Differential, disassembling and assembling

Special tools and equipment

- VW295 needle bearing drift
- VW401 thrust plate
- VW402 thrust plate
- VW407 punch
- VW408A punch
- VW447H thrust pad
- VW447I thrust pad
- VW472/1 pressure piece
- VW511 thrust pad
- 30-11 thrust pad

- 30-205 thrust pad
- 40-21 sleeve

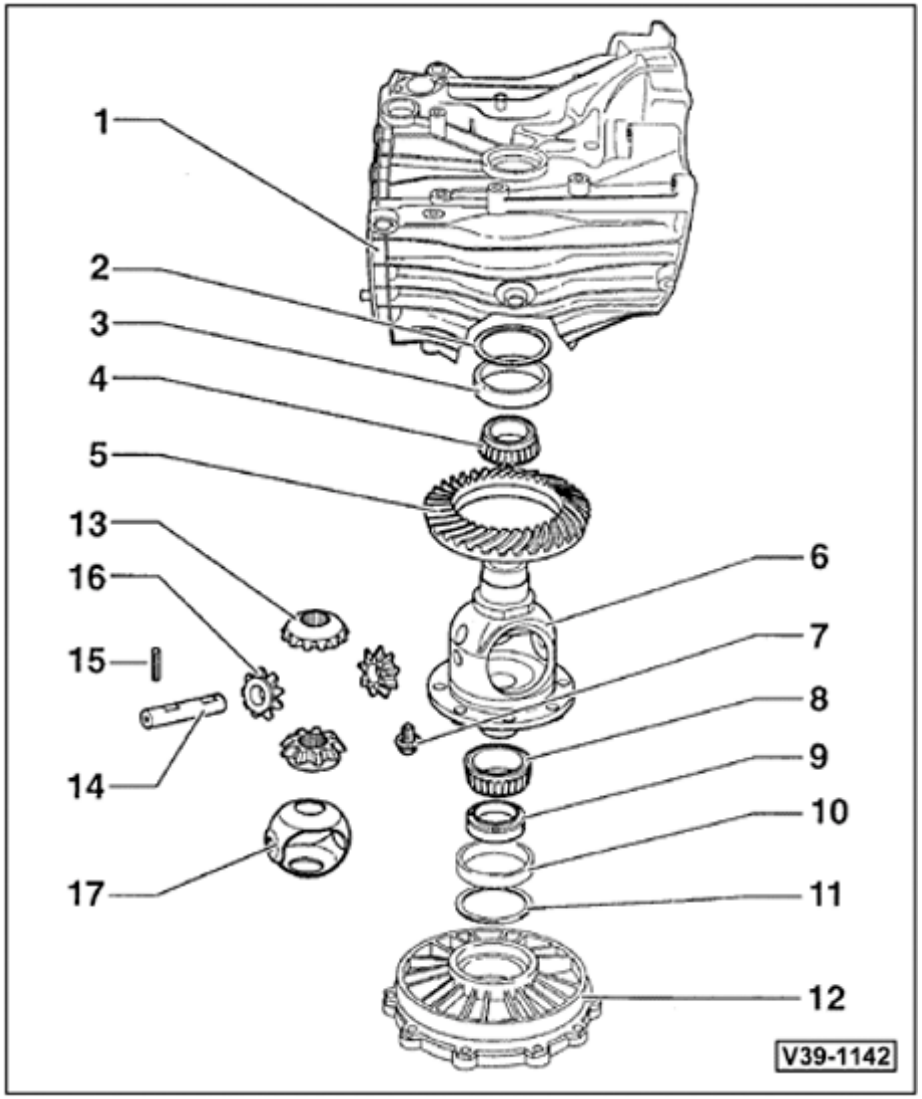
39-16

- 40-105 thrust piece
- 3138 drift
- 3144 press support
- 3296 tube
- Sealant AMV 188 001 02
- Kukko 20/10 two-arm puller or Kukko 44/2 puller
- Kukko 204/2 two-arm puller

Notes:

- *Removing and installing differential* ⇒ *Page 39-10* .
- *Replace both tapered roller bearings together.*
- *Adjustments are required when replacing components marked with 1)* ⇒ *Page 39-33* , *list of adjustments*

39-17



1 - Transmission housing 1)

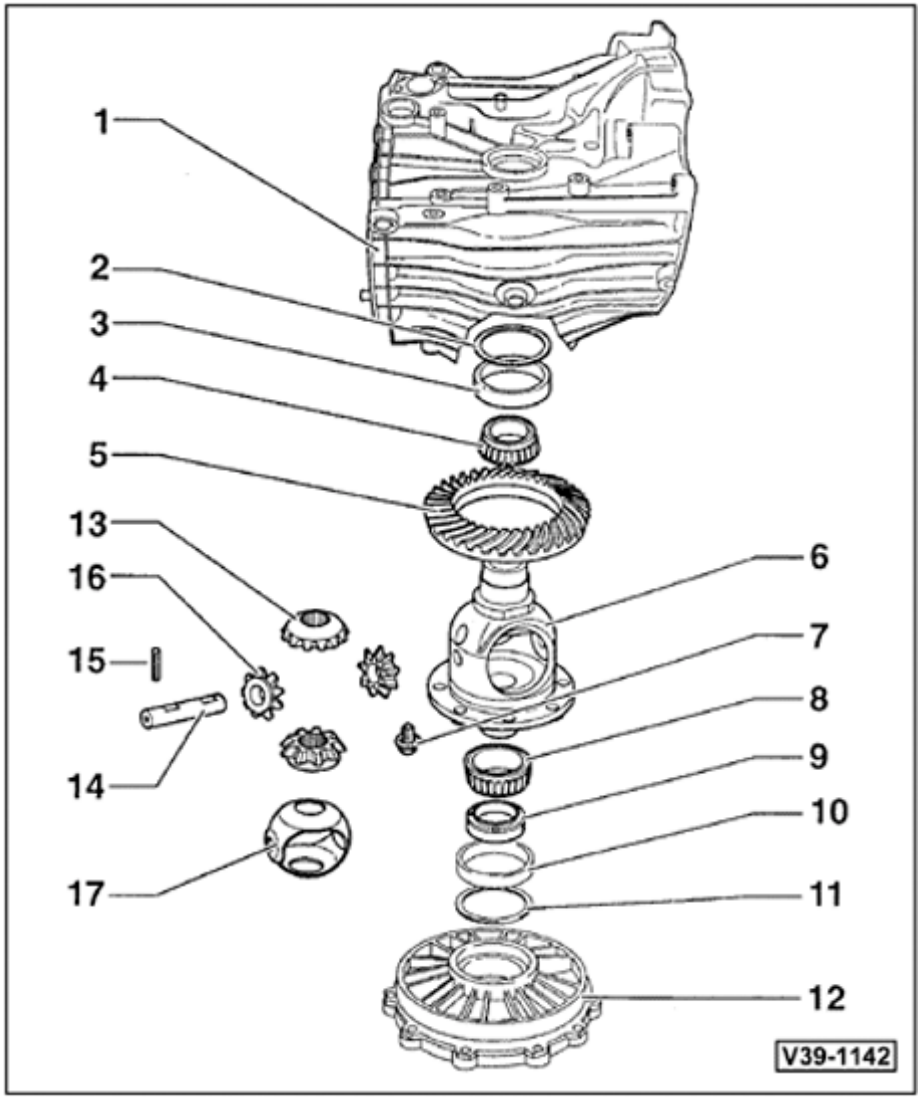
2 - Shim S2

- Note thickness
- List of adjustments ⇒ Page 39-33

3 - Right tapered roller bearing outer race 1)

- Left and right tapered roller bearings are identical (not for transmission without polygon bearing) ⇒ Page 00-3
- Driving out for transmission with polygon bearing ⇒ Fig. 1 , ⇒ Page 39-22
- Driving out for transmission without polygon bearing ⇒ Fig. 2 , ⇒ Page 39-22
- Driving in for transmission with polygon bearing ⇒ Fig. 3 , ⇒ Page 39-23
- Driving in for transmission without polygon bearing using VW295 needle bearing drift and 30-205 thrust pad

39-18



4 - Right tapered roller bearing inner race 1)

- Left and right tapered roller bearings are identical (not for transmission without polygon bearing) ⇒ Page 00-3
- Pull off using 3296 tube ⇒ Fig. 4
- Pressing on for transmission with polygon bearing ⇒ Fig. 5 , ⇒ Page 39-24
- Pressing on for transmission without polygon bearing using 40-21 sleeve

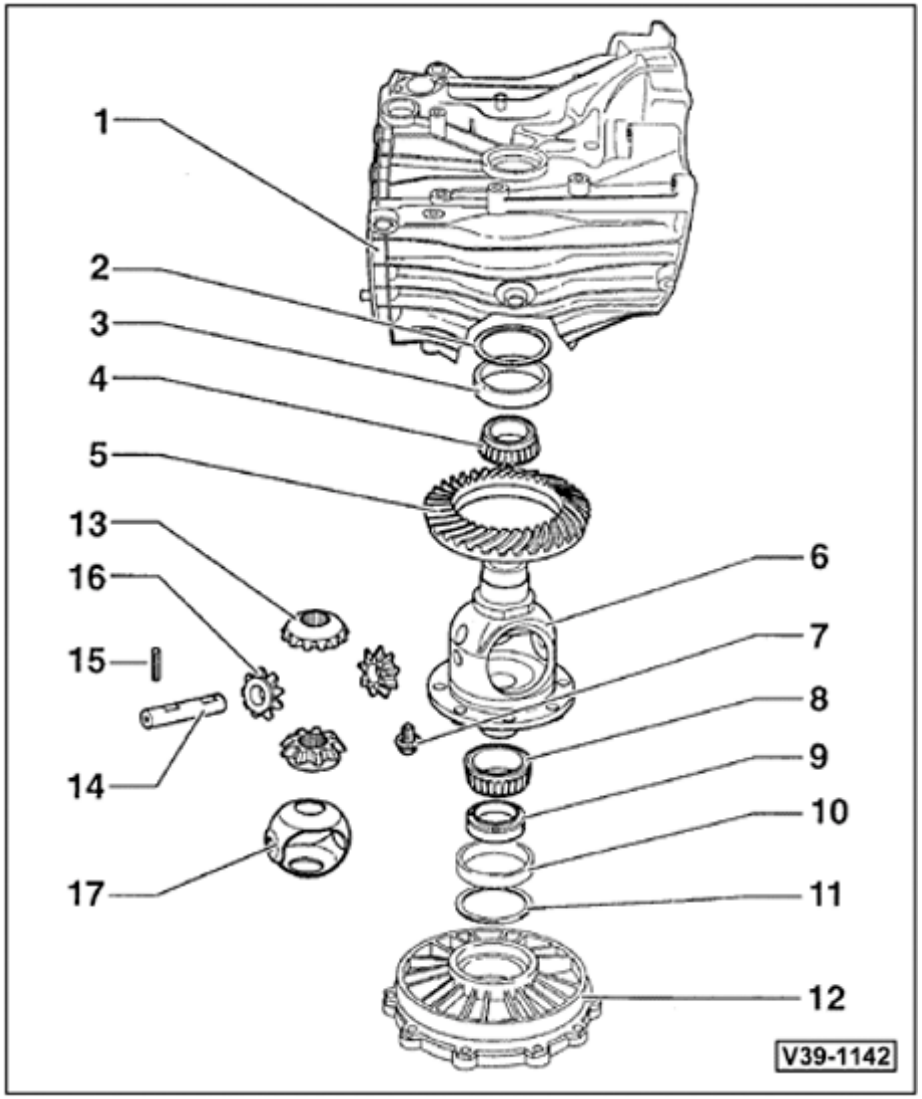
5 - Ring gear 1)

- Is matched to pinion shaft (gear set)
- Allocate according to transmission code letters using parts catalog microfiche ⇒ Page 00-3
- Remove from transmission housing using drift ⇒ Fig. 10
- Installing on differential housing ⇒ Fig. 11

6 - Differential housing 1)

- Allocate according to transmission code letters using parts catalog ⇒ Page 00-3

39-19



7 - Bolt

- Always replace
- Tighten to 60 Nm (44 ft lb) and then tighten another 45°
- Lightly tighten bolts then tighten diagonally to correct torque

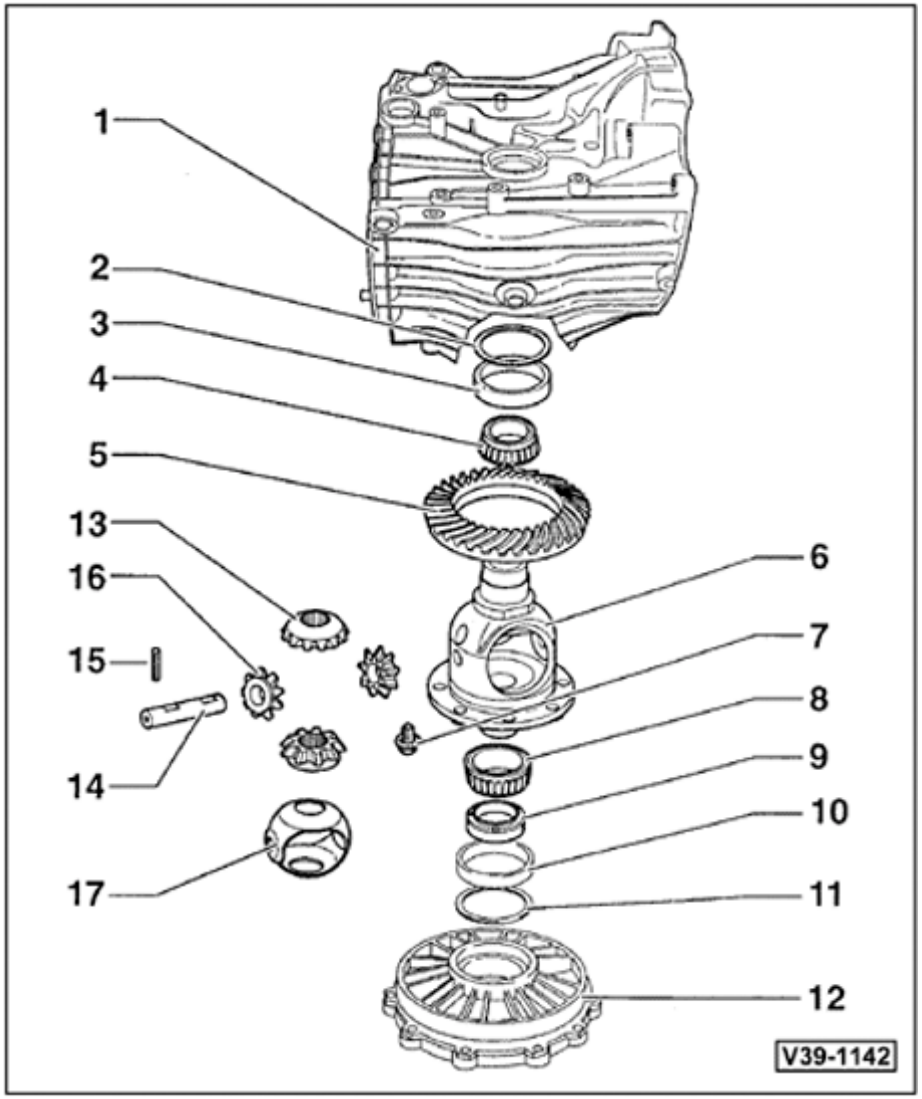
8 - Left tapered roller bearing inner race 1)

- Left and right tapered roller bearings are identical (not for transmission without polygon bearing) ⇒ Page 00-3
- Pulling off ⇒ Fig. 6
- Driving in for transmission with polygon bearing ⇒ Fig. 7 , ⇒ Page 39-25
- Pressing on for transmission without polygon bearing using 40-21 sleeve

9 - Drive gear for Vehicle Speed Sensor (VSS)

- Removing and installing ⇒ Page 39-7
- Carefully install onto differential without canting. Do not use force: the drive gear can break easily.

39-20



10 - Left tapered roller bearing outer race 1)

- Left and right tapered roller bearings are identical (not for transmission without polygon bearing) ⇒ Page 00-3
- Driving out ⇒ Fig. 8
- Driving in for transmission with polygon bearing ⇒ Fig. 9 , ⇒ Page 39-26
- Driving in for transmission without polygon bearing using VW295 needle bearing drift and 511-205 thrust pad

11 - Adjustment shim S1

- Note thickness
- List of adjustments ⇒ Page 39-33

12 - Final drive cover 1)

- Coat sealing surfaces with a thin layer of sealant AMV 188 001 02.

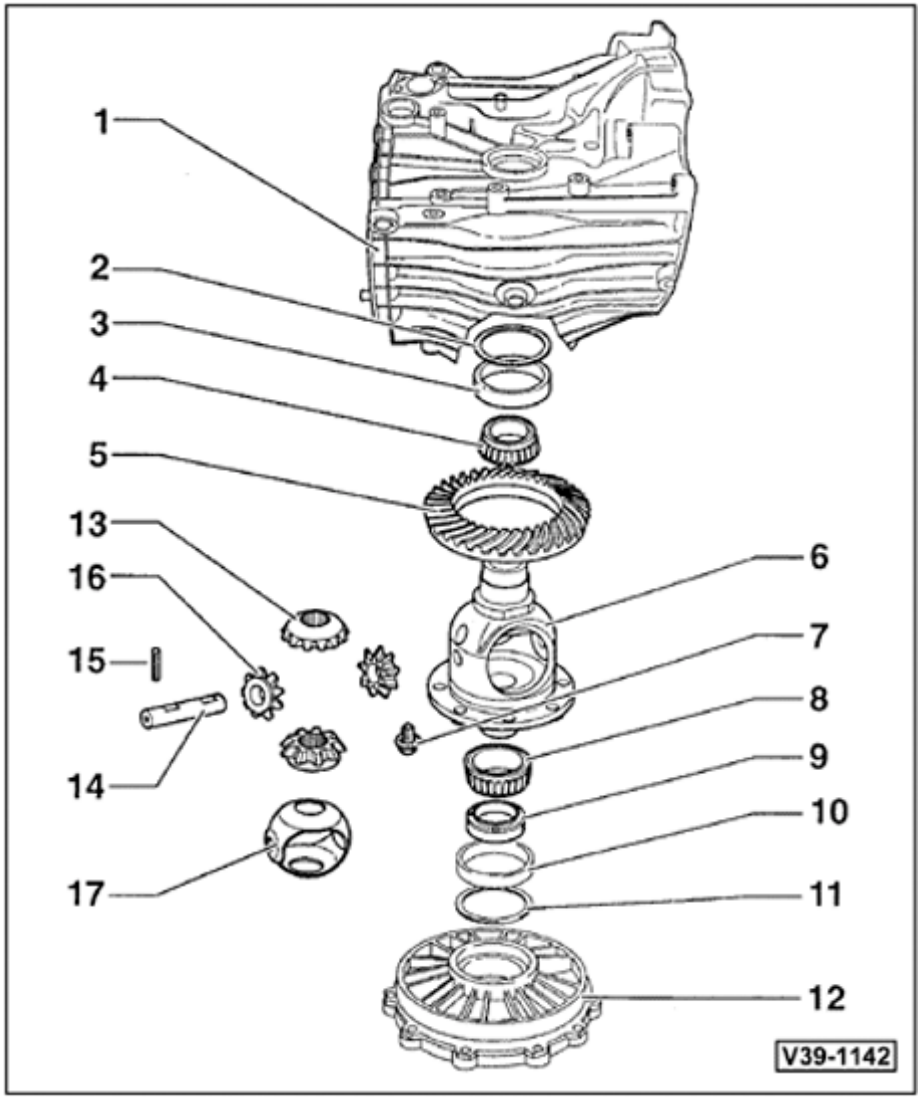
13 - Large differential bevel gear

- Installing ⇒ Fig. 12

14 - Differential bevel gear shaft

- Drive out using drift after removing roll pin

39-21



15 - Roll pin

- For securing differential bevel gear shaft
- Version with annular groove: Removing and installing ⇒ Fig. 13
- Version without annular groove: drive out using drift

16 - Small differential bevel gear

- Installing ⇒ Fig. 12

17 - Thrust washer assembly

- Lubricate with transmission fluid before installing

39-22

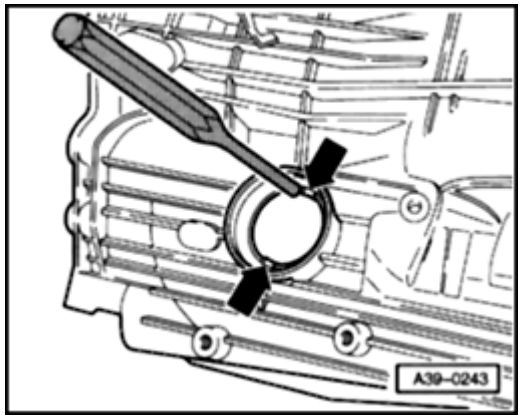


Fig. 1 Removing right tapered roller bearing outer race from transmission housing (for transmissions with polygon bearing)

- To drive out, place punch pin alternately on cut-outs (arrows) on bearing seat.

Note:

Adjustment shims are damaged when outer race is driven out. Replace adjustment shims.

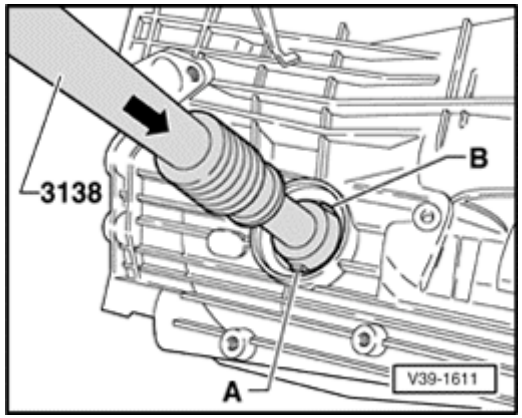


Fig. 2 Removing right tapered roller bearing outer race from transmission housing for transmissions without polygon bearing

- Turn webs -A- and -B- out until they sit on outer race within recess in transmission.
- After removing, check adjustment shims for damage.

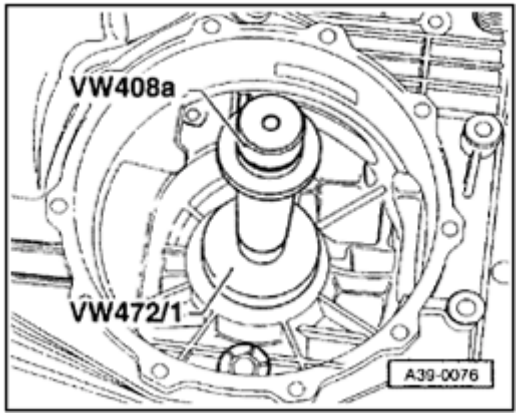


Fig. 3 Installing right tapered roller bearing outer race in transmission housing

- Insert VW472/1 pressure piece together with cone in outer race.

Note:

For transmissions with drive flange without polygon bearing (⇒ Page 00-3) use 30-205 thrust pad and VW295 needle bearing drift.

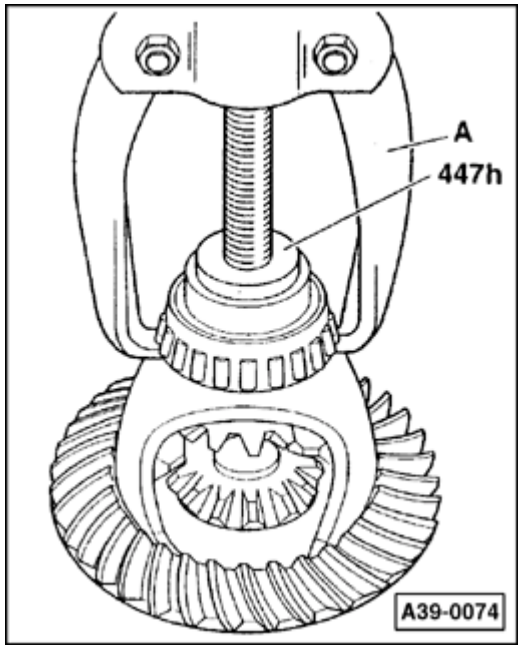


Fig. 4 Pulling off right tapered roller bearing inner race

A - Kukko 20/10 two-arm puller or Kukko 44/2 puller

Notes:

- *On a puller with a small spindle diameter, 30-11 thrust pad must be placed between 447H pressure washer and the puller.*
- *For transmissions with drive flange without polygon bearing (⇒ Page 00-3) use 40-105 thrust piece.*
- *The differential has a notch under the bearing seat to install puller -A-.*

39-24

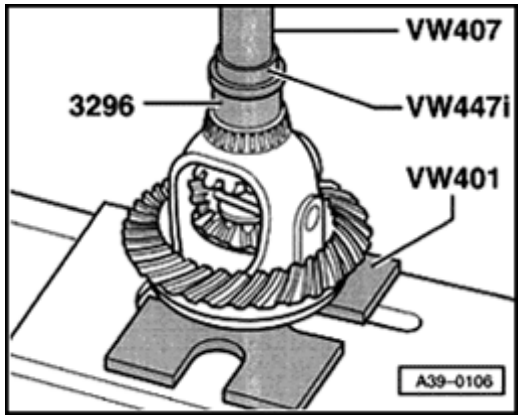


Fig. 5 Pressing on right tapered roller bearing inner race

WARNING!

Wear protective gloves!

- Heat inner race to approximately 100 ° C (212 ° F), position and install.

Note:

For transmissions with drive flange without polygon bearing (⇒ Page 00-3) use 40-21 sleeve.

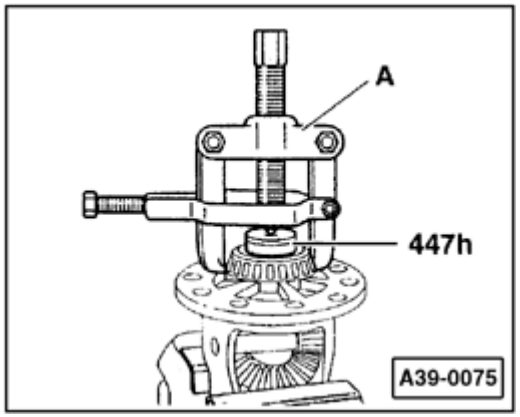


Fig. 6 Pulling off left tapered roller bearing inner race

A - Kukko 204/2 two-arm puller

Notes:

- *On a puller with a small spindle diameter, 30-11 must be placed between the 447H pressure washer and the puller.*
- *For transmissions with drive flange without polygon bearing (⇒ Page 00-3) use 40-105 thrust piece.*
- *The differential has a notch under the bearing seat to install puller -A-.*

39-25

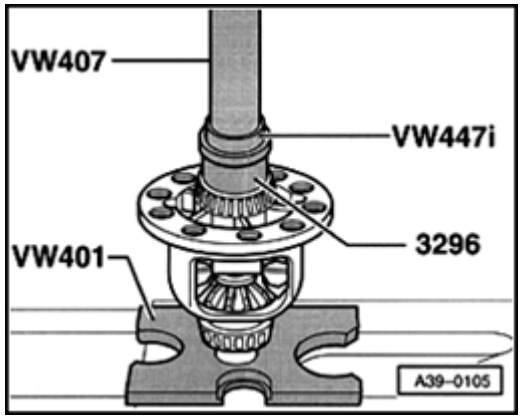


Fig. 7 Installing left tapered roller bearing inner race

WARNING!

Wear protective gloves!

- Heat inner race to approximately 100 ° C (212 ° F), position and install.

Note:

For transmissions with drive flange without polygon bearing (⇒ Page 00-3) use 40-21 sleeve.

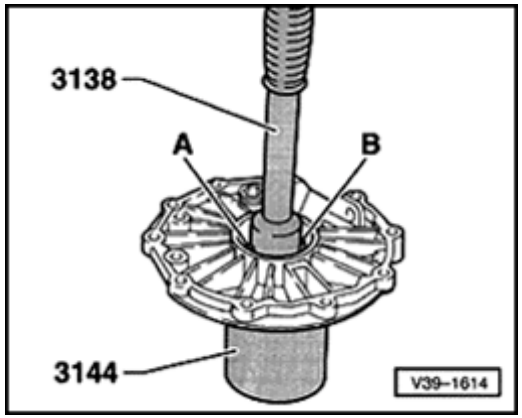


Fig. 8 Driving out left tapered roller bearing outer race from cover

- Turn webs -A- and -B- out until they sit on outer race within recess in transmission.
- After removing, check adjustment shims for damage.

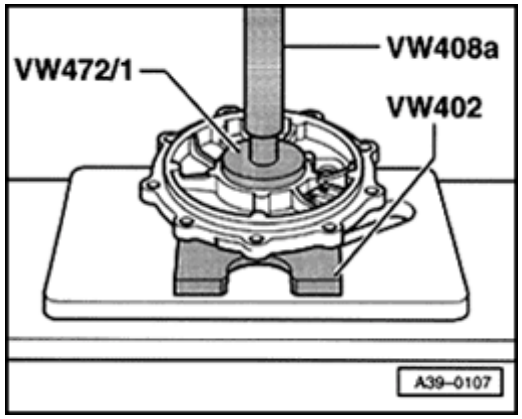


Fig. 9 Driving in left tapered roller bearing outer race into cover

- Insert VW472/1 pressure piece together with cone in outer race.

Note:

For transmissions with drive flange without polygon bearing (⇒ Page 00-3) use VW511 thrust pad and VW295 needle bearing drift.

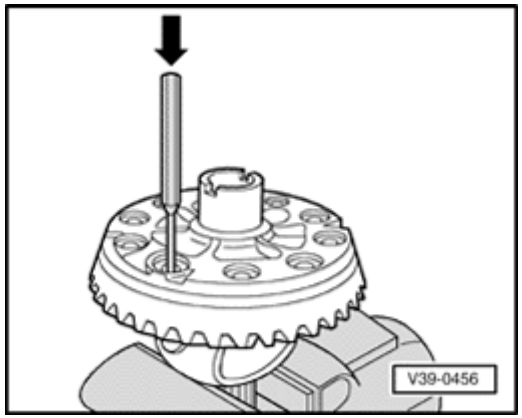


Fig. 10 Driving out ring gear from housing

39-27

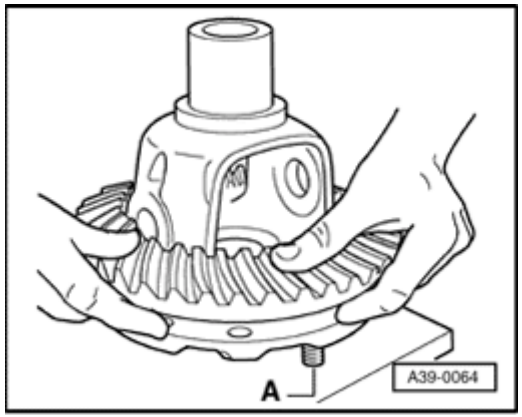


Fig. 11 Installing ring gear

WARNING!

Wear protective gloves!

- When installing ring gear guide with centering pins -A- (local manufacture).
- Heat ring gear to approximately 100 ° C (212 ° F) and install.
- Before installing bolts, allow ring gear to cool a bit. Then tighten to specified torque.

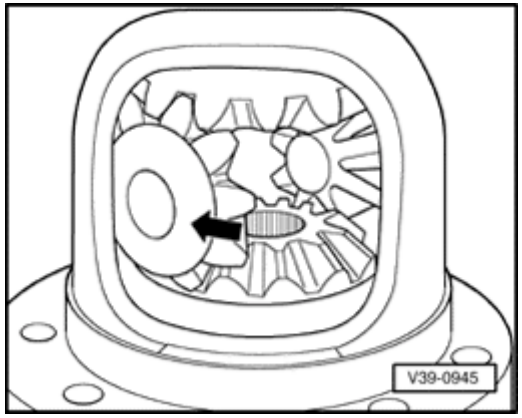


Fig. 12 Installing differential bevel gears

- Lubricate one-piece thrust washer with transmission oil before installing.
- Install large differential bevel gears.
- Install small differential bevel gears at 180 ° from their final position and rotate into place (arrow).
- Drive in differential bevel gear shaft to final position and secure.

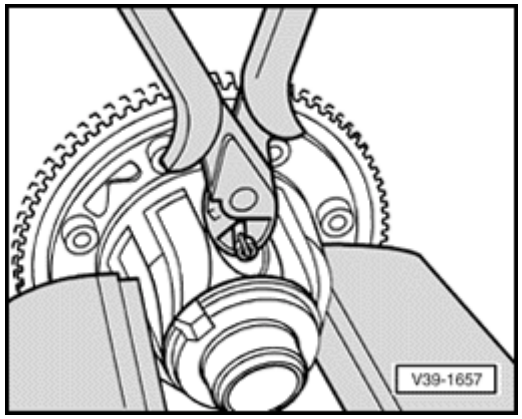


Fig. 13 Removing and installing roll pin

Removing

- Remove roll pin with annular groover using diagonal cutting pliers.
- Remove roll pin without annular groove using punch.

Installing

- Install roll pin to stop.