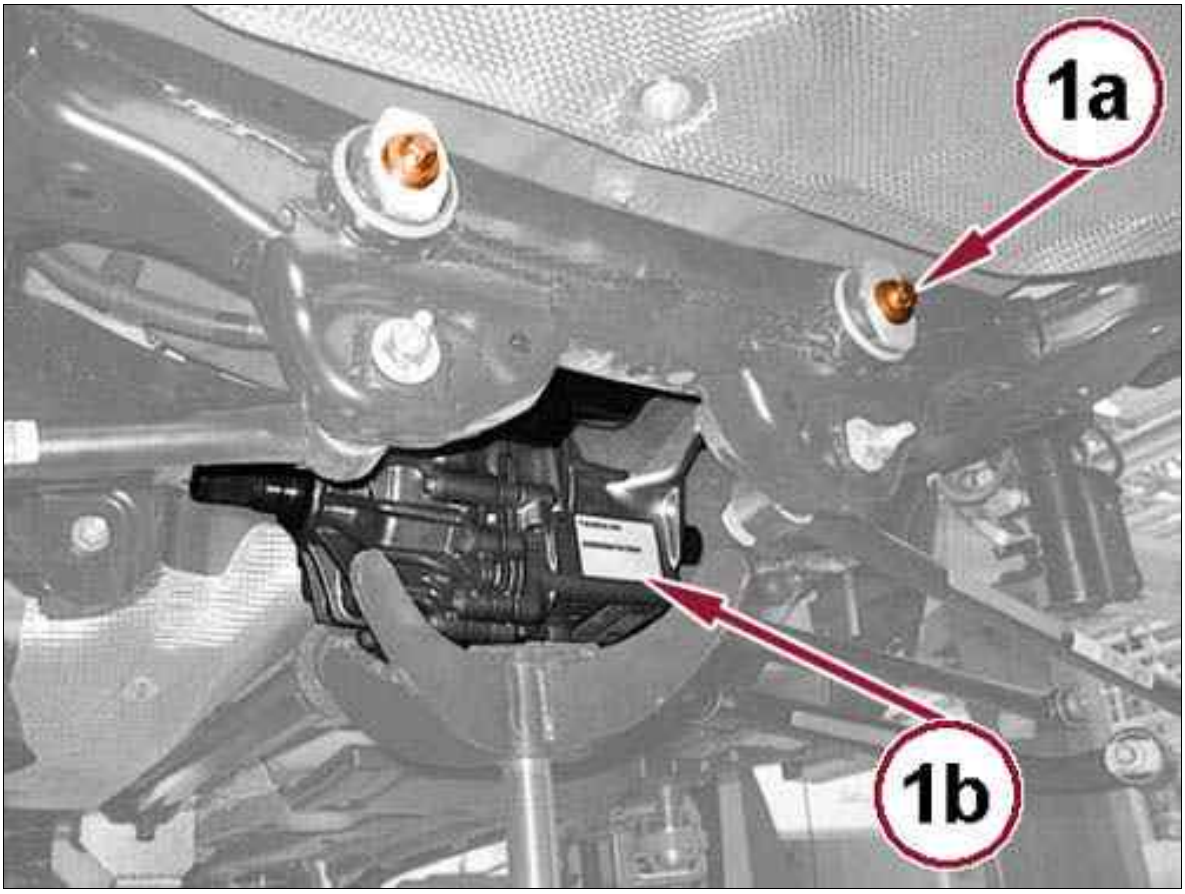
15. Position a suitable hydraulic lift to support the RDU and remove the front RDU mounting bolt (1).

Fig 9: RDU & Isolator Through Bolts



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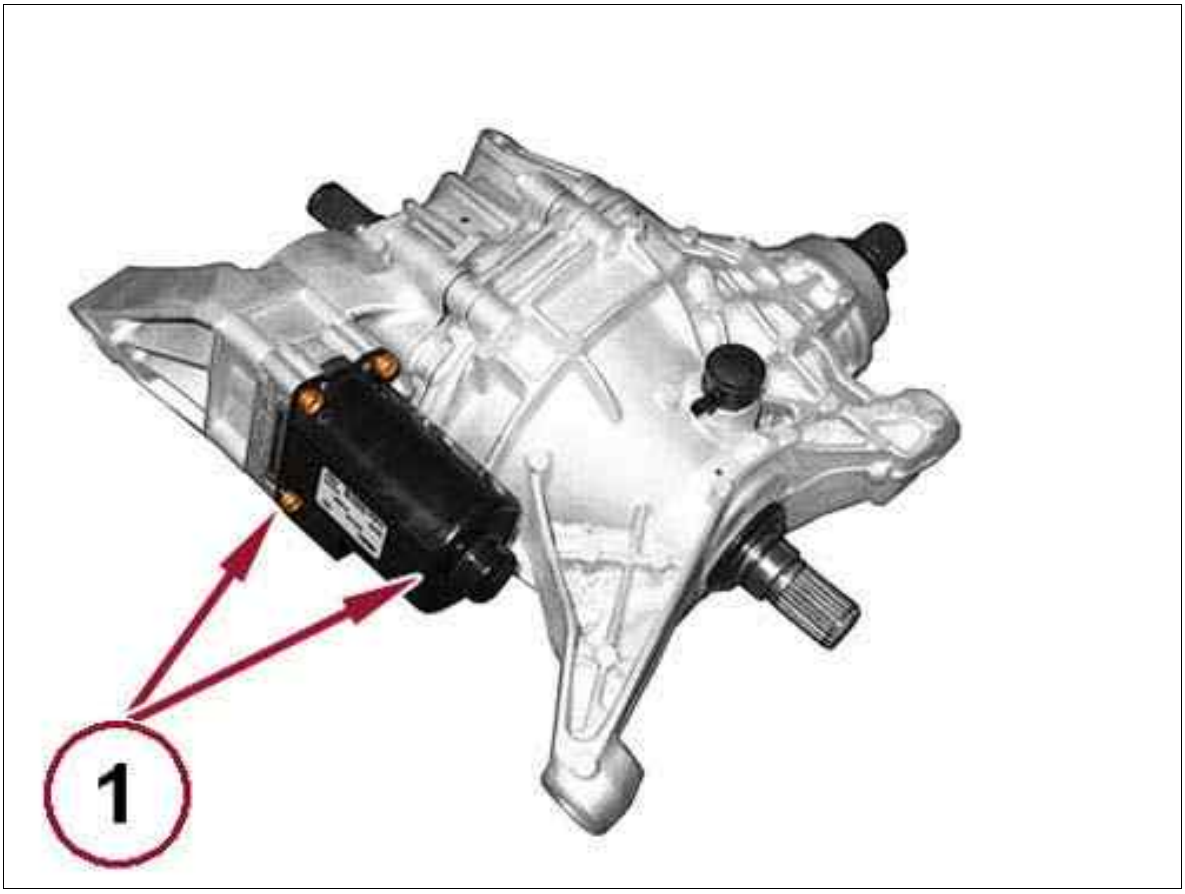
16. Remove the rear RDU isolator through bolts (1a) and remove the RDU (1b).

Fig 10: Actuator & Screws



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17. If necessary, remove the screws and the actuator (1) from the RDU.

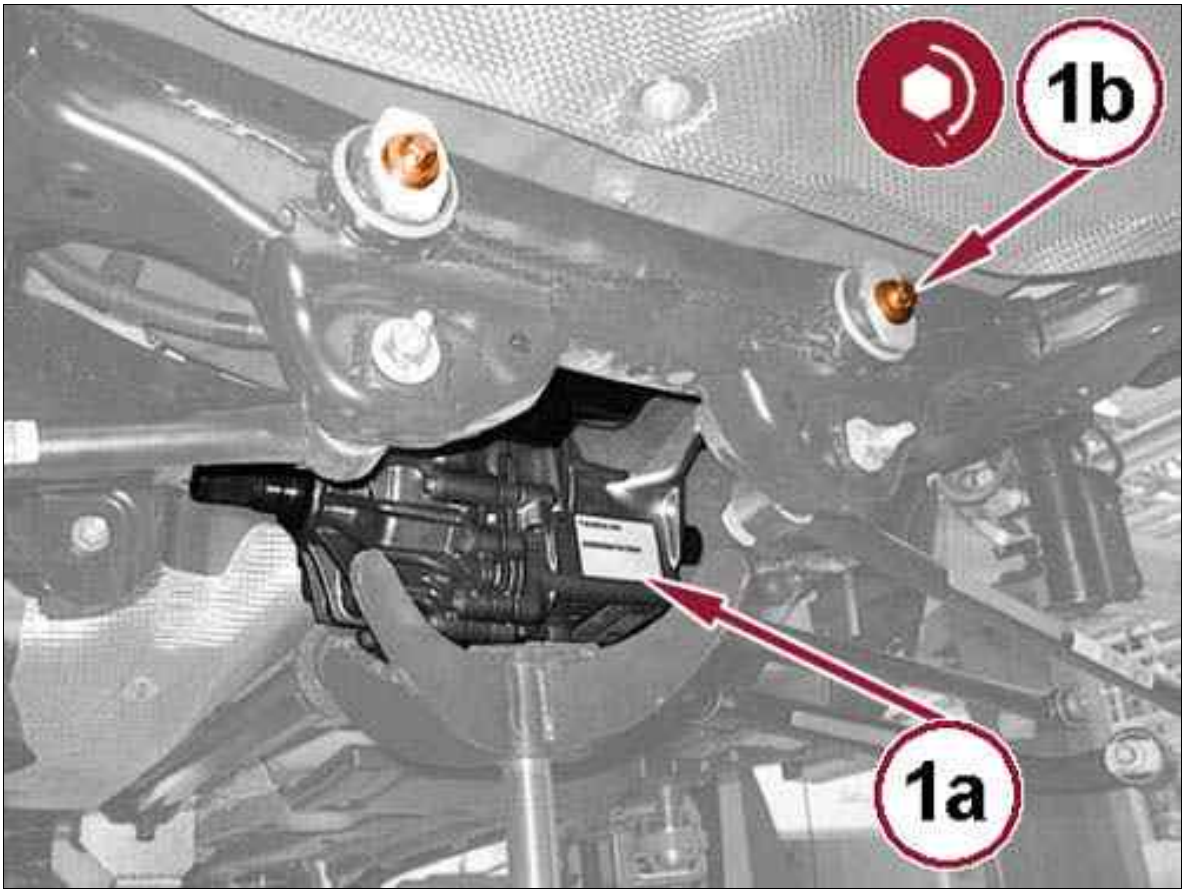
REMOVAL AND INSTALLATION > REMOVAL AND INSTALLATION > INSTALLATION

⚠ *CAUTION:*

Propeller shaft installation is a two-person operation. Never allow propeller shaft to hang from the center bearing, or while only connected to the transmission or rear axle flanges. A helper is required. If a propeller shaft section is hung unsupported, damage may occur to the shaft, coupler, and/or center bearing from over-angulation. This may result in driveline vibrations and/or component failure.

1. If removed, install the Rear Driveline Unit (RDM) actuator and tighten the screws.

Fig 1: RDU & Isolator Through Bolts



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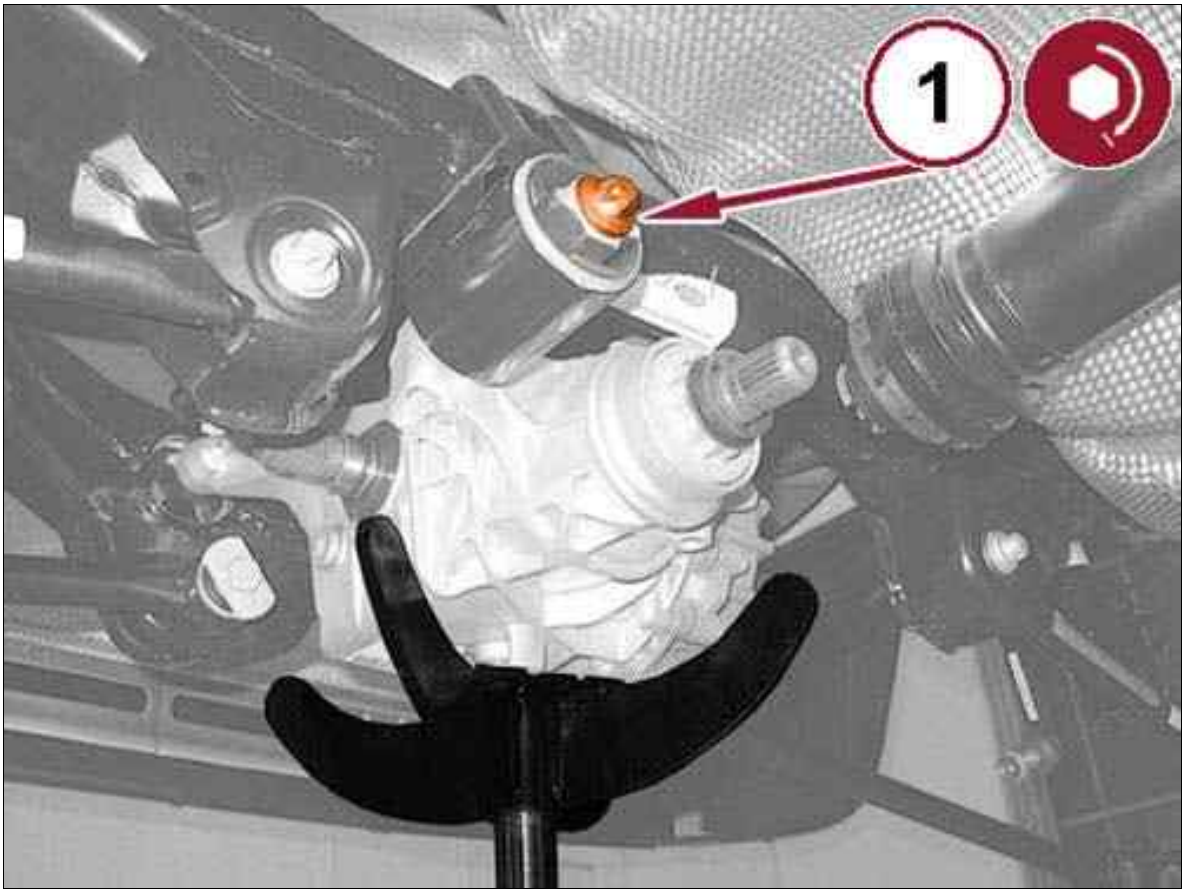
2. Raise the RDU (1a) into position and tighten the through bolts (1b) to the proper specification. Refer to SPECIFICATIONS .

Fig 2: Front RDU Mounting Bolt



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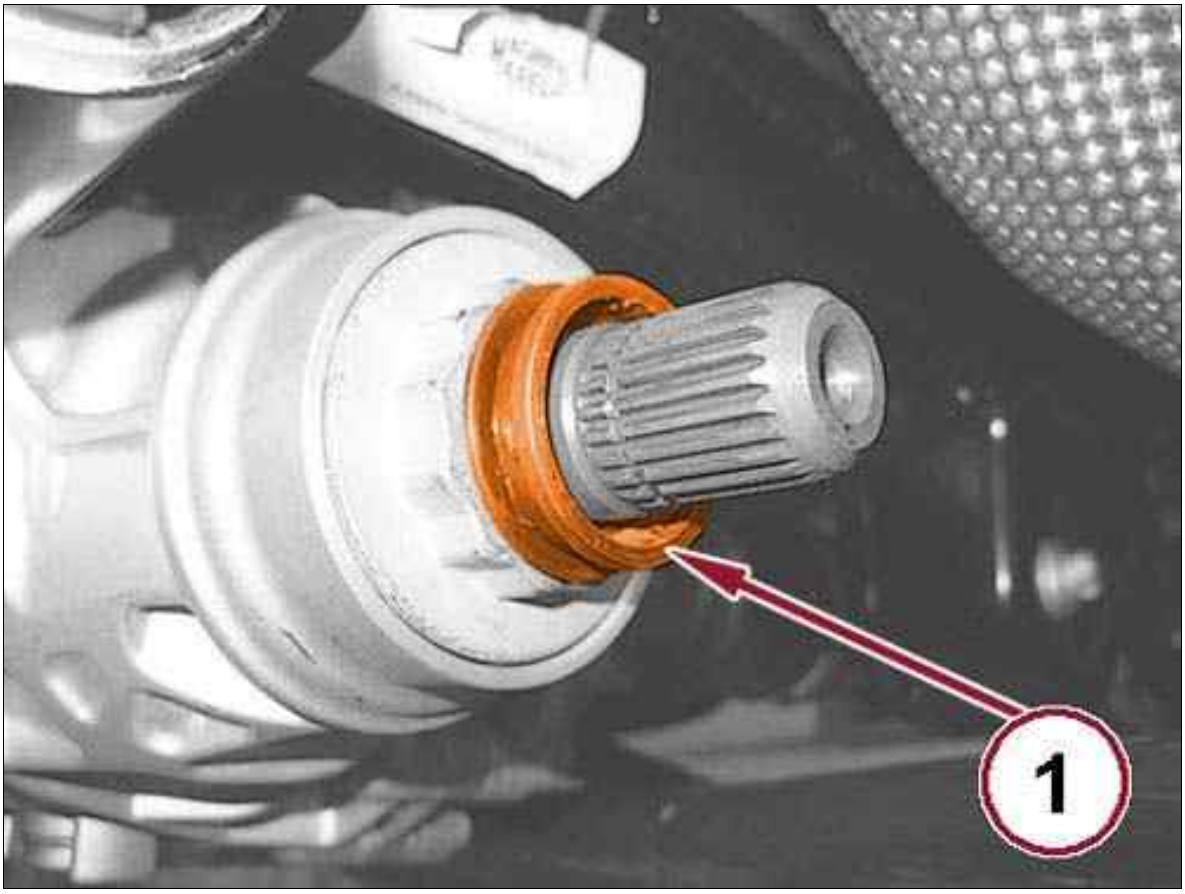
3. Install the front RDU mounting bolt (1) and tighten to the proper specification. Refer to SPECIFICATIONS .
4. Remove the hydraulic lift.

Fig 3: Dust Seal



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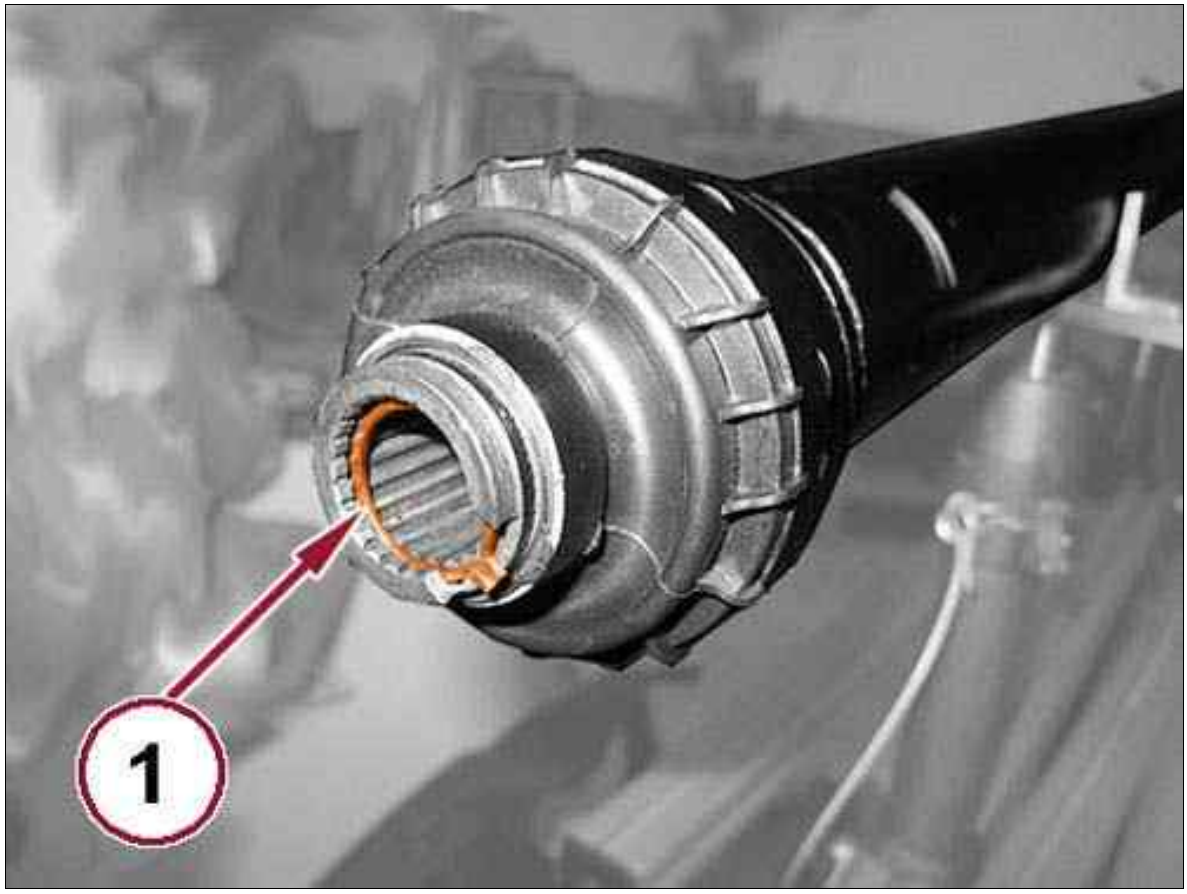
5. Install a new dust seal (1) on the pinion shaft of the RDU.

Fig 4: Snap Ring



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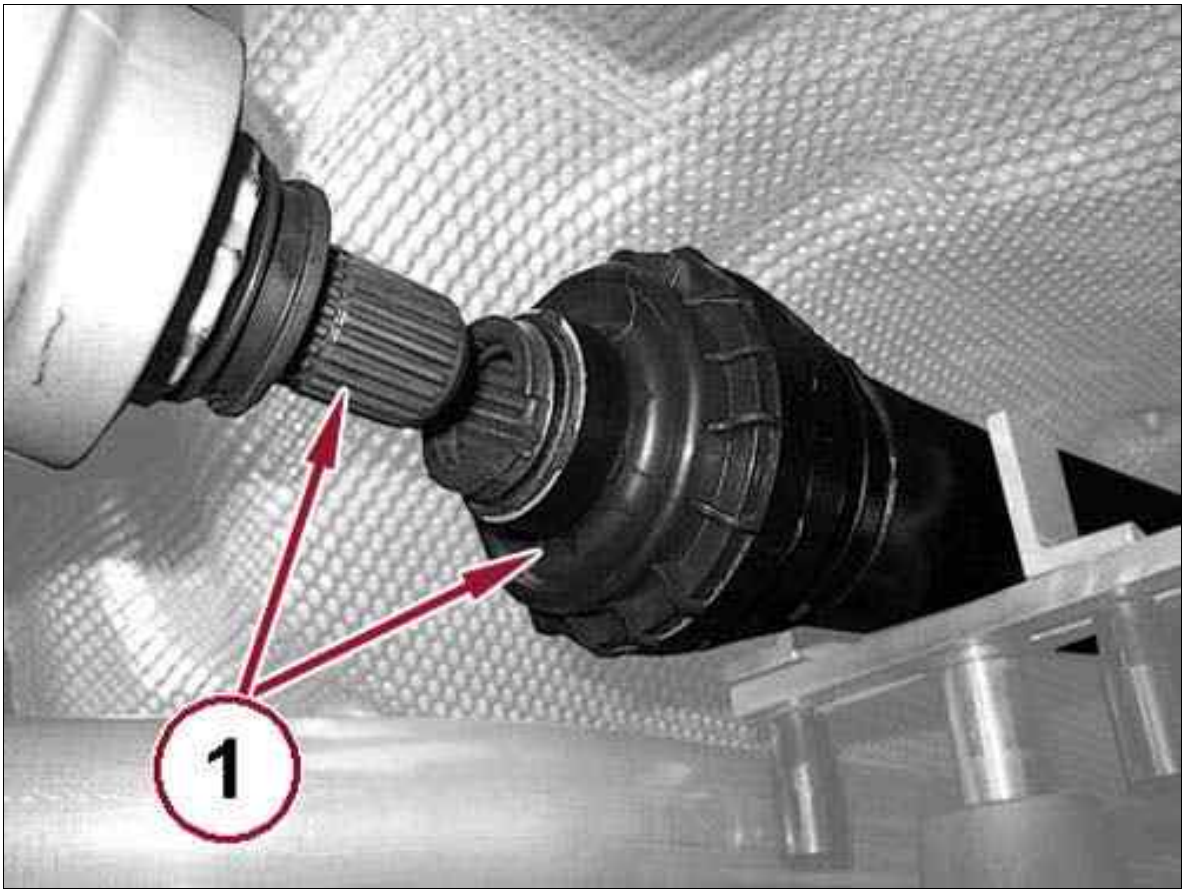
6. Install a new snap ring (1) in the drive shaft.

Fig 5: Propeller Shaft & Pinion



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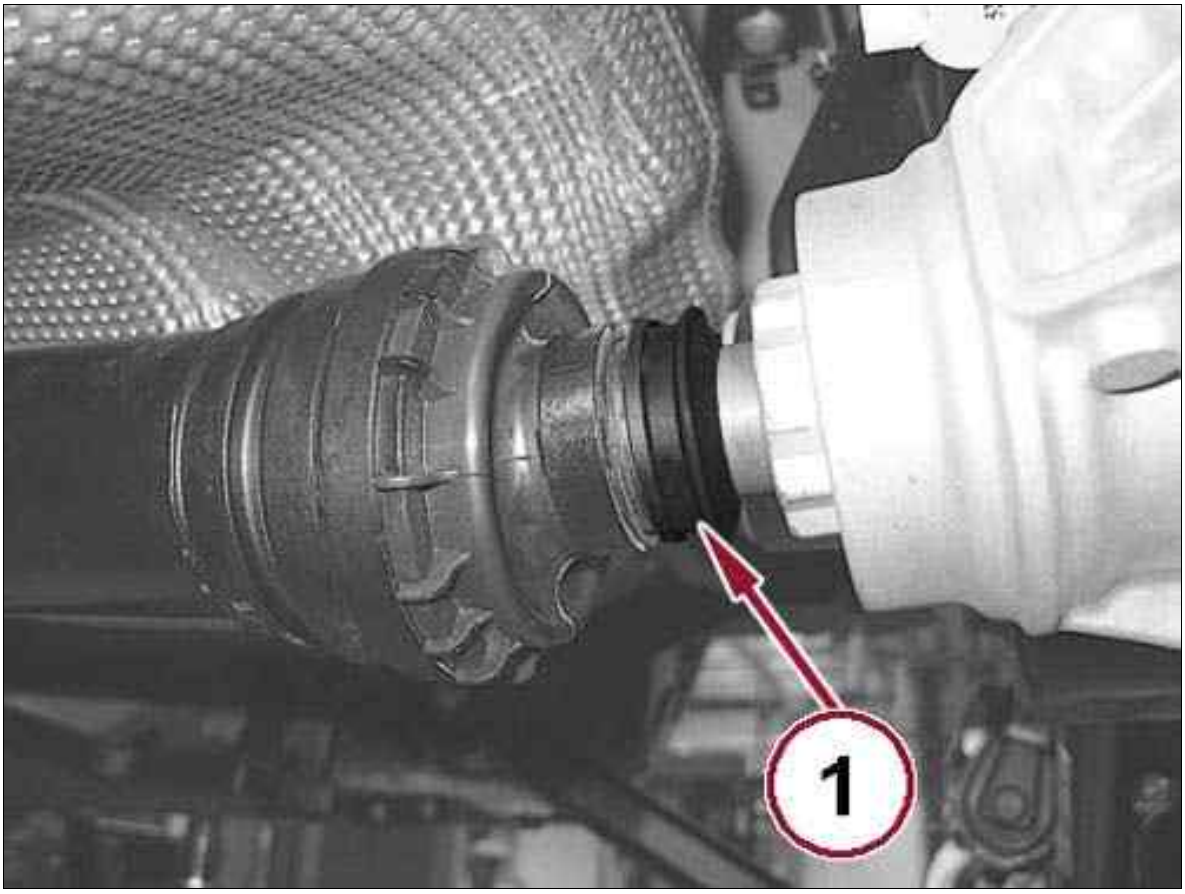
7. Connect the propeller shaft to the pinion of the RDU, verify the snap ring is seated in the groove on the pinion shaft.

Fig 6: Dust Cover



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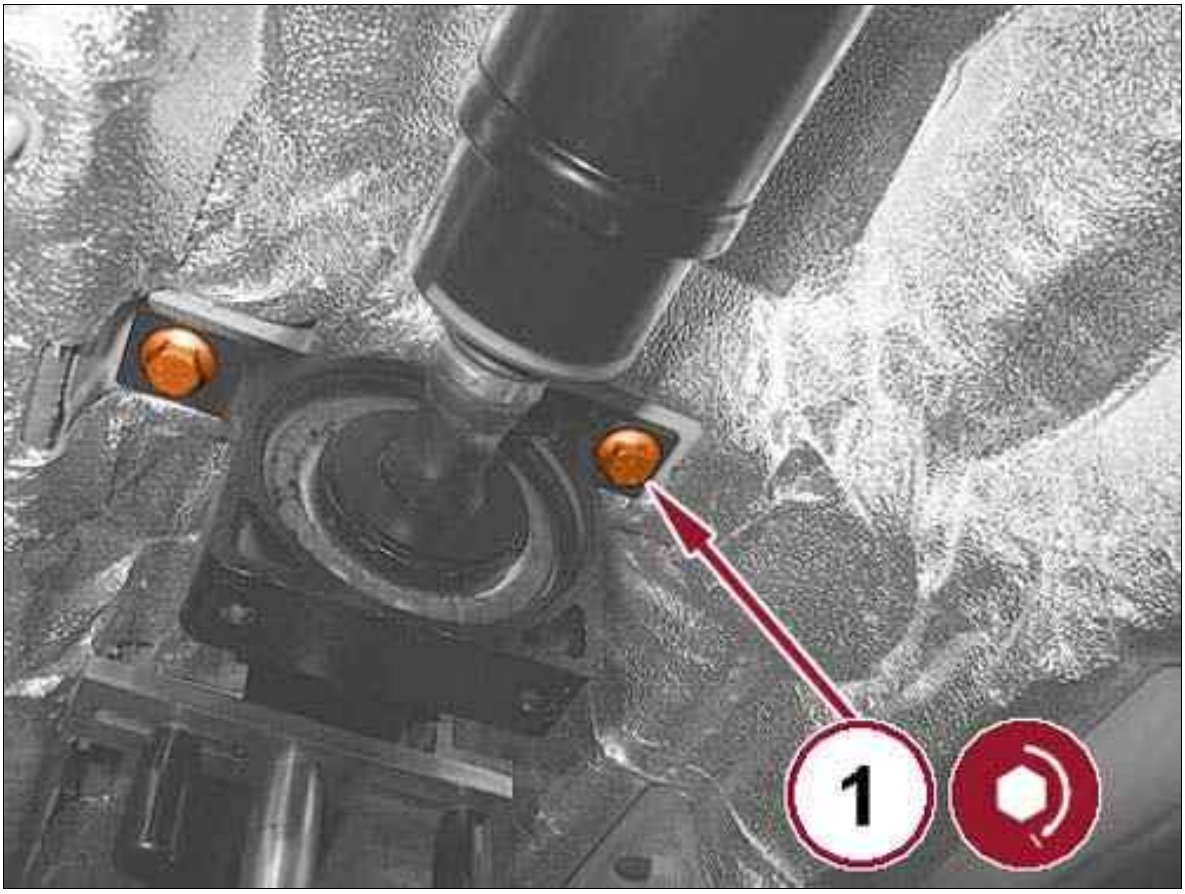
8. Position the new dust cover over the joint at the rear of the propeller shaft.

Fig 7: Propeller Shaft Center Support Bolts



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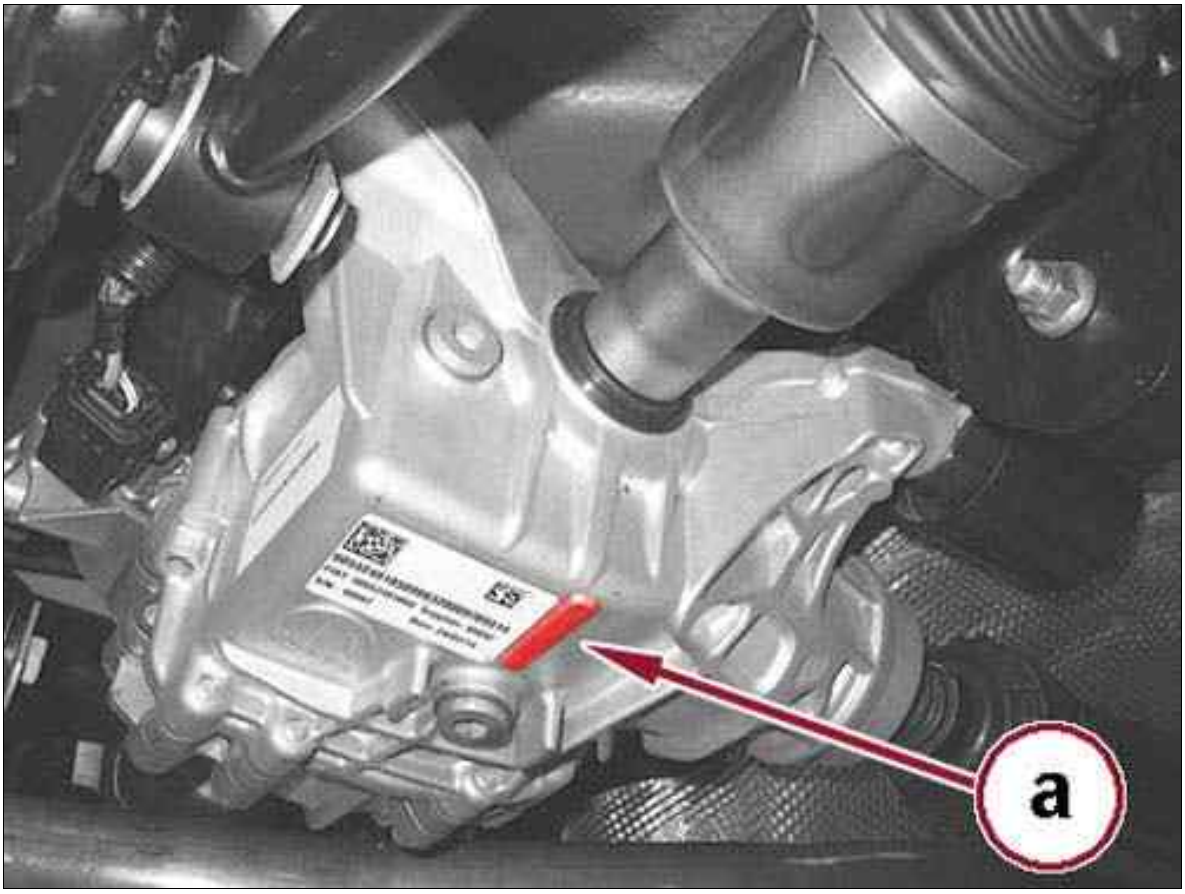
9. Install the propeller shaft center support bolts and tighten to the proper specification. Refer to SPECIFICATIONS .
10. Remove the propeller shaft support tools.
11. Remove the tape and the protective sleeve from the propeller shaft.
12. Connect the differential actuator wire harness connector.

Fig 8: RDU Code Location



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> *NOTE:*
>
> *If replacing the RDU, it is necessary to record the last two characters of the code in the area indicated (a) of the new RDU for performing the self learning procedure.*

13. When replacing the RDU connect the diagnostic scan tool, enter Miscellaneous Functions of the DriveTrain Control Module (DTCM) and run the self-learning procedure for the RDU.
14. Check and correct the fluid level in the RDU. Refer to FLUID, DIFFERENTIAL, STANDARD PROCEDURE .
15. Install the rear stabilizer bar. Refer to STABILIZER BAR, REAR SUSPENSION, REMOVAL AND INSTALLATION .
16. Install the rear halfshafts. Refer to REMOVAL AND INSTALLATION .
17. Install the rear knuckles. Refer to KNUCKLE, REAR, REMOVAL AND INSTALLATION .
18. Install the rear tires and wheels. Refer to REMOVAL AND INSTALLATION .
19. Install the muffler. Refer to MUFFLER, EXHAUST, REMOVAL AND INSTALLATION .

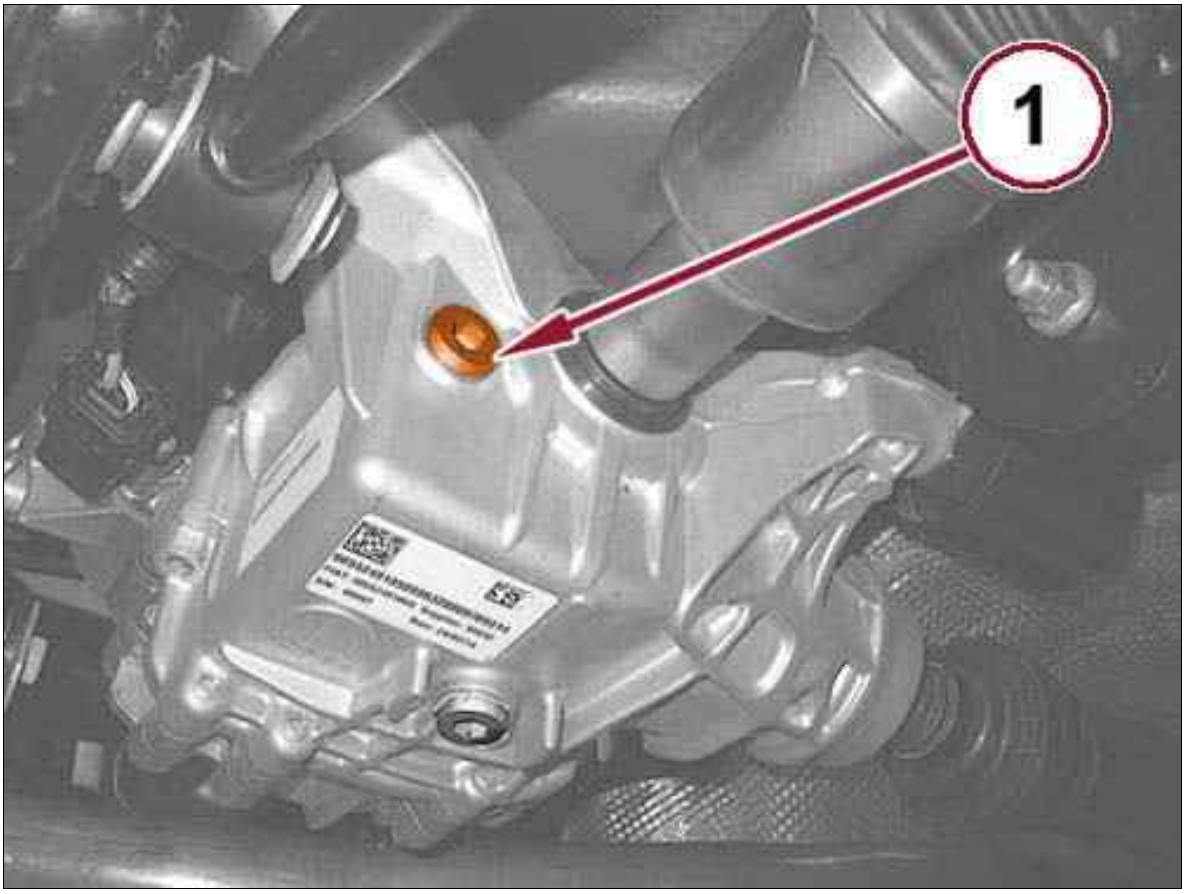
FLUID, DIFFERENTIAL > STANDARD PROCEDURE > DIFFERENTIAL FLUID FILL

The rear differential oil change is not a scheduled maintenance service.

The correct fill level is just below the bottom edge of the fill plug hole. Be sure the vehicle is on a level surface, or is hoisted in a level manner, in order to obtain the correct fill level.

1. Raise and support the vehicle. Refer to HOISTING, STANDARD PROCEDURE .

   Fig 1: Rear Differential Oil Filler Cap



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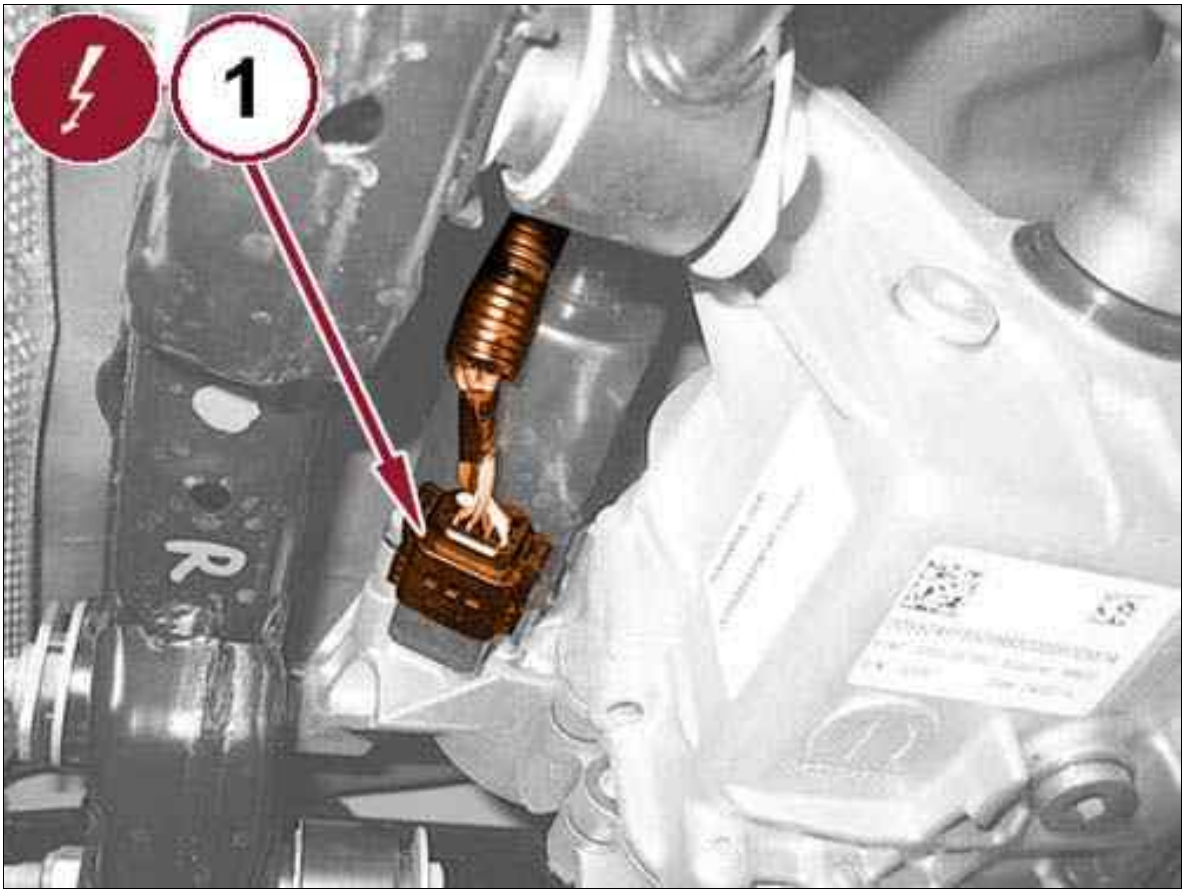
2. Remove the rear differential oil filler cap (1) and check the oil level is just below the bottom edge of the fill hole.
3. If necessary, add the specified fluid. Refer to CAPACITIES AND RECOMMENDED FLUIDS, SPECIFICATIONS .
4. Clean and install the differential fill plug (1) and tighten.

ACTUATOR, AXLE SHAFT > REMOVAL AND INSTALLATION > REMOVAL AND INSTALLATION > REMOVAL

1. Raise and support the vehicle. Refer to HOISTING, STANDARD PROCEDURE .

Fig 1: Rear Differential Actuator Wire Harness Connector



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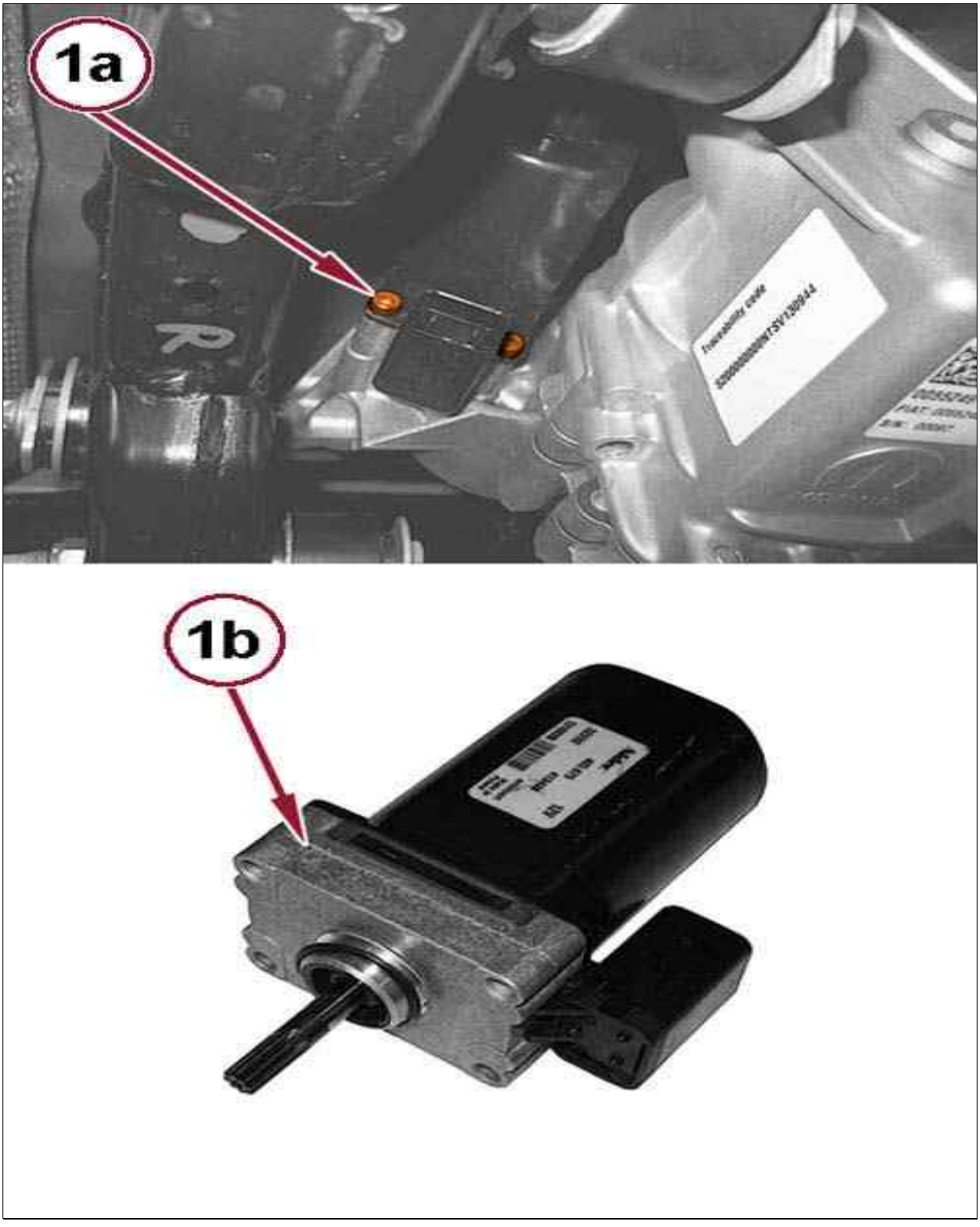
2. Disconnect the wire harness connector (1) at the rear differential actuator.

Fig 2: Rear Differential Actuator & Screws



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3. Remove the screws (1a) and remove the rear differential actuator (1b).

ACTUATOR, AXLE SHAFT > REMOVAL AND INSTALLATION > REMOVAL AND INSTALLATION > INSTALLATION

1. Install the rear differential actuator and tighten the screws.
2. Connect the wire harness connector at the rear differential actuator.