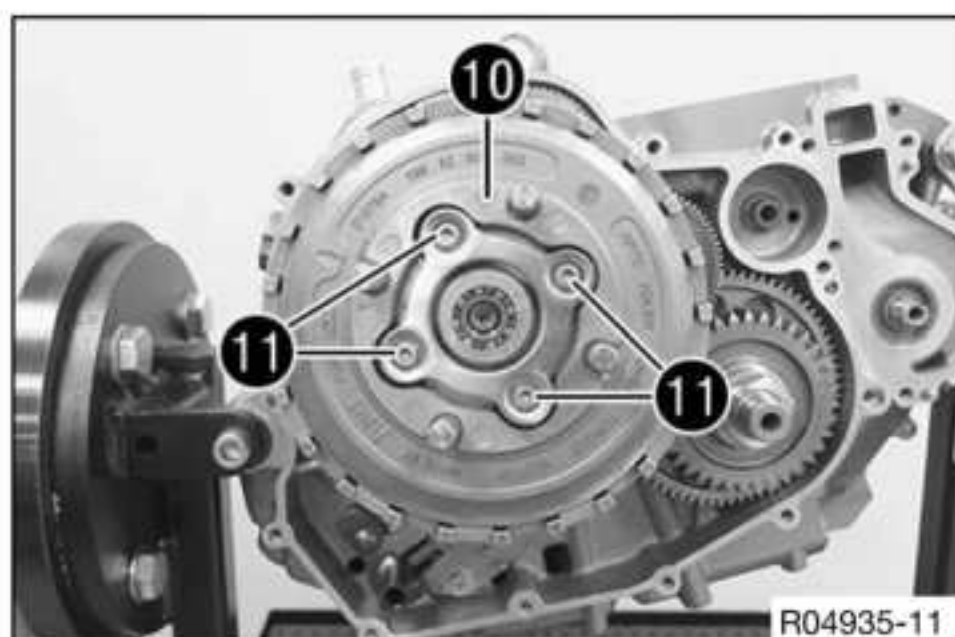


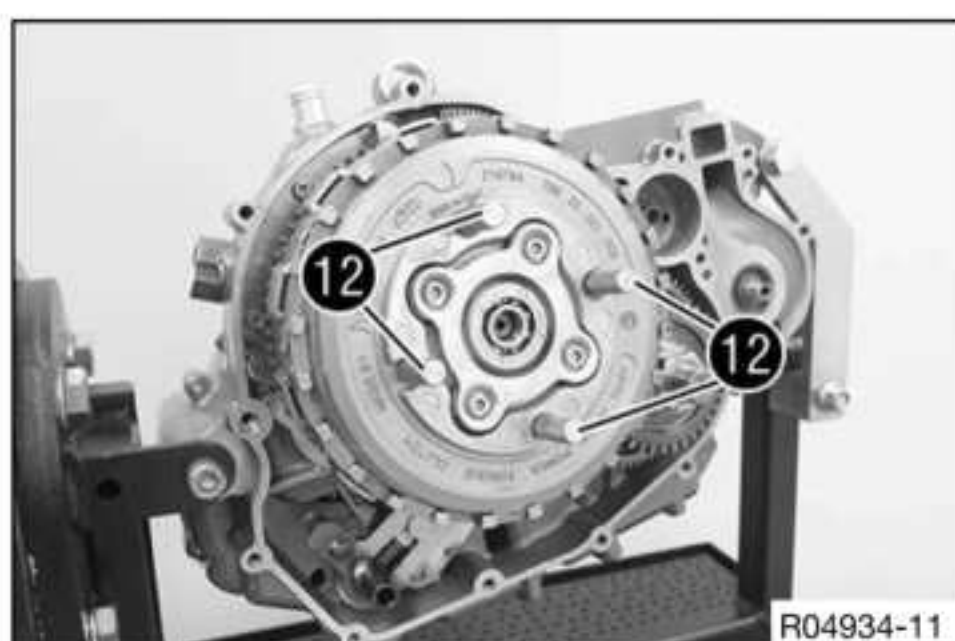
- Mount clutch throw-out **9**.



- Position clutch pressure cap **10**.
- Install and tighten screws **11** with the anticentrifugal ring and clutch springs.

Guideline

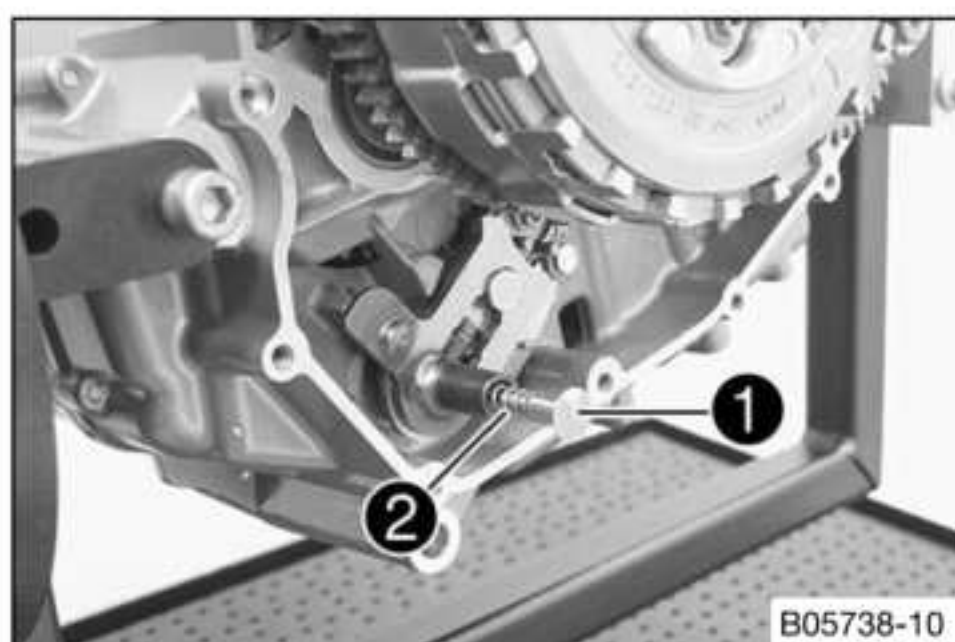
Screw, clutch spring	M5	8 Nm (5.9 lbf ft)
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- Remove special tool **12**.

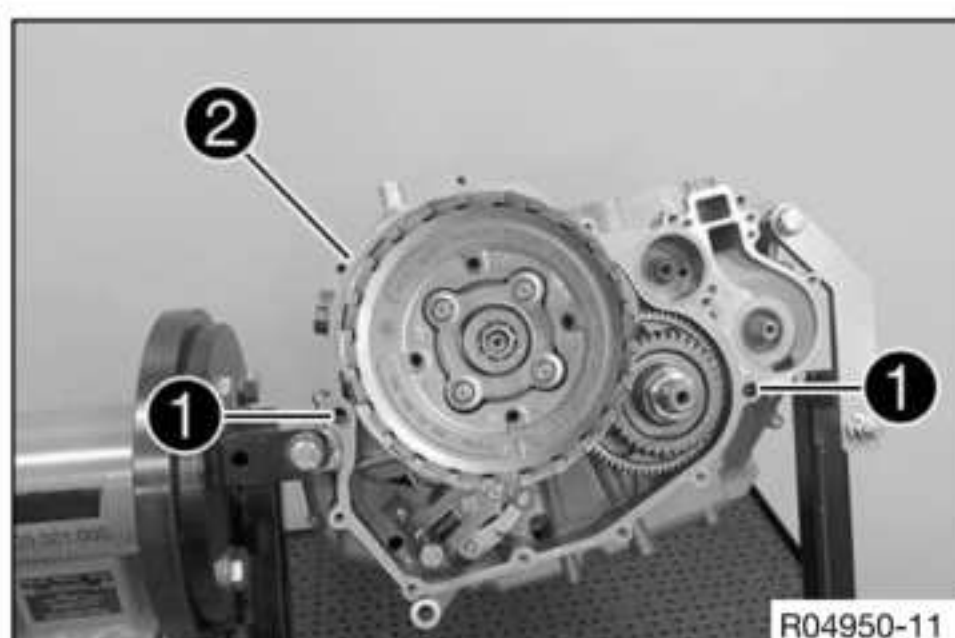
Assembly screws (75029033000) (p. 387)

18.5.11 Installing the spacer and spring

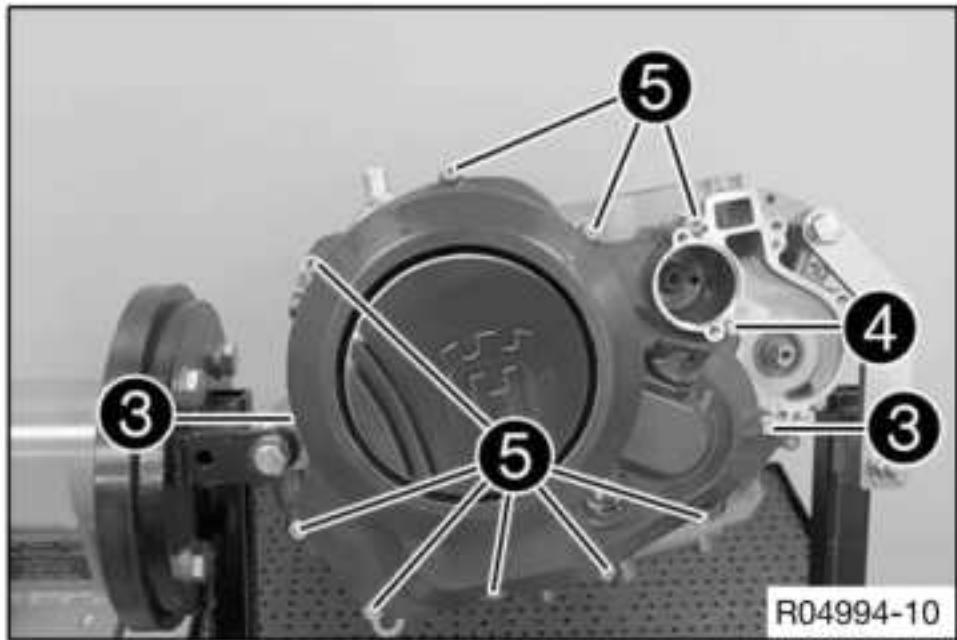


- Position spacer **1** and spring **2**.

18.5.12 Installing the clutch cover



- Mount dowels **1** and position the clutch cover gasket **2**.



- Position the clutch cover.
- Mount screws 3 but do not tighten yet.

Guideline

Screw, clutch cover	M6x30	10 Nm (7.4 lbf ft)
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- Mount screw 4 but do not tighten it yet.

Guideline

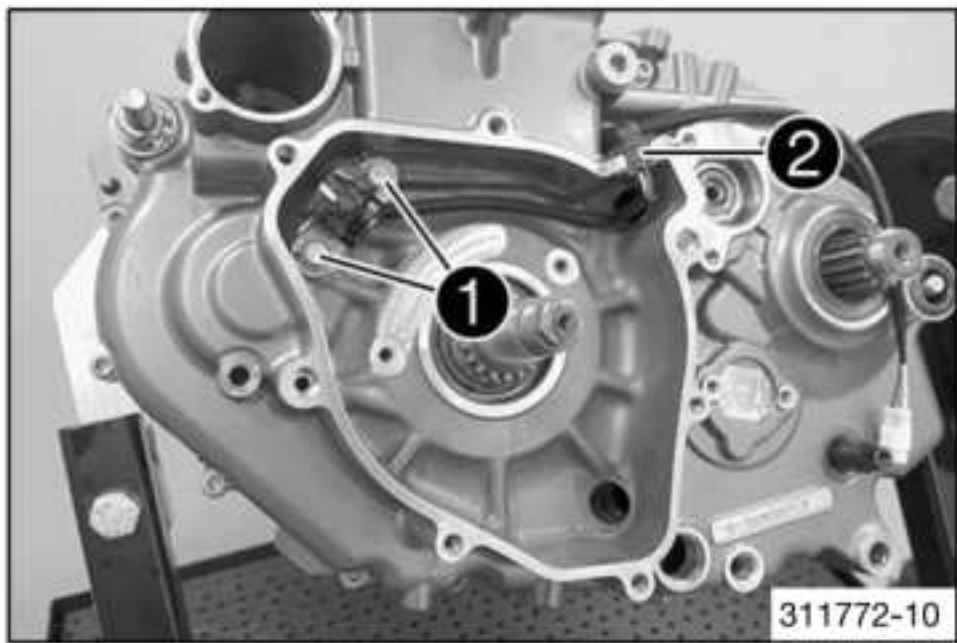
Screw, clutch cover	M6x35	10 Nm (7.4 lbf ft)
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- Mount screws 5 and tighten all screws in a crisscross pattern.

Guideline

Screw, clutch cover	M6x25	10 Nm (7.4 lbf ft)
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18.5.13 Installing the crankshaft speed sensor



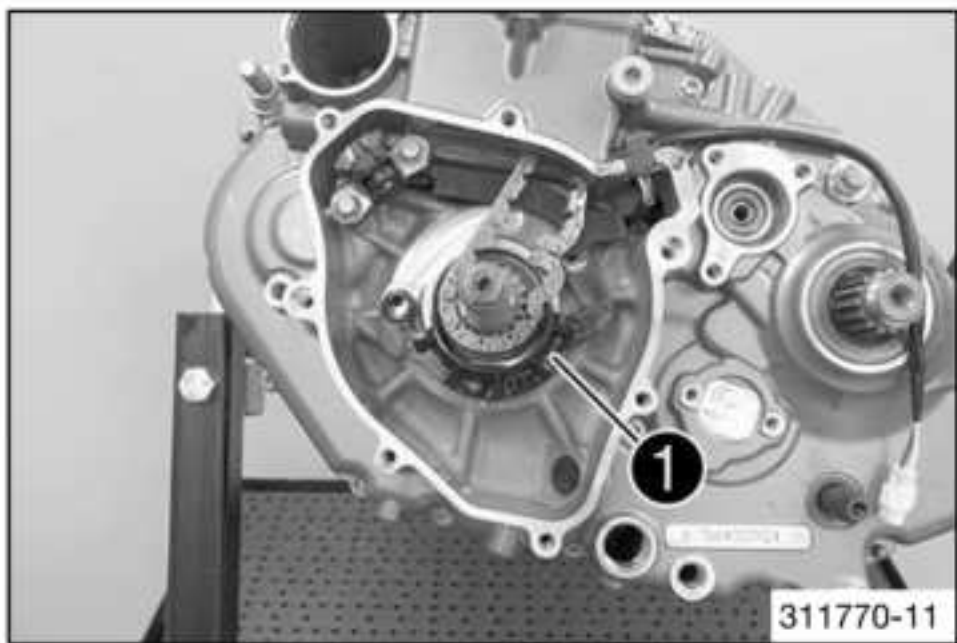
- Position the crankshaft speed sensor.
- Mount screws 1 but do not tighten yet.

Guideline

Screw, crankshaft speed sensor	M6	10 Nm (7.4 lbf ft) Loctite® 243™
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- Position the cable and position rubber grommet 2 in the engine case.

18.5.14 Installing the timing chain rails



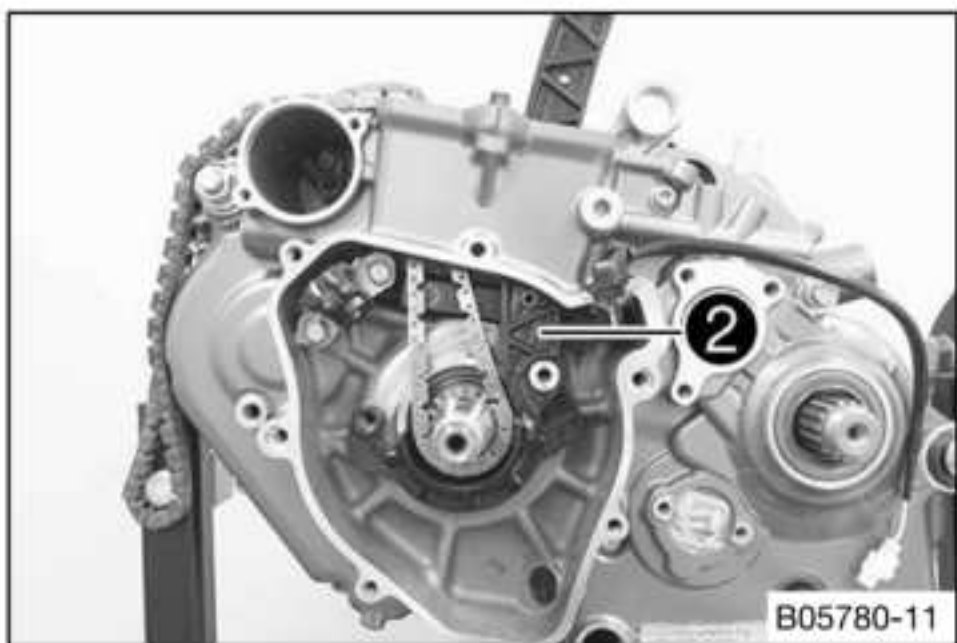
- Thread in the timing chain and place it over the timing chain sprocket.

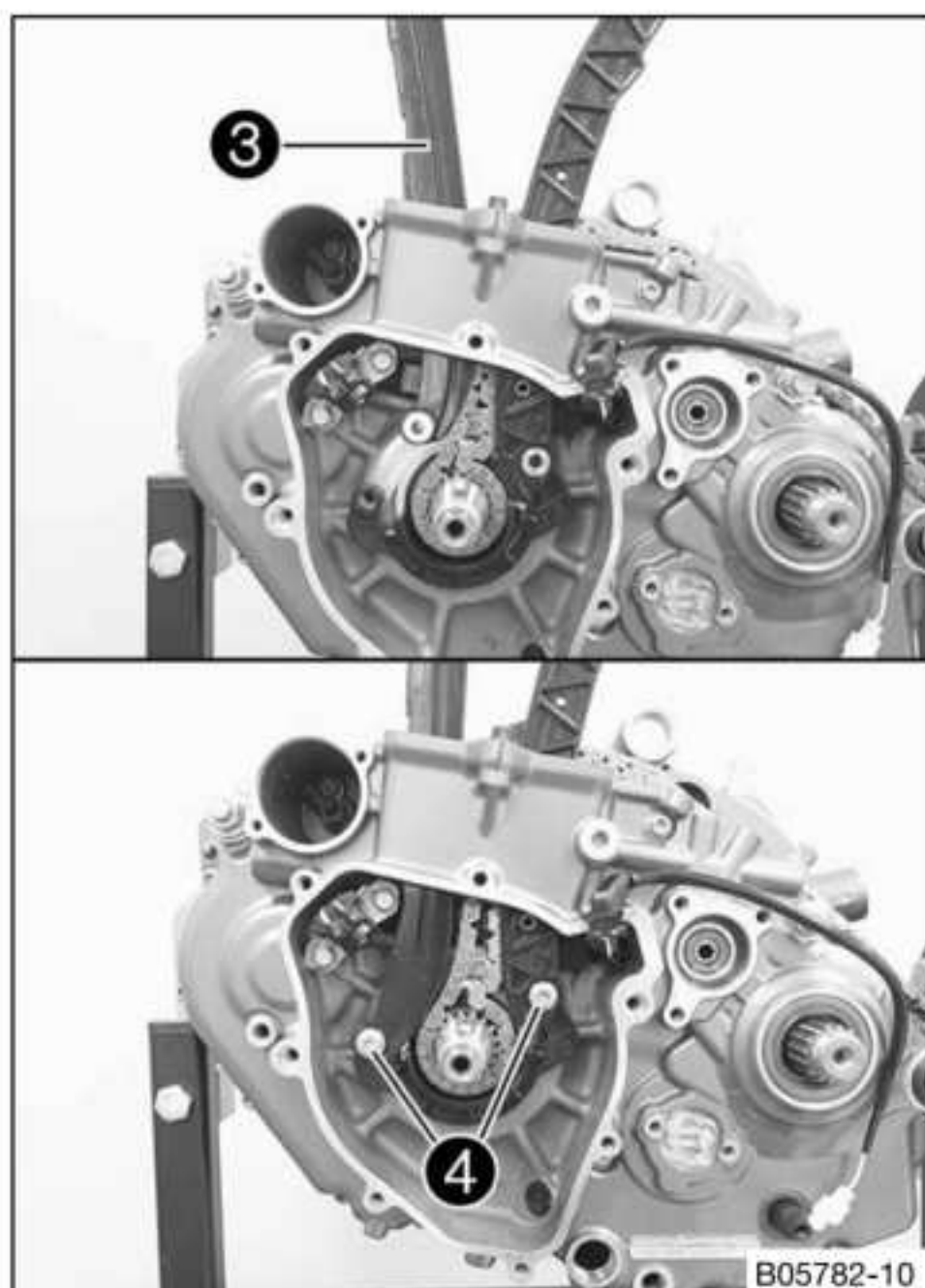


Info

If the timing chain was used before, ensure it is running in the correct direction.

- Position timing chain securing guide 1.
 - ✓ The crankshaft position sensor cable is routed in the cable duct of the timing chain securing guide.
- Position timing chain tensioning rail 2 from above.
- Insert the support bushing into the timing chain securing guide.





- Position timing chain guide rail **3** from above.
- Insert the support bushing into the timing chain securing guide.
- Mount and tighten screws **4**.

Guideline

Screw, timing chain guide rail	M6x30	10 Nm (7.4 lbf ft) Loctite®2701™
Screw, timing chain tensioning rail	M6x30	10 Nm (7.4 lbf ft) Loctite®2701™

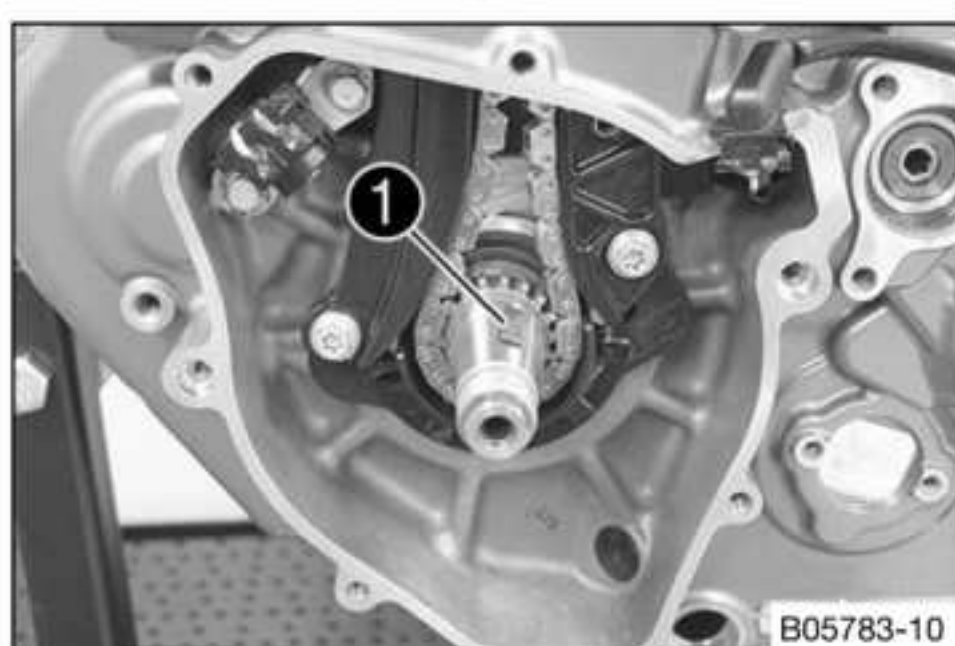


Info

Ensure that there is no thread locker on the collar of the screw; otherwise, the timing chain tensioning rail may block and break.

- Check both timing chain rails for freedom of movement.

18.5.15 Installing the rotor

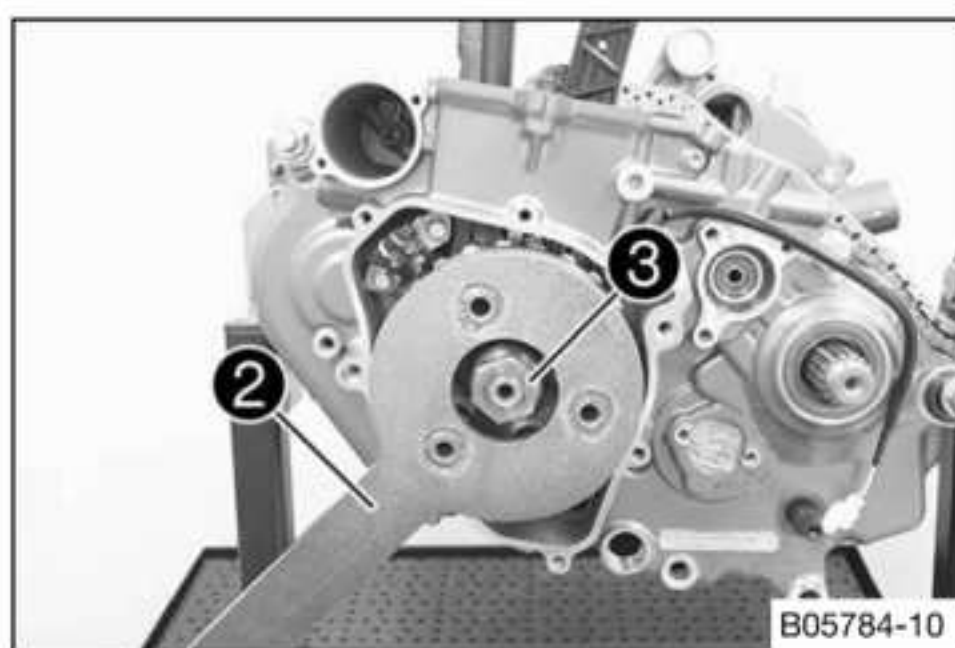


- Ensure that woodruff key **1** is seated properly.
- Degrease the cone of the crankshaft and rotor.
- Mount the rotor.



Info

Make sure that the crankshaft is not blocked.



- Hold the rotor with special tool **2**.

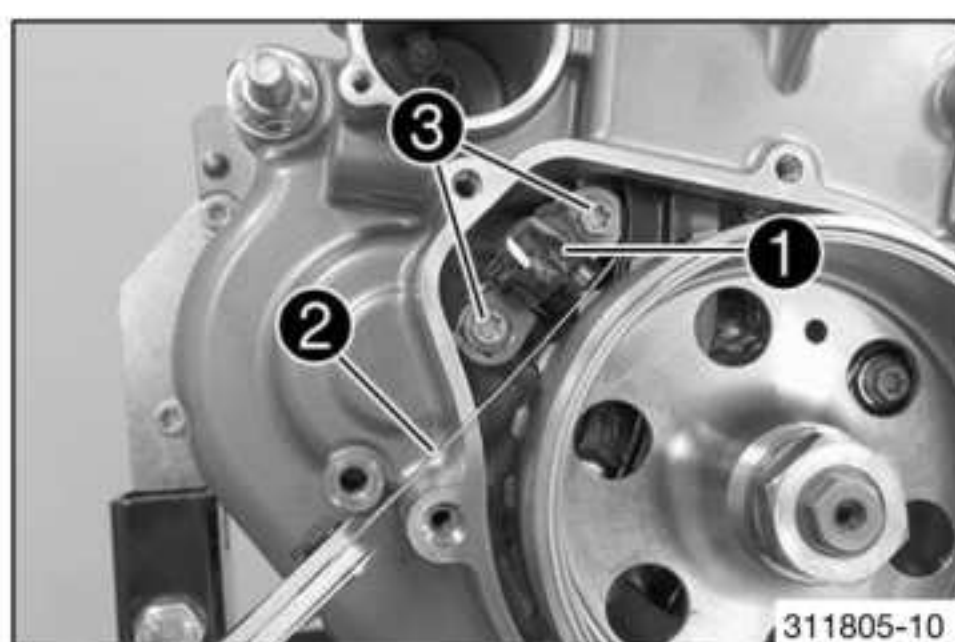
Holding wrench (75029091000) (p. 390)

- Mount and tighten nut **3** with the locking edge washer.

Guideline

Rotor nut	M18x1.5	100 Nm (73.8 lbf ft)
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18.5.16 Adjusting the crankshaft speed sensor distance



- Adjust the distance between crankshaft speed sensor **1** and the conductive element of the rotor using special tool **2**.

Guideline

Crankshaft position sensor/rotor - distance	0.70 mm (0.0276 in)
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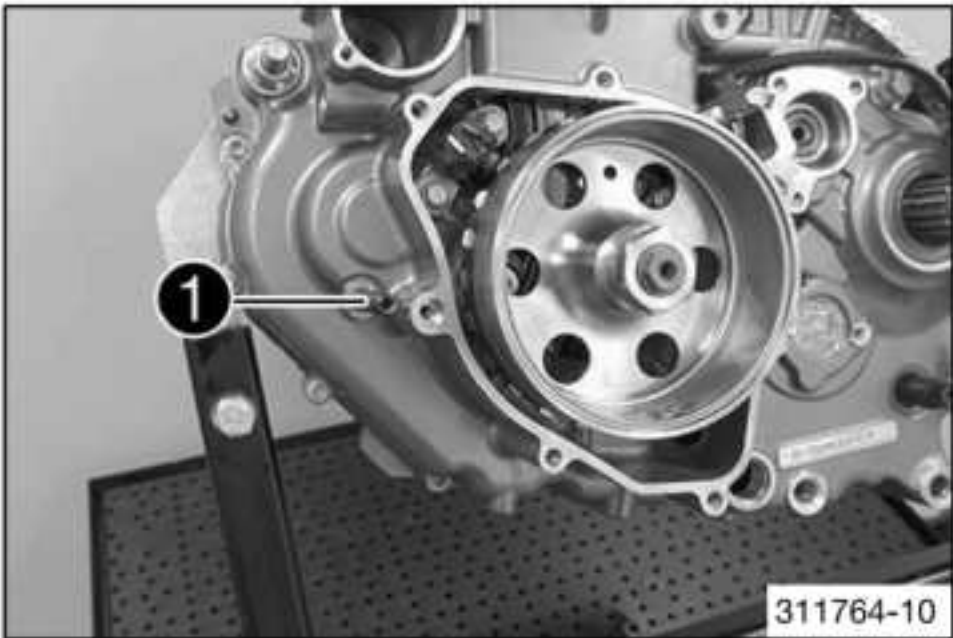
Feeler gauge (59029041100) (p. 384)

- Tighten screws **3**.

Guideline

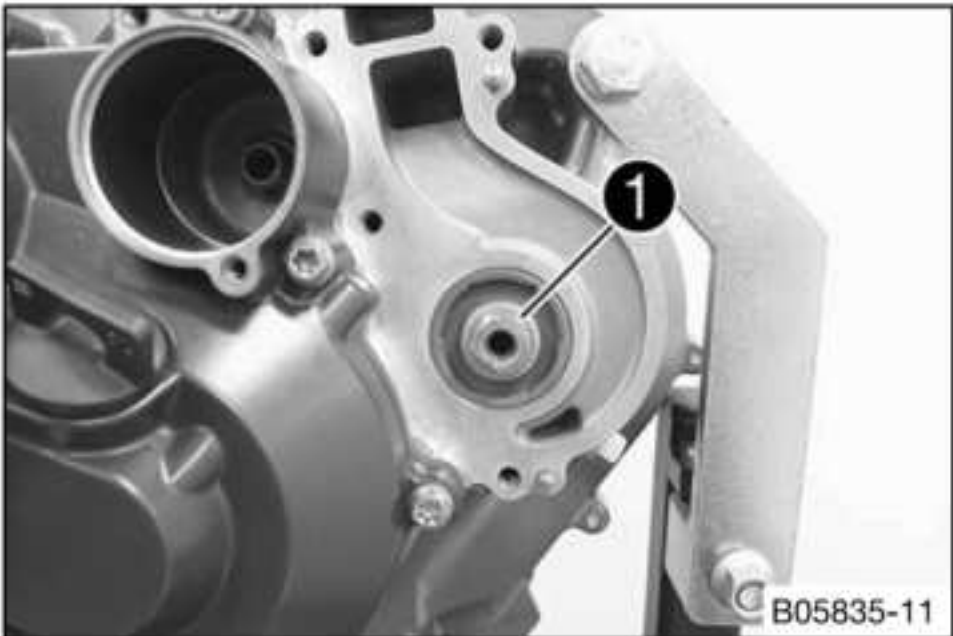
Screw, crankshaft speed sensor	M6	10 Nm (7.4 lbf ft) Loctite®243™
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18.5.17 Setting engine to top dead center

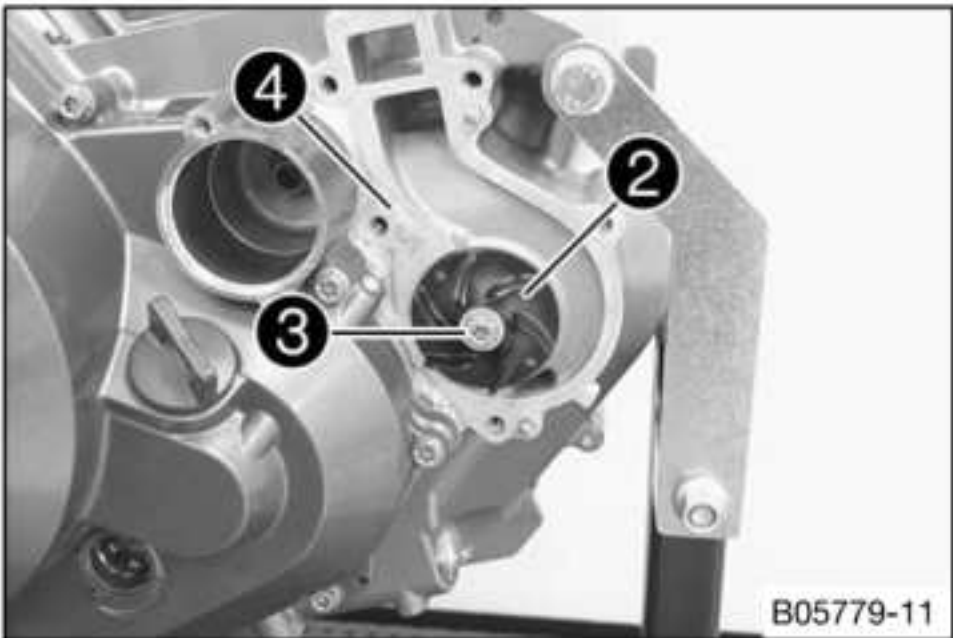


- Position crankshaft to TDC and lock with special tool 1.
- Locking screw (61229015000) (p. 386)

18.5.18 Mounting the water pump cover



- Mount form washer 1.

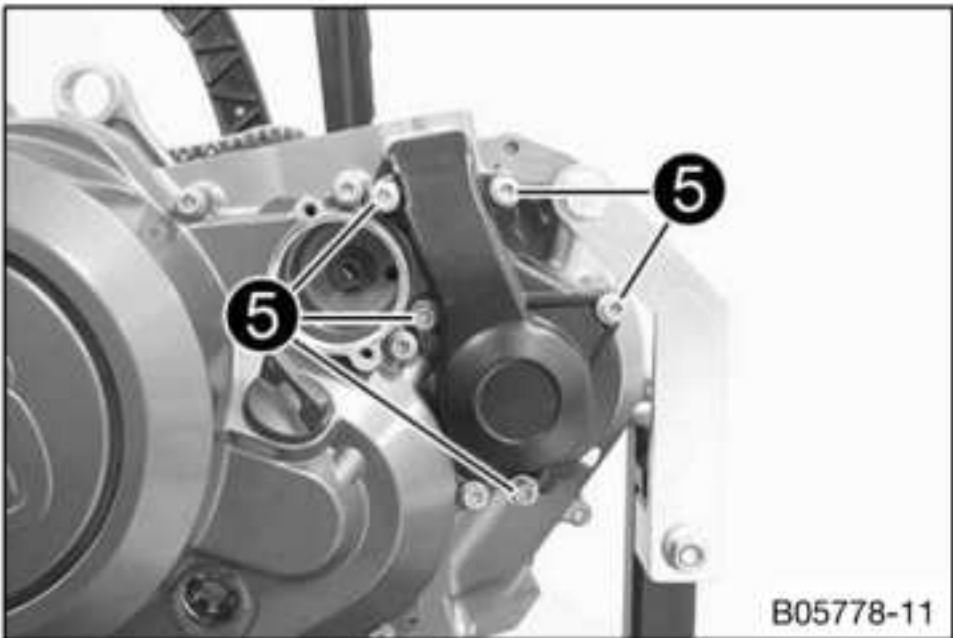


- Mount water pump impeller 2.
- Mount and tighten screw 3.

Guideline

Screw, water pump wheel	M6	10 Nm (7.4 lbf ft) Loctite®243™
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- Lay on the water pump cover seal 4.



- Position the water pump cover.
- Mount and tighten screws 5.

Guideline

Screw, water pump cover	M6	10 Nm (7.4 lbf ft)
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18.5.19 Installing the piston



- Shift the gap of the piston rings by 120°.
- Place the oiled piston on the cylinder.
- Clamp the piston rings together using the special tool.

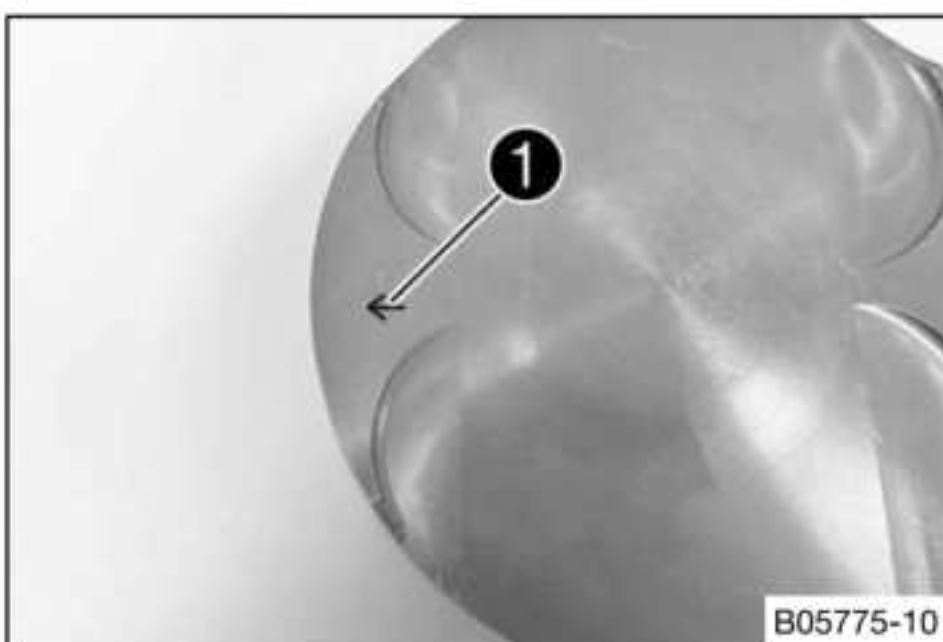
Piston ring compressor (60029015000) (p. 384)



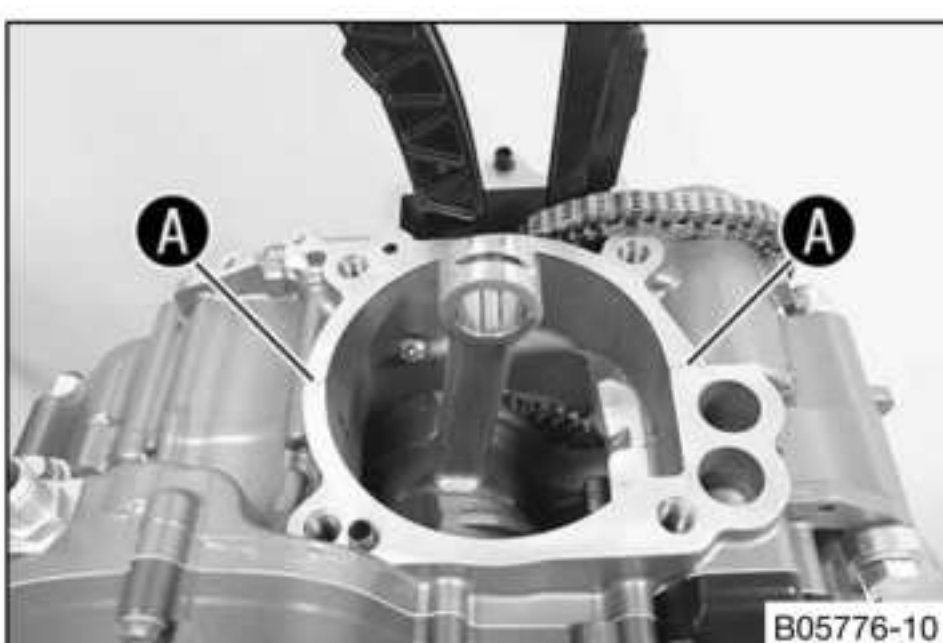
- Tap lightly on the piston ring compressor from the top with a plastic hammer so that it lies flush with the cylinder.
- ✓ The special tool must press the piston rings together properly and lie flush with the cylinder.



- Drive the piston into the cylinder by striking it carefully with the hammer handle.
- ✓ The piston rings should not catch or they will be damaged.

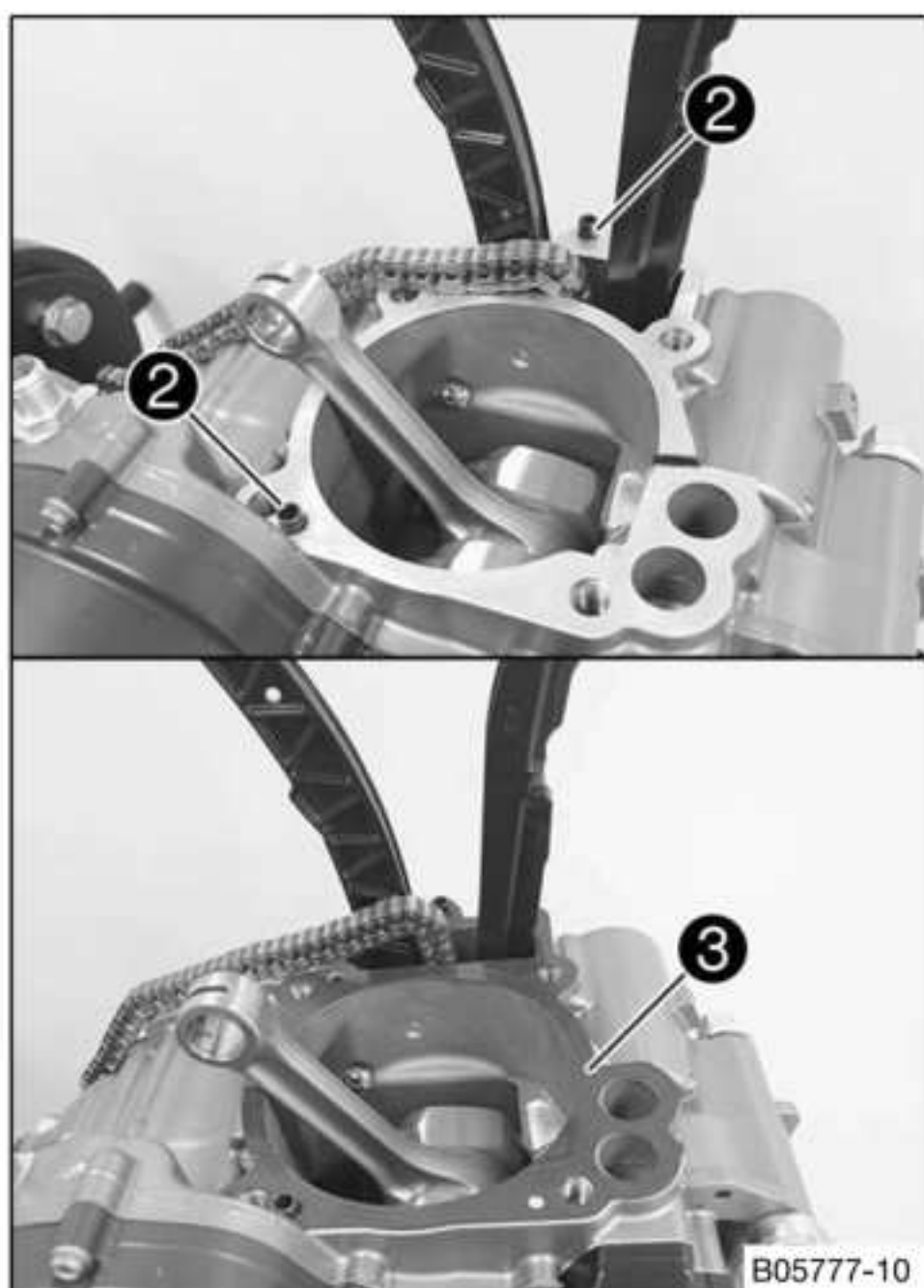


- Ensure that piston marking 1 faces the exhaust side.

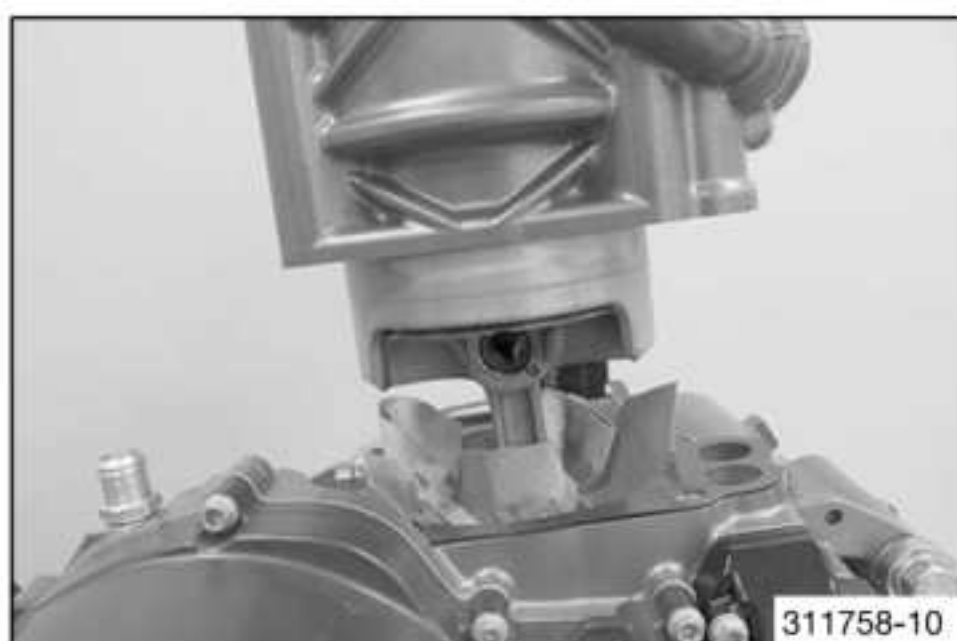


- Thinly apply sealing compound to area A.

Loctite® 5910



- Mount dowels ② and position cylinder base gasket ③.

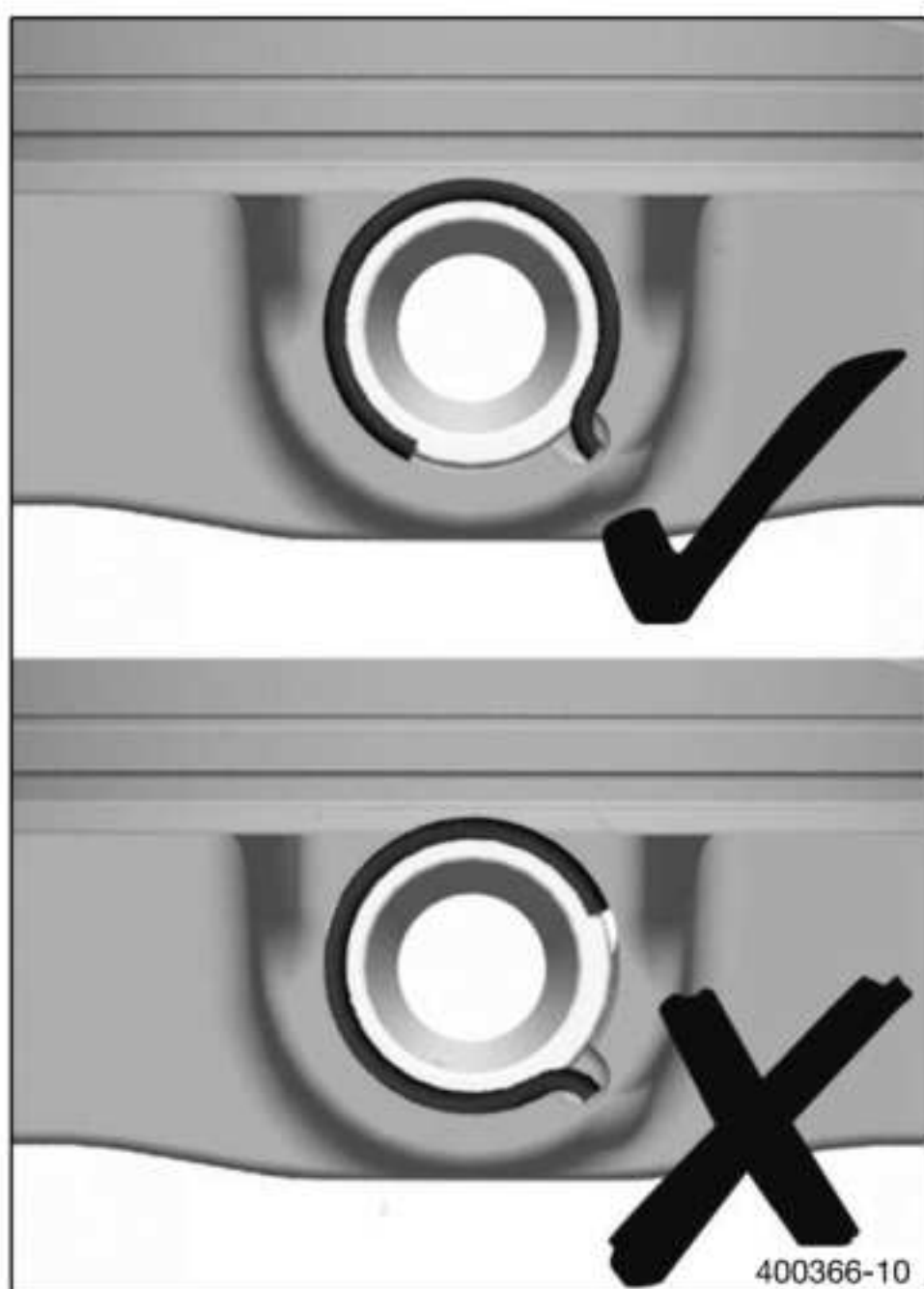


- Cover the engine case opening with a cloth. Thread the timing chain through the timing chain shaft. Mount the piston pin.



Info

For purposes of illustration, the following operations are shown on the removed piston.



- Position the piston ring lock.



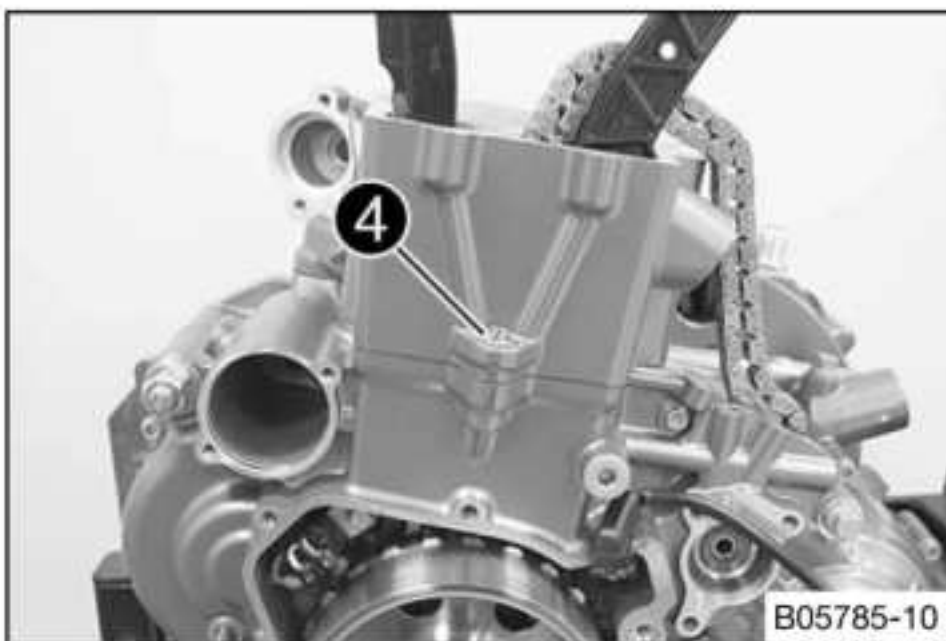
- Insert the special tool and press it with force towards the piston.
- Turn the special tool counterclockwise and, in doing so, press the piston ring lock into the groove.

Insertion for piston ring lock (75029035000) (📖 p. 388)

- Ensure that the piston ring lock is in the correct position on both sides.



- Remove the cloth.
- Keep the timing chain taut. Push the cylinder down carefully and engage the dowels.

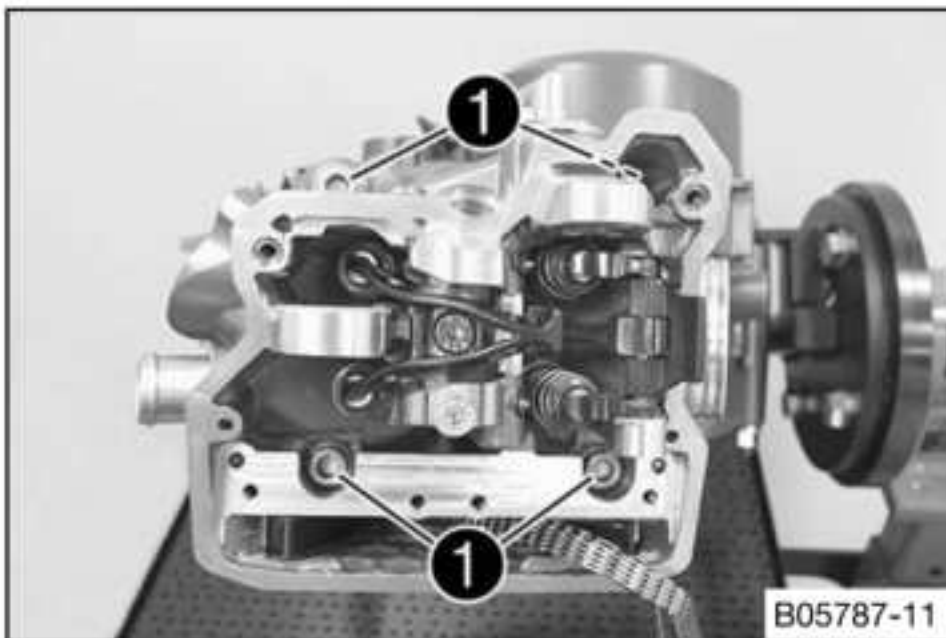


- Mount and tighten screw ④.

Guideline

Screw, timing chain shaft	M6	10 Nm (7.4 lbf ft) Loctite®243™
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18.5.20 Installing the cylinder head



- Put on the cylinder head gasket.



Info

Make sure the grooved pins are seated correctly.

- Put the cylinder head in place.
- Mount and tighten screws ① with the washers.

Guideline

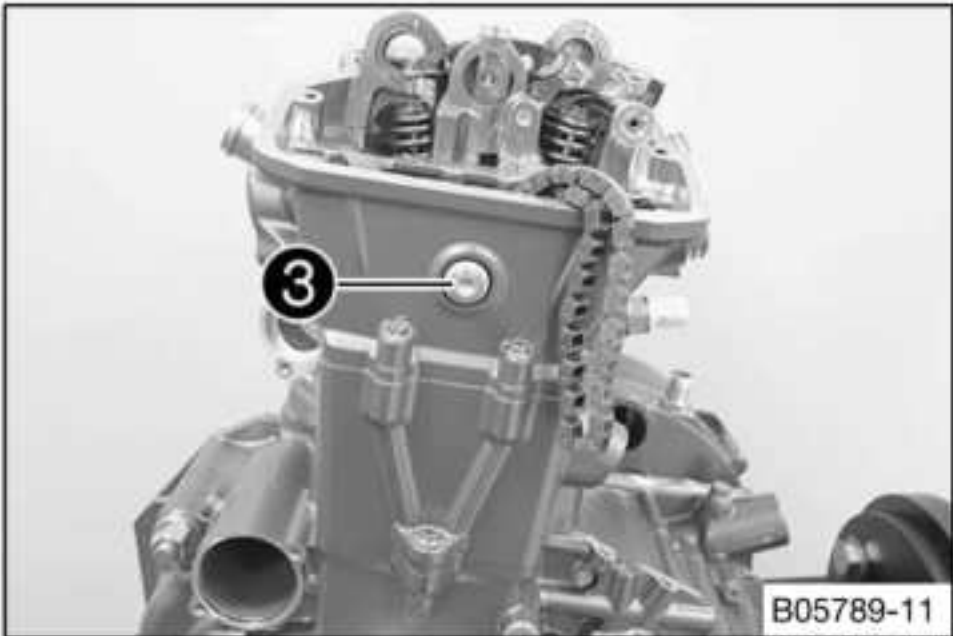
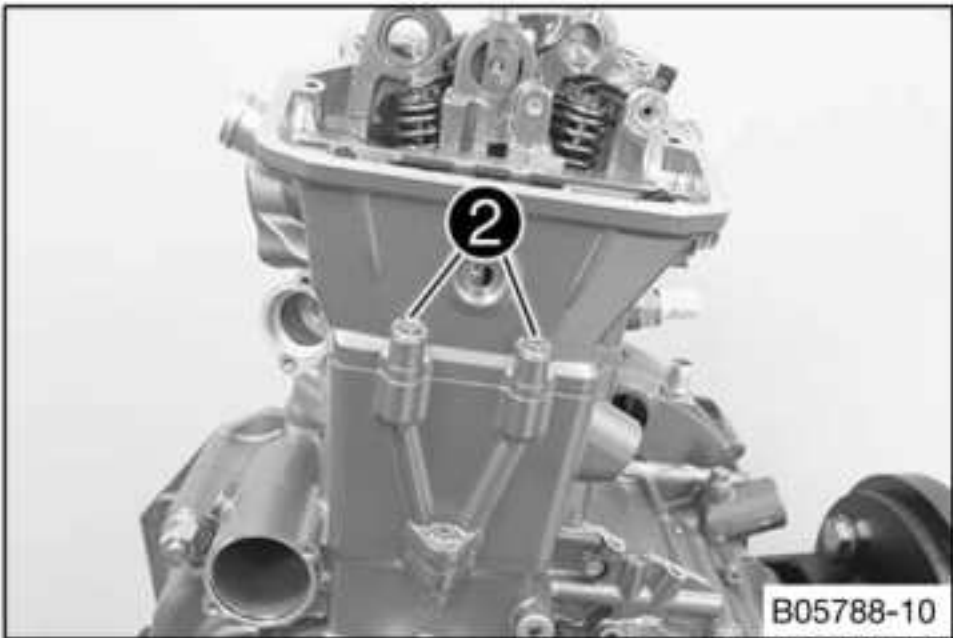
Screw, cylinder head	M10	Tightening sequence: Tighten diagonally, beginning with the rear screw on the timing chain shaft. 1st stage 15 Nm (11.1 lbf ft) 2nd stage 30 Nm (22.1 lbf ft) 3rd stage 45 Nm (33.2 lbf ft) 4th stage 60 Nm (44.3 lbf ft) Lubricated with engine oil Loctite® 577™
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i Info
Always use new cylinder head screws.

- Mount and tighten screws ②.

Guideline

Screw, cylinder head	M6	10 Nm (7.4 lbf ft) Loctite® 243™
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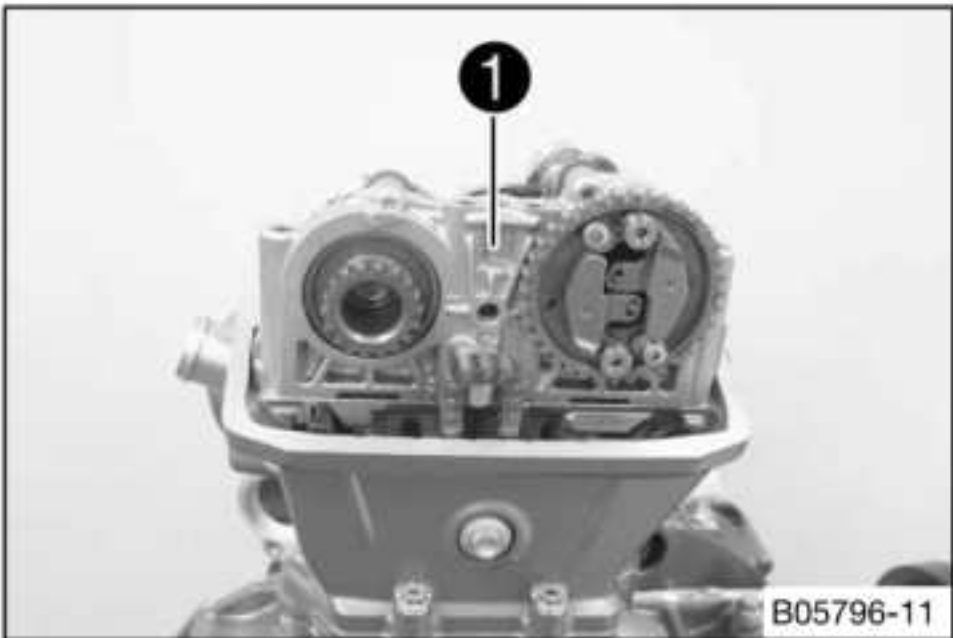


- Mount and tighten screw ③ with gasket.

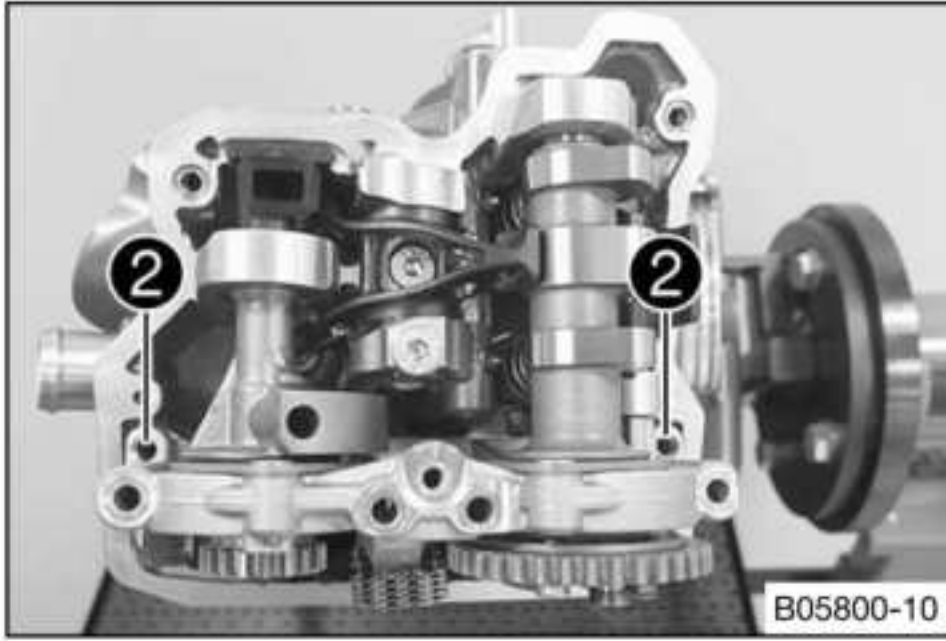
Guideline

Screw, timing chain shaft	M6	10 Nm (7.4 lbf ft) Loctite® 243™
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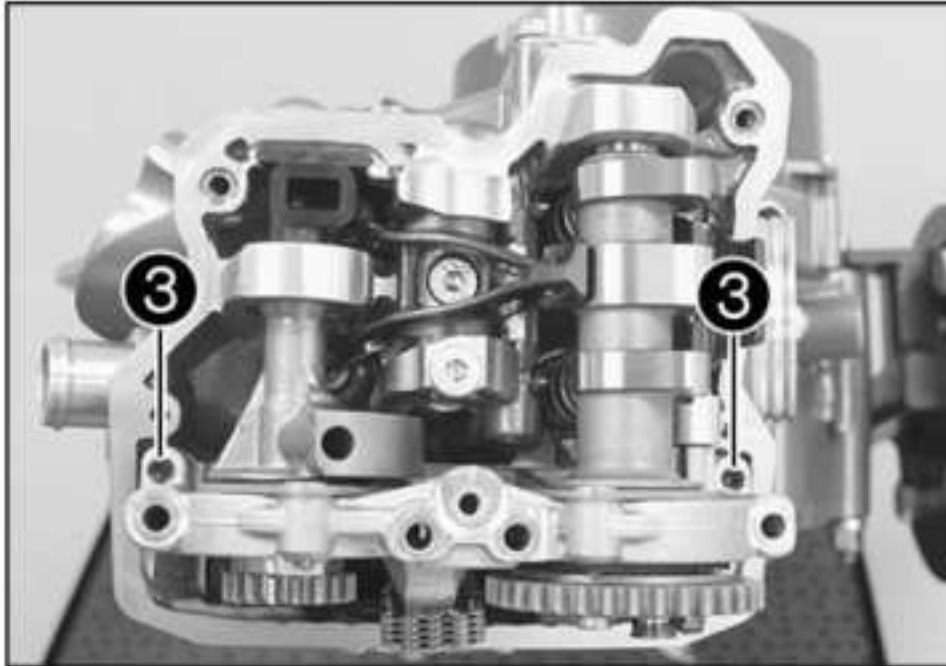
18.5.21 Installing the camshafts



- Mount camshaft bearing bridge ① with balancer shaft and camshaft.
 - ✓ Bleeder flange is positioned correctly in the balancer shaft.



- Mount dowel pins ②.



- Mount the setscrews ③ but do not tighten yet.

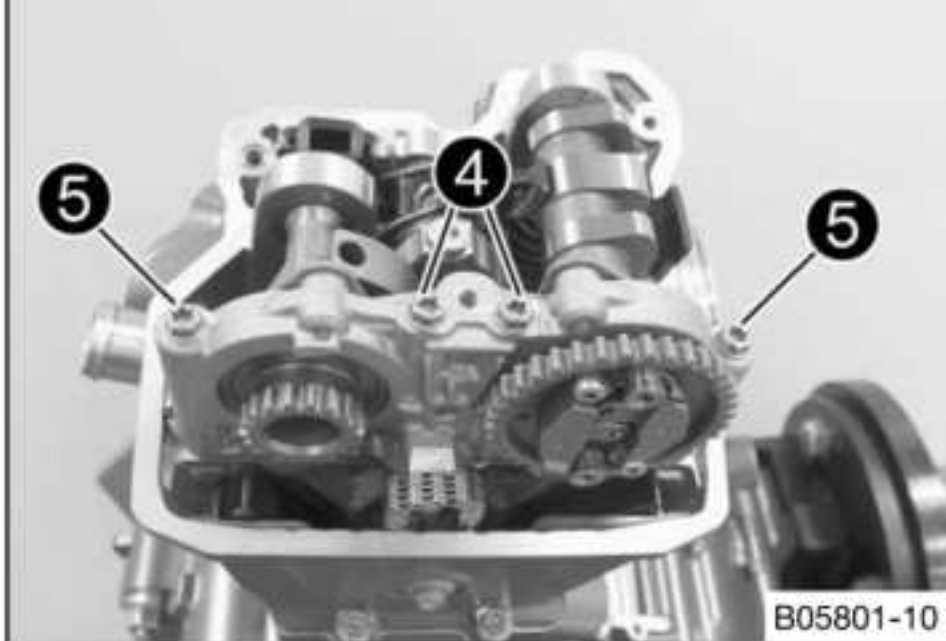
Guideline

Setscrew, camshaft bearing bridge	M8	6 Nm (4.4 lbf ft) Loctite®243™
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- Mount screws ④ but do not tighten yet.

Guideline

Screw, camshaft bearing support	M6x90	10 Nm (7.4 lbf ft)
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- Mount screws ⑤ but do not tighten yet.

Guideline

Screw, camshaft bearing support	M6x80	10 Nm (7.4 lbf ft)
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- Tighten screws ④ and ⑤ from the inside to the outside.

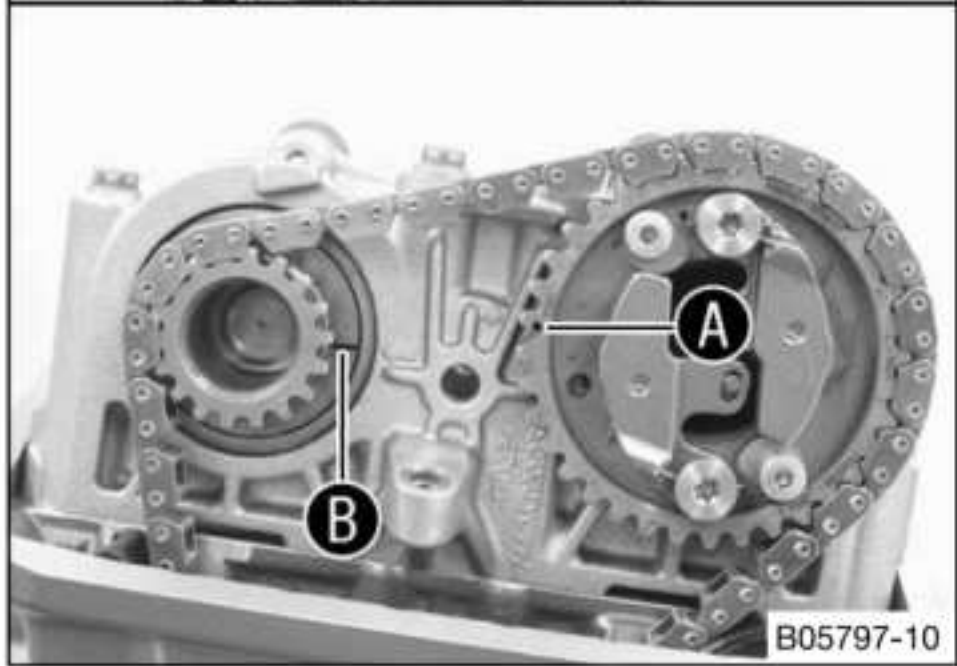
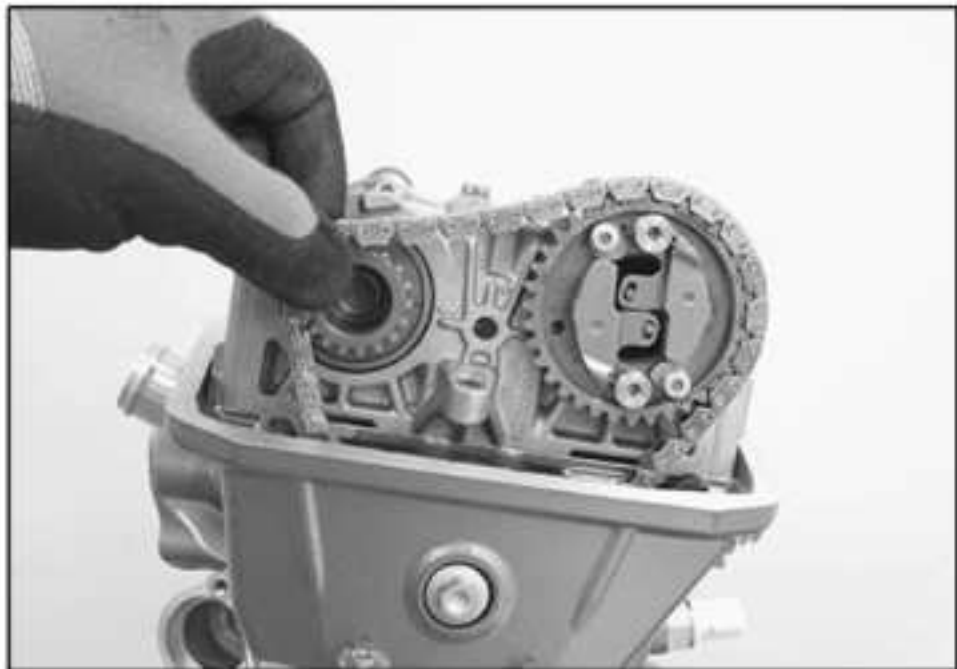
Guideline

Screw, camshaft bearing bridge	M6	10 Nm (7.4 lbf ft)
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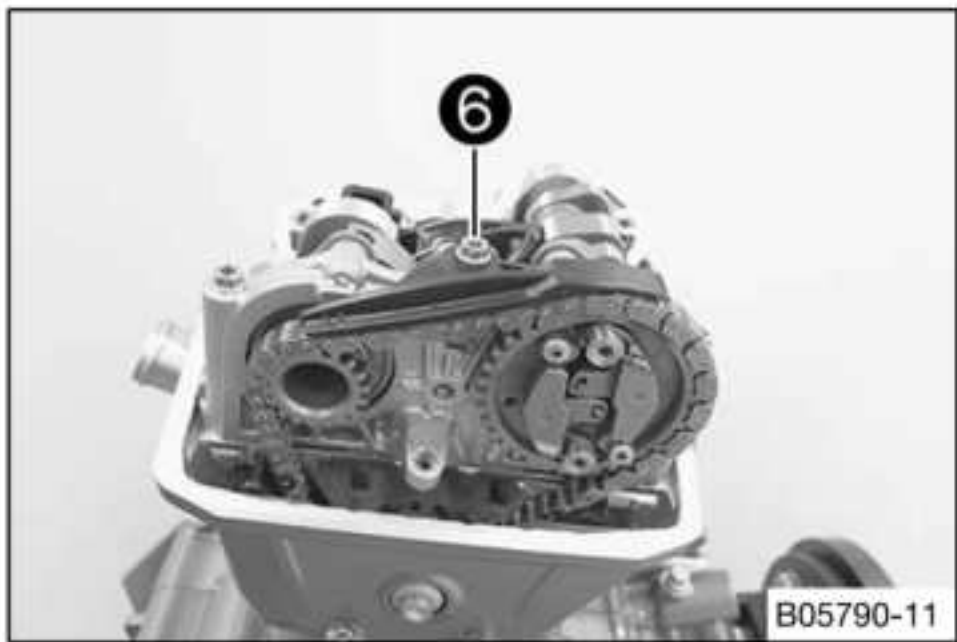
- Tighten the setscrews ③.

Guideline

Setscrew, camshaft bearing bridge	M8	6 Nm (4.4 lbf ft) Loctite®243™
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- Lay the timing chain over the camshaft.
 - ✓ The crankshaft is at top dead center.
 - ✓ Align marking **A** of the camshaft and the marking of the camshaft bearing bridge.
- Lay the timing chain over the balancer shaft.
 - ✓ The crankshaft is at top dead center.
 - ✓ Align marking **B** of the balancer shaft and the marking of the camshaft bearing bridge.

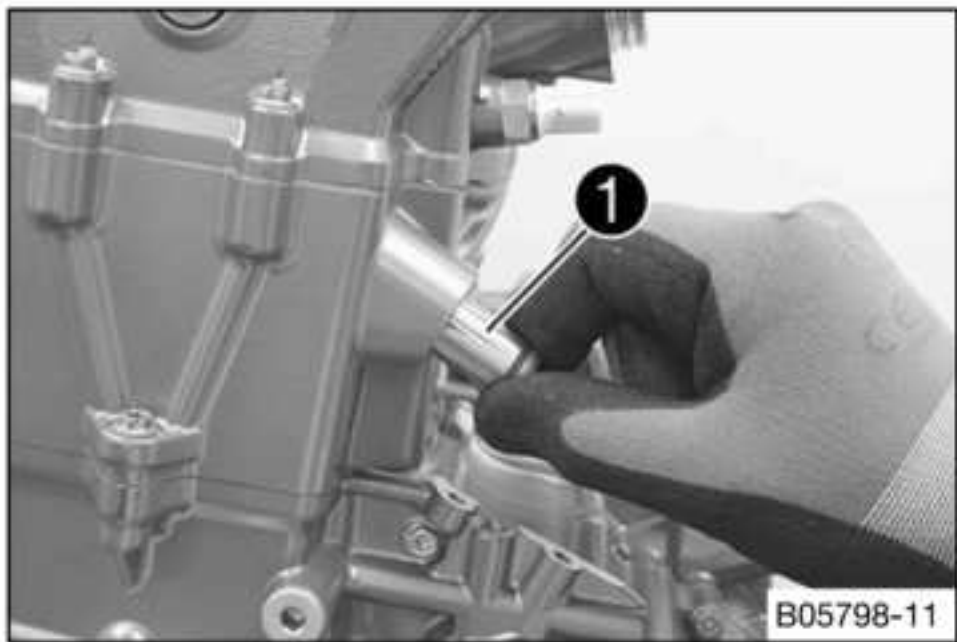


- Position guide rail.
- Mount and tighten screw **6**.

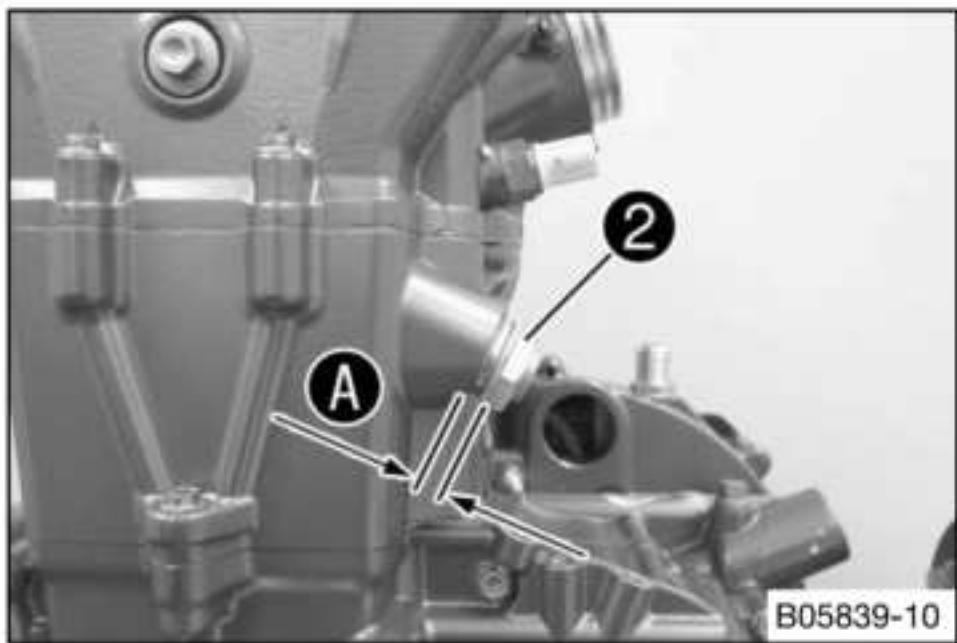
Guideline

Screw, guide rail	M6x20	10 Nm (7.4 lbf ft) Loctite® 243™
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18.5.22 Installing the timing chain tensioner



- Insert timing chain tensioner **1**.



- Mount screw plug **2** with new seal ring and screw in to distance **A**.

Guideline

Distance A	2 mm (0.08 in)
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