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Technical Infos

Power Transmission Group

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Contents / Vehicle Type

Vehicle type	Engine	Page
Alfa Romeo	1.9 JTD	38
Audi	1.4 / 1.6 16V	24
	1.6 / 2.0 8V	37
	1.8 20V	10
	1.8 T / 2.0	42
	1.9 TDI	17 + 27
	1.9 / 2.0 TDI (PD)	36
	1.6 TDI and 2.0 TDI (Common Rail)	34
	2.4 / 2.5 TDI 5-cyl.	22
	2.5 TDI 5-cyl.	25
	2.5 TDI V6	15
Citroën	1.6 Diesel; 9H engines	41
	2.5 / 2.8 D	26
Chevrolet	1.4 / 1.5 / 1.6 16V	30
Daewoo	1.4 / 1.5 / 1.6 16V	30
Daihatsu	Cuore	19
Fiat	Punto 188 A4 engine	9
	1.6 Diesel; 9H engines	41
	1.9 JTD engines	38
	2.5 / 2.8 D	26
Ford	1.25 / 1.4 / 1.6 16V, various from 4/97	20
	1.25 / 1.4 / 1.6 16V	43
	1.6 Diesel; 9H engines	41
	1.8 Diesel	12
	2.5 Diesel	11
GM	1.7 DTI up to engine number 328703, various	28
	1.7 D, various	32
Hyundai	1.4 - 1.6 16V, various	39

Vehicle type	Engine	Page
Iveco	2.5 / 2.8 D	26
Jeep	Cherokee	13
Mazda	1.6 Diesel; 9H engines	41
Mini	1.6 Diesel; 9H engines	41
Mitsubishi	1.3 / 1.5 engine type 4 G, various	40
	1.8 GDI	18
Nissan	1.5 dCi	21
Opel	1.4 / 1.6 / 1.8 / 2.0 16V	29
	1.6 / 1.8 16V	16
	1.7 DTI up to engine number 328703, various	28
	1.7 D, various	32
	1.9 JTD	38
	2.5 / 2.6 / 3.0 / 3.2 V6, various	44
	2.5 / 2.8 D	26
Peugeot	3.0 DTI V6	35
	1.6 Diesel; 9H engines	41
Renault	2.5 / 2.8 D	26
	Renault, various	31
	Master, Trafic	13
	1.2 16V	8 + 33
	1.4 / 1.6 16V	14
Rover / MG	1.5 dCi	21
Saab	2.5 / 2.8 D	26
	3.0 DTI V6	35
	2.0 / 2.5 V6	23
	1.9 JTD	38
	2.5 / 2.6 / 3.0 / 3.2 V6, various	44
	3.0 DTI V6	35

Vehicle type	Engine	Page
Seat	1.4 / 1.6 16V	24
	1.6 / 2.0 8V	37
	1.8 T/2.0	42
	1.9 TDI	17 + 27
	1.9 / 2.0 TDI (PD)	36
	1.6 TDI and 2.0 TDI (Common Rail)	34
Škoda	1.4 / 1.6 16V	24
	1.6 / 2.0 8V	37
	1.8 T / 2.0	42
	1.9 TDI	17 + 27
	1.9 / 2.0 TDI (PD)	36
	1.6 TDI and 2.0 TDI (Common Rail)	34
Suzuki	1.5 DDIS	21
Volvo	V40 / S40 1.8	18
	1.6 Diesel; 9H engines	41
VW	1.4 / 1.6 16V	24
	1.6 / 2.0 8V	37
	1.8 T / 2.0	42
	1.9 TDI	17 + 27
	1.9 / 2.0 TDI (PD)	36
	1.6 TDI and 2.0 TDI (Common Rail)	34
	2.4 / 2.5 TDI 5-cyl.	22
2.5 TDI 5-cyl.	25	
	2.5 TDI V6	15

Contents / Product

Product	Page
CT 522 K4 in CT 522 K1	13
CT 604 K1, CT 684 K1, CT 711 K1, CT 840 K1/K2, CT 935 K1/K2, CT 940 K1/K2, CT 949 K1	31
CT 738 K1	40
CT 817	19
CT 870 K1, CT 873 K1, CT 975 K3	29
CT 881 K2 / K4	20
CT 881 K3	43
CT 884 K1, CT 990 K1 / K2	44
CT 887 K1	30
CT 908 K1	37
CT 909 K5 in CT 909 K10	42
CT 919 K4 / K5	10
CT 939 K1-5	22
CT 939 K2 / K3	25
CT 941 K1	18
CT 942 K1	39
CT 946 K2 in CT 1044 K1	17
CT 957 K1 / K2	24
CT 975 K1 in CT 975 K3	16
CT 983 K1 / K2	12
CT 984 K2 and CT 1015 K2	15
CT 1014 K3	28
CT 1014 K2 / K3 / K5	32
CT 1028 K2 / K3 / K4, CT 1051 K1 / K2	36
CT 1035 K1 / K2	21
CT 1038 K1, CT 1034 K1, CT 989 K1 and CT 731 K1	26
CT 1044 K1	27
CT 1045 K1	8 + 33
CT 1055 / CT 1054	11
CT 1079 K1	35
CT 1092 K1	41
CT 1096 K1	23
CT 1105 K1	38

Product	Page
6PK1140 Elast in 6PK1070	34
6PK1748 in 5PK1750	14
BTT Hz (frequency measurement)	9
Installation tips - changing the timing belt	
VW Scirocco, Golf V, VI, Plus, Jetta III, from model year 2008, engine code CBDB	46
Renault Clio II 1.6 16V, engine code K4M 748	54
Opel 1.8i 16V C 18 XE	62
Audi A4, A6, A8, VW Passat 2.8 30V	70

CT 1045 K1

Renault 1.2 16V

Installation tip - tensioning pulley

Problem:

The tensioning pulley fails after a short period of operation, with the running surface possibly having separated from the bearing core. The running surface usually shows severe rubbing marks. The back of the timing belt is often substantially damaged or even completely worn through as a result of heat action.



Excerpt from the manual

Cause:

Because the eccentric has been rotated in the wrong direction, the tensioning pulley has moved to a position it was not intended to reach and made contact with a protruding edge in the drive.

As a result the tensioning pulley has mechanically seized, either completely or partially, and the belt has overheated on the running surface. The level of damage depends on the running time.



Damaged running surface

Solution:

Always install the timing belt exactly according to the manufacturer's instructions. In particular, comply with the rotational direction of the eccentric for tensioning (counterclockwise here). Otherwise the tensioning pulley can come into contact with a protruding edge which can result in premature failure.



Observe rotational direction

BTT Hz

Fiat Punto Motor 188 A4

Setting the timing belt tension by means of frequency measurement

Problem:

The manual specifies 150 - 160 Hz as the tension setting for the final tension (T2) with the BTT Hz.

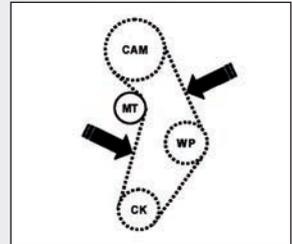
Subjective measurement results in the timing belt being tensioned too high.

100-110	2	150-160	FLA-f
190-210		234-245	FLA-k
190-210		234-245	FLA-k
		Auto	FLA-g
		Auto	FLA-g
125-135		150-165	FLA-c

Excerpt from the manual

Cause:

Fiat's nominal setting with a frequency gauge, applicable since the 2003 model year, is determined by adding two measurements. The first reading (between the camshaft pulley and the water pump) and the second reading (between the crankshaft and the tensioning pulley) have to be added. Older models can also be set using the BTT Hz.



Measuring points

Solution:

Pretension the timing belt to 7 Nm at the tensioning pulley using a torque wrench. Then secure the tensioning pulley and perform two engine revolutions. Now measure the readings at the two measuring points. The total value should be 150 - 160 Hz. Alternatively, you can also perform just one measurement above the water pump. The reading here should be 125 Hz.



BTT Hz

CT 919 K4/K5

Audi A4 1.8 20V

Converting vehicles built before 1998 to hydraulic tensioner

Problem:

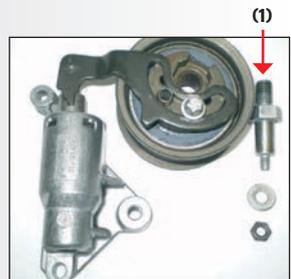
The belt drive makes noises after operating for a short time.

Cause:

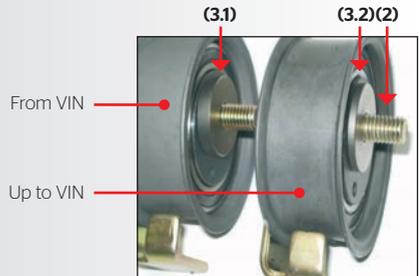
The newly installed tensioning pulley is not the correct distance from the engine and allows the belt to rub at the side on the inner flange (misalignment).

Solution:

When refitting vehicles built before and during 1998, the old version stud bolt (1) must be removed. The new version is then screwed into the same hole with a pre-mounted spacer (2). The problem here is that the manufacturer has two different thicknesses of spacer (3.1) + (3.2) which define the distance from the pulley to the engine. Despite the Vehicle Identification No. delimitation (production month: 01/96) it is not always clear which kit must be used since the stated Vehicle Identification No. can deviate from this. You should always check whether the new tensioning pulley is correctly aligned when mounted in the belt drive. Otherwise, noise will definitely occur or even serious damage to the engine.



Version to be replaced



New tensioning pulley design

CT 1055/CT 1054

Ford 2.5 Diesel

Converting the tensioning system

Problem:

The tensioning pulley included in the kit for the type delivered is different to the one installed in the vehicle.



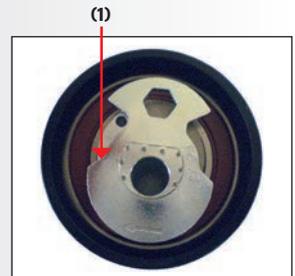
Type to be replaced

Cause:

According to Ford, the new tensioning pulley must be fitted in all 2.5 diesel engines when the timing belt is due to be changed. Given the fact that the structure has been changed completely, clarification is required on how to install or position this correctly.

Solution:

The new type is a semi-automatic tensioning pulley which is installed centrally in place of the manual tensioner. Following installation of the timing belt, adjust the tension on the pulley on the front by turning it in the direction of the arrow using a hex key. Please note, the semi-circular dot marking must be correctly aligned with the bottom edge (1) of the recess.



New tensioning pulley design
Target tension (1)

CT 983 K1/K2

Ford 1.8 Diesel

Converting the tensioning pulley system

Problem:

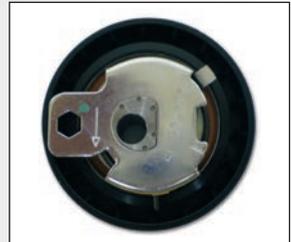
The tensioning pulley in the kit has a different technical design than the factory-fitted component.



Type to be replaced

Cause:

According to Ford, the new type of tensioning pulley has to be installed in all 1.8 diesel engines when the timing belt is due to be changed. Given the fact that the structure has been changed completely, clarification is required on how to install or position this correctly.



New tensioning pulley design

Solution:

The new type is a semi-automatic tensioning pulley which is installed centrally in place of the manual tensioner (50 Nm). Following installation of the timing belt, adjust the tension on the pulley on the front by turning it in the direction indicated by the embossed arrow using a hex key. Make sure that the recess is opposite the stop lug in approx. the 3 o'clock position. In some older types a few 1/10 mm must be filed off the cover in the area of the tensioning pulley.



Nominal tension

Replacing **CT 522 K4 with CT 522 K1** Renault Master, Trafic & Jeep Cherokee

Changing the tensioning pulley

Problem:

The tensioning pulley included in the kit for the type delivered is different to the one installed in the vehicle.



Type to be replaced

Cause:

According to the manufacturer, the new type of tensioning pulley has to be installed in all 2.1 diesel engines when the timing belt is due to be changed in accordance with kits referenced above. Given the fact that the structure has been changed, clarification is required on how to install or position this correctly.



New tensioning pulley design

Solution:

The new type is also a manual tensioning pulley which is installed in place of the previous tensioner. After the timing belt has been installed, the accompanying pulley is placed on the retaining plate and screwed on together. **The spring with sleeve is no longer used** (not depicted). The tension is then adjusted as per instructions in the past. (e.g.: BTT Hz: 104 Hz +/- 5)



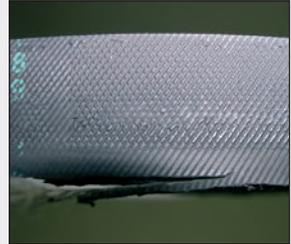
New tensioning pulley design

Replacing **6PK1748 with 5PK1750** Renault 1.4/1.6 16V with K4J/K4M AC system

Converting the V-ribbed belts

Problem:

The belt is very noisy, wears quickly and exhibits signs of abrasion. The tensile member and ribs can be torn out of the belt by edge contacts. This can lead to serious engine damage if the timing belt jumps off a pulley.



Cause:

The V-ribbed belt on older vehicles has six ribs (6PK1748). The new belt has only five ribs (5PK1750) to increase the distance from the ancillary units. According to Renault, this new belt should generally be installed.

Solution:

Position the 5-rib belt only on the outer grooves of all belt pulleys; the inside groove must remain free on all pulleys. In this connection, the generator's overrunning alternator pulley should also be checked to make sure that it is functioning perfectly and the hydraulic steering pump checked for axial play (misalignment). Before mounting the belt, remove any abrasion fines from the grooved pulley using a soft wire brush.



CT 984 K2 and CT 1015 K2

Audi, VW 2.5 TDI V6

Installation tip - tensioning system

Problem:

The tensioning lever chafes against the tensioning pulley. This can result in serious damage to the engine.



Chafing lever

Cause:

Due to improper positioning during installation, the tensioning lever comes into contact with the running surface after the parts have been in operation only briefly. By way of illustration, the side facing the engine is shown here (normally hidden).



Lever wrongly positioned

Solution:

Carefully check the position of the tensioning lever on the check stud. Only the lever contact surface shown here must be allowed to make contact with the catch. This ensures the running surface's freedom of movement.



Lever correctly positioned

Replacing **CT 975 K1 with CT 975 K3** Opel 1.6/1.8 16V

Changing the idler

Problem:

The idler pulley included in the kit for the type delivered is different to the one installed in the vehicle.



Pulley to be replaced

Cause:

According to the manufacturer, the new pulley with a plastic running surface (55373) must be installed when the belt is changed instead of the previous metal version (55333).

Solution:

The new pulley is now equipped with a pre-mounted bolt and can be fitted directly.



New idler roller

Replacing **CT 946 K2 with CT 1044 K1** Audi, VW, Seat, Škoda 1.9 TDI

(Common rail injection pump)

Problem:

The belt supplied with CT 1044 K1 is different in terms of appearance and number identification from the CT 946 belt installed so far.



CT 946

Cause:

The CT 1044 is reinforced with an additional fabric backing and can also be used for older TDI engines which were factory-fitted with the CT 946.



CT 1044 with fabric backing

Solution:

Kit CT 946 K2 is no longer available and has been replaced by CT 1044 K1. The engine number delimitation is therefore no longer applicable.

CT 941 K1

Mitsubishi 1.8 GDI, Volvo V40/S40 1.8

Overheating of idler

Problem:

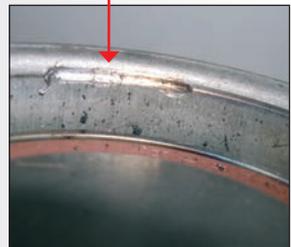
Shortly after the kit has been installed, the idler pulley fails due to degradation/overheating.



Failed idler

Cause:

Seizure of the tensioning pulley. This causes the belt to overheat and in turn to transmit this heat to the idler. As a result, the plastic cage of the bearing melts, causing the pulley to fail. The seizure of the tensioning pulley occurs when the roller rubs against the mounting support.



Tensioning pulley seized internally

Solution:

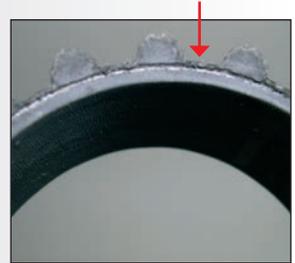
It is essential to clamp the tensioning pulley counterclockwise when an eccentric is used for tensioning. The pulley must be able to move freely on the mounting support. The tightening torque of 48 Nm on the fixing screw must be observed.

CT 817

Daihatsu Cuore, all years

Problem:

The belt is frayed on the sides and has the look of sloppy work.



Edges of the CT 817 (Fig. 1)

Cause:

The CT817's tensile member is Kevlar. For technical reasons, the edges appear as in Fig. 1 after being cut.



Conventional timing belt

Solution:

There is no cause for concern in using the belts.
No material flaw is involved here.

CT 881 K2 / K4

Ford 1.25/1.4/1.6 16V, various (from 04/1997)

Change in the tensioning pulley

Problem:

The tensioning pulley delivered in the kit is designed differently from the pulley previously installed in the vehicle (eccentric adjustment to pointer alignment using a hex key).



Previous pulley design

Cause:

According to the manufacturer, the new version must be installed instead of the previous one when belts are changed.



New design

Solution:

The new pulley is now equipped with a pre-mounted cotter pin and can be installed directly. After all components have been installed, simply remove the cotter pin and the tension is set automatically.

CT 1035 K1 / K2

Renault 1.5 dCi, Nissan 1.5 dCi, Suzuki 1.5 DDIS

Change in the tensioning pulley

Problem:

The tensioning pulley supplied in the kit is designed differently from the pulley previously installed in the vehicle.



Previous design

Cause:

There is an alternative design. This is supplied with the same screw and can be installed according to the vehicle manufacturer's specifications.



Alternative design

Solution:

Despite its different designs, the tensioning pulley can be used for all the vehicles specified in the catalog.



Comparison of base plates

CT 939 K1-5

Audi, VW 2.4/2.5 TDI 5-cyl

Oil-fouled tensioning pulley

Problem:

A cast part has broken off the tensioning pulley or the spring is broken. The tensioning pulley does not work, and the belt has jumped.

**Cause:**

The tensioning pulley is visibly contaminated by oil. The Teflon-coated friction pulley is designed to damp vibrations but ceases to work after coming into contact with oil.

**Solution:**

The oil contamination caused the failure of the pulley (excessive oscillation of the spring). Always check to ensure that the shaft sealing rings on the crankshaft/camshaft are functioning properly. If necessary, they must be replaced.

CT 1096 K1

Rover, MG, all 2.0/2.5 V6

Installation tip - tensioning pulley

Problem:

The tensioning pulley twists on the base frame during operation. During further operation, the running surface starts to contact the base frame and seizes. This can damage the engine.



Tensioning pulley

Cause:

You must ensure that the pulley is only pre-mounted on the base frame to 10 Nm.



Seized tensioning pulley

Solution:

After the belt has been installed and adjusted, the pulley must be definitively fixed by tightening the mounting bolt to 40-50 Nm.



CT 957 K1/K2

Audi, Seat, Škoda, VW 1.4/1.6 16V

Installation tip - tensioning pulley

Problem:

The timing belt has lost a great deal of its width, and has torn as a result.

**Cause:**

The timing belt has worn away at the side because the tensioning pulley was misaligned.

**Solution:**

When the tensioning pulley is installed, make sure that the arrester is latched properly in the core hole cover. Turn the adjustment eccentric counterclockwise to tighten the pulley. When the belt drive is rotated twice, be certain to check that the belt is aligned.



CT 939 K2/K3

Audi, VW 2.5 TDI 5 Zyl.

Washer (diamond-coated)

Problem:

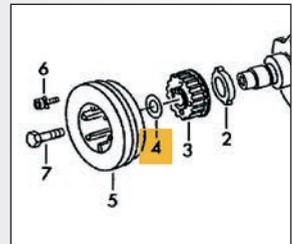
The timing belt kit contains a thin washer (diamond-coated) that was not previously installed in the vehicle.



Washer

Solution:

This special washer (4) must be fitted between the crankshaft drive pulley (3) and the torsional vibration damper (5). This increases the coefficient of friction.



Fitting position

CT 1038 K1, CT 1034 K1, CT 989 K1 & CT 731 K1

Citroën, Peugeot, Iveco, Fiat, Renault, Opel 2.5/2.8 D

Correct fitting of the tensioning pulley

Problem:

The tensioning pulley supplied with the kit breaks apart after a short period of operation, normally resulting in damage to the engine.



Disassembled bearing

Cause:

This is due to faulty alignment of the belt drive. The tensioning pulley is subjected to off-center loading and fails after a short running time.



Intact pulley

Solution:

To ensure correct belt alignment, it is vital that the tension pulley bracket is cleaned thoroughly, and that you subsequently check that the entire surface of the pulley is properly seated on the journal.



Journal of the tensioning pulley retaining plate

CT 1044 K1

Audi, VW, Seat, Škoda 1.9 TDI

Snapped-off idler

Problem:

The large idler snaps off following a short period of operation as a result of bearing seizure. This can lead to engine damage.



Large idler

Cause:

Because of insufficient tension, the back of the timing belt has become heated up on the two stabilizing rollers and transmitted heat to the large idler. Eventually it overheats and snaps off.



Stabilizing roller

Solution:

When adjusting timing belt tension, it is vital that the correct position of the marking on the tensioner pulley is checked again, even once the drive has been rotated several times. Care must be taken to make sure there is sufficient friction force at the small stabilizing rollers so that they are also driven without any slippage occurring.



Tensioning pulley

CT 1014 K3

Opel, GM 1.7 DTI, various (up to engine no. 328703)

Converting the tensioning system

Problem:

The new pulley does not fit into the slot for the old idler pulley. The engine support bracket is now positioned at a slant to the engine and can no longer be screwed onto it.



Old pulley from
CT 1014 K1

Cause:

According to "Opel TIS", the old, mechanical tensioning pulley from CT 1014 K1 can no longer be used. You must convert to the new type (as factory-fitted as of engine number 328704).



New tensioning pulley from
CT 1014 K3

Solution:

To mount the new pulley, an enclosed stay bolt has to be screwed in to the right of the injection pump pulley. This now serves as the catch for the modified pulley spring. The old engine support bracket must also be replaced with the likewise enclosed new type. This is necessary because with the new pulley there is no longer any base plate, which also previously served as a spacer plate for the engine support bracket. Tightening torque: 49 Nm.



Engine support bracket

CT 870 K1, CT 873 K1, CT 975 K3

Opel 1.4/1.6/1.8/2.0 16V

Installation tip - tensioning pulley

Problem:

The tensioning pulley makes noises after operating for a certain amount of time. In subsequent operation, the arrester can break and the belt loses its tension. As a rule, this results in damage to the engine!

Cause:

When cold, the pointer on the tensioning pulley no longer points to the mark and strikes the cold stop after each combustion cycle (hence the noise).



Pointer position too low

Solution:

Opel/GM specifies a special process for setting the tension when a timing belt is changed: When tensioning, turn the adjusting cam counterclockwise (to the left). Rotate the timing belt 2x by hand with fully tensioned tensioning pulley. Only after this has been done is the tension to be set by turning the cam to the right to the "new" mark. This must be done to ensure that the timing belt is properly seated in the pulley.



Full stop setting



Final setting

CT 887 K1

Daewoo, Chevrolet 1.4/1.5/1.6 16V

Installation tip - tensioning pulley

Problem:

The pointer on the tensioning pulley breaks off during installation and could severely damage the belt.



Snapped-off pointer

Cause:

There are two possible reasons for this:

1. Failure to loosen the water pump and to use it for adjusting the tension as described in the instructions.
2. During the specified two-fold rotation of the engine at increased tension (hole marking on the baseplate) the limit stop is subjected to excessive load and the movable pointer breaks off.



Damaged timing belt

Solution:

1. Make sure that the water pump is loosened, then turned using the corresponding tool (OE J-4249 2) and finally tightened again to 8 Nm.
2. The tongue of the pointer must be adjusted to ensure that it bears no load at any time. After turning the engine twice, both pointers must be perfectly aligned with one another.



Hole mark

CT 604 K1, CT 684 K1, CT 711 K1, CT 840 K1/K2, CT 935 K1/K2, CT 940 K1/K2, CT 949 K1

Renault, various Installation tip - tensioning pulley

Problem:

The tensioner blocked after a short period of operation.
The timing belt becomes hot and overheats the idler.



Overheated idler

Cause:

During tensioning pulley installation, the rotating axis was not fitted properly and/or the nut was not tightened sufficiently. This caused the pulley to twist under load and the running surface seized as a result of a bent retaining plate.



Seized tensioning pulley

Solution:

Ensure that the tensioning pulley is correctly installed on the mounting surface. The lug must be located in the recess of the retaining plate.

In addition, the specified tightening torque of 50 Nm must be observed during installation.

CT 1014 K2/K3/K5

Opel, GM 1.7 D, various

Change in the idler

Problem:

The idler in the kit is different from the one previously installed in vehicles.



Old idler pulley V 55317

Cause:

According to "Opel TIS" the old idler is no longer used. This is being changed to the new type with a large ball bearing without a flange.



New idler pulley V 55368

Solution:

Despite the changed design, the new type can be installed directly instead of the old steel idler.

CT 1045 K1

Renault 1.2 16V

Change in the tensioning pulley

Problem:

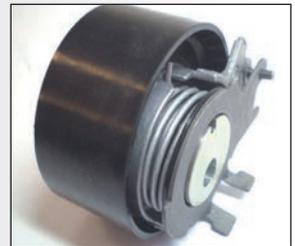
The running surface material of the tensioning pulley in the kit is different from that of the removed pulley.



Previous tensioning pulley

Cause:

The running surface of the tensioning pulley was changed by the manufacturer from sintered metal to plastic.



New tensioning pulley

Solution:

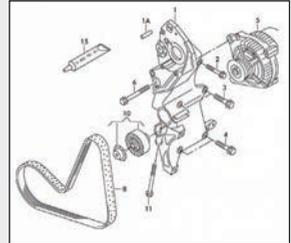
The new pulley can be used without limitations.

Replacing **6PK1140 ELAST** with **6PK1070** Audi, VW, Seat, Škoda 1.6 TDI & 2.0 TDI (Common Rail)

Converting the V-ribbed belt

Problem:

The 6PK1140 ELAST V-ribbed belt (OE no. 03L903137G) is being discontinued. The 6PK1070 replacement belt (OE no. 03L903137) cannot, however, be installed directly.



Belt drive

Cause:

During plant trials the modified design apparently contributed to improved running properties, and because of that the new design should now be used when the belt has to be replaced.

Solution:

The idler pulley (OE no. 03L145276) should be replaced with a tensioning element with roller (OE no. 038903315AH). Together with the new belt, the new tensioner is installed using a new M8x50 hexagon head screw (OE no. N10640801).



Tensioning element

CT 1079 K1

Opel, Renault, Saab 3.0 DTI V6

Idler failure as a result of overheating

Problem:

The belt fails due to overheating shortly after the kit is installed.



Overheated parts

Cause:

The idler pulley seizes due to improper installation! This results in overheating of the belt, which transmits heat to the other parts, in turn causing the belt drive to fail. The idler seizes if it is mounted with the wrong side of the pulley towards the mounting support.



Idler pulley mechanically seized (engine side up)

Solution:

The idler pulley between the camshafts must be installed with the raised inner flange towards the engine! If this is not done, the pulley is positioned incorrectly and will seize (see off-center signs of rubbing on the belt).

CT 1028 K2/K3/K4, CT 1051 K1/K2

VW, Audi, Seat, Škoda 1.9/2.0 TDI PD

Tensioning pulley breaks off after bolt snaps

Problem:

Belt drive failure soon after installation of the kit due to the tensioning pulley breaking off.



Broken-off tensioning pulley

Cause:

The tensioning pulley was unable to gain full supporting purchase on the engine. This resulted in the action of lateral forces on the stud bolt, which subsequently broke.



Stud bolt at transition (M10)

Solution:

The stud bolt must always be inserted as far as it will go into the engine so that the screwed-on contact surface of the tensioning pulley can be fully supported on the cylinder block without any additional loads being generated.



CT 908 K1

VW, Audi, Seat, Škoda 1.6/2.0 8V

Noise in belt drive

Problem:

Shortly after installation of the kit, noise comes from the cold engine (belt not aligning).

**Cause:**

The timing belt rubs up against the inside flange of the tensioner pulley, producing a squeaking sound.

**Solution:**

Before finally making the setting to the arrow marking, tension and relax the tensioner pulley five times. In addition, ensure that the tensioning pulley is fully and properly seated.



CT 1105 K1

Opel, Alfa Romeo, Fiat & Saab, 1.9 JTD

Idler failure as a result of overheating

Problem:

The belt drive fails as a result of the defective idler. The plastic running surface shows signs of overheating over its entire circumference (melting).



Defective idler

Cause:

The water pump is worn and seized. The back of the belt becomes overheated because of the resulting sliding friction. It then transfers this heat to the idler, and the running surface starts to melt and deform. This results in a loss of tension in the drive, causing the timing belt eventually to jump.



Overheated back of the timing belt

Solution:

The water pump should be inspected regularly to ensure that it is in perfect condition. The pump should always be replaced at the same time as the belt is replaced.



Seized water pump

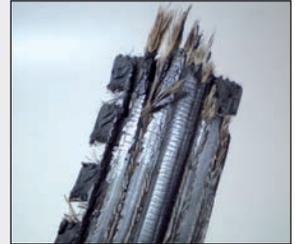
CT 942 K1

Hyundai 1.4 – 1.6 16V, various

Belt failure as a result of incorrectly fitted tension spring

Problem:

The belt drive fails due to a torn timing belt.



Torn belt

Cause:

The back of the timing belt became overheated because the tensioning pulley was prevented from turning freely.



Tensioning pulley

Solution:

The correct installation position of the tension spring must always be checked. Otherwise it may come into contact with the tensioning pulley running surface.



Contact between spring and running surface

CT 738 K1

Mitsubishi, 1.3/1.5 Motortyp 4 G, various

Pulley failure as a result of incorrectly fitted tension spring

Problem:

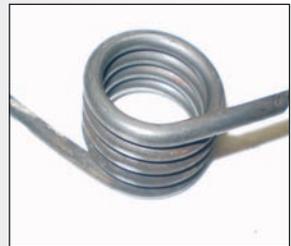
The belt drive fails because of a broken tensioning pulley.



Broken tensioning pulley

Cause:

The pulley has been split in the middle as a result of an unacceptable external action (spring contact).



Tension spring

Solution:

Always check that the tensioning spring has been positioned correctly. Otherwise, dangerous contact can occur with the tensioning pulley's running surface which is irretrievably damaged as a result.

CT 1092 K1 Peugeot, Citroën, Ford, Fiat, Mazda, Mini and Volvo 1.6 Diesel, 9H engines

Idler failure as a result of running surface seizure

Problem:

The belt drive fails due to the defective idler pulley. Part of the plastic running surface has been worn through.



Worn-through idler

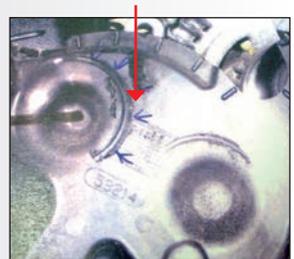
Cause:

The idler seizes due to inadmissible contact with the cover. The timing belt destroys the idler after a short period because of the belt sliding over it.



Solution:

Always make sure that the cover of the timing belt drive is positioned correctly and check for any potential distortion due to heat input. Long-term operation can be ensured only when the pulleys can rotate freely.



Timing belt cover

Replacing **CT 909 K5** with **CT 909 K10**

VW, Audi, Seat, Škoda 1.8 T/2.0

Converting the tensioning pulley system

Problem:

The components supplied in the timing belt kit do not match the components previously installed on the vehicle.



Version to be replaced

Cause:

A new tensioning system with a mechanical tensioning pulley is available for these vehicles. In this, the hydraulic tensioning damper with the small idler is replaced by a bracket for the idler.



New tensioning system

Solution:

After fitting the timing belt and the bracket (with the small idler), set the tensioning pulley to the mark by turning the eccentric clockwise. Check the setting after cranking the engine twice. Tighten the nut of the tensioning pulley to a torque of 23 +/- 3 Nm.



Tensioning pulley mark

CT 881 K3

Ford 1.25/1.4/1.6 16V

Crankshaft screws

Problem:

Crankshaft screws of two different lengths (29 and 44.5 mm) are supplied in the kit.



Crankshaft screw
M12 x 1.75 x 29

Cause:

A 44.5 mm long screw has been used with effect from production date 15.08.2005.



Crankshaft screw
M12 x 1.75 x 44,5

Solution:

To make doubly sure that the appropriate screw is used, you must determine the depth of the bore.

42 mm: 29 mm screw

52 mm: 44.5 mm screw

Both screws are tightened to a torque of 40 Nm + 90°.

CT 884 K1, CT 990 K1/K2

Opel, Saab 2.5/2.6/3.0/3.2 V6, various

Installation tip - idlers

Problem:

After a short period of operation the timing belt jumps because of a lack of tension.



Jumped timing belt

Cause:

The screw attaching the idler pulley to the plate has snapped and caused a sudden loss of tension.



Snapped-off idler

Solution:

The factory default setting of the idler with a prefitted screw may not be used. The screws of both idlers must be tightened to 40 Nm in accordance with the setup process specified by the manufacturer.

... comprehensive
information

... directly to
the product

... always absolutely
up-to-date

... no mountains
of paper and
no out-of-date
information

... simple and
easy access

... everything
at a glance



... free

... satisfied
customers



... product-specific
special features

"Find an explanation of PIC on YouTube too"

www.contitech.de/yt07en



... no registration required

... saves time

... article-specific

... attractive and clear

Installation Tips - Changing timing belts

For models: VW Scirocco, Golf V, VI, Plus, Jetta III, engine code: CBDB (From model year 2008)

Large numbers of the engine are installed in various VW models. When the timing belt is changed, serious mistakes are often made. To ensure that changing the belts goes smoothly, ContiTech Power Transmission Group is providing mechanics with detailed installation tips. Step by step, the ContiTech expert explains how to replace belts correctly.

VW recommends that the timing belt and tensioning pulley be replaced as follows:

- > Scirocco: 2009 and older: every 180,000 km
2010 and newer: every 210,000 km
Tensioning pulley:
2010 and newer every 210,000 km
- > Golf Plus: Timing belt every 180,000 km
- > Golf V: Timing belt every 180,000 km
- > Golf VI: Timing belt and tensioning pulley every 210,000 km
- > Jetta III: 2009 and older: every 180,000 km,
tensioning pulley every 360,000 km
2010 and newer: timing belt and
tensioning pulley every 210,000 km

Labor time:

2.20 hours for all engines

TIP:

When the timing belt is changed, the tensioning pulley, the idler pulley and the water pump should be replaced, too.

Special tools required:

1. Locking pin for camshaft (OE 3359)
2. Locking pin for high-pressure pump sprocket (OE 3359)
3. Arrestor (OE T 10172, OE T 10172/4)
4. Lock ring tool for crankshaft (OE T 10050)
5. Socket wrench (OE T 10264)
6. Locking pin (OE T 10265)

Safety notes:

Turn the engine in the direction of engine rotation **ONLY** on the crankshaft sprocket. The crankshaft and camshaft sprockets must never be rotated after the timing belt has been removed.

- > Do not use camshaft locking tool(s) as an arrester when loosening or tightening the camshaft sprocket.
- > When turning the camshaft, the crankshaft must not be positioned at top dead center (TDC).
- > The timing belt must not come in contact with oil or cooling water.
- > Only adjust the timing belt when the engine is cold.
- > Make a note of the radio code. Disconnect the battery's negative terminal.
- > We recommend that, once the timing belt has been removed, it should always be renewed and not re-used.

Tightening torques:

New self-locking nuts and bolts should always be fitted.

- > Bolt(s) on camshaft sprocket (7)
(see fig. 1)
Use new bolts.
Central bolt: 100 Nm
Sprocket bolts 20 Nm + 90°
- > Bolt(s) on high-pressure pump sprocket (8)
(see fig. 1)
Use new bolts.
29 Nm + 90°
- > Nut(s) on tensioning pulley (4)
(see fig. 2)
Use new bolts.
20 Nm + 45°
- > Center timing belt guard
Use new nut(s)
10 Nm
- > Lower timing belt guard
Use new bolt(s)
10 Nm
- > Bolt(s) on vibration damper
Use new bolt(s).
10 Nm + 90°
- > Idler
Bolt
Use new bolt(s)
50 Nm + 90°

Removal:

- > Remove engine cover
 - > Dismantle fuel filter
 - > Disconnect the plug on the coolant temperature sensor
 - > Open clip(s). Remove the upper timing belt guard
 - > Remove front right wheel-house liner
 - > Remove drive unit belt
 - > Remove vibration damper
 - > Remove the lower timing belt guard
 - > Remove the center timing belt guard
 - > Remove coolant pipe(s)
-
- > **Position the engine at TDC cylinder 1.**
Note the marking(s) (1) (2.2) (2.3)
(see figs. 1+2).
 - > **The geared segment on the camshaft timing belt sprocket must be at the top (1).**

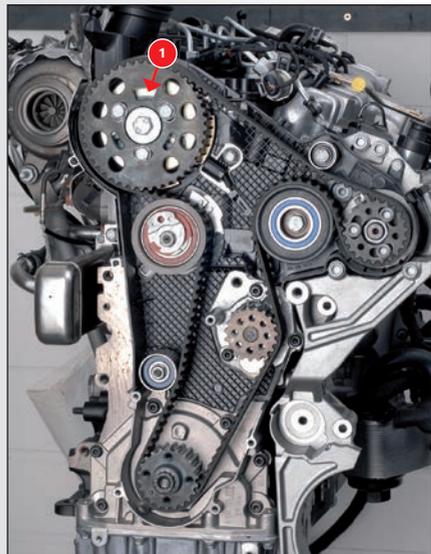


Fig. 1

- > Use lock ring tool for crankshaft OE (T 10050) (2.1).
- > Markings of crankshaft and lock ring tool for crankshaft must align (2.2 + 2.3) (fig. 2).

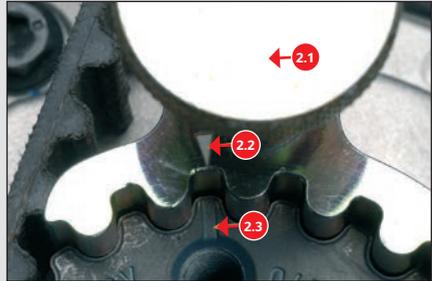


Fig. 2

- > Lock ring tool for crankshaft: Pins must be positioned flush in the bore holes.
- > Fit the locking pins (3.1 + 4.1), high-pressure pump sprocket and camshaft (figs 3 + 4).
- > Loosen the bolts on the high-pressure pump sprocket (3.2) (fig. 3).
- > Loosen the bolts on the camshaft sprocket (4.2) (fig. 4).
- > Use arrester.

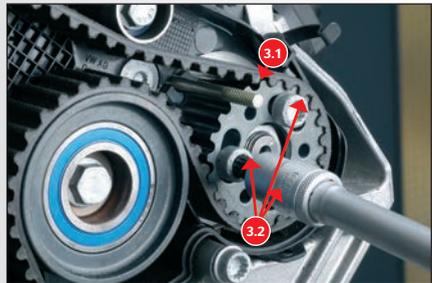


Fig. 3

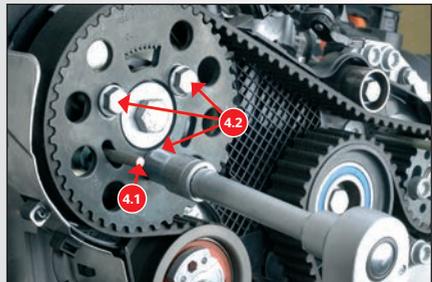


Fig. 4

- > Loosen the nut of the tensioning pulley (5.1/6.1).
- > Using the hex key, turn the eccentric (5.3/6.3) of the tensioning pulley counter-clockwise, until the tensioning pulley can be disconnected with the special tool (5.2).
- > Socket wrench OE (T 10264)
- > Locking pin OE (T 10265)

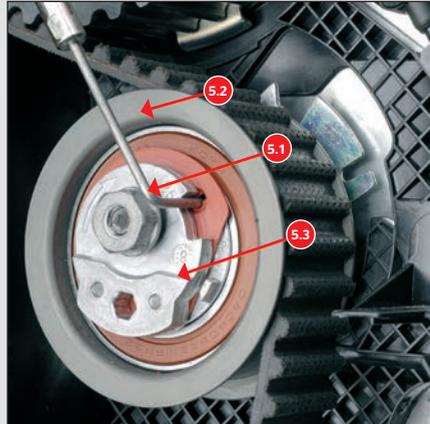


Fig. 5

- > Using the hex key, turn the tensioning pulley clockwise (maximum load stop) (6.3).
- > Tighten the nut of the tensioning pulley slightly (5.1/6.1).
- > Remove the timing belt from the idler first and then from the sprockets.

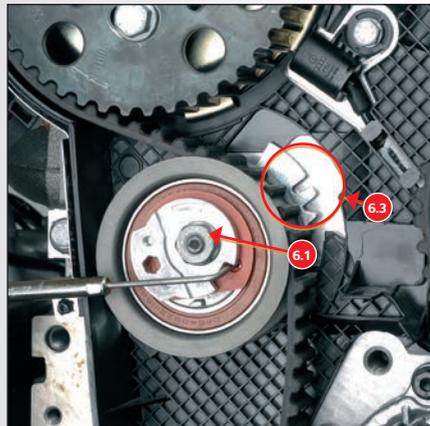


Fig. 6

- > Using the hex key, turn the tensioning pulley clockwise (in the direction of the arrow).
- > The pointer of the tensioning pulley must be flush with the recess in the base plate (8.1).

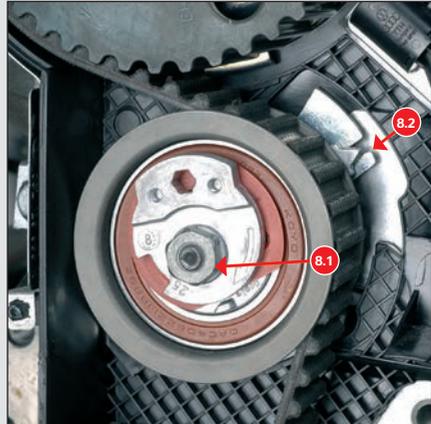


Fig. 8

- > The nut of the tensioning pulley must not turn while this is being done (8.2).
- > Tighten the nut of the tensioning pulley (8.2).
- > Brace the camshaft sprocket counterclockwise to maintain pretension (use the arrester).
- > Tighten the screw(s) on the camshaft sprocket (4.2) (fig. 4).
- > Tighten the screw(s) on the high-pressure pump sprocket (3.2) (fig. 3).
- > Remove locking pins on the high-pressure pump sprocket and on the camshaft sprocket (3.1 + 4.1) (figs. 3 + 4).
- > Remove crankshaft lock ring tool (fig. 2).
- > Rotate the crankshaft twice in the direction of engine rotation.
- > Position the crankshaft right before the TDC of the first cylinder.

- > Insert crankshaft lock ring tool (6.1) OE (T 10050).
- > Turn the crankshaft until the lock ring tool can be inserted.
- > The pin on the crankshaft lock ring tool must be directly in front of the bore hole of the sealing flange (6.1) (arrows). Turn the crankshaft until the lock ring tool can be inserted (*fig. 6*).
- > Check whether the camshaft can be locked with the lock ring tool. The pointer of the tensioning pulley must be flush with the recess in the base plate.
- > Tighten screw(s) on the camshaft sprocket.
- > Tighten screw(s) on the injection pump sprocket.

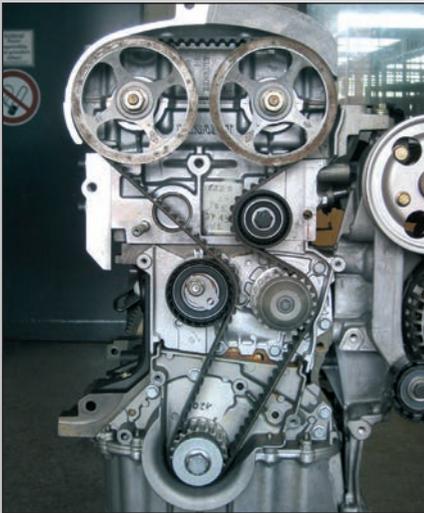
The rest of the installation procedure takes place as for the disassembly procedure but in the reverse order.

- > Mount the drive unit belt.
- > Decode the radio, program the volatile memory.
- > Start the engine and check for proper function.
- > Read error memory.
- > Carry out a test drive.
- > Document timing belt change.
- > 1 crankshaft lock ring tool.

Installation Tips - changing timing belts

As an example Renault Clio II 1.6 16V,
Engine code K4M 748

This engine, and its equivalents in different engine sizes, is installed in other Renault vehicles in large numbers and initially does not seem to raise any questions with regard to changing the timing belt under normal circumstances, even for mechanics unfamiliar with it. However, critical mistakes are made again and again here and have a negative effect on the belt drive. To ensure that changing the belt goes smoothly, we have provided mechanics with installation tips which are clear in our view.



Motorcode K4M 748

Change interval recommended by vehicle manufacturer:

- > For vehicles manufactured up to March 3, 1999: replace every 100,000 km or every 5 years
- > For vehicles manufactured from March 12, 1999: replace every 120,000 km or every 5 years (the tensioning pulley, guide pulleys and water pump should be replaced at the same time).

Labor time:

- > Clio: 2.70 hours
- > Mégane: 3.60 hours
- > Mégane Scénic: 3.90 hours
- > Laguna: 2.50 hours

Special tool:

- > Crankshaft locking pin, Renault tool code MOT1489
- > Camshaft alignment ruler, Renault tool code MOT1496

1. First identify the vehicle exactly using the engine code on the engine block. (fig. 1)



Fig. 1

2. Disconnect the vehicle battery.
3. Remove:
 - a. Drain cooling water
 - b. Support engine
 - c. Right engine mount
 - d. Ancillary unit drive belt (V-ribbed belt)
 - e. Plugs from rear end of camshafts. (fig. 2)



Fig 2

- f. Plug from cylinder block (fig. 3)



Fig 3

4. Turn the crankshaft to the right to the setting position. The grooves in the camshafts must be aligned.

Note:

The grooves are located below the top edge of the cylinder head. (fig. 4)

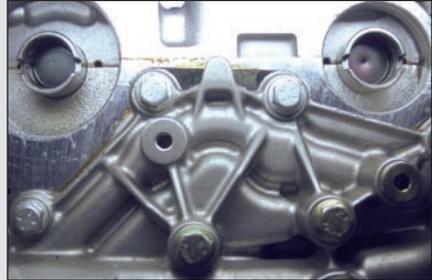


Fig. 4

5. Insert the locking pin into the cylinder block (tool code MOT1489).

Note:

The crank web must be up against the locking pin. (figs. 5/6)



Fig. 5



Fig. 6

6. Then apply the alignment ruler at the rear end of the camshafts (tool code MOT1496). (fig. 7)
7. Lock the flywheel using a large screwdriver or suitable tool and loosen the screw of the crankshaft pulley.

Note:

The flywheel must be securely locked so that the locking pin does not break or become bent, or that the camshaft ruler or the camshaft itself is not damaged when loosening the crankshaft screw.



Fig. 7

8. Remove:
 - g. Crankshaft pulley screw
 - h. Crankshaft pulley
 - i. Top and bottom timing belt covers
9. Loosen the nut of the tensioning pulley.

10. Have the belt push the tensioning pulley off. (fig. 8)
11. Remove and fit new:
 - > Tensioning pulley nut
 - > Tensioning pulley
 - > Guide pulley
 - > Timing belt
 - > Water pump

Note:

The crankshaft pulley must not slip off the crankshaft.



Fig. 8

Installation:

1. Check whether the locking pin is inserted. The crankshaft must be up against the locking pin.
2. The grooves in the camshafts must be aligned.
3. Also check whether the alignment ruler is correctly applied.
4. Then install the new water pump.

Note: Carefully clean the sealing surface between engine block and water pump and remove any remaining seal.

5. Install the new guide pulley and tighten to 45 Nm. (fig. 2)

Note: Pay attention to the tightness of the bolt that holds the tensioning pulley in the water pump housing.

6. Install the new tensioning pulley and tighten the nut to 7 Nm for the time being. (fig. 3)



Fig. 1



Fig. 2

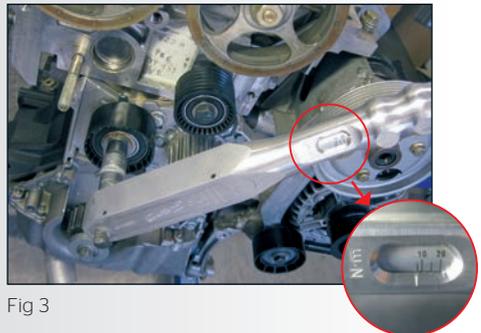


Fig 3

Note:

Pay attention to the tightness of the bolt that holds the tensioning pulley in the water pump housing.

7. Remove the crankshaft sprocket and gear. Degrease the end of the crankshaft. Reinstall the crankshaft sprocket.
8. Fit the timing belt going around towards the left starting from the crankshaft sprocket. Make sure that the timing belt is tight on the load side.
9. Degrease the crankshaft belt pulley.
10. Install the crankshaft belt pulley.
11. Measure the length of the screw of the crankshaft belt pulley. Maximum length: 49.1 mm. If longer: fit new screw.
12. Screw in the crankshaft belt pulley screw. New screw: do NOT oil.
13. Tighten the crankshaft belt pulley screw for the time being. Leave a gap of 2-3 mm between the contact surface of the screw and the crankshaft belt pulley.
14. Loosen the nut of the tensioning pulley. Turn tensioning pulley to the right until the movable pointer is at the right stop. Use a 6 mm hex key.

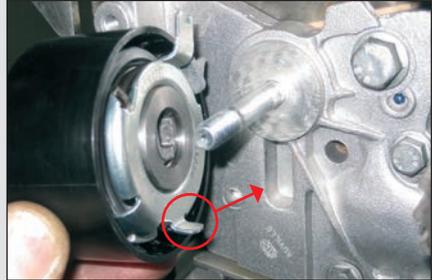


Fig 4

Note:

The movable pointer must be 7-8 mm behind the fixed pointer.

15. Tighten the tensioning pulley nut for the time being, tightening torque: 7 Nm.
16. Lock the flywheel with a large screwdriver and tighten the screw of the crankshaft belt pulley for the time being, tightening torque: 20 Nm.
17. Remove:
 - > Locking pin
 - > Alignment ruler
18. Lock the flywheel with a large screwdriver and tighten the screw of the crankshaft belt pulley by a further 120-150 degrees.
19. Turn the crankshaft two rotations to the right into the setting position. This is an extremely important step. If this is not done, the belt drive will start making noise in a short time due to insufficient tension.
20. Insert the locking pin into the cylinder block.
21. The crank web must be against the locking pin.
22. Check whether you can easily apply the camshaft alignment ruler.
23. Brace the tensioning pulley using a 6 mm hex key. Loosen the nut of the tensioning pulley.



Fig. 5

- 24. Turn the tensioning pulley to the left until the pointer is aligned with the notch.
(figs. 6/7)
- 25. Tighten the tensioning pulley nut, tightening torque: 27 Nm.
- 26. Remove the locking pin.
- 27. Turn the engine drive two more times, check the setting and adjust if necessary.
- 28. Screw in the cylinder block plug.
- 29. Insert new plugs at the end of the camshaft.
- 30. Install the components in reverse order of removal. Fill up the cooling water and vent the cooling system.



Fig 6

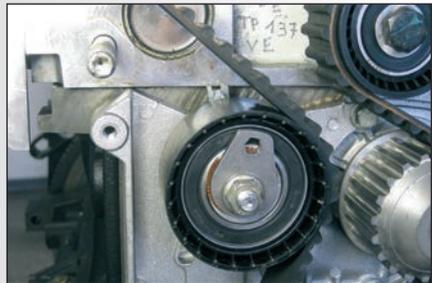
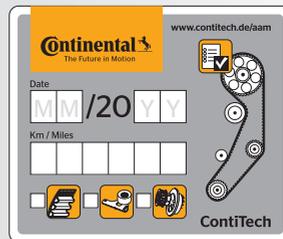


Fig. 7

- 31. Record the replacement of the original ContiTech timing belt on the supplied sticker and affix it in the engine compartment.
- 32. Test run the engine or take a test drive.



Installation Tips - changing timing belts

As an example

Opel 1.8i 16V C 18 XE

This engine, and its equivalents in different engine sizes, is installed in other Opel vehicles in large numbers and initially does not seem to raise any questions with regard to changing the timing belt under normal circumstances, even for mechanics unfamiliar with it. However, critical mistakes are often made with regard to adjusting the tensioning pulley. To ensure that changing the belt goes smoothly, we have provided mechanics with installation tips which are clear in our view.

Change interval recommended by vehicle manufacturer:

- > Replace every 60,000 km or every 4 years (the tensioning pulley, guide pulleys and water pump should be replaced at the same time).

Labor time:

- > Astra F - 1.8: 0.90 hours

Special tool:

- > Camshaft locking tool, e.g. Multi-Lock from the Tool Box.





Fig. 1

1. First identify the vehicle exactly using the engine code, which can be found on the outer edge of the transmission mounting flange on the engine block (fig. 2).
2. Disconnect the vehicle battery.
3. Remove:
 - a. Complete air filter
 - b. Air intake hose
 - c. C 18 XE/XEL: air mass sensor
 - d. Support engine
 - e. Right engine mount
 - f. Ancillary unit drive belt (V-ribbed belt)
 - g. Power-steering / air-conditioning compressor pump
 - h. Timing belt cover



Fig. 2



Fig 3

Removing timing belt

4. Turn the crankshaft to the right until the timing mark on the crankshaft pulley aligns with the tip on the engine block. (fig. 4)



Fig. 4

5. On camshaft sprockets with a single timing mark, make sure that the mark of the respective camshaft sprocket is aligned with the marks of the valve cover. On camshaft sprockets with two timing marks, check that the "INTAKE" and "EXHAUST" timing marks are aligned with the marks of the valve cover. (fig. 5)

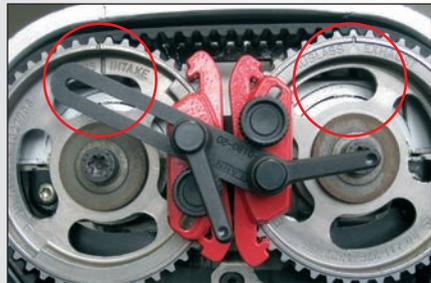


Fig. 5

6. Lock the camshaft with the locking tool.

Note:

If the timing belt is removed without locking the camshafts, the camshafts rotate and the engine timing is off. The timing belt can no longer be mounted properly. In such cases, the camshafts can only be positioned for fitting by using unprofessional methods. (fig. 6)



Fig. 6

7. Remove the crankshaft pulley.
8. Loosen the tensioning pulley screw.
9. Turn the tensioning pulley to the right until the pointer is at the left stop. Here, the tab attached with a hexagon socket screw must move clockwise downwards. Use a hex key here.
10. Remove the timing belt.
11. Drain cooling water and remove the tensioning pulley, idlers and the water pump.
12. Change the idlers and the water pump.



Fig. 7



Fig. 8

Note:

When installing the water pump, make sure that it is positioned correctly. The lug of the water pump must be located in the recess of the rear timing belt housing. (fig. 9)



Fig. 9

Installation of the timing belt:

13. Install the tensioning pulley. Make certain that the arrester on the back of the tensioning pulley (base plate of the tensioning pulley) is positioned between the contact surfaces on the engine block ... (fig. 10)



Fig. 10

... and not next to them.
(fig. 11)

14. Fit the new timing belt in the opposite direction to the direction of rotation, starting at the crankshaft sprocket.



Fig. 11

15. Turn the tensioning pulley with the adjusting cam to the left until the pointer is at the right stop. Here, the hexagon socket screw moves counterclockwise upwards. Use a hex key. Then tighten the new tensioning pulley slightly. (fig. 12)

Note:

This is an especially important step. If this is not done, the belt drive will start making noise in a short time due to insufficient tension. Now rotate the engine by hand in the running direction at least twice after removing the locking tool.



Fig. 12

16. Loosen the screw of the tensioning pulley and turn the tensioning pulley to the right (clockwise) until the pointer is aligned with the notch in the bracket. (fig. 13)



Fig. 13

- 17. Tighten the tensioning pulley screw to 20 Nm. (fig. 14)
- 18. Turn the engine drive two more times, check the setting and adjust if necessary.
- 19. Install the components in reverse order of removal. Fill up the cooling water and vent the cooling system.

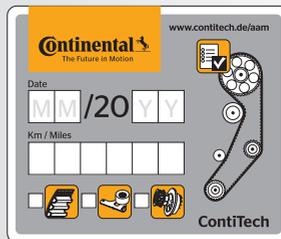


Fig. 14



Fig. 15

- 20. Record the replacement of the original ContiTech timing belt on the supplied sticker and affix it in the engine compartment.
- 21. Test run the engine or take a test drive.



Installation Tips - changing timing belts

As an example

Audi A4, A6, A8, VW Passat 2.8 30V

This engine is installed in large numbers in various Audi and VW models. Critical mistakes are often made when changing the timing belt. To ensure that changing the belt goes smoothly, the ContiTech Power Transmission Group is providing fitters with detailed installation tips. ContiTech experts explain step-by-step how to change belts correctly. Audi recommends changing the timing belt every 120,000 km and fitting a new tensioning pulley at the same time.

Note:

The tensioning pulley, tensioner, idler, water pump and thermostat should also be changed at the same time.

Special tools required (fig. 1):

1. Crankshaft locking tool no. 3242 (also in the TOOL BOX)
2. Camshaft locking tool no. 3391
3. Camshaft sprocket remover no. 3032
4. Supporting sleeves no. 3369

Labor time:

- > A4: 2.90 hours
- > A6 (up to 1997): 2.50 hours
- > A6 (from 1997): 3.50 hours
- > A8: 1.90 hours
- > Passat: 3.30 hours

Preparatory work:

- > Identify the vehicle using the engine code.
- > Disconnect the vehicle battery.
- > Do not turn the crankshaft and camshaft once the timing belt has been removed.
- > Remove spark plugs so that the engine can turn more easily.
- > Turn the engine in its normal direction (clockwise).
- > ONLY turn the engine at the crankshaft sprocket and not at other sprockets!
- > Observe all tightening torques.

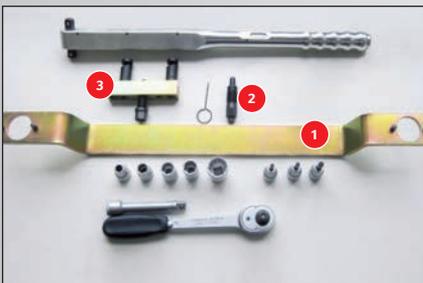


Fig. 1

Removal:

1. Jack up the vehicle at the front and support it.
2. A6 1997 and later/A4: move the radiator support panel to the service position:
 - > Remove the front bumper
 - > Remove the air intake hose between the front panel and the air filter
 - > Remove the screws in the front panel
 - > Attach the support sleeves no. 3369 in the front panel
 - > Push the front panel forward
 - > Insert the top back screws into the front holes to hold the panel



Fig. 2

3. Remove:
 - > Viscous fan (left-handed thread)
 - > Ancillary unit timing belt
 - > Left and right timing belt covers

4. Turn the crankshaft clockwise to TDC in the third cylinder. The timing marks have to match up. (*fig. 3*)



Fig. 3

5. The large holes on the mounting plates for the camshaft sprockets must be opposite each other. (*fig. 4*)
6. If this is not the case, turn the crankshaft to the right a further complete turn.

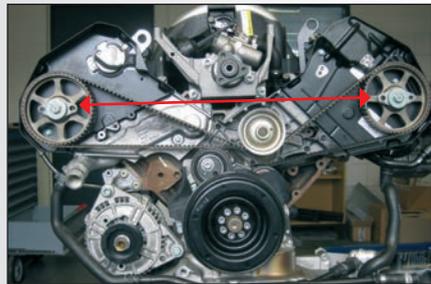


Fig. 4

7. Remove the plug from the crankcase (fig. 5) and screw in the crankshaft locking tool (no. 3242).



Fig. 5

Note:

The TDC bore in the crank web must be in line with the hole for the plug. (figs. 6/7)



Fig. 6



Fig. 7

- Turn the tensioning pulley to the right until the holes in the push rod line up with those in the tensioner casing. Use an 8 mm hex key. Hold the push rod by inserting a locking pin with a diameter of 2 mm through the hole in the tensioner casing. (fig. 8)



Fig 8

Note:

Always insert the hex key completely into the hex socket of the tensioning pulley to ensure that the power is transmitted over a large area when turning the tensioning pulley against the piston of the damper. If this is not the case, then the tension pulley eccentric may break or crack.



Fig 9

We recommend being patient when pushing the piston rod into the damper casing by turning the tensioning pulley. The piston takes some time to push out the oil in the damper.



Fig 10

9. Remove:
 - > The screws of the crankshaft belt pulley (not the crankshaft pulley screw!!)
 - > The crankshaft belt pulley
 - > The viscous fan mount

Note:

The two screws on the mount can be reached through the hole in the belt pulley (Audi).

- > Remove the lower timing belt cover
- > Remove the timing belt

When removing the tensioning pulley, remember to put the spacer back between the engine and the tensioning pulley.

(fig. 11)

Installation:

1. Remove the screw of the camshaft sprockets.
2. Screw an M10 screw into the camshaft as a counter bearing for the camshaft sprocket remover.
3. Loosen and remove both camshaft sprockets from their tapered end. Use the remover no. 3032.
4. Install:
 - > Mounting plates
 - > Screws
5. Slightly tighten the screws for the camshaft sprockets.
6. The camshaft sprockets must turn easily without tilting.



Fig. 11

7. Place the timing belt around the camshaft sprockets and the water pump belt pulley.
8. Fit the locking tool (no. 3391) on the camshafts.

9. The crankshaft locking tool must be fitted. (fig. 12)



Fig. 12

10. Place the timing belt around the guide roller, crankshaft sprocket and tensioning pulley. (fig. 13)
11. Slightly turn the tensioning pulley to the right. Use an 8 mm hex key for this. Remove the locking pin from the tensioner casing to release the push rod.
12. Apply the torque wrench to the hex socket of the tensioning pulley.
13. Tension the timing belt to 15 Nm by turning to the left.



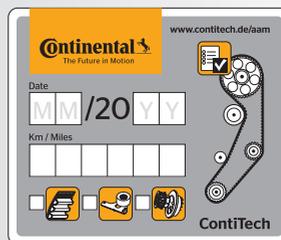
Fig. 13

14. Then remove the torque wrench.
15. Tighten the camshaft sprocket screw to 55 Nm.
16. Remove:
 - > Camshaft locking tool
 - > Crankshaft locking tool
17. Screw the plug in.
18. Fit the crankshaft belt pulley. The notches must be aligned to the nipple on the crankshaft sprocket (Audi).
19. Tighten the screws on the crankshaft belt pulley to 25 Nm (Audi 20 Nm).
20. Install the components in reverse order of removal.

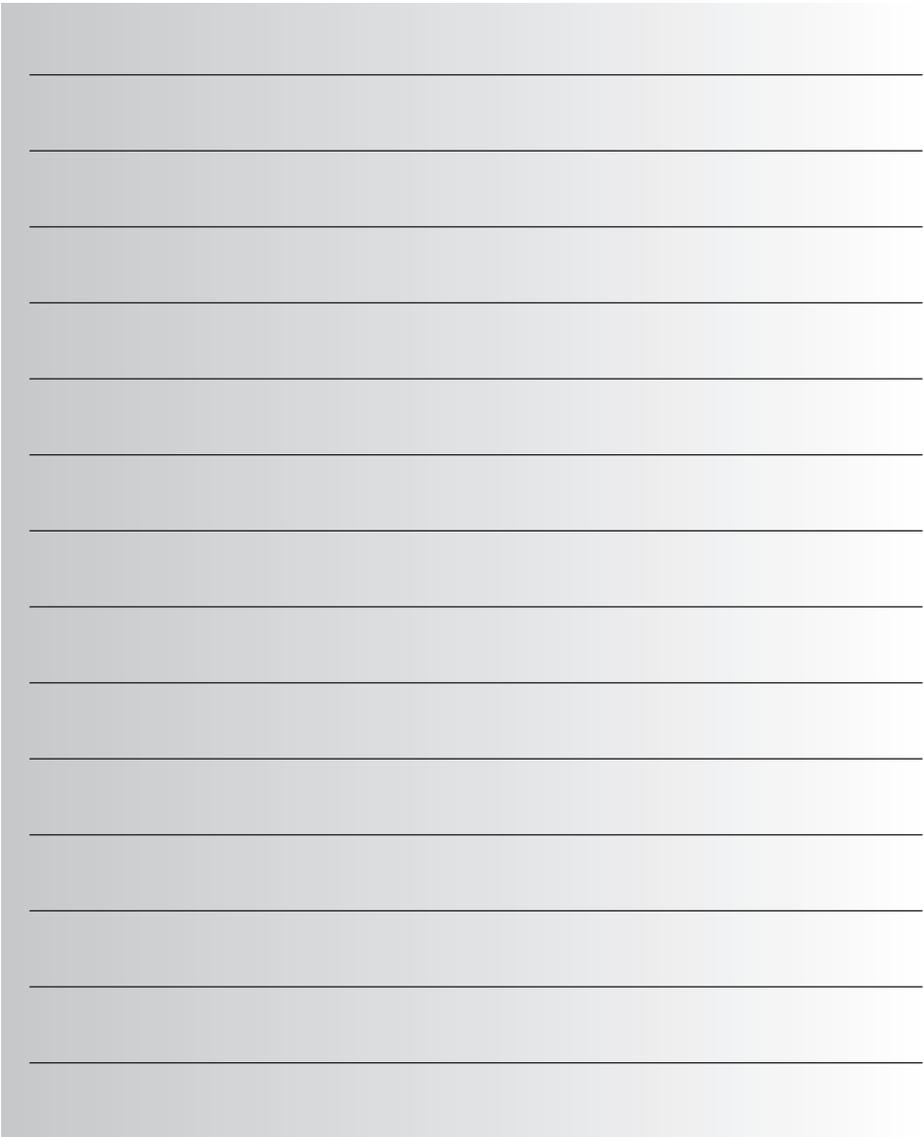


Fig. 14

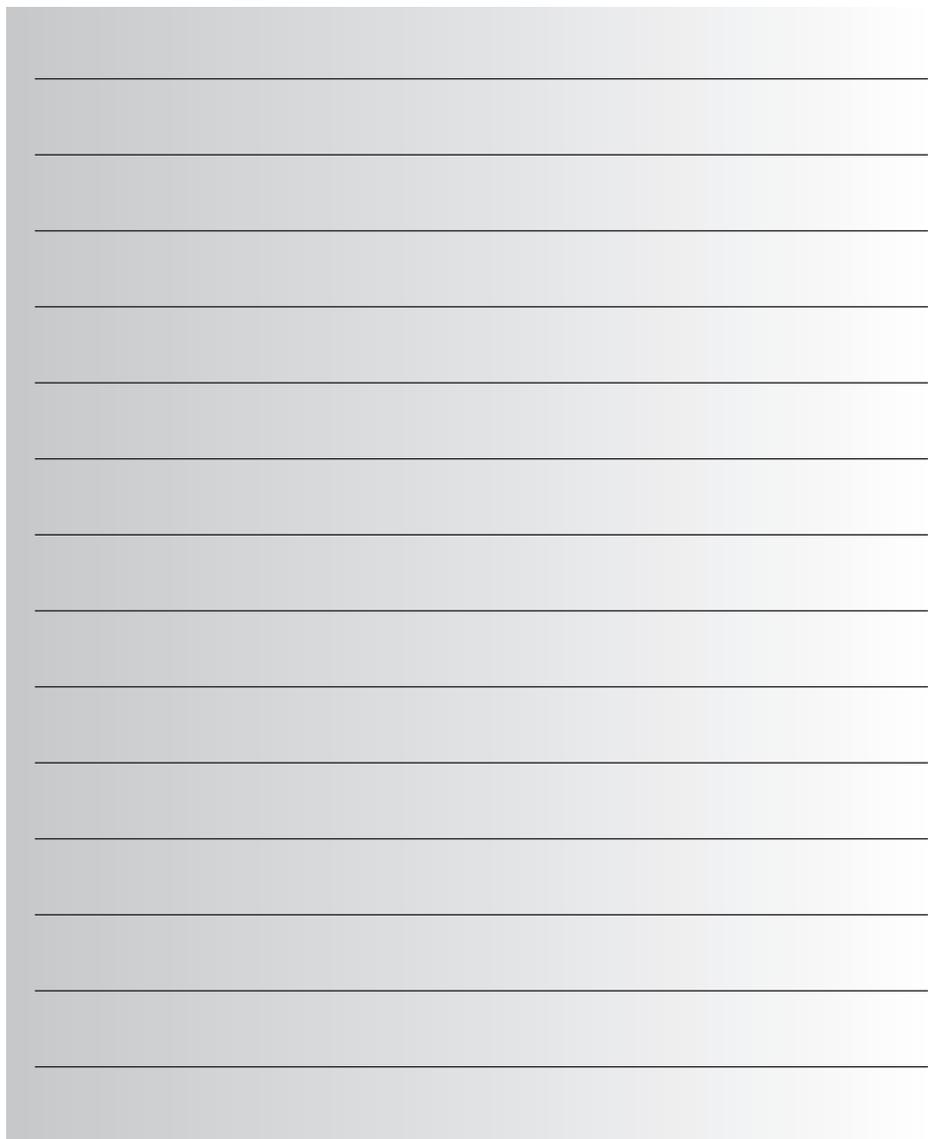
21. Record the replacement of the original ContiTech timing belt on the sticker provided and affix it in the engine compartment.
22. Test run the engine or take a test drive.



Notes



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ContiTech

Power Transmission Group

Market segment

Automotive Aftermarket

Contact

ContiTech Antriebssysteme GmbH
Hanover, Germany
Tech. Hotline +49 (0)511 938-5178
aam@ptg.contitech.de

Your local contact

www.contitech.de/contactlocator



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