

11 21 531 Replacing all crankshaft main bearings (N16)



Special tools required:

11 4 470



Important!

Modified assignment of bearing positions.

Bearing position (1) is at the output end (clutch end)

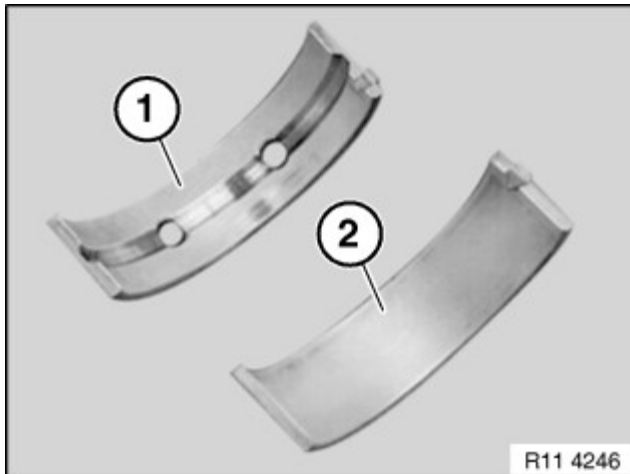
Determine main bearing colours; the designations on the crankcase and crankshaft are always required and can only be determined using the table.

A different bearing classification is necessary at bearing seat 5 on account of the central bolt on the timing chain drive.



Necessary preliminary tasks:

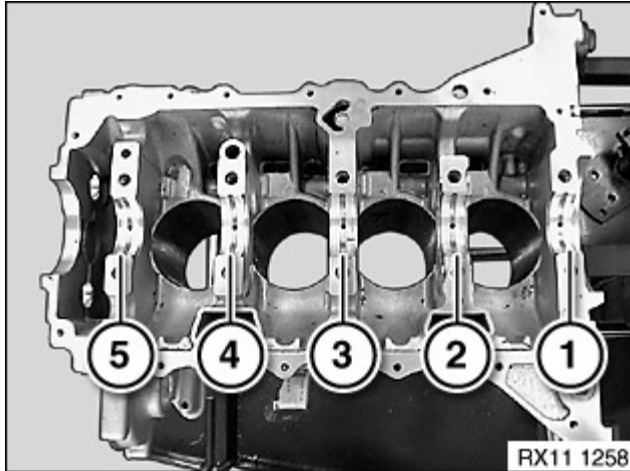
Remove crankshaft.



Installation note:

Bearing shell (1) with lubricant groove must be fitted in crankcase upper section.

Bearing shell (2) without lubricant groove must be fitted in crankcase lower section (bedplate).

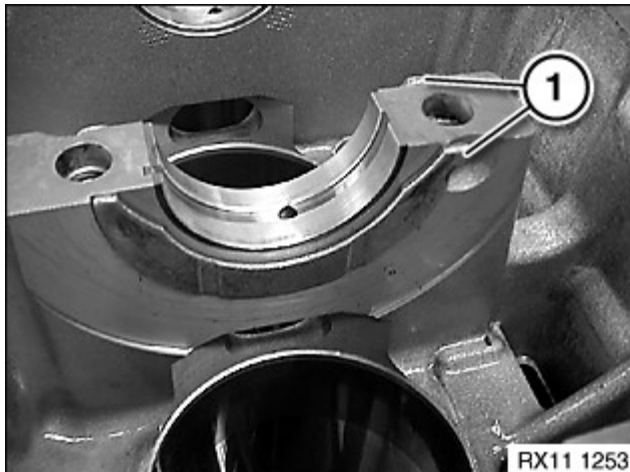


Important!
 Modified assignment of bearing positions.
 Bearing position (1) is at the output end (clutch end)

Bearings (1 to 5).
 Bearing (2) is a guide bearing.

Important!
 Clean sealing surfaces.
 Do **not** clean sealing surfaces with a metal-cutting tool.

Clean sealing surfaces with special tool 11 4 470 .



Insert guide rings (1) in crankcase at bearing seat (2) with groove facing outwards.
 If necessary, attach with engine oil to crankcase.



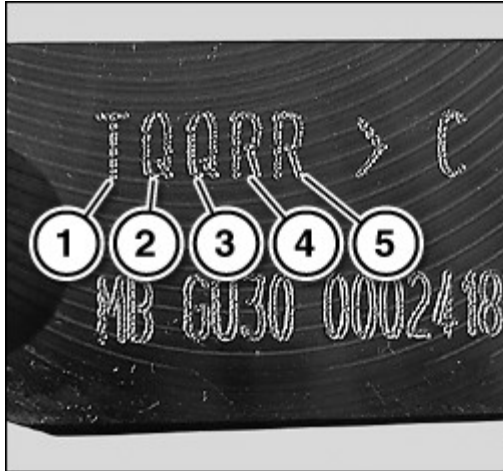
Bearing classification on crankcase upper and lower sections:

Bearing allocation 1 - 5: the designations on the crankshaft are always required.

Refer to the table for the colour code.

Example:

Bearing 1.	Letter P
Bearing 2.	Letter K
Bearing 3.	Letter I
Bearing 4.	Letter N
Bearing 5.	Letter N



Bearing classification on crankcase upper and lower sections:

Bearing allocation 1 - 5: the designations on the crankcase are always required.

Refer to the table for the colour code.

Example:

Bearing 1.	Letter T
Bearing 2.	Letter Q
Bearing 3.	Letter Q
Bearing 4.	Letter R
Bearing 5.	Letter R

Example: Crankshaft / crankcase.

Bearing (1):

Letter **P** on the crankshaft and letter **T** on the crankcase correspond to bearing colour codes for the crankcase **Or**= orange with lubricating groove.

Letter **P** on the crankshaft and letter **T** on the crankcase correspond to bearing colour codes for the crankcase lower section (bedplate) **Ge**= yellow without lubricating groove.

Bearing (2):

Letter **K** on the crankshaft and letter **Q** on the crankcase correspond to bearing colour codes for the crankcase **Or**= orange with lubricating groove.

Letter **K** on the crankshaft and letter **Q** on the crankcase correspond to bearing colour codes for the crankcase lower section (bedplate) **Or**= orange without lubricating groove.

Bearing (3):

Letter **I** on the crankshaft and letter **Q** on the crankcase correspond to bearing colour codes for the crankcase **Or**= orange with lubricating groove.

Letter **I** on the crankshaft and letter **Q** on the crankcase correspond to bearing colour codes for the crankcase lower section (bedplate) **Or**= orange without lubricating groove.

Bearing (4):

Letter **N** on the crankshaft and letter **R** on the crankcase correspond to bearing colour codes for the crankcase **Ge**= yellow without lubricating groove.

Letter **N** on the crankshaft and letter **R** on the crankcase correspond to bearing colour codes for the crankcase

lower section (bedplate) **Ge**= yellow without lubricating groove.

Attention: See extra table.

Bearing (5):

Letter **N** on the crankshaft and letter **R** on the crankcase correspond to bearing colour codes for the crankcase **Ge**= yellow with lubricating groove.

Letter **N** on the crankshaft and letter **R** on the crankcase correspond to bearing colour codes for the crankcase lower section (bedplate) **Gr**= green without lubricating groove.



Crankshaft bearing colours, bearing positions 1–4

- Sw = Black.
- Gr = Green.
- Ge = Yellow.
- Or = Orange.
- Br = Brown.

Table overview of bearing classification: Upper section, bearings 1 – 4																		
Crankshaft																		
Bearings 1-4	A	B	C	D	E	G	H	I	K	M	N	P	q	R	S	T	U	
K U R b e L g e h	A	Ge	Ge	Ge	Ge	Ge	Gr	Gr	Gr	Gr	Gr	Gr	Gr	Gr	Sw	Sw	Sw	Sw
	B	Ge	Ge	Ge	Ge	Ge	Ge	Gr	Gr	Gr	Gr	Gr	Gr	Gr	Gr	Sw	Sw	Sw
	C	Ge	Ge	Ge	Ge	Ge	Ge	Ge	Gr	Gr	Gr	Gr	Gr	Gr	Gr	Gr	Sw	Sw
	D	Ge	Ge	Ge	Ge	Ge	Ge	Ge	Ge	Gr	Gr	Gr	Gr	Gr	Gr	Gr	Gr	Sw
	E	Or	Ge	Ge	Ge	Ge	Ge	Ge	Ge	Ge	Gr	Gr	Gr	Gr	Gr	Gr	Gr	Gr
	G	Or	Or	Ge	Ge	Ge	Ge	Ge	Ge	Ge	Gr	Gr	Gr	Gr	Gr	Gr	Gr	Gr
	H	Or	Or	Or	Ge	Ge	Ge	Ge	Ge	Ge	Ge	Ge	Gr	Gr	Gr	Gr	Gr	Gr
	I	Or	Or	Or	Or	Ge	Ge	Ge	Ge	Ge	Ge	Ge	Ge	Gr	Gr	Gr	Gr	Gr
	K	Or	Or	Or	Or	Or	Ge	Ge	Ge	Ge	Ge	Ge	Ge	Ge	Gr	Gr	Gr	Gr
	M	Or	Or	Or	Or	Or	Or	Ge	Ge	Ge	Ge	Ge	Ge	Ge	Ge	Gr	Gr	Gr
N	Or	Or	Or	Or	Or	Or	Or	Ge	Ge	Ge	Ge	Ge	Ge	Ge	Ge	Gr	Gr	
P	Or	Or	Or	Or	Or	Or	Or	Or	Ge	Ge	Ge	Ge	Ge	Ge	Ge	Ge	Gr	
q	Br	Or	Or	Or	Or	Or	Or	Or	Or	Ge	Ge	Ge	Ge	Ge	Ge	Ge	Ge	
R	Br	Br	Or	Or	Or	Or	Or	Or	Or	Or	Ge	Ge	Ge	Ge	Ge	Ge	Ge	
S	Br	Br	Br	Or	Or	Or	Or	Or	Or	Or	Or	Ge	Ge	Ge	Ge	Ge	Ge	
T	Br	Br	Br	Br	Or	Or	Or	Or	Or	Or	Or	Or	Ge	Ge	Ge	Ge	Ge	

ä	U	Br	Br	Br	Br	Br	Or	Or	Or	Or	Or	Or	Or	Or	Ge	Ge	Ge	Ge
U	X	Br	Br	Br	Br	Br	Br	Or	Or	Or	Or	Or	Or	Or	Or	Ge	Ge	Ge
s	Y	Br	Br	Br	Br	Br	Br	Br	Or	Or	Or	Or	Or	Or	Or	Or	Ge	Ge
e	Z-Series	Br	Br	Br	Br	Br	Br	Br	Or	Or	Or	Or	Or	Or	Or	Or	Or	Ge

**Table overview of bearing classification: Lower section, bearings 1 – 4
Crankshaft**

Bearings 1-4		A	B	C	D	E	G	H	I	K	M	N	P	q	R	S	T	U
K U R b e L g e h ä U s e	A	Ge	Gr	Gr	Gr	Gr	Gr	Gr	Gr	Gr	Sw	Sw	Sw	Sw	Sw	Sw	Sw	Sw
	B	Ge	Ge	Gr	Gr	Gr	Gr	Gr	Gr	Gr	Gr	Sw	Sw	Sw	Sw	Sw	Sw	Sw
	C	Ge	Ge	Ge	Gr	Gr	Gr	Gr	Gr	Gr	Gr	Gr	Sw	Sw	Sw	Sw	Sw	Sw
	D	Ge	Ge	Ge	Ge	Gr	Gr	Gr	Gr	Gr	Gr	Gr	Gr	Sw	Sw	Sw	Sw	Sw
	E	Ge	Ge	Ge	Ge	Ge	Gr	Gr	Gr	Gr	Gr	Gr	Gr	Gr	Sw	Sw	Sw	Sw
	G	Ge	Ge	Ge	Ge	Ge	Ge	Gr	Gr	Gr	Gr	Gr	Gr	Gr	Gr	Sw	Sw	Sw
	H	Ge	Ge	Ge	Ge	Ge	Ge	Ge	Gr	Gr	Gr	Gr	Gr	Gr	Gr	Gr	Sw	Sw
	I	Ge	Ge	Ge	Ge	Ge	Ge	Ge	Ge	Gr	Gr	Gr	Gr	Gr	Gr	Gr	Gr	Sw
	K	Or	Ge	Ge	Ge	Ge	Ge	Ge	Ge	Ge	Gr	Gr	Gr	Gr	Gr	Gr	Gr	Gr
	M	Or	Or	Ge	Ge	Ge	Ge	Ge	Ge	Ge	Ge	Gr	Gr	Gr	Gr	Gr	Gr	Gr
	N	Or	Or	Or	Ge	Ge	Ge	Ge	Ge	Ge	Ge	Ge	Gr	Gr	Gr	Gr	Gr	Gr
	P	Or	Or	Or	Or	Ge	Ge	Ge	Ge	Ge	Ge	Ge	Ge	Gr	Gr	Gr	Gr	Gr
	q	Or	Or	Or	Or	Or	Ge	Ge	Ge	Ge	Ge	Ge	Ge	Ge	Gr	Gr	Gr	Gr
	R	Or	Or	Or	Or	Or	Or	Ge	Ge	Ge	Ge	Ge	Ge	Ge	Ge	Gr	Gr	Gr
	S	Or	Or	Or	Or	Or	Or	Or	Ge	Ge	Ge	Ge	Ge	Ge	Ge	Ge	Gr	Gr
	T	Or	Or	Or	Or	Or	Or	Or	Or	Ge	Ge	Ge	Ge	Ge	Ge	Ge	Ge	Gr
U	Br	Or	Or	Or	Or	Or	Or	Or	Or	Ge	Ge	Ge	Ge	Ge	Ge	Ge	Ge	
X	Br	Br	Or	Or	Or	Or	Or	Or	Or	Or	Ge	Ge	Ge	Ge	Ge	Ge	Ge	
Y	Br	Br	Br	Or	Or	Or	Or	Or	Or	Or	Or	Or	Ge	Ge	Ge	Ge	Ge	
Z-Series	Br	Br	Br	Br	Or	Or	Or	Or	Or	Or	Or	Or	Or	Ge	Ge	Ge	Ge	



Crankshaft bearing colours, bearing position 5:

- Sw = Black.
- Gr = Green.
- Ge = Yellow.
- Or = Orange.

Br = Brown (only in crankcase upper section).

**Table overview of bearing classification: Upper section, bearing 5
Crankshaft**

Bearing 5		A	B	C	D	E	G	H	I	K	M	N	P	q	R	S	T	U
K U R b e L g e h ä U s e	A	Gr	Gr	Gr	Gr	Gr	Gr	Gr	Gr	Sw	Sw	Sw	Sw	Sw	Sw	Sw	Sw	Sw
	B	Ge	Gr	Gr	Gr	Gr	Gr	Gr	Gr	Gr	Sw	Sw	Sw	Sw	Sw	Sw	Sw	Sw
	C	Ge	Ge	Gr	Gr	Gr	Gr	Gr	Gr	Gr	Gr	Sw	Sw	Sw	Sw	Sw	Sw	Sw
	D	Ge	Ge	Ge	Gr	Gr	Gr	Gr	Gr	Gr	Gr	Gr	Sw	Sw	Sw	Sw	Sw	Sw
	E	Ge	Ge	Ge	Ge	Gr	Gr	Gr	Gr	Gr	Gr	Gr	Gr	Sw	Sw	Sw	Sw	Sw
	G	Ge	Ge	Ge	Ge	Ge	Gr	Gr	Gr	Gr	Gr	Gr	Gr	Gr	Sw	Sw	Sw	Sw
	H	Ge	Ge	Ge	Ge	Ge	Ge	Gr	Gr	Gr	Gr	Gr	Gr	Gr	Gr	Sw	Sw	Sw
	I	Ge	Ge	Ge	Ge	Ge	Ge	Ge	Gr	Gr	Gr	Gr	Gr	Gr	Gr	Gr	Sw	Sw
	K	Ge	Ge	Ge	Ge	Ge	Ge	Ge	Ge	Gr	Gr	Gr	Gr	Gr	Gr	Gr	Gr	Sw
	M	Or	Ge	Ge	Ge	Ge	Ge	Ge	Ge	Ge	Gr	Gr	Gr	Gr	Gr	Gr	Gr	Gr
	N	Or	Or	Ge	Ge	Ge	Ge	Ge	Ge	Ge	Ge	Gr	Gr	Gr	Gr	Gr	Gr	Gr
	P	Or	Or	Or	Ge	Ge	Ge	Ge	Ge	Ge	Ge	Ge	Gr	Gr	Gr	Gr	Gr	Gr
	q	Or	Or	Or	Or	Ge	Ge	Ge	Ge	Ge	Ge	Ge	Gr	Gr	Gr	Gr	Gr	Gr
	R	Or	Or	Or	Or	Or	Ge	Ge	Ge	Ge	Ge	Ge	Ge	Ge	Gr	Gr	Gr	Gr
	S	Or	Or	Or	Or	Or	Or	Ge	Ge	Ge	Ge	Ge	Ge	Ge	Ge	Gr	Gr	Gr
	T	Or	Or	Or	Or	Or	Or	Or	Ge	Ge	Ge	Ge	Ge	Ge	Ge	Ge	Gr	Gr
	U	Or	Or	Or	Or	Or	Or	Or	Or	Ge	Ge	Ge	Ge	Ge	Ge	Ge	Ge	Gr
	X	Br	Or	Or	Or	Or	Or	Or	Or	Or	Or	Ge	Ge	Ge	Ge	Ge	Ge	Ge
Y	Br	Br	Or	Or	Or	Or	Or	Or	Or	Or	Ge	Ge	Ge	Ge	Ge	Ge	Ge	
Z-Series	Br	Br	Br	Or	Or	Or	Or	Or	Or	Or	Or	Or	Ge	Ge	Ge	Ge	Ge	

**Table overview of bearing classification: Lower section, bearing 5
Crankshaft**

Bearing 5		A	B	C	D	E	G	H	I	K	M	N	P	q	R	S	T	U
	A	Gr	Gr	Gr	Gr	Sw	Sw	Sw	Sw	Sw	Sw	Sw	Sw	Sw	Sw	Sw	Sw	
	B	Gr	Gr	Gr	Gr	Gr	Sw	Sw	Sw	Sw	Sw	Sw	Sw	Sw	Sw	Sw	Sw	
	C	Gr	Gr	Gr	Gr	Gr	Gr	Sw	Sw	Sw	Sw	Sw	Sw	Sw	Sw	Sw	Sw	
	D	Gr	Gr	Gr	Gr	Gr	Gr	Gr	Sw	Sw	Sw	Sw	Sw	Sw	Sw	Sw	Sw	
	E	Gr	Gr	Gr	Gr	Gr	Gr	Gr	Gr	Sw	Sw	Sw	Sw	Sw	Sw	Sw	Sw	
	G	Ge	Gr	Gr	Gr	Gr	Gr	Gr	Gr	Gr	Sw	Sw	Sw	Sw	Sw	Sw	Sw	

K U R b e L g e h ä U s e	H	Ge	Ge	Gr	Gr	Gr	Gr	Gr	Gr	Gr	Gr	Sw	Sw	Sw	Sw	Sw	Sw	Sw
	I	Ge	Ge	Ge	Gr	Gr	Gr	Gr	Gr	Gr	Gr	Gr	Sw	Sw	Sw	Sw	Sw	Sw
	K	Ge	Ge	Ge	Ge	Gr	Gr	Gr	Gr	Gr	Gr	Gr	Gr	Sw	Sw	Sw	Sw	Sw
	M	Ge	Ge	Ge	Ge	Ge	Gr	Gr	Gr	Gr	Gr	Gr	Gr	Gr	Sw	Sw	Sw	Sw
	N	Ge	Ge	Ge	Ge	Ge	Ge	Gr	Gr	Gr	Gr	Gr	Gr	Gr	Gr	Sw	Sw	Sw
	P	Ge	Ge	Ge	Ge	Ge	Ge	Ge	Gr	Gr	Gr	Gr	Gr	Gr	Gr	Gr	Sw	Sw
	q	Ge	Ge	Ge	Ge	Ge	Ge	Ge	Ge	Gr	Gr	Gr	Gr	Gr	Gr	Gr	Gr	Sw
	R	Or	Ge	Ge	Ge	Ge	Ge	Ge	Ge	Ge	Gr	Gr	Gr	Gr	Gr	Gr	Gr	Gr
	S	Or	Or	Ge	Ge	Ge	Ge	Ge	Ge	Ge	Ge	Gr	Gr	Gr	Gr	Gr	Gr	Gr
	T	Or	Or	Or	Ge	Ge	Ge	Ge	Ge	Ge	Ge	Ge	Gr	Gr	Gr	Gr	Gr	Gr
	U	Or	Or	Or	Or	Ge	Ge	Ge	Ge	Ge	Ge	Ge	Ge	Gr	Gr	Gr	Gr	Gr
	X	Or	Or	Or	Or	Or	Ge	Ge	Ge	Ge	Ge	Ge	Ge	Ge	Gr	Gr	Gr	Gr
	Y	Or	Or	Or	Or	Or	Or	Ge	Ge	Ge	Ge	Ge	Ge	Ge	Ge	Gr	Gr	Gr
	Z-Series	Or	Or	Or	Or	Or	Or	Or	Ge	Ge	Ge	Ge	Ge	Ge	Ge	Ge	Gr	Gr



Install crankcase lower section.
Assemble engine.