

The BMW Motorcycle — Rear Wheel Drive

Documentation for the BMW Service Training School

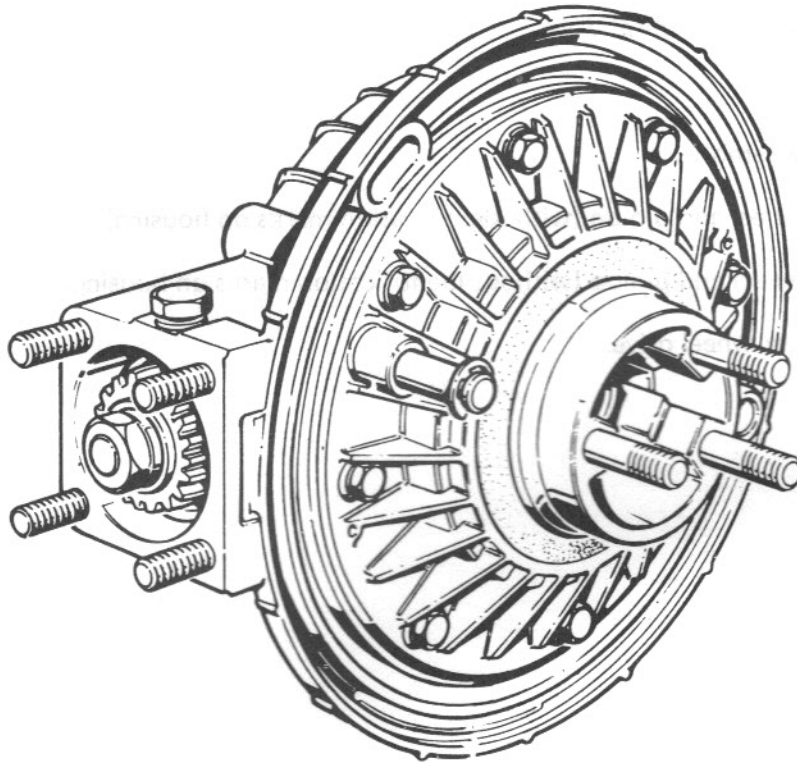
BMW Motorrad GmbH + Co. Munich
Service Promotion



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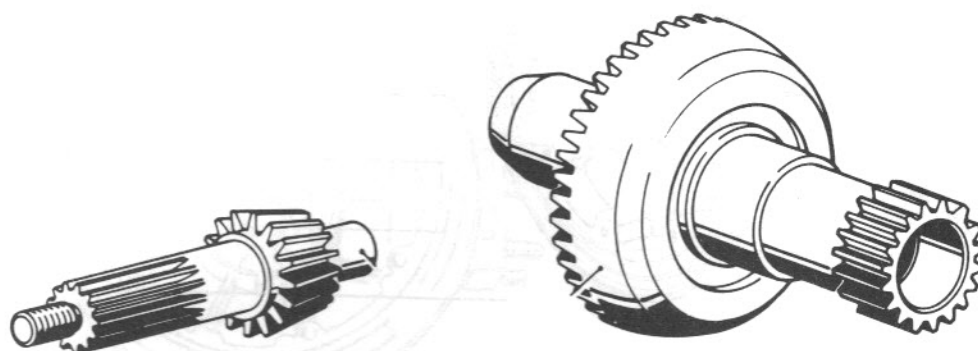
The BMW motorcycle rear wheel drive



Rear wheel drive — BMW R 80 G/S

The BMW motorcycle rear wheel drive consists of an extremely strong light alloy casing with cover, and a crown wheel and pinion with Klingelnberg (Pallid) teeth. The bevel pinion runs at the front (neck) in a double-row ball thrust bearing with split inner race, and at the rear in a needle roller bearing. The crown wheel, with which the bevel pinion engages at an angle of 90 degrees, runs in a needle roller bearing (casing side) and a ball bearing in the cover. It is splash lubricated by running partially immersed in an oilbath, and supplies lubricating oil in this way to the bevel pinion and the bearings. Power is transmitted from the crown wheel to the motorcycle's rear wheel by taper splines (except on the R 80 G/S).

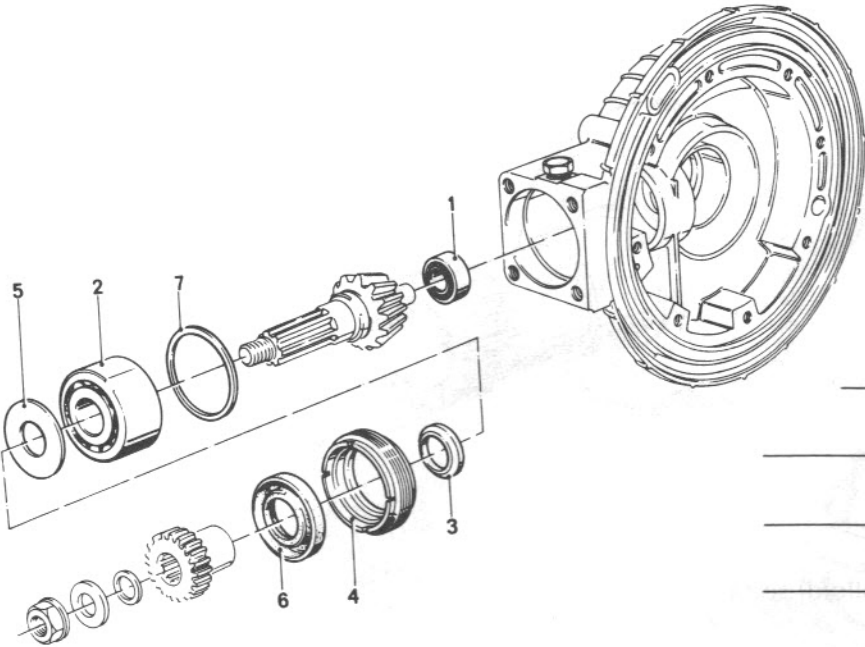
Technical data:



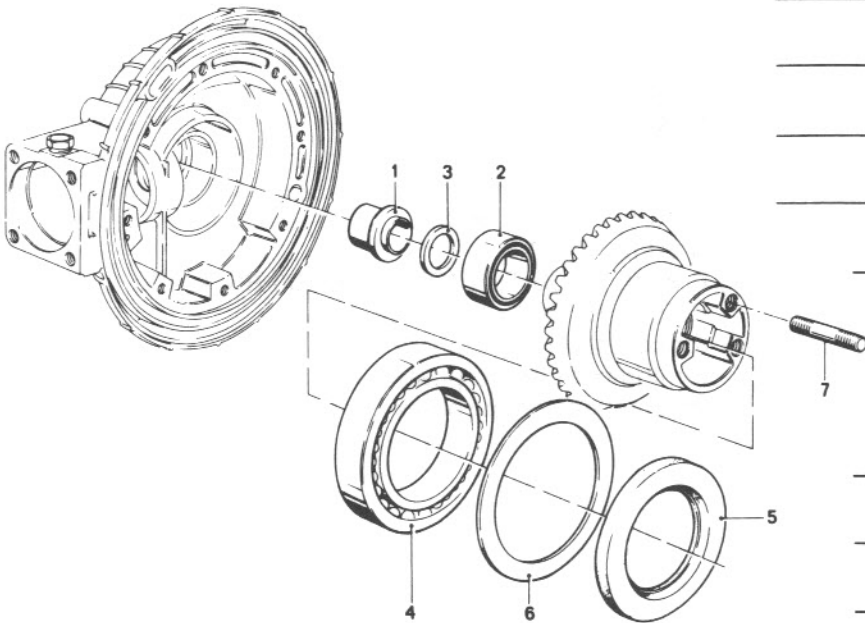
TOOTH PATTERN: Klingelnberg (Pallid) spiral bevel

Ratio	Number of teeth on crown wheel and pinion	Model
4.50 : 1	36 : 8	for competition purposes
4.25 : 1	34 : 8	R 45
3.89 : 1	35 : 9	R 45 S
3.56 : 1	32 : 9	R 50/5, R 60/7
3.44 : 1	31 : 9	R 65
3.36 : 1	37 : 11	R 60/5, /6, R 80 N, R 80 G/S
3.20 : 1	32 : 10	R 75/5, /6, /7, R 80 S
3.09 : 1	34 : 11	R 90/6, R 100/7
3.00 : 1	33 : 11	R 90 S, R 100 T, R 100 RT, R 100 RS, R 100
2.91 : 1	32 : 11	R 75/5, R 100 S, R 100 CS
2.81 : 1	31 : 11	for competition purposes
2.75 : 1	33 : 12	for competition purposes
2.62 : 1	34 : 13	for competition purposes

Rear wheel drive — components and assembly



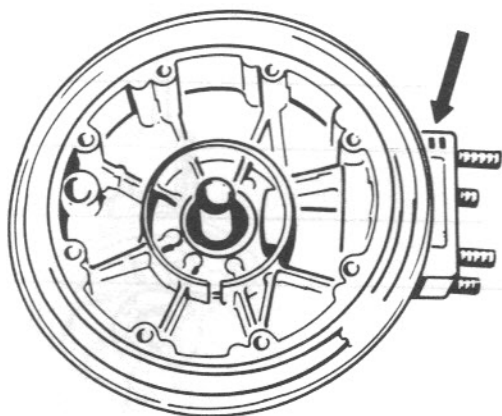
Bevel pinion bearings and mounting



Crown wheel bearings

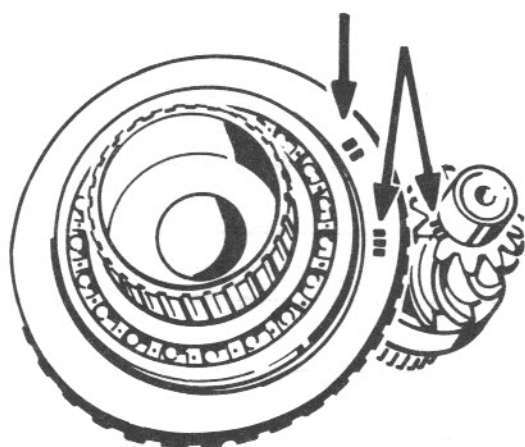
Renewing crown wheel and pinion

(from /7 models on — with identification marks on housing)



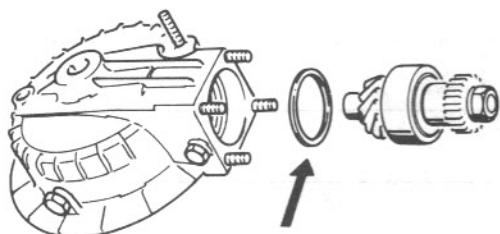
58 = TOLERANCE

Note the matching code number and the bevel pinion tolerance figure on the gears.



855 = MATCHING CODE NUMBER
-9 = TOLERANCE FOR BEVEL PINION

Determining thickness of spacing washer between housing and double-row ball bearing



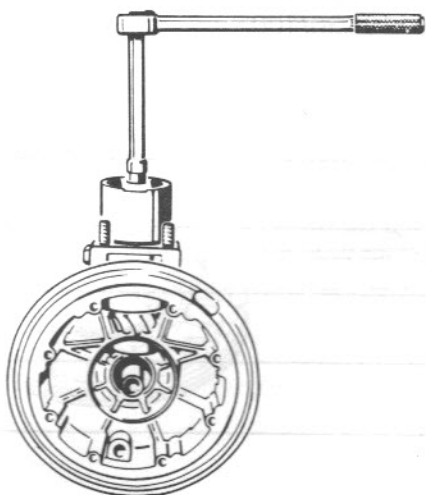
BASIC BEVEL PINION DIMENSION is 77.50 mm
 BASIC HOUSING DIMENSION is 75.50 mm
 STANDARD SPACING WASHER is therefore 2.00 mm thick

Specimen calculation (based on tolerances illustrated)

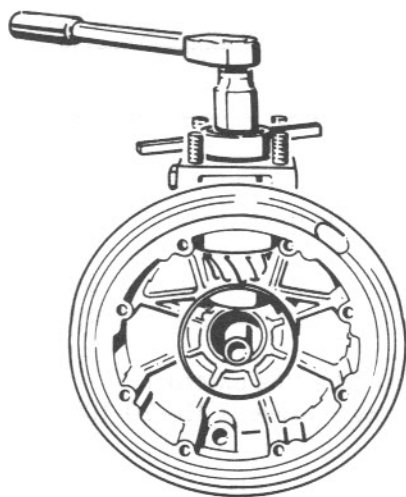
		Actual measurement
Housing tolerance	= 58	75.58
Bevel pinion tolerance	= - 9	77.41
	77.41	
	- 75.58	
	1.83	

This difference, rounded off as necessary, is the spacing washer thickness = 1.85 mm.

Installing new bevel pinion with spacing washer

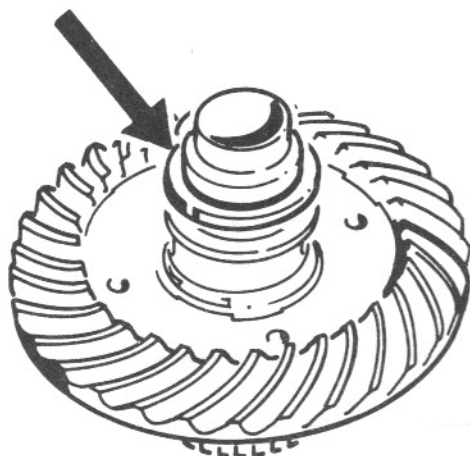


Screw journal nut into cold housing.



Secure pinion nut with 'Loctite 242'.

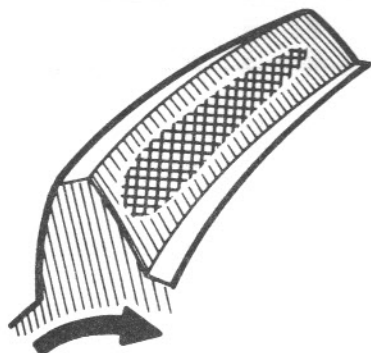
Checking tooth contact pattern



Adjust tooth backlash with bronze thrust ring to app. 10–30/100.

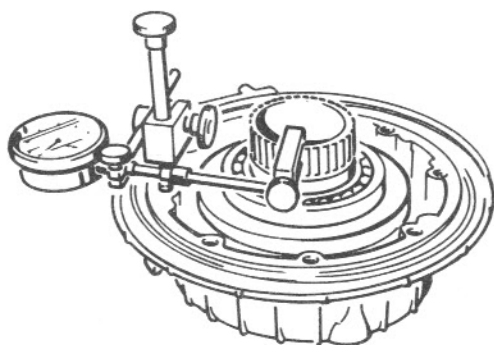
Procedure:

Apply engineer's blue to the crown wheel (outer pinion flank). Install the crown wheel. Apply a light load with the palm of the hand and turn the bevel pinion to the right (clockwise). Remove the crown wheel and examine the contact pattern on the front pinion flanks.



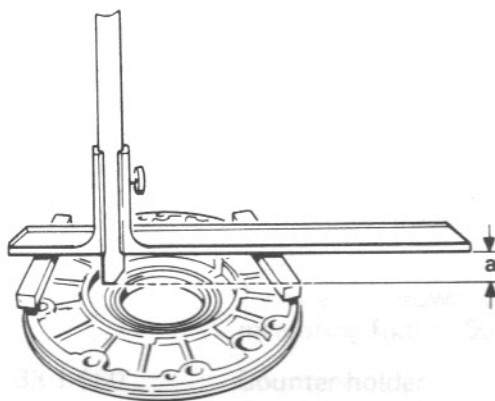
A good contact pattern lies in the middle of the tooth, slightly closer to the thicker end.

Adjusting tooth backlash



Correct play measured at the external diameter of the crown wheel is 15–20/100.

Adjusting side play of crown wheel



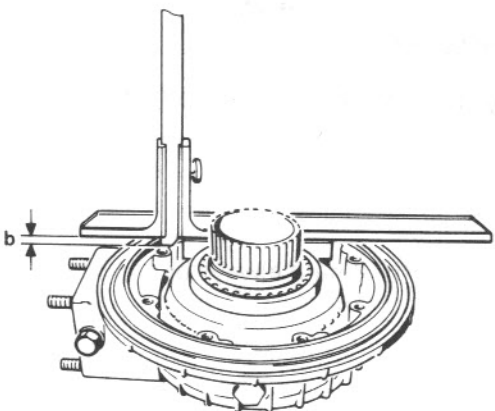
33 1 700 Counter holder

To slacken and tighten drive shaft

33 1 700

Pin wrench

To slacken and tighten threaded ring drive shaft



Determine dimensions 'a' and 'b' with the special depth gauge and 2 measuring bars.

Dimension 'a' is always greater than dimension 'b'.

Install steel shims as necessary, remembering that play of app. 0.1 mm must always be present.

Renewing crown wheel and pinion (without identifying marks on housing)

Procedure:

Strip down rear wheel drive.

Locate tolerance mark on crown wheel, e.g. TOLERANCE + 11.

Using a micrometer, determine the thickness of the bevel pinion spacing washer (between housing and double-row ball bearing).

E.g. DIMENSION + 2.15 mm.

Calculating housing dimension

Basic dimension for bevel pinion = $77.50 + 11 = 77.61$ mm.

77.61

-2.15

75.46 = HOUSING DIMENSION

When a new housing is used (without tolerance indicated), always take the BASIC DIMENSION = 75.50 mm for the calculation.

Important:

After assembling the crown wheel and pinion, the CONTACT PATTERN should always be checked on the forward flank of the bevel pinion teeth.

Special tools — rear wheel drive

Order No.	Designation
33 1 600	Retaining device for assembly stand 00 1 500 To support drive shaft housing when stripping down and assembling
33 1 620	Ring spanner To tighten 12-sided bolts securing rear wheel drive to swinging arm (R 80 G/S)
33 1 630	Clamp To measure crown wheel and pinion tooth backlash (in conjunction with measuring fixture 00 2 500)
33 1 650	Counter-holder To slacken and tighten drive shaft pinion nut
33 1 700	Pin wrench To slacken and tighten threaded ring (drive shaft pinion)
33 1 750	Drift To drive in the radial sealing ring (at threaded ring on drive shaft)
33 1 800	Assembly sleeve To protect radial sealing ring during assembly (drive shaft cover)
33 1 800	Fixture For driving radial sealing ring into drive housing cover
33 1 880	Drift For driving in radial sealing ring
33 5 600	Clamp fixture To clamp rear spring struts when removing and installing
33 5 605	Clamp To clamp spring of rear spring strut when removing and installing
33 1 610	Additional mounting for rear wheel drive (R 80 G/S)
33 1 830	Three-arm puller for removing ball bearing from crown wheel (R 80 G/S)
33 1 307	Pressure head for three-arm puller
33 1 860	Drift for shaft sealing ring (R 80 G/S)