

240 Automatic Transmission

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a. Automatic Transmission Gear Ratios 240-1

GENERAL

Automatic transmissions are identified by code letters found on a data plate located on the side of the transmission case, behind the manual valve lever. See **200 Transmission-General** for application information. For gear ratio specifications, see **Table a**.

CAUTION —

ATF does not circulate unless the engine is running. When towing an automatic transmission vehicle, use a flat-bed truck or raise the rear wheels off the ground.

The electronic transmission control module (TCM) monitors transmission operation for faults and alerts the driver by illuminating the transmission fault indicator on the instrument panel. On-board diagnostic codes stored in the TCM must be downloaded and interpreted by trained technicians using special BMW diagnostic equipment.

NOTE —

Internal repairs to the automatic transmission require special service equipment and knowledge. If it is determined that internal service is required, consult an authorized BMW dealer about a factory reconditioned unit or a transmission rebuild.

TRANSMISSION SERVICE

ATF level, checking

The automatic transmissions installed in the E36 models are normally filled with Dexron III automatic transmission fluid (ATF), although alternative fluids have been installed from the factory, depending on transmission type and model year. Some transmissions are filled with a special BMW "lifetime" automatic transmission fluid, which does not require periodic fluid changes.

CAUTION —

Mixing different types of transmission fluids will lead to transmission failure.

NOTE —

The transmission lubricant installed can be found on a type plate on the side of the transmission. In addition, a sticker may be located on the fluid sump indicating the type of transmission lubricant used. If in doubt, consult an authorized BMW dealer for alternate fluid use and current information regarding transmission operating fluids.

The transmission is not equipped with a dipstick. Checking the ATF level requires measuring and maintaining a specified ATF temperature during the checking procedure. The checking temperature is not fully warm or cold (the ATF sump should be approximately warm to the touch).

Table a. Automatic Transmission Gear Ratios

Transmission	A4S 310R (THM-R1) (1992-1993)	A4S 310R (THM-R1) (1993-on)	A5S 310Z (5HP 18)	A4S 270R (THM-R1)
Gear ratios:				
1st	2.40	2.86	3.67	2.86
2nd	1.47	1.62	2.00	1.62
3rd	1.00	1.00	1.41	1.00
4th	0.72	0.72	1.00	0.72
5th	-	-	0.74	-
Reverse	2.00	2.00	4.10	2.00

TRANSMISSION SERVICE

WARNING —

If the appropriate temperature measuring equipment is not available, ATF level checking should be left to an authorized BMW dealer. The checking procedure should be done on a lift with the engine running in neutral. In addition, the transmission fluid temperature must be maintained within a narrow range during the checking procedure.

1. Place vehicle on a lift.

WARNING —

To lift the vehicle safely, see 010 Fundamentals for the Do-it-Yourself Owner.

2. Warm up drivetrain by running engine until ATF reaches specified temperature. Apply brake and, while idling engine, shift through all gears several times. Turn engine off.

ATF Level Checking

- Fluid temperature..... 30-55°C (86-131°F)

3. Remove ATF fill plug. Place transmission in neutral and restart engine. See Fig. 1 or Fig. 2.

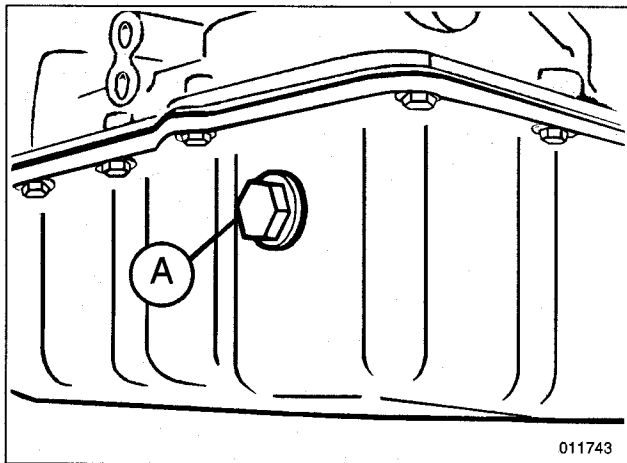


Fig. 1. ATF fill plug (A) on A4S 270 R/A4S 310R transmissions.

4. With ATF at specified temperature, add fluid until it spills from fill hole.

WARNING —

Hot ATF can scald. Wear eye protection and protective clothing and gloves during the check. If the transmission was overfilled, hot ATF will spill from the filler hole when the fill plug is removed.

5. Reinstall fill plug using new sealing ring.

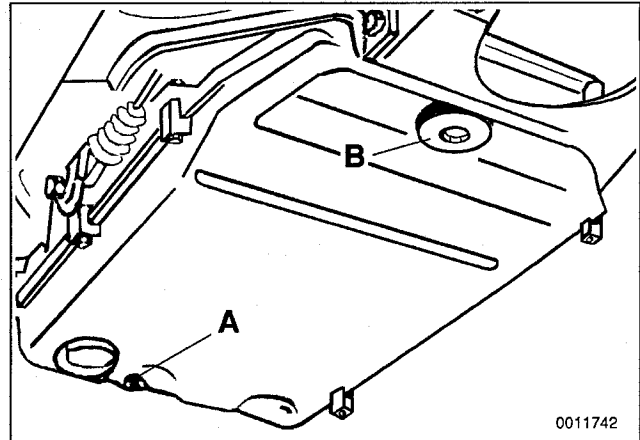


Fig. 2. ATF drain plug (A) and fill plug (B) on A5S 310Z transmission.

Tightening Torques

- ATF fill plug to ATF sump
A4S 270R/A4S 310R 33 Nm (24 ft-lb)
A5S 310Z (M30 plug) 100 Nm (74 ft-lb)

ATF, draining and filling

The procedure given here includes removal and installation of the ATF fluid strainer (filter).

1. Remove drain plug and drain fluid into container. See Fig. 3 or Fig. 2 given earlier.

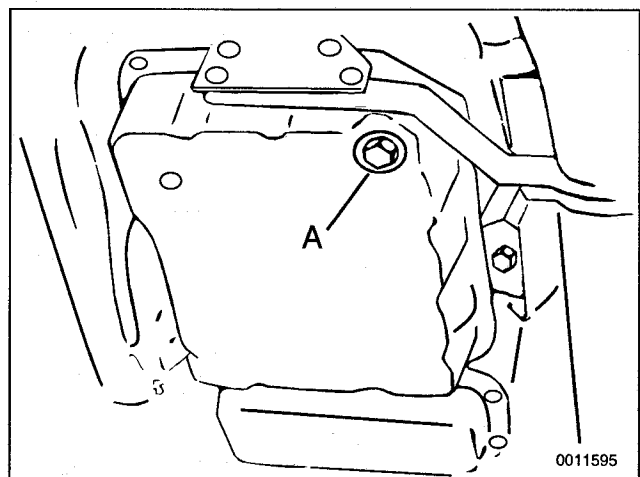


Fig. 3. ATF drain plug (A) on A4S 270 R/A4S 310R.

WARNING —

The ATF must not be hot when draining. Do not drain the ATF if the engine and/or transmission is hot. Hot ATF can scald. Wear eye protection, protective clothing and gloves.

2. On A4S 270R/A4S 310R transmissions: Remove front and rear oil sump mounting bolts and remove sumps and sump gaskets.

NOTE —

The A4S 270 R/A4S 310 R transmissions may be fitted with ASE (inch) bolts.

3. On A5S 310Z transmission: Remove oil sump mounting bolts and brackets, noting position of brackets. Remove sump and sump gasket.
4. Remove ATF strainer mounting screws and remove strainer together with gasket or O-ring. See Fig. 4 or Fig. 5.

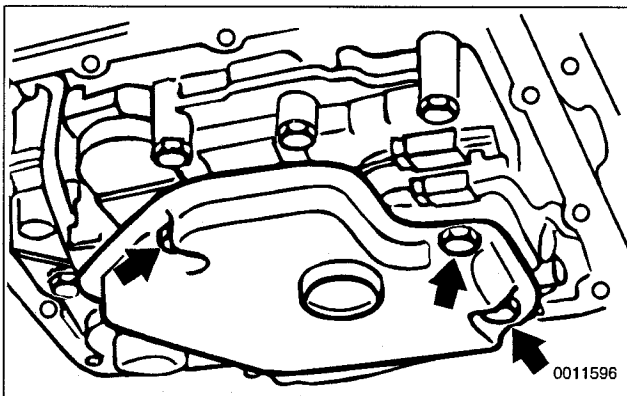


Fig. 4. A4S 270R/A4S 310R fluid strainer mounting bolts (arrows).

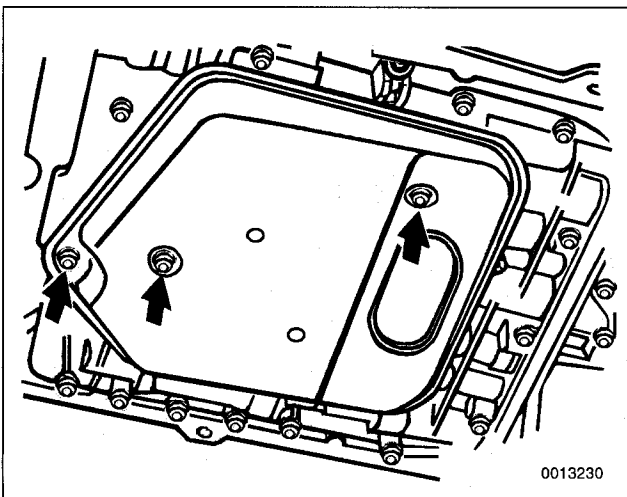


Fig. 5. A5S 310Z fluid strainer mounting bolts (arrows).

5. Installation is reverse of removal.

- Always replace seal for drain plug and all gasket(s) and O-rings.
- Clean sump and sump magnet(s) using a lint-free cloth.
- On A4S 270R/A4S 310R transmissions: Use new bolts at sump and tighten bolts in-line, one after other (*do not* tighten bolts in a cross-wise pattern).
- On A5S 310Z transmission, be sure to install rounded sump clamping brackets at corners of sump.
- Fill transmission with approved fluid.
- Check fluid level as described under **ATF level, checking**.

NOTE —

Use new sump bolts purchased from BMW. Alternatively, clean old bolts and coat with Loctite® thread locking compound or equivalent.

Automatic Transmission Fluid Capacity (refill only)

- A4S 270R/A4S310R
Removal of large sump only 3.0 liters (3.2 qt)
Removal of both sumps 5.0 liters (5.3 qt)
- A5S 310Z 3.3 liters (3.5 qt)

Tightening Torques

- ATF drain plug to ATF sump
A4S 270R/A4S 310R 25 Nm (18 ft-lb)
A5S 310Z (M10 plug) 16 Nm (12 ft-lb)
- ATF fill plug to ATF sump
A4S 270R/A4S 310R 33 Nm (24 ft-lb)
A5S 310Z (M30 plug) 100 Nm (74 ft-lb)
- ATF strainer to valve body
A4S 270R/A4S 310R 20 Nm (15 ft-lb)
A5S 310Z 6 Nm (53 in-lb)
- ATF sump to transmission
A4S 270R/A4S 310R (M6) 12 Nm (9 ft-lb)
A5S 310Z (M6) 6 Nm (53 in-lb)

TRANSMISSION REMOVAL AND INSTALLATION

Removal and installation of the transmission is best accomplished on a lift using a transmission jack. Use caution and safe workshop practices when working beneath car and lowering transmission.

WARNING —

To lift the vehicle safely, see 010 Fundamentals for the Do-it-Yourself Owner.

CAUTION —

- Be sure the vehicle is properly supported. The removal of the transmission may upset the balance of the vehicle on a lift.
- Tilting the engine to remove the transmission can lead to damage to various components due to lack of clearance.
 - On cars with AST remove throttle body.
 - Remove brake fluid reservoir if necessary.

Torx-head bolts are used to mount the transmission to the bellhousing. Be sure to have appropriate tools on hand before starting the job.

Transmission, removing and installing

1. Disconnect negative (–) cable from battery.

CAUTION —

Prior to disconnecting the battery, read the battery disconnection cautions given at the front of this manual on page viii.

2. Install engine support across engine bay. Raise and safely support vehicle. See Fig. 6.

WARNING —

- When raising the car using a floor jack or a hydraulic lift, carefully position the jack pad to prevent damaging the car body. A suitable liner (wood, rubber, etc.) should be placed between the jack and the car to prevent body damage.
- Watch the jack closely. Make sure it stays stable and does not shift or tilt. As the car is raised, the car may roll slightly and the jack may shift.

CAUTION —

Removal of transmission will cause engine to tip unless engine support is used.

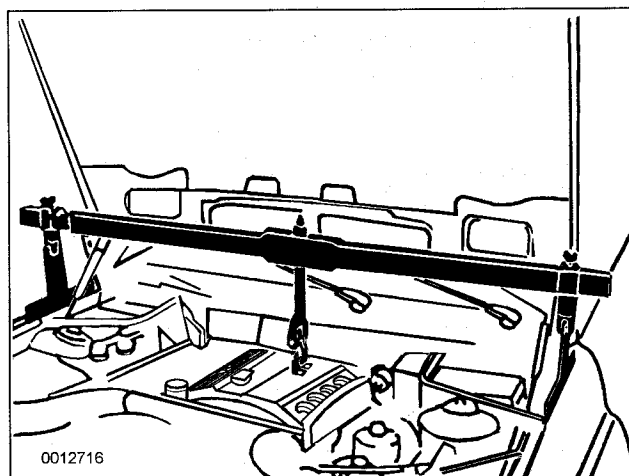


Fig. 6. Engine support equipment used to support engine from above before removing transmission.

3. Raise vehicle to gain access to underside of car.
4. Drain ATF from transmission as described earlier.
5. Disconnect oxygen sensor harness. Remove exhaust system, and exhaust heat shield. See 180 Exhaust System.
6. Remove driveshaft. See 260 Driveshaft.
7. With selector lever in **Park**, disconnect shift selector lever cable from lever and remove cable bracket. Hold linkage clamping bolt stationary when loosening clamping nut. See Fig. 7.

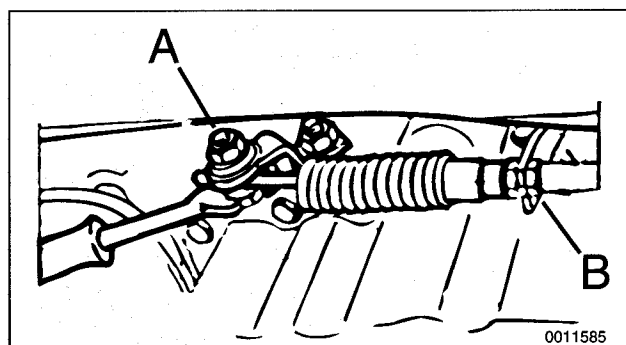


Fig. 7. Selector lever cable clamping nut (A). Loosen cable clamping nut (B) and remove cable from bracket. Always counterhold clamping bolt when loosening nut.

8. Disconnect main harness connector from transmission by turning its bayonet lock ring counterclockwise. Remove wiring harness from transmission housing. See Fig. 8.

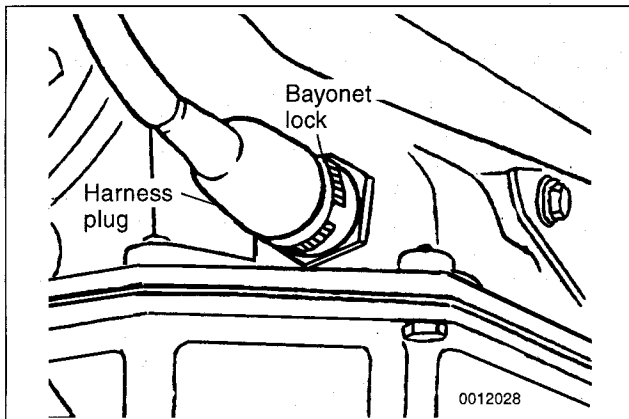


Fig. 8. Harness connector at automatic transmission.

9. Where applicable, disconnect harness connector from speed sensor at top of transmission.
10. Disconnect transmission cooler line clamps from engine. Disconnect lines from transmission.
11. Support transmission with transmission jack. Remove reinforcing cross brace (if applicable) and transmission support crossmember.

NOTE —

Note installation position of support crossmember.

12. Remove access plug in cover plate on right side of engine block and remove torque converter bolts. Turn crankshaft to access bolts. See Fig. 9.
13. Remove bellhousing-to-engine mounting bolts. See Fig. 10.

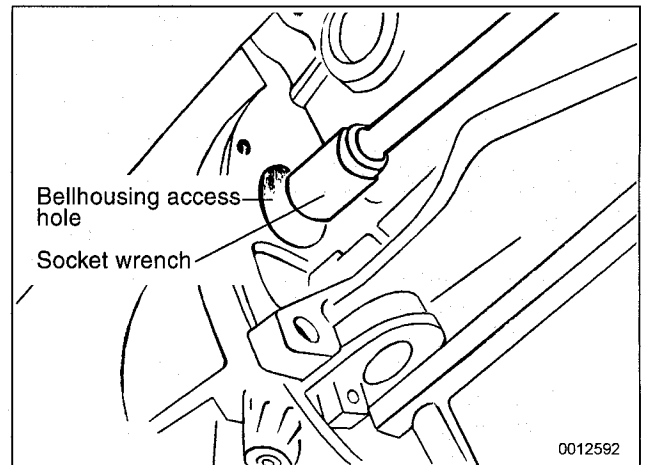


Fig. 9. Access and remove torque converter bolts through hole in bellhousing cover.

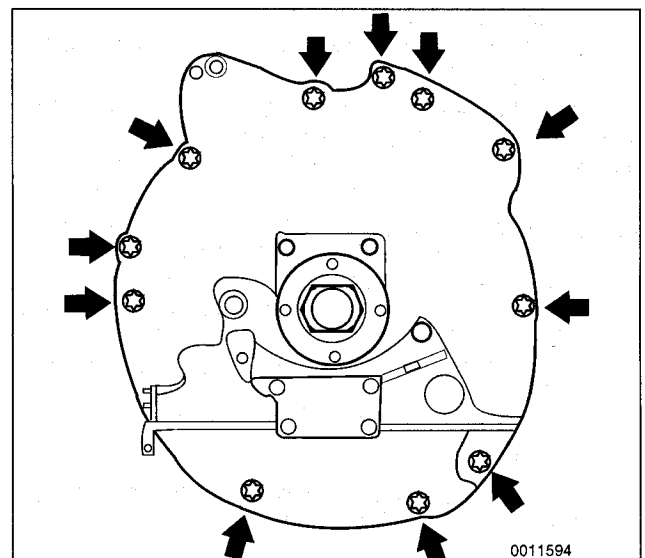


Fig. 10. Transmission-to-engine Torx-head mounting bolts.

14. Remove transmission by pulling back and down. Lower jack to allow transmission to clear vehicle.

CAUTION —

Do not allow the torque converter to fall off the transmission input shaft.

15. Installation is reverse of removal, noting the following:

- Blow out oil cooler lines with low-pressure compressed air and flush cooler with clean ATF twice before reattaching lines to transmission.

CAUTION —

- Wear safety glasses when working with compressed air.
- Do not reuse ATF after flushing.

- Install new sealing washers on hollow bolts.
- Install new O-rings on transmission cooler lines, where applicable.
- Inspect drive plate for cracks or elongated holes. Replace if necessary.
- Check to be sure torque converter is seated correctly in transmission during final installation.
- When mounting transmission to engine, the three mounting tabs on torque converter must be aligned with indentations on driveplate. Use an alignment dowel to line up bolt holes, if necessary.
- Fill transmission with clean ATF until oil level is even with fill hole. Then check fluid level as described earlier.
- Adjust gearshift mechanism. See **250 Gearshift linkage**.

NOTE —

Torx-head mounting bolts should always be used with washers to prevent difficult removal.

Tightening Torques

- ATF drain plug to ATF sump
 - A4S 270R/A4S 310R 25 Nm (18 ft-lb)
 - A5S 310Z (M10 plug) 16 Nm (12 ft-lb)
- ATF fill plug to ATF sump
 - A4S 270R/A4S 310R 33 Nm (24 ft-lb)
 - A5S 310Z (M30 plug) 100 Nm (74 ft-lb)
- ATF cooler lines (A4S 270R/A4S 310R)
 - Coupling nuts 20 Nm (15 ft-lb)
 - Hollow bolts 37 Nm (28 ft-lb)
- Reinforcing cross brace to chassis (M10) 42 Nm (31 ft-lb)
- Torque converter to drive plate (M10) 45 Nm (33 ft-lb)
- Transmission support crossmember to chassis
 - M8 22-24 Nm (16-17 ft-lb)
 - M10 42 Nm (31 ft-lb)
- Transmission to engine (Torx-head with washer)
 - M8 21 Nm (15 ft-lb)
 - M10 42 Nm (31 ft-lb)
 - M12 72 Nm (53 ft-lb)

