

TRANSMISSION

Final Drive, Differential - Manual Transmission Internal Components 0B4 AWD (Sedan)

39 FINAL DRIVE, DIFFERENTIAL

DESCRIPTION AND OPERATION

DIFFERENTIAL OVERVIEW

NOTE: The differential can be removed and installed without removing the shifter, input shaft, output shaft, drive pinion and transmission cover.

The bearing pre-load for the tapered roller bearing must be adjusted when replacing the final drive cover. Refer to **FINAL DRIVE COVER**.

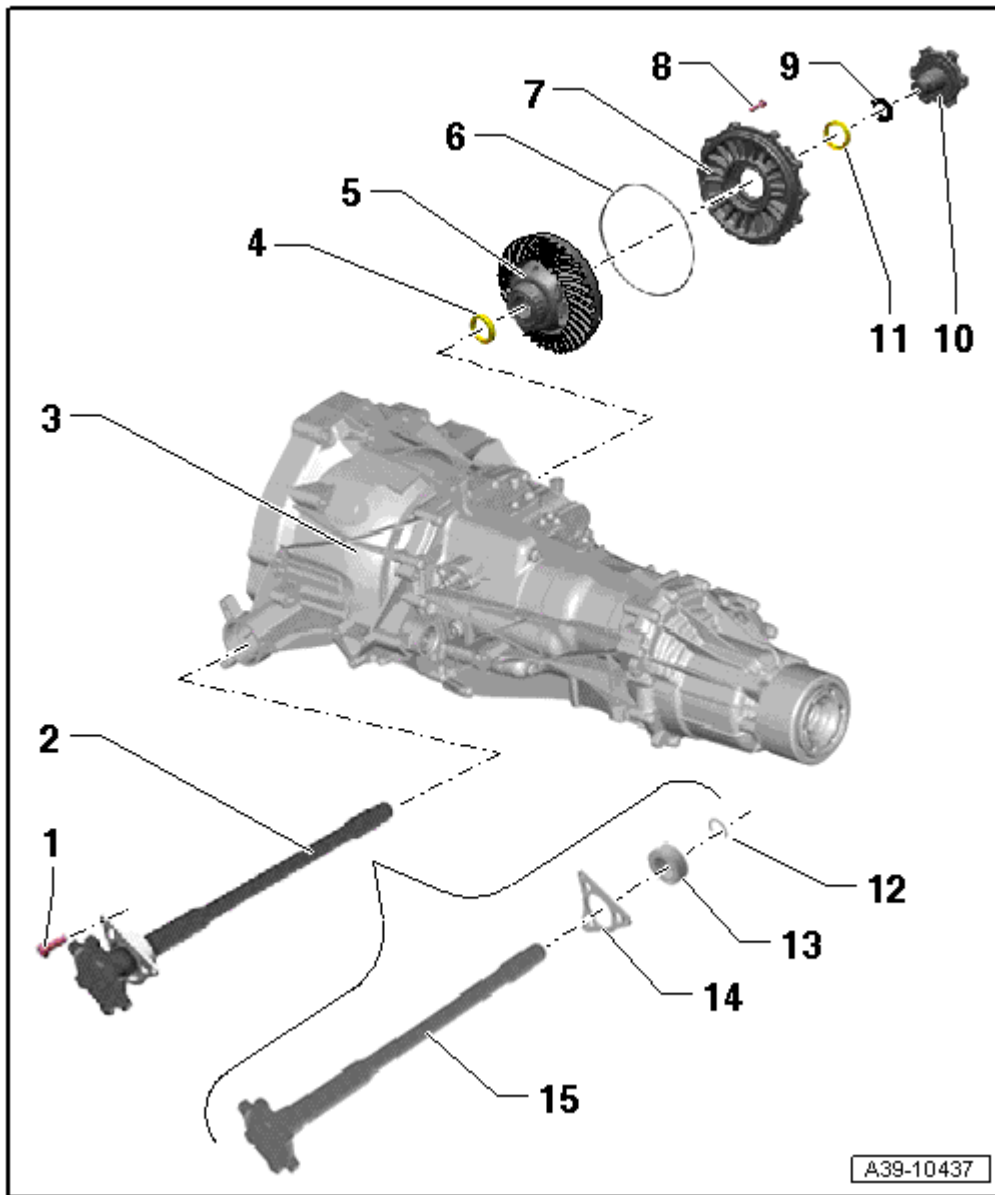


Fig. 1: Differential Overview

Courtesy of AUDI OF AMERICA, LLC

1. Bolt

- 24 Nm
- Steel bolts (M8; 25 mm long)
- Quantity: 3
- Insert with locking fluid AMV 185 101 A1

2. Left Flange Shaft

- With bracket and ball bearing
- Removing and installing, refer to **LEFT FLANGE SHAFT SEAL WITH TRANSMISSION REMOVED**

- Replacing the ball bearing or bracket, refer to **LEFT FLANGE SHAFT BALL BEARING MOUNTING BRACKET**
3. Transmission Housing
 - Can currently be replaced only with the differential and the pinion
 4. Shaft Seal
 - For the left flange shaft
 - Removing and installing, refer to **LEFT FLANGE SHAFT SEAL WITH TRANSMISSION REMOVED**
 5. Differential with Ring Gear
 - The ring gear cannot be removed from the differential.
 - The differential bevel gears cannot be replaced.
 6. O-ring
 - Always replace
 - Coat with transmission fluid
 7. Final Drive Cover
 - Removing and Installing, refer to **FINAL DRIVE COVER**
 8. Bolt
 - 24 Nm
 - Steel bolts (M8; 42 mm long)
 - Quantity: 10
 9. Locking Ring
 - Always replace
 - Removing and installing; Refer To **Fig. 16**
 10. Right Flange Shaft
 - Removing and installing, refer to **RIGHT FLANGE SHAFT SEAL WITH TRANSMISSION REMOVED**
 - Driving in with Needle Bearing Drift VW 295
 11. Shaft Seal
 - For the right flange shaft
 - Removing and installing, refer to **RIGHT FLANGE SHAFT SEAL WITH TRANSMISSION REMOVED**
 12. Locking Ring
 13. Ball Bearing
 - For the left flange shaft
 - Removing and installing, refer to **LEFT FLANGE SHAFT BALL BEARING MOUNTING BRACKET**
 14. Bracket
 - For the left flange shaft
 - Removing and installing, refer to **LEFT FLANGE SHAFT BALL BEARING MOUNTING**

BRACKET

15. Left Flange Shaft

SPECIFICATIONS**FASTENER TIGHTENING SPECIFICATIONS**

Component	Bolt Size	Nm
Final Drive Cover, Steel Bolts (42 mm long)	M8	24
Left Flange Shaft, Steel Bolts (25 mm long) ¹	M8	24
¹ Insert with locking fluid.		

REMOVAL AND INSTALLATION**FLANGE SHAFT SEALS FLANGE SHAFTS, REPLACING**

It is possible to replace the right flange shaft seal with the transmission still installed. Refer to **[For engine(s) CCBA] Removal and Installation** .

- For replacing the left flange shaft seal with the transmission removed, refer to **LEFT FLANGE SHAFT SEAL WITH TRANSMISSION REMOVED**.
- For replacing the right flange shaft seal with the transmission removed, refer to **DIFFERENTIAL OVERVIEW**.

LEFT FLANGE SHAFT SEAL WITH TRANSMISSION REMOVED**Special tools and workshop equipment required**

- Needle Bearing Drift VW 295
- Puller T10037
- Thrust Piece for Final Drive at Gearbox T40164
- Drip Tray VAS 6208
- Sealing grease G 052 128 A1

Removing

- Transmission is removed, refer to **[For engine(s) CCBA] Removal and Installation** .

Place the VAS 6208 under the transmission.

-- Remove the bolt -arrow- and drain the transmission fluid.

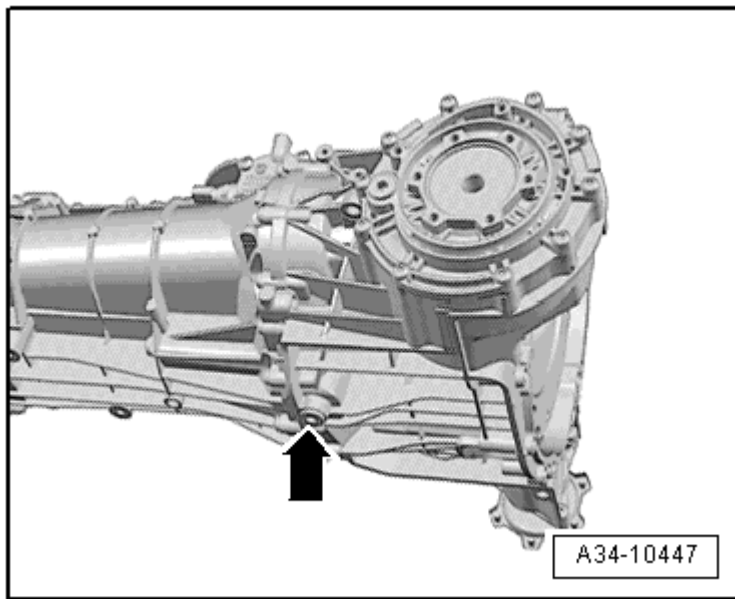


Fig. 2: Locating Transmission Fluid Drain Plug
Courtesy of AUDI OF AMERICA, LLC

- Install and tighten the bolt -arrow-. Tightening specification; refer to **TRANSMISSION HOUSING**.
- Remove bolts -arrows- on the left flange shaft mounting bracket.

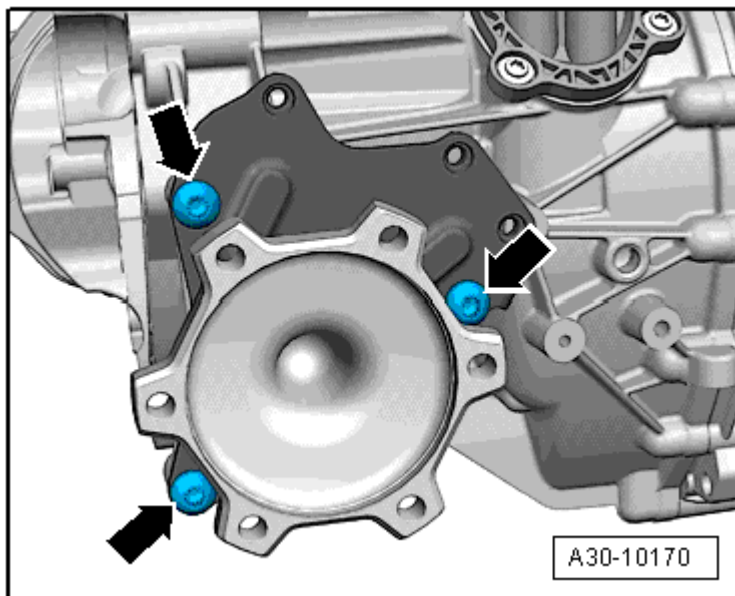


Fig. 3: Locating Left Flange Shaft Mounting Bracket Bolts
Courtesy of AUDI OF AMERICA, LLC

- Remove the flange shaft from the transmission in the direction of -arrow A-.

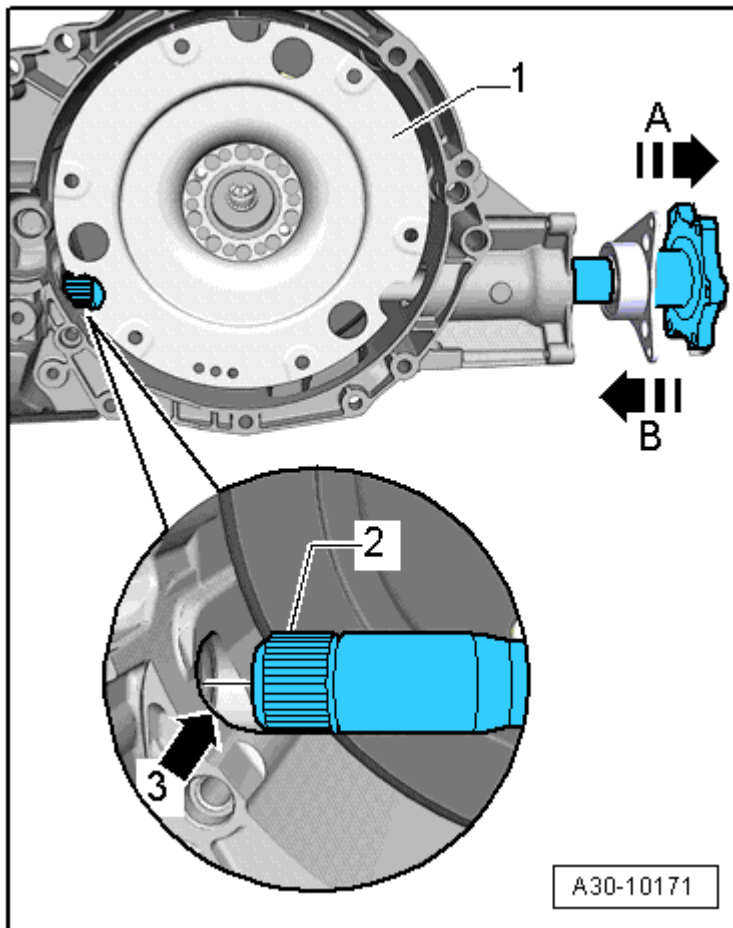


Fig. 4: Removing Flange Shaft

Courtesy of AUDI OF AMERICA, LLC

NOTE: If it is not possible to remove the left flange shaft by hand, then use the slide hammer-complete set VW 771 to remove it.

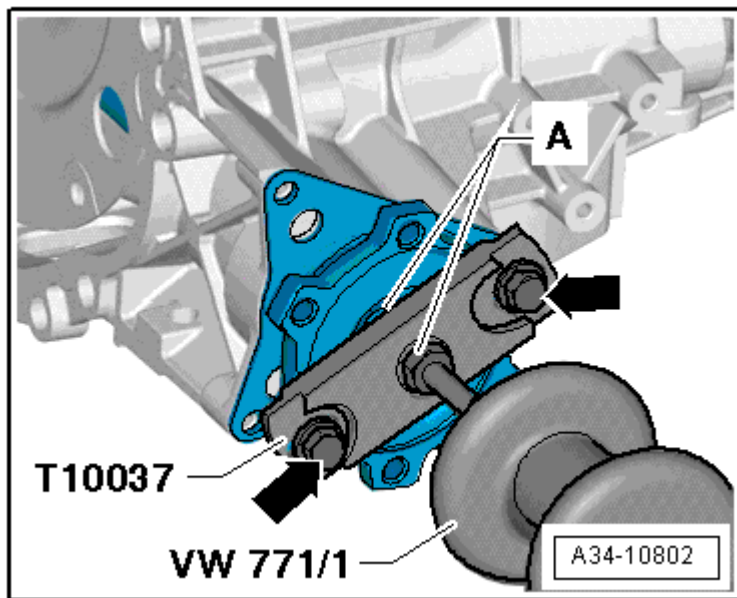


Fig. 5: Identifying T10037 Installed On Flange
Courtesy of AUDI OF AMERICA, LLC

Attach the plate from the puller T10037 to the flange shaft -arrows- and attach the spindle from the VW 771 (nuts -A-).

-- Remove the right flange shaft by installing the puller T10037 to the final drive cover -arrow-.

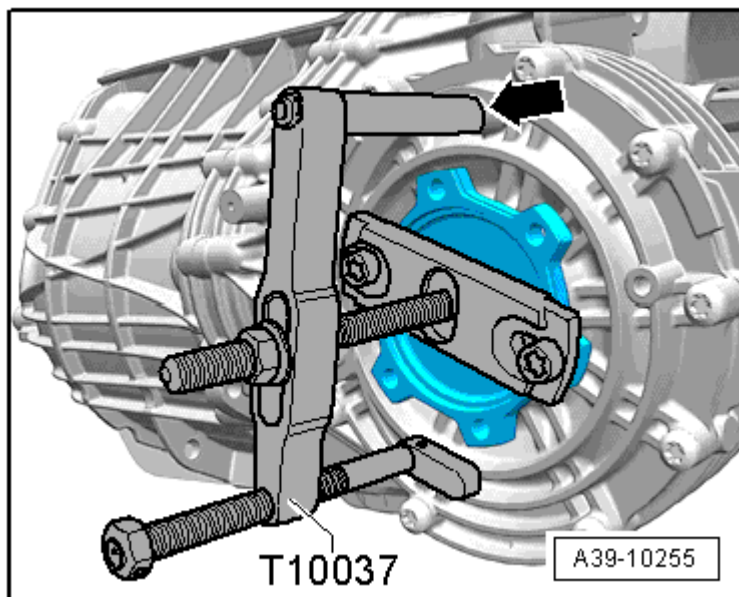


Fig. 6: Removing Right Flange Shaft
Courtesy of AUDI OF AMERICA, LLC

-- Remove the bolts -arrows-.

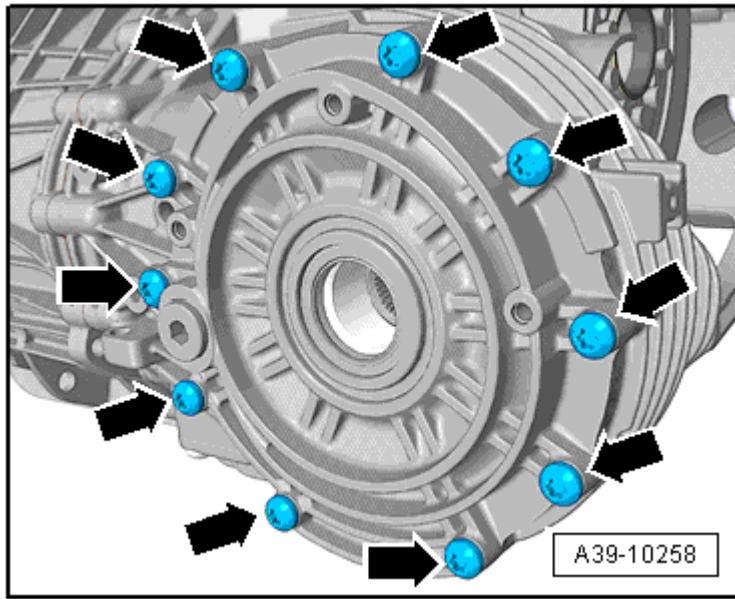


Fig. 7: Locating Final Drive Cover Bolts
Courtesy of AUDI OF AMERICA, LLC

CAUTION: Danger of causing damage to the differential.

- Slowly and carefully remove front final driver cover from transmission housing. Otherwise differential can fall out of transmission.
- A damaged differential may not be installed again. If the differential gets damaged, then the transmission must be replaced.

-- Carefully remove the front final drive cover; when doing this some transmission oil will drain out.

-- Carefully remove the differential -arrow- and lay it on a soft support.

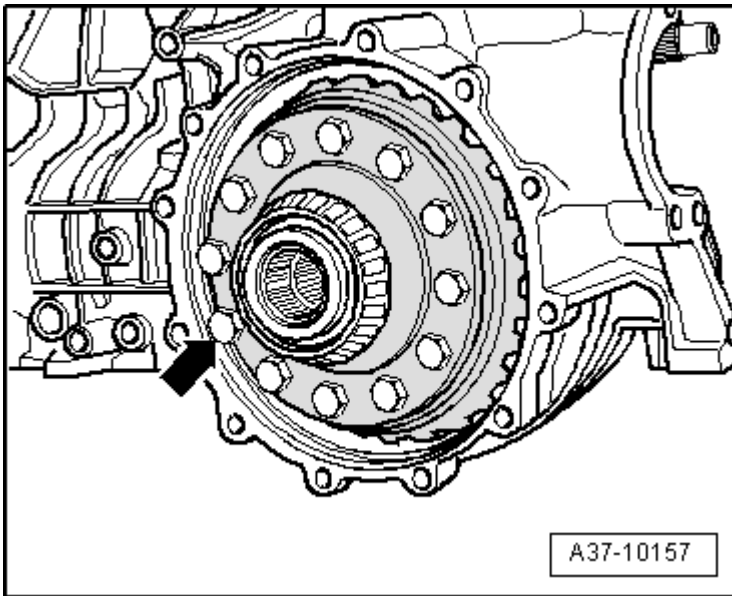


Fig. 8: Removing/Installing Differential
Courtesy of AUDI OF AMERICA, LLC

- Pry out the left flange shaft seal.
- Thoroughly clean the area where the transmission is accessed.

Installing

Installation is performed in the reverse order of removal while observing the following:

- Lightly coat the new seal on the outside with oil and install it using the T40164.

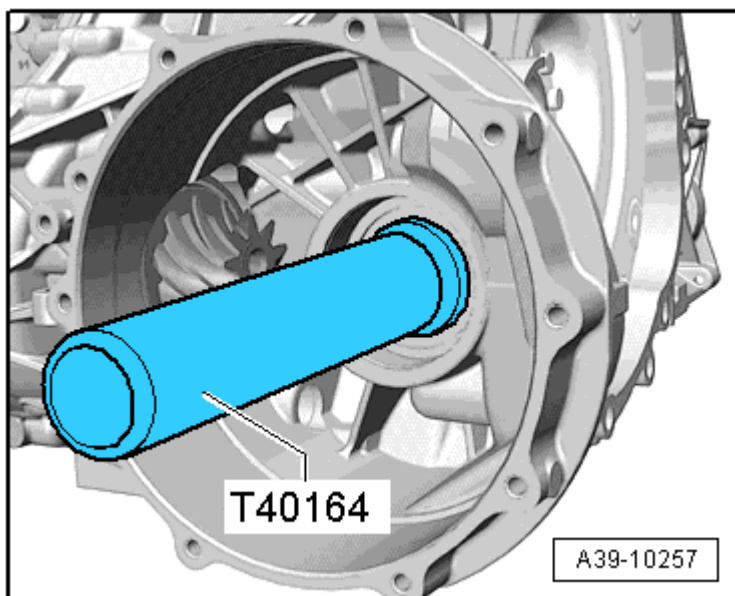


Fig. 9: Installing Differential Seal

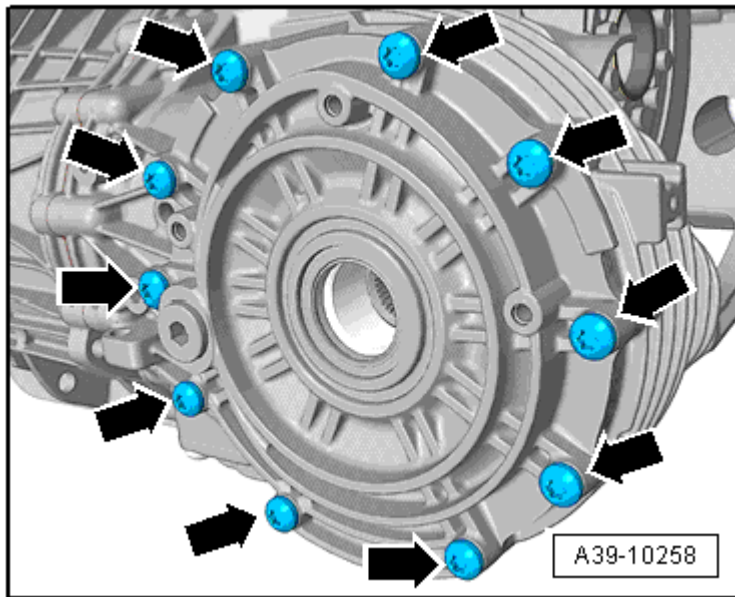
Courtesy of AUDI OF AMERICA, LLC

- The open side of the seal faces the T40164.

-- Install the shaft seal all the way. Be careful not to bend it.

-- Fill the space between the sealing- and dust lip half way with sealing grease G 052 128 A1.

-- Install the differential.

**Fig. 10: Locating Final Drive Cover Bolts**

Courtesy of AUDI OF AMERICA, LLC

-- Install the final drive cover with a new O-ring and tighten the bolts -arrows-. Tightening specification; Refer to item 8 in **Fig. 1**.

-- Always replace the right flange shaft locking ring -A-.

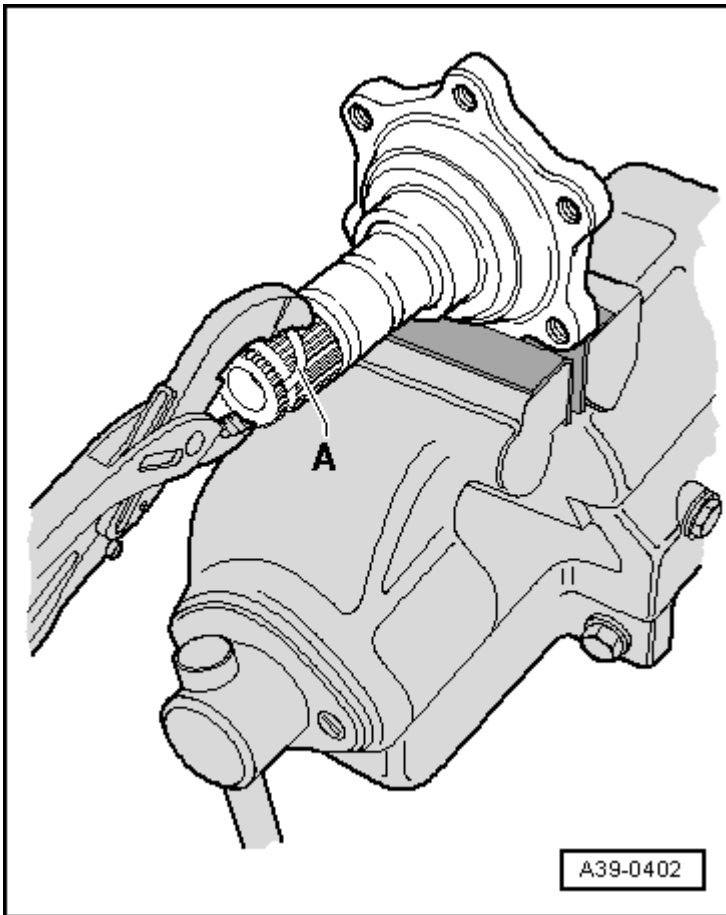


Fig. 11: Replacing Right Flange Shaft Locking Ring
Courtesy of AUDI OF AMERICA, LLC

- Clamp the flange shaft in a vise with jaw protectors. Remove the old circlip from the groove in the flange shaft using the new circlip -A-.
- Drive the right flange shaft in using the VW 295.
- Rotate the clutch module -1- until the opening to the differential -arrow 3- is seen.

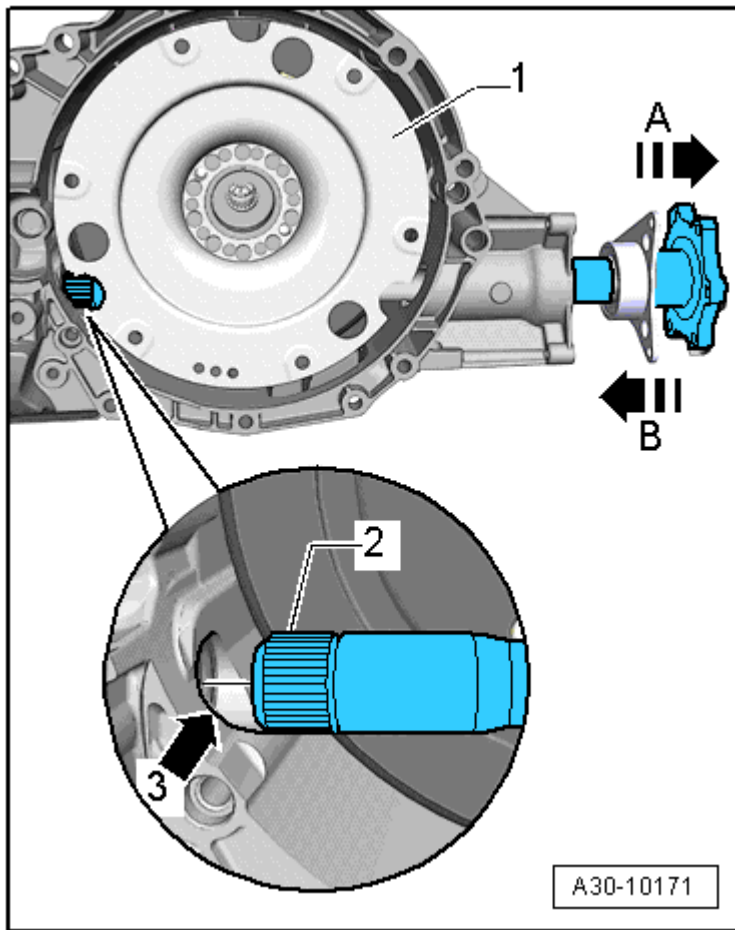


Fig. 12: Removing Flange Shaft

Courtesy of AUDI OF AMERICA, LLC

-- Thoroughly clean the left flange shaft -2-.

-- Install the left flange shaft -2- into the transmission -arrow B-. When doing this, insert the flange shaft centrally into the shaft seal on the front differential -arrow 3-.

CAUTION: Danger of damaging the shaft seal.

- If the shaft is not centered, the shaft splines -2- will damage the shaft seal -arrow 3- between the differential and transmission housing.
- Always replace a damaged shaft seal. Refer to LEFT FLANGE SHAFT SEAL WITH TRANSMISSION REMOVED.

-- Clean bolt threads -arrows- with a wire brush. Then install the bolts with locking compound AMV 185 101 A1 and tighten down the flange shaft mounting bracket; Refer to item 1 in **Fig. 1** to the tightening specification.

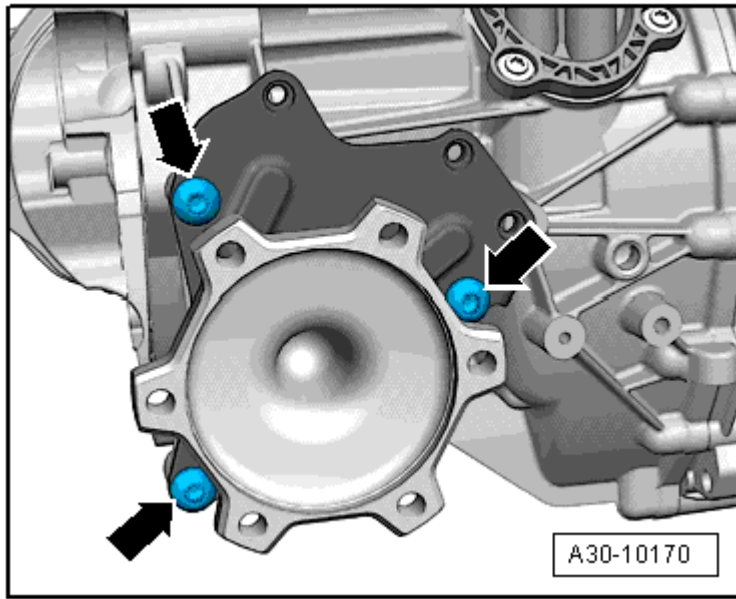


Fig. 13: Locating Left Flange Shaft Mounting Bracket Bolts
Courtesy of AUDI OF AMERICA, LLC

-- Fill with transmission fluid and check transmission fluid level in manual transmission. Refer to **[For engine (s) CCBA] General Information** .

RIGHT FLANGE SHAFT SEAL WITH TRANSMISSION REMOVED

NOTE: It is possible to replace the right flange shaft seal with the transmission still installed. Refer to **[For engine(s) CCBA] Removal and Installation** .

Special tools and workshop equipment required

- Needle Bearing Drift VW 295
- Puller T10037
- Thrust Piece T40163
- Sealing grease G 052 128 A1

Removing

-- Remove right flange shaft by fastening the T10037 to transmission housing -arrow-.

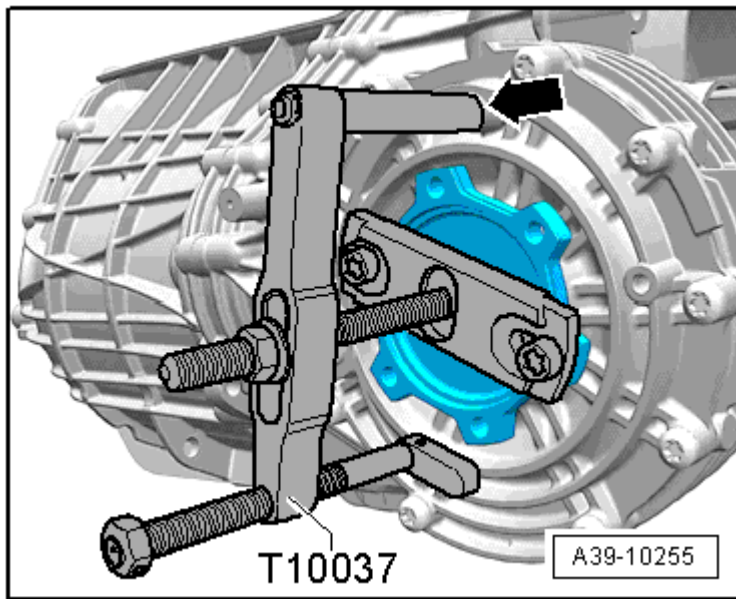


Fig. 14: Removing Right Flange Shaft
Courtesy of AUDI OF AMERICA, LLC

-- Pry out flange shaft seal using a lever.

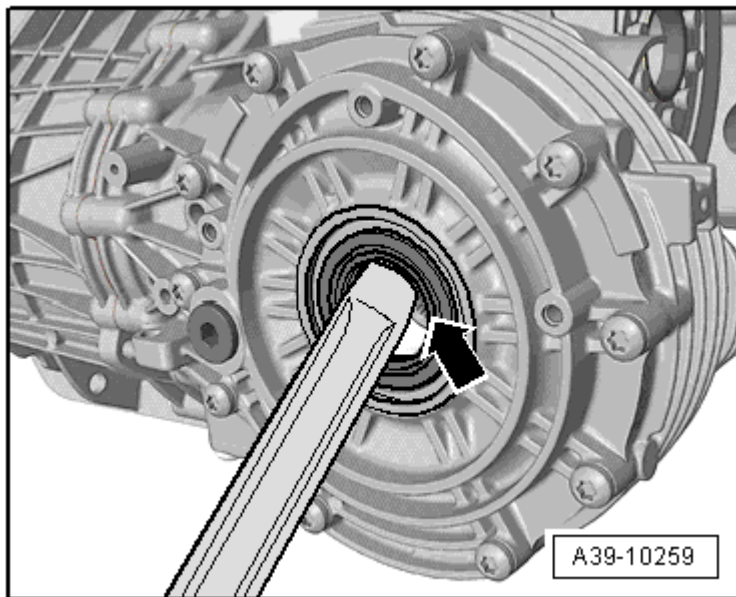


Fig. 15: Prying Out Flange Shaft Sealing Ring
Courtesy of AUDI OF AMERICA, LLC

Installing

Installation is performed in the reverse order of removal while observing the following:

-- Always replace the flange shaft locking ring -A-.

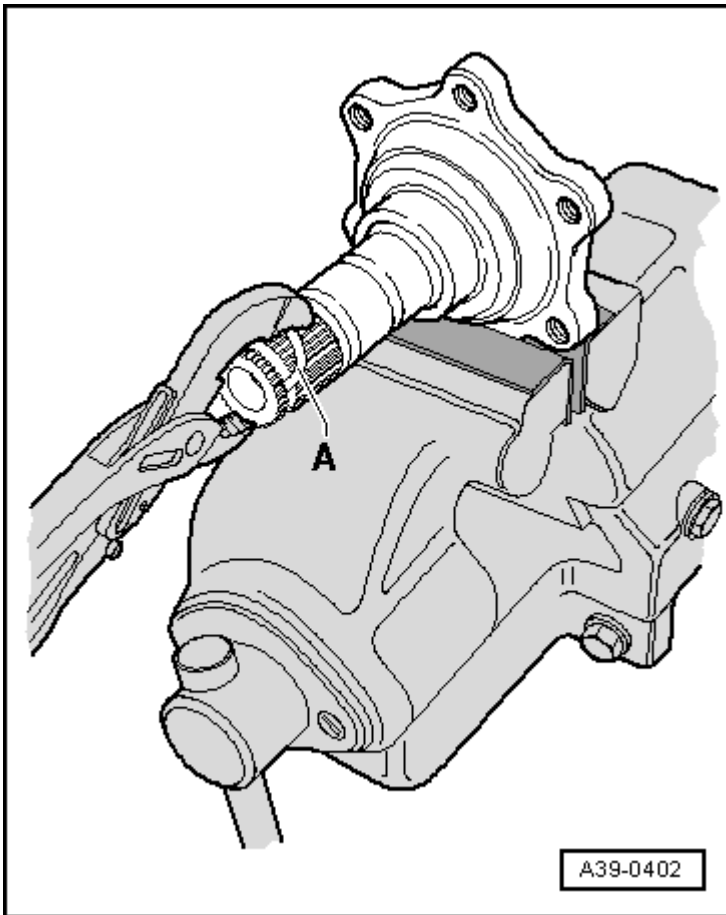


Fig. 16: Replacing Right Flange Shaft Locking Ring
Courtesy of AUDI OF AMERICA, LLC

- Clamp the flange shaft in a vise with jaw protectors. Use the new circlip -A- to press the previous circlip out of the flange shaft groove.
- Lightly coat the outer circumference of the new shaft seal with oil.

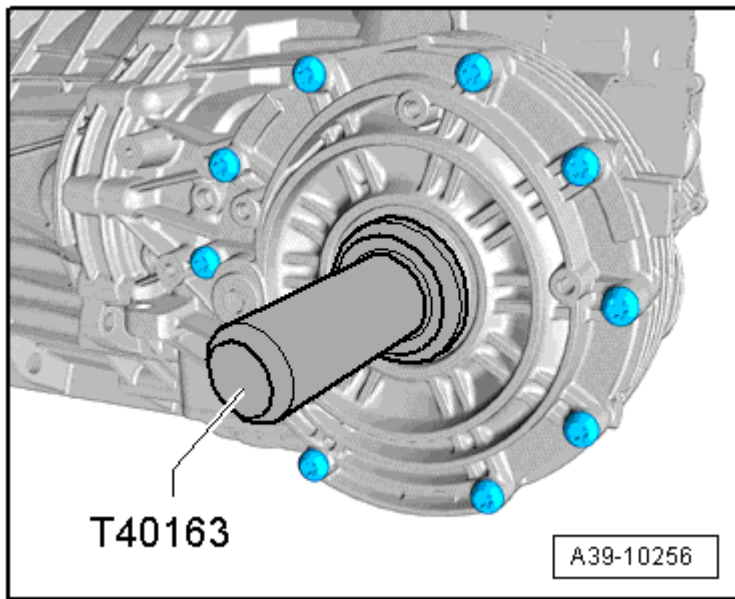


Fig. 17: Installing Shaft Seal

Courtesy of AUDI OF AMERICA, LLC

- Install the new right flange shaft seal all the way without tilting it.
- Fill the space between the sealing and dust lip half way with sealing grease G 052 128 A1.
- Drive the flange shaft in using a VW 295.
- Fill with transmission fluid and check transmission fluid level in manual transmission. Refer to **[For engine (s) CCBA] Description and Operation** .

INPUT SHAFT SEAL, A5 COUPE FROM MY 2008, THROUGH TRANSMISSION SERIES NUMBER 000760, REPLACING

NOTE: **Transmission with these transmissions series numbers were installed only in the Audi A5 Coupe from MY 2008.**

Special tools and workshop equipment required

- Pulling Hook T20143/1
- Assembly Tool T10122
- Press Tool for Shaft Seal T10184
- Sealing grease G 052 128 A1
- Transmission is removed, refer to **[For engine(s) CCBA] Removal and Installation** .

- Remove the clutch module. Refer to **CLUTCH MODULE** .

-- Pry out the input shaft seal.

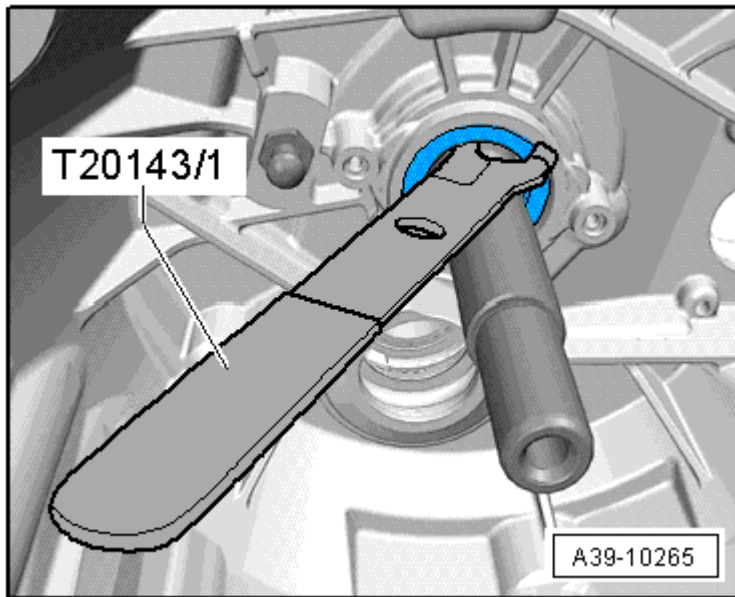


Fig. 18: Removing Input Shaft Seal

Courtesy of AUDI OF AMERICA, LLC

-- Lightly coat the outer circumference of the new shaft seal with oil.

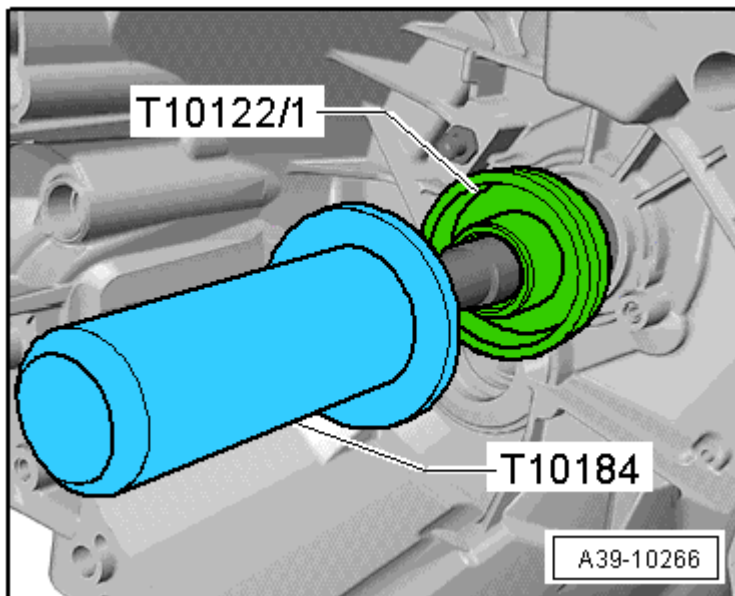


Fig. 19: Installing Input Shaft Seal

Courtesy of AUDI OF AMERICA, LLC

-- Fill the space between the sealing and dust lip half way with sealing grease G 052 128 A1.

-- Drive the new seal in until it is flush without tilting it.

-- Install the clutch module **CLUTCH MODULE => Installing** .

INPUT SHAFT SEAL, A4 AND A5, FROM MY 2008, TRANSMISSION SERIES NUMBER 000761

Special tools and workshop equipment required

- Pulling Hook T20143/1
- Thrust Piece T40174
- Sealing grease G 052 128 A1
- Transmission is removed, refer to **[For engine(s) CCBA] Removal and Installation** .

-- Remove the clutch module. Refer to **CLUTCH MODULE** .

-- Pry out the input shaft seal.

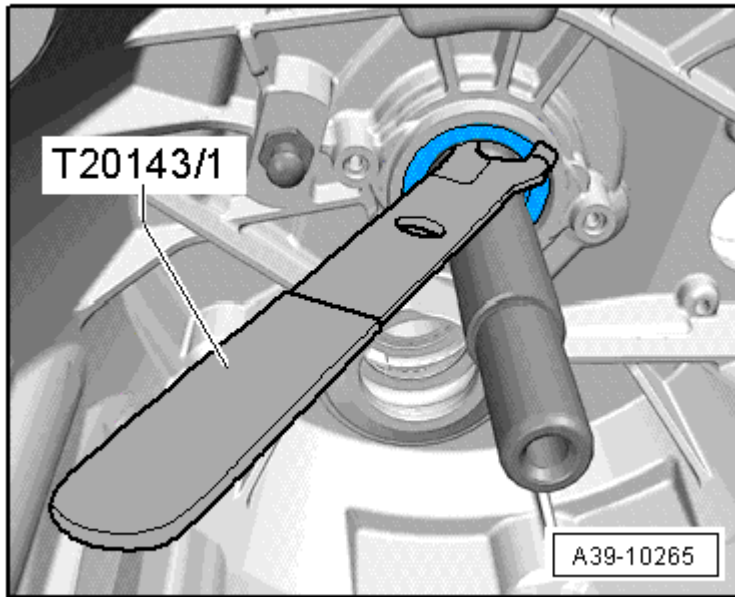


Fig. 20: Removing Input Shaft Seal
Courtesy of AUDI OF AMERICA, LLC

-- Lightly coat the outer circumference of the new shaft seal with oil.

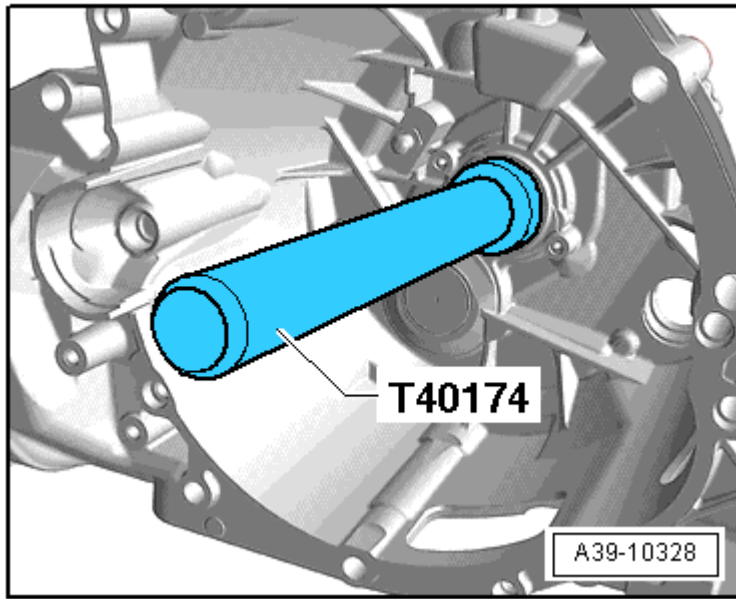


Fig. 21: Installing Shaft Seal

Courtesy of AUDI OF AMERICA, LLC

- Fill the space between the sealing and dust lip half way with sealing grease G 052 128 A1.
- Install the shaft seal all the way. Be careful not to bend it.
- Install the clutch module **CLUTCH MODULE => Installing** .

LEFT FLANGE SHAFT BALL BEARING MOUNTING BRACKET

Special tools and workshop equipment required

- Thrust Plate VW 401
- Thrust Plate VW 402
- Thrust Disc VW 412
- Tube 42 mm Dia.VW 516

-- Remove the left flange shaft. Refer to **LEFT FLANGE SHAFT SEAL WITH TRANSMISSION REMOVED**.

-- Remove the locking ring -1- from the flange shaft.

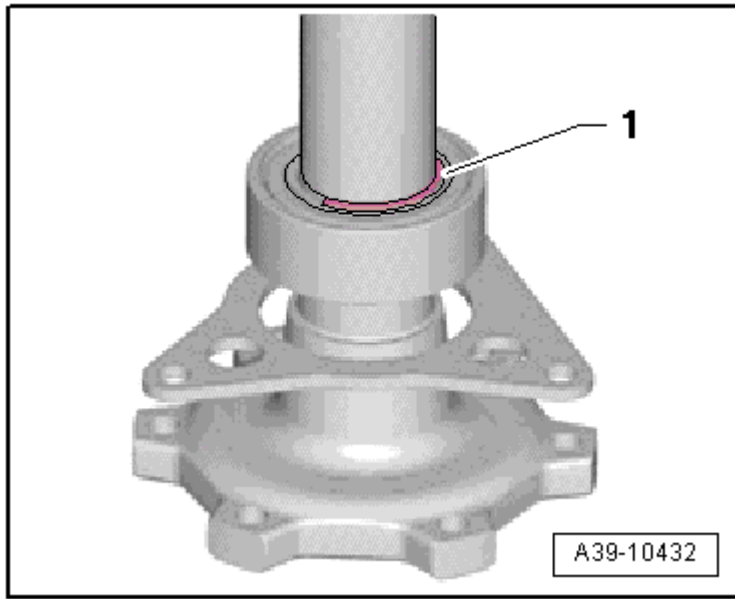


Fig. 22: Removing Left Flange Shaft

Courtesy of AUDI OF AMERICA, LLC

-- Remove the ball bearing -A- from the flange shaft.

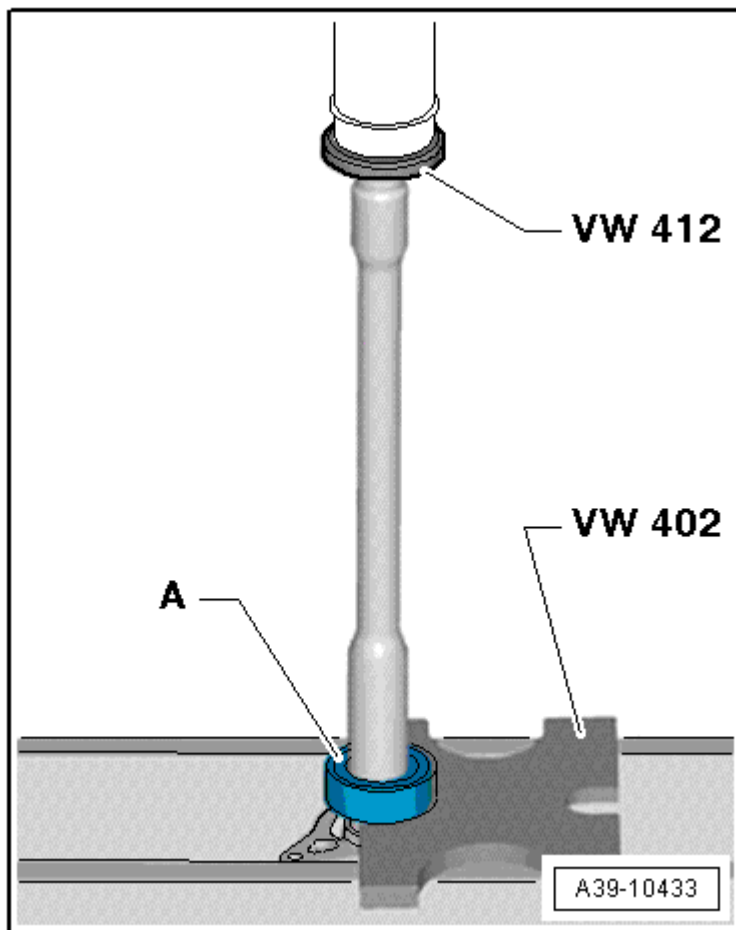


Fig. 23: Removing Locking Ring, Remove Ball Bearing
Courtesy of AUDI OF AMERICA, LLC

-- Install the ball bearing -A- on the flange shaft all the way.

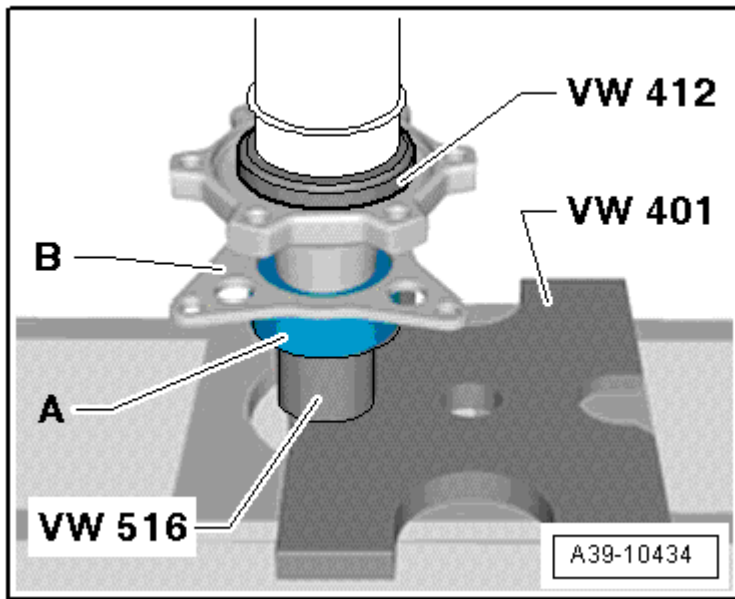


Fig. 24: Installing Ball Bearing

Courtesy of AUDI OF AMERICA, LLC

- Place the bracket -B- on the ball bearing beforehand.
- Installed position for bearing bracket: Lettering on the bearing bracket faces the flange.

-- Install the circlip -1- in the flange shaft groove.

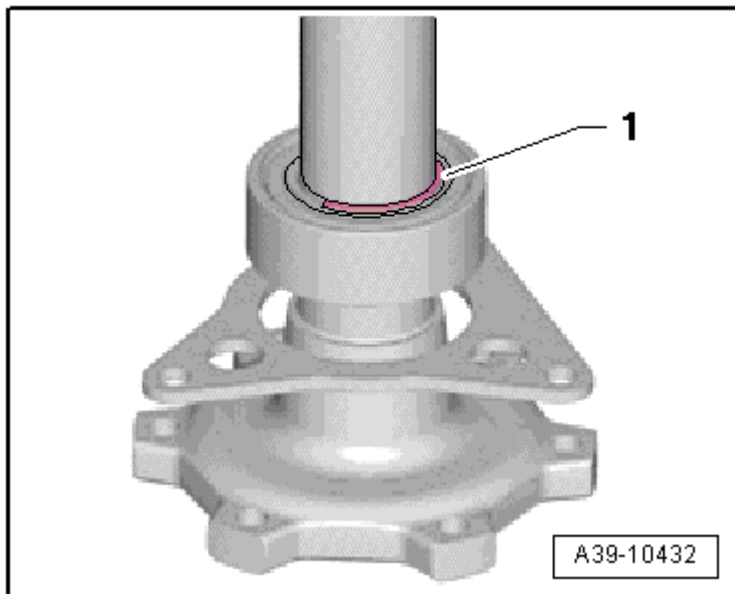


Fig. 25: Removing Left Flange Shaft

Courtesy of AUDI OF AMERICA, LLC

FINAL DRIVE COVER

- The adjusting shim used for the differential tapered roller bearing pre-load must be determined again when replacing the final drive cover.

NOTE: This adjusting shim is located behind the outer race / tapered roller bearing inside the final drive cover.

Special tools and workshop equipment required

- Crankshaft Seal Installing Tool VW 204 B
- Needle Bearing Drift VW 295
- End Gauge VW 385/33
- Centering Disk VW 385/41
- Dial Gauge Holder VW 387
- Thrust Plate VW 402
- Thrust Disc VW 412
- Grease Cap Puller VW 637/2
- Press Tool 3345
- Puller T10037
- Ruler T40100

- Turn the transmission so that final drive cover faces upward. Drain the transmission fluid if necessary.
- Remove the right flange shaft by installing the T10037 to the final drive cover -arrow-.

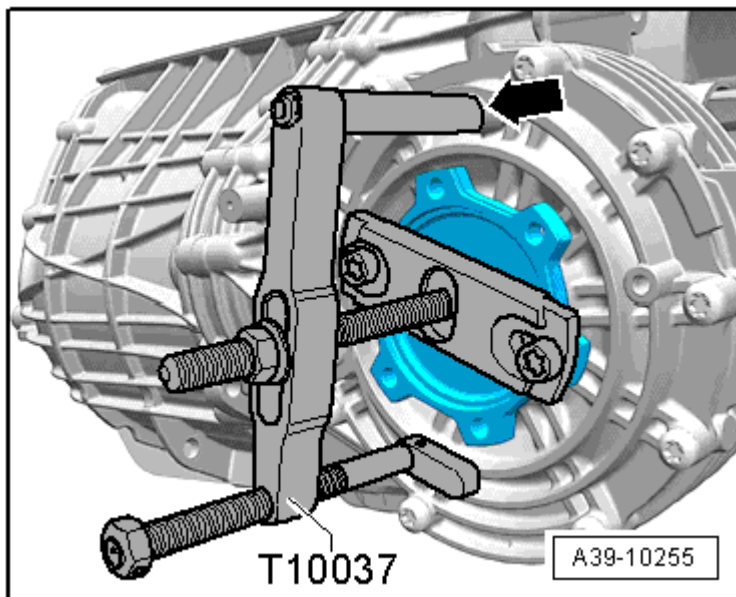


Fig. 26: Removing Right Flange Shaft
Courtesy of AUDI OF AMERICA, LLC

-- Remove the bolts -arrows-.

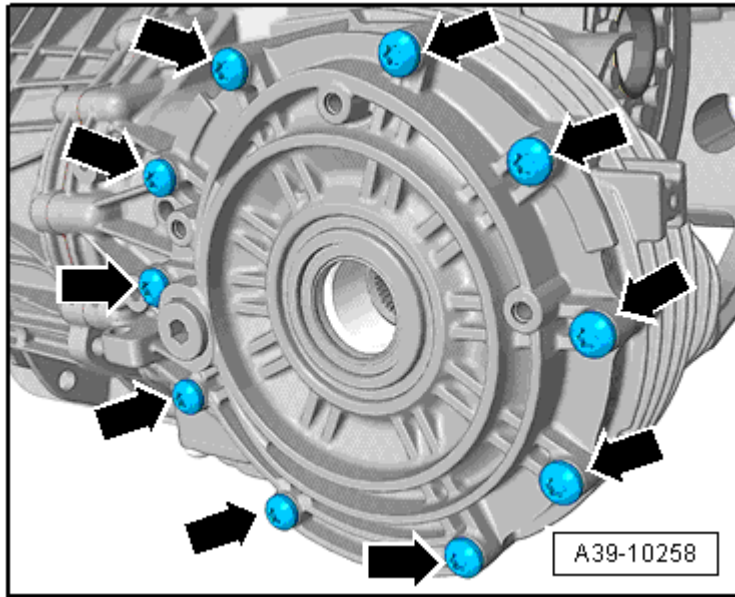


Fig. 27: Locating Final Drive Cover Bolts

Courtesy of AUDI OF AMERICA, LLC

CAUTION: Danger of causing damage to the differential.

- **Slowly and carefully remove front final driver cover from transmission housing. Otherwise differential can fall out of transmission.**
- **A damaged differential may not be installed again. If the differential gets damaged, then the transmission must be replaced.**

-- Remove the final drive cover.

-- Mount the VW 637/2 alternating from side to side and pressing in direction of -arrow- and then carefully pry out the outer race / tapered roller bearing from the old final drive cover.

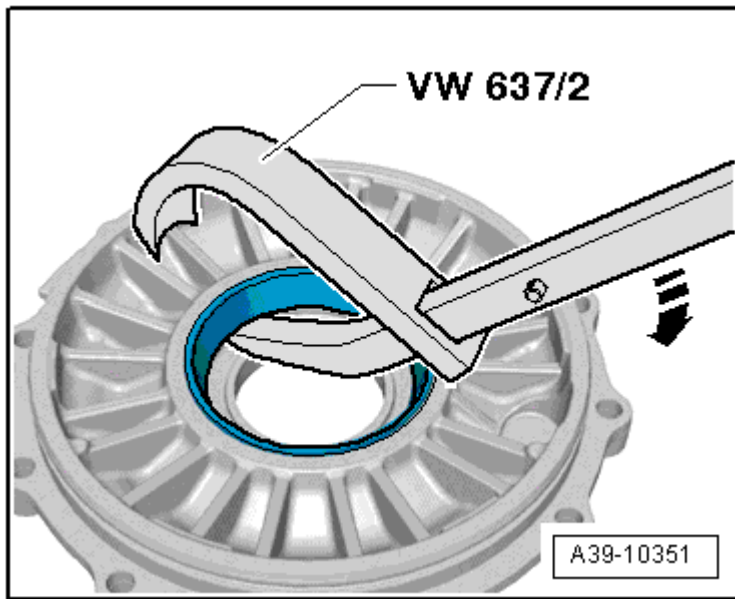


Fig. 28: Prying Outer Race Tapered Bearing
Courtesy of AUDI OF AMERICA, LLC

NOTE: If it is not possible to remove the outer race / tapered roller bearing using the VW 637/2, then remove the outer race using the internal puller Kukko 21/89 -B- and the counterholder Kukko 22/4 -A-.

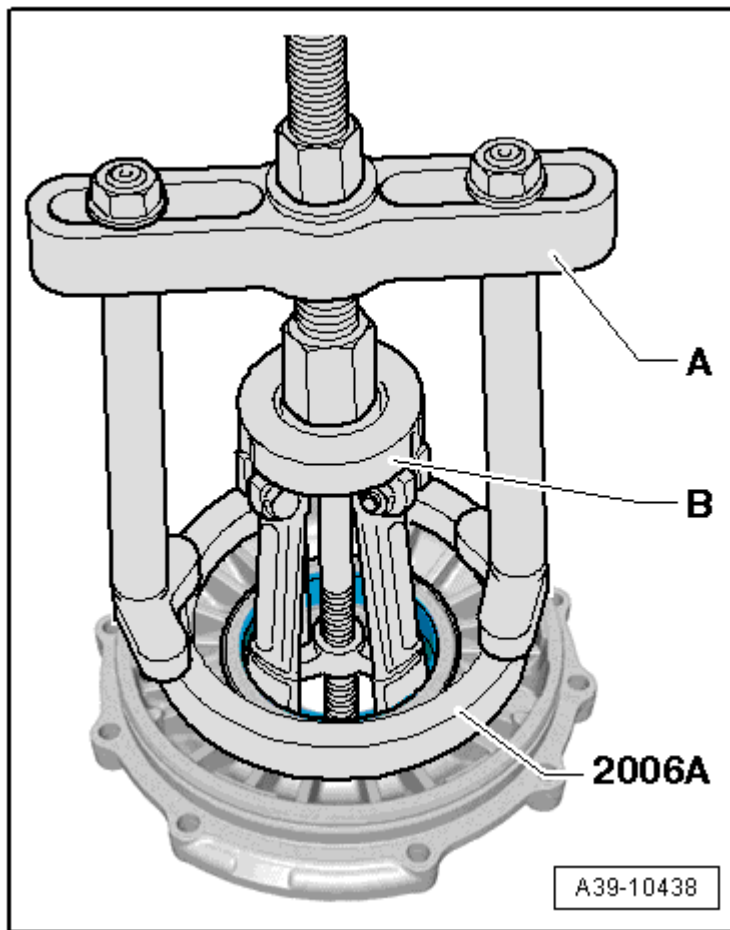


Fig. 29: Removing Outer Race Tapered Bearing
Courtesy of AUDI OF AMERICA, LLC

A - Counter-support, for example, Kukko 22/4

B - Internal puller 56 to 110 mm, for example, Kukko 21/89

-- Remove the old adjusting shim.

Determining Shim Thickness

-- Measure the dimension -a- on the old and new covers as follows:

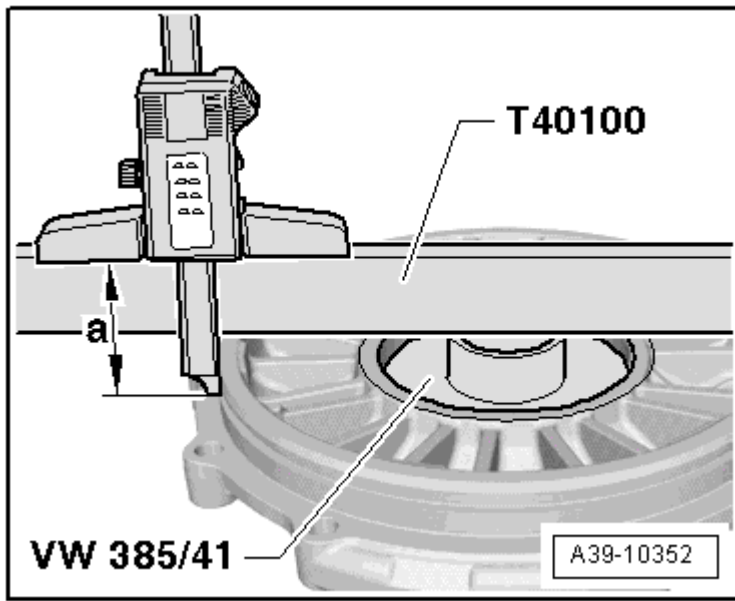


Fig. 30: Determining Shim Thickness
 Courtesy of AUDI OF AMERICA, LLC

- Install the centering disk VW 385/41 in the bearing seat for the outer race / tapered roller bearing.
- Measure the bolting surface with the digital depth gauge (for example, digital depth gauge VAS 6087).

Example:

Dimension -a- for the old final drive cover	58.40 mm
Dimension -a- for the new final drive cover	58.65 mm
Difference	= 0.25 mm

- Install a thicker adjusting shim if the dimension -a- on the new cover is smaller.
- Install a thinner adjusting shim if the dimension -a- on the new cover is larger.

Example:

Old shim	1.50 mm
Difference	- 0.25 mm
New shim	= 1.25 mm

NOTE:

- In this example, the adjusting shim thickness is 1.25 mm.
- Install the new adjusting shim in the new final drive cover.

-- Install the outer race/tapered roller bearing all the way. The smaller diameter of the VW 204 B faces the outer race/tapered roller bearing.

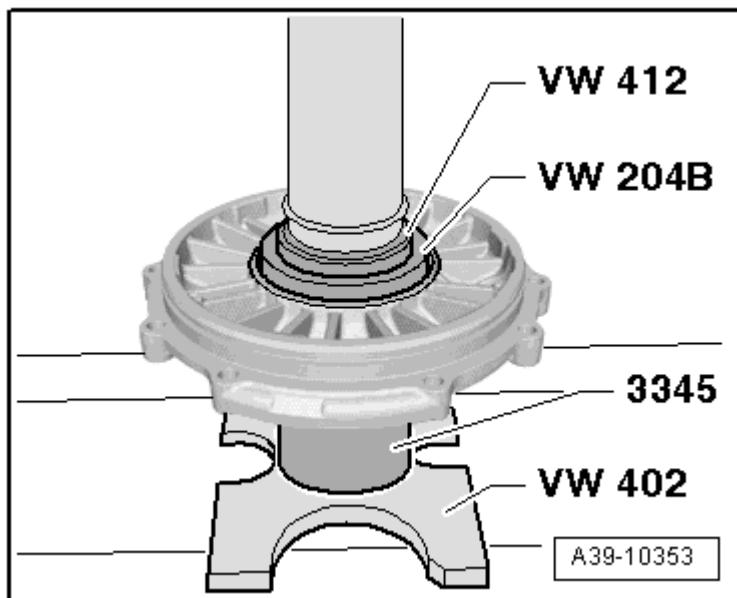


Fig. 31: Installing Outer Race Tapered Bearing
Courtesy of AUDI OF AMERICA, LLC

NOTE: Support the final drive cover using the 3345 directly under the bearing mount.

Check the bearing pre-load measure for the tapered roller bearing / differential as follows:

-- Install the final drive cover without an O-ring and tighten the 4 bolts -arrows-.

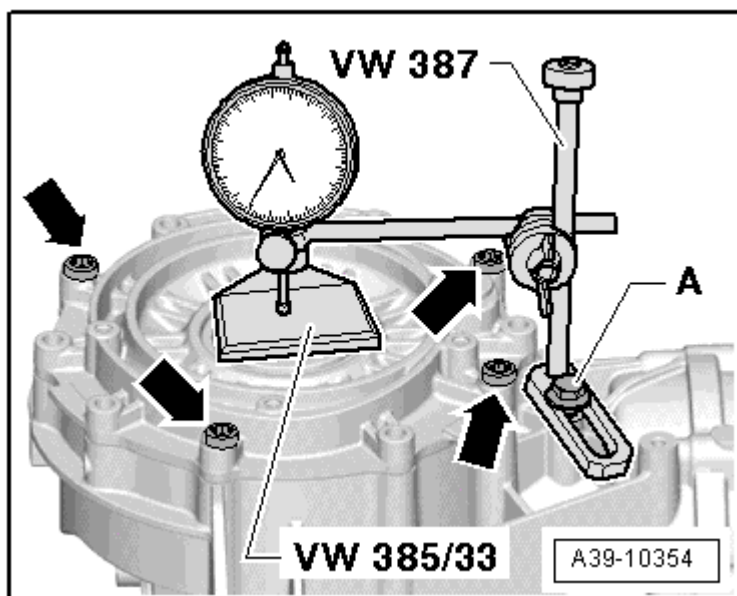
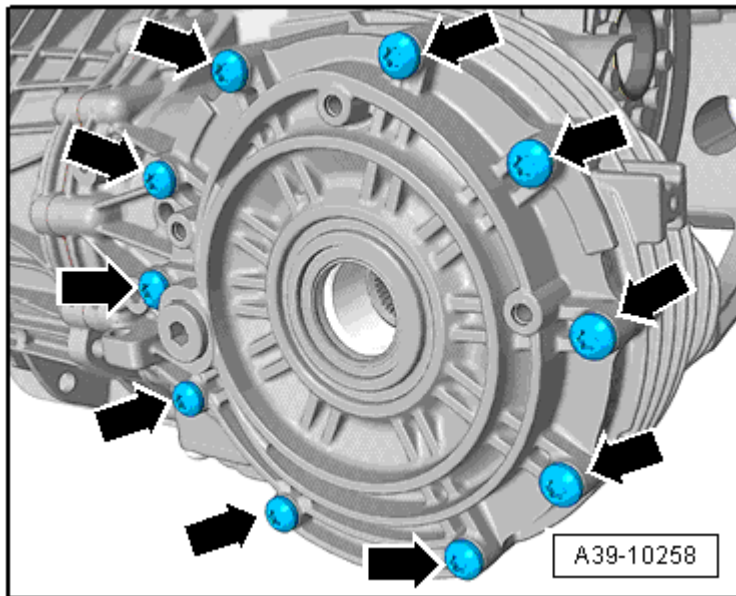


Fig. 32: Checking Tapered Roller Bearing Pre-Load

Courtesy of AUDI OF AMERICA, LLC

- Install the measuring tools.
- Attach the VW 387 in the threaded hole in the transmission housing with the bolt -A-.
- Position the dial gauge extension in the center of the end gauge VW 385/33.
- Set the dial gauge (3 mm measuring range) with 1 mm pre-load to 0.
- Loosen the 4 bolts -arrows- diagonally one turn.
- Read the measured value on the gauge.
 - It must be 0.10 to 0.15
- Install the final drive cover with a new O-ring and tighten the bolts -arrows-. Tightening specification; refer to item 8 in **Fig. 1**.

**Fig. 33: Locating Final Drive Cover Bolts**

Courtesy of AUDI OF AMERICA, LLC

- Lightly coat the outer circumference of the new shaft seal with oil.

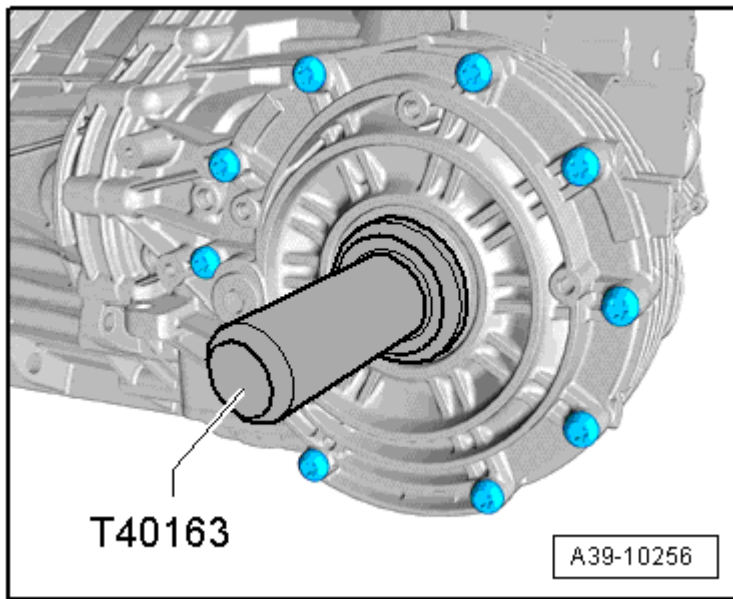


Fig. 34: Installing Shaft Seal

Courtesy of AUDI OF AMERICA, LLC

- Install the new right flange shaft seal all the way without tilting it.
- Fill the space between the sealing and dust lip half way with sealing grease G 052 128 A1.
- Always replace the right flange shaft locking ring -A-.

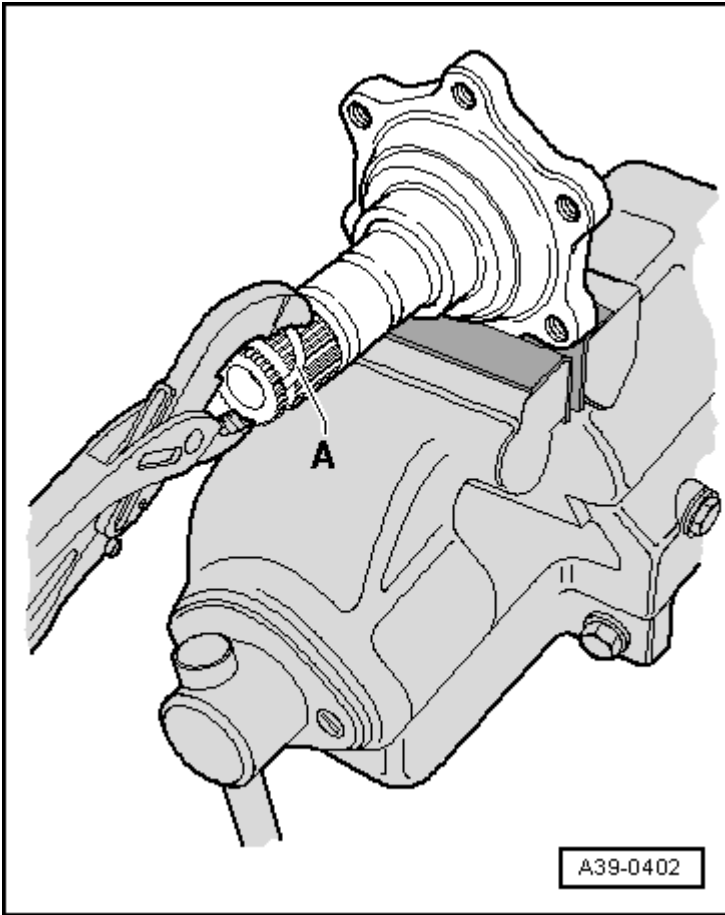


Fig. 35: Replacing Right Flange Shaft Locking Ring
Courtesy of AUDI OF AMERICA, LLC

-- Clamp the flange shaft in a vise with jaw protectors. Remove the old circlip from the groove in the flange shaft using the new circlip -A-.

-- Drive the right flange shaft in using the VW 295.

-- Fill the transmission fluid in the manual transmission if it was drained earlier and then check the fluid level. Refer to **[For engine(s) CCBA] General Information** .

SPECIAL TOOLS

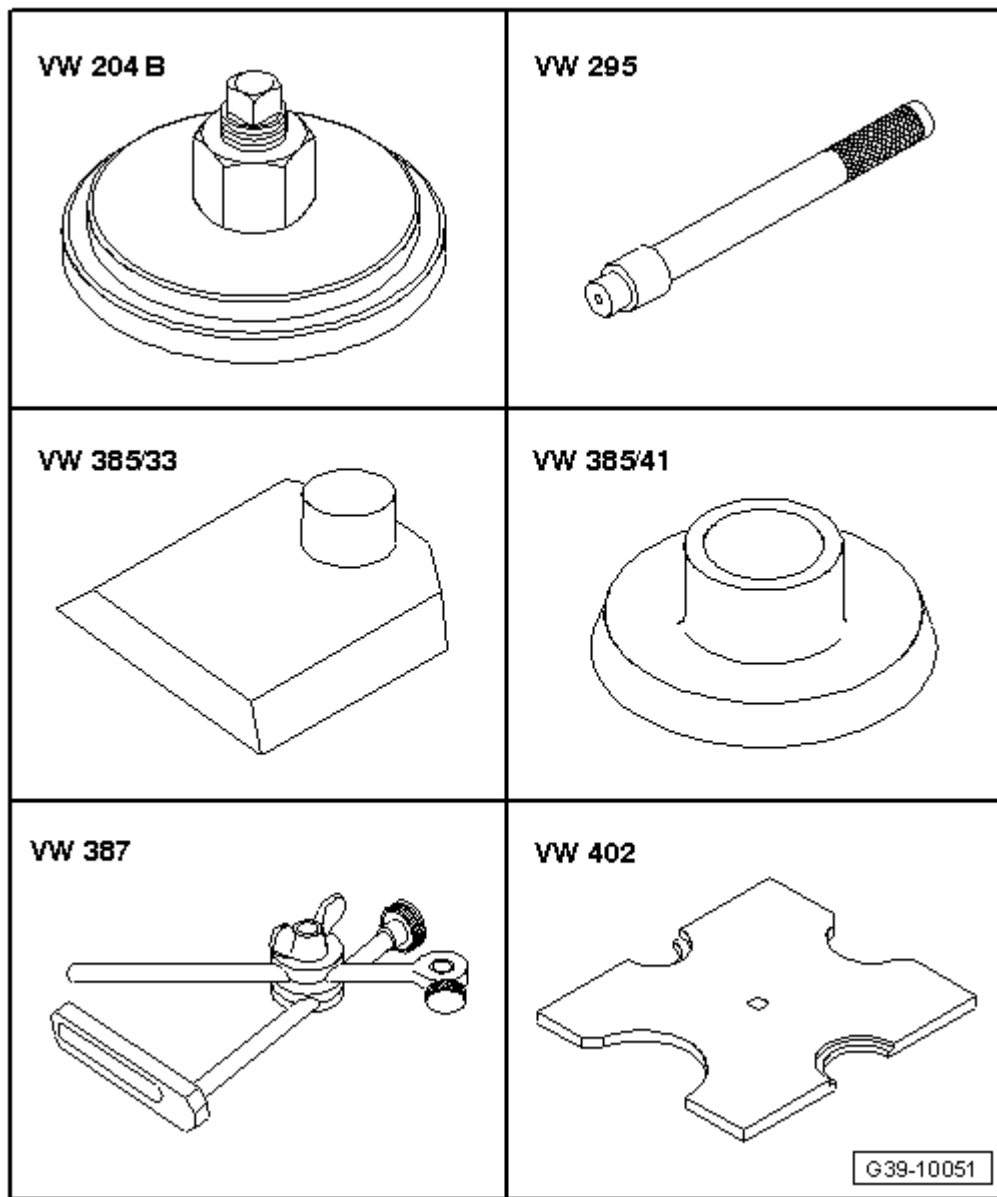


Fig. 36: Special Tools And Workshop Equipment (1 Of 2)

Courtesy of AUDI OF AMERICA, LLC

Special tools and workshop equipment required

- Crankshaft Seal Installing Tool VW 204 B
- Needle Bearing Drift VW 295
- End Gauge VW 385/33
- Centering Disk VW 385/41
- Dial Gauge Holder VW 387
- Thrust Plate VW 402

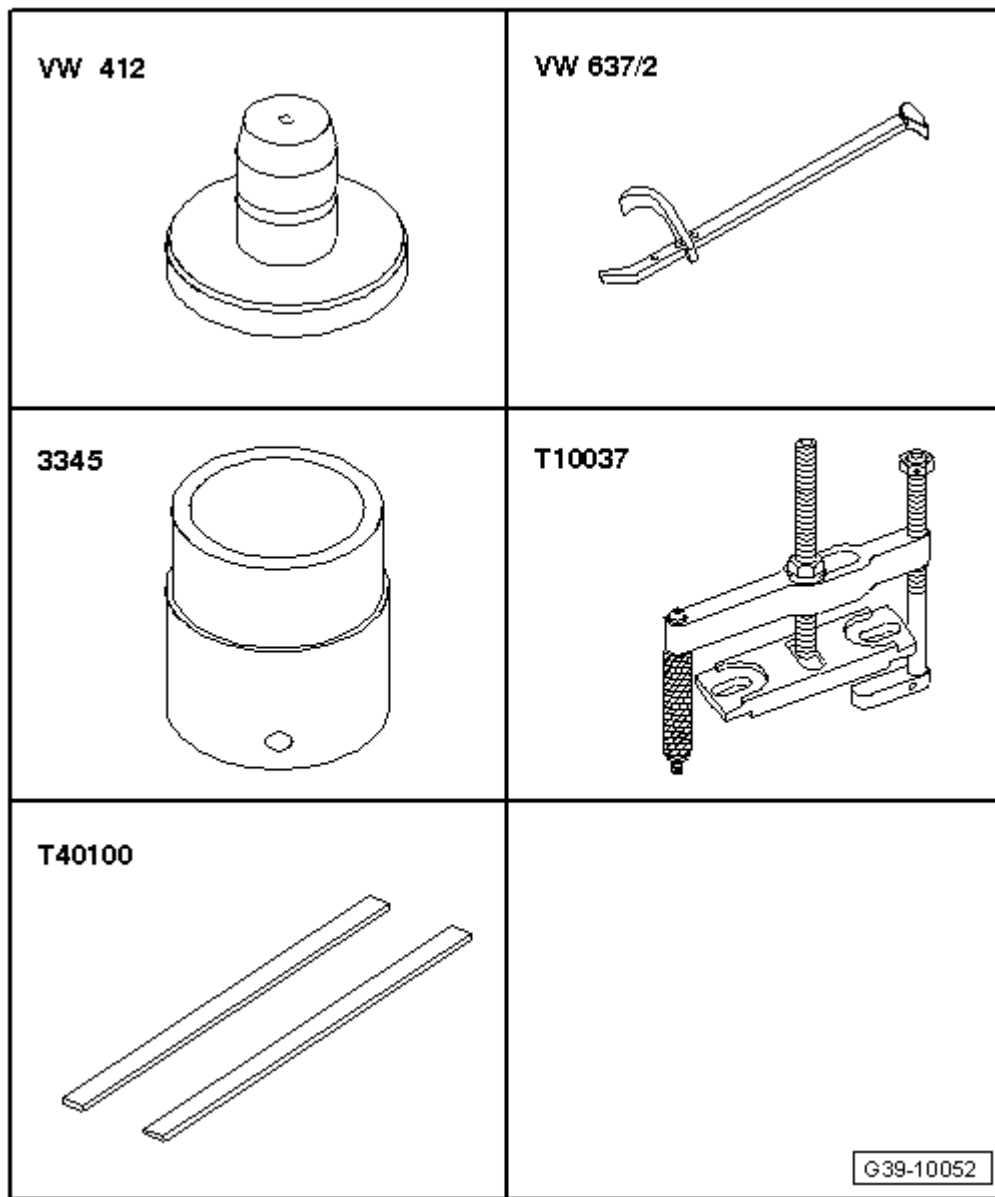


Fig. 37: Special Tools And Workshop Equipment (2 Of 2)

Courtesy of AUDI OF AMERICA, LLC

Special tools and workshop equipment required

- Thrust Disc VW 412
- Grease Cap Puller VW 637/2
- Press Tool 3345
- Puller T10037
- Ruler T40100

Special tools and workshop equipment required

- Thrust Piece T40163

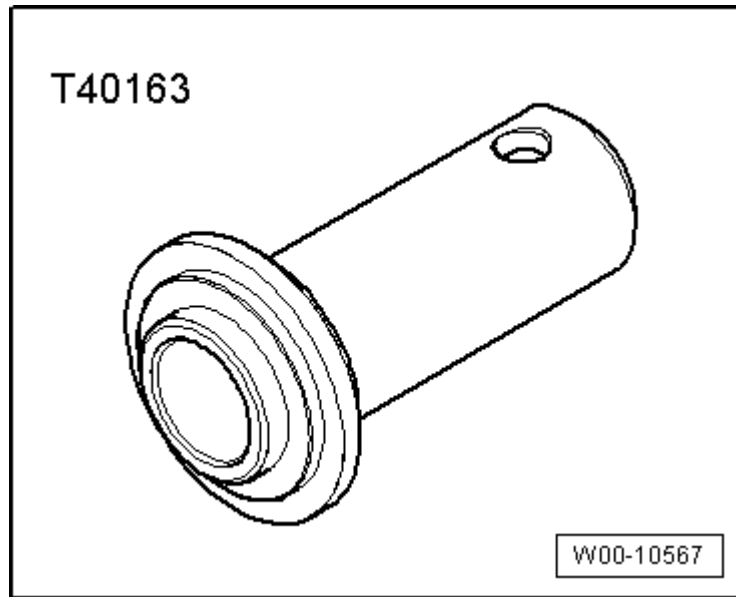


Fig. 38: Thrust Piece T40163
Courtesy of AUDI OF AMERICA, LLC

- Thrust Piece for Final Drive at Gearbox T40164

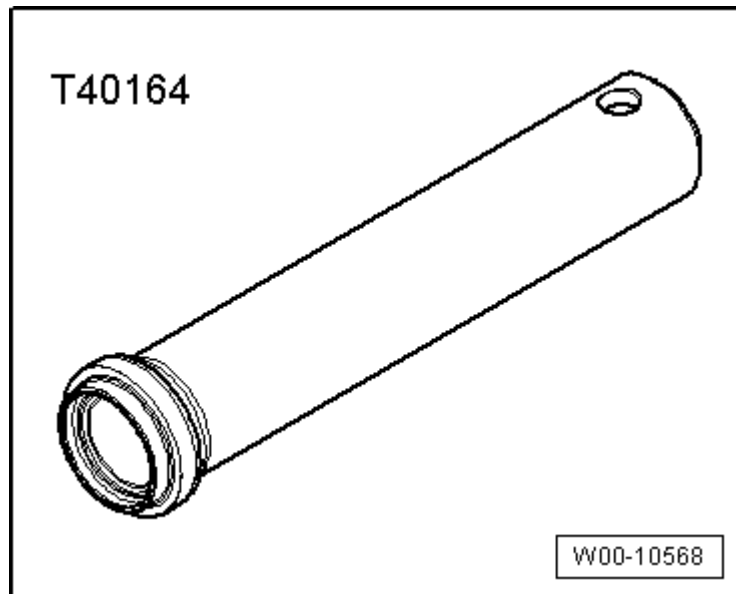


Fig. 39: Thrust Piece for Final Drive at Gearbox T40164
Courtesy of AUDI OF AMERICA, LLC

- Thrust Piece T40174

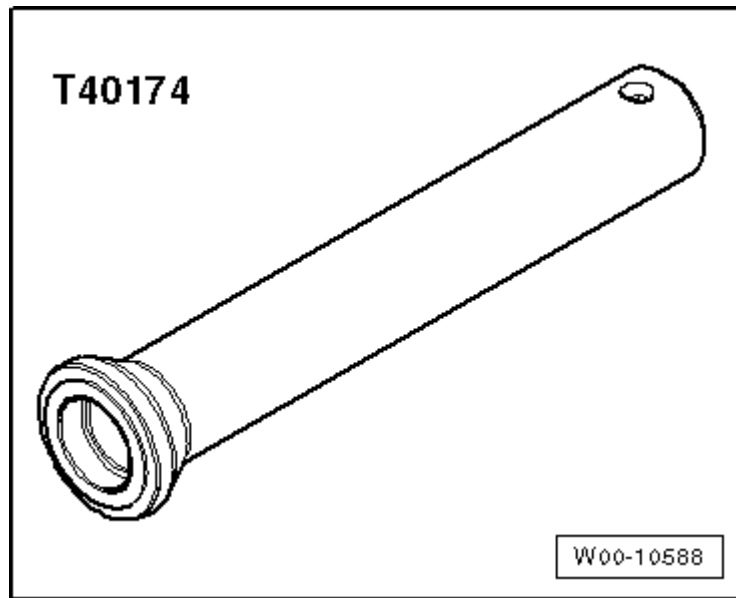


Fig. 40: Thrust Piece T40174
Courtesy of AUDI OF AMERICA, LLC

- Press Tool for Shaft Seal T10184

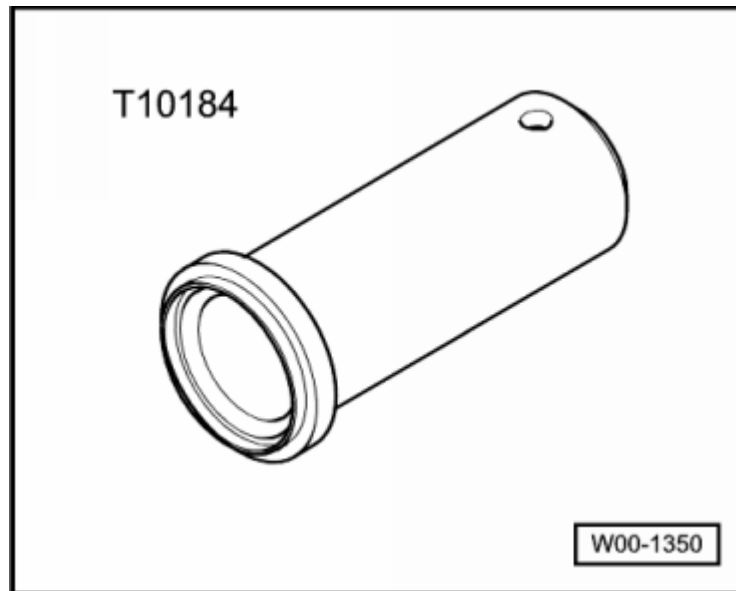


Fig. 41: Press Tool for Shaft Seal T10184
Courtesy of AUDI OF AMERICA, LLC

- Pulling Hook T20143/1

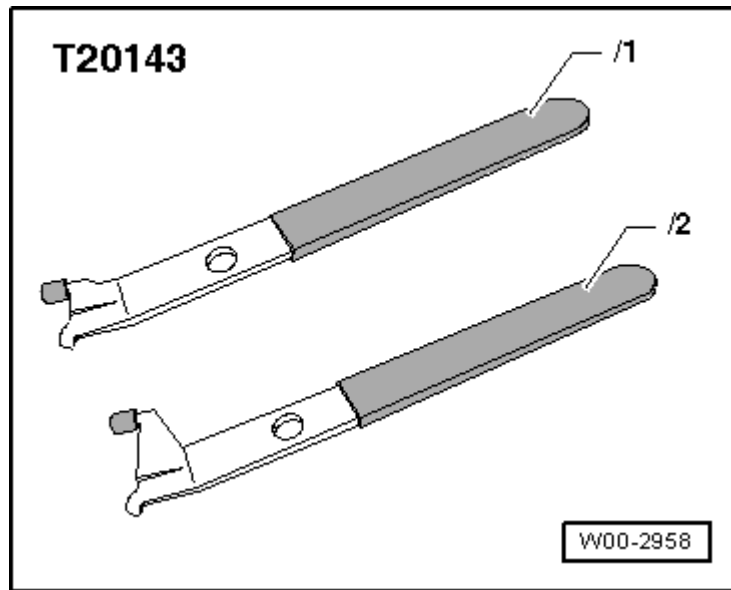


Fig. 42: Pulling Hook T20143/1
Courtesy of AUDI OF AMERICA, LLC

- Assembly Tool T10122

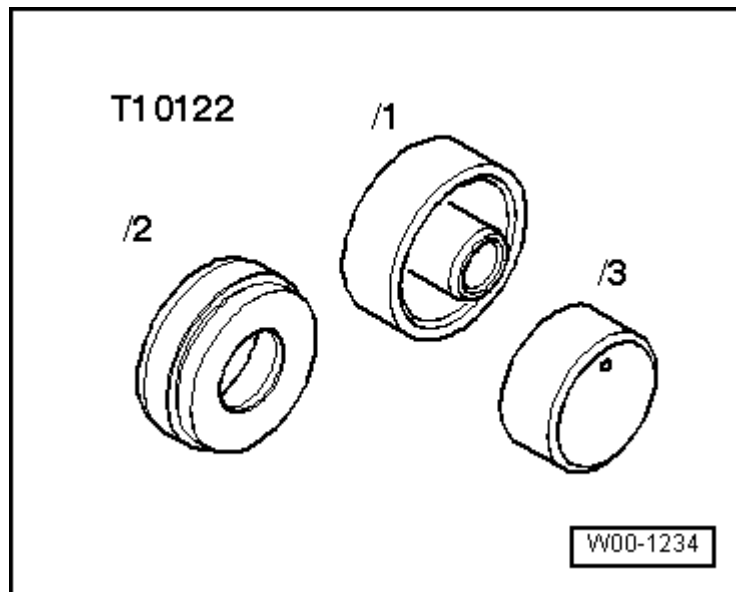


Fig. 43: Assembly Tool T10122
Courtesy of AUDI OF AMERICA, LLC

- Drip Tray VAS 6208

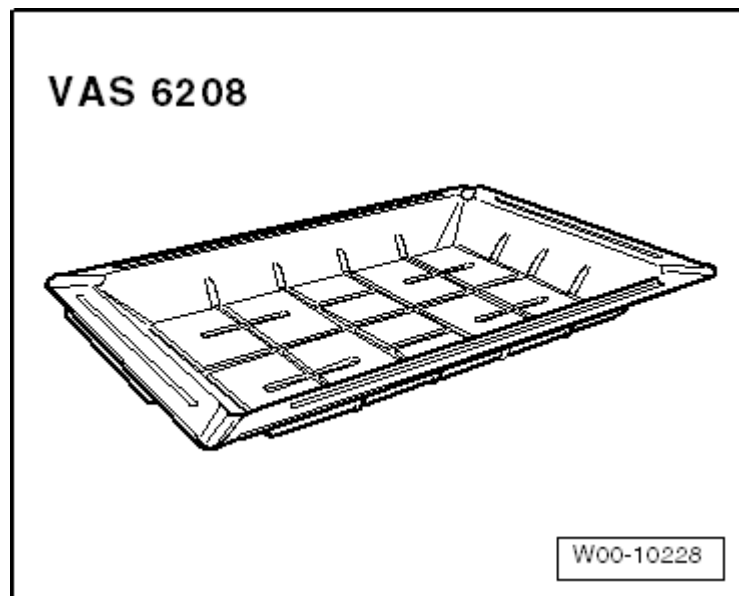


Fig. 44: Drip Tray For Shop Crane VAS 6208
Courtesy of AUDI OF AMERICA, LLC

- Thrust Plate VW 401

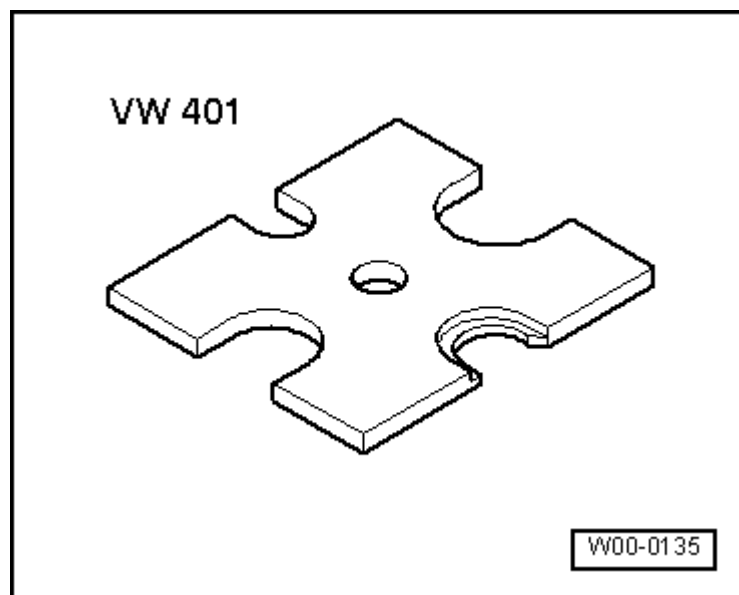


Fig. 45: Thrust Plate VW 401
Courtesy of AUDI OF AMERICA, LLC

- Tube 42 mm Dia.VW 516

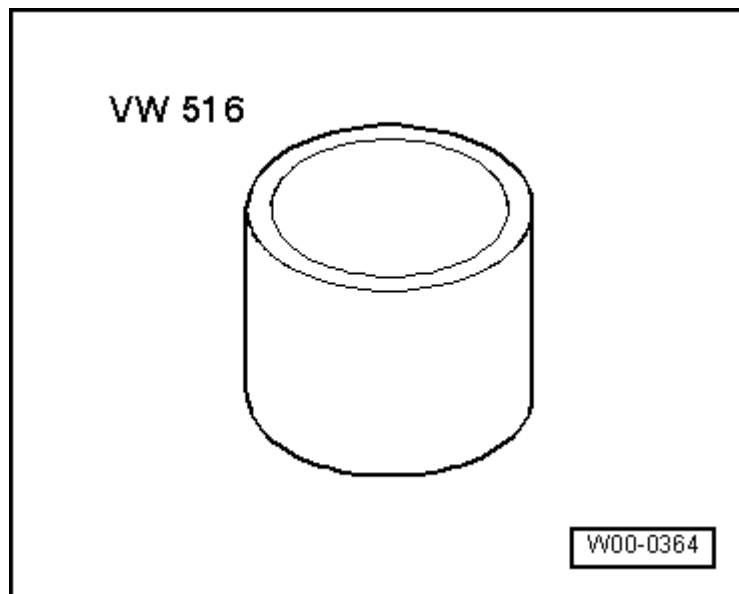


Fig. 46: Tube 42 mm Dia VW 516
Courtesy of AUDI OF AMERICA, LLC

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