

Clutch

Specifications

Model	1502	1602	1802	2002	2002 T1	2002 tii
Clutch	Hydraulic, single dry plate, coil springs, torsional vibration damper and automatic wear adjustment	Hydraulic, single dry plate, coil springs, torsional vibration damper and automatic wear adjustment	Hydraulic, single dry plate, diaphragm spring torsional vibration damper and automatic wear adjustment	Hydraulic, single dry plate, diaphragm spring, torsional vibration damper and automatic wear adjustment (Hydraulic single plate with torsional vibration damper) ²⁾	Hydraulic, single dry plate, diaphragm spring, torsional vibration damper and automatic wear adjustment	Hydraulic, single dry plate, diaphragm spring, torsional vibration damper and automatic wear adjustment
Type	KFS 200 K	KFS 200 K	MF 215 K ⁵⁾	MF 215 K ⁵⁾ (HB 225 Sph) ²⁾	MF 228 K Sph (HB 225 Sph) ²⁾	MF 228 K Sph
Contact pressure	app. kg (lb)	430 ± 20 (948 ± 44)	407 ... 479 ⁶⁾ (897 ... 1056)	407 ... 479 (897 ... 1056) ⁶⁾ (420(926)) ²⁾	455 ± 35 (1003 ± 77) (420(926)) ²⁾	485 ± 35 (1067 ± 77)
Spring colours	green-violet-yellow	green-violet-yellow	none	none (blue-grey-blue) ²⁾	none (blue-grey-blue) ²⁾	yellow
Max. clutch imbalance	15	15	15 ⁷⁾	15 ⁷⁾ (15) ²⁾	20 (15) ²⁾	20
Max. plane runout of diaphragm spring	—	—	0.6 (0.024)	0.6 (0.024) (—) ²⁾	0.6 (0.024) (—) ²⁾	0.6 (0.024)
Max. plane runout of thrust arm faces	0.4 (0.016)	0.4 (0.016)	—	— (0.4(0.016)) ²⁾	— (0.4 (0.016)) ²⁾	—
Slip moment (min.)	140 (14.0) (101)	140 (14.0) (101)	180 (18.0) (130)	180 (18.0) (130) 18 (18.0 (130)) ²⁾	180 (18.0) (130) 180 (18.0) (130)) ²⁾	180 (18.0) (130)

1) Earlier version has mechanically operated single dry plate clutch with torsional vibration damper.

2) BMW 2002 up to chassis No. 1 626 693, BMW 2002 RHD up to 1 651 034, BMW 2002 USA up to 1 665 200, BMW 2002 T1 up to 1 681 795

3) Previously 400 ± 20 kp (882 ± 44 lb)

4) Previously green-yellow-green on BMW 1602

5) Previously MF 228 K Sph up to 73 model

6) Previously 455 ± 35 kp (1003 ± 77 lb) on MF 228 K Sph clutch

7) Previously 20 cmg on MF 228 K Sph clutch

Models	1502	1602	1802	2002	2002 Ti	2002 tii
Driving plate extl. dia.	200 ± 1 (7.87 ± 0.04)	200 ± 1 (7.87 ± 0.04)	216 ± 1 ¹⁾ (8.50 ± 0.04)	216 ± 1 (8.50 ± 0.04) ¹⁾ (228 ± 1 (8.98 ± 0.04)) ²⁾	228 ± 1 (8.98 ± 0.04) ¹⁾ (228 ± 1 (8.98 ± 0.04)) ²⁾	228 ± 1 (8.98 ± 0.04)
Driving plate intl. dia.	130+1 (5.12+0.04)	130+1 (5.12+0.04)	144+1 ³⁾ (5.67+0.04)	144+1 (5.67+0.04) ³⁾ 150+1 (5.91+0.04) ²⁾	150+1 (5.91+0.04) ³⁾ 150+1 (5.91+ 0.04) ²⁾	150+1 (5.12+0.04)
Lining engine side gearbox side	T 50s T 50s	T 50s T 50s	T 50s/17 T 50s/17	T 50s/17 (T 50s/17) ²⁾ T 50s/17 (T 50s/17) ²⁾	T 50s/17 (T 50s/17) ²⁾ T 50s/17 (T 50s/17) ²⁾	T 50s/17 T 50s/17
Lining thickness engine side	4.2 (0.165)	4.2 (0.165)	3.7 (0.146) ⁴⁾	3.7 (0.146) ⁴⁾ (3.8 (0.15)) ²⁾	3.8 (0.15) (3.8 (0.15)) ²⁾	3.8 (0.154) ⁶⁾
gearbox side	4.2 (0.165)	4.2 (0.165)	3.7 (0.146) ⁵⁾	3.7 (0.146) ⁵⁾ (4.2 (0.165)) ²⁾	4.2 (0.165) ⁵⁾ (4.2 (0.165)) ²⁾	3.9 (0.154) ⁷⁾
Total thickness removed	10.1 ± 0.25 (0.398 ± 0.010)	10.1 ± 0.25 (0.398 ± 0.010)	10.05 ± 0.40 ⁸⁾ (0.396 ± 0.016)	10.05 ± 0.40 (0.396 ± 0.016) ⁸⁾ (10.6 ± 0.25) (0.417 ± 0.010) ²⁾	10.6 ± 0.25 (0.417 ± 0.010) (10.6 ± 0.25) (0.417 ± 0.010) ²⁾	10.6 ± 0.25 (0.417 ± 0.010)
—compressed at 400 kp (880 lb)	9.3 ± 0.25 (0.366 ± 0.010)	9.3 ± 0.25 (0.366 ± 0.010)	—	— (—) ²⁾	— (—) ²⁾	—
—compressed at 480 kp (1060 lb)	—	—	8.9 ± 0.25 ⁹⁾ (0.350 ± 0.010)	8.9 ± 0.25 (0.350 ± 0.010) ⁹⁾ (9.3 ± 0.25 (0.366 ± 0.010)) ²⁾	9.3 ± 0.25 (0.366 ± 0.010) (9.3 ± 0.25 (0.366 ± 0.010)) ²⁾	9.3 ± 0.25 (0.366 ± 0.010)
Min. thickness removed	7.3 (0.287)	7.3 (0.287)	8.95 (0.352) ¹⁰⁾	8.95 (0.352) ¹⁰⁾ (9.0 (0.354)) ²⁾	9.0 (0.364) (9.0 (0.354)) ²⁾	9.0 (0.354)
—compressed at 400 kp (880 lb)	6.5 (0.256)	6.5 (0.256)	—	— (—) ²⁾	— (—) ²⁾	—
—compressed at 480 kp (1060 lb)	—	—	7.8 (0.307) ¹¹⁾	7.8 (0.307) ¹¹⁾ (7.7 (0.303)) ²⁾	7.7 (0.303) (7.7 (0.303)) ²⁾	7.7 (0.303)
Max. clutch plate runout at 192 mm (7.56 in) dia.	0.6 (0.024)	0.6 (0.024)	—	— (—) ²⁾	— (—) ²⁾	—
Max. clutch plate runout at 220 mm (8.66 in) dia.	—	—	0.6 (0.024) ¹²⁾	0.6 (0.024) ¹²⁾ (0.6 (0.024)) ²⁾	0.6 (0.024) (0.6 (0.024)) ²⁾	0.6 (0.024)
Max. clutch plate runout at 210 mm (8.27 in) dia.	—	—	0.6 (0.024)	0.6 (0.024)	—	—
Max. driving plate imbalance	10	10	10	10 (10) ²⁾	10 (10) ²⁾	10

- ¹⁾ Previously 228 ± 1 mm (8.98 ± 0.04 in) on MF 228 K Sph clutch
²⁾ BMW 2002 up to chassis No. 1 626 693, BMW 2002 RHD up to 1 651 034,
BMW 2002 USA up to 1 665 200, BMW 2002 Ti up to 1 681 795
³⁾ Previously 150 + 1 mm (5.91 + 0.04 in) on MF 228 K Sph clutch
⁴⁾ Previously 3.8 mm (0.15 in) on MF 228 K Sph clutch
⁵⁾ Previously 4.2 mm (0.165 in) on MF 228 K Sph clutch
⁶⁾ Previously 3.8 mm (0.15 in)
⁷⁾ Previously 4.2 mm (0.165 in) on MF 228 K Sph clutch
⁸⁾ Previously 10.6 ± 0.25 mm (0.417 ± 0.010 in) on MF 225 K Sph clutch
⁹⁾ Previously 9.3 ± 0.25 mm (0.366 ± 0.010 in) on MF 225 K Sph clutch
¹⁰⁾ Previously 9.0 mm (0.354 in) on MF 225 K Sph clutch
¹¹⁾ Previously 7.7 mm (0.303 in) on MF 225 K Sph clutch
¹²⁾ Applies to clutch plate with extl. dia. 228 ± 1 mm (8.976 ± 0.039 in)

Specifications

Clutch

Model	1502	1602	1802	2002	2002 T1	2002 tii
Clutch play at throwout arm mm (in)	Automatic wear adjustment ¹⁾			Automatic wear adjustment (3 ... 3.5 (0.12 ... 0.14)) ²⁾	Automatic wear adjustment (3 ... 3.5 (0.12 ... 0.14)) ²⁾	Automatic wear adjustment
Play at clutch pedal mm (in)	app. 5.0 (0.2) ³⁾			app. 5.0 (0.2) (app. 20 ... 25 (0.8 ... 1.0)) ²⁾	app. 5.0 (0.2) (app. 20 ... 25 (0.8 ... 1.0)) ²⁾	app. 5.0 (0.2)
Master cylinder bore mm (in)	19.05 (0.75) ⁴⁾			19.05 (0.75) ²⁾ (19.05 (0.75)) ²⁾	19.05 (0.75) ²⁾ (19.05 (0.75)) ²⁾	19.05 (0.75)
stroke mm (in)	30.0 (1.181) ⁴⁾			30.0 (1.181) ²⁾ (30.0 (1.181)) ²⁾	30.0 (1.181) ²⁾ (30.0 (1.181)) ²⁾	30.00 (1.181)
Slave cylinder bore mm (in)	20.64 (0.813) ⁴⁾			20.64 (0.813) ²⁾ (19.05 (0.75)) ²⁾	20.64 (0.813) ²⁾ (19.05 (0.75)) ²⁾	20.64 (0.813)
stroke mm (in)	20.00 (0.787) ⁴⁾			20.00 (0.787) ²⁾ (24.00 (0.945)) ²⁾	20.00 (0.787) ²⁾ (24.00 (0.945)) ²⁾	20.00 (0.787)
Clutch pedal travel mm (in)	167 + 5 (6.57 + 0.20) ^{5) 6)}			167.5 (6.57 + 0.20) ⁷⁾ (174.0 (6.85)) ^{2) 8)}	167+5 (6.57 + 0.20) ²⁾ (174.0 (6.85)) ²⁾	167 + 5 ⁷⁾ (6.57 + 0.20)

1) 3 ... 3.5 mm (0.12 ... 0.14 in) on BMW 1600-2 with mechanical clutch operation

2) BMW 2002 up to chassis No. 1 626 693, BMW 2002 RHD up to chassis No. 1 651 034, BMW 2002 USA up to chassis No. 1 665 200, BMW 2002 T1 up to chassis No. 1 681 795

3) app. 20 ... 25 mm (0.8 ... 1.0 in) on BMW 1600-2 with mechanical clutch operation

4) Not on BMW 1600-2 with mechanical clutch operation

5) 173.5 mm (6.83 in) on BMW 1600-2 with mechanical clutch operation

6) 160 + 5 mm (6.299 + 0.197 in) on BMW 1600-2 RHD; 160 + 9 mm (6.299 + 0.354 in) on BMW 1502 and 1602 RHD

7) 160 + 9 mm (6.299 + 0.354 in) for RHD cars

8) 160 + 5 mm (6.299 + 0.197 in) for RHD cars

9) 160 + 5 mm (6.299 + 0.197 in) for RHD cars

10) 160 + 5 mm (6.299 + 0.197 in) for RHD cars

11) 160 + 5 mm (6.299 + 0.197 in) for RHD cars

12) 160 + 5 mm (6.299 + 0.197 in) for RHD cars

13) 160 + 5 mm (6.299 + 0.197 in) for RHD cars

14) 160 + 5 mm (6.299 + 0.197 in) for RHD cars

15) 160 + 5 mm (6.299 + 0.197 in) for RHD cars

16) 160 + 5 mm (6.299 + 0.197 in) for RHD cars

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18) 160 + 5 mm (6.299 + 0.197 in) for RHD cars

19) 160 + 5 mm (6.299 + 0.197 in) for RHD cars

20) 160 + 5 mm (6.299 + 0.197 in) for RHD cars

21) 160 + 5 mm (6.299 + 0.197 in) for RHD cars

22) 160 + 5 mm (6.299 + 0.197 in) for RHD cars

23) 160 + 5 mm (6.299 + 0.197 in) for RHD cars

24) 160 + 5 mm (6.299 + 0.197 in) for RHD cars

25) 160 + 5 mm (6.299 + 0.197 in) for RHD cars

26) 160 + 5 mm (6.299 + 0.197 in) for RHD cars

27) 160 + 5 mm (6.299 + 0.197 in) for RHD cars

28) 160 + 5 mm (6.299 + 0.197 in) for RHD cars

29) 160 + 5 mm (6.299 + 0.197 in) for RHD cars

30) 160 + 5 mm (6.299 + 0.197 in) for RHD cars

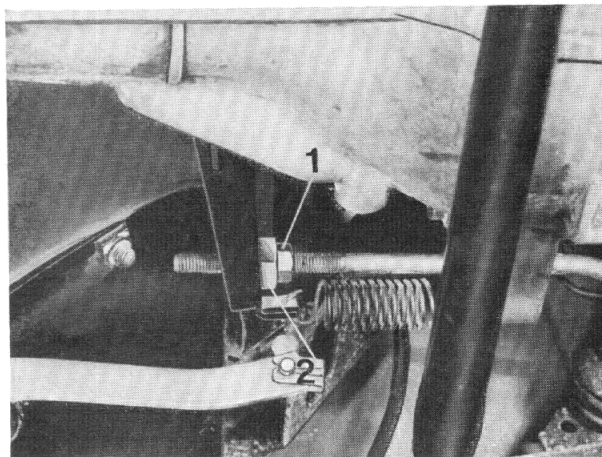
Tightening torques in Nm (mkp) (lb.ft)

Clutch to flywheel	22 + 2 (2.2 + 0.2) (15.9 + 1.4)	Clutch pedal through-bolt	32 + 4 (3.2 + 0.4) (23 + 2.8)
Pipe and hose at master and slave cylinders	13 + 3 (1.3 + 0.3) (9.4 + 2.2)	Locknut for thrust rod/throwout arm ¹⁾	17 + 3 (1.7 + 0.3) (12.3 + 2.2)
Master cylinder retaining bolts	22 + 2 (2.2 + 0.2) (15.9 + 1.4)	Nut on ring bolt for tension spring/pedal	7 + 1.2 (0.7 + 0.12) (5.1 + 0.9)
		¹⁾ BMW 1600-2 (mechanical clutch operation)	

21 00 004 Clutch operating clearance – adjusting

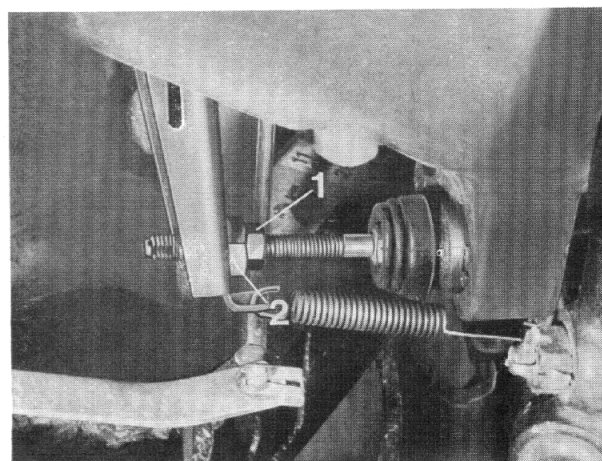
A) Mechanical clutch operating mechanism

Loosen the locknut (1), then turn the adjusting nut (2) until the specified clutch operating clearance¹⁾ is obtained. Retighten the locknut.



B) Hydraulic clutch operating mechanism

After loosening the locknut (1), the specified clutch operating clearance¹⁾ is obtained by turning the adjusting nut (2). Finally, retighten the locknut.



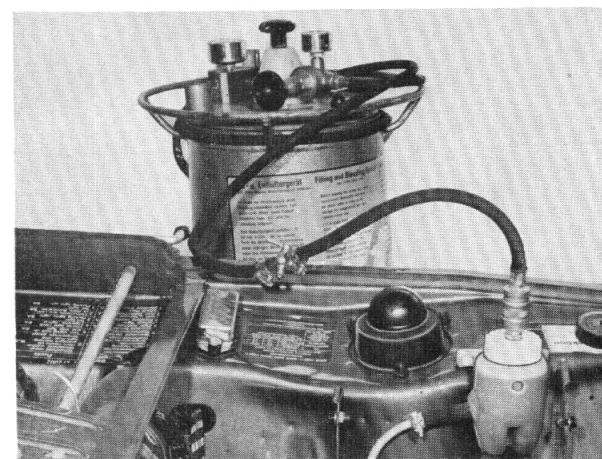
21 00 006 Clutch hydraulic system – bleeding

A) With bleeding device

Connect the bleeding device.

Keep the bleed screw on the clutch slave cylinder open until no further air bubbles emerge.

While doing so, depress the clutch pedal fully several times.



B) Without bleeding device

Fill the topping-up reservoir.

Attach the bleed hose to the slave cylinder bleed screw. The other end of the bleed hose must be immersed in a vessel containing sufficient brake fluid to prevent air from being drawn in during bleeding.

Depress the clutch pedal fully approx. 10 times, then hold down.

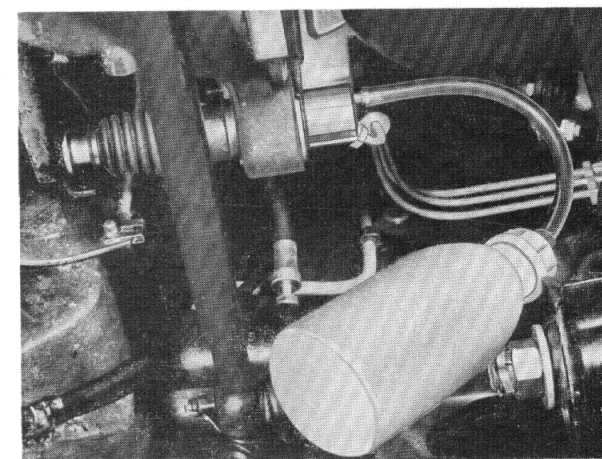
Open the bleed screw.

When air bubbles no longer emerge, close the bleed screw.

Release the clutch pedal and depress again approx. 10 times.

Repeat the process until no further air bubbles emerge from the hydraulic system.

Warning: The level of fluid in the reservoir must be topped up continually as bleeding proceeds.



¹⁾ See specifications

21 21 000 Removal and fitting of clutch

A) Coil-spring clutch BMW 1502/1602

Removal and fitting of gearbox – 23 00 020.

Use BMW 6013 locking tool for clamping flywheel.

Unscrew clutch fastening bolts, working crosswise and uniformly.

Take out clutch and drive plate.

Important: Do not drop clutch and drive plate, or they may be damaged.

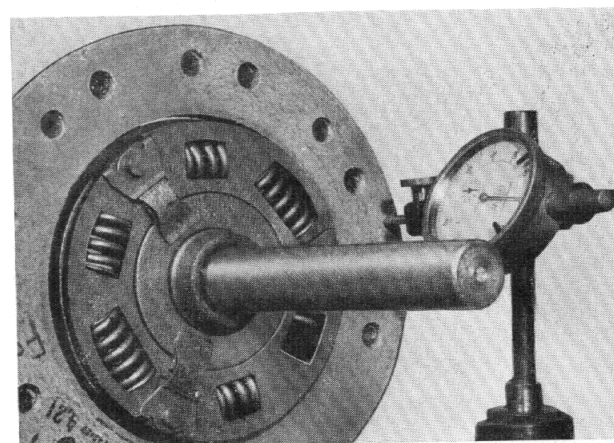
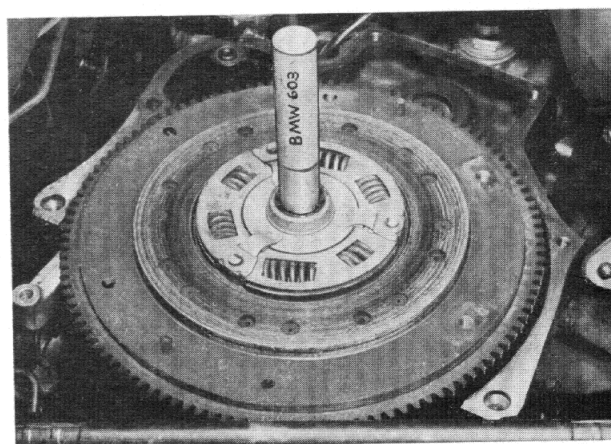
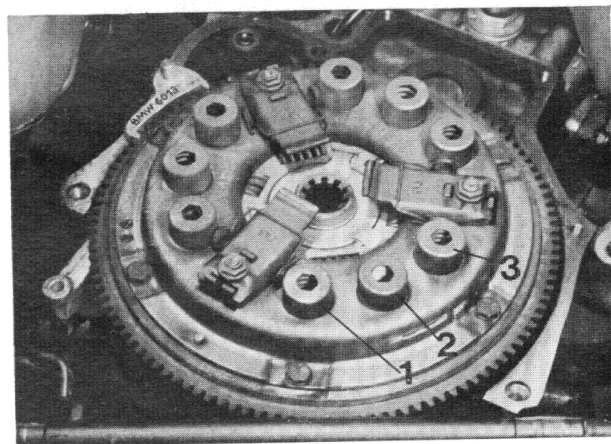
Important: The contact of the clutch¹⁾ can be seen from the colour marks on springs 1 to 3.

Note when fitting:

- Fit clutch into dowel pins. Tighten fastening bolts evenly to specified torque, working crosswise¹⁾.
- Check ball bearing in crankshaft for freedom of movement.
- Apply a thin coating of Molykote Longterm 2 to the splines of the drive shaft. The drive plate must slide easily.
- Apply a **thin** coating of Olista Longtime 3 EP to the sides of the cams, guide and bearing surfaces of the pressure lever and at the angular support, in order to prevent squeaking.

Centre the drive plate in the flywheel, using BMW 603 centring tool.

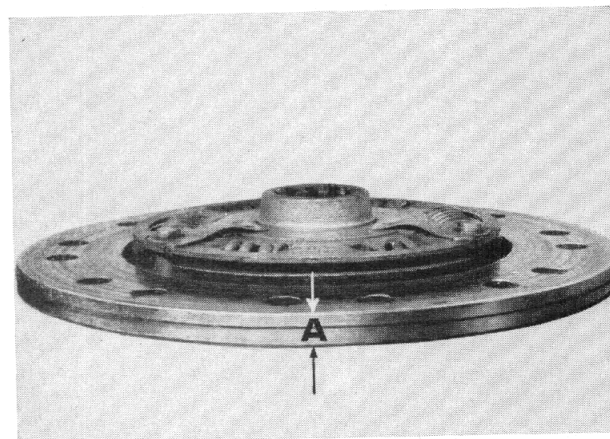
Note when fitting: Before fitting a new drive plate, check the contact surface of the flywheel¹⁾ for score marks.



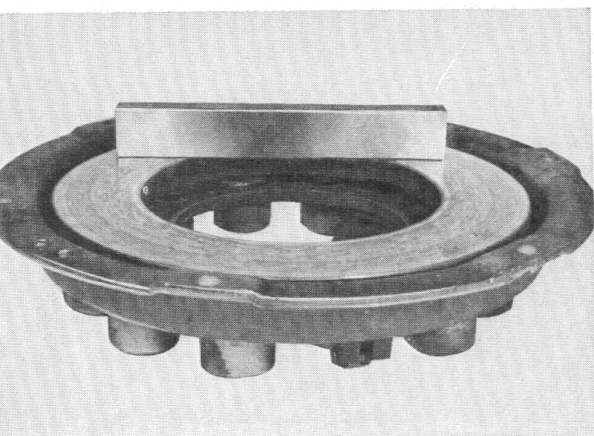
Check drive plate with lining for lateral runout¹⁾.

Check drive plate for wear¹⁾ (A) and cracks, and torsional damper for loose spring elements and cracks.

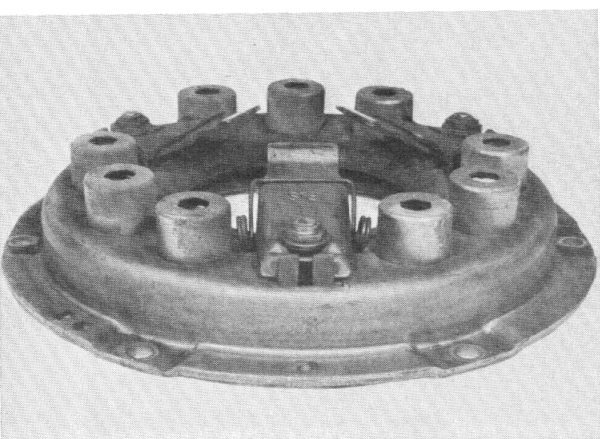
Note when fitting: Observe correct side of clutch.



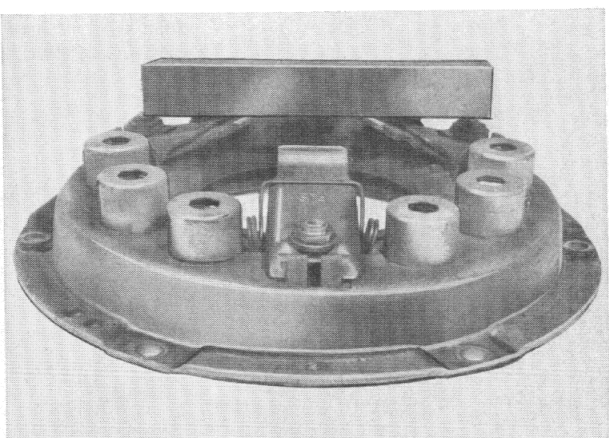
¹⁾ See specifications



Carry out visual check of clutch for cracks, wear and burns.
The contact surface must be smooth and even.



Carry out visual check of pressure levers and spring elements.



Check pressure lever surfaces¹⁾ for vertical runout.

When installing: Adjust clutch play if manual adjustment is provided – 21 00 004.



¹⁾ See specifications

B) Diaphragm-spring clutch

BMW 1802/2002/2002 TI/2002 tii

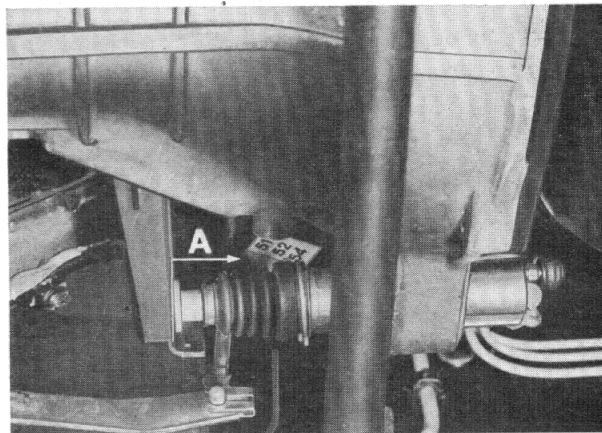
Check drive plate in situ for wear.

Press release lever by hand in the direction of travel, until it reaches the stop.

When new, the travel of throwout arm. A must be 17 ... 19 mm (0.669 ... 0.748 in).

If A is less than 5 mm (0.197 in) replace drive plate.

Check for correct operation: With the engine idling, it must be possible to engage reverse gear after 3 to 5 seconds without any noise of teeth meshing.

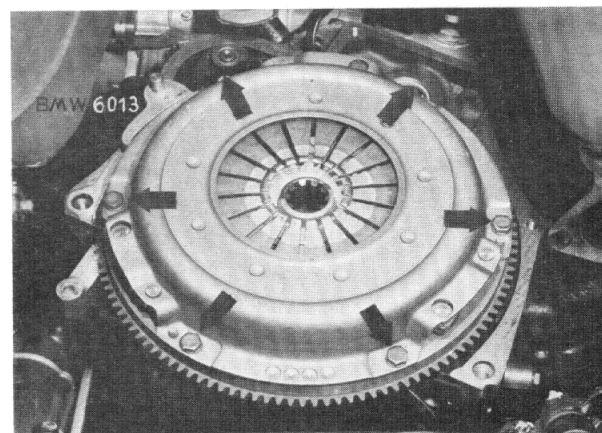


Removal and fitting of gearbox – 23 00 020.

Check edges of plate spring¹⁾ for lateral runout.

Use locking tool 6013 to stop flywheel from turning.

Unscrew the fastening bolts on the clutch by 1 to 1 1/2 turns, until clutch is without load. Remove fastening bolts, clutch and drive plate.



Note when fitting:

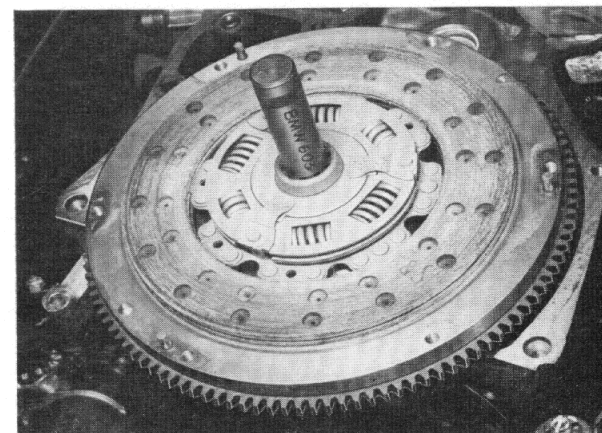
- Fit clutch into dowel pins. Tighten fastening bolts one after the other by 1 to 1 1/2 turns¹⁾.
- Note colour mark on clutch¹⁾.
- Check gearbox drive shaft bearing in crankshaft for freedom of movement.
- Apply a thin coat of Molykote Longterm 2 on the wedge-shaped grooves of the drive shaft. The drive plate must slide easily.

Important: Do not throw or drop clutch. If the clutch is not handled properly, the three tangential leaf springs which hold the clutch in the direction of rotation may be bent. In this event the plate spring will release the clutch, but the pressure ring will not be moved up sufficiently (because of the springs) and the drive plate will not be released.

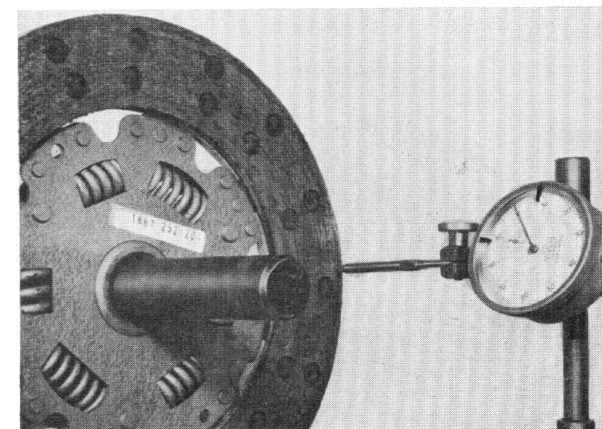
Note when fitting:

Using centring tool 603, adjust drive plate to correct position in flywheel.

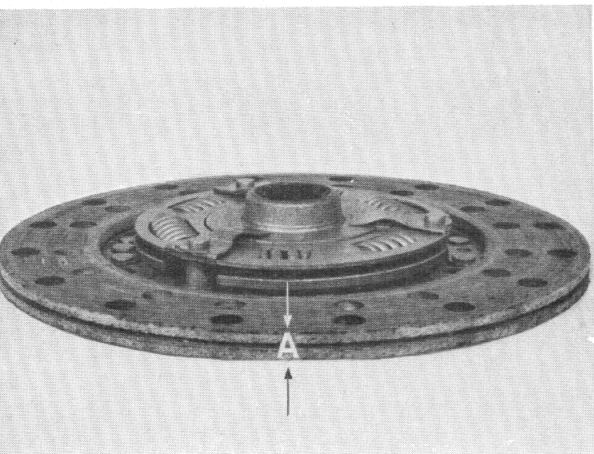
Before installing a new drive plate, check contact surface of flywheel¹⁾ for score marks.



Check drive plate with lining for lateral runout¹⁾.

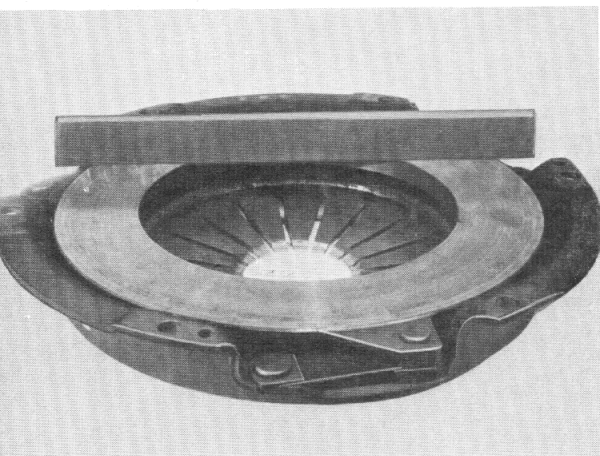


¹⁾ See specifications



Check drive plate for wear¹⁾ and cracks.
Check torsional damper for loose spring elements and cracks.

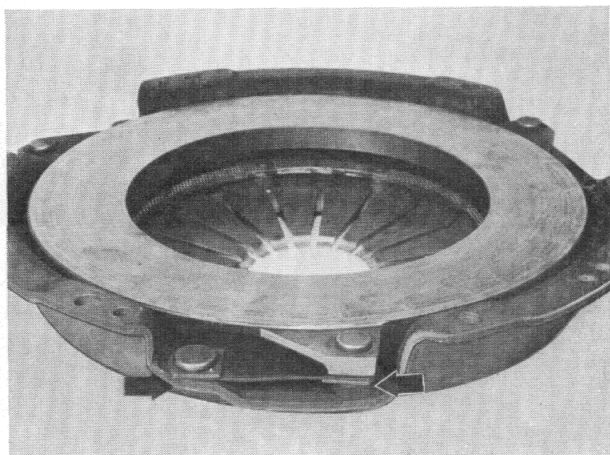
Fitting instruction: Note clutch side.



Visual inspection of clutch for cracks, wear and burnt spots.
Pressure surface must be flat.



Visual inspection of rivet joints for wear and firm seating.
Replace clutches with loose or worn rivet heads.



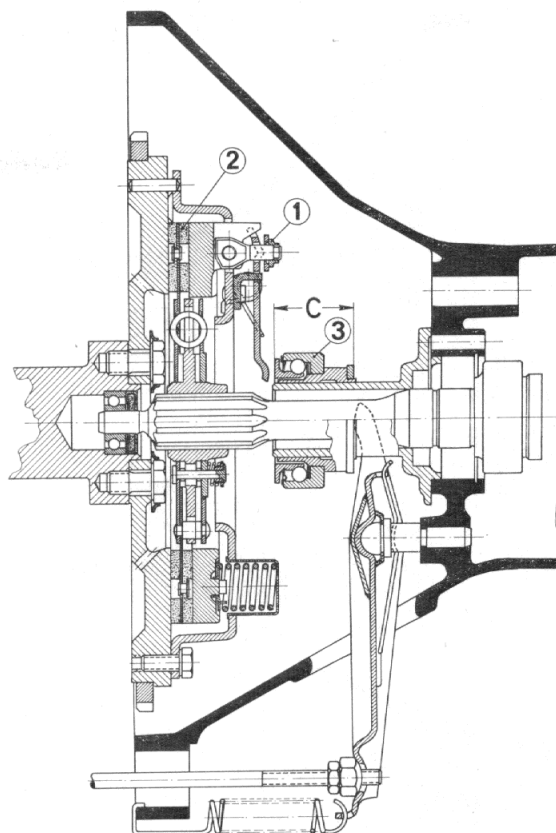
Visual inspection of spring connection between pressure plate and cover.
Replace clutch if rivets are loose.



¹⁾ See specifications

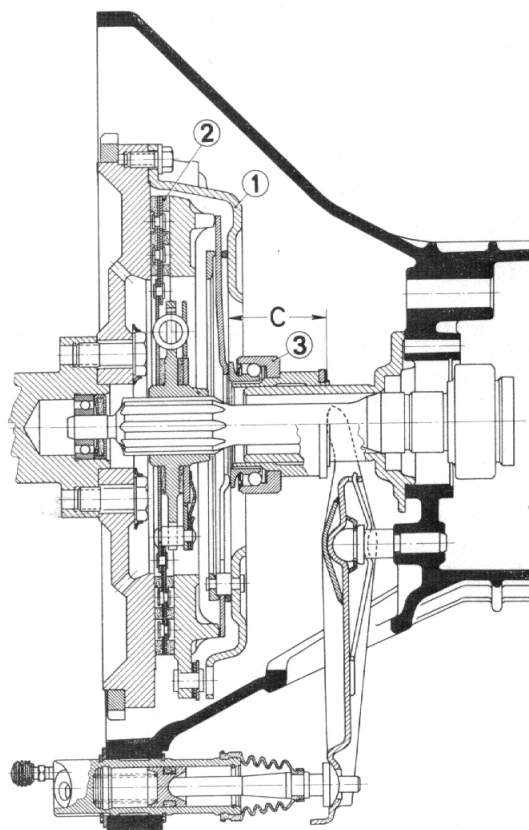
Layout – 1502/1602 clutch
(from 71 model on – hydraulic clutch operation)

BMW model	Designation	Fichtel & Sachs Ref. No.
1502/1602	1 Clutch pressure plate Coil spring	KFS 200 K
	2 Driving plate	1861 528 001 200 mm (7.9 in) extl. dia.
	3 Clutch release standard	3151 141 202 ¹⁾ C = 42.5 ± 0.4 mm (1.673 ± 0.016 in)
	self-centering	3151 040 001 C = 43 ± 0.4 mm (1.693 ± 0.016 in)

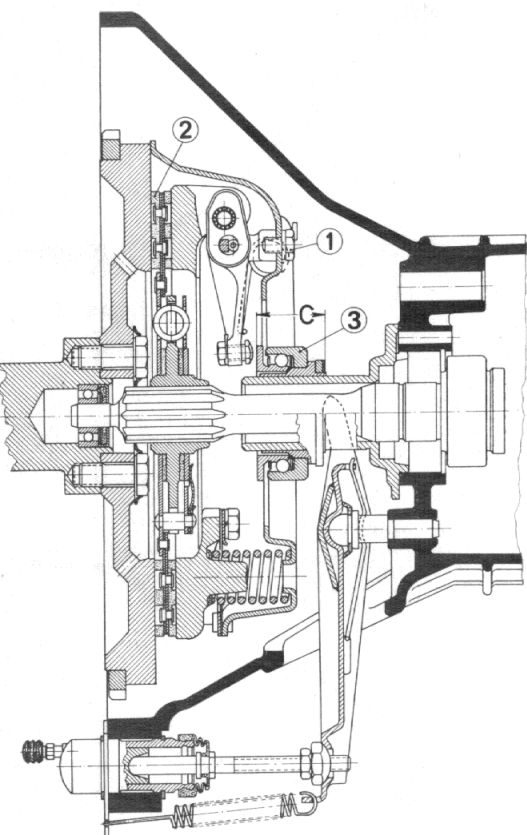


Layout – 1802/2002/2002 TI/2002 tii clutch

BMW model	Designation	Fichtel & Sachs Ref. No.
1802/2002	1 Clutch pressure plate Diaphragm spring	MK 215 K MF 228 k Sph ²⁾
	2 Driving plate	1861 508 001 216 mm (8.504 in) extl. dia.
		1861 501 001 ²⁾ 228 mm (8.976 in) extl. dia.
	3 Clutch release standard	3151 141 202 ¹⁾ C = 42.5 ± 0.4 mm (1.673 ± 0.016 in)
	self-centering	3151 040 001 C = 43.0 ± 0.4 mm (1.693 ± 0.016 in)
2002 TI/ 2002 tii	1 Clutch pressure plate Diaphragm spring	MF 228 K Sph
	2 Driving plate	1861 501 001 228 mm (8.976 in) extl. dia.
	3 Clutch release standard	3151 139 103 C = 47.5 ± 0.4 mm (1.870 ± 0.016 in)
	self-centering	3151 039 001 C = 48.0 ± 0.4 mm (1.890 ± 0.016 in)



¹⁾ If clutch is noisy, use self-centering clutch throwout bearing
²⁾ up to 73 models



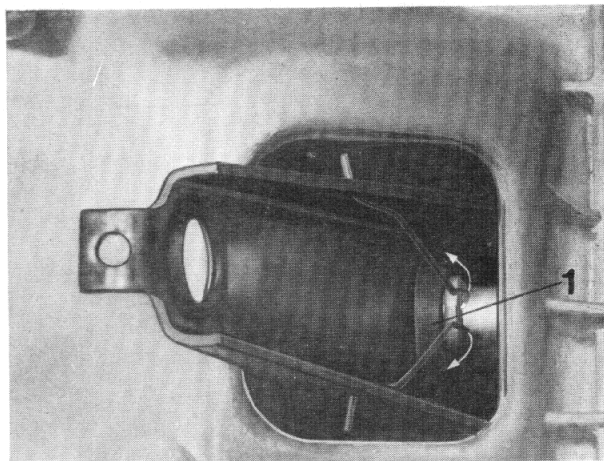
Layout — 2002/2002 TI clutch

BMW model	Designation	Fichtel & Sachs Ref. No.
2002/ 2002 TI	1 Clutch pressure plate Coil spring	HB 225 Sph
	2 Driving plate	1861 501 001 228 mm (8.976 in) extl. dia.
	3 Clutch release	C = 34 ± 0.4 mm (1.339 \pm 0.016 in)

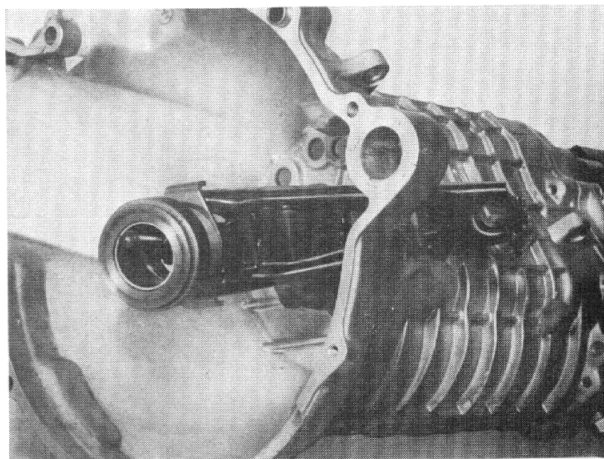
21 51 000 Removal and fitting of clutch release lever

Removal and fitting of gearbox – 23 00 020.
Lift spring above knuckle bolt collar.

Note when fitting: Angular seal (1) must be between the knuckle bolt and the release lever.



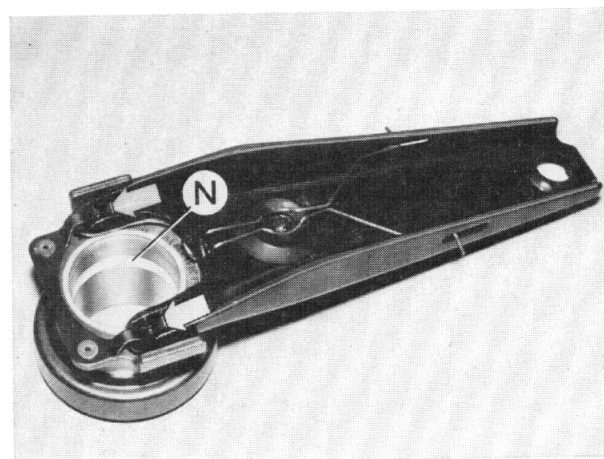
Remove release unit and release lever to the front.



Remove release unit from support springs.

Note when fitting: Coat support springs, angular seal and knuckle bolt with Molykote Longterm 2.

Fill lubricating groove (N) with Molykote Longterm 2.
If this is not done, the release lever bearing will seize.



21 51 001 Replacement of clutch release lever

Removal and fitting of clutch release lever – 21 51 000.

Note when fitting: Correct height C, versions A and B.

A = standard

B = self-centering

In the event of a repair, version A should be replaced by version B.

Version A:

BMW 1502/1602/1802/2002

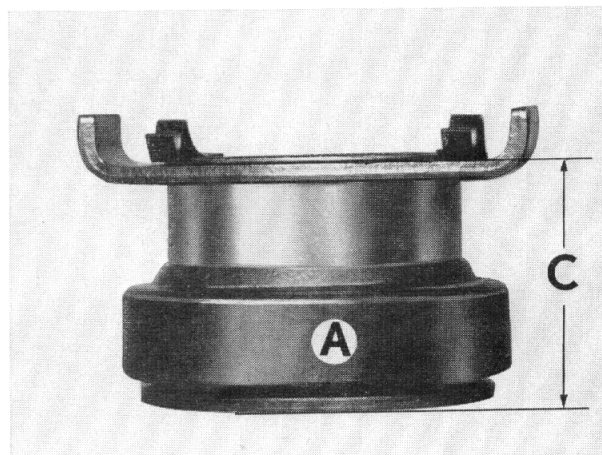
C = 42.5 ± 0.4 mm (1.673 ± 0.016 in)

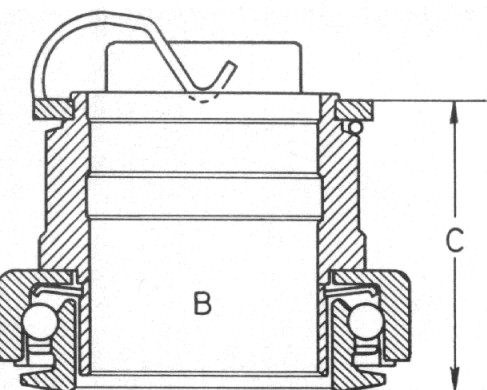
F & S No. 3151 141 202

BMW 2002 TI/2002 tii

C = 47.5 ± 0.4 mm (1.870 ± 0.016 in)

F & S No. 3151 139 103





Version B:

BMW 1502/1602/1802/2002:

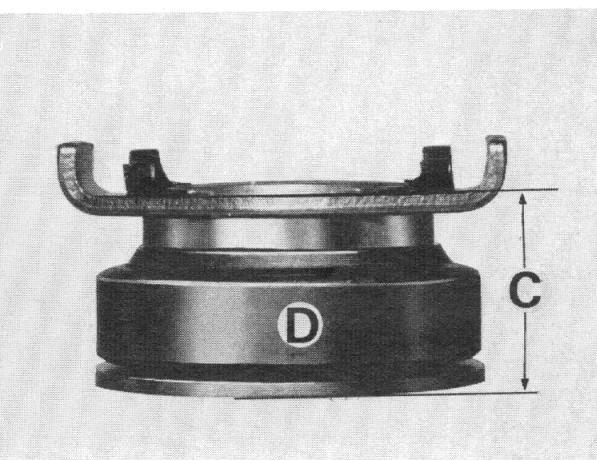
$C = 43.0 \pm 0.4 \text{ mm}$ ($1.693 \pm 0.016 \text{ in}$)

F & S No. 3151 040 001

BMW 2002 TI/2002 tii:

$C = 48.0 \pm 0.4 \text{ mm}$ ($1.890 \pm 0.016 \text{ in}$)

F & S No. 3151 039 001



Version D for coil-spring clutch

BMW 2002/2002 TI:

$C = 34.0 \pm 0.4 \text{ mm}$ ($1.339 \pm 0.016 \text{ in}$)

F & S No. 3151 142 102



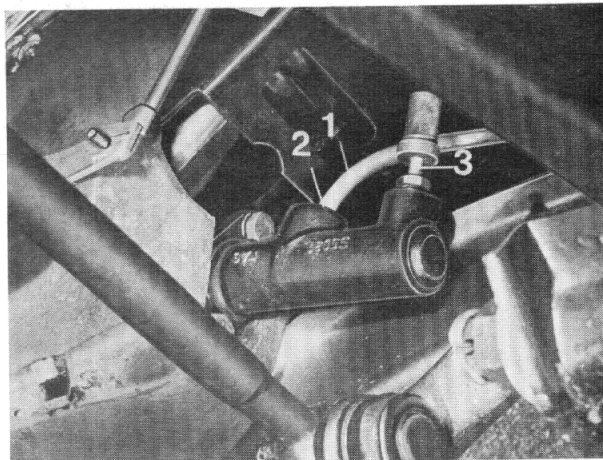
21 52 000 Removal and fitting of clutch master cylinder

Draw off brake fluid in equalizing reservoir until level is reached where topping-up pipe enters.

Pull topping-up pipe (1) out of master cylinder.

Note when fitting: Fit plug (2) so that no air can be drawn in.

Detach pipe (3) from master cylinder.

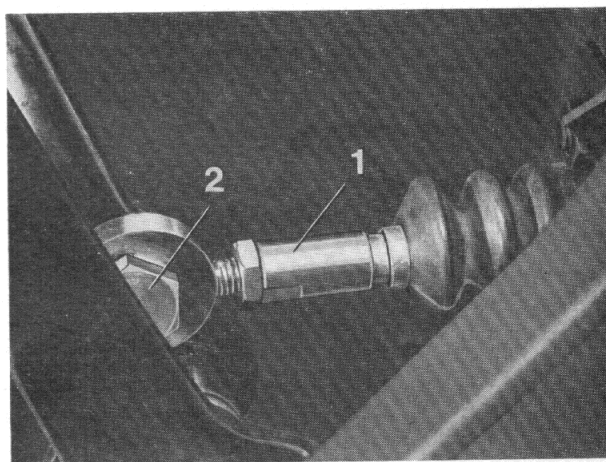


Remove carpet as far as necessary from pedals.

Disconnect thrust rod (1) at clutch pedal.

Note when fitting: Clutch pedal travel¹⁾ can be adjusted by means of thrust rod (1).

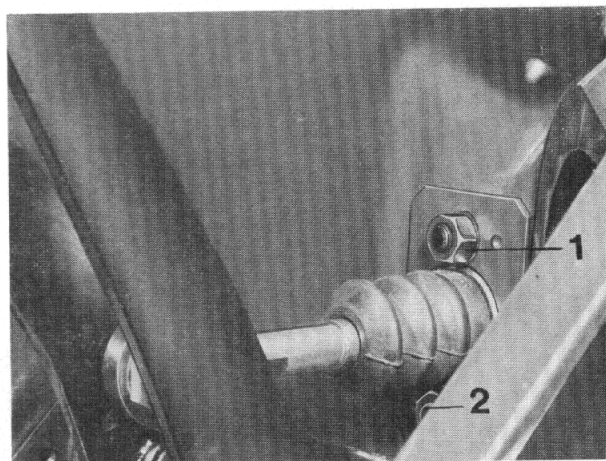
Install bolt (2) and bushes using Molykote Longterm 2.



Unscrew retaining nuts (1) and (2).

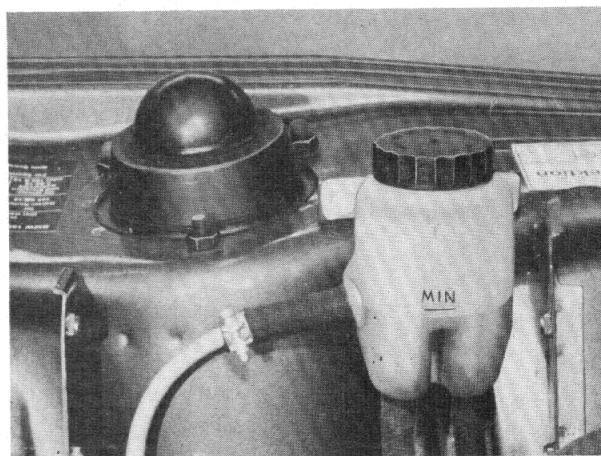
Take out master cylinder.

Bleed clutch hydraulic system – 21 00 006.

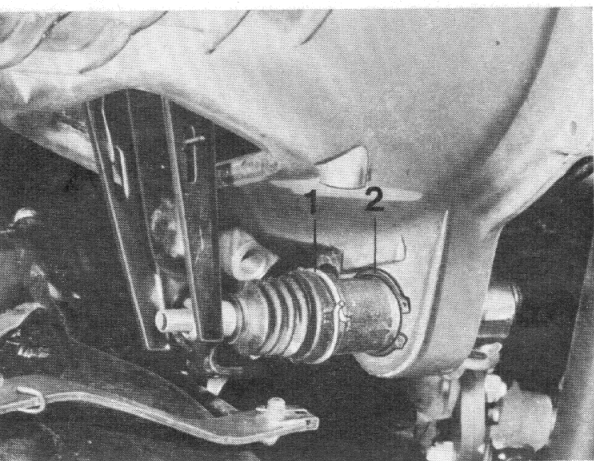


21 52 010 Removal and fitting of clutch cylinder

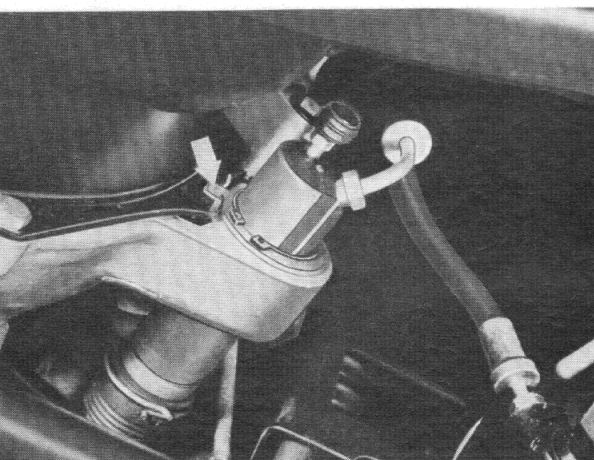
Draw off brake fluid in equalizing reservoir until level is reached where topping-up pipe enters.



¹⁾ See specifications



Remove support ring (1) and circlip (2).
Pull clutch slave cylinder out to the front.



Detach pressure pipe from clutch slave cylinder and remove cylinder.

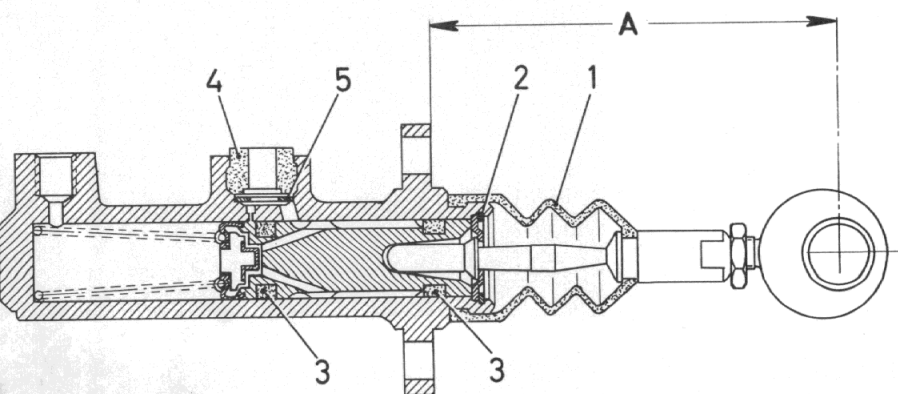
Note when fitting: Correct position of support plate.
Bleed clutch hydraulic system – 21 00 006.

21 52 502 Overhauling clutch master cylinder (removed)

Install repair kit.

- 1 Gaiter
- 2 Lock ring
- 3 Slotted rings
- 4 Sealing plug
- 5 Washer

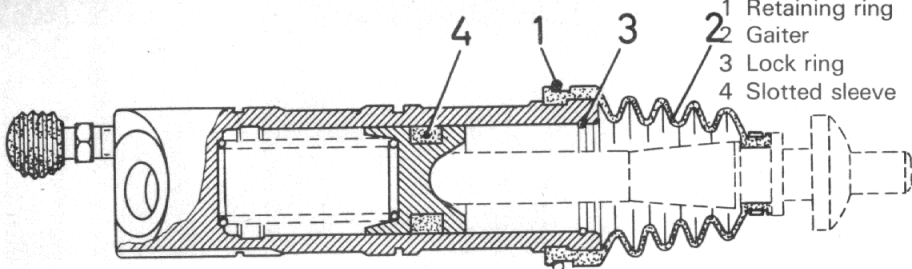
Adjust distance A to 100 ± 0.5 mm (3.9 ± 0.020 in).



21 52 512 Overhauling clutch slave cylinder (removed)

Install repair kit.

- 1 Retaining ring
- 2 Gaiter
- 3 Lock ring
- 4 Slotted sleeve



Trouble shooting on clutch

Fault	Cause	Remedy
Clutch slips	<ul style="list-style-type: none"> a) Contact pressure¹⁾ of clutch too low. b) Lining ¹⁾ badly worn. c) Lining oiled up - gearbox - or crankshaft sealing ring defective. d) Clutch was overheated e) Clutch not Original BMW part 	<ul style="list-style-type: none"> a) Renew clutch. b) Renew drive plate. c) Renew defective sealing ring and drive plate. d) Renew clutch. e) Fit Original BMW part.
Clutch grabs	<ul style="list-style-type: none"> a) Lining ¹⁾ not as per specification b) Lining oiled up. c) Shifter pressing on one side. d) Pressure plate pressing out of true. e) Crankshaft not in alignment with gearbox input shaft. f) Engine and gearbox mounting defective g) Drive plate not Original BMW part. 	<ul style="list-style-type: none"> a) Renew drive plate. b) Renew drive plate. c) Check release lever. d) Renew pressure plate. e) Check centering surfaces of engine and gearbox. f) Renew engine and gearbox mounting. g) Fit Original BMW part.
Clutch does not disengage	<ul style="list-style-type: none"> a) Drive plate adjusted too far or lining broken. b) Excessive lateral runout¹⁾ of drive plate. c) Lining rusted onto flywheel. d) Drive plate sticking on gearbox input shaft. e) Bearing for gearbox input shaft in crankshaft defective. f) Air in clutch hydraulic system. g) Tangential leaf springs in clutch broken off. 	<ul style="list-style-type: none"> a) Renew drive plate. b) Straighten or renew drive plate c) Clean flywheel, roughen lining with emery cloth. d) Free drive plate on gearbox input shaft, replace defective parts. e) Renew bearing in crankshaft. f) Bleed clutch hydraulic system. g) Renew clutch.
Clutch noises	<ul style="list-style-type: none"> a) Imbalance ¹⁾ of clutch and drive plate excessive. b) Torsional damper defective. c) Clutch shifter defective. d) Bearing for gearbox input shaft in crankshaft defective. e) Rivet connections of clutch loose. 	<ul style="list-style-type: none"> a) Renew clutch or drive plate. b) Renew drive plate. c) Renew clutch shifter. d) Renew bearing in crankshaft. e) Renew clutch.

¹⁾ See Technical data