



KD481.05

Assembly/disassembly recommendations

<p>SUBARU: Forester (I, II, II FL, III), Legacy (IV, V), Impreza (G11, FL G11, GR/GV),</p>	<p>ENGINES 1.5 i, 2.0 (i, R, X, XS, STi, XT), 2.5 (STi, Ti, XT, i, STiS, WRX)</p>	<p>OE reference See below</p>
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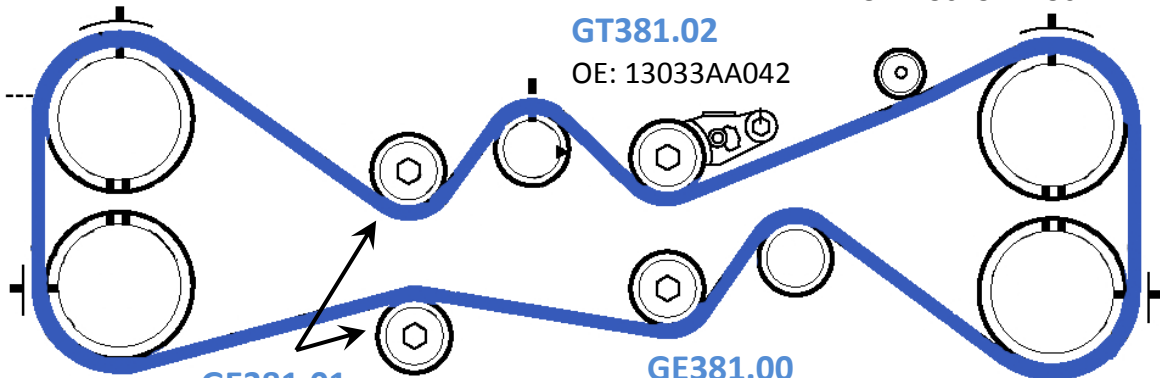
TIMING KINEMATICS OF THE KIT KD481.05

BELT WITH TEETH
281 teeth
OE: 13028AA240



GE381.04
OE: 13073AA230

GT381.02
OE: 13033AA042



GE381.01
OE: 13073AA142

GE381.00
OE: 13085AA080



PROBLEMS WITH THE TENSIONER GT381.02

PROBLEMS WITH BROKEN BEARINGS

Probable cause

An incorrectly fitted timing belt.

This breakage is characteristic of overheating on the roller tensioner, due to the contact between the belt and a fixed member of the engine.

The rise in temperature of the back causes a shift of the belt on a blocked pulley or on one of the belt guides.

The heat transfer comes from the rear of the belt (which has melted due to the friction) through to the pulley, causing an increase in temperature, which rapidly destroys the grease and bearing cages. This results in the destruction of the tensioner pulley.



PROBLEMS WITH POOR BELT TENSION AND SCREW BREAKAGES

Probable cause

Insufficient tightening of the screw.

The stress responsible for the screw breakage was caused by the to and fro of the roller. This is due to an insufficient tightening of the screws which failed to press the roller firmly against the engine, the screw then worked in shear rather than in tension.

The play that is then created between the roller and the engine causes a belt tension fault, as well as a misalignment of the belt.



Consequence

After breakage, the tensioner pulley rests against the body of the tensioner, which generally leads to further destruction.

The outer ring of the bearing is thus often colored as a result of increased temperature due to contact with the belt.



ADVICE

- The recommended tightening torque is **39 Nm**.
- You have to assemble the timing kit as suggested by the manufacturer's installation procedures, as the timing on these types of engines is very specific.
- Use the special tool for installation.
- Follow the following procedure for positioning the belt relative to the belt guide.

BELT POSITIONING

During the install phase of a new timing belt (or when changing the roller tensioner), it is necessary to check the distance between the back of the belt and metal belt guide.

Indeed, the manufacturer specifies a play of 1 ± 0.5 mm.

As mentioned above, not adhering to this distance can cause various problems in the timing.

Therefore you should complete the install by tightening all screws to the torque recommended by the manufacturer, ie **9.75 Nm**; the guide is then at the correct distance from the belt.

REPLACEMENT

Special tools

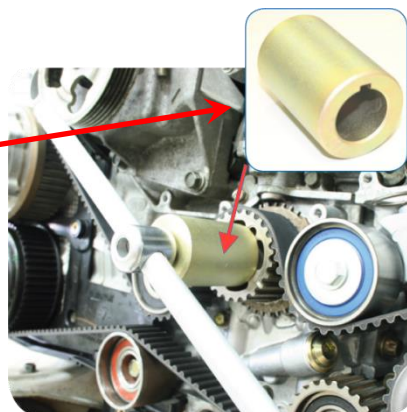
- Sleeve - OE 4999 87500
- Thrust bearing - OE 4999 77100

Tightening torque

39 Nm on all vehicles

Precautions:

- Disconnect the battery earth
- DO NOT turn the crankshaft or camshaft before timing belt has been fitted
- Remove the spark plugs to facilitate the rotation of the motor
- Rotate the engine in the normal direction of rotation (unless otherwise stated)
- DO NOT turn the engine with the camshaft or other drive gears
- Adhere to tightening torques



REMOVAL



Engines with variable timing: make a mark with chalk or paint on the camshaft sprockets and the camshaft timing devices to facilitate alignment during installation.

1) Raise the front of the vehicle

2) Remove:

- Accessory belt casing
- The accessory belt(s)
- The air-conditioning belt tensioner

3) Hold the crankshaft pulley:

Use the tool OE 4999 77100.

4) Remove:

- The crankshaft pulley bolt
- The crankshaft pulley
- The timing cover
- Manual transmission:
the timing belt guide for the crankshaft sprocket

5) Manual transmission: remove the timing belt guides positioned at the camshaft sprockets

6) Turn the crankshaft clockwise. Align the timing marks.

Use the tool OE 4999 87500



Ensure that the arrow-shaped mark on the crankshaft sprocket is at the 3 o'clock position

7) Remove:

- Fixed roller
- Timing belt

REPLACING

1) Remove:

- The automatic tensioner bolt (**Mark 15**)
- The automatic roller tensioner GT381.02
- Roller tensioners

2) Replace the tensioner roller and rollers

3) Install the automatic roller tensioner GT381.02

Tighten the bolt to **39 Nm (Mark 15)**.

4) Make sure the timing marks are aligned

mark 7, mark 8, mark 9, mark 10, mark 11, mark 12 and mark 13.



If it is necessary to rotate the camshaft, proceed separately, slowly, taking care to avoid contact between the intake and exhaust valves, which could cause damage. Turn the left camshafts in the directions indicated by the arrows.

5) Install the timing belt starting from the crankshaft sprocket

6) Align the marks on the belt with the marks on the sprockets

mark 7, mark 8, mark 10, mark 11 and mark 13

Check that the arrow on the belt is pointed in the direction of rotation.

7) Install the fixed roller (GE381.01)

Tighten the bolt to **39 Nm**

8) Make sure the timing marks are aligned

mark 7, mark 8, mark 9, mark 10, mark 11, mark 12 and mark 13.

9) Remove the locking pin from the body roller tensioner to release the piston (Mark 18)

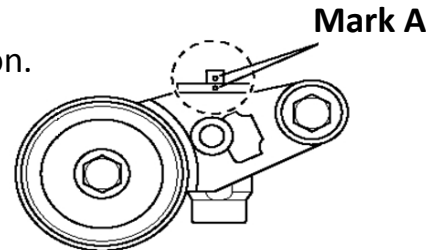
In case of early unpinning: How to reposition the locking pin on the hydraulic tensioner?

- Slowly compress the piston into the body of the hydraulic tensioner using a press until the holes are aligned (**Mark A**).

This operation must be carried out in a vertical position.



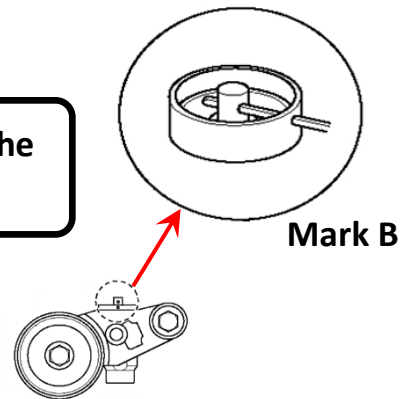
Do not exceed a force of 1000 kg



- Hold the piston in place by inserting a 2 mm diameter pin through the hole in the body of the tensioner (**Mark B**).



The time spent on pressing the piston into the tensioner body must exceed 3 minutes.



- 10) Manual transmission:** install the timing belt guide for the crankshaft sprocket (**mark 6**). Lightly tighten the bolts (**Mark 19**)

- 11) Manual transmission:** install the timing belt guides on the camshaft sprockets (**CA1**), (**CA2**) and (**CA4**). Slightly tighten the bolts

- 12) Manual transmission:** adjust the distance between the back of the timing belt and its guide to 0.5-1.5 mm (**Mark 6**). Tighten the bolts to **10 Nm** (**Mark 19**).

- 13) Manual transmission:** adjust the distance between the back of the timing belt and the timing belt guides positioned at the camshaft sprockets (**CA1**), (**CA2**) and (**CA4**) to 0.5-1.5 mm. Tighten the nuts:
- →2002 : **10 Nm**
 - 2003→: **6 Nm**

14) Reinstall the remaining parts in the reverse order of removal

15) Hold the crankshaft pulley

Use the tool OE 4999 77100

16) Engine 2.0 - Tighten the bolt for the crankshaft pulley (Mark 1):

- →**2006**: lubricate the thread and the face of the bolt and tighten to **44 Nm**. Then tighten the bolt to **130 Nm**, checking the bolt rotates **45°**; if this is not the case, remove the bolt and put in a new one. Tighten the bolt.
Tightening torque: **44 Nm +45-60°**
- **2007-09**: lubricate the thread and the face of the bolt and tighten to **44 Nm**. Then tighten the bolt to **130 Nm**, checking the bolt rotates **45°**; if this is not the case, remove the bolt and put in a new one. Lubricate the bolt threads. Tighten the bolt. Tightening torque: **44 Nm + 45-60°**
- **2010**: → lubricate the thread and the face of the bolt and tighten to **47 Nm + 45-60°**.

17) Engine 2.0 Turbo - Tighten the crankshaft pulley bolt (Mark 1):

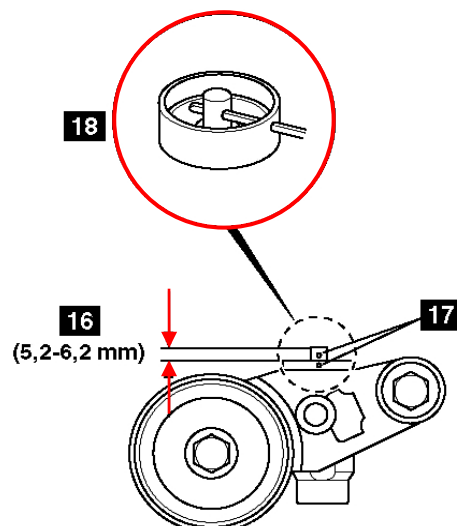
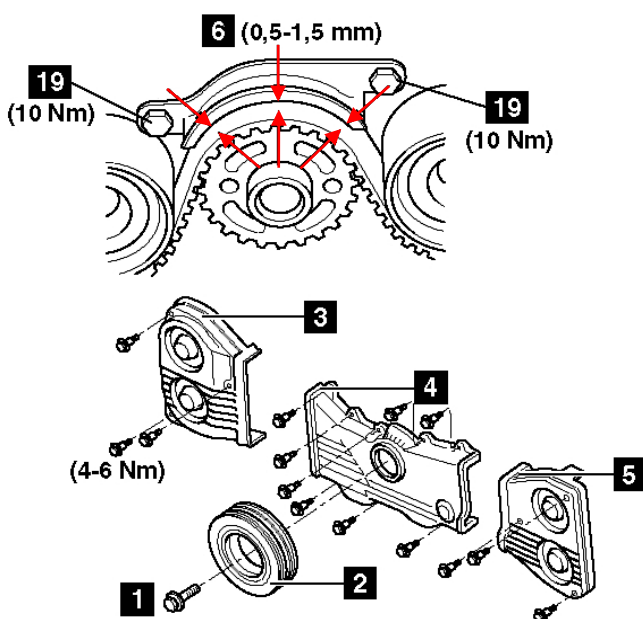
- →**1999** : tightening torque **122-137 Nm**
- **2000-04**: lubricate the thread and the face of the bolt and tighten to **44 Nm**. Then tighten the bolt to **127 Nm**, checking the bolt rotates **45°**; if this is not the case, remove the bolt and put in a new one. Tighten the bolt.
Tightening torque: **44 Nm + 45-60°**
- **2005**: lubricate the thread and the face of the bolt and tighten to **44 Nm**. Then tighten the bolt to **130 Nm**, checking the bolt rotates **45°**; if this is not the case, remove the bolt and put in a new one. Tighten the bolt.
Tightening torque: **44 Nm + 45-60°**

18) Engine 2.5 Turbo - Tighten the crankshaft pulley bolt (Mark 1):

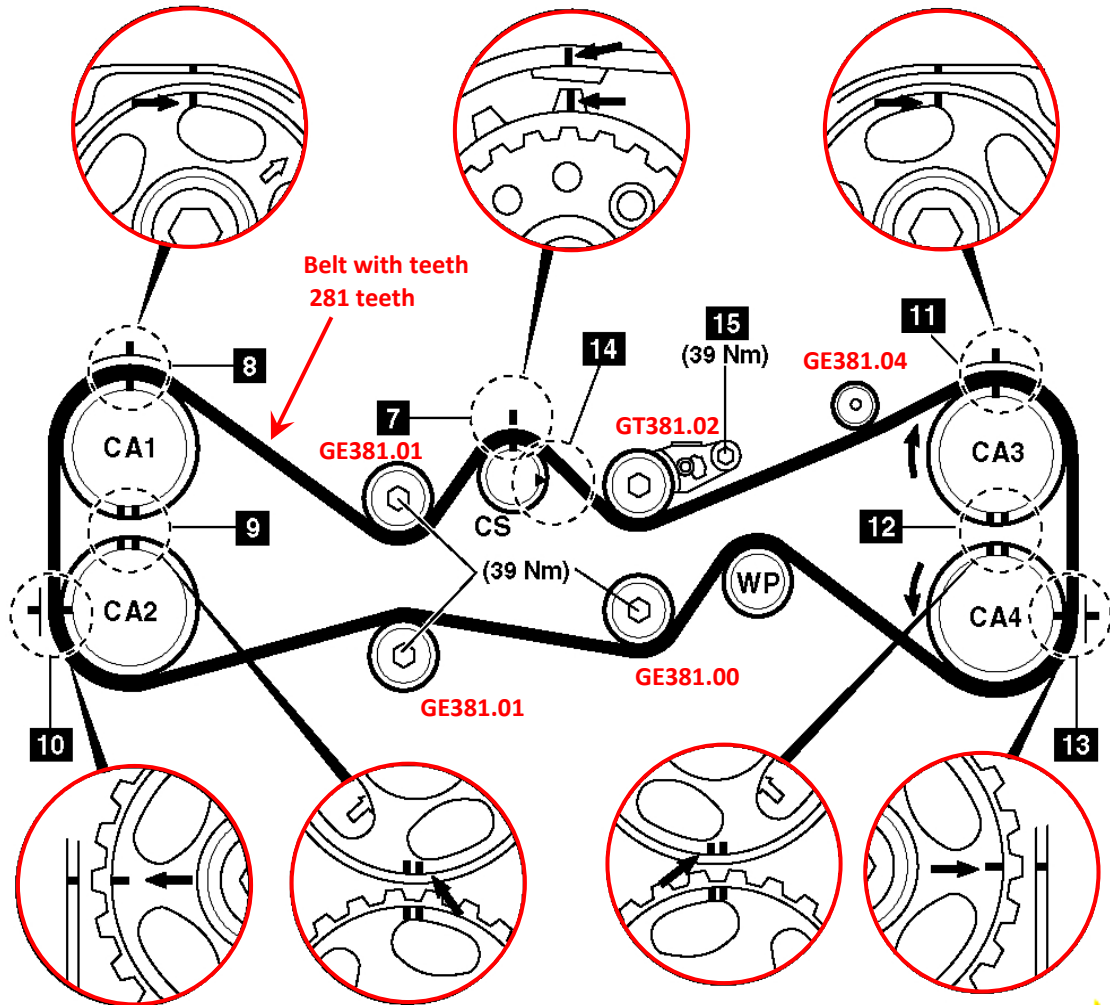
- →**2007**: lubricate the thread and the face of the bolt and tighten to **44 Nm**. Then tighten the bolt to **180 Nm**, checking the bolt rotates **65°**; if this is not the case, remove the bolt and put in a new one. Lubricate the bolt threads. Tighten the bolt. **Tightening torque: 44 Nm + 65-75°**
- **Automatic transmission, 2008**: lubricate the thread and the face of the bolt and tighten to **44 Nm**. Then tighten the bolt to **130 Nm**, checking the bolt rotates **45°**; if this is not the case, remove the bolt and put in a new one. Lubricate the bolt threads. Tighten the bolt. **Tightening torque: 44 Nm +45-60°**
- **Manual transmission, 2008**: lubricate the thread and the face of the bolt and tighten to **44 Nm**. Then tighten the bolt to **180 Nm**, checking the bolt rotates **65°**; if this is not the case, remove the bolt and put in a new one. Lubricate the bolt threads. Tighten the bolt. **Tightening torque: 44 Nm + 65-75°**
- **2007**:→ lubricate the thread and the face of the bolt and tighten to **47 Nm + 60±5°**



On engines without belt tensioners, the new belt must be installed using special tools.



Subaru Forester 2.0 Engine



Recommendations

Be sure to power on the hydraulic cylinder to avoid excessive play between the piston rod and the support on the engine block.

Make sure the O-ring of the roller tensioner screw is present and in the correct position before assembly.

Follow the manufacturers' assembly procedures as well as their indicated tightening torques

Consult vehicle applications in our online catalogue: <http://lc.cx/catalog-ra>



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ALWAYS FOLLOW THE VEHICLE MANUFACTURER'S RECOMMENDATIONS!

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