

Mounting tool for lock ring (76629032000) (📖 p. 391)

- Position lock ring ④ on special tool ① and push down with sleeve ②.
- ✓ The lock ring engages in the groove of the transmission shaft.
- Mount sixth-gear sliding gear ⑤ with the shift groove facing upward.
- Position special tool ① on the transmission shaft.

Mounting tool for lock ring (76629032000) (📖 p. 391)

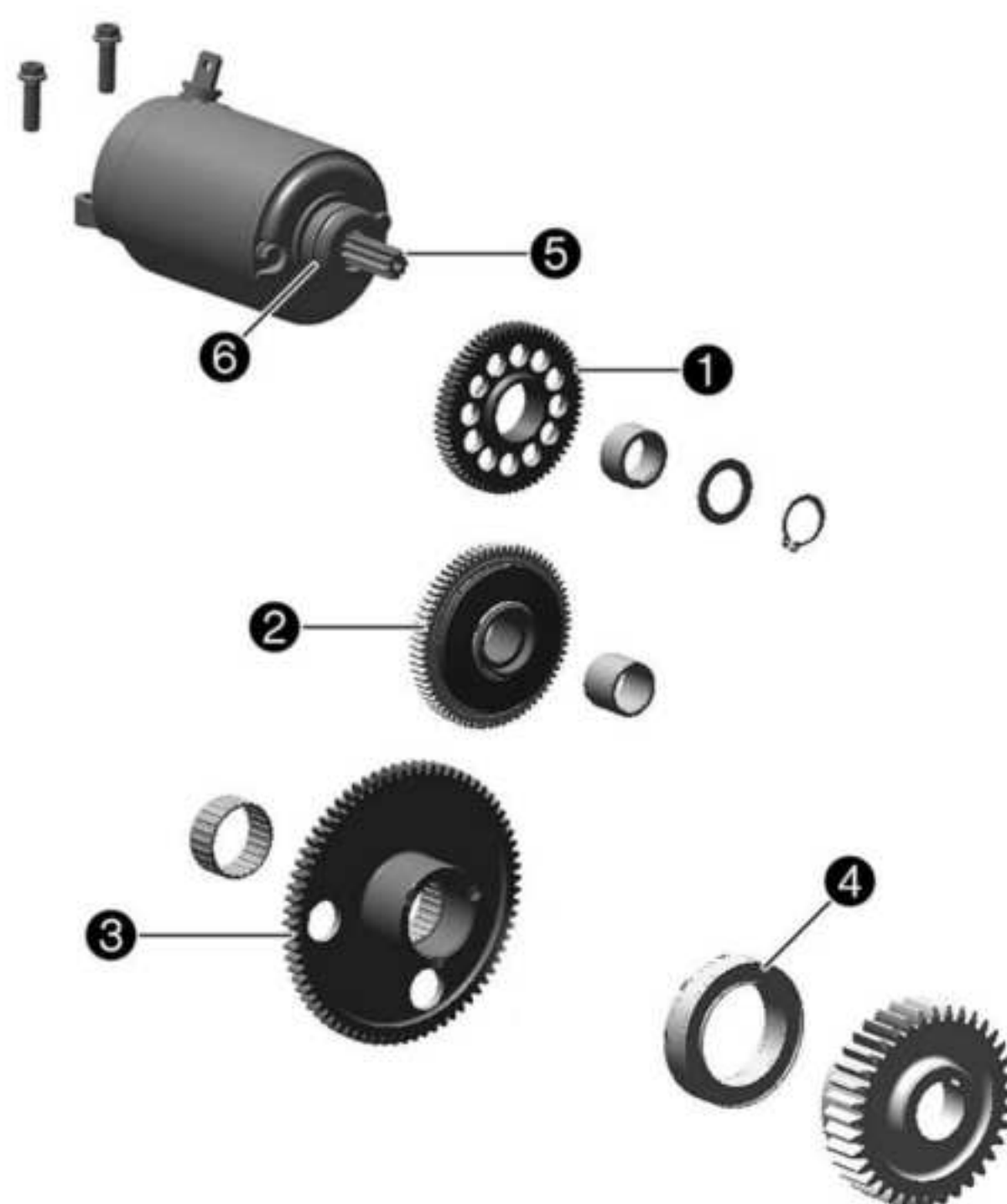
- Position lock ring ⑥ on special tool ① and push down with sleeve ②.
- ✓ The lock ring engages in the groove of the transmission shaft.
- Mount stop disk ⑦.
- Mount needle bearing ⑧ and fourth-gear idler gear ⑨ with the collar facing upward.
- Mount needle bearing ⑩ and third-gear idler gear ⑪ with the collar facing downward.
- Mount stop disk ⑫.
- Position special tool ① on the transmission shaft.

Mounting tool for lock ring (76629032000) (📖 p. 391)

- Position lock ring ⑬ on special tool ① and push down with sleeve ②.
- ✓ The lock ring engages in the groove of the transmission shaft.
- Mount fifth-gear sliding gear ⑭ with the shift groove facing downward and stop disk ⑮.
- Mount needle bearing ⑯, first-gear idler gear ⑰ with the recess facing downward and stop disk ⑱.
- Finally, check all the gear wheels for smooth operation.



#### 18.4.39 Checking the starter drive

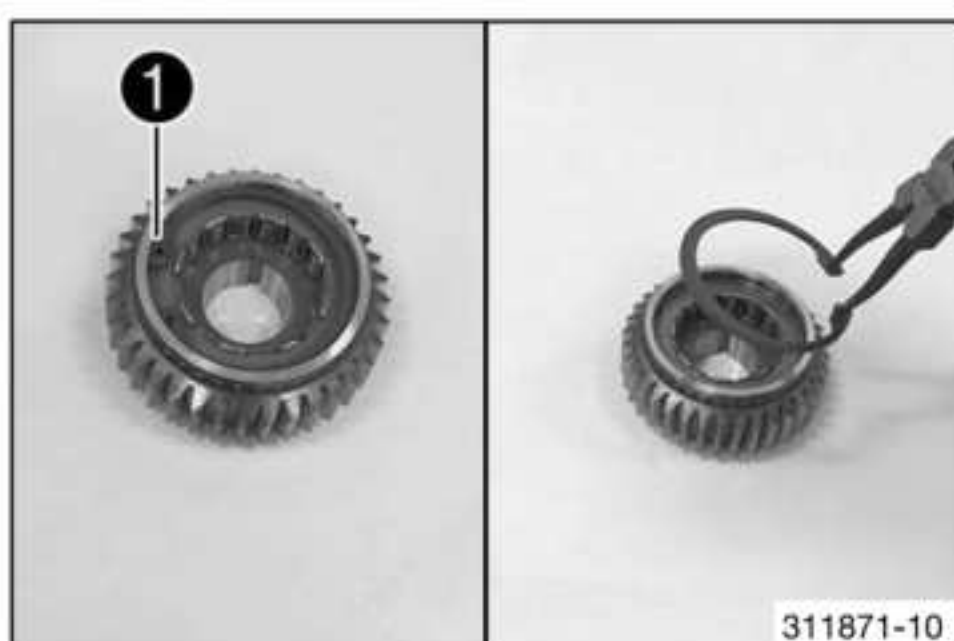


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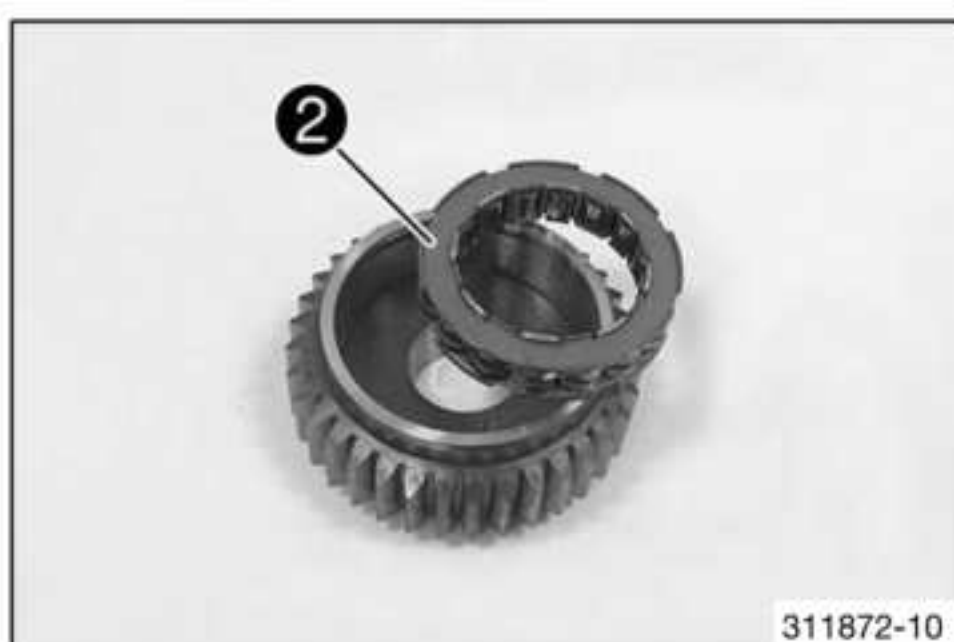
- Check the gear mesh and bearing of starter idler gear ① for damage and wear.
  - » If there is damage or wear:
    - Change the starter idler gear and/or needle bushing.
- Check the gear teeth and bearing of torque limiter ② for damage and wear.

- » If there is damage or wear:
  - Change the torque limiter and/or needle bearing.
- Check freewheel gear **3** and bearing when removed for damage and wear.
  - » If there is damage or wear:
    - Change the freewheel gear or bearing.
- Check freewheel **4** when removed for damage and wear.
  - » If there is damage or wear:
    - Change the freewheel.
- Check the gear teeth of starter motor **5** for damage and wear.
  - » If there is damage or wear:
    - Change the starter motor.
- Connect the negative cable of a 12-volt power supply to the housing of the starter motor. Connect the positive cable of the power supply briefly with the connector of the starter motor.
  - » If the starter motor does not turn when the circuit is closed:
    - Change the starter motor.
- Change O-ring **6** of the starter motor.

## 18.4.40 Removing the freewheel

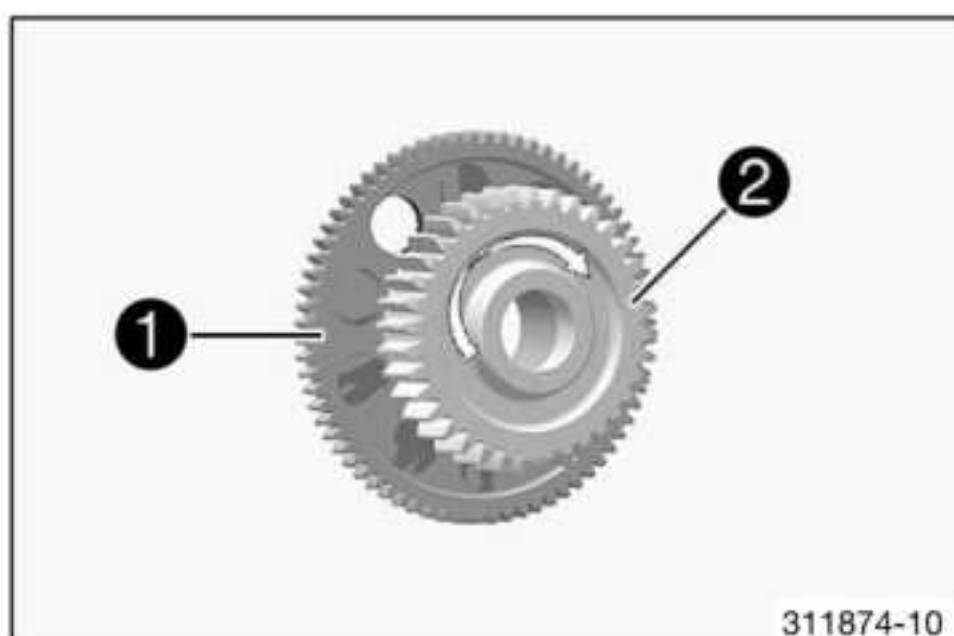


- Remove lock ring **1**.



- Take freewheel **2** out of the primary gear wheel.

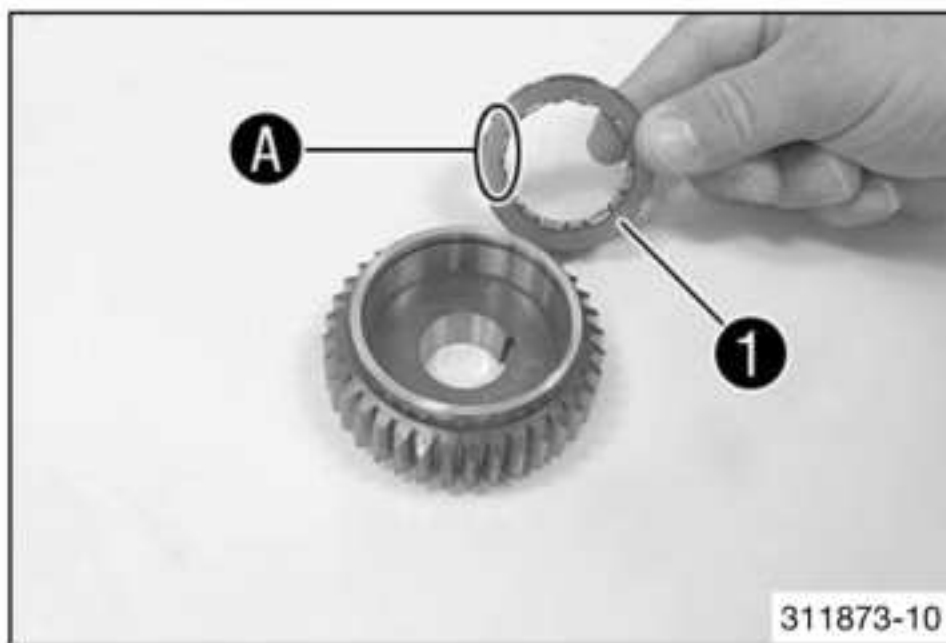
## 18.4.41 Checking the freewheel



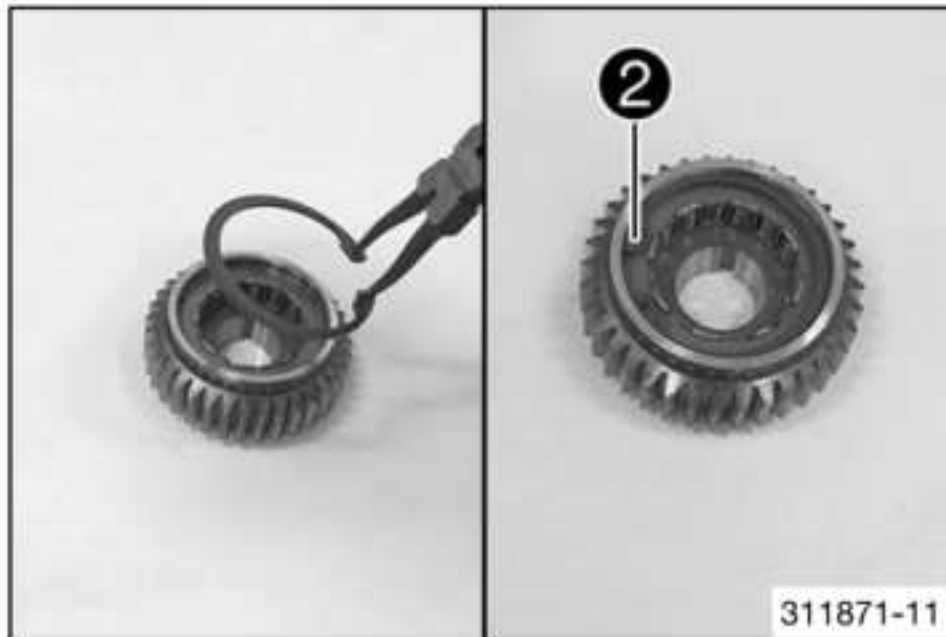
- Insert freewheel gear **1** into primary gear wheel **2**, turning the primary gear wheel clockwise; do not wedge!
- Check the locking action of freewheel gear **1**.
  - » The primary gear wheel cannot be turned clockwise or does not lock counterclockwise:
    - Remove the freewheel. (📖 p. 240)
    - Turn the freewheel 180°.
    - Install the freewheel. (📖 p. 241)



## 18.4.42 freewheel, installing



- Thoroughly oil all parts.
- Position freewheel **1**.
- ✓ Marking **A** is not visible after assembly.

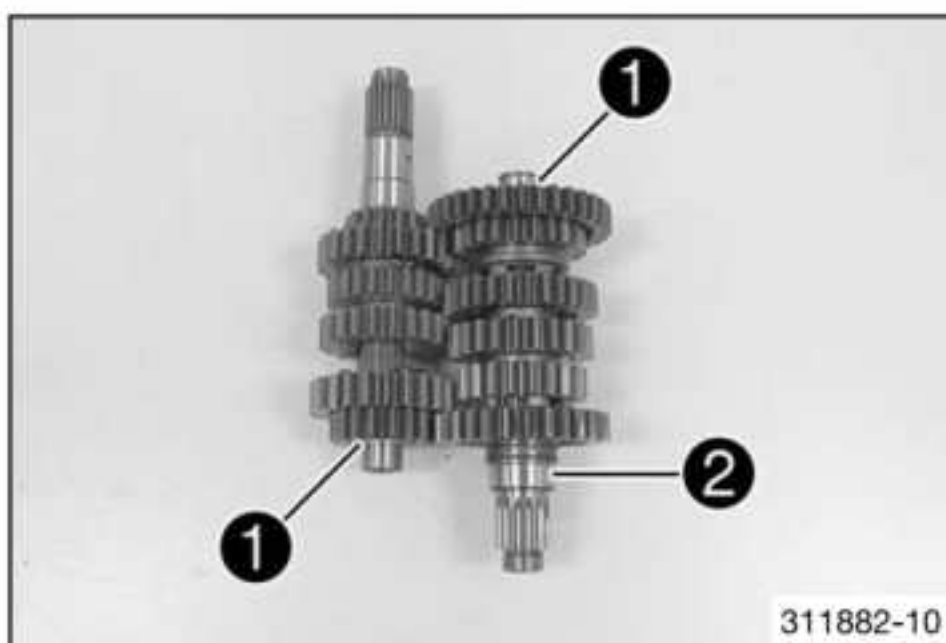


- Mount lock ring **2**.

**i Info**  
The lock ring must engage audibly.

## 18.5 Engine assembly

### 18.5.1 Installing the transmission shafts



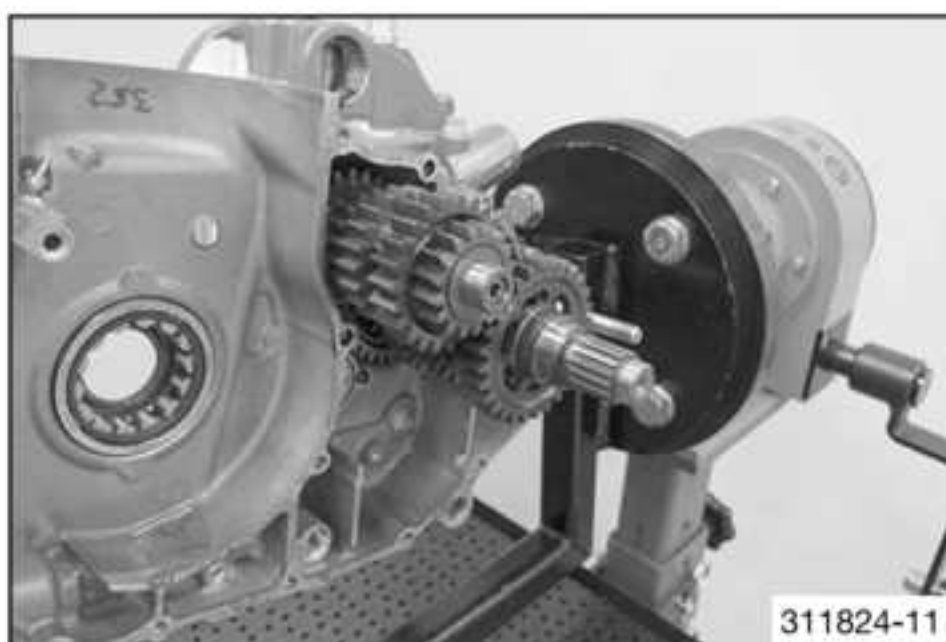
- Clamp the right section of the engine case.

Holder for engine motor stand (75012001070) (p. 387)

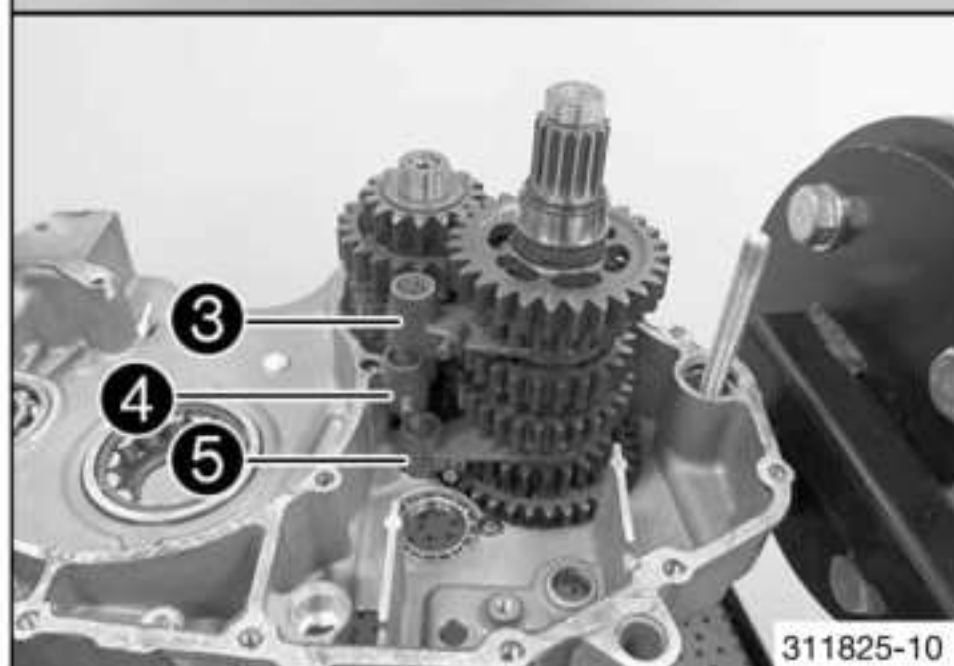
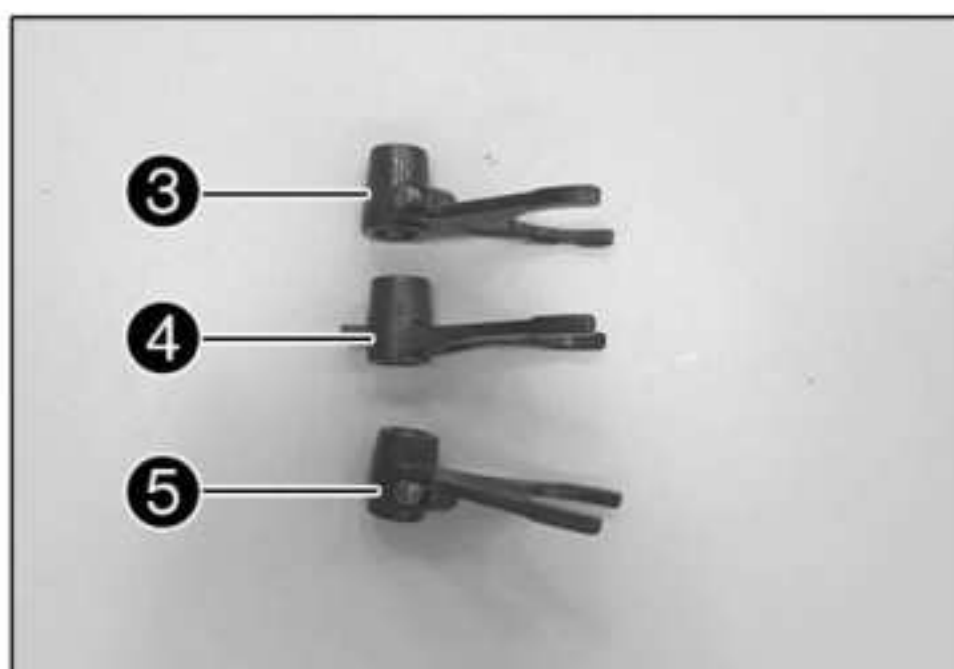
Fitting for work stand (75012001060) (p. 387)

Engine assembly stand (80329001000) (p. 393)

- Make sure that both stop disks **1** are installed.
- Mount inner bearing race **2** on the countershaft.



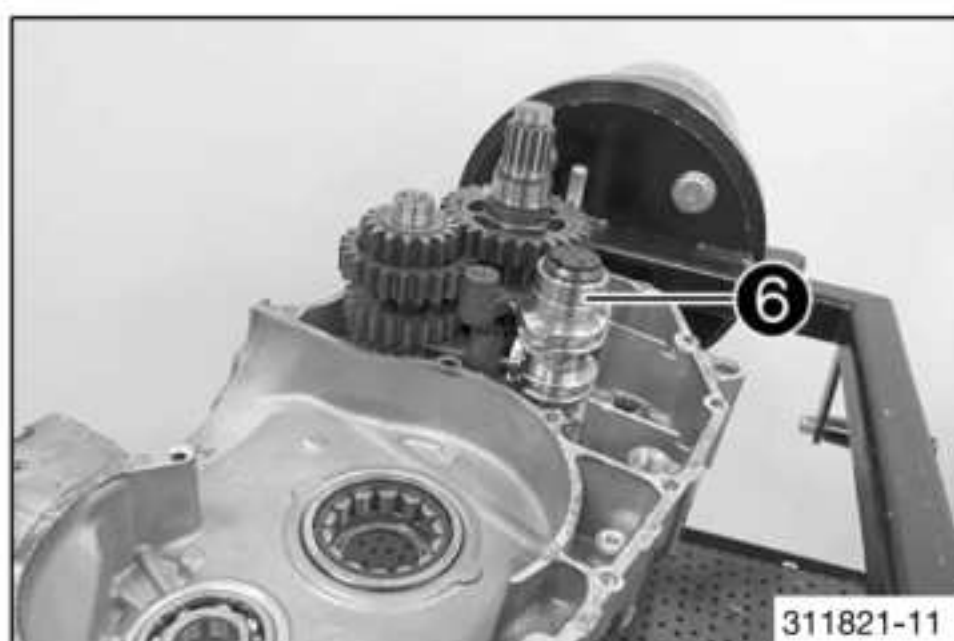
- Oil all bearings.
- Slide both transmission shafts together into the bearing seats.



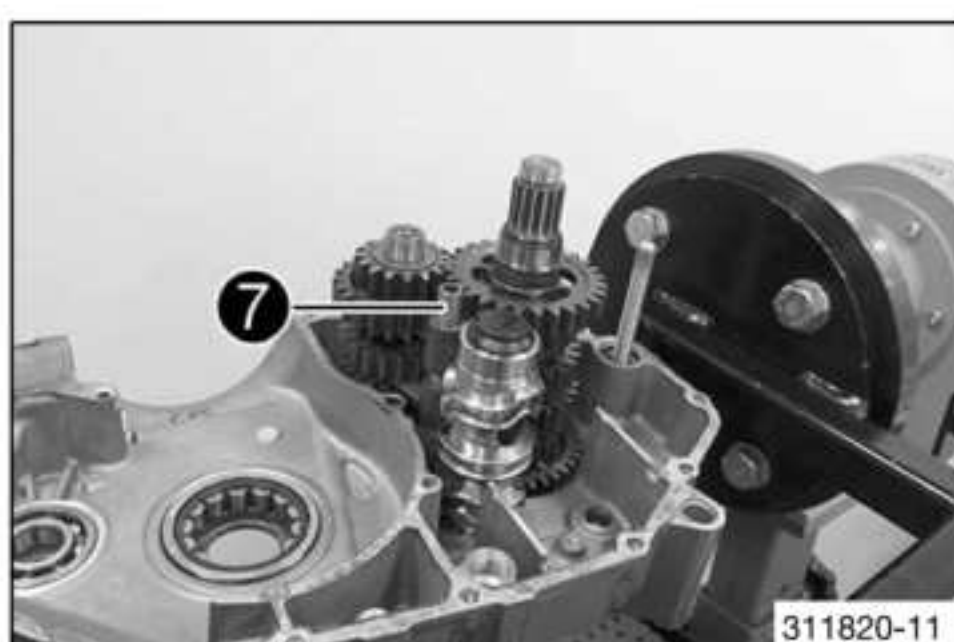
- Mount upper shift fork ③, middle shift fork ④, and lower shift fork ⑤.

## **i** Info

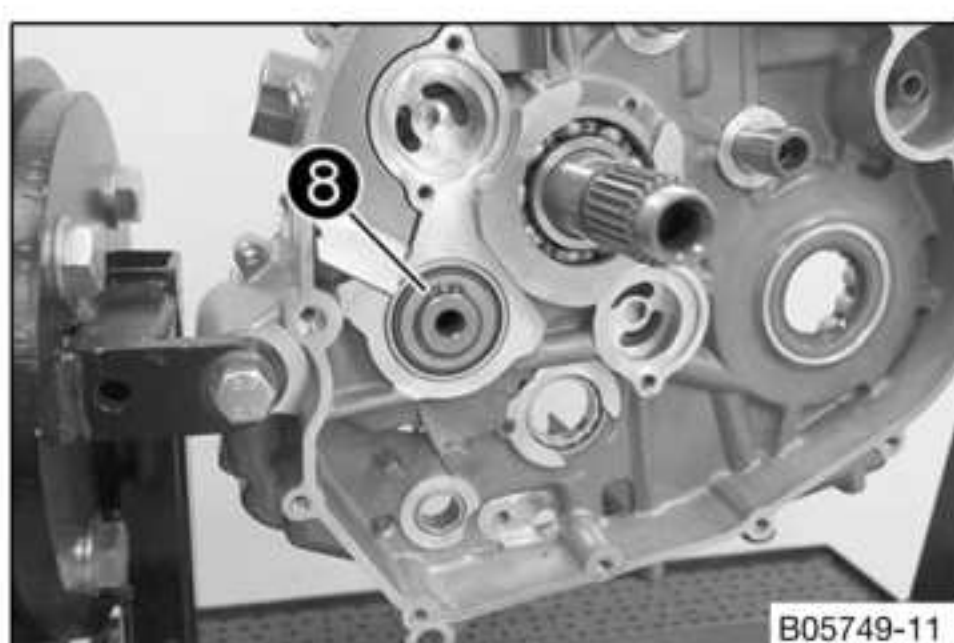
For easier assembly of middle shift fork ④, lift the sliding gear of the third/fourth gear.



- Mount shift drum ⑥.
- Hang the shift forks into the shift drum.



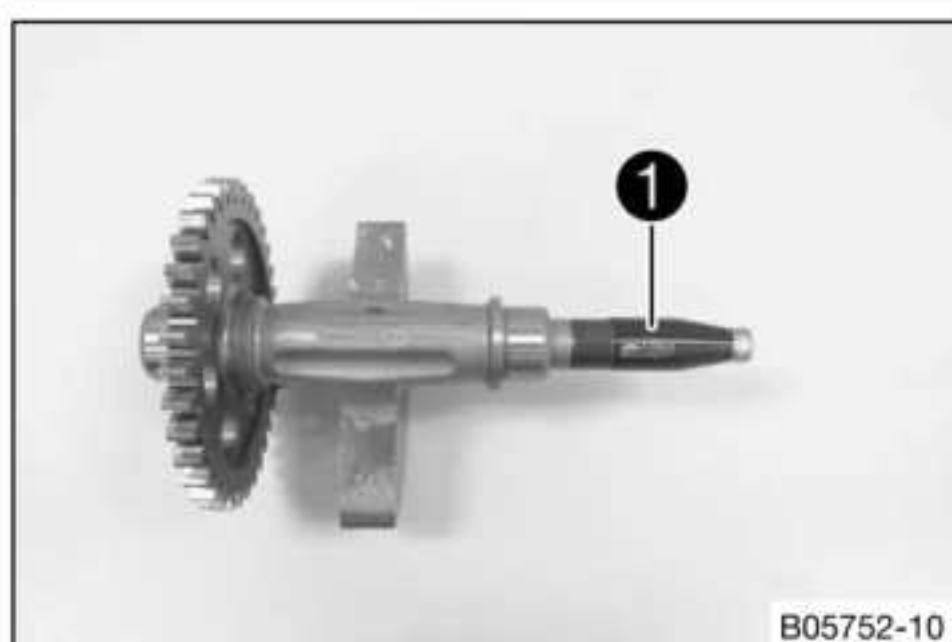
- Mount shift rail ⑦.
- Check the transmission for smooth operation.



- Mount the washer and lock ring ⑧.

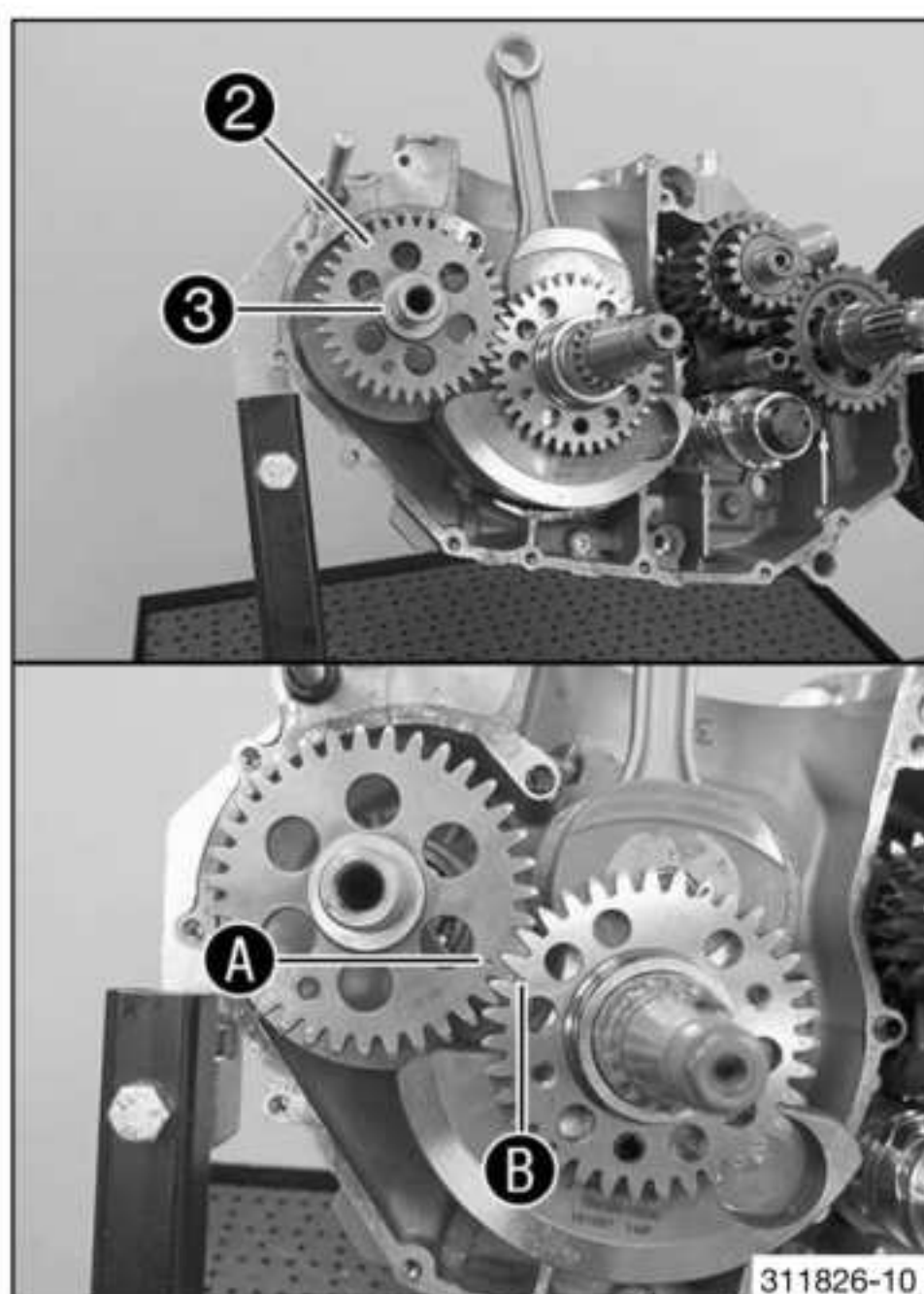


## 18.5.2 Installing crankshaft and balancer shaft



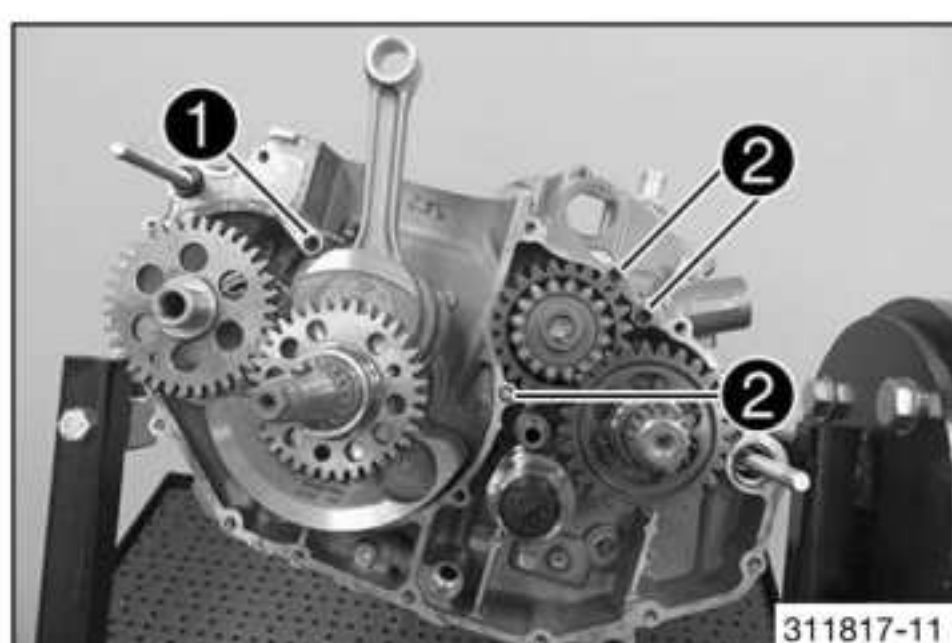
- Mount special tool **1** on the balancer shaft.

Protection cap (61229005100) (p. 386)



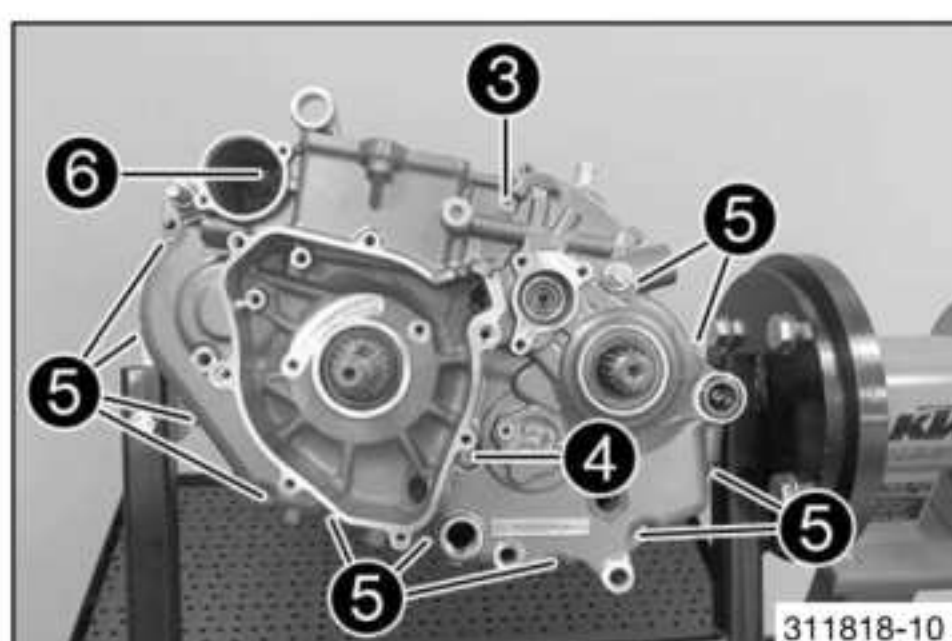
- Position the crankshaft.
- Grease the shaft seal rings of the balancer shaft.
- Push balancer shaft **2** into the bearing seat and remove the special tool.
- ✓ Align markings **A** and **B**.
- Mount stop disk **3**.

## 18.5.3 Installing the left engine case



- Mount O-ring **1**.
- Mount dowels **2**.
- Degrease the sealing surface. Apply sealing compound to the left section of the engine case.

Loctite® 5910



- Mount the left section of the engine case. If necessary, strike it lightly with a rubber mallet and turn the transmission shafts.



### Info

Do not use the screws to pull the two sections of the engine case together.

- Take off special tool from the crankshaft.

Protecting sleeve (75029080000) (p. 390)



- Mount screw ③ but do not tighten yet.

Guideline

Screw, engine case	M6x80	10 Nm (7.4 lbf ft)
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- Mount screw ④ but do not tighten yet.

Guideline

Screw, engine case	M6x70	10 Nm (7.4 lbf ft)
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- Mount screws ⑤ but do not tighten yet.

Guideline

Screw, engine case	M6x30	10 Nm (7.4 lbf ft)
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- Mount screw ⑥ with the washer but do not tighten yet.

Guideline

Screw, engine case	M6x25	10 Nm (7.4 lbf ft)
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Info

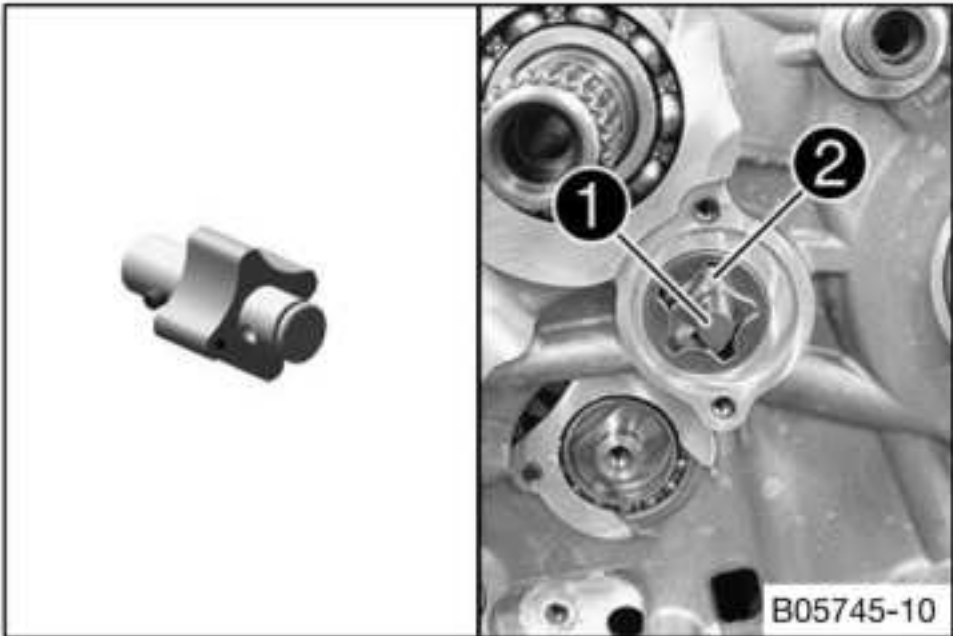
Mount the screw with a new copper washer.

- Tighten all screws in a crisscross pattern.

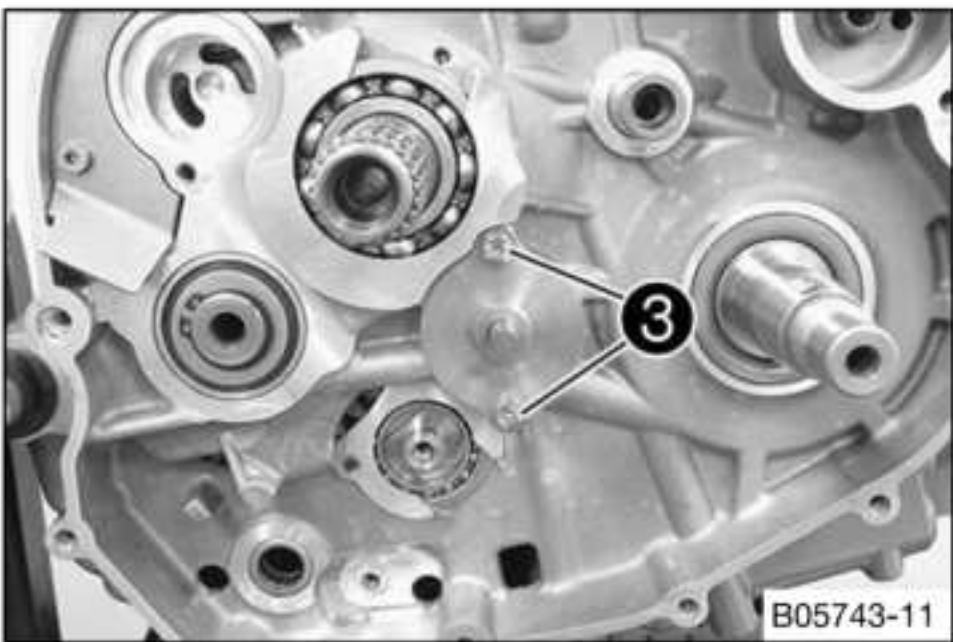
Guideline

Screw, engine case	M6	10 Nm (7.4 lbf ft)
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18.5.4 Installing the oil pumps



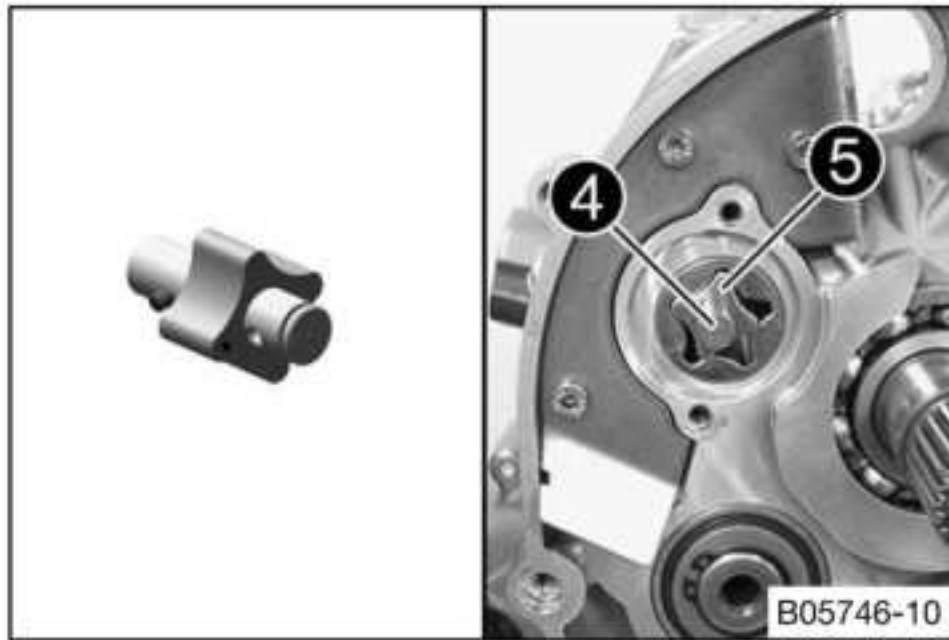
- Mount the pin and internal rotor on the oil pump shaft.
- Position the external rotor in the engine case with the bevel facing inward.
- Mount oil pump shaft ① with internal rotor ②.
- Oil the parts.



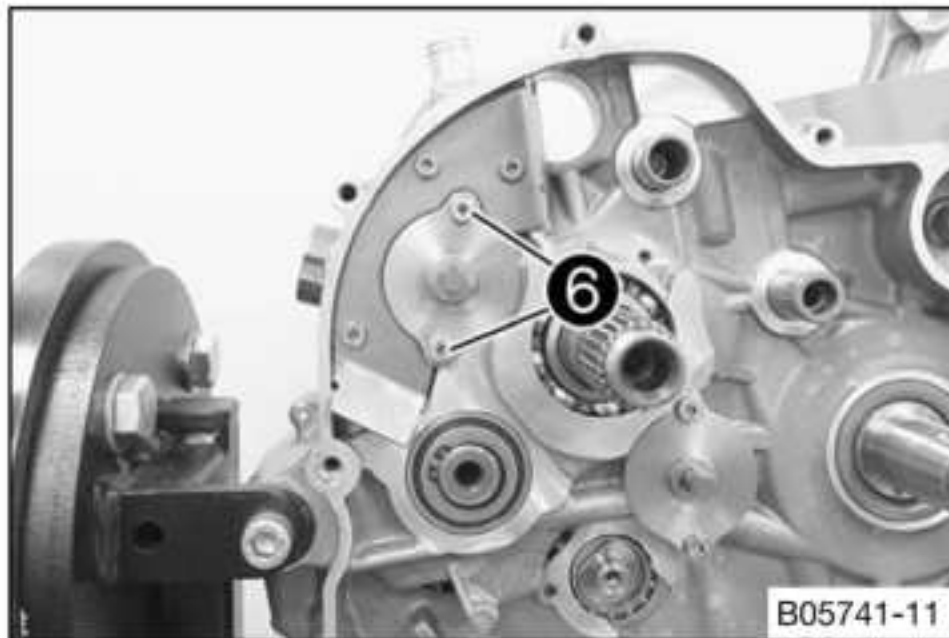
- Position the oil pump cover.
- Mount and tighten screws ③.

Guideline

Screw, oil pump cover	M5	6 Nm (4.4 lbf ft) <b>Loctite®243™</b>
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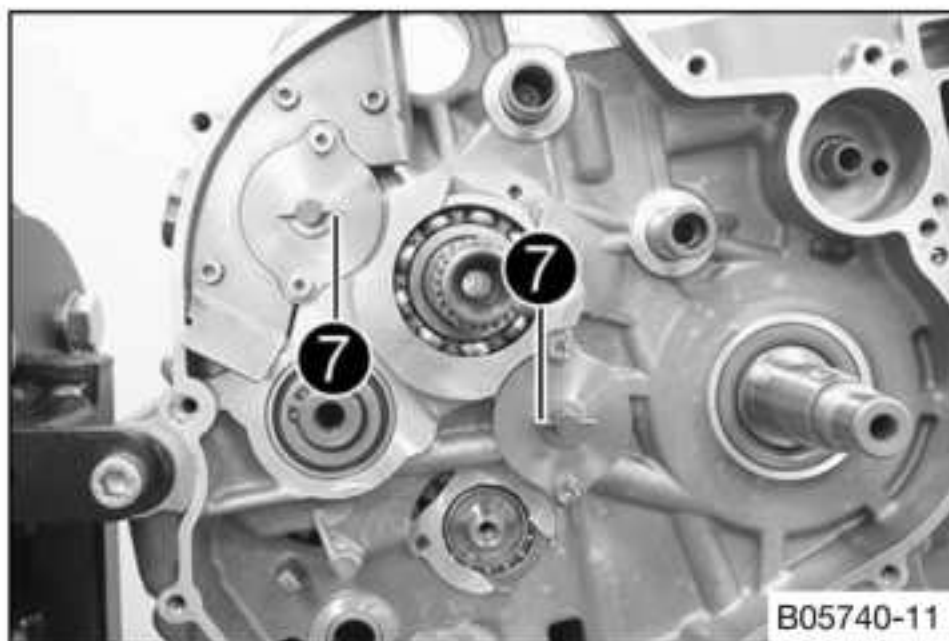
- Mount the pin and internal rotor on the oil pump shaft.
- Position the external rotor in the engine case with the bevel facing inward.
- Mount oil pump shaft ④ with internal rotor ⑤.
- Oil the parts.



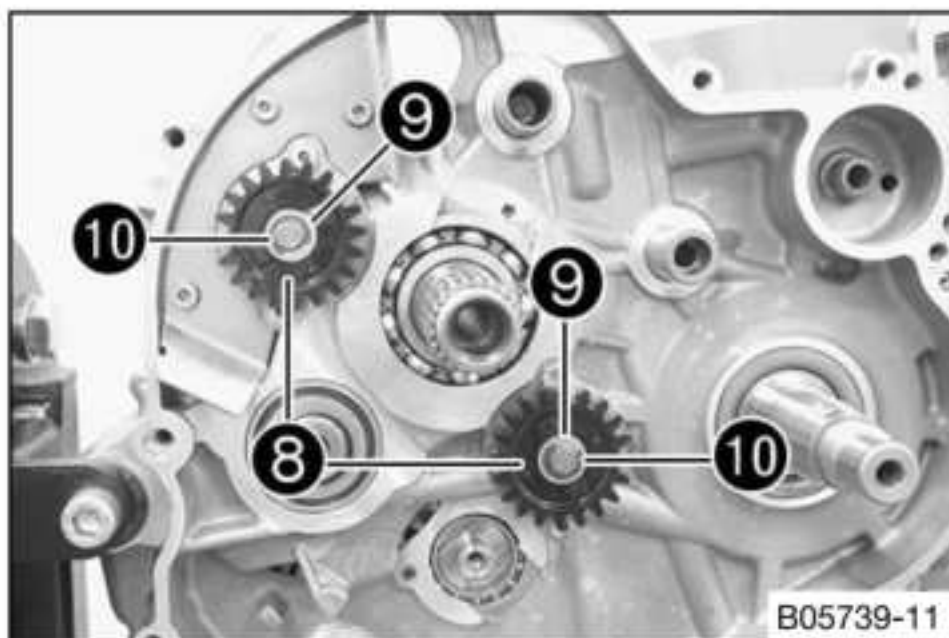
- Position the oil pump cover.
- Mount and tighten screws ⑥.

## Guideline

Screw, oil pump cover	M5	6 Nm (4.4 lbf ft) <b>Loctite®243™</b>
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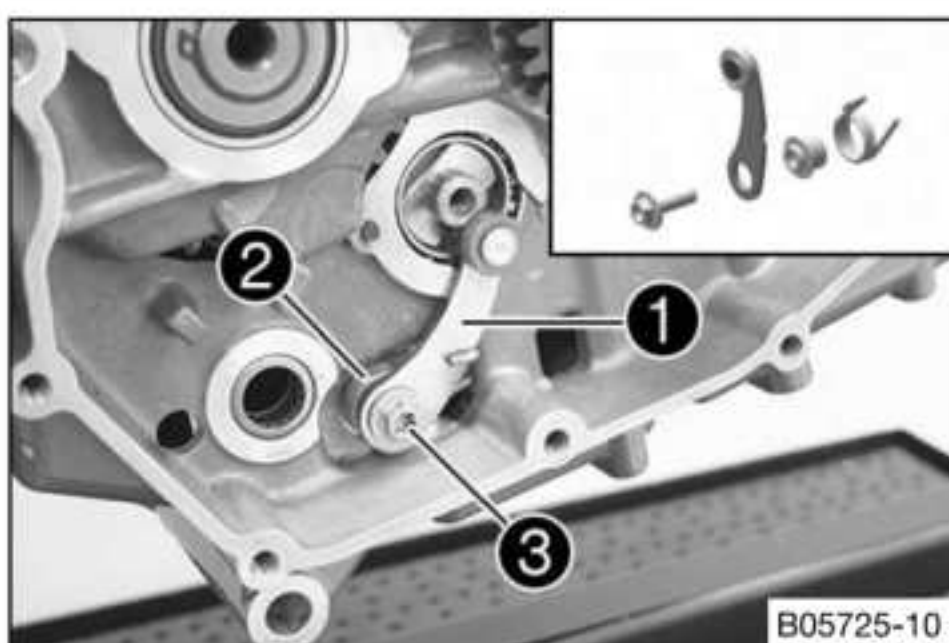


- Mount washers and pins ⑦.



- Mount oil pump gear wheels ⑧, washers ⑨ and lock washers ⑩.

## 18.5.5 Installing locking lever



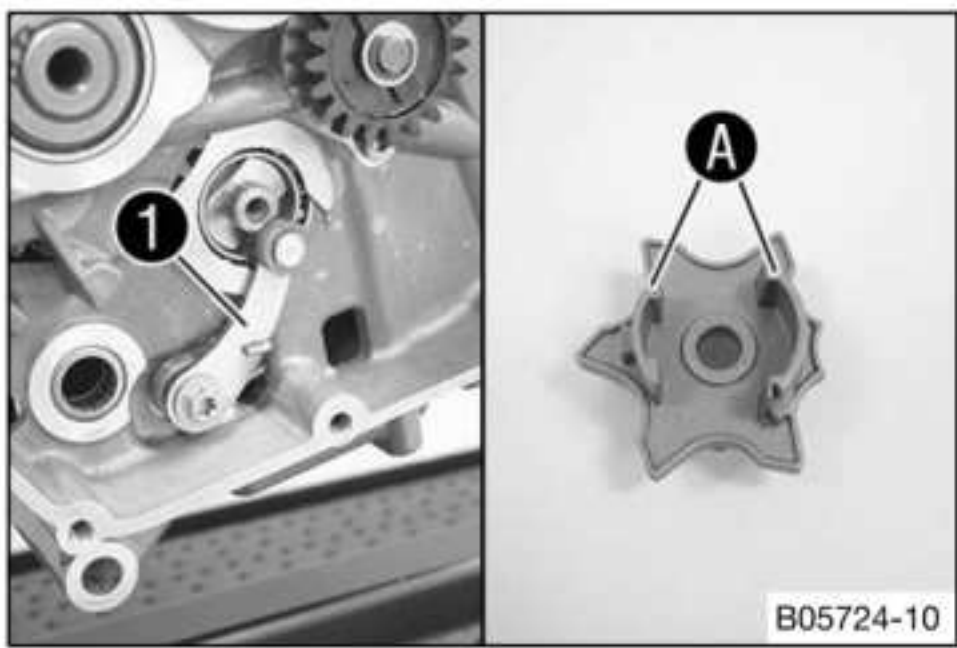
- Position locking lever ① with sleeve and spring ②.
- Mount and tighten screw ③.

## Guideline

Screw, locking lever	M6	10 Nm (7.4 lbf ft) <b>Loctite®243™</b>
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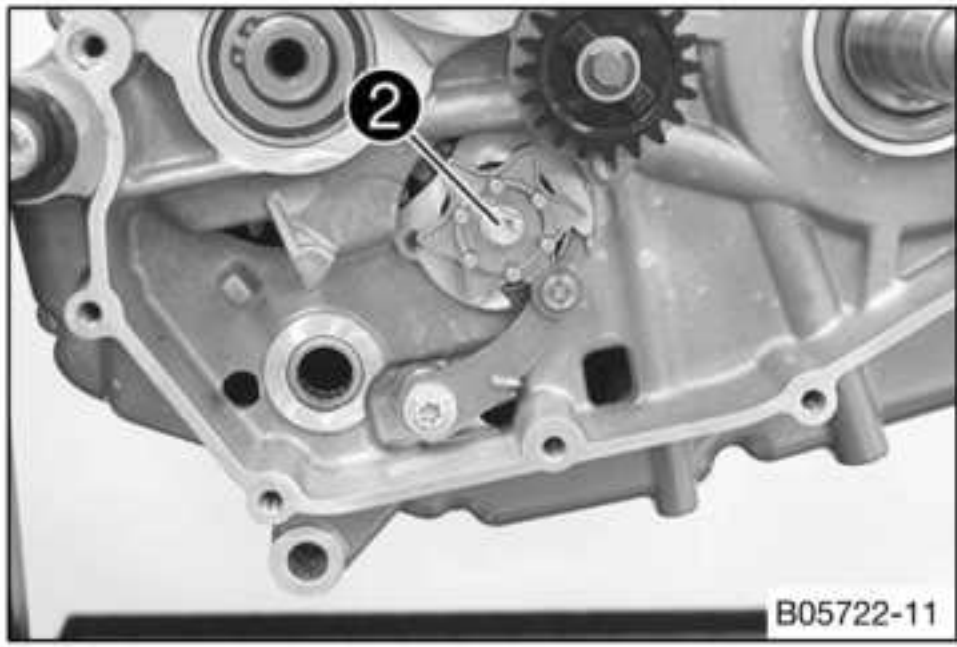


18.5.6 Installing shift drum locating



- Press locking lever 1 down and position shift drum locating.

**i Info**  
The flat surfaces A of the shift drum locating are not symmetric.

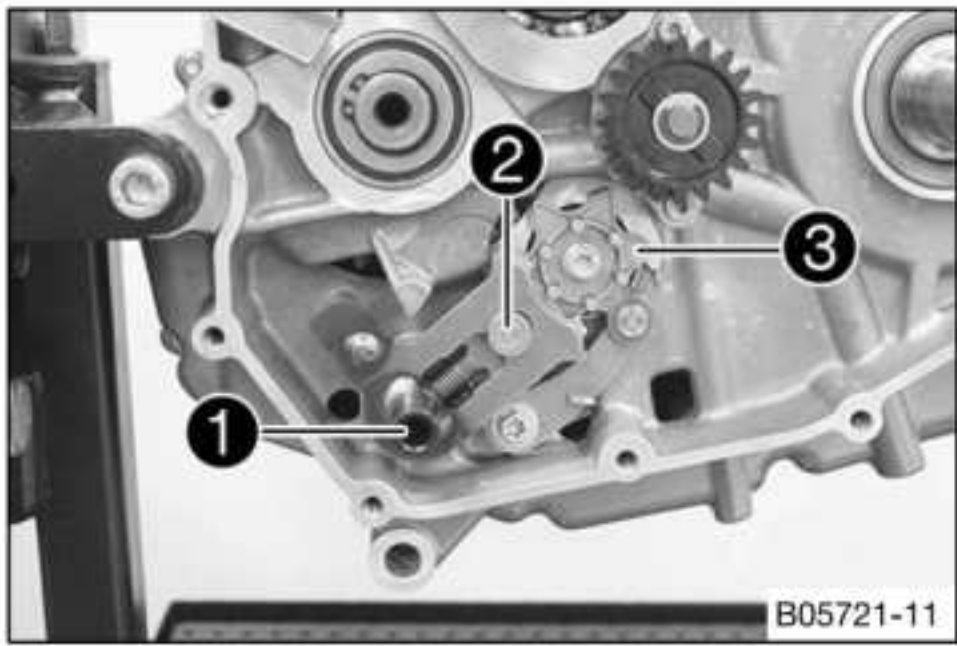


- Release the locking lever.
- Mount and tighten screw 2.

Guideline

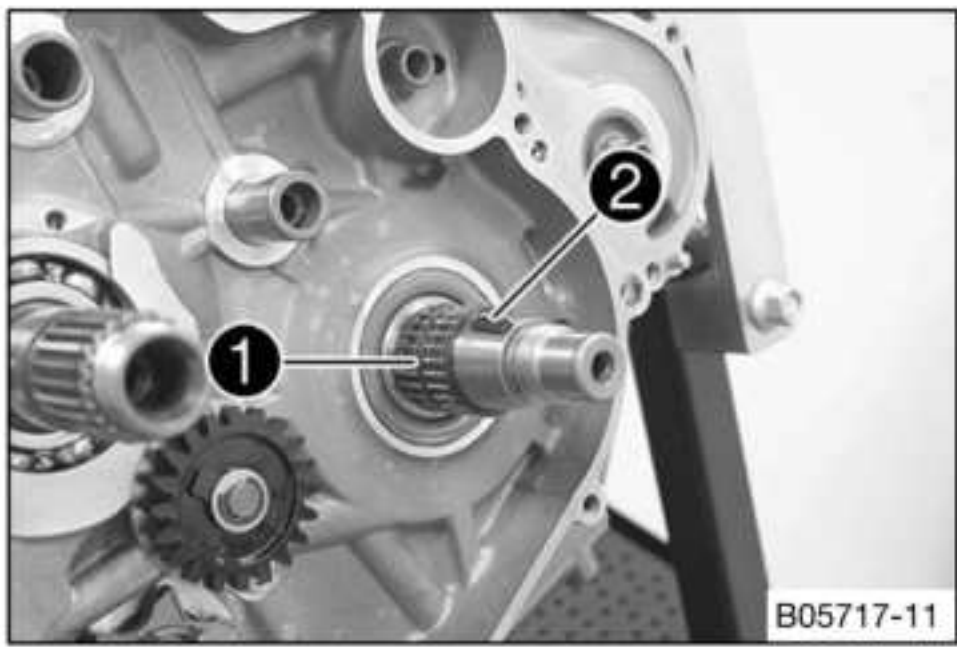
Screw, shift drum locating	M6	10 Nm (7.4 lbf ft) <b>Loctite® 243™</b>
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18.5.7 Installing shift shaft



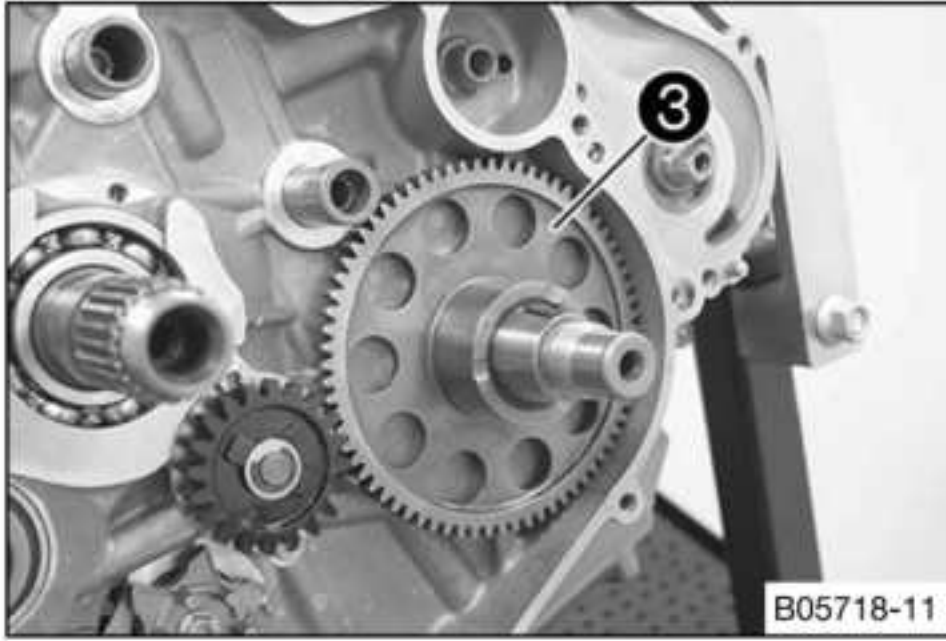
- Slide shift shaft 1 with the washer into the bearing seat.
- Push sliding plate 2 away from the shift drum locating 3. Insert the shift shaft all the way.
- Let the sliding plate engage in the shift drum locating.
- Shift through the transmission.

18.5.8 Installing the starter drive

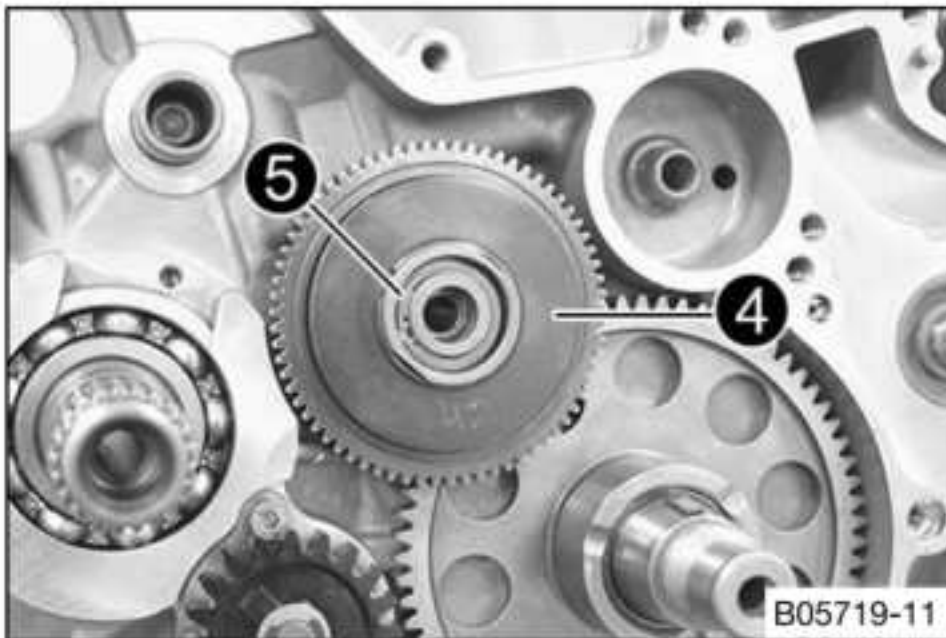


- Mount the two needle bearings 1 and the woodruff key 2.

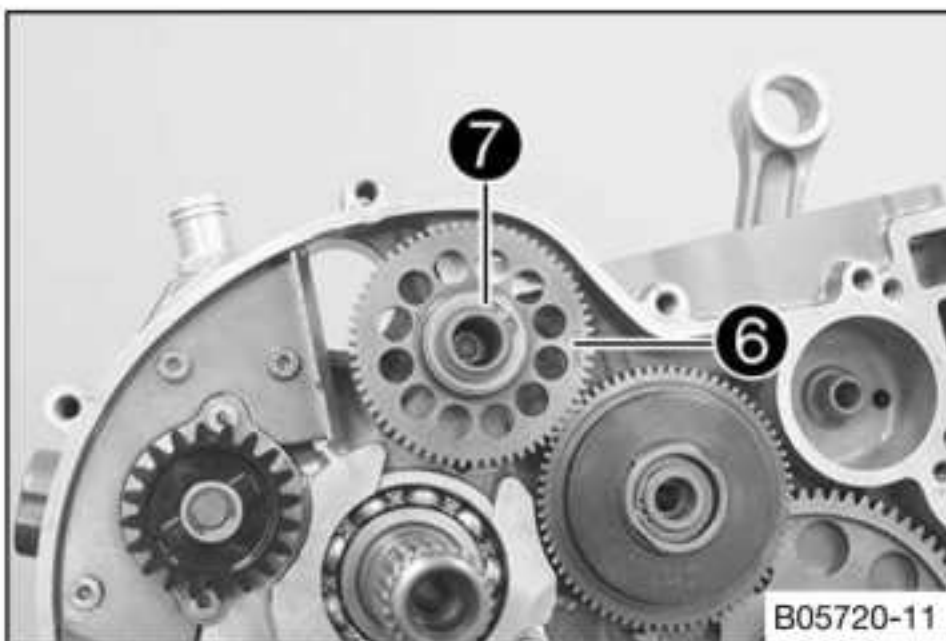




- Position freewheel gear ③.

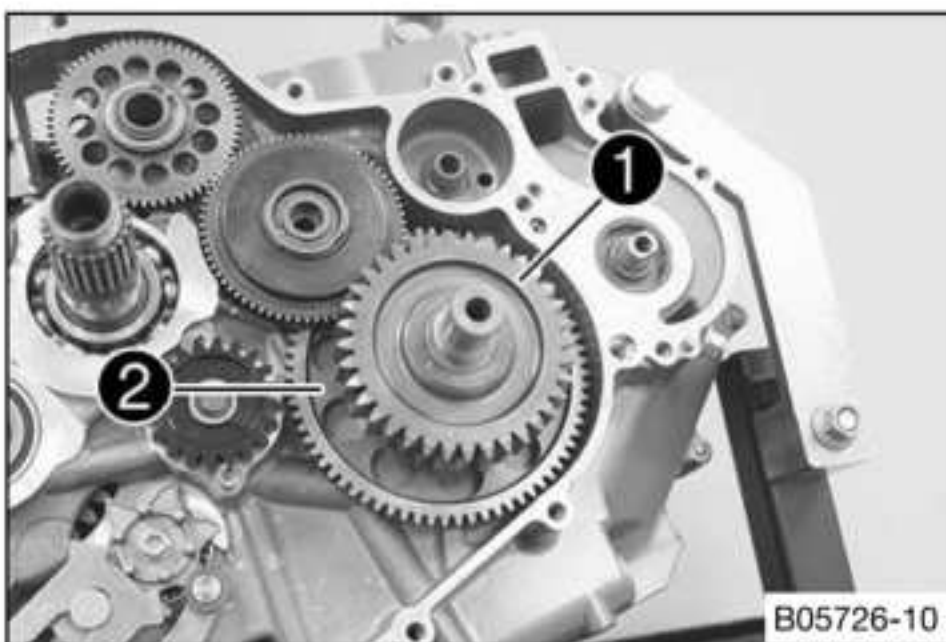


- Mount the needle bearing and torque limiter ④ with the washer.
- Mount lock ring ⑤.



- Mount the starter idler gear ⑥ with the washer.
- Mount lock ring ⑦.

## 18.5.9 Installing the primary gear wheel



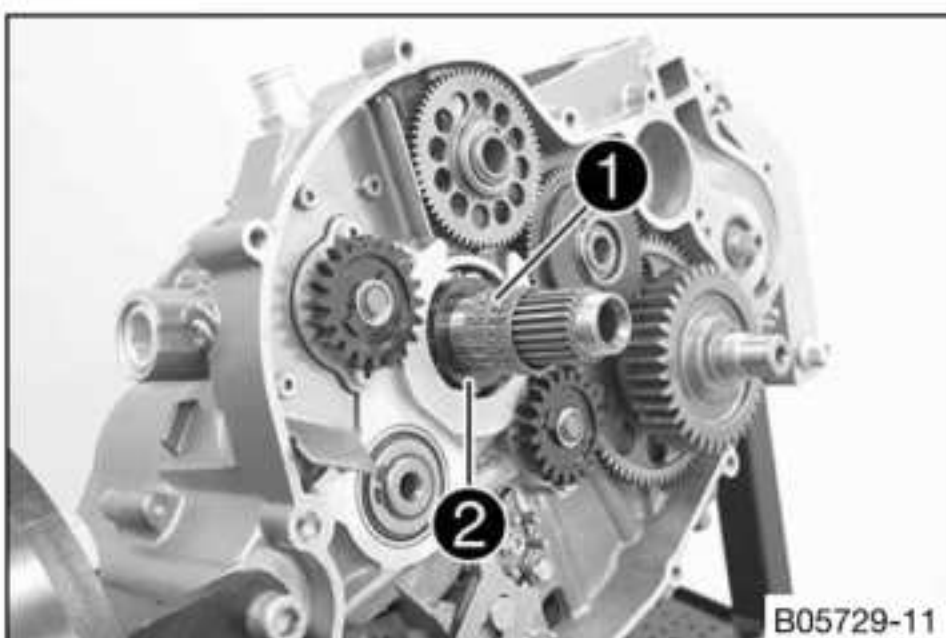
- Ensure that the woodruff key is seated properly.
- Mount primary gear wheel ①.



### Info

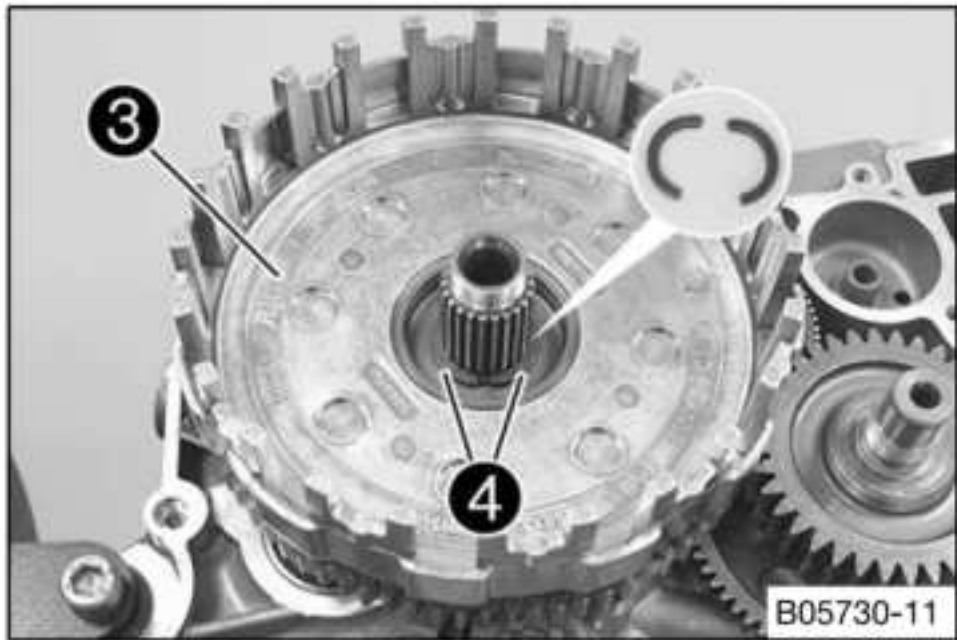
Turn freewheel gear ② backwards and forwards to ease meshing.

## 18.5.10 Installing the clutch basket



- Mount supporting plate ① and needle bearing ②.



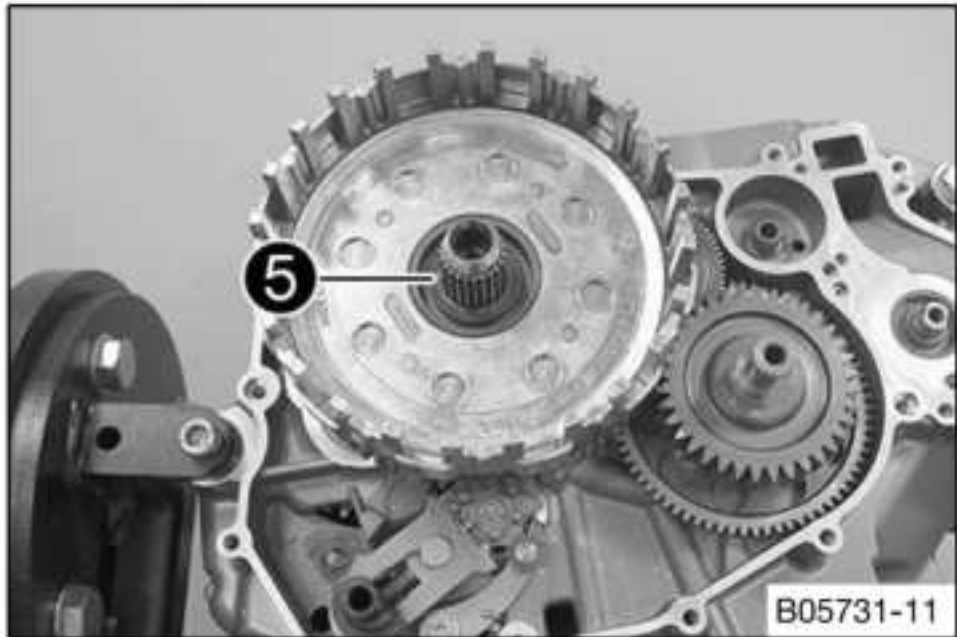


- Mount clutch basket ③.

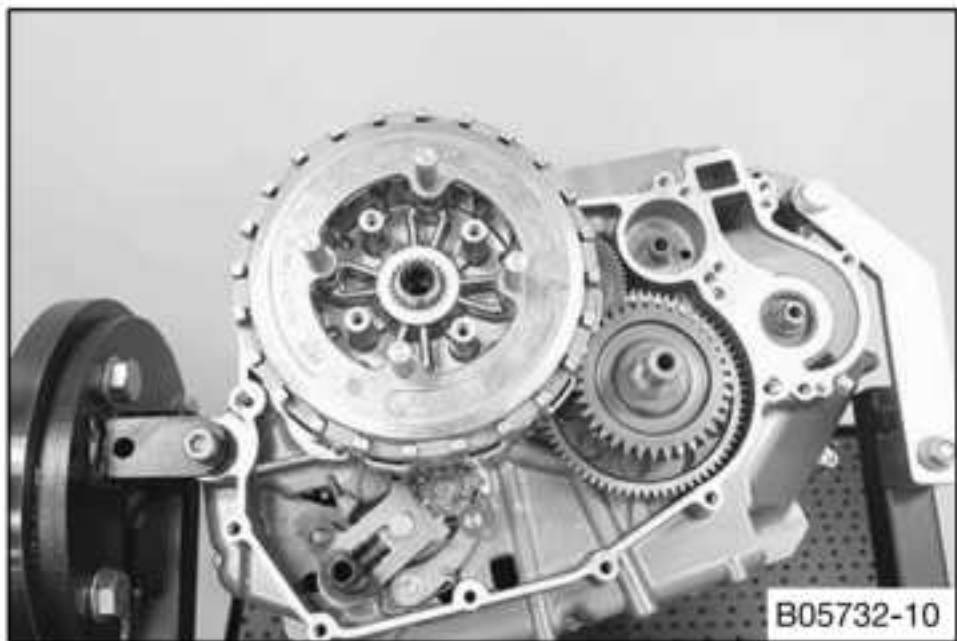
**i Info**  
Turn the clutch basket and oil pump gear wheels backwards and forwards slightly to help them mesh more easily.

- Mount half washers ④ with the sharp edge facing outward.

**i Info**  
Grease the half washers to ease assembly.

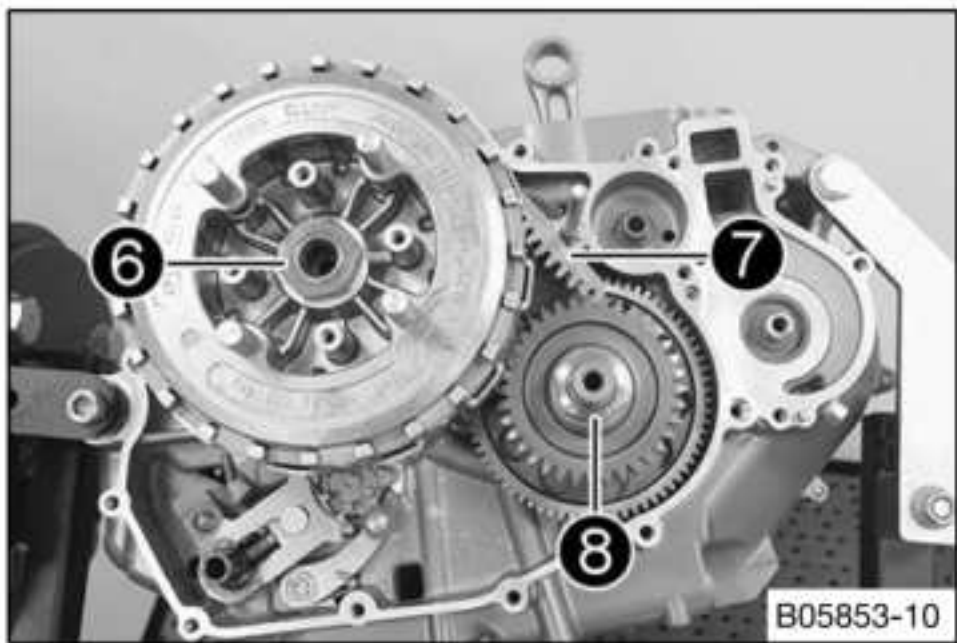


- Position stepped washer ⑤ with the recesses toward the half washers.



- Insert the antihopping clutch in the clutch basket.  
✓ The uppermost clutch facing disc is offset by one tooth.

**i Info**  
If necessary, turn the main shaft a little to ease engagement.



- Mount nut ⑥ with the washer.
- Lock the clutch basket and primary gear wheel using special tool ⑦ and tighten the nut.

Guideline

Nut, inner clutch hub	M20x1.5	120 Nm (88.5 lbf ft) <b>Loctite®243™</b>
Gear segment (75029081000) (📖 p. 390)		

**i Info**  
Make sure that the crankshaft is not locked.

- Mount and tighten nut ⑧.

Guideline

Nut, primary gear wheel	M20LHx1.5	90 Nm (66.4 lbf ft) <b>Loctite®243™</b>
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- Remove the special tool.

Gear segment (75029081000) (📖 p. 390)
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