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ContiTech: Expert Tips for Changing Timing Belts

- Detailed instructions for a CT1015 WP1 and CT1018K1 in an Audi A4 (B6) 2.5-liter V6 TDI with engine code AKE MY 2001
- ContiTech shows how to avoid errors when changing belts

Significant errors are frequently committed when changing the timing belt. To ensure that the belt change operation goes smoothly, the ContiTech Power Transmission Group provides fitters with a detailed installation guide. In this, ContiTech experts provide a step-by-step explanation of the correct change procedure.

The manufacturer recommends changing the timing belt in the case of a timing belt and fuel injection pump every 120,000 km. In addition, the timing belt and fuel injection pump should be checked every 30,000 km.

Tip: The multi V-belt ought to be changed at the same time as the timing belt. It is essential, therefore, to change the multi V-belt as part of the package in order to avoid later failures with unnecessary costs. If, despite this, the decision is taken to re-fit the multi V-belt anyway, mark the running direction before removing it.

The labor time is 4.1 hours.

Fitters require the following special tools for this procedure which are also contained in the ContiTech Tool Box V01:

- | | |
|------------------------------------|-----------------------------|
| 1. Locking tool for crankshaft | OE (3242), Tool Box V01/8 |
| 2. Locking tool | OE (T40011) Tool Box V01/24 |
| 3. Counterhold | OE (3036), Uni Tool Box/3 |
| 4. Hex socket head | OE (3078) |
| 5. Fuel injection pump locking pin | OE (3359) Tool Box V01/6 |
| 6. Camshaft locking tool | OE (3458) Tool Box V01/19 |
| 7. Puller | OE (T40001) |

Preparatory work:

Identify the vehicle using the engine code.

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Disconnect the vehicle battery. Do not turn the crankshaft and camshaft once the timing belt has been removed. Turn the engine in the normal direction of rotation (clockwise), unless otherwise specified.

Turn the engine only at the crankshaft sprocket and not at other sprockets. Only carry out checks and adjustments when the engine is cold. Avoid contact between the belt and harmful substances, such as engine oil or coolant.

Comply with all the tightening torques specified by the vehicle manufacturer.

Removal: front bumper cover, engine compartment underpanel, engine cover, visco fan, upper left and right timing belt guards, multi V-belt cover, torque reaction mount, air pipe for turbocharger and charge-air cooler left, coolant expansion reservoir and multi V-belt. Move hood latch to service position.

Removal – fuel injection pump timing belt:

1. Set valve timings to TDC mark.

Turn engine at crankshaft until small bore on fuel injection pump vibration damper is at top. Insert fuel injection pump locking pin into small bore of fuel injection pump vibration damper (Figs. 1, 2).



Fig. 1



Fig. 2

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2. Remove cover from oil filler nozzle. If TDC is correctly set, "OT" (German for TDC) must be visible on camshaft (Figs. 3, 4).



Fig. 3

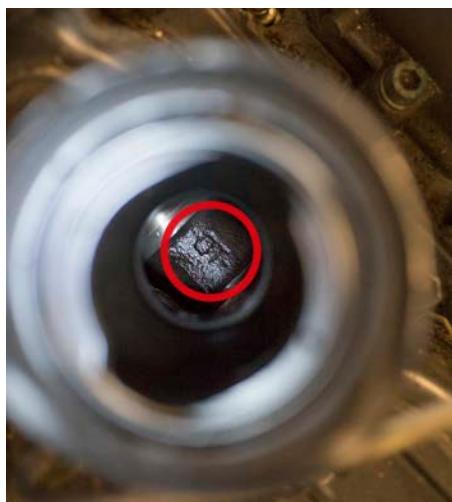


Fig. 4

3. Screw locking tool OE (3242) into cylinder block on right shortly before gearbox flange connection above oil pan (Figs. 5, 6). Remove screw plug before doing so.



Fig. 5



Fig. 6

4. Remove vacuum pump on cylinder head at left. To do so, remove vacuum pump bolts and turn pump counterclockwise. Leave lines connected (Figs. 7, 8, 9).



Fig. 7



Fig. 8



Fig. 9

5. Carefully lever camshaft cover on right side off using screwdriver (Figs. 10, 11). Take care not to damage seal surface. Cover is damaged during removal and must be replaced (timing belt kit contains new cover).



Fig. 10



Fig. 11

6. Insert locking tool in both sides of cylinder heads. To do so, attach hooks of chains at suitable location (Figs. 12, 13, 14). **Do not use camshaft locking tool as counterhold!**



Fig. 12



Fig. 13



Fig. 14

7. Remove vibration damper from fuel injection pump sprocket. **Do not under any circumstances loosen central nut of fuel injection pump or fuel injection pump default position will otherwise be moved! Fuel injection pump cannot be adjusted using workshop equipment.**

8. Using hex socket head OE (3078) loosen nut for tensioning pulley of fuel injection pump timing belt, counterholding with hex key (Fig. 15). Remove fuel injection pump timing belt.



Fig. 15

Removal – camshaft belt:

1. Unscrew eight bolts of crankshaft vibration damper and remove vibration damper.
2. Remove lower timing belt guard.
4. Remove visco fan belt pulley.
5. Unscrew six bolts of timing cover and remove timing cover.

6. Loosen three bolts on drive sprocket for fuel injection pump from camshaft sprocket and remove. Use counterhold OE (3036).
7. Loosen and remove drive sprocket.
8. Loosen both central bolts of left and right camshafts, using counterhold OE (3036) (Fig. 16).



Fig. 16

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9. Slowly loosen timing belt tensioning pulley clockwise using 8mm hex key until hydraulic damper is pushed so far down that locking tool OE (T40011) can be inserted into hydraulic damper (Figs. 17, 18, 19).



Fig. 17



Fig. 18



Fig. 19

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Hydraulic damper is oil-damped and can only be retracted, i.e. pressed together, by slowly applying steady force. It may only be operated via tensioning pulley. Pressing together with vise or pliers could damage hydraulic damper.

10. Withdraw both camshaft sprockets from camshaft cone using puller OE (T40001) (Figs. 20, 21).



Fig. 20



Fig. 21

11. Remove left camshaft sprocket (Fig. 22).



Fig. 22

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12. Remove timing belt.

Installation – camshaft belt:

1. Fit new components from timing belt kit. Check remaining components such as camshaft sprocket and crankshaft sprocket for damage. With timing belt tensioning pulley check that guide pin on reverse of tensioning pulley is correctly installed (Figs. 23, 24, 25).

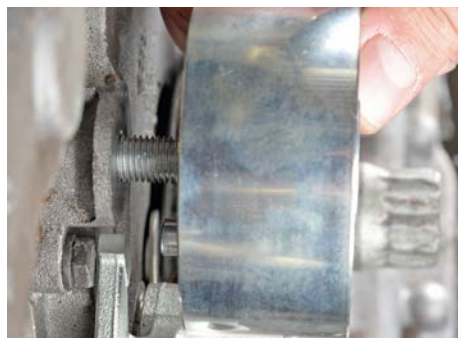


Fig. 23



Fig. 24



Fig. 25

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2. Fit timing belt, starting at crankshaft sprocket and then place belt over right camshaft sprocket, tensioning pulley and idler, coolant pump and, finally, over removed left camshaft sprocket. Slide camshaft sprocket plus timing belt onto camshaft cone and screw central bolt in again (Figs. 26, 27, 28). Take care to ensure that timing belt is not kinked during fitting. Timing belt must be tight between sprockets on tight side.



Fig. 26

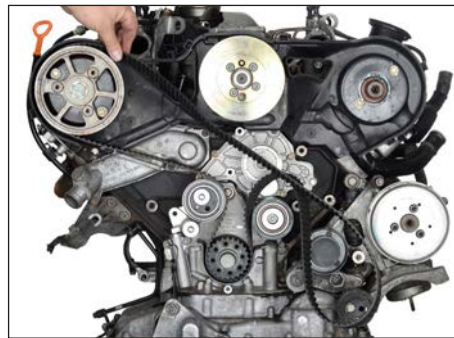


Fig. 27



Fig. 28

3. Tighten both camshaft bolts until camshaft sprockets can just still be turned and do not tilt.

4. Slowly tighten timing belt tensioning pulley using 8mm hex key until locking tool OE (T40011) can easily be removed from hydraulic damper (Fig. 18).

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5. Pretension timing belt by applying 15 Nm counterclockwise torque at 8 mm hexagon socket of tensioning pulley (Fig. 29). This pretensions hydraulic damper, and hydraulic damper piston extends further. Timing belt tension is now correctly set.



Fig. 29

6. Tighten both camshaft sprockets to 75 Nm using counterhold OE (3036).

7. Fit new tensioning pulley for fuel injection pump timing belt in central timing cover and ensure that tensioning pulley ear engages fixing stud (Fig. 30).



Fig. 30

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8. Fit central timing cover (Fig. 31), tightening torques: (1) 45 Nm; (2) 10 Nm; (3) 22 Nm; (4) 10 Nm.

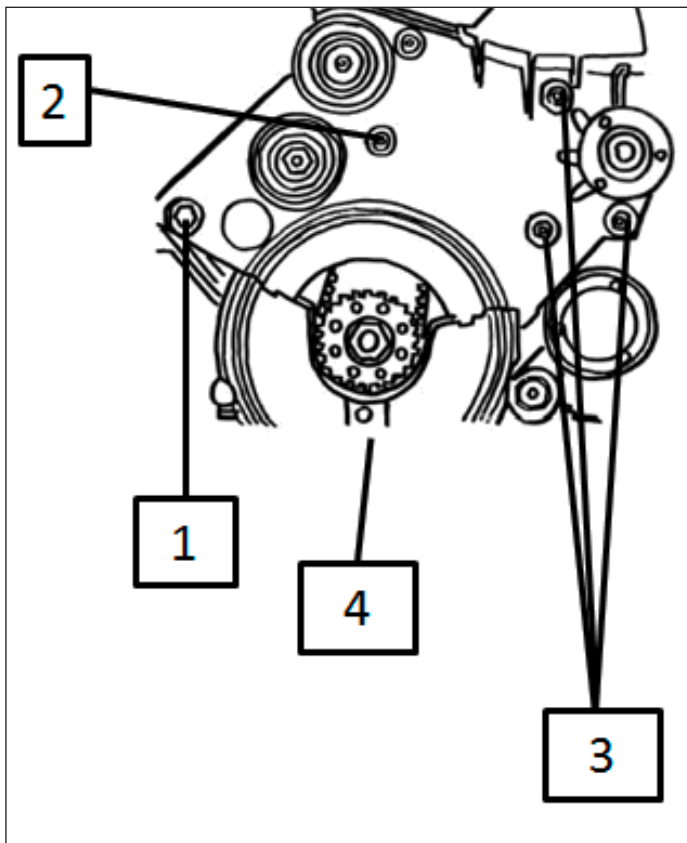


Fig. 31

9. Fit lower timing belt guard, crankshaft vibration damper (22 Nm) and visco fan belt pulley.

Installation – injection pump timing belt:

1. Mount drive sprocket for fuel injection pump on camshaft sprocket in center of slots such that it can still just move.
2. Fit timing belt for fuel injection pump.

3. Tension timing belt using hex socket head OE (3078) and hex key (Fig. 32). Turn hex key counterclockwise until marks (pointers) are aligned (Fig. 33). Tighten tensioning pulley fastening nut to 36 Nm using hex socket head OE (3078).



Fig. 32



Fig. 33

4. Tighten three bolts of drive sprocket for fuel injection pump on camshaft sprocket to 22 Nm.
5. Remove crankshaft locking tool OE (3242), fuel injection pump locking pin OE (3359) and camshaft locking tool OE (3458).
6. Turn crankshaft through two revolutions in direction of engine rotation and set engine to TDC again as in points 1 to 6 of removal for fuel injection pump timing belt.
7. Check tension setting for fuel injection pump timing belt. Markings (pointers) must be aligned (Fig. 33).
8. Re-install vibration damper of fuel injection pump sprocket (22 Nm).

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9. Fit new cover on cylinder head at right rear. Install vacuum pump (10 Nm).
10. Locate screw plug in cylinder block (crankshaft locking tool OE (3242)) and screw in (35 Nm).
11. Assembly and finalization as for removal but in reverse order. Tighten bolts of torque reaction mount to 40 Nm.
12. Record changing of original ContiTech timing belt on sticker supplied and stick this in engine compartment (Fig. 34).

Then carry out a test run or test drive.



Fig. 34