5 Automatic transmission - removal and installation

Removal

Note:
This is an involved operation. Read through the procedure thoroughly before starting work, and ensure that adequate lifting tackle and/or jacking/support equipment is available. A suitable tool will be required to align the torque converter when installing the transmission, and new fluid pipe O-rings may be required.

1 Open the hood, then raise the hood to its fully open position (see Chapter 11).

2 Disconnect the battery negative cable. **Caution:** *If the radio in your vehicle is equipped with an anti-theft system, make sure you have the correct activation code before disconnecting the battery.*

3 Jack up the vehicle and support securely on axle stands. Note that the vehicle must be raised sufficiently to allow clearance for the transmission to be removed from under the vehicle.

4 Remove the starter motor (see Chapter 5 Part A).

5 Where applicable, unbolt the exhaust mounting crossmember from under the vehicle.

6 Remove the driveshaft (see Chapter 8).

7 Drain the automatic transmission fluid (see Chapter 1).

8 Where applicable, unscrew the union nut and remove the fluid filler pipe from the transmission fluid pan.

9 Disconnect the selector cable from the transmission with reference to Section 3 .

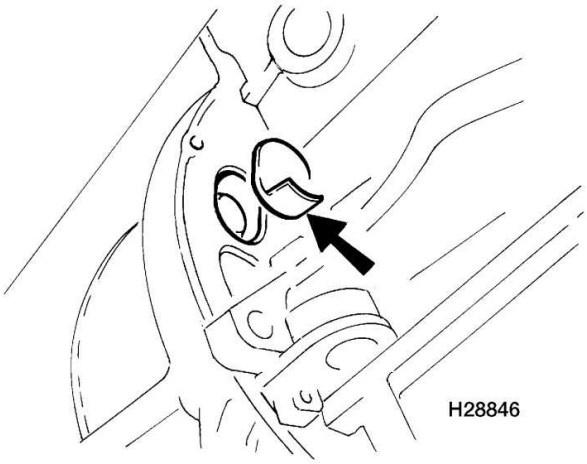
10 Disconnect the transmission wiring harness plug(s). Release the wiring harness from the brackets and clips on the transmission.

11 Where applicable, release the oxygen sensor from the bracket on the transmission.

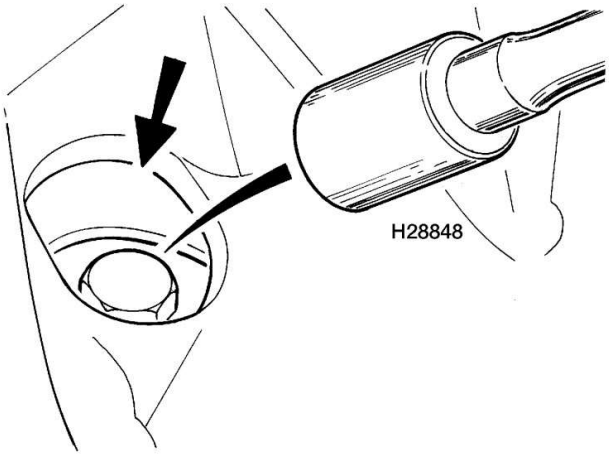
12 Unbolt the fluid cooler pipe brackets and clamps, then pull the fluid cooler pipes from the transmission fluid pan.

13 Pry the plug from the aperture in the engine/transmission adapter plate, above the oil pan, or from the aperture in the crankcase, depending on model, for access to the torque converter securing bolts **(see illustrations)** .

5.13a Pry the plug (arrow) from the engine/transmission adapter plate . . .



5.13b . . . or from the aperture in the crankcase



14 Unscrew the three torque converter bolts, turning the crankshaft using a wrench or socket on the pulley hub bolt, for access to each bolt in turn.

15 Support the transmission using a floor jack and interposed block of wood. **Caution:** *The transmission is heavy, so ensure that it is adequately supported.*

16 On six-cylinder models, if not already done, remove the heater/ventilation inlet air ducting from the rear of the engine compartment as follows.

A. Lift the grille from the top of the ducting (on certain Coupe models, it will be necessary to remove the securing screws and lift off the complete cowl grille assembly).

B. Working through the top of the ducting, remove the screws securing the cable ducting to the air ducting and move the cable ducting clear.

C. Unscrew the nuts and/or screw(s) securing the air ducting to the firewall (where applicable, bend back the heat shielding for access).

D. Remove the air ducting by pulling upwards.

E. Move the previously removed cable ducting clear of the valve cover.

17 On four-cylinder models, unbolt the wiring ducting from the rear of the engine, then connect an engine hoist and lifting tackle to the engine lifting eye (incorporated in the rear flange of the cylinder block casting) at the rear left-hand corner of the cylinder block. Raise the lifting tackle to just take the weight of the engine.

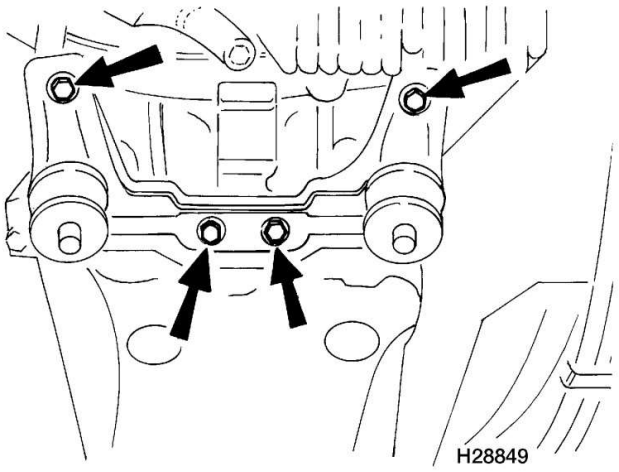
18 As an alternative, support the engine using a floor jack under the oil pan, with a block of wood between the jack and oil pan to spread the load. Raise the jack to just touch the oil pan.

19 On six-cylinder models, connect the lifting tackle to the engine lifting eye at the rear left-hand corner of the cylinder block (incorporated in the rear flange of the cylinder block casting).

20 Unbolt the crosstube from the vehicle floor, under the transmission bellhousing.

21 Where applicable, unbolt the transmission front mount assembly **(see illustration)** .

5.21 Where applicable, unscrew the securing bolts (arrows) and remove the transmission front mounting assembly



22 Check to ensure that the engine and transmission are adequately supported then, working under the vehicle, unscrew the nuts securing the transmission rubber mountings to the lugs on the transmission casing.

23 Remove the bolts securing the transmission crossmember to the body, then withdraw the crossmember from under the vehicle. If necessary, bend back or unbolt the exhaust heat shield for access to the crossmember bolts.

24 Using the jack(s) and engine hoist (where applicable), lower the engine and transmission until the rear of the engine cylinder head/manifold assembly is almost touching the engine compartment firewall. Check that the assembly is not resting against the heater hose connections on the firewall.

25 Where applicable, unscrew the bolt securing the engine/transmission adapter plate to the right-hand side of the transmission bellhousing.

26 Unscrew the engine-to-transmission bolts, and recover the washers, then slide the transmission rearwards.

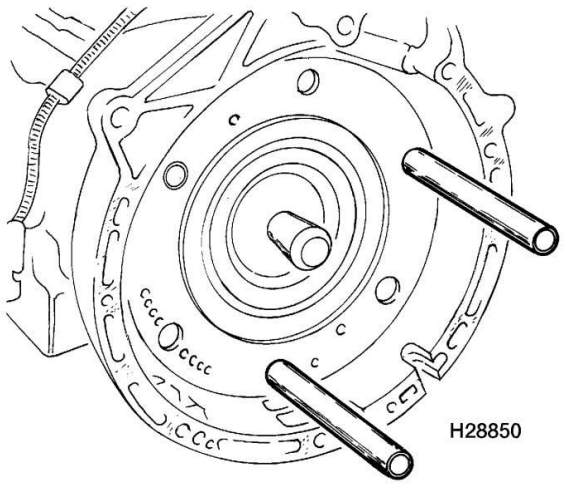
27 Insert a suitable metal or wooden lever through the slot in the bottom of the bellhousing to retain the torque converter. As the transmission is released from the engine, check to make sure that the engine is not forced against the heater hose connections or the firewall.

28 Lower the transmission and carefully withdraw it from under the vehicle, making sure that the torque converter is held in position. If the transmission is to be removed for some time, ensure that the engine is adequately supported in the engine compartment.

29 To remove the torque converter, first remove the retaining lever.

30 Fit two long bolts to two of the torque converter securing bolt holes, and use the bolts to pull the torque converter from the transmission **(see illustration)** . Pull evenly on both bolts. Be prepared for fluid spillage.

5.30 Fit two long bolts to lift out the torque converter



Installation

31 Where applicable, install the torque converter, using the two bolts to manipulate the converter into position.

32 Ensure that the transmission locating dowels are in position on the engine.

33 Before mating the transmission with the engine, it is essential that the torque converter is perfectly aligned with the driveplate. Once the engine and transmission have been mated, it is no longer possible to turn the torque converter to allow re-alignment.

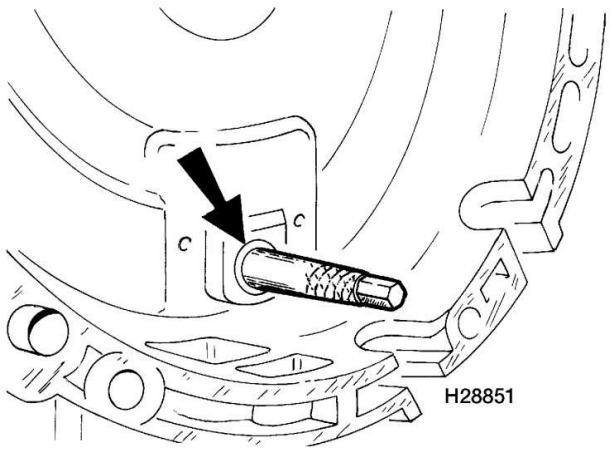
34 To align the driveplate with the torque converter, BMW recommends a special tapered tool which screws into the converter. It may be possible to improvise a suitable tool using an old driveplate-to-torque converter bolt with the head cut off, or a length of threaded bar - note that the end of the bolt or bar must either have a slot cut

in the end, or flats machined on it to allow it to be unscrewed once the engine and transmission have been mated.

35 Turn the driveplate to align one of the driveplate-to- torque converter bolt holes with the aperture in the bottom of the oil pan/bellhousing (for access to the oil pan securing bolt). This is essential to enable the alignment stud to be removed after the engine and transmission have been mated.

36 Screw the alignment tool into the relevant hole in the converter **(see illustration)** .

5.36 Alignment tool (arrow) screwed into the torque converter, aligned with aperture in bottom of oil pan/bellhousing



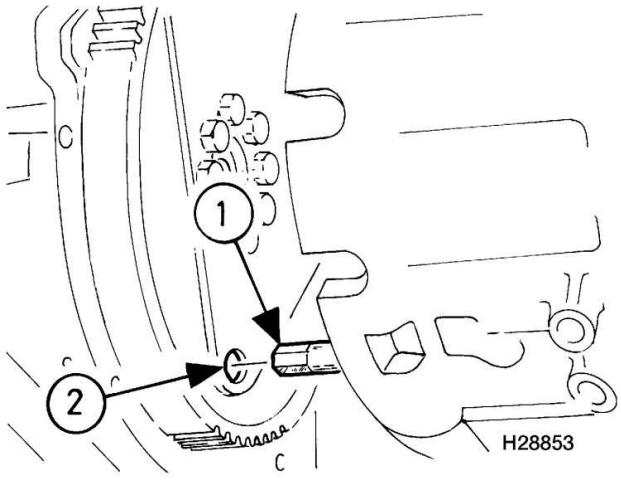
37 Where applicable, remove the retaining lever from the torque converter.

38 Ensure that the transmission is adequately supported, and maneuver it into position under the vehicle.

39 Turn the torque converter to align one of the driveplate bolt holes with the alignment tool fitted to the converter, then move the transmission into position.

40 Ensure that the alignment tool passes through the hole in the driveplate, then install and tighten the engine-to-transmission bolts, ensuring that the washers are in place **(see illustration)** .

5.40 Ensure that the alignment tool (1) passes through the hole (2) in the driveplate



41 Unscrew the alignment tool from the converter, then install the driveplate-to-torque converter bolt. Tighten the bolt to the specified torque.

42 Turn the crankshaft as during removal for access to the remaining two driveplate-to- torque converter bolt locations. Install and tighten the bolts.

43 Further installation is a reversal of removal, bearing in mind the following points.

A. Tighten all fasteners to the specified torque values, where applicable.

B. Check the condition of the transmission fluid pipe O-rings and replace if necessary.

C. Install the driveshaft (see Chapter 8).

D. Install the starter motor (see Chapter 5 Part A).

E. Reconnect and adjust the selector cable (see Section 3).

F. On completion, refill the transmission with fluid (see Chapter 1).