

# HAZET-WERK

HÖCHSTE TECHNOLOGIE IN DER WERKZEUGFERTIGUNG SEIT 1868  
HIGHEST TECHNOLOGY IN TOOL MANUFACTURE SINCE 1868



## 3488/8



**Betriebsanleitung**  
**Werkzeug-Zusatzsortiment für Motoreinstellung an FORD**

**Operating Instructions**  
**Engine Timing Tool Supplement Set for FORD**

**Mode d'emploi**  
**Jeu additionnel d'outils pour le calage de distribution sur véhicules FORD**

**Instrucciones de uso**  
**Juego adicional de herramientas para el calado de distribución en vehículos FORD**

**Bedieningsinstructies**  
**Gebruiksaanwijzing aanvullend gereedschap-assortiment voor de motorafstelling van FORD**

**Instruzioni d'uso**  
**Assortimento addizionale di utensili per la messa in fase per FORD**

## FORD



**HAZET SET 3488/8**

**SUPPLEMENT SET TO HAZET 3488/17 FORD TIMING KIT:**

**FORD 1.4 & 1.6TDCi DIESEL ENGINES (TIMING BELT)**

<b>Models:</b>	<b>Engine Codes:</b>	<b>Use from HAZET 3488/8 Set Tools:</b>
FIESTA	F6JA, F6JB,	} HAZET 3788-21 HP Pump Locking Pin
FUSION	F6JC, G8DA,	
FOCUS	G8DB, HHDA,	
C-MAX	HHDB, HHJA, HHJB	
		Also required from HAZET 3488/17 Kit
		HAZET 3788-21 Crankshaft Locking Pin
		HAZET 3788-22 Flywheel Locking Pin
		HAZET 3788-23 Camshaft Locking Pin

**FORD 2.0TDCi DIESEL ENGINES (TIMING BELT)**

<b>Models:</b>	<b>Engine Codes:</b>	<b>Use from HAZET 3488/8 Set Tools:</b>
FOCUS	G6DA, G6DB,	} HAZET 3488-12 Flywheel Locking Pin
MONDEO	G6DC, AZBA,	
C-MAX	AZWA, QXBA,	
S-MAX	QXWA, QXWB	
GALAXY		
		HAZET 3488-16 Adaptor for HAZET 3488-5 Flywheel Locking Tool (HAZET 3488-5 from Kit HAZET 3488/17)
		Also required from HAZET 3488/17 Kit
		HAZET 3488-5 Flywheel Locking Tool
		HAZET 3788-23 Camshaft Locking Pin

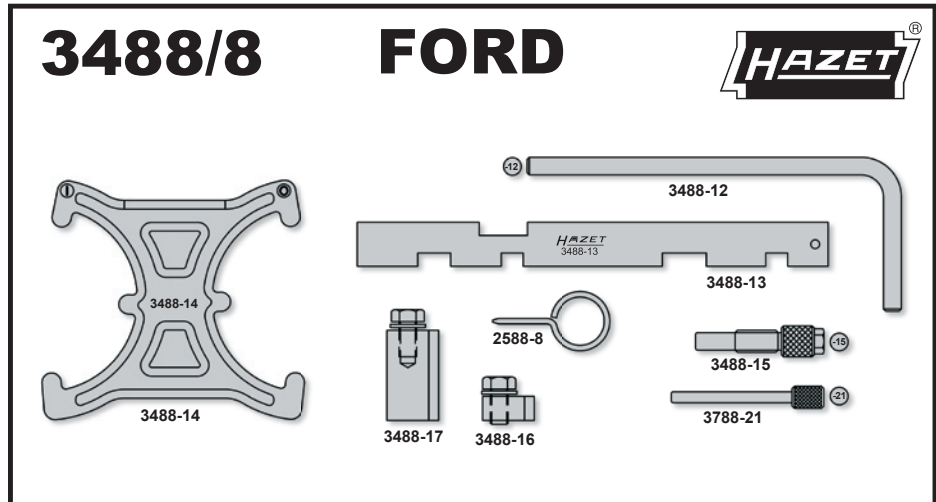
**FORD 1.25 / 1.4 & 1.6 16v. LATER PETROL ENGINES (TIMING BELT)**

<b>Models:</b>	<b>Engine Codes:</b>	<b>Use from HAZET 3488/8 Set Tools:</b>
FIESTA	F8JA, F8JB, FUJA,	} HAZET 3488-13 Camshaft Setting Plate
FUSION	FUJB, M7JA, M7JB,	
FOCUS	FXJA, FXJB, FXDA,	
C-MAX	FXDB, FXDC, FYDA,	
	FYDB, FYDC, HWDA, HWDB.	
		HAZET 3488-15 Crank Location Pin
		HAZET 2588-8 Tensioner Locking Pin

**FORD 1.6 Ti-VCT PETROL ENGINES (TIMING BELT)**

<b>Models:</b>	<b>Engine Codes:</b>	<b>Use from HAZET 3488/8 Set Tools:</b>
FOCUS	HXDA, PNDA,	} HAZET 3488-13 Camshaft Setting Plate
C-MAX	RHBA	
		HAZET 3488-14 Sprocket Locking Tool
		HAZET 3488-15 Crank Location Pin
		HAZET 3488-17 Adaptor for HAZET 3488-5 Flywheel Locking Tool (HAZET 3488-5 from Kit HAZET 3488/17).
		HAZET 2588-8 Tensioner Locking Pin
		Also required from HAZET 3488/17 Kit
		HAZET 3488-5 Flywheel Locking Tool.

## 1. Technical Information / Components of the Set



HAZET No.	Qty./Contents	Ford
2588-8	1 x	303-1054
3488-12	1 x	303-1059
3488-13	1 x	303-376B
3488-14	1 x	303-1097
3488-15	1 x	303-748
3488-16	1 x	303-393-01
3488-17	1 x	303-393-02
3788-21	1 x	303-732 (21-260)

## 2. Included

- HAZET 3488/8 Tool Set for Engine Timing **FORD**  
With soft foam insert.



Maintenance work on engines must be carried out only by experienced mechanics. Always wear personal protective equipment.

### 3. Prior to Operation



*Always ensure tools are used, inspected and maintained in compliance with the respective local, state, national or federal regulations.*

- Before starting to work, disconnect engine from power supply. Carefully read operating instructions for the engine and if necessary for the other equipment assemblies and devices (e.g. radio etc.)



#### ATTENTION

Ensure that the radio code is recorded.



#### CAUTION

Jacked up vehicles must be secured adequately



#### ATTENTION

Only use appropriate spare parts.

### 4. Operation

#### Timing Belt Replacement

Diesel / Petrol Engines on FORD vehicles

#### 4.1 FORD 1.4 & 1.6TDCi DIESEL ENGINES (TIMING BELT)

#### 4.2 FORD 2.0TDCi DIESEL ENGINES (TIMING BELT)

#### 4.3 FORD 1.25 / 1.4 & 1.6 16v. LATER PETROL ENGINES (TIMING BELT)

#### 4.4 FORD 1.6 Ti-VCT PETROL ENGINES (TIMING BELT)

#### 4.1 FORD 1.4 & 1.6TDCi DIESEL ENGINES (TIMING BELT)

Ford 1.4TDCi and 1.6TDCi diesels are also in Citroën / Peugeot models designated as HDi engines.

- The tool required from HAZET 3488/8 Set to cover these applications is:- HAZET 3788-21 HP Pump Locking Pin.
- In addition, the following tools will be required from HAZET 3488/17 FORD Timing Tool Kit:-  
HAZET 3788-21 Crankshaft Locking Pin  
HAZET 3788-22 Flywheel Locking Pin  
HAZET 3788-23 Camshaft Locking Pin

- Timing belt replacement on these engines now requires the use of 4 Locking Pins.
- The timing belt replacement procedures for these engines are as detailed in the HAZET 3488/17 Timing Tool Kit, EXCEPT that the PSA / Ford procedures now call for an additional Locking Pin (as per HAZET 3788-21 Pin) specifically for 'locking' the position of the High Pressure fuel pump during timing belt replacement.
- Originally, only one Locking Pin was provided to cover both crankshaft and HP pump, but as the crankshaft, camshaft and HP pump must be locked at the same time, the additional HAZET 3788-21 Locking Pin is required, and is therefore included in HAZET 3488/8 Set.
- One of the HAZET 3788-21 Locking Pins is used to lock the crankshaft and the other one locks the fuel pump sprocket. Check the fuel pump alignment, ensuring via the hole in the pump sprocket aligns with the corresponding hole in the pump bracket. Align by positioning the holes in the sprocket vertically.

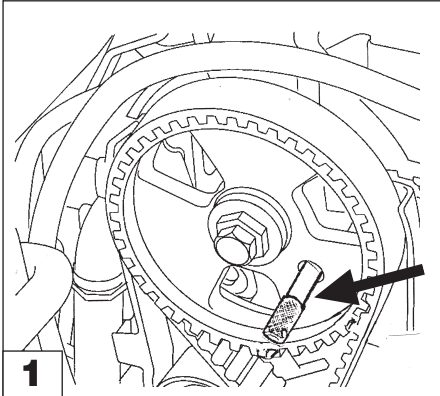
#### 4.2 FORD 2.0TDCi DIESEL ENGINES (TIMING BELT)

- Introduced 2003 in the Focus C-Max following an engine development joint venture with PSA (Citroën/Peugeot), these second generation common rail diesels have a camshaft timing belt (unlike the earlier Ford 2.0/2.2/2.4 diesels in Mondeo / Transit which are Chain Drive).
- The tools required from HAZET 3488/8 Set to cover these applications are:-  
HAZET 3488-12 Flywheel Locking Pin  
HAZET 3488-16 Adaptor for HAZET 3488-5 Flywheel Locking Tool
- In addition, the following Tools will be required from the HAZET 3488/17 FORD Timing Tool Kit:-  
HAZET 3788-23 Camshaft Locking Pin  
HAZET 3488-5 Flywheel Locking Tool
- It is necessary to dismantle major components for this belt replacement application including removal of the auxiliary belt, starter motor and coolant expansion tank.



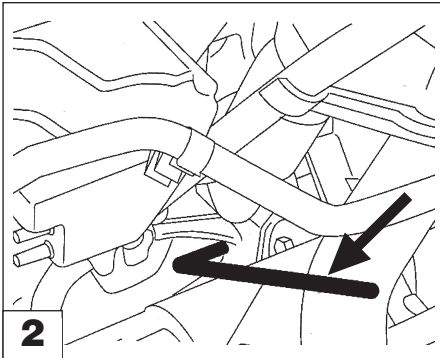
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- Removal of the upper timing belt cover is straightforward but the crankshaft pulley and CKP sensor will need to be removed prior to removing the lower belt cover.
- **NOTE:** The crankshaft must only be turned in the direction of normal rotation.



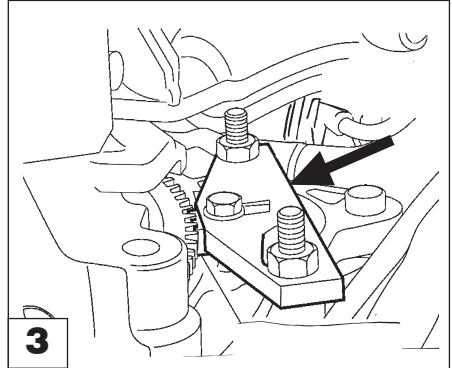
**HAZET 3788-23 Camshaft Locking Pin**

- Turn the crankshaft until the timing hole in the camshaft sprocket aligns with the datum hole – in the 4-o-clock position.
- Insert HAZET 3788-23 Camshaft Locking Pin.



**HAZET 3488-12 Flywheel Locking Pin**

- Insert HAZET 3488-12 Locking Pin in to the flywheel to 'set' the crankshaft position prior to 'locking' in place with the Flywheel Locking Tool.



**HAZET 3488-5 Flywheel Locking Tool and HAZET 3488-16 Adaptor**

- The Flywheel Locking Tool configuration for the 2.0TDCi engine is obtained by using the Main Plate from HAZET 3488-5 Locking Tool and replacing its existing Adaptor with the HAZET 3488-16 Adaptor, attaching it to the Main Plate.
- Ensure that the Flywheel Locking Tool Assembly is firmly bolted in position, in the location where the starter motor is normally fitted and that the Adaptor locates on to the flywheel through the starter motor aperture. Adjust the Adaptor to 'lock' in to the teeth of the flywheel before firmly bolting it in place to retain the crankshaft in a fixed position.
- Release and remove the crankshaft pulley bolt (do not discard bolt at this stage).
- Remove the crankshaft pulley.



**CAUTION: DO NOT touch the outer sensor ring.**

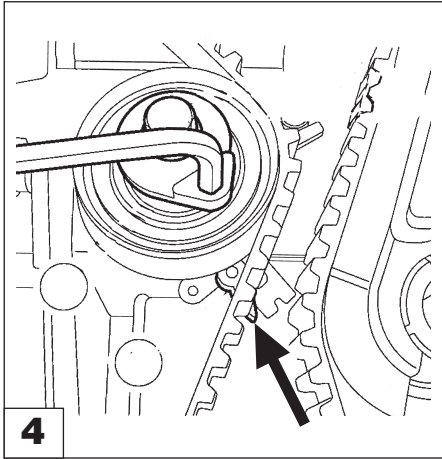
- Remove the tensioner pulley and the old timing belt – **DO NOT** re-fit a used belt.



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### Installing a new timing belt

- Install the new belt with the directional arrows in the direction of crankshaft rotation.
- Fit a new tensioner pulley with its retaining bolt screwed in finger-tight only.



- Use an allen key to turn the tensioner anti-clockwise to apply tension to the belt.
- Check that the tensioner pointer is positioned on the left-side of the tensioner window, and tighten the pulley retaining bolt.
- Prepare to re-fit the crankshaft pulley.



**CAUTION: DO NOT touch the outer sensor ring.**

- Use the old pulley centre bolt to install the crankshaft pulley, tighten the bolt to 50Nm.
- Remove the HAZET 3488-12 Flywheel Locking Pin and HAZET 3788-23 Camshaft Locking Pin.
- Remove the Flywheel Locking Tool.
- Turn the crankshaft **4 times**, by hand, in the normal direction of rotation.
- Align the timing and datum holes for the camshaft sprocket and insert HAZET 3788-23 Locking Pin.
- Insert the HAZET 3488-12 Flywheel Locking Pin and the Flywheel Locking Tool.

- Release and remove the crankshaft pulley bolt and discard.
- Remove the crankshaft pulley.

### Final Tension Position

- Use an allen key on the tensioner to maintain tension on the timing belt whilst slackening the tensioner retaining bolt and **positioning the tensioner pointer CENTRALLY** within the window of the tensioner.
- Tighten the tensioner bolt.
- Install the crankshaft pulley with a new centre bolt and tighten in 2 stages – 70Nm. + 62 degrees.
- Remove all tools.

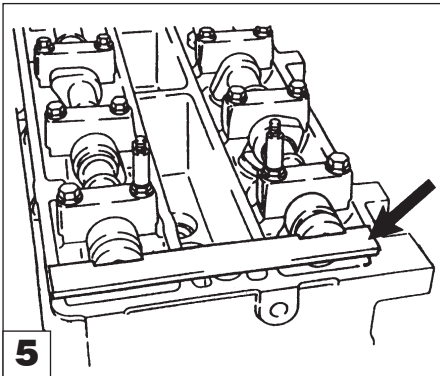
### 4.3 FORD 1.25 / 1.4 & 1.6 16v. LATER PETROL ENGINES (TIMING BELT)

- For timing belt replacement applications on the **later** 1.25, 1.4 and 1.6 16v. Twin Camshaft Petrol engines specifically detailed on the “Applications” page, FORD instructions introduced a new Crankshaft Location Pin, Tensioner Locking Pin and also utilised the later Camshaft Setting Plate used on the FORD 1.6Ti-VCT engines
- The tools required from HAZET 3488/8 Set to cover these applications are:-  
HAZET 3488-13 Camshaft Setting Plate  
HAZET 3488-15 Crankshaft Location Pin  
HAZET 2588-8 Tensioner Locking Pin
- On Ford timing belt replacement applications it is necessary to remove the crankshaft pulley in order to remove the timing belt.



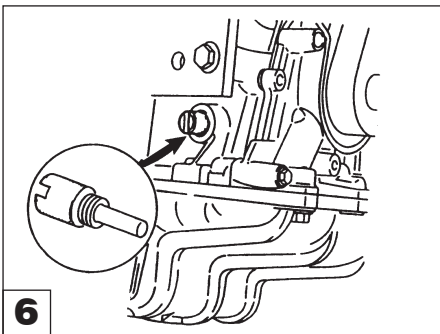
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### Engine timing – General Guide



#### HAZET 3488-13 Camshaft Setting Plate

- On the later 1.25, 1.4 and 1.6 Ford 16v. twin camshaft engines (Duratec) as detailed on the "Applications" page, HAZET 3488-13 Setting Plate is used to lock the camshafts in the correct timing position via slots located at the rear of the camshafts.
- For these timing applications it is important to ensure that the crankshaft is at TDC using HAZET 3488-15 and that HAZET 3488-13 Setting Plate is in position at the rear of the camshafts.



#### HAZET 3488-15 Crankshaft Location Pin

- Ford replaced the HAZET 3488-10 Pin with HAZET 3488-15 for these LATER small size engines and also used it to counter-hold the crankshaft during the **TIGHTENING ONLY** (NOT removal) of the crankshaft pulley bolt.

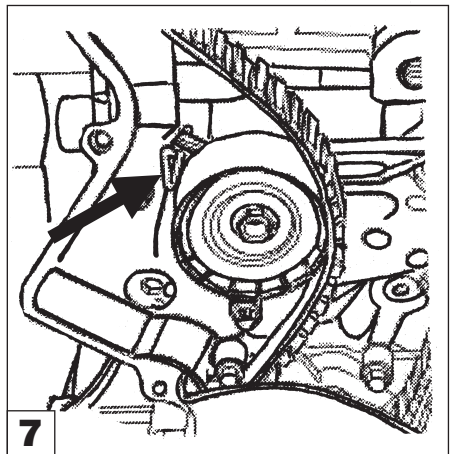
- For all applications, use the HAZET 3488-15 Location Pin to ensure the crankshaft is at TDC. Remove the engine/crankshaft blanking plug to allow the Location Pin to be screwed into position and then **carefully** rotate the crankshaft until the web **rests** against the pin.



#### CAUTION: HAZET 3488-15

Location Pin is used to position the crankshaft only. It **MUST NOT** be used to counter-hold the crankshaft whilst **RELEASING** the crankshaft pulley bolt.

- For these timing belt replacement applications, once the HAZET 3488-13 Plate and HAZET 3488-15 Pin are in position, the tensioner can then be slackened/compressed and the timing belt removed.

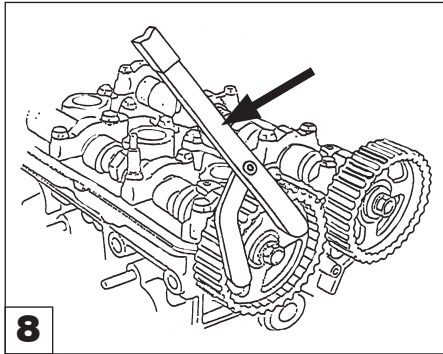


#### HAZET 2588-8 Belt Tensioner Locking Pin

- These **later** 1.25, 1.4 and 1.6 engines can have a timing belt tensioner which must be 'locked back' away from the belt to release tension off the timing belt during removal.
- HAZET 2588-8 Locking Pin is inserted in to the tensioner to maintain tension off the belt.
- Once a new belt is fitted the HAZET 2588-8 Pin is pulled out allowing the tensioner to react on the belt and apply tension.



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- For these timing belt replacement applications, the camshaft sprockets must be free to turn on the camshafts when installing and tensioning the new belt. The HAZET 3488-13 Setting Plate **MUST BE** 'locking' the camshafts in position before the camshaft sprockets can be loosened. Use a suitable Sprocket Holding Tool to counter-hold the camshaft sprockets whilst releasing the centre bolt. Some camshafts provide a hexagon to locate a spanner to counter-hold the camshaft.
- When a new timing belt is installed, the tensioner should be applied following the manufacturer's procedure. Then, using a suitable Holding Tool, counter-hold the camshaft sprockets whilst tightening the centre bolts.
- Remove Setting Plate and TDC Location Pin.
- Rotate the engine a least two revolutions and return to TDC position inserting the Crankshaft Location Pin. Re-check the camshaft position by ensuring that HAZET 3488-13 Setting Plate can be easily inserted into the slots in the camshaft. If not, re-check belt tensioning procedure again.

#### 4.4 FORD 1.6 Ti-VCT PETROL ENGINES (TIMING BELT)

- The tools required from HAZET 3488/8 Set to cover this application are:-  
HAZET 3488-13 Camshaft Setting Plate  
HAZET 3488-14 VCT Setting Plate  
HAZET 3488-15 Crankshaft Location Pin  
HAZET 3488-17 Adaptor for HAZET 3488-5 Flywheel Locking Tool  
HAZET 2588-8 Tensioner Locking Pin
- In addition to timing belt replacement, these tools also cover VCT timing adjustment.
- The Ford 1.6 16v. Ti VCT Duratec (Sigma) petrol engine was first introduced in the Ford Focus in 2004. The engine has variable camshaft timing (VCT) on both the inlet and exhaust camshafts.

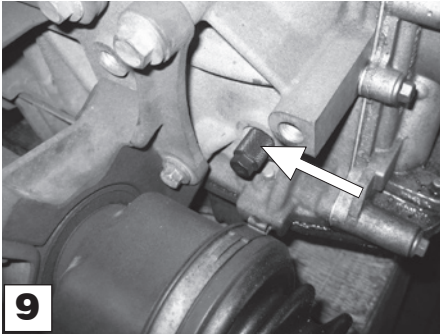
#### Timing Belt Replacement

- Raise and support the front of the vehicle in order to remove the Right-Hand front road wheel.
- Remove the air filter housing/assembly, PAS reservoir (do not disconnect) and auxiliary belt.
- Remove the alternator and starter motor. Detach the coolant expansion tank (do not disconnect), and position to one side.
- Remove the coolant pump pulley and upper timing belt cover.
- Turn the crankshaft until the timing marks on the VCT Units are in the **11-o-clock** position (crankshaft is now just before TDC No.1 cylinder).
- **NOTE:** The crankshaft must only be turned in the direction of normal rotation.



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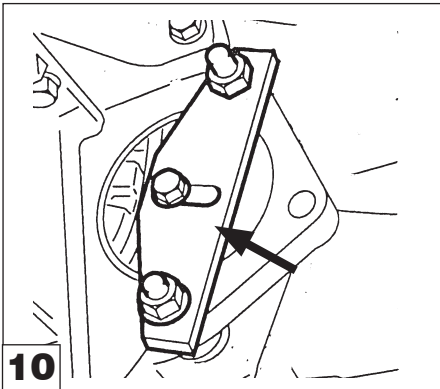




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#### HAZET 3488-15 Crankshaft TDC Location Pin

- Remove the blanking plug in the engine block, in order to insert the HAZET 3488-15 Crankshaft Location Pin.
- Carefully and slowly, turn the crankshaft clockwise to **rest fully** on the HAZET 3488-15 Location Pin.



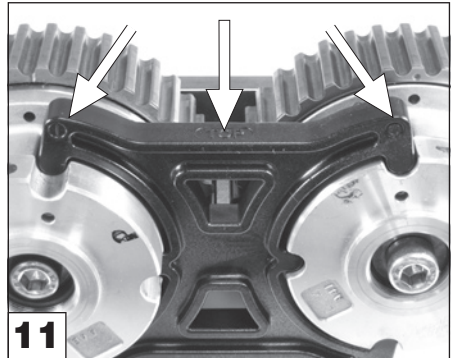
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- Ensure the crankshaft web is fully resting on the HAZET 3488-15 Location Pin and 'lock' the flywheel by installing the Flywheel Locking Tool at the starter motor position.

#### HAZET 3488-5 Flywheel Locking Tool and HAZET 3488-17 Adaptor

- The Flywheel Locking Tool configuration for the 1.6Ti-VCT engine is obtained by using the Main Plate from HAZET 3488-5 Locking Tool and replacing its existing Adaptor with the HAZET 3488-17 Adaptor, attaching it to the Main Plate.

- Ensure that the Flywheel Locking Tool Assembly is firmly bolted in position, in the location where the starter motor is normally fitted and that the Adaptor locates on to the flywheel through the starter motor aperture. Adjust the Adaptor to 'lock' in to the teeth of the flywheel before firmly bolting it in place to retain the crankshaft in a fixed position.
- The camshaft timing marks should be at **12-o'clock** position. The marks are located on front of the sprocket teeth – "I" on the Left-Hand sprocket and "." on the Right-Hand sprocket.
- Remove the crankshaft pulley and discard its centre bolt. Remove the lower belt cover.
- Support the engine and remove the front engine mounting bracket after marking its installed position.



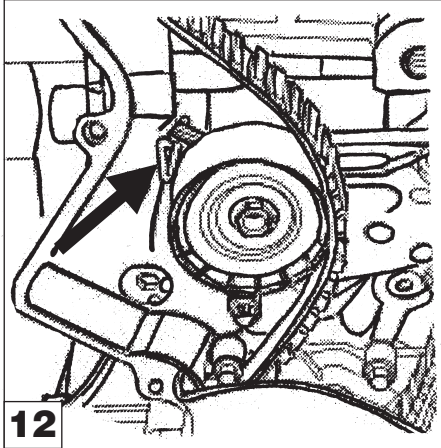
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#### HAZET 3488-14 VCT Setting Plate

- Fit HAZET 3488-14 VCT Setting Plate onto the VCT Units. The word "**TOP**" should be visible on top of the Setting Plate. The "Scribe Mark I" should be on the Left-Hand arm of the Setting Plate, with the "Zero (Dot) Mark 0" on the Right-Hand arm of the Plate, **matching the timing marks on the camshaft sprockets.**



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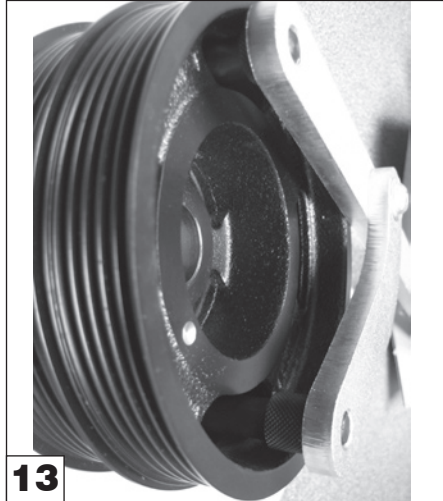


**HAZET 2588-8 Tensioner Locking Pin**

- Apply pressure to the timing belt to activate the tensioner pulley and allow the insertion of Locking Pin HAZET 2588-8
- Remove the old timing belt and discard it.

#### Installing new timing belt

- Check that the VCT Setting Plate, Crankshaft Location Pin and Flywheel Locking Tool are correctly fitted.
- Install the new timing belt in a **clockwise** direction, starting at the VCT Units/camshaft sprocket, then the crankshaft gear. Ensure the belt is taut between sprockets.
- Once the belt is fully fitted, remove the HAZET 2588-8 Tensioner Locking Pin to release tension on to the belt.
- Measure the depth of the bore in the crankshaft to determine the correct new crankshaft pulley centre bolt to use.
- If bore depth is 42mm. – use M12 x 29mm. bolt
- If bore depth is 52mm. – use M12 x 44.5mm. bolt
- Install the lower belt cover.

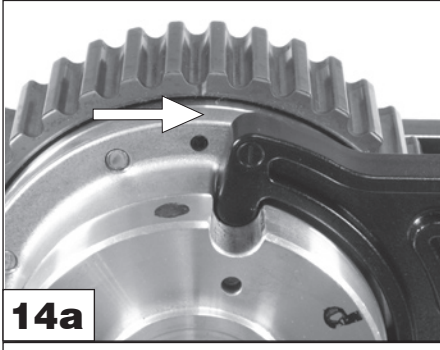


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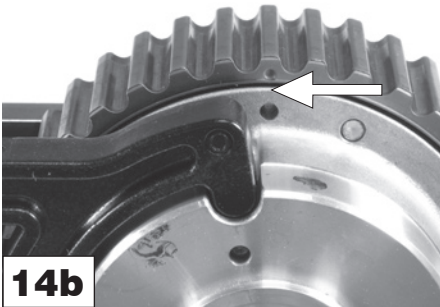
- Install the crankshaft pulley, and counter-hold the pulley with a suitable Holding Tool, whilst tightening centre bolt, in two stages, 45Nm. + 90 degrees.
- **NOTE:** The Crankshaft gear does not have a keyway
- Remove the VCT Setting Plate, Crankshaft Location Pin and Flywheel Locking Tool.
- Turn the crankshaft carefully, by hand, 2 turns in the direction of normal rotation, and return to the position where the marks on the VCT Units are at **11-o'clock**.
- Insert HAZET 3488-15 Crankshaft Location Pin and carefully turn the crankshaft to **rest fully** on the Location Pin.



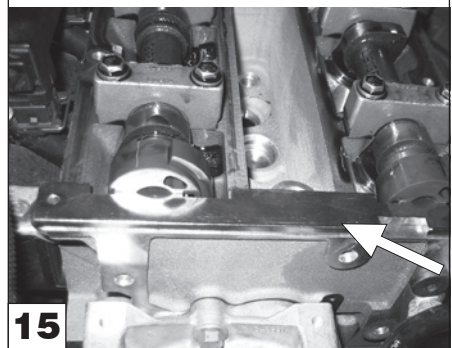
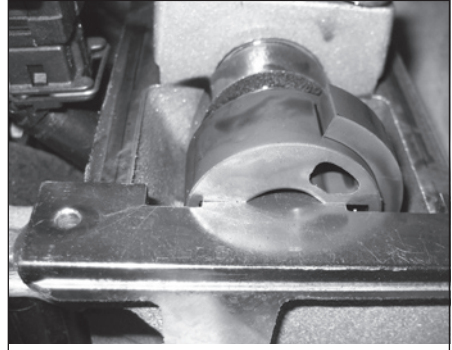
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14a



14b



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- Fit HAZET 3488-14 VCT Setting Plate on to the VCT Units and check that the timing marks on the **VCT Units** and **camshaft sprockets** align and are near to the outer edges of the VCT Setting Plate upper arms.
- If the timing marks do not align, repeat the belt installation and tensioning procedures.

#### Timing Adjustment -

#### Setting the VCT Units (Cylinder head/ Camshaft replacement applications)

- When carrying out work on cylinder head / camshaft replacement or valve timing adjustment it will be necessary to re-set the VCT / camshafts.
- When removing the VCT Units, counter-hold the camshafts, with a spanner, at the hexagons provided on the camshafts. Remove the centre blanking plugs of the VCT Units, and unscrew and remove the centre retaining bolts.

#### HAZET 3488-13 Camshaft Setting Plate

- When installing the VCT Units, the crankshaft is positioned at TDC No.1 cylinder and HAZET 3488-13 Camshaft Setting Plate is inserted into the slots located at the rear of the camshafts to position and 'lock' the camshafts in their 'timed' position.
- The VCT Units are placed onto the camshafts and the new centre retaining bolts are inserted and screwed to finger-tight only.
- The timing mark of each of the VCT Units should be positioned at the **12-o'clock** position.
- HAZET 3488-14 VCT Setting Plate is inserted onto the VCT Units and the centre bolts tightened to 25Nm.
- Remove HAZET 3488-14 VCT Setting Plate and HAZET 3488-13 Camshaft Setting Plate.



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- Counter-hold the camshafts, with a spanner, at the hexagons provided on the camshafts and carry out the final tightening procedure – tightening the VCT centre retaining bolts 75 degrees.



**CAUTION: DO NOT use HAZET 3488-14 and HAZET 3488-13 Setting Plates to counter-hold camshafts /VCT Units during final tightening procedure of the VCT Unitsretaining bolts.**

- Insert HAZET 3488-14 VCT Setting Plate to check that the timing position is correct and that the timing marks on the sprockets align with the marks on the VCT Units near to the outer edges of HAZET 3488-14 VCT Setting Plate upper arms.



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