

210 Clutch

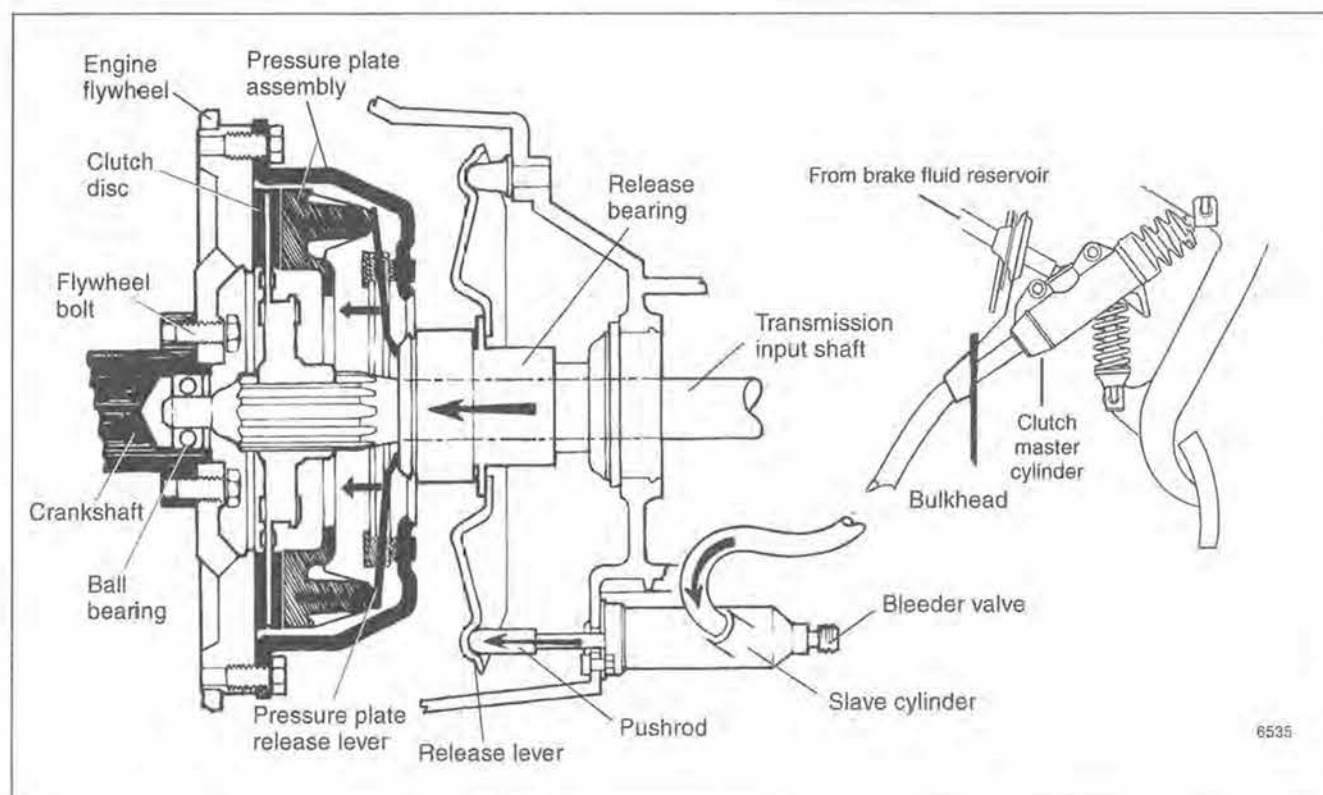
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GENERAL

The repair group covers replacement of the clutch mechanical and clutch hydraulic components. Special tools may be required for some of the service described in this repair group. Read the procedures through before beginning a job.

NOTE—

See 200 Transmission—General for transmission application information.



GENERAL

CLUTCH HYDRAULIC

The clutch is hydraulically actuated by master and slave cylinders. Clutch disc wear is automatically taken up by the pushrod travel of the slave cylinder, making periodic adjustment unnecessary.

NOTE—

Although seal rebuild kits are available for the master and slave cylinders, replacement of leaking master or slave cylinders as complete units is suggested.

Clutch hydraulic system, bleeding and flushing

If the clutch/brake fluid is murky or muddy, or has not been changed within the last two years, it should be flushed from the clutch hydraulic circuit. Flushing the old fluid from the clutch lines is done using a brake system pressure bleeder.

- Remove brake fluid reservoir cap and attach appropriate pressure bleeder to fluid reservoir as per manufacturer's instructions.

CAUTION—

Do not exceed 1 bar (14.5 psi) of pressure at the fluid reservoir.

- Connect a length of clear hose to slave cylinder bleeder valve and place open end of hose into clean container.
- Open bleeder screw on slave cylinder.
- Slowly operate clutch pedal several times. Close bleeder screw once fluid runs clear without air bubbles.
- Check fluid reservoir and top off fluid level.

NOTE—

If there is air trapped in the lines, unbolt the slave cylinder from the transmission. Push the slave cylinder pushrod all the way in and then slowly release it. Repeat process two times. This will force any remaining air in the system into the fluid reservoir.

Clutch master cylinder, replacing

The clutch master cylinder is mounted to the pedal assembly, directly above the clutch pedal.

- Disconnect negative (–) battery cable. See **020 Maintenance**.

CAUTION—

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

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- Remove brake fluid reservoir cap. Using a clean syringe, remove brake fluid from fluid reservoir.

WARNING—

Brake fluid is poisonous. Do not siphon brake fluid with your mouth. Wear hand and eye protection.

- Disconnect fluid feeder hose from the master cylinder. Be prepared to catch any leaking fluid.
- Working on engine side of bulkhead, disconnect fluid line fitting from master cylinder.
- Remove lower left instrument panel trim. On cars with SRS (airbag), remove the lower dashboard panel.
- Remove clutch pedal pushrod eccentric bolt (**arrow**). Note position of dot on bolt head before loosening nut.

NOTE—

Note the position of the "dot" on the head of the eccentric bolt. The dot must be facing either toward the master cylinder or away from the master cylinder, but not in between.

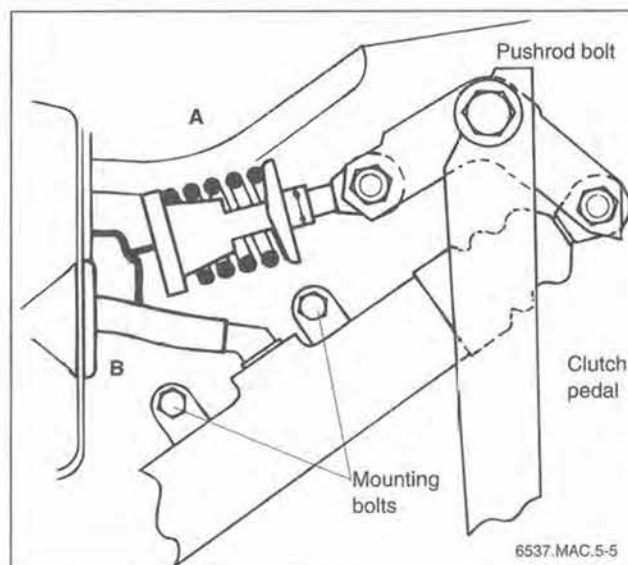
- Remove bolts connecting clutch master cylinder to clutch pedal bracket and remove master cylinder.

CAUTION—

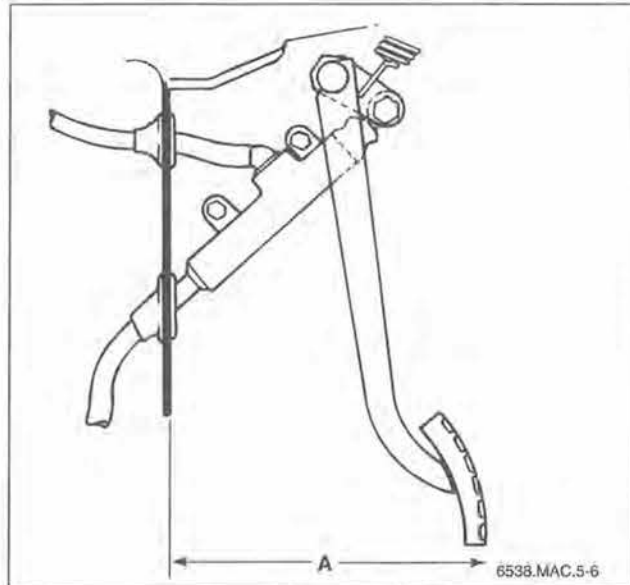
Brake fluid is damaging to paint. Any brake fluid that spills on the car should be cleaned off immediately.

- Installation is reverse of removal. Install pushrod eccentric bolt with dot on bolt head facing away from clutch master cylinder.

- On models with clutch pedal over-center helper spring (**A**), spring must be correctly seated before installing pushrod bolt.



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Check clutch pedal height. If pedal adjustment is incorrect, loosen eccentric bolt nut and rotate bolt 180° (dot facing the master cylinder). Refill brake fluid reservoir and then bleed clutch hydraulic system as described under **Clutch hydraulic system, bleeding and flushing**.

Tightening Torques

- Clutch master cylinder to console 9 Nm (80 in-lb)
- Clutch pushrod to clutch pedal 22 Nm (18 ft-lb)
- Fluid line to master cylinder 16 Nm (12 ft-lb)

CAUTION—

If making adjustments at the pushrod end, do not screw the pushrod end all the way in. This may cause the locknut to jam against the clutch pedal during operation. If pushrod length is changed significantly, check the locknut clearance with the clutch pedal fully depressed.

Tightening Torque

- Clutch master cylinder pushrod locknut. 10 Nm (89 in-lb)

Clutch slave cylinder, replacing

The slave cylinder is mounted to the left-hand (driver's) side of the transmission.

- Remove brake fluid reservoir cap. Using a clean syringe, remove brake fluid from reservoir.

WARNING—

Brake fluid is poisonous. Do not siphon brake fluid with your mouth. Always dispose of old fluid properly.

- Loosen fluid line fitting at slave cylinder. Unbolt slave cylinder from transmission and disconnect fluid pipe. Catch excess fluid in a container.
- Inspect pushrod tip and release lever for wear. Pushrod should be worn only on the tip.

NOTE—

The release lever should show wear only in the pushrod recess. Wear on the side of the pushrod tip, or wear on the release lever other than in the pushrod recess indicates misalignment.

Installation is reverse of removal. Lightly coat plastic pushrod tip with molybdenum disulfide grease (Molykote Long-term 2 or equivalent). Be sure pushrod tip engages recess in clutch release lever during installation. Refill brake fluid reservoir and bleed clutch hydraulic system as described in **Clutch hydraulic system, bleeding and flushing**.

Tightening Torques

- Slave cylinder to transmission 22 Nm (18 ft-lb)
- Fluid pipe connection
to slave cylinder 16 Nm (10 to 12 ft-lb)

CLUTCH MECHANICAL

The transmission must be removed from the engine to access the clutch mechanical components. See **230 Manual Transmission**.

If there are signs of oil at the bottom of the transmission, check for a faulty rear crankshaft oil seal. Remove the flywheel to access the rear seal. A faulty seal should be replaced.

NOTE—

If the flywheel is removed, new bolts must be used when re-mounting the flywheel. The old bolts should not be reused.

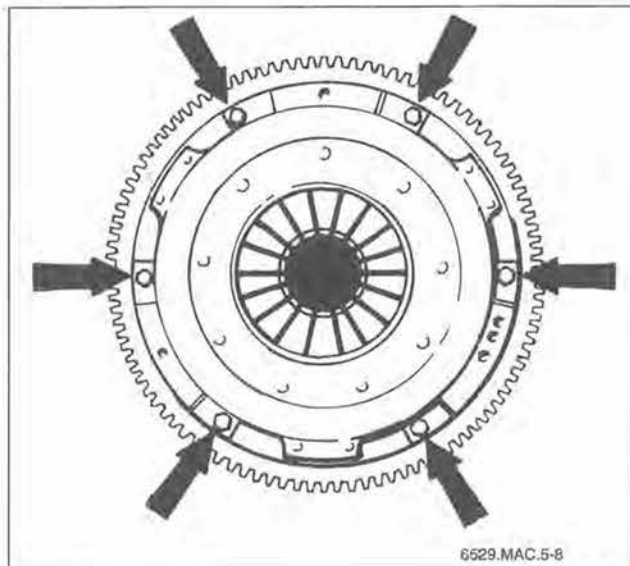
Clutch, removing

- Remove transmission from engine. See **230 Manual Transmission**.

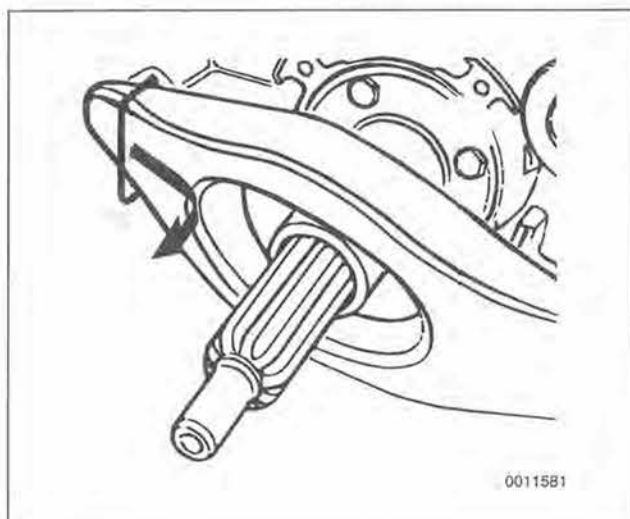
- ◀ Lock engine flywheel in position and unbolt pressure plate. Loosen bolts (**arrows**) in stages until spring pressure is evenly relieved.

WARNING—

The clutch disc may contain asbestos fibers. Asbestos materials can cause asbestosis. Always wear an approved respirator and protective clothing when handling components containing asbestos. Do not use compressed air, do not grind, heat, weld, or sand on or near any asbestos materials.



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- Pull release bearing off transmission input shaft. Remove clutch release lever by sliding it out of spring clip in direction of arrow.

Clutch, inspecting and installing

An alignment tool (clutch pilot tool) should be used to center the clutch disc to the pressure plate. Always use new clutch pressure plate bolts when installing the pressure plate to the flywheel.

- Inspect clutch pressure plate for wear or damage. Replace pressure plate if any faults are found.
 - loose rivets
 - bent or misaligned release levers
 - warped, cracked or scored friction surface

NOTE—

New pressure plates are normally coated with a corrosion inhibitor for storage. Use a grease-free solvent to clean the friction surface of new pressure plates before installation.

- Clean flywheel friction surface and inspect for wear, cracks, and scoring. Check for loose or worn guide pins. Replace flywheel if any faults are found.
- Check clutch disc thickness, runout, and general condition. Check friction surface for oil contamination. Replace clutch disc if any faults are found.

Clutch Disc

- Clutch disc runout (max.) 0.50 mm (0.020 in.)
- Clutch disc thickness (min.) 7.5 mm (0.295 in.)

- Clean release bearing guide sleeve on transmission. Clean input shaft splines.
- Inspect splines of clutch disc and transmission input shaft. Check that clutch disc slides freely on shaft.

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- Inspect clutch release bearing for smooth operation. Check for wear on bearing and lever contact surfaces. Check release lever pivot pin for wear. Replace worn parts.
- Check grooved input shaft ball bearing in crankshaft center. Replace bearing if it does not rotate smoothly.
- Assemble clutch disc and pressure plate assembly to flywheel. Thread new pressure plate bolts and hand tighten.

WARNING—

Always use new pressure plate mounting bolts.

NOTE—

- *Make sure the pressure plate is aligned on the flywheel guide pins.*
- *Be sure the clutch disc is installed correctly. The new disc should be marked with "engine side" and "transmission side".*
- Center clutch disc to crankshaft using a clutch pilot tool. Tighten pressure plate mounting bolts evenly until disc is firmly held in place.
- Remove centering tool and finish torquing bolts in uniform pattern.

Tightening Torques

- Flywheel to crankshaft
(use new bolts) 105 Nm (77 ft-lb)
- Pressure plate to flywheel (use new bolts)
8.8 grade 24 Nm (18 ft-lb)
10.9 grade 34 Nm (25 ft-lb)

NOTE—

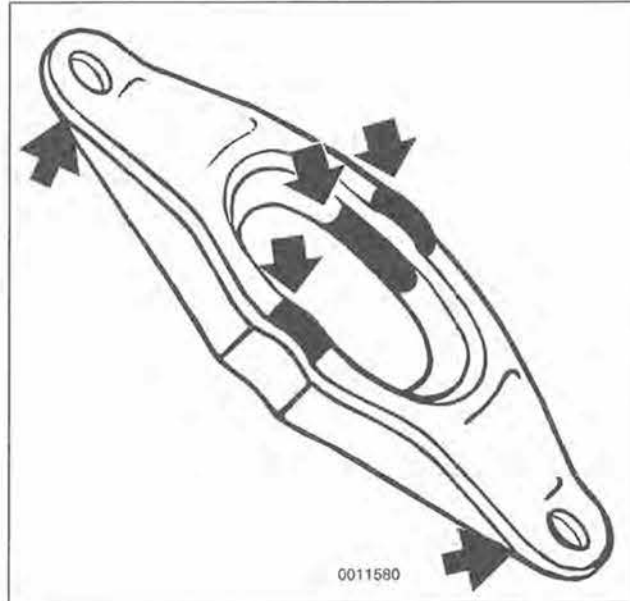
Bolt grade is marked on the bolt head.

- Lightly lubricate clutch disc splines and transmission input shaft splines.

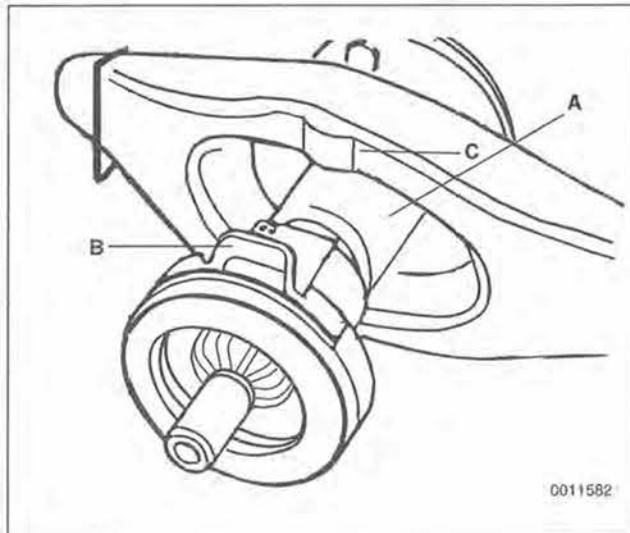
CAUTION—

BMW recommends using a light coat of Microlube GL 261 on the clutch disc and transmission input shaft splines.

210-8 CLUTCH



Lightly grease contact points on release lever (**arrows**).



Clutch release bearing correctly installed. Bearing tabs (**A**) align with contact points (**B**) on release lever.

NOTE —

The original release bearings differ from replacement ones. Replacement bearings from BMW have a plastic guide sleeve. Bearings should be lightly lubricated with molybdenum disulfide grease (Molykote Longterm 2 or equivalent).

- Remove flywheel holding fixture and reinstall transmission. See **230 Manual Transmission**.

NOTE —

To help align the input shaft in the clutch disc, rotate the transmission output shaft slowly as the transmission is seated.

