

21 Clutch

21 00 006	Clutch – bleed	21 - 1
21 11 000	Clutch housing – remove and install	21 - 1
21 21 000	Clutch disc – remove and install	21 - 2
565	Drive plate – check for lateral runout	21 - 4
21 51 000	Clutch release – remove and install / replace	21 - 4
21 52 000	Clutch master cylinder – remove and install	21 - 5
010	Clutch slave cylinder – remove and install	21 - 5
502	Clutch master cylinder – overhaul	21 - 6
512	Clutch slave cylinder – overhaul	21 - 6
	Clutch – troubleshoot	21 - 7

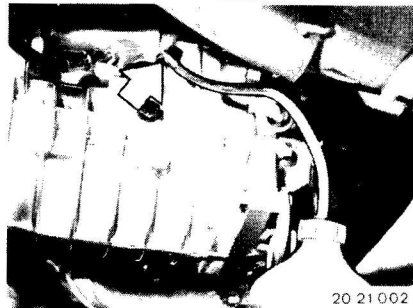
21 00 006 BLEEDING CLUTCH

Unscrew cap on brake fluid tank.
Remove float container (1).
Connect bleeder.



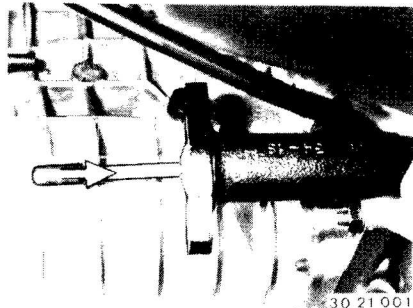
20 21 001

Open bleeder screw on clutch slave cylinder until escaping fluid is without air bubbles.
Operate clutch pedal several times during this procedure.

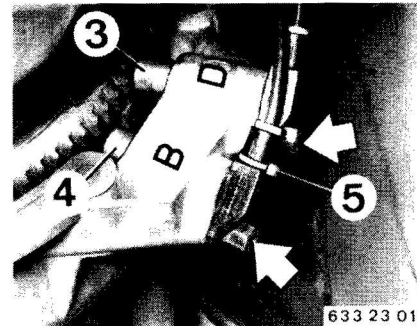


20 21 002

If there is still air in system after repeating the bleeding procedures several times, detach slave cylinder on transmission.
Press push rod against stop in slave cylinder and release slowly.
This will push back any residual air into the tank and guarantee maximum release travel.
Never operate clutch pedal as long as the slave cylinder is removed.



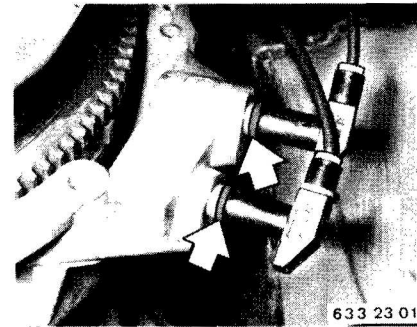
30 21 001



633 23 018

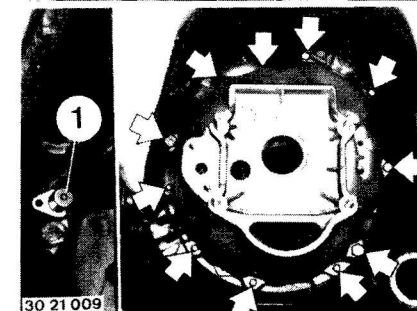
21 11 000 REMOVING AND INSTALLING CLUTCH HOUSING

BMW M 3:
Remove transmission see 23 00 022.
Remove DME senders.
Important! – Installation:
Check installed position.
Plugs must not be mixed up.
Install speed sensor (3) in bore (D) and reference mark sensor (4) with ring (5) in bore (B).
Engine cannot be started, if plugs are mixed up.



633 23 019

Installation:
Check O-rings.
Install sensors with Molykote Longterm 2.
Important!
Face surface of DME senders must be free of grease and dirt.



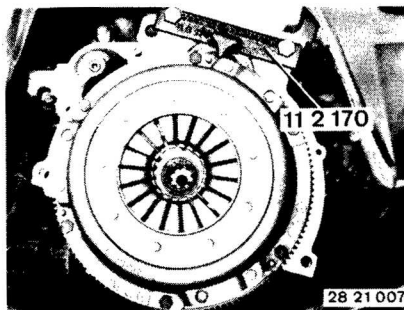
30 21 009

Remove position sender (1).
Unscrew clutch housing.
Use a Torx wrench** to unscrew Torx bolts.
Important! – Installation:
Torx bolts must be installed with washers to avoid an increase in breaking-loose torque.
Tightening torque*.

* See Specifications
** Source of Supply: HWB

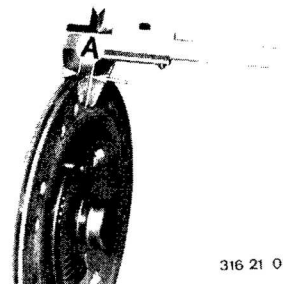
21 21 000 REMOVING AND INSTALLING CLUTCH DISC

Check clutch for wear before removing. Clutch liners are okay, if Special Tool 21 2 060 can be pushed into opening of slave cylinder against stop.



Engine M 20:
Hold flywheel with Special Tool 11 2 170.

Drive plate is worn and must be replaced when there is a gap of 5 mm (0.197") between Special Tool 21 2 060 and slave cylinder.



Check drive plate for wear (A)*, cracks and torsion damper for tight fit of spring elements.

Important! – Installation:
Check transmission end mark on drive plate.

Note:
The drive plate of the version with a double mass flywheel is rigid and not fitted with a damper.
The torsion damper is integrated in the flywheel.

Remove transmission — see 23 00 022.

Check deviation at tips of diaphragm springs*.

Engine M 10:

Hold flywheel with Special Tool 11 2 160.

Loosen mounting bolts separately 1 to 1 1/2 turns until clutch is relaxed.

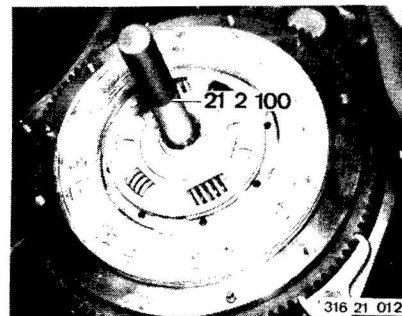
Remove mounting bolts, clutch disc and drive plate.

Clean clutch components.

Liners contain asbestos — conform with safety precautions (also refer to general information in Group 0).

Important!

Don't throw or drop clutch disc — improper handling could bend off tangential leaf springs which hold clutch disc in turning direction. Diaphragm springs would then still introduce lift, but because of the weak leaf springs the pressure ring would not lift sufficiently and the drive plate would not clear.



Installation:

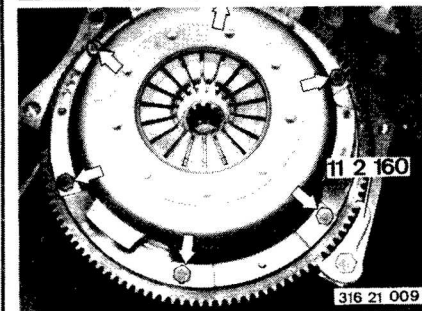
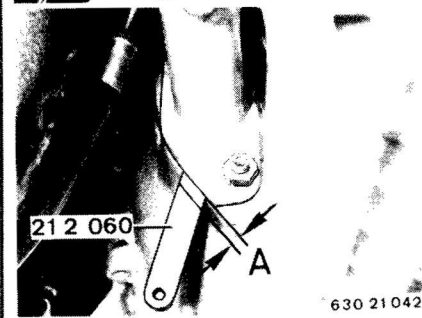
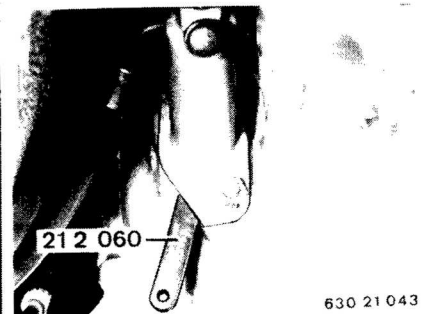
Check grooved ball bearing in crankshaft for easy movement, replacing if necessary.

Check flywheel for scoring.

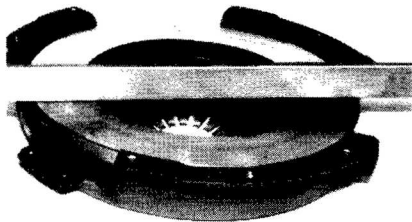
Center drive plate in flywheel with Special Tool 21 2 100.

* See Specifications

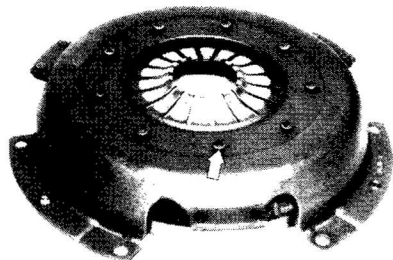
* See Specifications



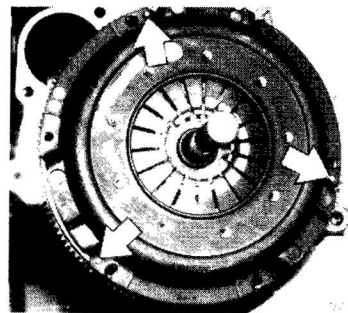
Visually inspect clutch for cracks, wear and burnt spots.
Pressure contact surface must be level.



316 21 013



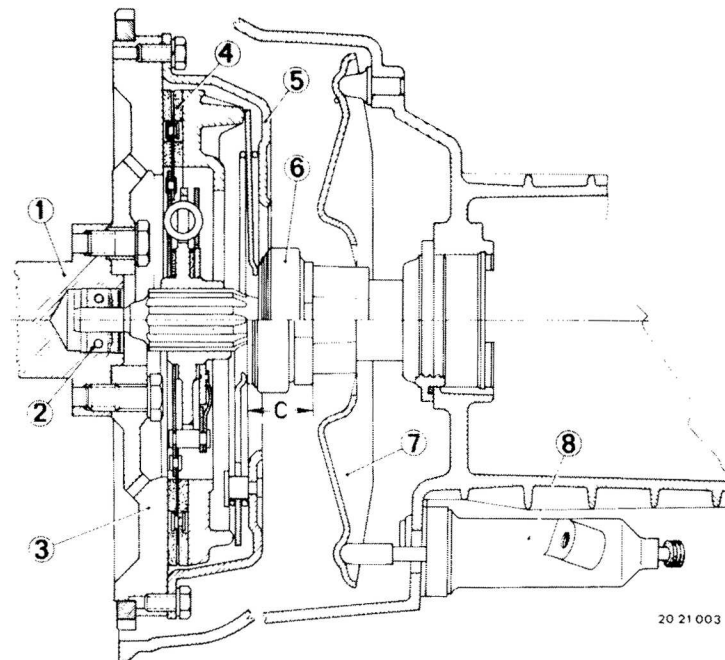
316 21 014



21 013

Visually inspect clutch rivets for wear and tight fit.
Replace a clutch with loose or worn rivets.
Important!
Remove all corrosion inhibitor when installing a new clutch disc.
Note:
The clutch for the version with a double mass flywheel is lower in height.

Place clutch disc over dowel pins.
Tighten mounting bolts separately and uniformly to specified torque*.
Give transmission input shaft a light coat of Microlube GL 261** in area of splines and guide pins.



20 21 003

Clutch Assembly:

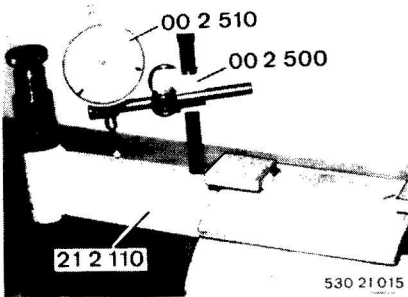
- 1 Crankshaft
- 2 Grooved ball bearing
- 3 Flywheel
- 4 Drive plate*
- 5 Thrust plate*
- 6 Release*
- 7 Release lever
- 8 Clutch slave cylinder

* See Specifications
** Source of Supply: HWB

* See Specifications

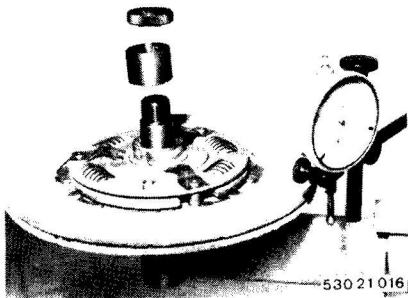
21 21 565 CHECKING DRIVE PLATE FOR LATERAL RUNOUT -- Drive Plate Removed --

Clamp tester 21 2 110 in a vise.
Mount dial gage 00 2 510 and holder 00 2 500.



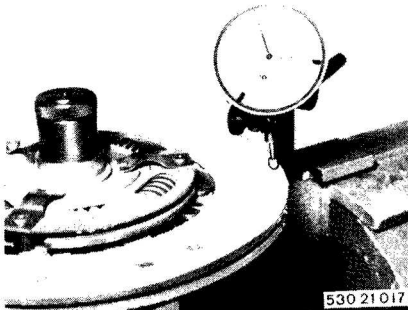
530 21 015

Clamp drive plate on tester and clean liner with emery cloth.



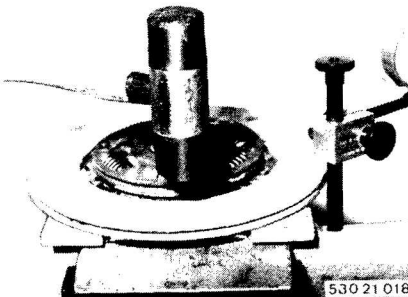
530 21 016

Apply dial gage about 3 mm (0.118") from outer edge.
Turn drive plate and read lateral runout*.



530 21 017

Straighten drive plate by applying knocks from a plastic hammer on take-up points of tester.
Repeat testing procedures.

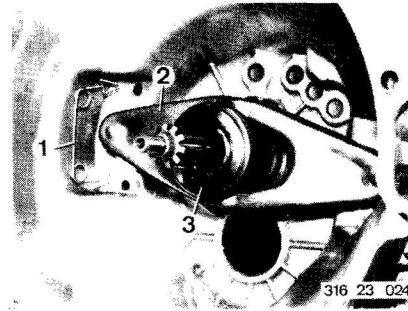


530 21 018

* See Specifications

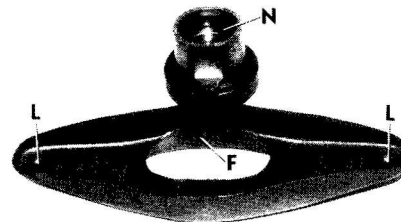
21 51 000 REMOVING AND INSTALLING/ REPLACING CLUTCH RELEASE

Remove transmission -- see 23 00 022.
Remove spring (1) and release lever (2) with release (3).



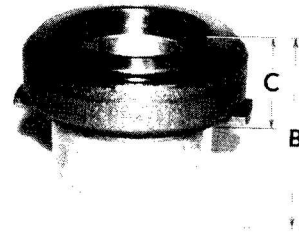
316 23 024

Installation:
Pack lubricating groove (N) with Molykote Longterm 2.
Coat guides (F) and bearings (L) with Molykote Longterm 2 lightly.
Non-conformance could cause bearing to seize on guide sleeve.



316 23 025

Check height of release B* and C*.

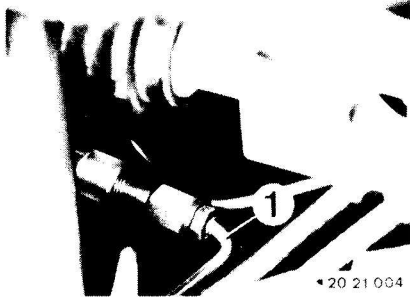


316 21 017

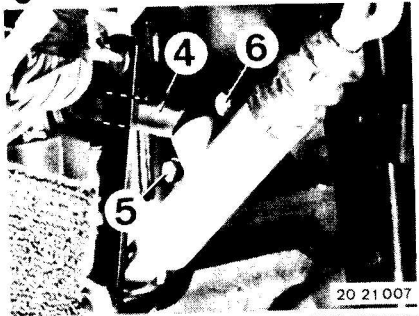
* See Specifications

21 52 000 REMOVING AND INSTALLING CLUTCH MASTER CYLINDER

Disconnect pipe (1) to slave cylinder. B6414

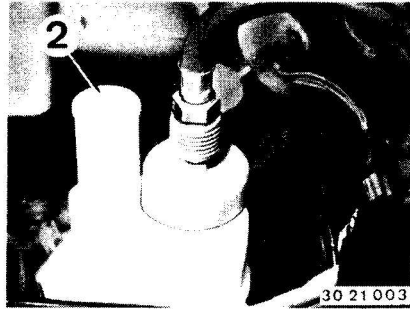


20 21 004



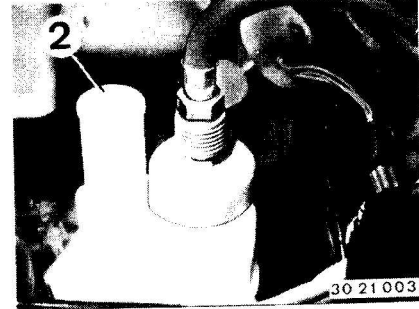
20 21 007

Pull out filling pipe (4).
Unscrew bolts (5 and 6).
Remove master cylinder.
Installation:
Bleed clutch — see 21 00 006.



30 21 003

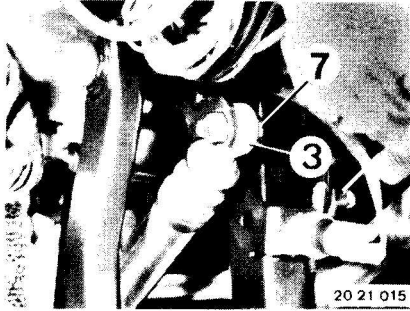
Unscrew cap on brake fluid tank.
Remove float container (2).
Draw off brake fluid in tank to lower level to connection for the filling pipe.



30 21 003

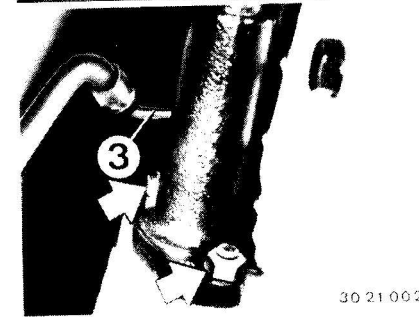
21 52 010 REMOVING AND INSTALLING CLUTCH SLAVE CYLINDER

Unscrew cap on brake fluid tank.
Remove float container (2).
Draw off brake fluid in tank to lower level to connection for filling pipe.



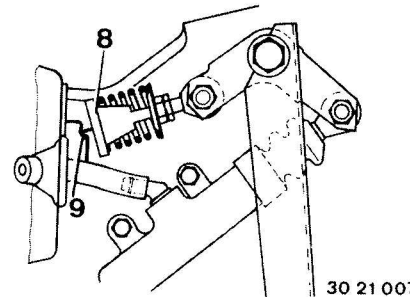
20 21 015

Remove instrument panel trim at bottom left — see 51 45 180.
Disconnect piston rod (3) on the clutch pedal.
Installation:
Adjust the clutch pedal with eccentric bolt (7) — see Group 35.



30 21 002

Unscrew slave cylinder on transmission.
Remove slave cylinder.
Disconnect pipe (3).
Note:
A slave cylinder with a diameter of 22.2 mm (0.874"), instead of 20.64 mm (0.809"), must be installed for the version with a double mass flywheel, to avoid contact of the release lever when the clutch pedal is floored (also refer to Service Information of Group 21).
Installation:
Bleeder screw faces down.
Install front push rod with Molykote Long-term 2.
Bleed clutch -- see 21 00 006.



30 21 007

Important! — Installation:
Engage over-center spring (8) in guide tab (9) on the pedal base prior to installation of the piston rod (3).

**21 52 502 OVERHAULING CLUTCH
MASTER CYLINDER
(Removed)**

Clean master cylinder and inside parts with alcohol.

Replace entire master cylinder, if cylinder has scoring or corrosion.

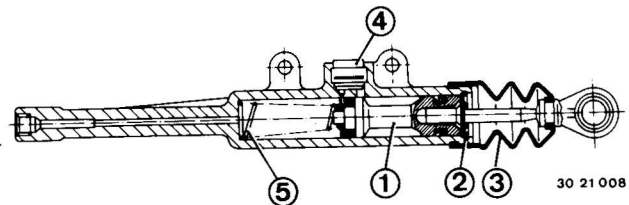
Install repair kit.

Note:

Only use repair kit of same make as pertinent master cylinder, consisting of:

- 1 Piston assembly
- 2 Circlip
- 3 Protective cap
- 4 Sealing plug
- 5 Spring

Coat cylinder bore and grooves lightly with ATE brake cylinder paste*.



30 21 008

**21 52 512 OVERHAULING CLUTCH
SLAVE CYLINDER
(Removed)**

Clean slave cylinder and inside parts with alcohol.

Replace entire slave cylinder, if cylinder bore has scoring or corrosion.

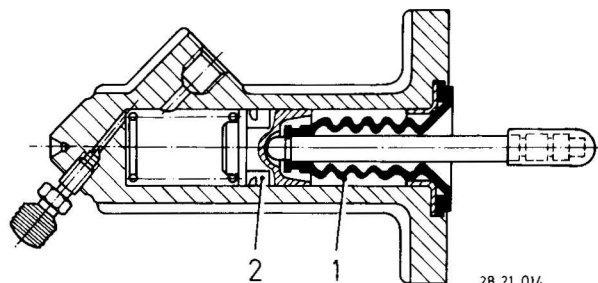
Install repair kit.

Note:

Only use repair kit of same make as pertinent slave cylinder, consisting of:

- 1 Protective cap
- 2 Grooved cup
Retaining ring
Toothed ring

Coat cylinder bore and grooved cup lightly with ATE brake cylinder paste*.



28 21 014

TROUBLESHOOTING CLUTCH

Condition	Cause	Correction
Clutch slips	<ul style="list-style-type: none"> a) Clutch contact pressure* insufficient b) Liner* seriously worn c) Liner splattered with oil – transmission or crankshaft seal faulty d) Clutch was overheated e) Clutch not an original BMW part 	<ul style="list-style-type: none"> a) Replace clutch 21 21 000 b) Replace drive plate 21 21 000 c) Replace faulty seal and drive plate d) Replace clutch 21 21 000 e) Install original BMW parts
Clutch grabs	<ul style="list-style-type: none"> a) Liner* not as specified b) Liner splattered with oil c) Release pressure one-sided d) Pressure plate pressing crooked e) Crankshaft not aligned with transmission input shaft f) Engine and transmission suspension faulty g) Drive plate not an original BMW part 	<ul style="list-style-type: none"> a) Replace drive plate 21 21 000 b) Replace drive plate 21 21 000 c) Check release lever d) Replace pressure plate 21 21 000 e) Check centering surfaces on engine and transmission f) Replace engine and transmission suspension g) Install original BMW parts
Clutch does not release	<ul style="list-style-type: none"> a) Drive plate wrenched excessively or liner broken b) Drive plate has excessive lateral runout* c) Liner rusted on flywheel d) Drive plate seized on transmission input shaft e) Bearing in crankshaft for transmission input shaft faulty f) Air in clutch hydraulic system g) Tangential leaf springs of clutch bent off 	<ul style="list-style-type: none"> a) Replace drive plate 21 21 000 b) Straighten or replace drive plate 21 21 565 c) Clean flywheel, roughen liner surfaces with emery cloth d) Service drive plate on transmission input shaft, replacing damaged parts if necessary e) Replace bearing in crankshaft 11 21 571 f) Bleed clutch 21 00 006 g) Replace clutch 21 21 000
Clutch noise	<ul style="list-style-type: none"> a) Unbalance* of clutch and drive plate excessive b) Torsional damper defective c) Clutch release faulty d) Bearing in crankshaft for transmission input shaft faulty e) Clutch rivets loose 	<ul style="list-style-type: none"> a) Replace clutch and/or drive plate 21 21 000 b) Replace drive plate 21 21 000 c) Replace clutch release d) Replace bearing in crankshaft 11 21 571 e) Replace clutch 21 21 000

* See Specifications