

## Installing a new balance shaft assembly

### Special tools and workshop equipment required

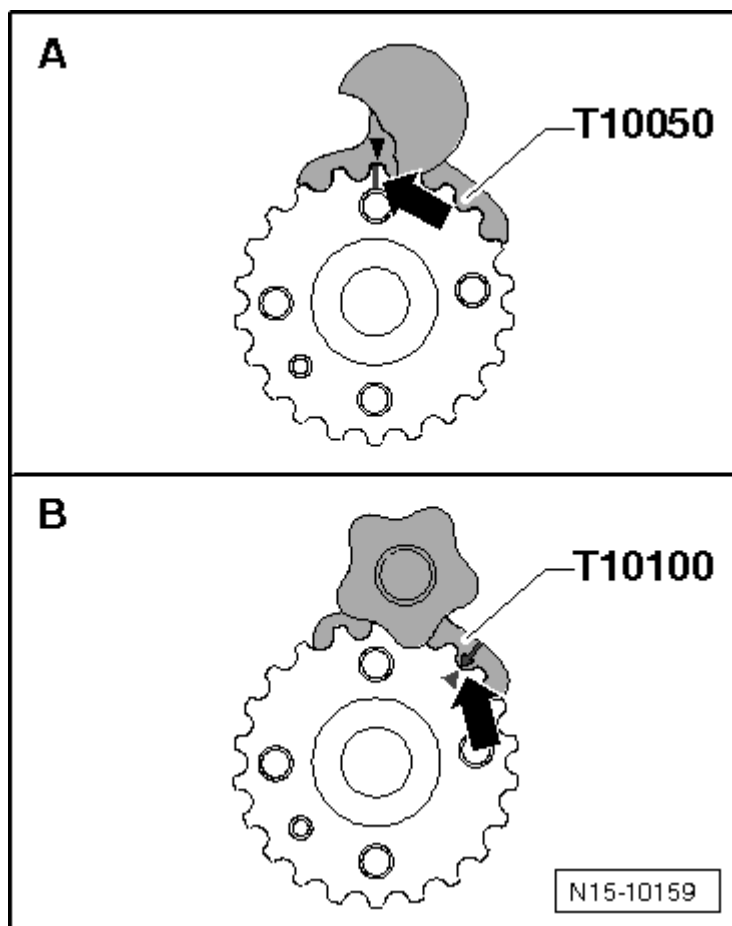
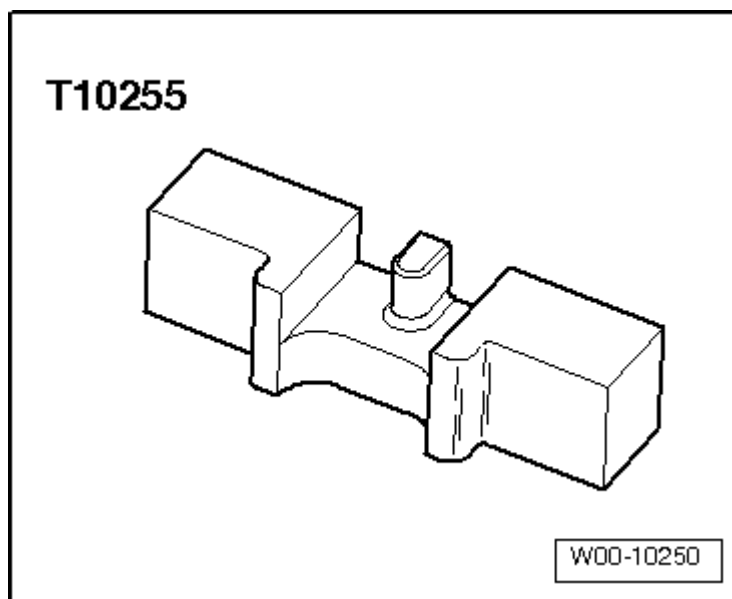
- ♦ Locking tool -T10255-

### Procedure

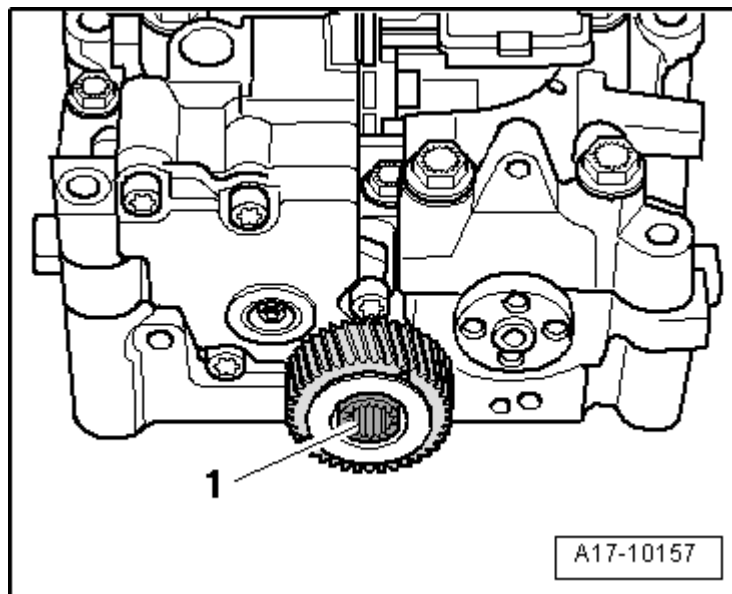


#### Note

- ♦ *The spur gear drive of the balance shaft assembly must be installed with a backlash of 0.038 ... 0.072 mm.*
- ♦ *To achieve the correct backlash, a suitably thick coating is already applied to the new idler gear. The coating is applied to the teeth on parts of the circumference.*
- ♦ *The coating is worn down rapidly and the backlash is then correct.*
- ♦ *A new balance shaft assembly must always be installed in conjunction with a new idler gear which has the correct coating.*
- ♦ *A white dot on the idler gear indicates the correct installation position.*
- ♦ *Idler gears not marked with a white dot are coated all round. They can be installed in any position.*
- ♦ *Renew the bolts tightened with specified tightening angle.*
- Crankshaft sprocket is locked using crankshaft stop -T10050- for engines with circular crankshaft sprocket, or crankshaft stop -T10100- for engines with oval crankshaft sprocket.



- Before positioning balance shaft assembly on cylinder block slacken off bolt -1- for idler gear approx.  $\frac{1}{4}$  turn.
- Check that two dowel sleeves are in place, to ensure that balance shaft assembly is located correctly on cylinder block.

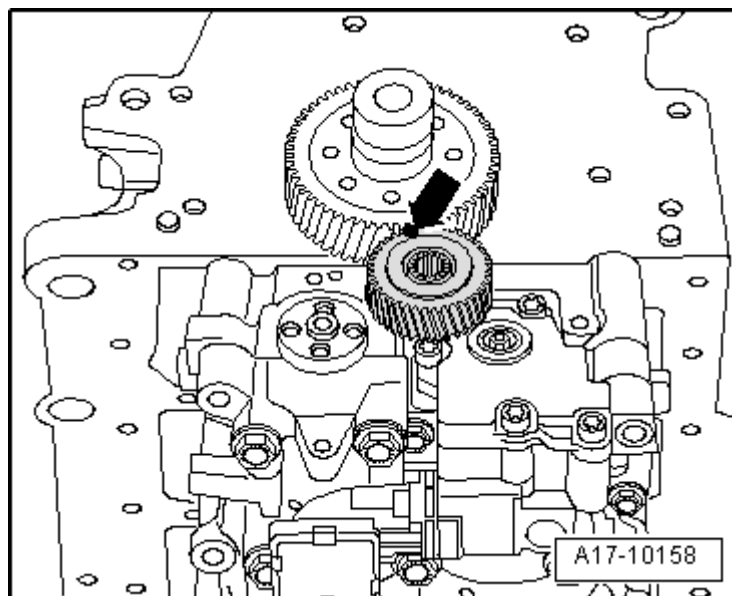


- Position balance shaft assembly on cylinder block, making sure idler gear is in correct position:
  - White dot -arrow- on idler gear must be aligned centrally with crankshaft.
  - Idler gears not marked with a white dot can be installed in any position.

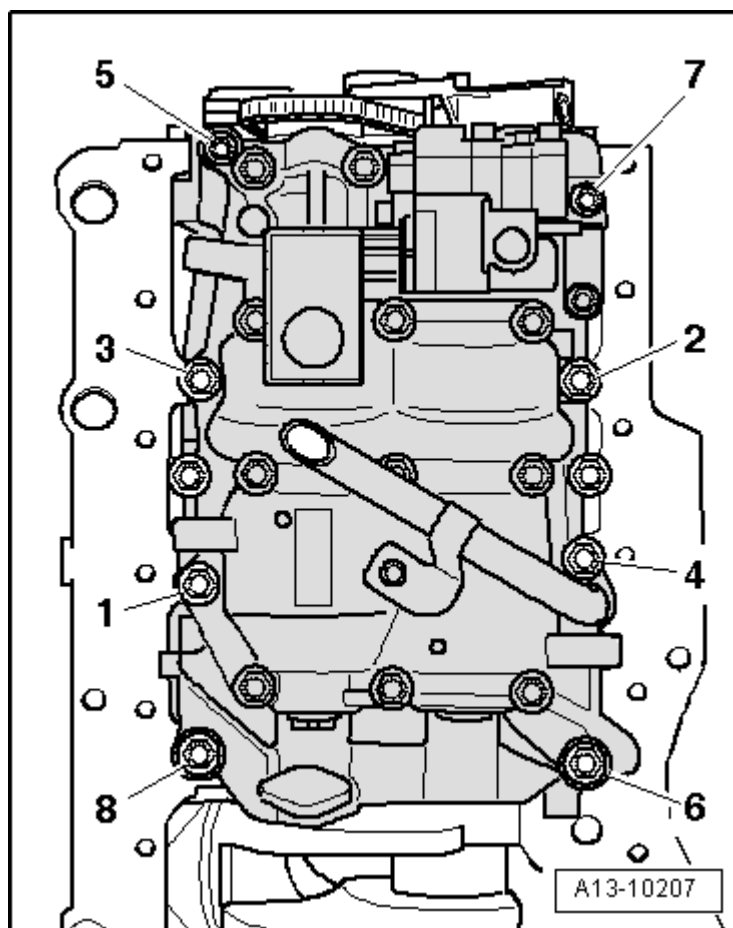


#### Note

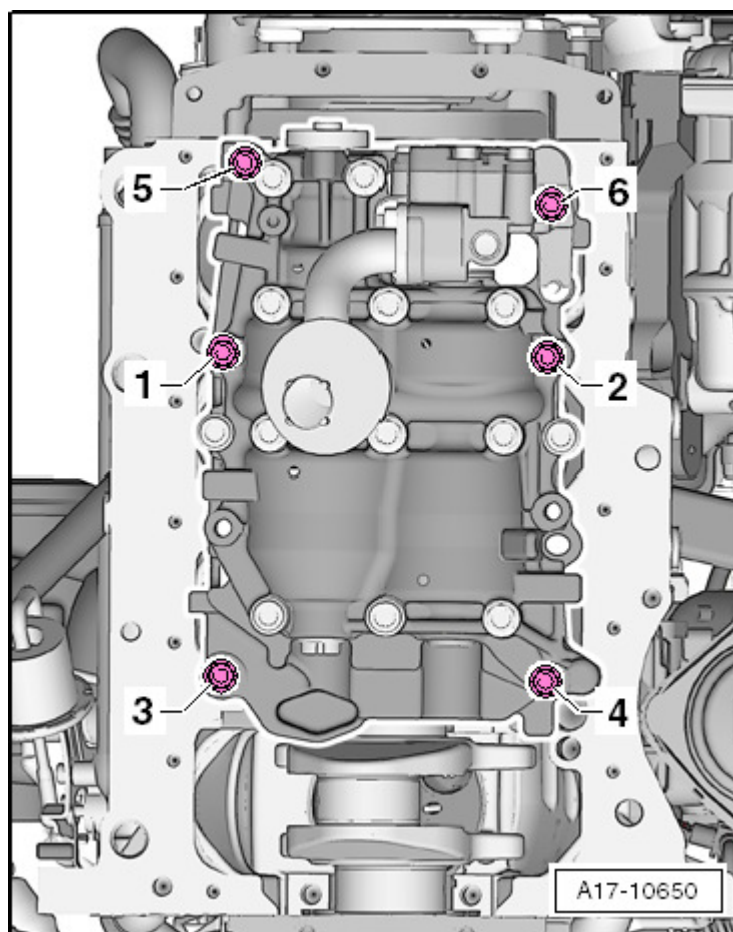
Take care not to damage coating on idler gear.



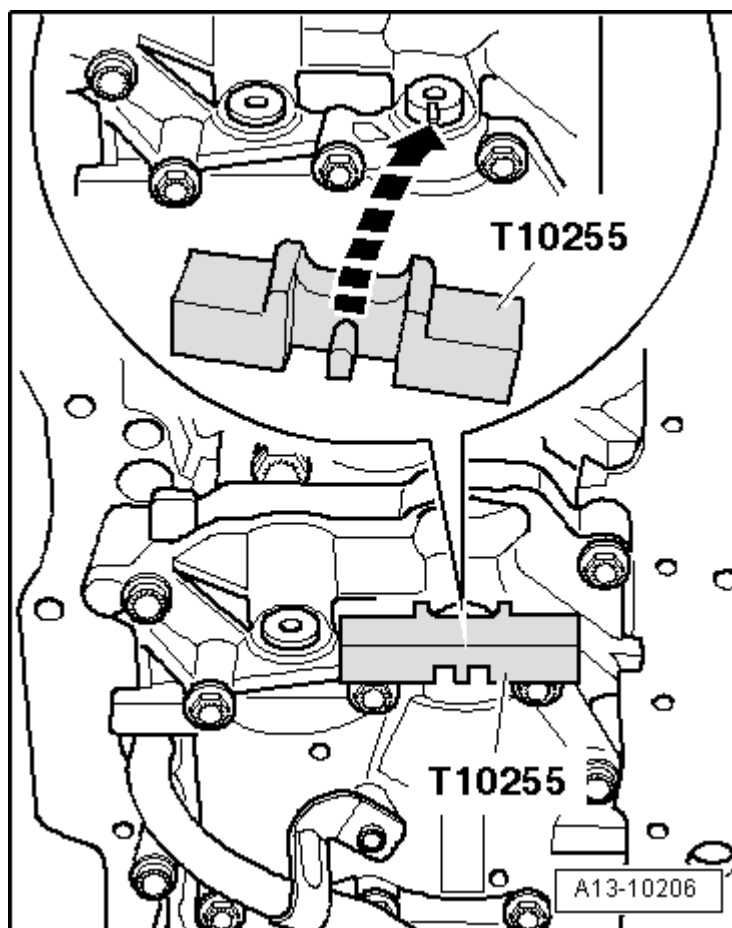
- ♦ Balance shaft assembly with eight attachment points: tighten bolts → Fig..



- ◆ Balance shaft assembly with six attachment points: tighten bolts → Fig..



- Lock balance shaft with locking tool - T10255-; turn balance shaft to do so, if necessary.
- The lug of the locking tool must engage in the groove of the balance shaft.

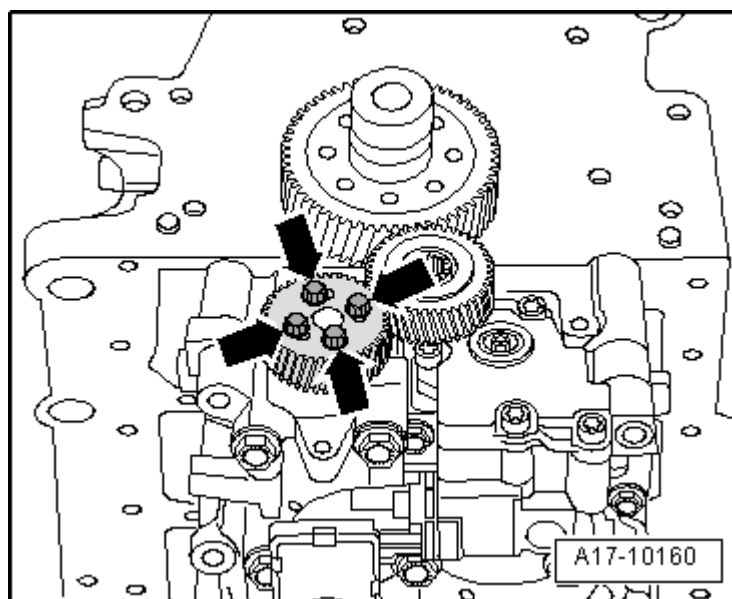


- Carefully fit balance shaft gear onto balance shaft; to do so, push idler gear slightly to one side.



#### Note

- ♦ Take care not to damage coating on idler gear.
- ♦ If it is not possible to align the elongated holes in the balance shaft gear with the threaded holes, you must turn the gear some teeth further as required and then fit it again.
- Secure balance shaft gear -arrows-.
- Remove locking tool -T10255-.



The following three steps have to be performed simultaneously (a second mechanic is therefore required):

- Push idler gear -3- firmly in direction of - arrow- into teeth on drive gear -2- and balance shaft gear -1-. If necessary use a wooden rod to do so.
- At the same time, turn balance shaft gear slightly in anti-clockwise direction.

- Tighten bolt for idler gear.
- Detach crankshaft stop.

**Note**

*After installation the idler gear must have no backlash. This can be checked by exerting light pressure by hand.*

Remaining installation steps are carried out in reverse sequence; note the following:

- Install sump → [Chapter](#).
- Install vibration damper → [Chapter](#).

