

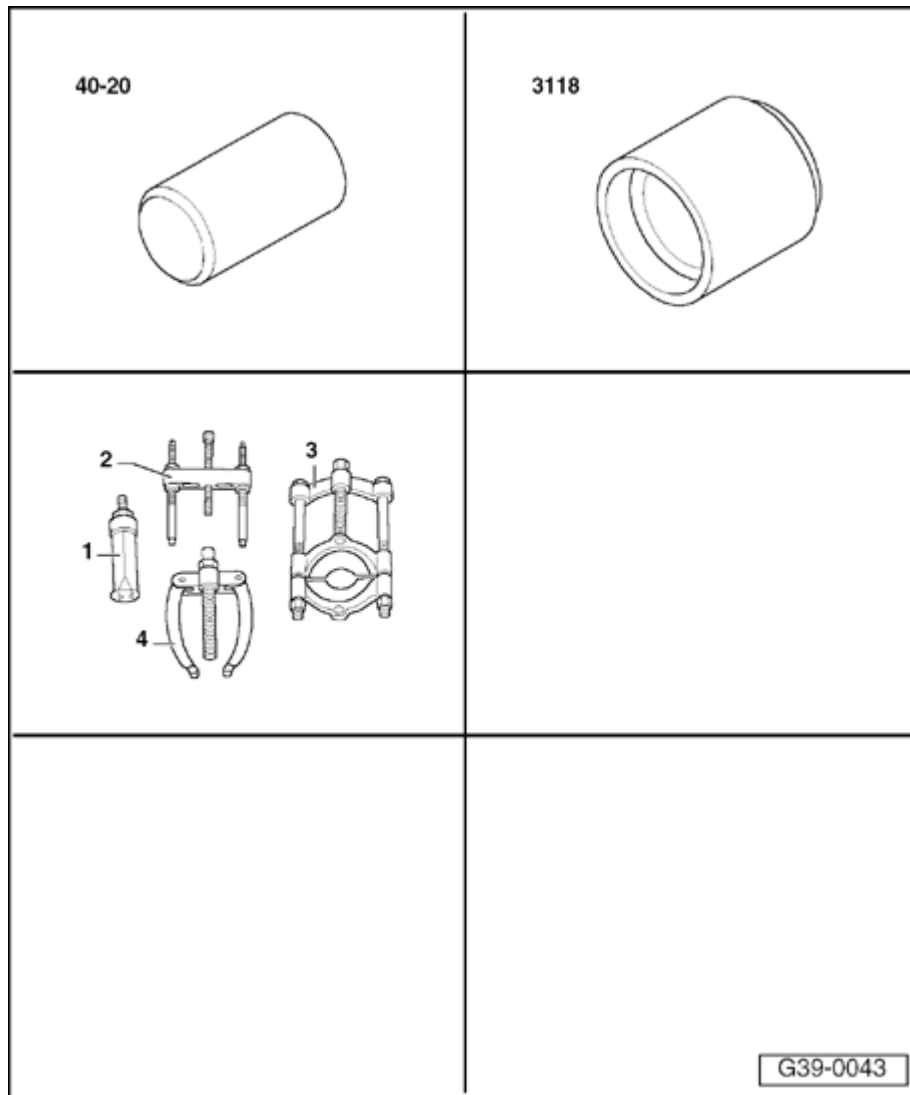
Center differential, servicing

Transmission installed

Special tools and equipment

- ◆ VW401 thrust plate
- ◆ VW412 punch
- ◆ VW402 thrust plate
- ◆ VW454 thrust tube
- ◆ VW407 punch
- ◆ 3021 protractor

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- ◆ 4020 press tube
- ◆ 3118 press support
- ◆ Item 3 Kukko 17/2 separating tool

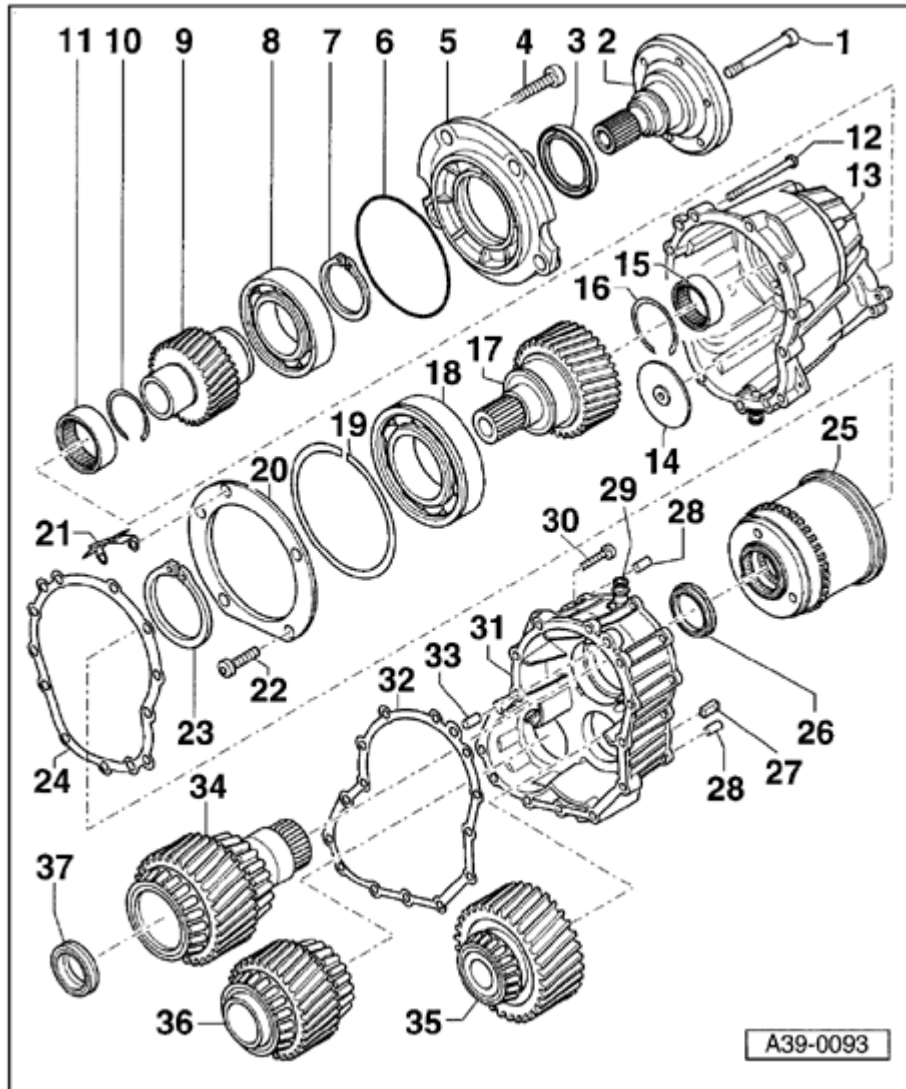
WARNING!

Do not run engine with the center differential removed or without gear oil and do not tow vehicle.

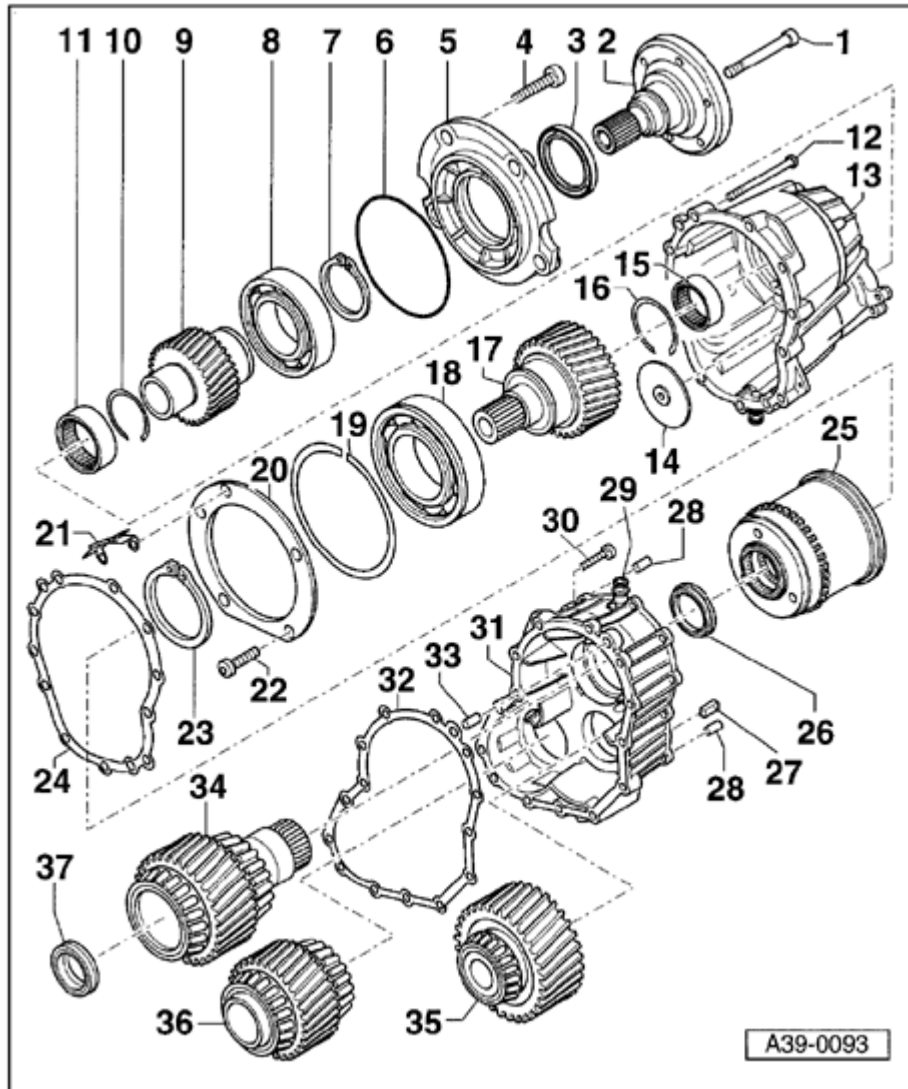
Notes:

- ◆ Rules of cleanliness for working on automatic transmissions ⇒ [page 37-148](#) .
- ◆ General repair notes ⇒ [page 00-27](#) .

The parts listed in the following illustration can be removed with the transmission installed.



- 1 - Socket head bolt - 25 Nm**
- 2 - Rear drive flange**
- 3 - Seal**
 - ◆ Always replace ⇒ [page 39-61](#)
- 4 - Bolt - 23 Nm**
 - ◆ 4x
- 5 - Housing cover**
- 6 - O-ring**
 - ◆ Coat with transmission fluid
- 7 - Snap ring**
- 8 - Grooved ball bearing**
 - ◆ For spur gear 1
 - ◆ Pressing off ⇒ [Fig. 1](#) , ⇒ [page 39-54](#)
 - ◆ Pressing on ⇒ [Fig. 2](#) , ⇒ [page 39-54](#)



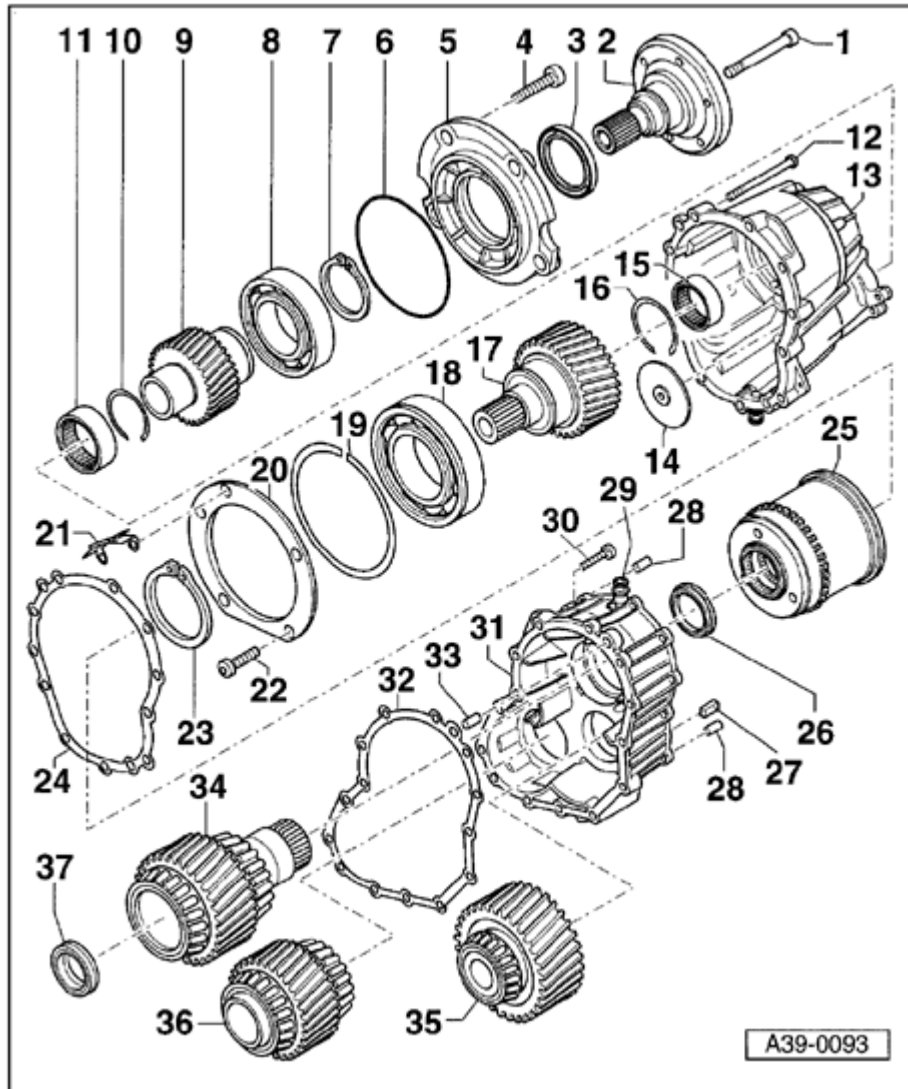
9 - Spur gear 1

- ◆ For rear gear set
- ◆ If damaged, only replace together with spur gear 2 -Item 17 - Always replace
- ◆ To remove and install, pull out of center differential housing toward rear together with -item 7 - and -item 8 -

10 - Snap ring

11 - Needle bearing

- ◆ For spur gear 1
- ◆ Only remove for replacement
- ◆ To insert, heat up transfer gear housing to approx. 100 ° C and drive out needle bearing toward rear using drift (Warning! Wear protective gloves)
- ◆ Drive in to stop using 3021 protractor

**12 - Bolt - 23 Nm**

- ◆ Loosen or tighten in stages and in diagonal sequence

13 - Center differential housing**14 - Tension nut**

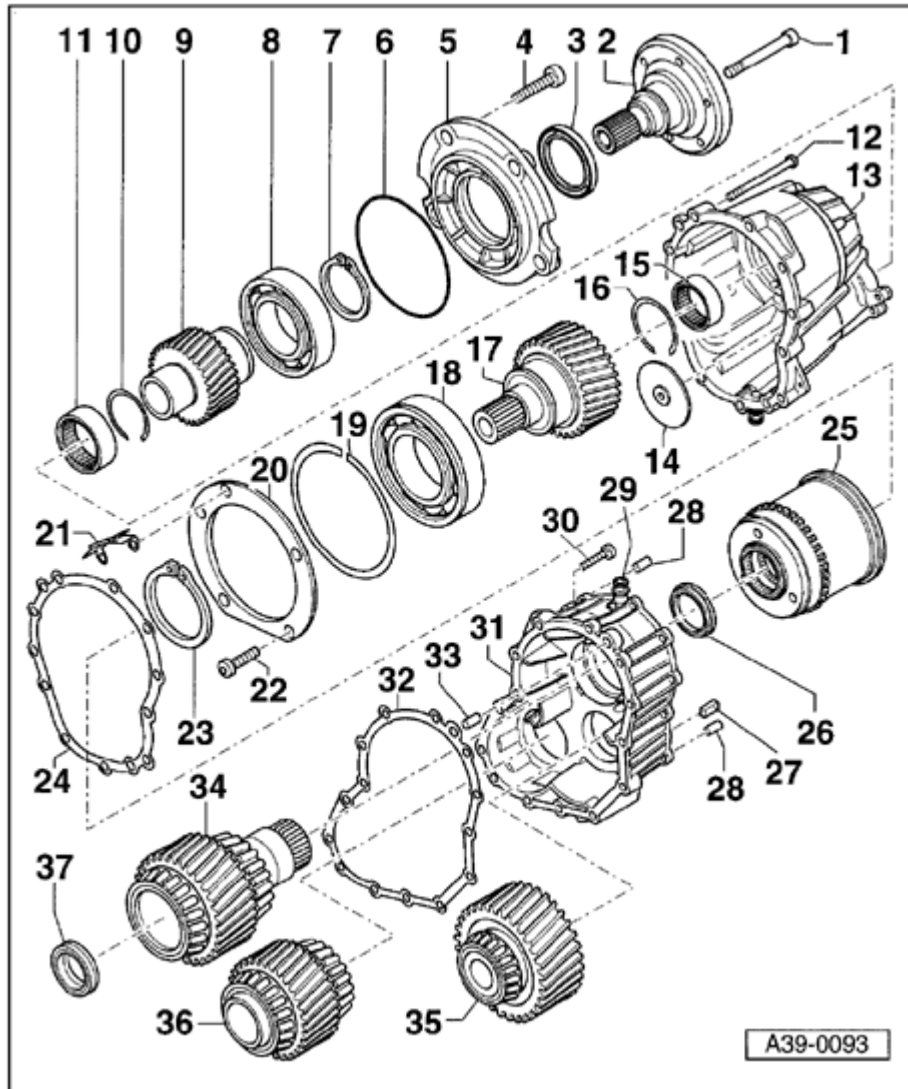
- ◆ For rear drive flange -Item no. 2 -

15 - Needle bearing

- ◆ For spur gear 2
- ◆ Only remove for replacement
- ◆ Always replace ⇒ [page 39-69](#)

16 - Snap ring**17 - Spur gear 2**

- ◆ For rear gear set
- ◆ If damaged, only replace together with spur gear 1 -item 9 -
- ◆ To remove and install, remove center differential housing ⇒ [page 39-56](#) and pull out together with -item 18 , 19 , 23 -



18 - Grooved ball bearing

- ◆ For spur gear 2
- ◆ Pressing off ⇒ [Fig. 3](#) , ⇒ [page 39-55](#)
- ◆ Pressing on ⇒ [Fig. 4](#) , ⇒ [page 39-55](#)

19 - Snap ring

- ◆ For securing grooved ball bearing -item 18 - in center differential housing

20 - Washer

- ◆ For grooved ball bearing -item 18 -
- ◆ Before installing, clip on guide plate -item 21 -

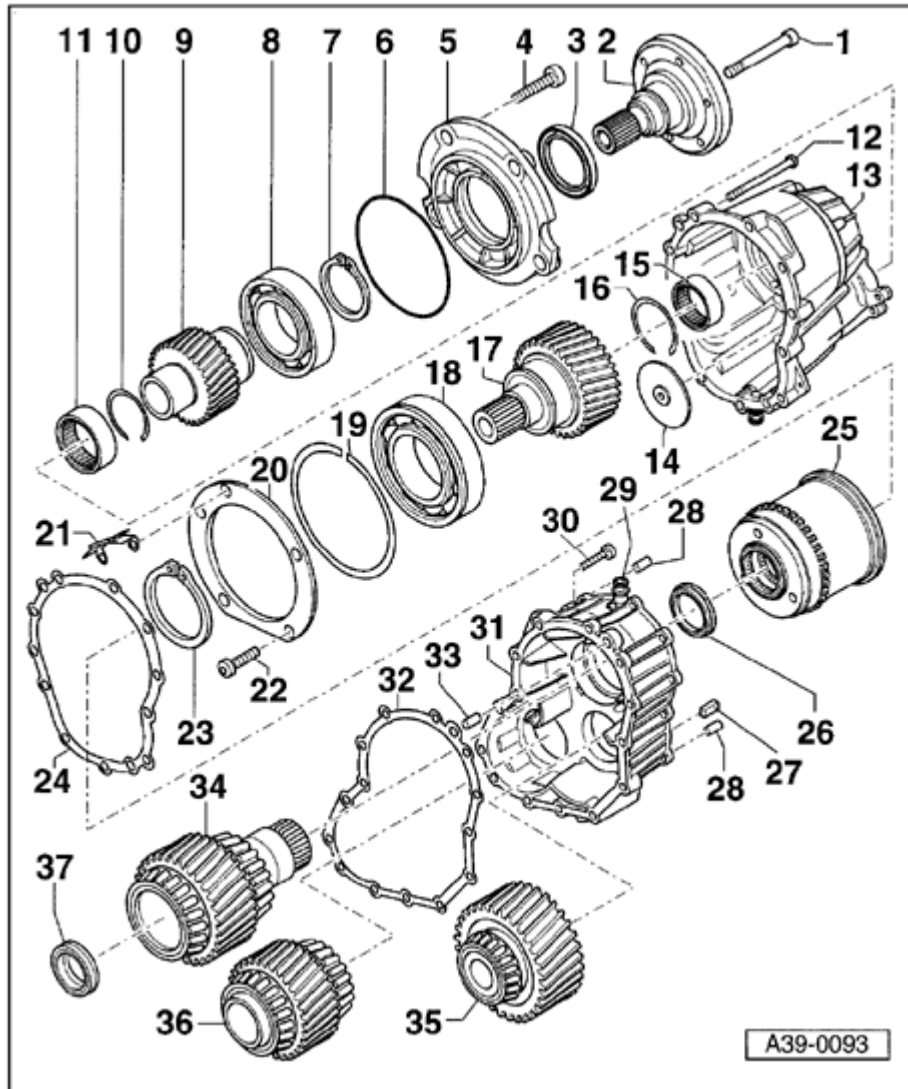
21 - Alignment plate

22 - Bolt 10 Nm

23 - Snap ring

- ◆ For securing grooved ball bearing -item 18 - on spur gear 2 - item 17 -

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**24 - Gasket**

- ◆ Always replace ⇒ [page 39-56](#)

25 - Torsen differential

- ◆ If damaged replace as complete unit
- ◆ Removing and installing ⇒ [page 39-56](#)

26 - Seal

- ◆ Always replace ⇒ [page 39-65](#)

27 - Magnet

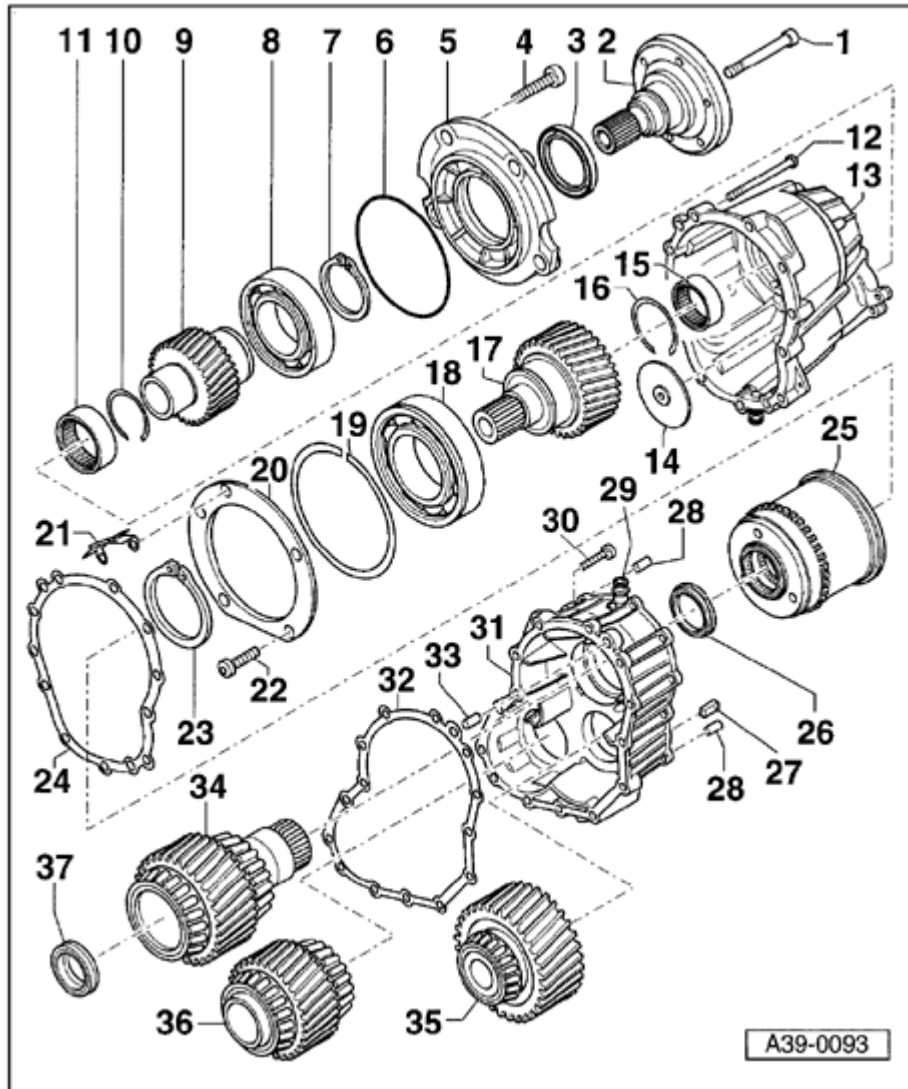
- ◆ Removing and installing ⇒ [page 39-56](#)

28 - Bushing

- ◆ 2x

29 - Breather

- ◆ For transfer gear
- ◆ With cap installed
- ◆ Installation position: Without cover, breather must project 10 to 11 mm out of housing



30 - Bolt - 23 Nm

- ◆ Observe tightening sequence ⇒ [page 39-27](#)

31 - Intermediate flange for front final drive

32 - Gasket

- ◆ Always replace ⇒ [page 39-24](#)

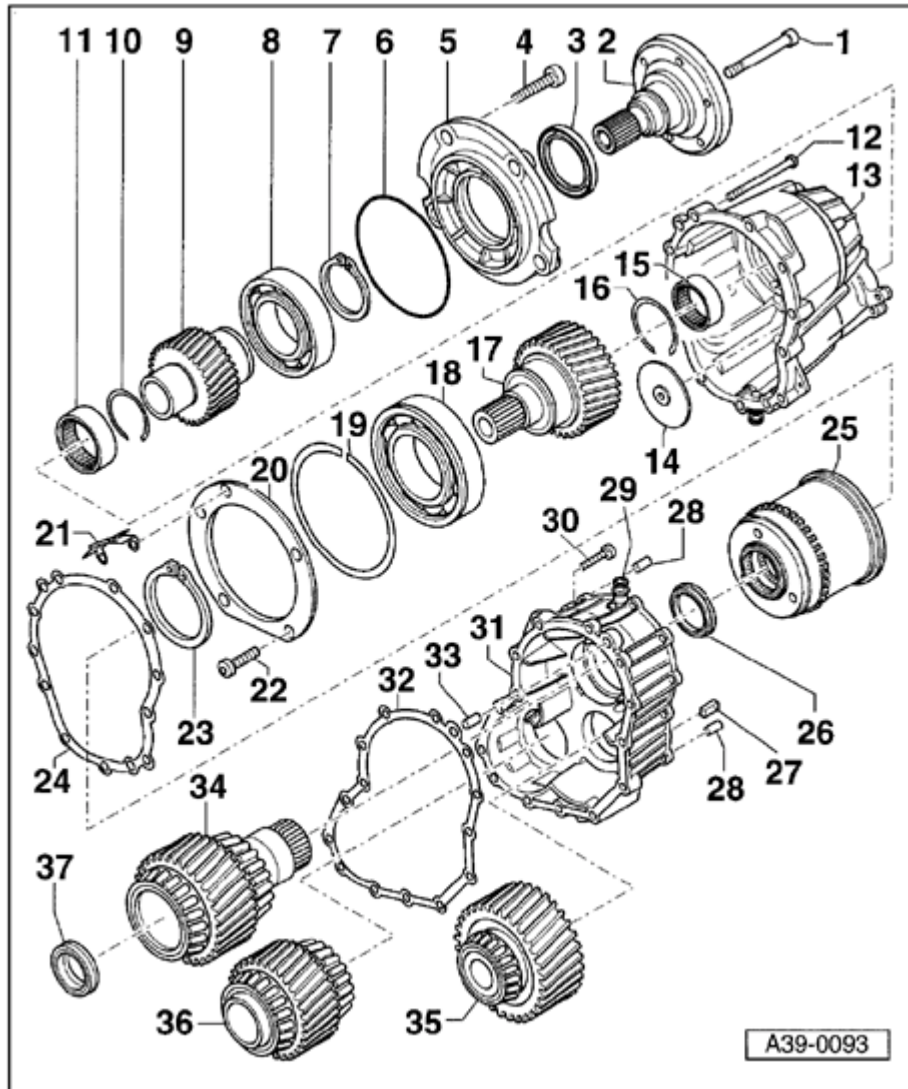
33 - Bushing

34 - Drive pinion

- ◆ For front final drive
- ◆ Removing and installing ⇒ [page 39-67](#)

35 - Intermediate pinion

- ◆ For front final drive
- ◆ Installation position: gear identification faces toward transfer gear

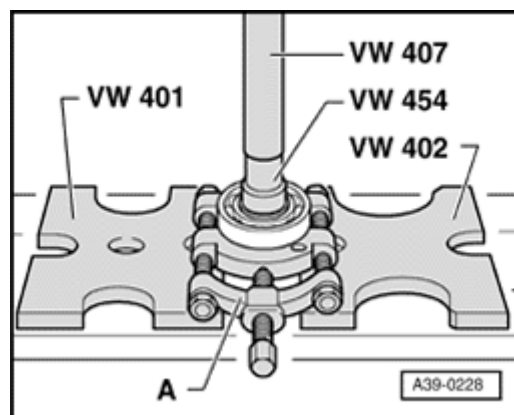


36 - Output pinion

- ◆ For front final drive
- ◆ Installation position: gear identification faces toward transfer gear

37 - Seal

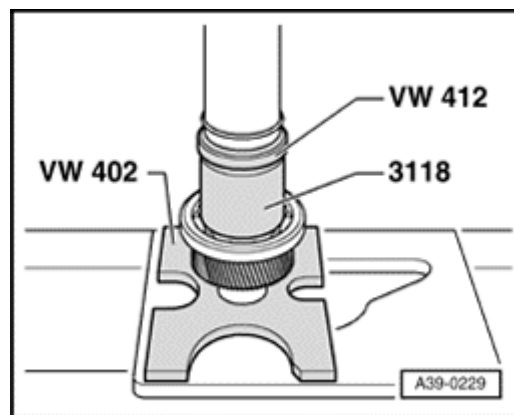
- ◆ Always replace ⇒ [page 39-67](#)



A

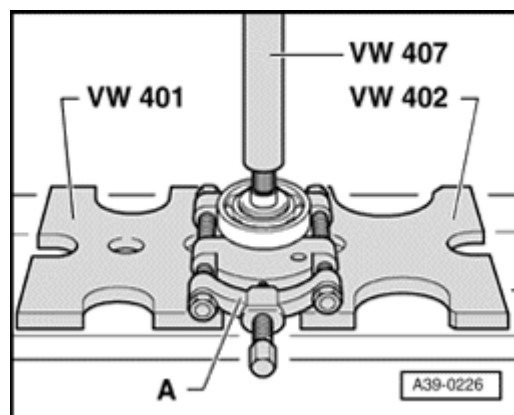
Fig. 1 Press off grooved ball bearing for spur gear 1

A - Separating device 22-115 mm, e.g. Kukko 17/2 separating tool



A

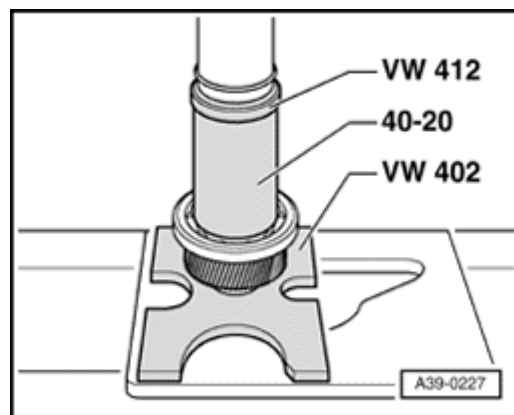
Fig. 2 Press on grooved ball bearing for spur gear 1



A

Fig. 3 Press off grooved ball bearing for spur gear 2

A - Separating device 22-115 mm, e.g. Kukko 17/2 separating tool



A

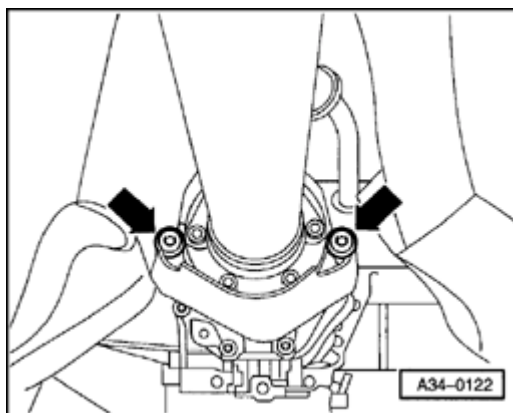
Fig. 4 Press on grooved ball bearing for spur gear 2

Center differential, removing and installing

Removing

- Remove front exhaust pipes:

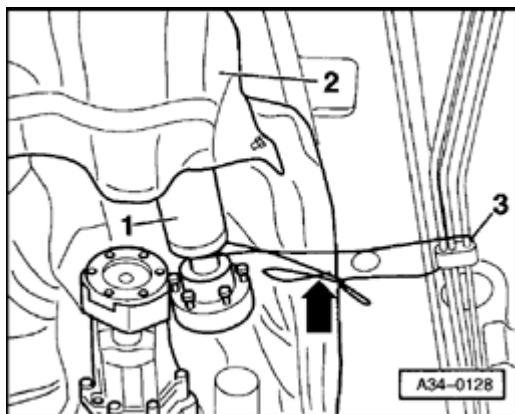
⇒ *Repair Manual, Engine Mechanical, Repair Group 26; removing and installing exhaust system*



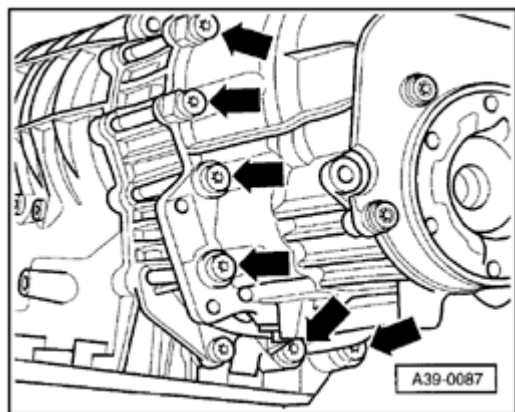
A

- Unbolt heat shield for driveshaft from cover for Torsen differential (arrows).

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- A
- Unbolt driveshaft -1- from transmission and let rest on heat shield -2- ⇒ [page 39-79](#) , Driveshaft, removing and installing.
 - Secure driveshaft using wire (arrow) at bracket -3- of fuel lines.
 - Drain center differential gear oil ⇒ [page 39-40](#) .

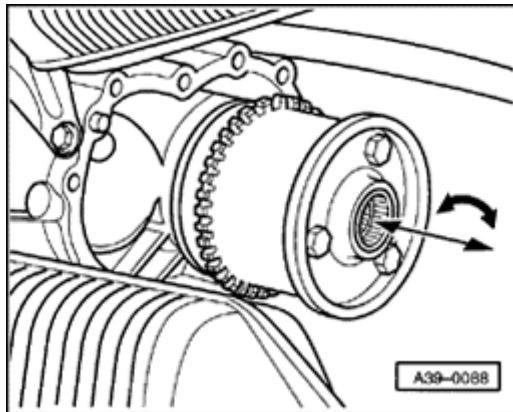


- A
- Loosen mounting bolts (arrows) for center differential housing in diagonal sequence and remove.

WARNING!

Carefully pull center differential housing off of transmission toward rear. The Torsen differential could otherwise fall out of the transmission.

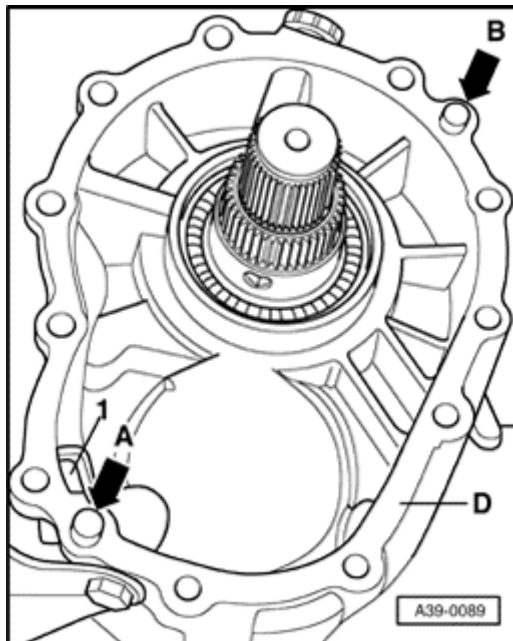
39-58



- A**
- Pull Torsen differential off output shaft toward rear.

Installing

Installation is reverse of removal, noting the following:



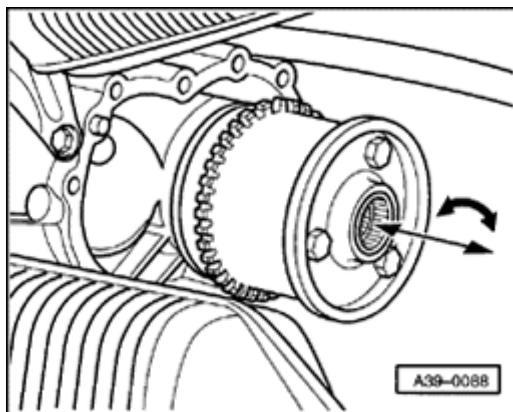
- A**
- Check for alignment bushing (arrow A) and (arrow B).
 - Install gasket

Note:

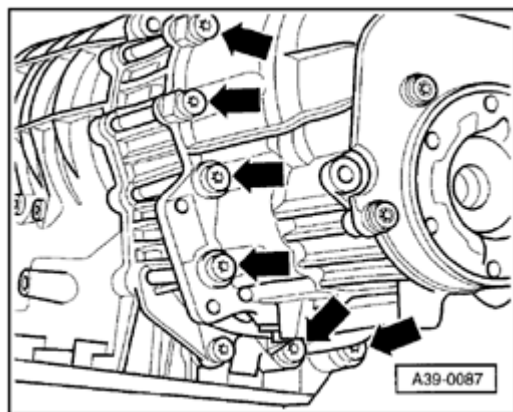
Lightly coat sealing surface -D- with gear oil to prevent the seal from slipping.

- Slide cleaned magnet into cast holding pocket -1- in intermediate flange.

- Add 200 ml. gear oil to output housing ⇒ (comparable to gear oil, topping up on removed and disassembled center differential ⇒ [page 39-43](#)).



- A
- Install Torsen differential onto splines of output shaft and bottom spur gear while turning slowly.
- Check whether installed Torsen differential can be turned by hand.



- A
- Install fully assembled transfer housing with installed spur gears and rear drive flange onto transmission flange.
- Insert bolts for transfer housing and tighten to final tightening torque in diagonal sequence in several stages.
- Bolt driveshaft to transmission flange ⇒ [page 39-79](#) , Driveshaft, removing and installing.
- Fill transfer housing with gear oil and check oil level ⇒ [page 39-40](#) .

Tightening torques

Component	Nm
Center differential housing to transmission housing	23
Heat shield for driveshaft to transmission	23

O-ring for driveshaft output flange, replacing

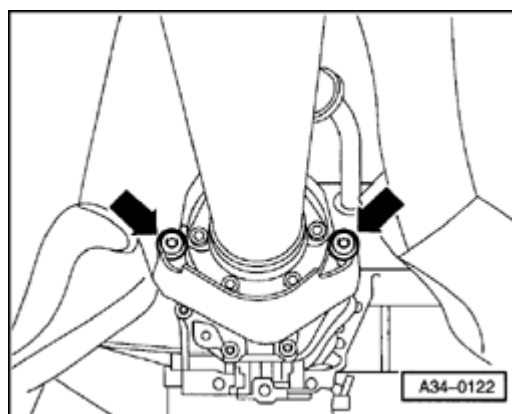
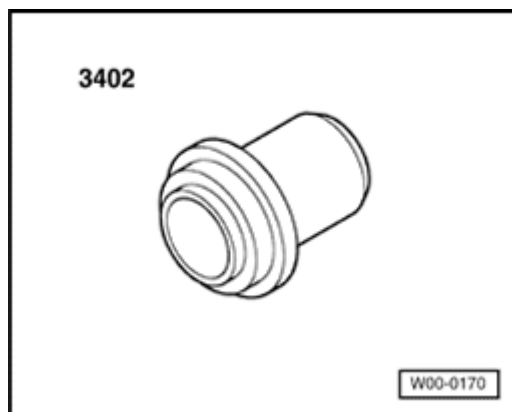
Special tools and equipment

- ◆ 3402 pressure piece

Removing

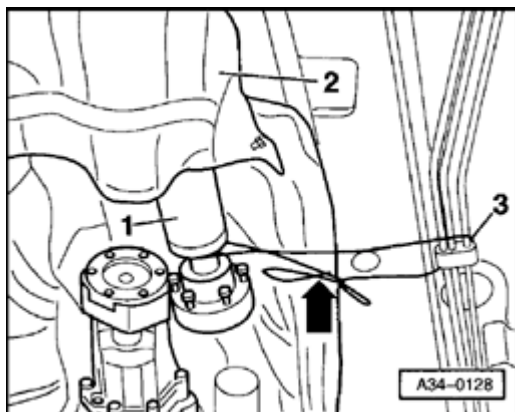
- Remove front exhaust pipes:

⇒ *Repair Manual, Engine Mechanical, Repair Group 26; removing and installing exhaust system*

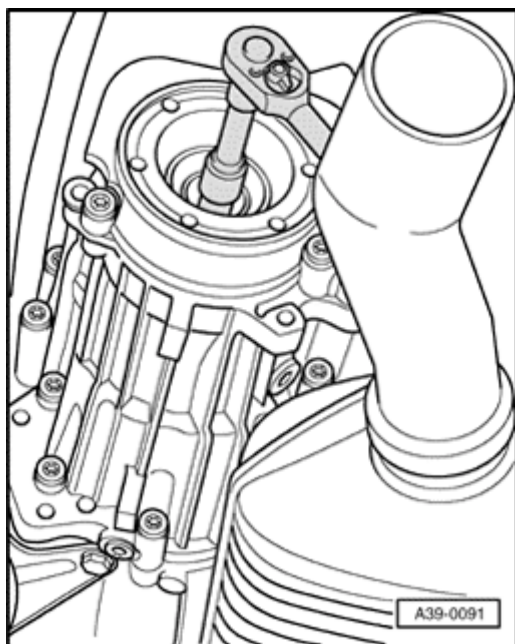


- Unbolt heat shield for driveshaft from cover for Torsen differential (arrows).

39-62

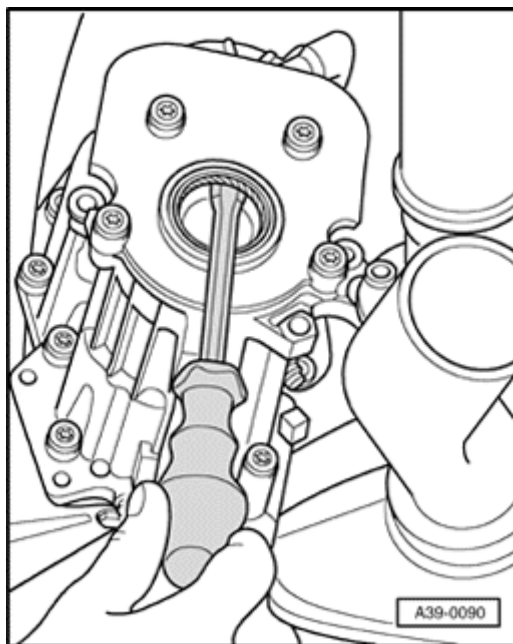


- A
- Unbolt driveshaft -1- from transmission and let rest on heat shield -2- ⇒ [page 39-79](#) , Driveshaft, removing and installing.
 - Secure driveshaft using wire (arrow) at bracket -3- of fuel lines.
 - Drain center differential gear oil ⇒ [page 39-40](#) .



- A
- Unbolt output flange while securing output flange against turning using a drift.
 - Pull out output flange.

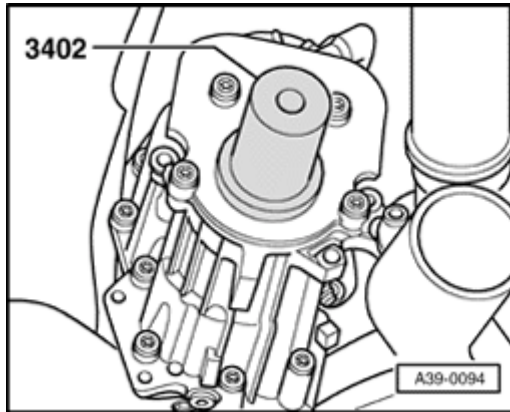
39-63



- A** - Remove O-ring using appropriate screwdriver.

Installing

Installation is reverse of removal, noting the following:



A

- Drive O-ring in to stop using 3402 pressure piece.
- Secure output flange with socket-head bolt.
- Bolt driveshaft to transmission flange ⇒ [page 39-79](#) , Driveshaft, removing and installing.
- Fill transfer housing with gear oil and check oil level ⇒ [page 39-40](#) .

Tightening torques

Component	Nm
Socket-head bolt for rear drive flange	25
Heat shield for driveshaft to transmission	23

Seal in intermediate flange for front final drive, replacing

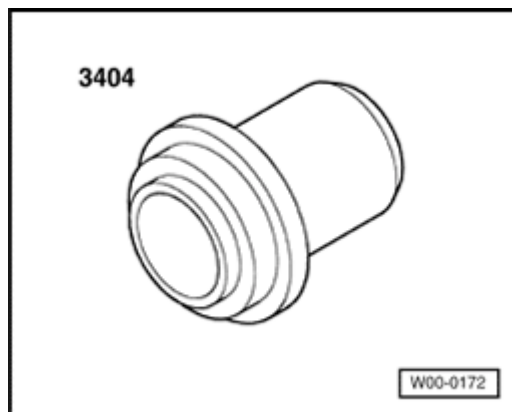
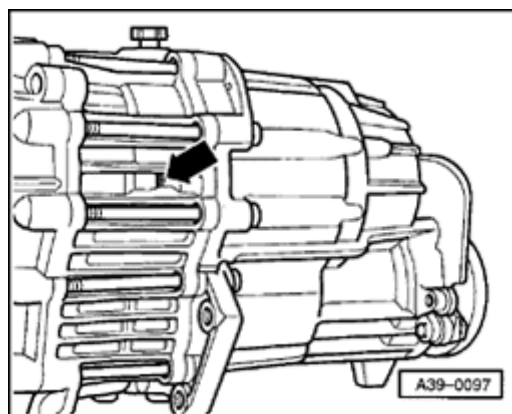
Note:

- ▲ *An inspection opening is provided on the left side of the intermediate flange to check for oil leaks (arrow) for the seal in drive pinion and the seal in intermediate flange.*

If oil escapes at this inspection opening, this double seal must be replaced.

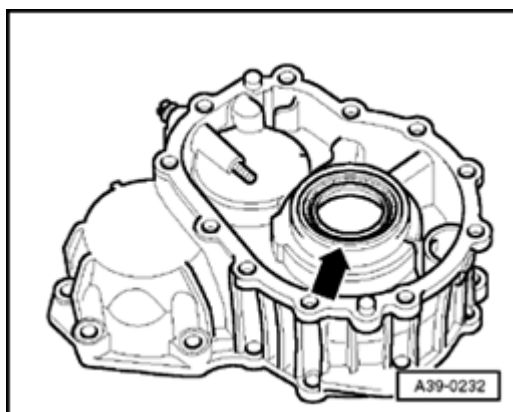
Special tools and equipment

- ▲ ◆ 3404 thrust piece



Removing

- Remove center differential ⇒ [page 39-56](#) .
- Remove intermediate flange for front final drive.



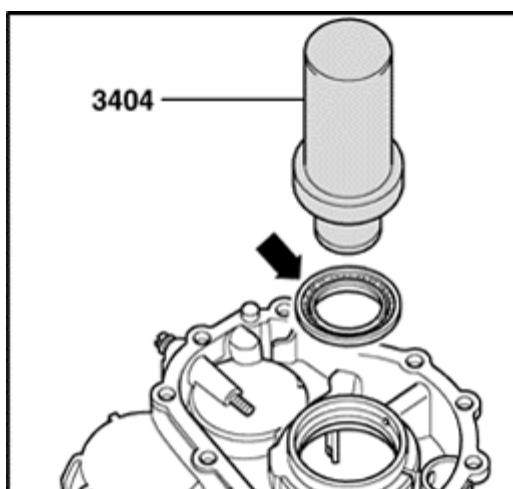
A

- Drive seal (arrow) out in direction of transfer gear using mandrel.

Installing

Installation is reverse of removal, noting the following:

- Check seal seat in transmission housing for damage; rework if necessary.



A

- Slide seal onto 3404 thrust piece so that the larger and projecting outer ring (arrow) of seal faces tool.
- Drive in seal up to 3404 thrust piece stop.

Note:

If installing the intermediate flange to the output shaft carelessly, the sealing lip of the seal can be damaged.

- Install center differential ⇒ [page 39-58](#) .

Seal in drive pinion, replacing

Note:

- ▲ *An inspection opening is provided on the left side of the intermediate flange to check for oil leaks (arrow) for the seal in drive pinion and the seal in intermediate flange.*

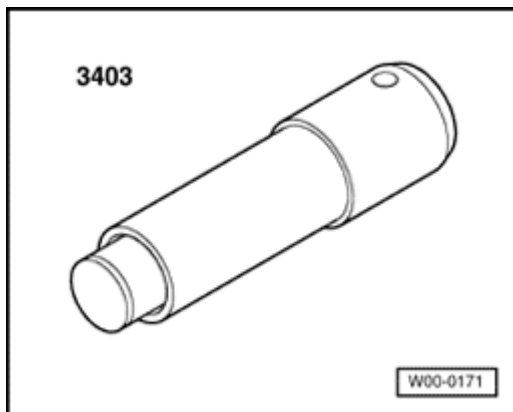
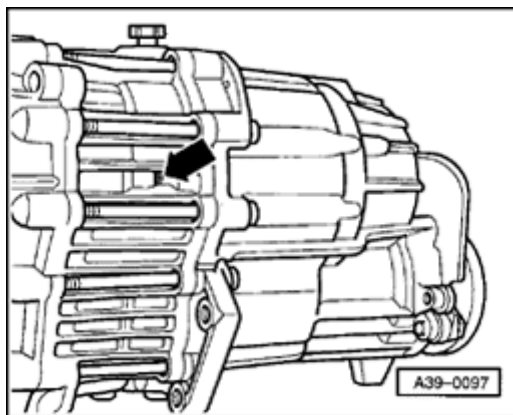
If oil escapes at this inspection opening, this seal must be replaced.

Special tools and equipment

- ▲ ♦ 3403 thrust piece

Removing

- Remove center differential ⇒ [page 39-56](#) .
- Remove intermediate flange for front final drive.
- Carefully pull off drive pinion from driveshaft.



WARNING!

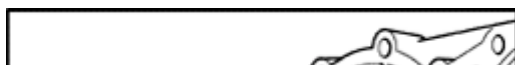
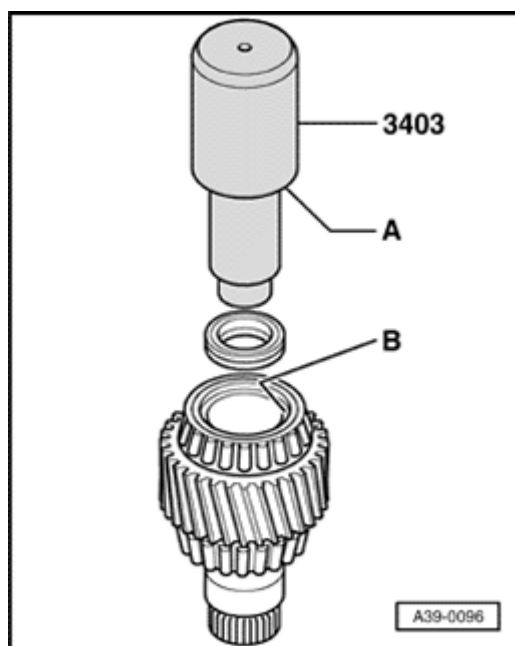
Do not reinstall spur gears that have fallen to the ground. The transmission must be replaced in this case.

- Drive out seal using drift.

Installing

Installation is reverse of removal, noting the following:

- Slide seal onto 3403 thrust piece.
- Drive seal in up to 3403 thrust piece stop.



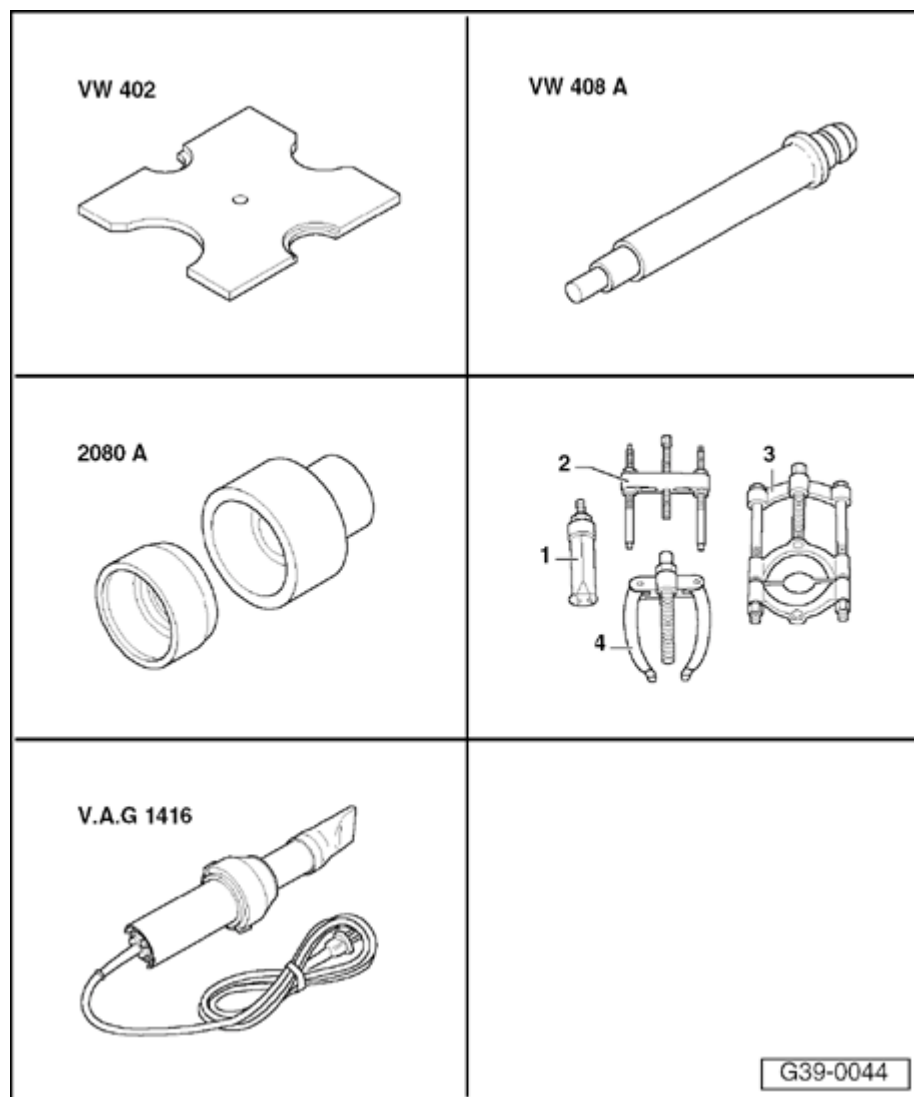


- Completely cover splines on end of shaft (arrow) with insulating tape without creasing or overlapping the tape, to prevent damage to seal when sliding on drive pinion.
- Install drive pinion on center of output shaft. (Installed position ⇒ [page 39-53](#))

Note:

If installing the intermediate flange on the output shaft carelessly, the sealing lips of the seal can be damaged.

39-69



Needle bearing for spur gear 2, replacing

Special tools and equipment

- ◆ VW402 thrust plate
- ◆ VW408A punch
- ◆ Press sleeve for 2080A sleeve
- ◆ Item 1 Kukko 21/4 extractor
- ◆ Item 3 Kukko 22/1 support
- ◆ VAG1416 hot air blower

Removing

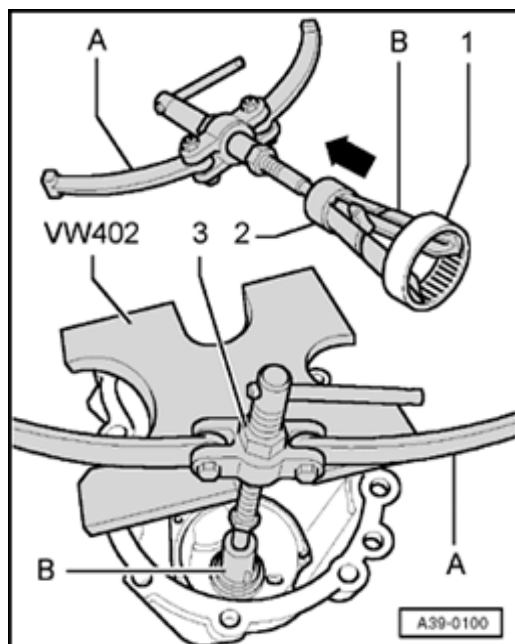
- Remove center differential ⇒ [page 39-56](#) .

Note:

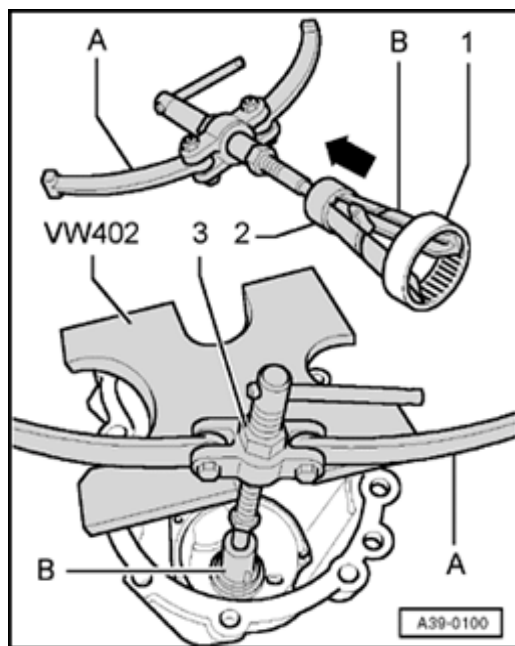
⚠ The upper part of the illustration shows how the pulling hooks of extractor -B- must be inserted into needle bearing -1-.

- Slide centering sleeve -2- of extractor -B- approx. 4 mm in direction of arrow in order to be able to open pulling hooks of extractor far enough.

A - Support e.g. Kukko 22/1



39-71



A

- Spread extractor -B- into upper lip of needle bearing -1- and secure extractor at nut.
- Install retainer -A- on extractor -B- as illustrated.
- Support retainer -A- using VW402 thrust plate and pre-tension at nut 3 of retainer.
- Using commercially available hot air blower, quickly heat up outside of transfer housing in vicinity of needle bearing seat to approx. 100 ° C.

WARNING!***Wear protective gloves!***

- Quickly pull out needle bearing.

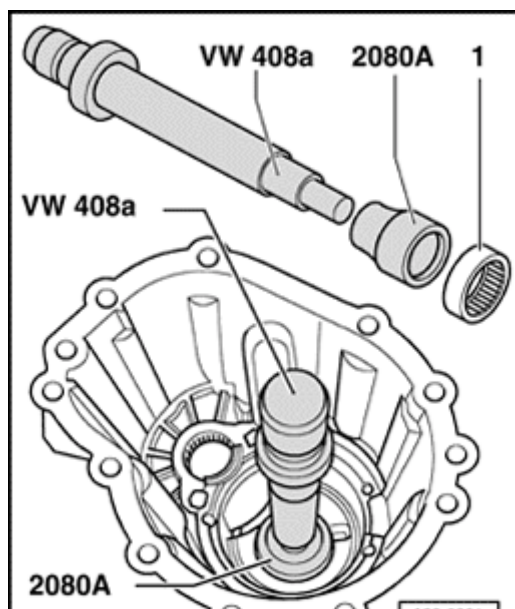
Installing

Installation is the reverse of removal. Also carry out the following procedure.

- Check needle bearing seat in transfer housing for damage, rework if necessary.
- Using commercially available hot air blower, uniformly heat up outside of transfer housing in vicinity of needle bearing seat to approx. 100 ° C.

WARNING!

Wear protective gloves!



A

- Place 2080A sleeve onto new needle bearing -1-.
- Drive needle bearing into transfer housing up to stop using VW408A punch.