

General repair instructions

The maximum possible care, cleanliness and proper tools are essential to ensure satisfactory and successful transmission repairs. The usual basic safety precautions also apply when carrying out vehicle repairs.

A number of generally applicable instructions for individual repair operations, which are otherwise mentioned at various points in the Repair Manual, are summarized here. They apply to this Repair Manual.

Special tools and equipment

For a complete list of special tools and equipment used in this Repair Manual ⇒ Special tools catalog

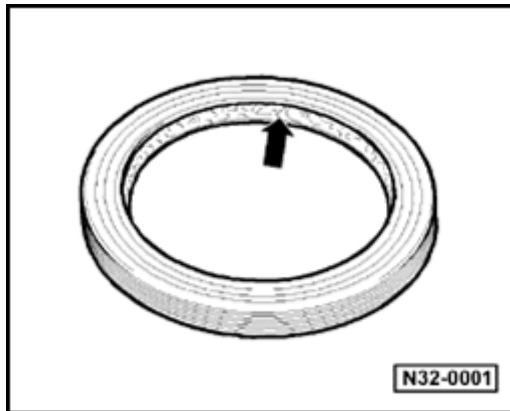
Transmission

- ◆ After replacing the transmission or rear final drive, check oil level and top-up if necessary ⇒ [Page 34-38](#) and ⇒ [Page 39-84](#) .
- ◆ Capacities and specifications ⇒ [Page 00-3](#) and ⇒ [Page 00-9](#) .
- ◆ Thoroughly clean all connections and the surrounding area before disconnecting.

- ◆ When installing transmission, make sure dowel sleeves for aligning the engine and transmission are correctly seated.

O-rings, gaskets, seals

- ◆ Always replace O-rings, gaskets and seals.
- ◆ After removing gaskets and seals, always inspect the contact surfaces on the housing or shaft for burrs resulting from removal or for other signs of damage.
- ◆ Thoroughly clean housing joint surfaces before assembling.



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- ◆ Before installing radial shaft seals, lightly oil outer edge and fill space between sealing lip and dust lip (arrow) with oil.
- ◆ The open side of the seals face toward the side containing the oil.
- ◆ When replacing seals, always vary the point at which the sealing lips make contact (use insertion depth tolerances).
- ◆ Lightly lubricate O-rings before installing, this prevents the rings from being pinched when inserting.
- ◆ Check oil level after replacing gaskets and seals ⇒ [Page 34-38](#) or ⇒ [Page 39-84](#) .

Sealants

- ◆ Thoroughly clean housing joint surfaces before applying sealing paste.

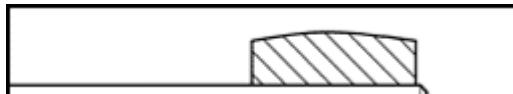
CAUTION!

◆ **Part numbers are listed here for reference only. Always check with your Parts department for the latest information.**

- ◆ Apply sealing paste AMV 188 200 03 or AMV 188 001 02 evenly and not too thick. Do not use sealing paste AMV 188 001 02 on a transmission with magnesium housing.
- ◆ Breather holes must remain free of sealing paste.

Circlips

- ◆ Always replace
- ◆ Do not over-stretch circlips.
- ◆ Circlips must be fully seated in the groove.



Roll pins

- ◆ Always replace roll pins.
- ◆ Installed position: slot is longitudinal to line of force (arrow).

Nuts, bolts

- ◆ Always replace self-locking nuts and bolts.
- ◆ Loosen nuts or bolts, opposite to tightening sequence.
- ◆ Tighten and loosen bolts and nuts for securing covers and housings in a diagonal sequence.
- ◆ Especially delicate parts, such as clutch pressure plates, must not be canted. Loosen and tighten bolts and nuts in stages in a diagonal sequence.
- ◆ The tightening torques stated apply to non-oiled nuts and bolts.
- ◆ The threads of bolts which are secured by a locking compound should be cleaned using a wire brush. Then apply AMV 185 101 A1 when installing.

CAUTION!

- ◆ ***Part numbers are listed here for reference only. Always check with your Parts department for the latest information.***

- ◆ ***Threaded holes for self-locking bolts or bolts coated with locking fluid must be cleaned with tap. Otherwise there is a danger of bolts shearing when subsequently being removed.***

WARNING!

- ◆ ***Do not re-use any fasteners that are worn or deformed in normal use.***

- ◆ ***Some fasteners are designed to be used only once, and are unreliable and may fail if used a second time. This includes, but is not limited to, nuts, bolts, washers, circlips and cotter pins. Always follow the recommendations in this manual-replace these fasteners with new parts where indicated, and any other time it is deemed necessary by inspection.***

Bearings

- ◆ Install needle bearings with the lettering on the bearing (the side with thicker metal) facing the drift or other installation tool.
- ◆ Grease needle bearing for the input shaft in the crankshaft.
- ◆ Lubricate all bearings in transmission with gear oil before installing.
- ◆ Always replace tapered roller bearings on one shaft together and use new bearings from the same manufacturer.
- ◆ Heat tapered roller bearing inner races to approx. 100 ° C (212 ° F) before installing. Press in until stop is reached so there is no axial play.
- ◆ Do not interchange inner and outer bearing races with those from other bearings of the same size.
- ◆ The tapered roller bearings for the output shaft and the differential in the transmission are low-friction bearings. Do not additionally oil new tapered roller bearings when measuring friction torque. The bearings are pre-treated at the

factory with a special type of oil for this purpose.

Shims

- ◆ Use a micrometer to measure the shims at several points. Different tolerances make it possible to obtain the exact shim thickness required.
- ◆ Check for burrs and signs of damage.
- ◆ Only install shims that are in perfect condition.

Gears, synchro-hubs, inner races for sliding gears

- ◆ Heat gears and synchro-hubs to approx. 100 °C (212 °F) before installing. Press in until stop is reached so there is no axial play.
- ◆ Heat inner races for sliding gears to approx. 100 °C (212 °F) when installing.
- ◆ The temperature can be checked using VAG1558 temperature tester.
- ◆ Observe installation position.

Sliding gears

After assembling, check axial play of 1st to 5th sliding gears and reverse sliding gear (0.15-0.35 mm .006-.014 in.) and check for free movement.

Synchronizer rings

- ◆ Do not interchange.
- ◆ When re-using, install synchronizer rings with the same gear with which they were previously matched.
- ◆ Check for signs of wear; replace if necessary.
- ◆ Lubricate with gear oil before installing.

Clutch mechanism

- ◆ When removing transmission, remove clutch slave cylinder without opening hydraulic lines.

CAUTION!

Do not depress the clutch pedal after removing the slave cylinder. Otherwise the piston will be pressed out of the slave cylinder.

- ◆ Do not cant clutch pressure plate, loosen and tighten in a diagonal sequence and in stages.
- ◆ To reduce odor caused by a burnt clutch, thoroughly clean the bellhousing, flywheel and

the side of the engine facing the transmission.