

38 AUTOMATIC TRANSMISSION - GEARS, HYDRAULIC CONTROLS

TRANSMISSION, DISASSEMBLING AND ASSEMBLING

Transmission, disassembling and assembling

CAUTION: Do not run engine with the end cover removed or without ATF filling and do not tow vehicle.

End cover, removing and installing

NOTE:

- Rules of cleanliness for working on automatic transmissions --> Rules for cleanliness when working on transmission.
- General repair notes --> Repair instructions.

Special tools, testers and auxiliary items required

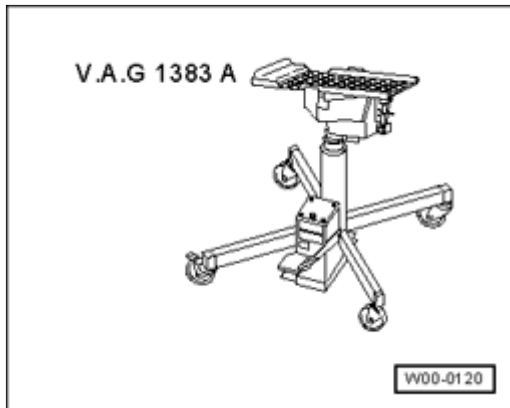


Fig. 150: Identifying Engine/Transmission Jack V.A.G. 1383 A
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Engine/transmission jack V.A.G 1383 A

Removing

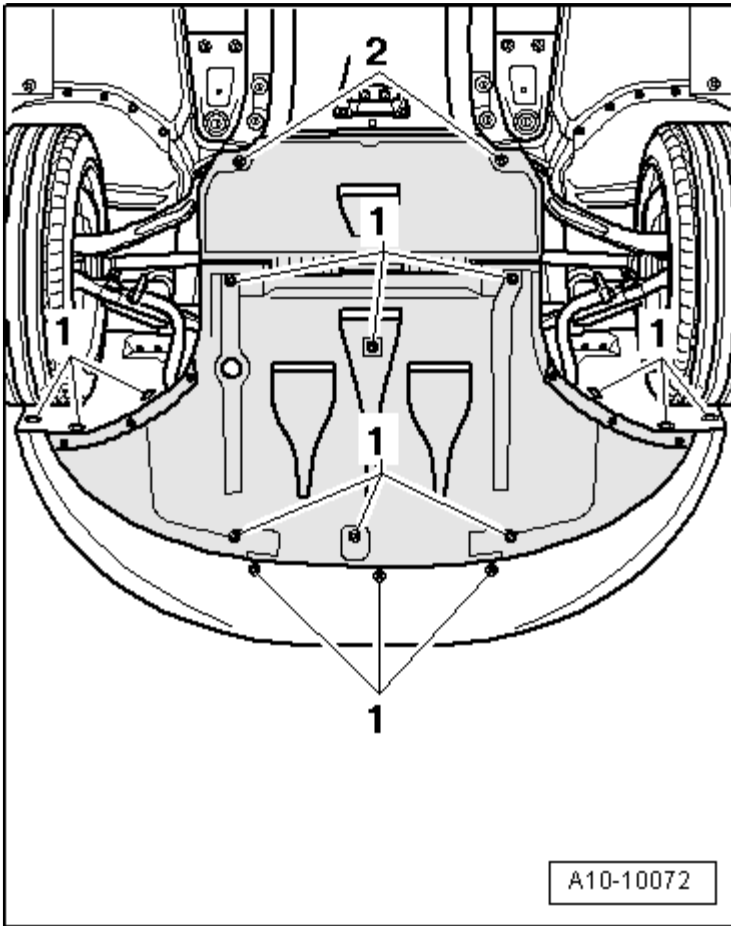


Fig. 151: Identifying Quick-Release Fasteners & Noise Insulation
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Loosen quick-release connectors - 1 - and - 2 - and remove noise insulation.
- Drain ATF --> **ATF, changing or filling after repairs.**

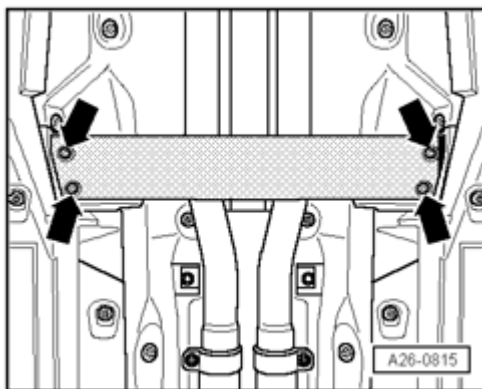


Fig. 152: Removing Front Transverse Beam
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Remove front crossmember - **arrows** -.

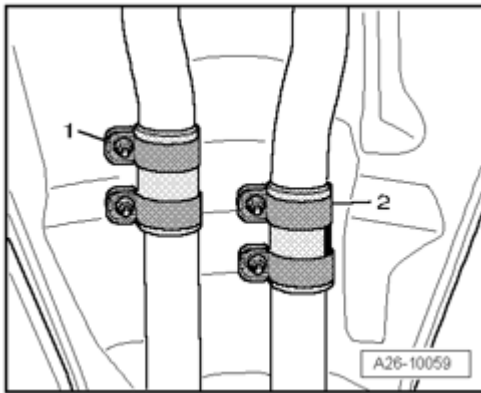


Fig. 153: Loosening Clamping Sleeves

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Loosen clamping sleeves - **1** - and - **2** -.

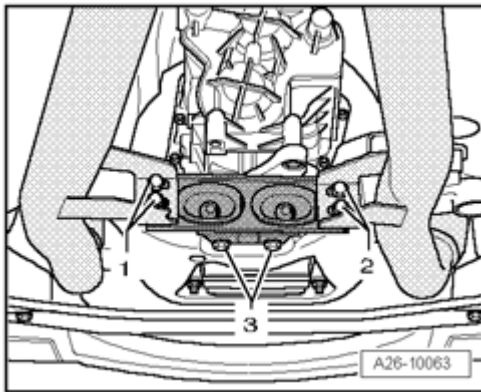


Fig. 154: Removing/Installing Mounting Bolts For Front Exhaust Pipes

Courtesy of VOLKSWAGEN UNITED STATES, INC.

NOTE:

- Flex joint in front exhaust pipe must not be bent more than 10 °, otherwise it may be damaged.

- Remove bolts - **1** - and - **2** - at front exhaust pipe rear bracket.

NOTE:

- Disregard - **3** -.

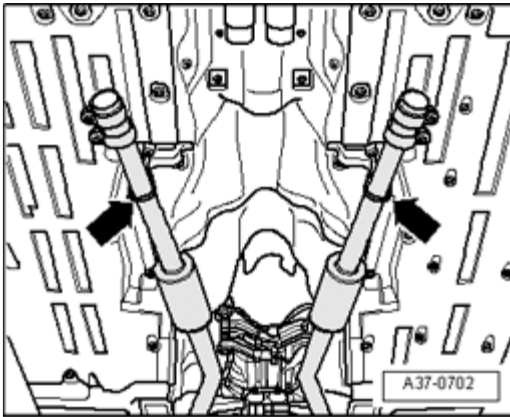


Fig. 155: Left And Right Exhaust System Pipes Tied Up To Body
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Tie left and right exhaust system pipes up to body - **arrows** -.

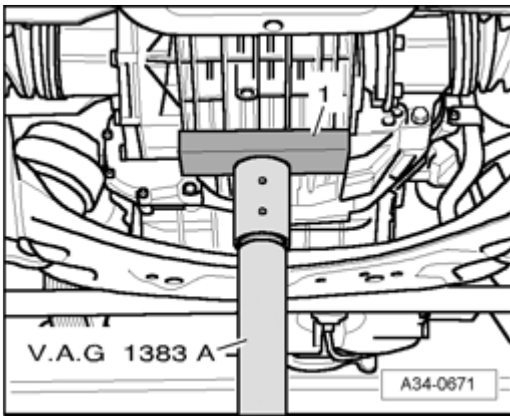


Fig. 156: Placing Plunger Of Engine/Transmission Jack V.A.G 1383 A With Block Of Wood Inserted In Between Transmission At Bottom
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Place plunger of engine/transmission jack V.A.G 1383 A with a block of wood inserted in between - **1** - on transmission at bottom.
- Raise transmission slightly using engine/transmission jack V.A.G 1383 A.

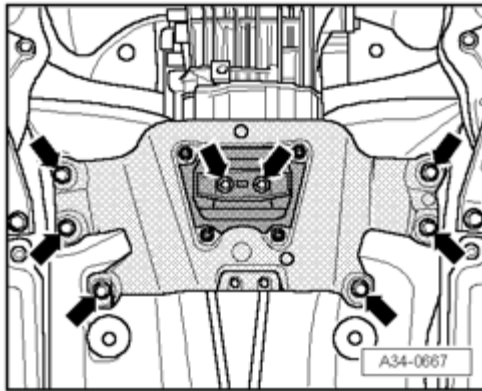


Fig. 157: Left Transmission Support, Bolts And Transmission Mounting -- Vehicles With 8-Cyl. Engine
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Remove bolts - **arrows** - and remove tunnel crossmember.

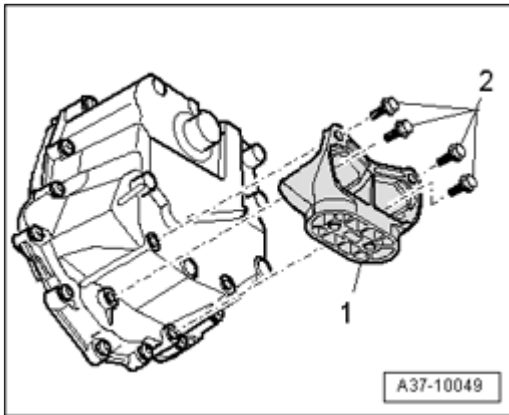


Fig. 158: Identifying Transmission Support And Bolts
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Remove bolts - **2** - and remove transmission support - **1** - from transmission.

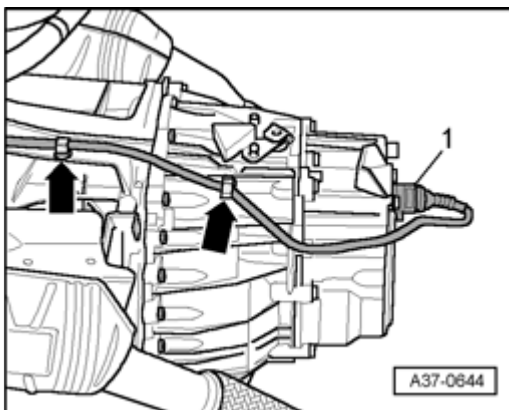


Fig. 159: Disengaging Electrical Harness Connector And Disconnecting From Transmission
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Disengage electrical harness connector - 1 - and disconnect from transmission.

NOTE:

- Ignore - arrows -.

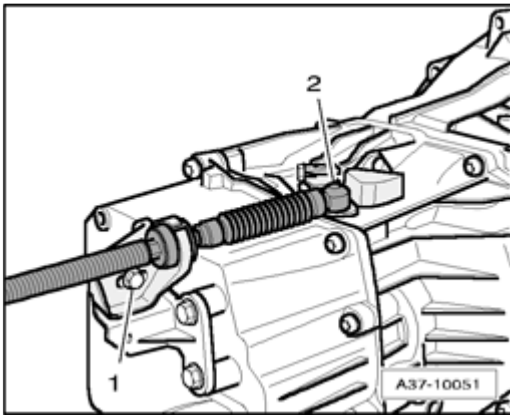


Fig. 160: Removing Support Bracket For Selector Lever Cable
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Mark installation position of support bracket for selector lever cable.
- Remove bolt - 1 - support bracket for selector lever cable.

NOTE:

- Disregard - 2 -.

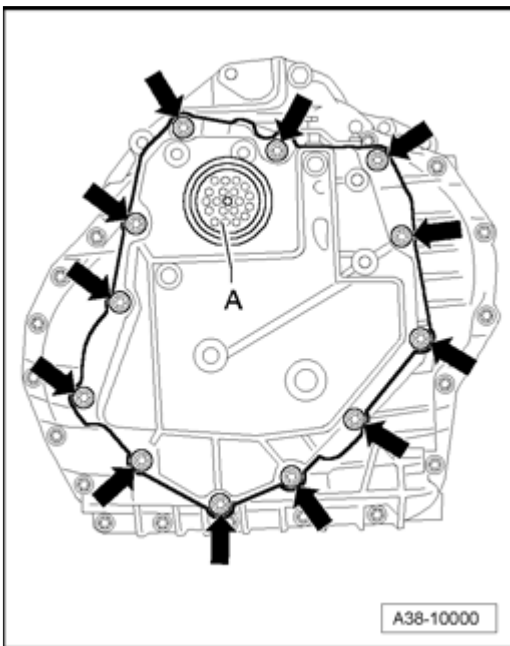


Fig. 161: Removing/Installing Bolts And End Cover
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Remove bolts - **arrows** - and remove end cover.

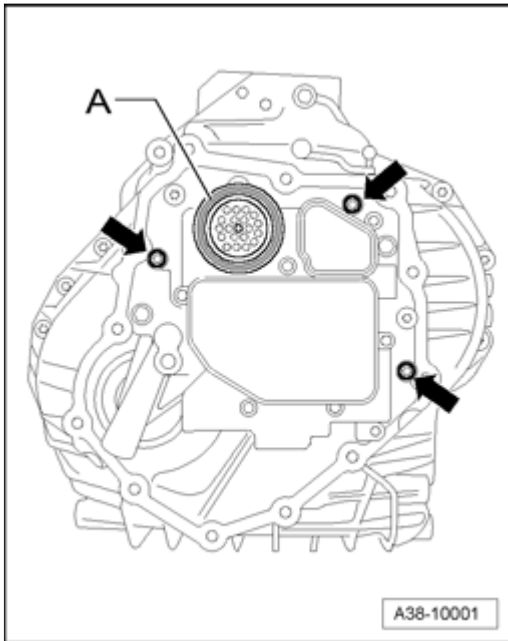


Fig. 162: Sliding New Twin Lip Oil Seal With Twin Lips Facing Outward Onto Connector At Transmission Control Module (TCM) J217

Courtesy of VOLKSWAGEN UNITED STATES, INC.

Installing

Installation is in reverse order of removal. Note the following:

NOTE:

- **Replace sealing rings, seals and bolts for end cover.**

- Slide new twin lip oil seal - **A** - with twin lips facing outward onto connector at Transmission Control Module (TCM) J217.
- Clean sealing surfaces on transmission housing and on end cover.
- If bushings were installed in transmission housing or in cover, they must be re-mounted in the same location.

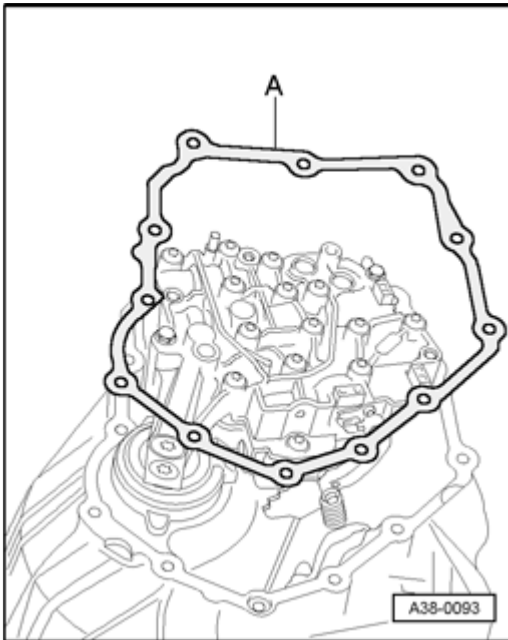


Fig. 163: Placing New Seal For End Cover Onto Transmission Housing
 Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Place new seal for end cover - A - onto transmission housing.

NOTE:

- There are metal and paper seals. The new seal must be made of the same material as the old one.
- Make sure bushings are seated properly.

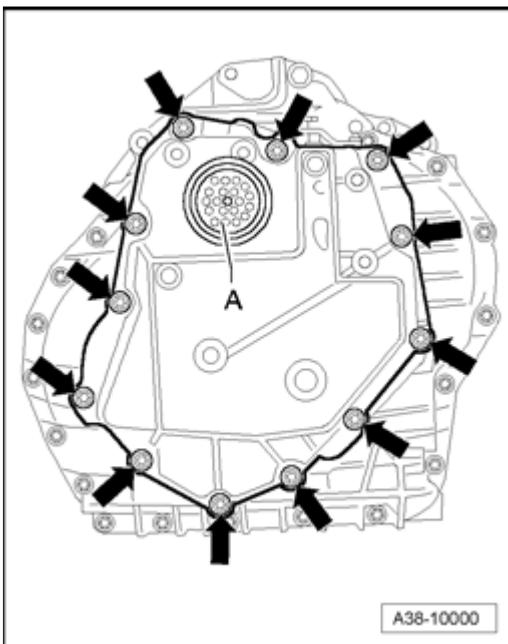


Fig. 164: Removing/Installing Bolts And End Cover

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Put on end cover and make sure seal does not slip.
- Tighten new bolts - **arrows** - , first hand-tighten and in diagonal sequence, and then to tightening torque.
- Check installation position of twin lip oil seal - **A** - :
- Twin lip oil seal must fit flush (sealing lips must not be twisted).
- Press selector shaft lever in position "D".

NOTE:

- **To ensure selector shaft lever is in position "D" , shift selector shaft lever on transmission back to stop in "P" and then 3 positions forward (in direction of travel).**

- Install selector lever bracket according to marking on console.
- Install transmission support --> **Transmission mounting and transmission support, removing and installing.**

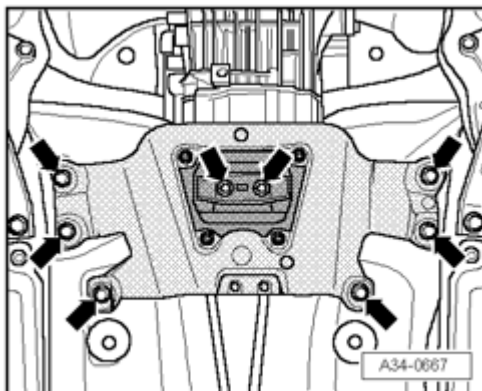


Fig. 165: Left Transmission Support, Bolts And Transmission Mounting -- Vehicles With 8-Cyl. Engine
 Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Install tunnel crossmember - **arrows** -.
- Install exhaust system and align free of tension --> **26 - EXHAUST SYSTEM, EMISSION CONTROLS** .
- Fill with ATF --> **ATF, changing or filling after repairs.**

Torque specifications

Component	Nm
End cover to transmission	15 plus an additional 90 ° turn * See note* See note
Tunnel crossmember to chassis	40
Transmission mount to transmission support	23

*Replace bolts.

* 90 ° is a quarter turn.

Transmission Control Module (TCM) J217 , removing and installing

NOTE:

- Rules of cleanliness for working on automatic transmissions --> Rules for cleanliness when working on transmission.
- General repair notes --> Repair instructions.

Removing

- Remove end cover --> End cover, removing and installing.

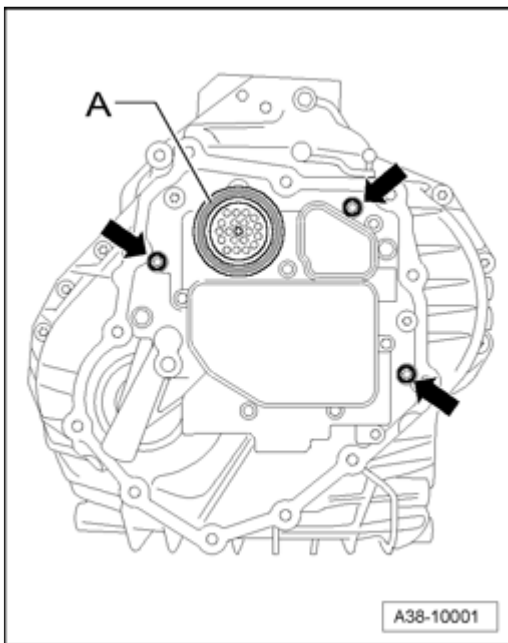


Fig. 166: Sliding New Twin Lip Oil Seal With Twin Lips Facing Outward Onto Connector At Transmission Control Module (TCM) J217

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Remove bolts - **arrows** - and pull out Transmission Control Module (TCM) J217 without tilting it.
- Remove twin lip oil seal - **A** - from Transmission Control Module (TCM) J217.

NOTE:

- When setting aside Transmission Control Module (TCM) J217 , make sure sensors on control module are not damaged.

Installing

Installation is in reverse order of removal. Note the following:

NOTE: • Replace seals and O-rings.

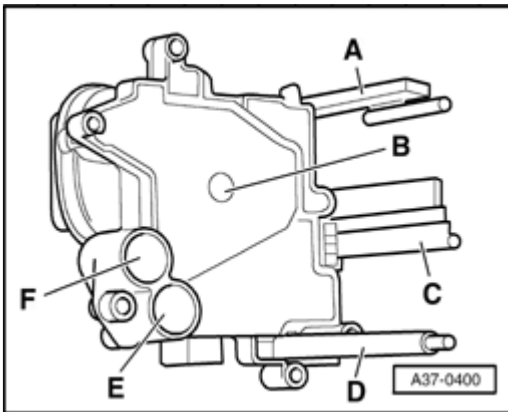


Fig. 167: Identifying Sensors Of Soiling And Metal Shavings
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- If necessary, clean sensors - A - , - C - and - D - of soiling and metal shavings.
- Clean selector shaft --> **Selector shaft, cleaning.**

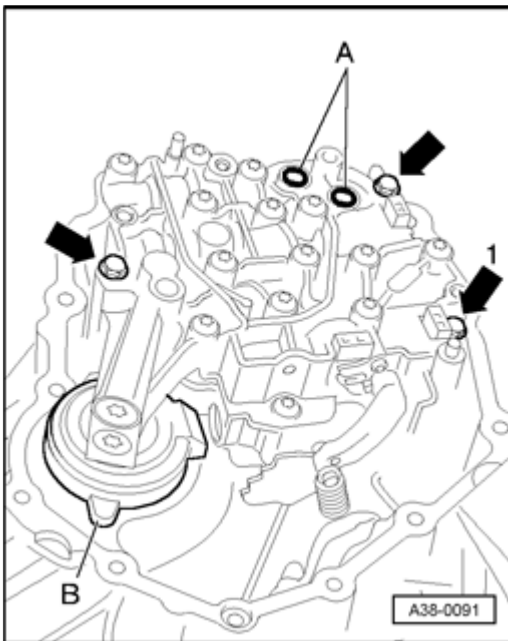


Fig. 168: Coating New O-Rings On Hydraulic Control Module With ATF
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Before installing Transmission Control Module (TCM) J217 , coat new O-rings - A - on hydraulic control module with ATF.

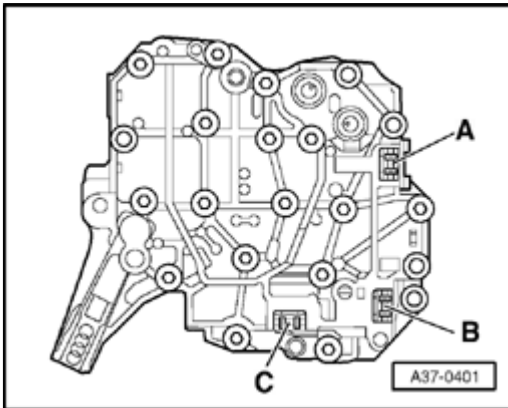


Fig. 169: Identifying Hydraulic Control Module Components
 Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Install Transmission Control Module (TCM) J217 without canting it.
- Harness connectors - **A** -, - **B** - and - **C** - on rear side of control module must engage on hydraulic control module.

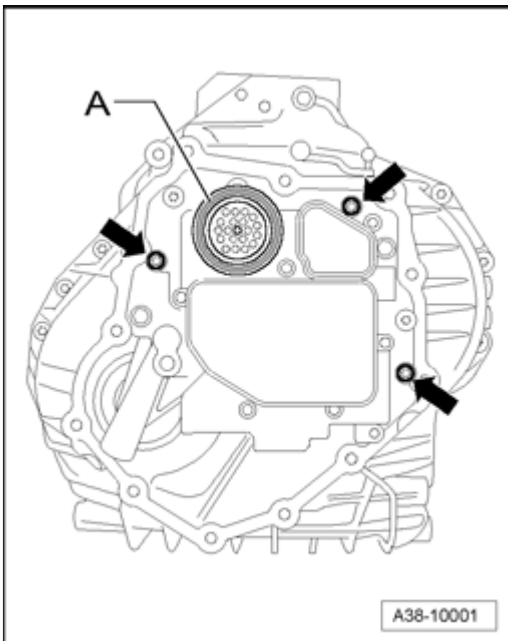


Fig. 170: Sliding New Twin Lip Oil Seal With Twin Lips Facing Outward Onto Connector At Transmission Control Module (TCM) J217
 Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Tighten bolts - **arrows** -.
- Install end cover --> **End cover, removing and installing.**

After connecting Transmission Control Module (TCM) J217 , the following work steps must be performed:

- Perform coding of a new Transmission Control Module (TCM) J217.
- Perform adaptation for Transmission Control Module (TCM) J217.

Use Vehicle Diagnosis, Testing and Information System VAS 5051 for this.

Torque specification

Component	Nm
Transmission Control Module (TCM) J217 to hydraulic control module	10

Selector shaft, cleaning

NOTE:

- **Rules of cleanliness for working on automatic transmissions --> Rules for cleanliness when working on transmission.**
- **General repair notes --> Repair instructions.**

Work procedure

- Remove Transmission Control Module (TCM) J217 --> **Transmission Control Module (TCM) J217, removing and installing.**

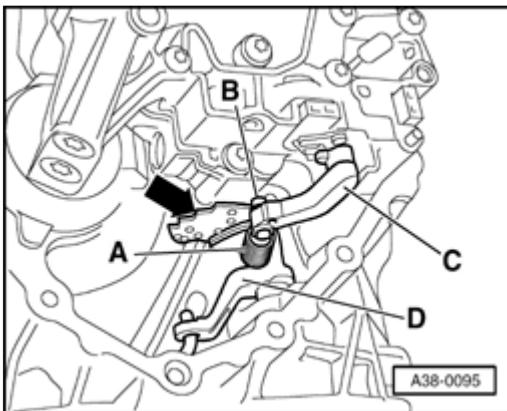


Fig. 171: Identifying Catch Of Selector Shaft, Spring & Roller
 Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Clean selector shaft retainer - **arrow** - with a lint-free cloth. Clean contact surfaces of magnet especially thoroughly of metal shavings and the like.

NOTE:

- **Make sure that spring - A - and roller - B - are secured properly.**

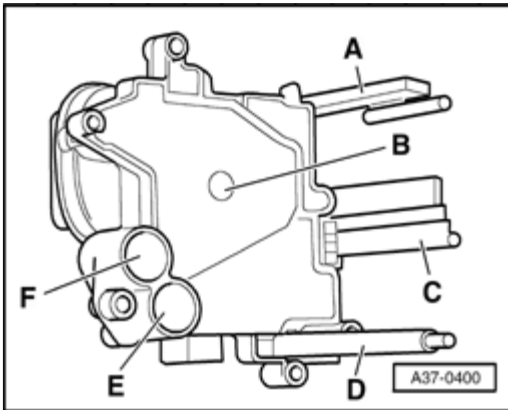


Fig. 172: Identifying Sensors Of Soiling And Metal Shavings
 Courtesy of VOLKSWAGEN UNITED STATES, INC.

- If necessary, clean sensors - A - , - C - and - D - of soiling and metal shavings.
- Install Transmission Control Module (TCM) J217 --> **Transmission Control Module (TCM) J217 , removing and installing.**

Hydraulic control module, removing and installing

NOTE:

- **Rules of cleanliness for working on automatic transmissions --> Rules for cleanliness when working on transmission.**
- **General repair notes --> Repair instructions.**
- **Always replace hydraulic control assembly if it has collected dirt or if it is faulty.**

Removing

- Remove Transmission Control Module (TCM) J217 --> **Transmission Control Module (TCM) J217 , removing and installing.**

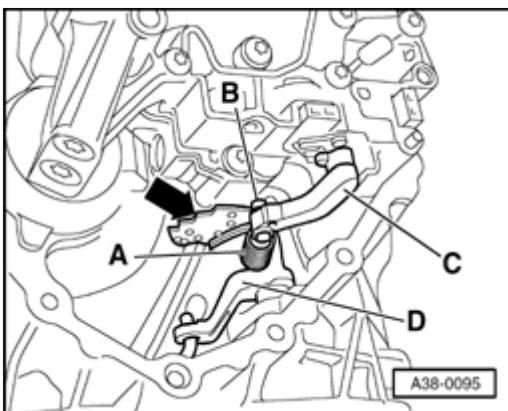


Fig. 173: Identifying Catch Of Selector Shaft, Spring & Roller
 Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Pull slider for selector lever position - **C** - downward out of bearing hole of hydraulic control module.
- Disengage spring - **A** - from selector shaft - **D** -.

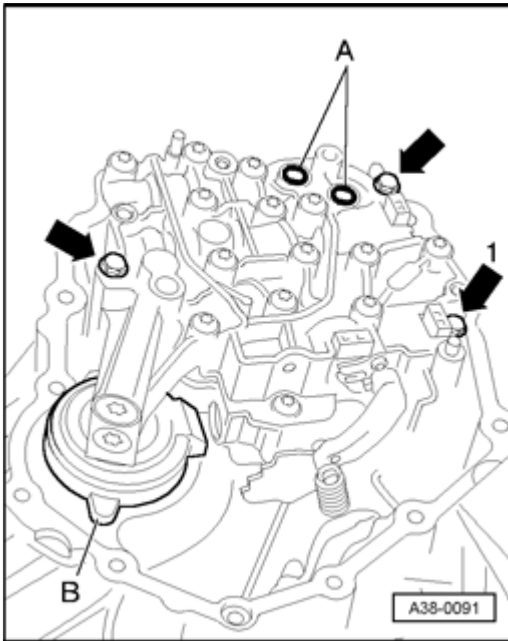


Fig. 174: Coating New O-Rings On Hydraulic Control Module With ATF
 Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Remove bolts - **arrows** - and remove hydraulic control module.

Installing

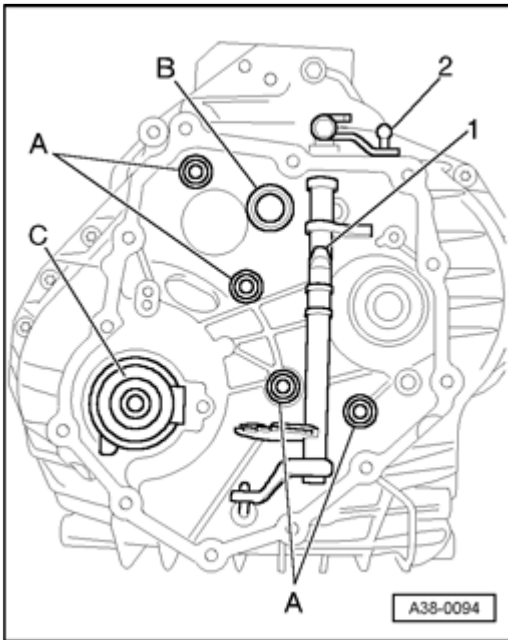


Fig. 175: Identifying Axial Sealing Elements, Cover, Selector Shaft & Shifting Cam
 Courtesy of VOLKSWAGEN UNITED STATES, INC.

Installation is in reverse order of removal. Note the following:

NOTE:

- **Replace seals and O-rings.**

- Replace axial sealing elements - **A** - (qty. 4) and - **B** -.

NOTE:

- **Lightly lubricate axial sealing elements with ATF before installing.**
- **Axial sealing elements - A - must be inserted into mounts with smaller diameter facing transmission.**

- Install cover - **C** - , while doing so, note locating tab.
- Locating tab on rear side of cover must be inserted into small hole on transmission surface.
- Push lever for selector shaft - **2** - completely toward front until it stops so that shifting cam - **1** - stands almost vertically (with slight tilt toward right).

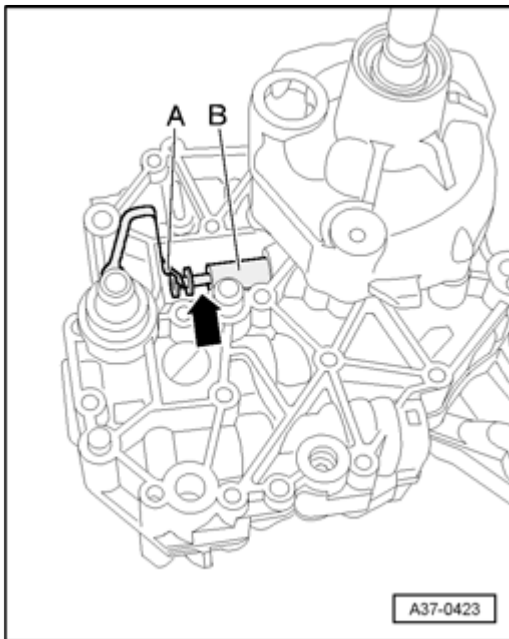


Fig. 176: Pressing Control Piston On Rear Side Of Hydraulic Control Module Completely Inward Until It Engages Into Assembly Spring

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Press control piston - **B** - on rear side of hydraulic control module completely inward (left) until it engages into assembly spring - **A** -.
- Insert hydraulic control assembly into transmission. Align unit properly to fit without jamming.

NOTE:

- When installing control module, make sure that shifting cam (item 1 in Fig. 175) engages into free groove - arrow - on control piston - **B** -.

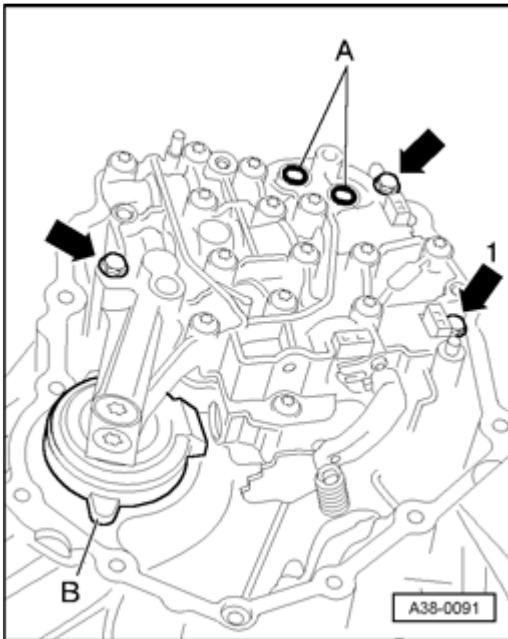


Fig. 177: Coating New O-Rings On Hydraulic Control Module With ATF
 Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Hand-tighten bolts - **arrows** -. Bolt - **arrow 1** - is shorter than the other 2 bolts.
- Check that cover is mounted properly.
- Locating tab - **B** - must be inserted into hole intended for it on the transmission.

Check function of control piston

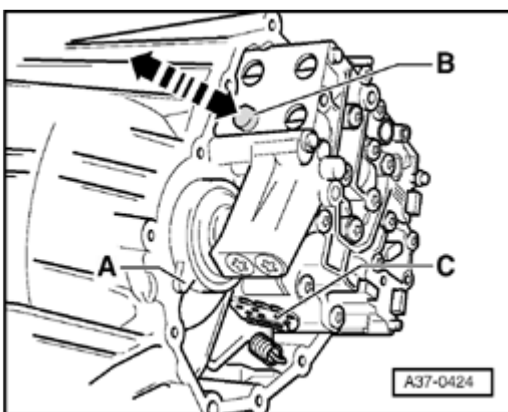


Fig. 178: Moving Selector Shaft At Detent Plate
 Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Move selector shaft at detent plate - **C** - or at lever for selector shaft several times toward left and right.
- When doing this, control piston - **B** - must travel outward and inward accordingly - **arrow** -.

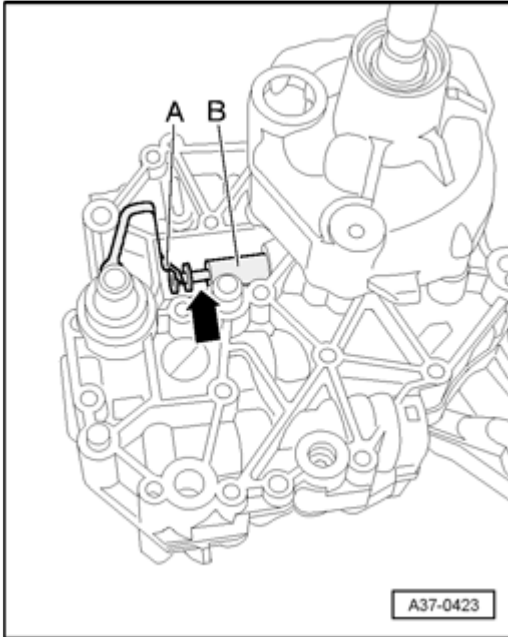


Fig. 179: Pressing Control Piston On Rear Side Of Hydraulic Control Module Completely Inward Until It Engages Into Assembly Spring
Courtesy of VOLKSWAGEN UNITED STATES, INC.

If control piston does not move, shifting cam has not engaged into groove - **arrow** - at control piston on rear side of hydraulic control module. In this case:

- Remove hydraulic control module once again and insert again.

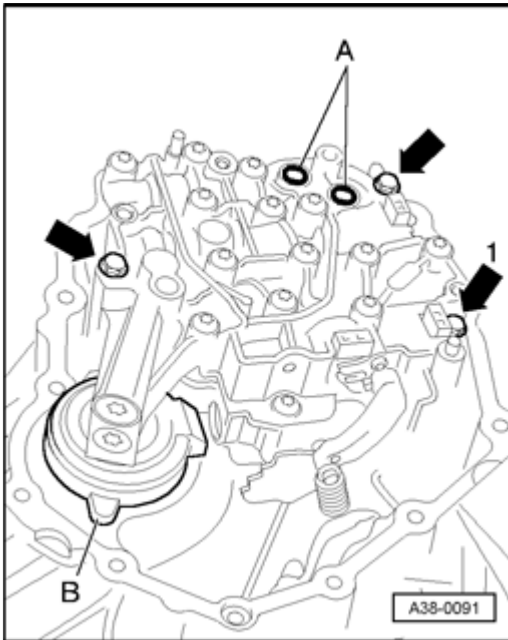


Fig. 180: Coating New O-Rings On Hydraulic Control Module With ATF
 Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Tighten bolts - **arrows** -.

Installing slider for selector lever position

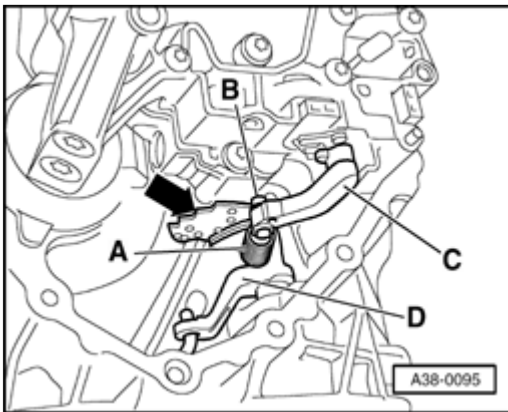


Fig. 181: Identifying Catch Of Selector Shaft, Spring & Roller
 Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Connect roller - **B** - with collar downward onto slider for selector lever position - **C** -.
- Engage spring - **A** - into selector shaft - **D** - and slider for selector lever position.
- Slide slider for selector lever position into bearing hole in housing of hydraulic control module.

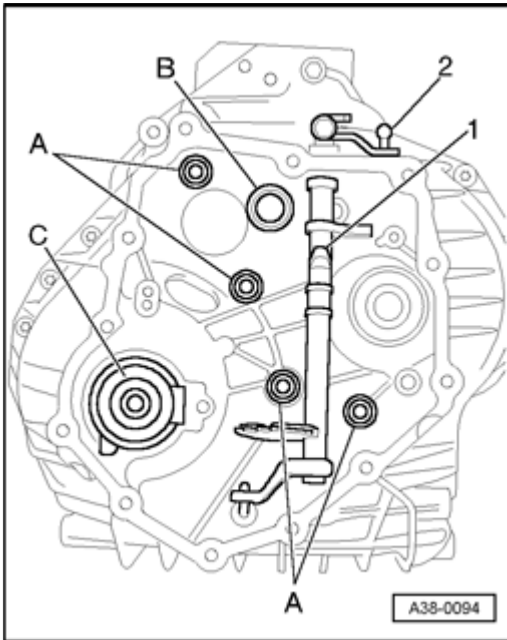


Fig. 182: Identifying Axial Sealing Elements, Cover, Selector Shaft & Shifting Cam
 Courtesy of VOLKSWAGEN UNITED STATES, INC.

NOTE:

- For the sake of illustration, transmission is shown without hydraulic control module.

○ Shift lever for selector shaft - **2** - toward front and rear until stop:

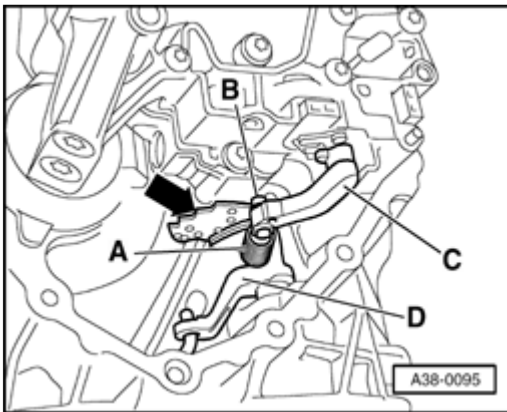


Fig. 183: Identifying Catch Of Selector Shaft, Spring & Roller
 Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Detent plate - **arrow** - moves toward front or rear.
- When doing this, it must allow the roller - **B** - to be engaged in the individual notches.
- Slider for selector lever position - **C** - moves in steps toward front or rear.
- Roller must be installed with collar facing downward so that it cannot be pulled off upward.

- Clean selector shaft --> **Selector shaft, cleaning.**
- Install Transmission Control Module (TCM) J217 --> **Transmission Control Module (TCM) J217, removing and installing.**
- Install end cover --> **End cover, removing and installing.**

Torque specification

Component	Nm
Hydraulic control module to transmission housing	10

Input shaft, removing and installing

NOTE:

- **Rules of cleanliness for working on automatic transmissions --> Rules for cleanliness when working on transmission.**
- **General repair notes --> Repair instructions.**

Special tools, testers and auxiliary items required

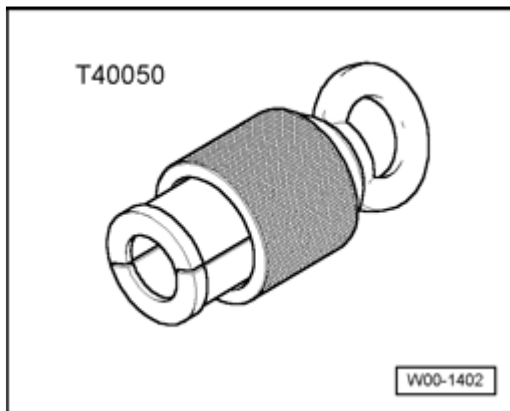


Fig. 184: Puller T40050

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Puller T40050

Removing

- Transmission removed and secured to assembly stand --> **Transmission, attaching to assembly stand.**
- Drain ATF --> **ATF, changing or filling after repairs.**

NOTE:

- **Fill with fresh ATF after repair.**

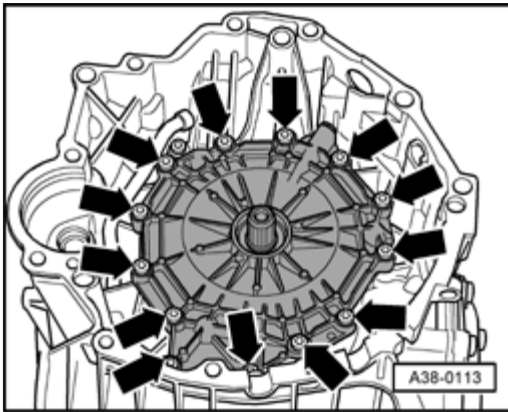


Fig. 185: Removing Input Shaft Bolts

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Remove bolts - **arrows** -.
- Using a plastic mallet, carefully knock input shaft flange cover so that input shaft flange cover loosens itself from seal.

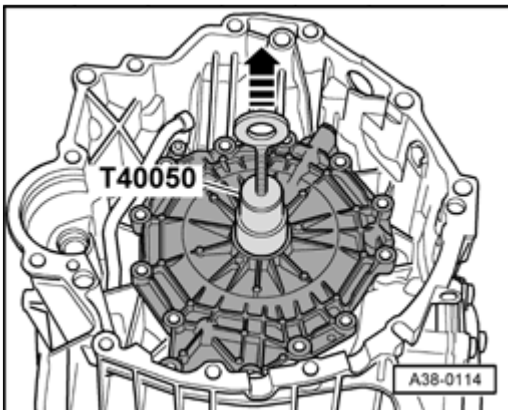


Fig. 186: Securing Puller T40050 On Transmission Input Shaft

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Secure puller T40050 on transmission input shaft.
- Check puller T40050 for secure seating on input shaft.
- Circlip must be pushed all the way down.
- Pull input shaft with flange cover and forward clutch on Puller T40050 out of transmission housing - **arrow** -.

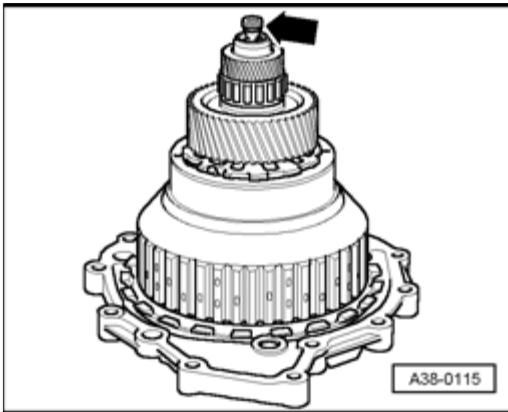


Fig. 187: Identifying Oil Pipe

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Do not put down input shaft on its guide bearing - **arrow** - at bottom end.

CAUTION: The reverse gear clutch plates must not be removed from the transmission housing.

Installing

Installation is in reverse order of removal. Note the following:

- Clean sealing surfaces on transmission housing and flange cover.

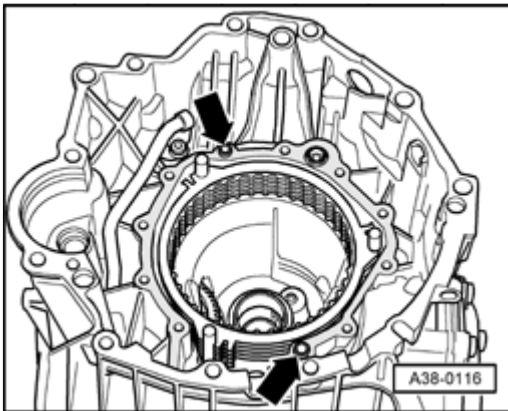


Fig. 188: Checking Whether Bushings For Centering Flange Cover On Transmission Housing Are Installed And Seated Securely

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Check whether bushings - **arrows** - for centering flange cover on transmission housing are installed and seated securely.

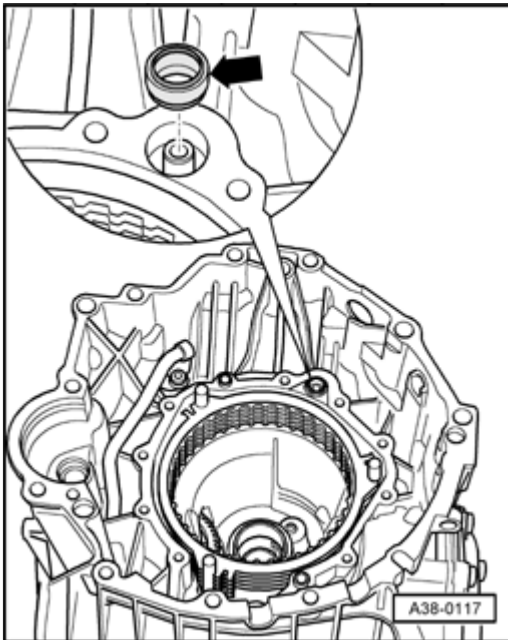


Fig. 189: Checking Condition Of Sealing Ring
 Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Check condition of sealing ring - **arrow** - , replace if necessary.
- Installation position of oil seal: Sealing lip towards flange cover.
- Place paper gasket in position.

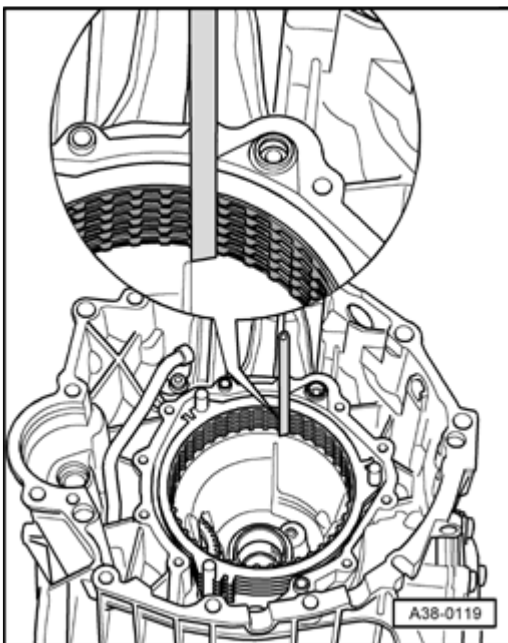


Fig. 190: Aligning Clutch Discs Of Reverse Gear Clutch E.G. Using Straight-Edge
 Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Align clutch discs of reverse gear clutch e.g. using a straight-edge.
- Splines must stand exactly in a row.
- Insert input shaft in transmission housing together with flange cover and forward clutch.

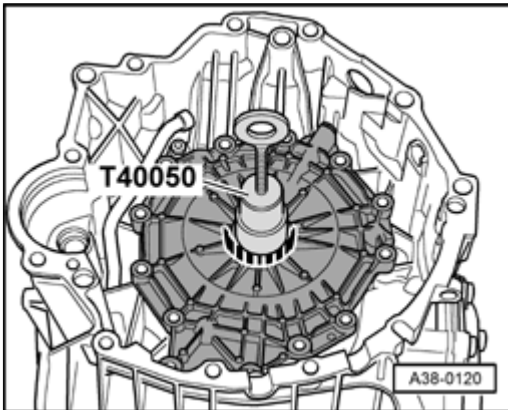


Fig. 191: Using Back And Forth Rotating Motions On Input Shaft Until Clutch Discs Of Reverse Gear Clutch Have Engaged

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Use back and forth rotating motions - **arrow** - on input shaft until clutch discs of reverse gear clutch have engaged. When doing this, raise input shaft slightly.
- Just before input shaft is fully in position, rotate it counter-clockwise over the last few millimeters so that it engages in the teeth of the helical intermediate gear.

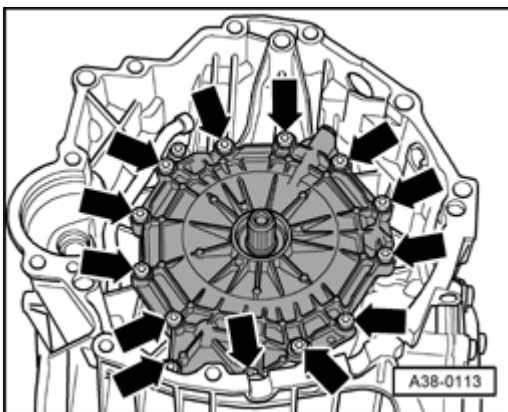


Fig. 192: Removing Input Shaft Bolts

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Tighten bolts - **arrows** - in diagonal sequence and in stages.
- Fill at least 4.5 to 5 liters of new ATF into transmission.
- After installing transmission, check ATF level and top off --> **ATF in planetary gear** .

Torque specification

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2008 Audi A6 Quattro

TRANSMISSION Continuously Variable Transmission (CVT) 01J

Component	Nm
Flange cover on transmission housing	23