

# AST5080

Diesel Engine Overhaul Timing Tool Kit



Auto Service Tools Ltd

## AST5080 Diesel Engine Overhaul Tool Kit

### Kit Options:

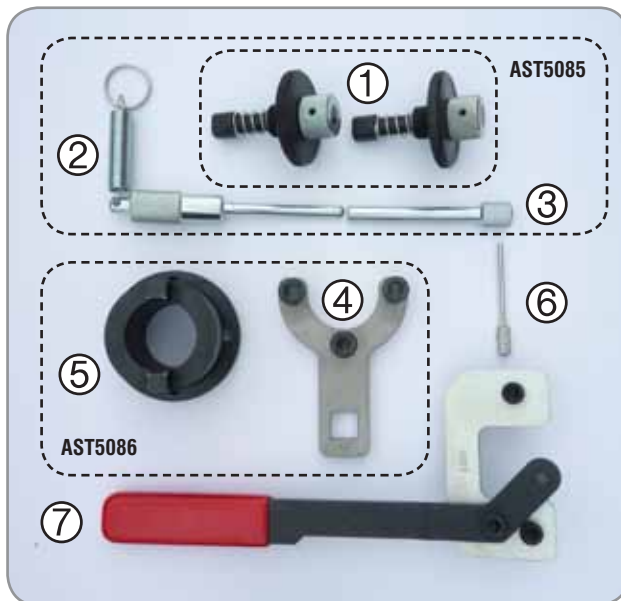
**AST5085** Engine Setting/Locking Tool Set  
(Camshaft Setting & Flywheel Locking Tools)

**AST5086** Engine Timing Adjustment Tool Set  
(Camshaft & Crankshaft Counter hold Tools)

### Kit Contents / Spares:



**AST5080**



### Applications:

**1.3 16v. Diesel engine in:**

#### ALFA ROMEO (JTD Multijet)

Mito

#### FIAT (JTD Multijet)

500	Panda	Punto
Punto Evo	Idea	Linea
Grande Punto	Doblo	Doblo Cargo

#### FORD (TDCi Duratorq)

Ka

#### LANCIA (JTD Multijet)

Ypsilon Musa

#### OPEL/VAUXHALL (CDTi)

Agila	Agila-B	Corsa-C/Combo
Corsa-D	Tigra-B	Meriva
Astra-H		

#### SUZUKI (DDiS)

Swift Ignis Wagon R+

**Engines:** 169A1000, 169B1000, 188A8000, 188A9000, 199A2000, 199A3000, 199A9000, 199B1000, 199B2000, 223A9000, 843A2000, A13DTC, A13DTR, A13DTE, Y13DT, Y13DTH, Z13DT, Z13DTE, Z13DTH, Z13DTI, Z13DTJ, Z13DTR

Item	Part Number	Description
<b>AST5085</b> Timing Setting / Locking Tool Set – items 1 to 3		
1	AST4771	Camshaft Setting Tools (Pair)
2	AST4772	Flywheel Locking Pin
3	AST4881	Flywheel Locking Pin
-	AST5085-84	Case + Insert
<b>AST5086</b> Timing Adjustment Tool Set – items 4 & 5		
4	AST5081	Crankshaft Pulley Flange Holding Tool
5	AST5082	Camshaft Holding Tool
6	AST4489	Tensioner Locking Pin
7	AST4883	Timing Chain Tensioner Tool
-	AST5080-84	Case + Insert

**NOTE:** AST5080 Engine Overhaul Timing Tool Kit includes all tools from AST5085 and AST5086 Sets.

### Associated Tools:

**AST4884** Crankshaft Timing Position Tool  
(For applications where gearbox is removed)

**IMPORTANT:** Always refer to the vehicle manufacturer's service instructions, or proprietary manual, to establish the current procedures and data. Product Information Sets detail applications and use of the tools with any general instructions provided as a guide only. AST has a policy of continuous development & reserve the right to change product specification or appearance without prior notice.

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## Application Coverage:

**AST5085** - For straightforward checking of camshaft and crankshaft timing.

**AST5086** - For counter holding the crankshaft and camshafts during engine timing setting and adjustment procedures, used in conjunction with AST5085.

**AST5080** - For locking, setting and adjustment of engine timing during engine/cylinder head overhaul procedures.

**NOTE:** AST5080 Engine Overhaul Timing Tool Kit includes all of the tools from AST5085 and AST5086 sets.

	<b>AST4771</b> Camshaft Setting Tool (X2)	<b>AST4772</b> Flywheel Locking Pin	<b>AST4881</b> Flywheel Locking Pin	<b>AST4883</b> Timing Chain Tensioner Tool	<b>AST4489</b> Tensioner Locking Pin	<b>AST5081</b> Crankshaft Pulley Flange Holding Tool	<b>AST5082</b> Camshaft Holding Tool
<b>AST5085</b> Engine Timing Check Kit	●	●	●				
<b>AST5086</b> Engine Timing Adjustment Kit						●	●
<b>AST5080</b> Engine Overhaul Timing Tool Kit	●	●	●	●	●	●	●



**AST5080**



**AST5085**



**AST5086**

## Engine Introduction

The range of Fiat 1.3 16v. diesel engines, used by a number of vehicle manufacturers, are all twin camshaft, common rail diesels. The chain drive connects crankshaft to exhaust camshaft, which is in turn connected by gears to the inlet camshaft.

Built into the design and construction of these engines are a number of features to minimise the level of disassembly required during repair work. These features are particularly relevant to maintaining the engine timing during removal of the cylinder head/camshafts. For example, with the use of the special tools in the AST5080 Overhaul Timing Tool Kit the cylinder head/camshafts can be removed without removing the front-end timing cover, sprockets, and timing chain.

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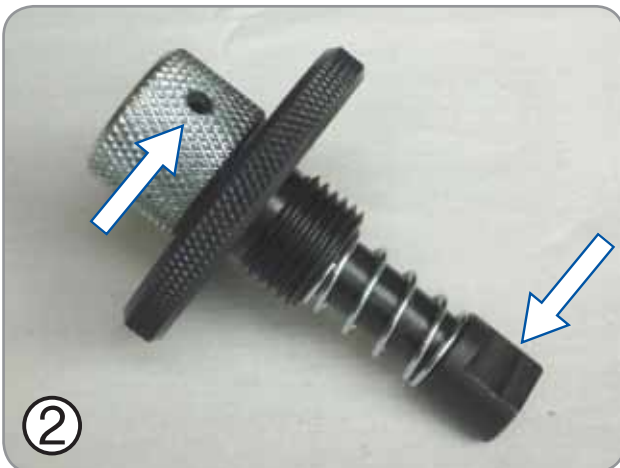
## Engine Timing Check

Correct engine timing position is established using **AST4771 camshaft setting tools** and either **AST4772** or **AST4881 locking pin**.

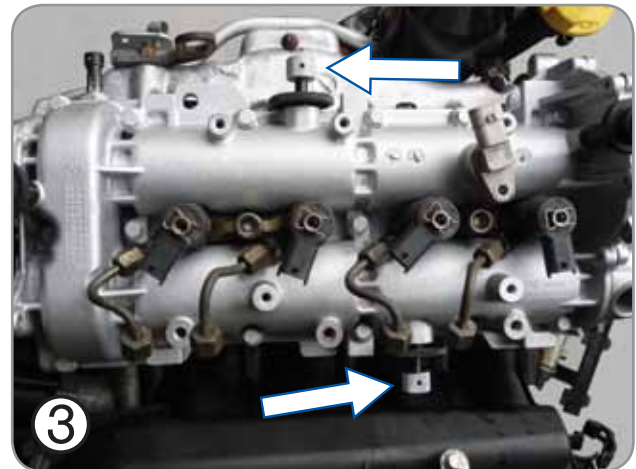


**NOTE:** To access the blanking plugs in the camshaft housing, which are removed in order to insert **AST4771 camshaft setting tools**, it is necessary to detach the fuel rail and engine management wiring harness and disconnect the glow plug, injector and sensor multiplugs.

## AST4771 Camshaft Setting Tools (Pair)



**AST4771 camshaft setting tools** have spring loaded spindles on the end of which are 'flats' which engage the 'timing position slots' in the camshafts. These 'flats' are aligned to a roll pin to aid position during fitting.



Remove the blanking plugs from the camshaft housing and screw in **AST4771 camshaft setting tools**. Using the roll pin in the spindle knob as a guide, ensure the flats on the ends of the spindles are horizontal. Slowly turn the engine in its normal direction of rotation.

**IMPORTANT:** Ensure that the location 'flats' on the spindle remain horizontal when rotating the camshafts.

When the ends of the spindles engage the slots in the camshaft an audible 'click' will be heard as the springs activate the spindles.

The timing kit contains two different Flywheel Locking Pins. Select the appropriate pin for the vehicle manufacturer.

## AST4881 Flywheel Locking Pin (Alfa Romeo, Fiat, Ford, Lancia)



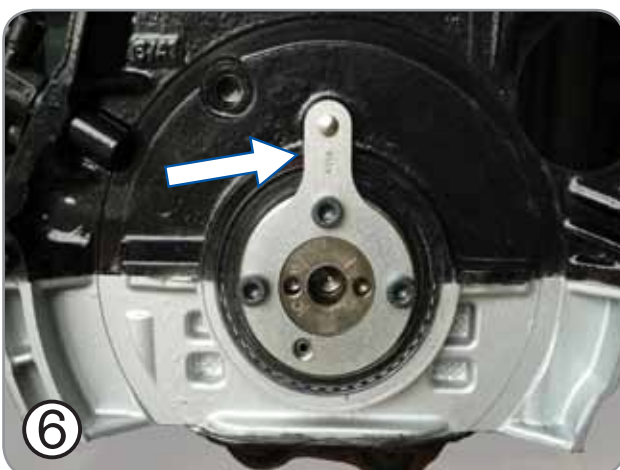
For Alfa Romeo, Fiat, Ford and Lancia applications the crankshaft timing position is established by locating **AST4881 locking pin** into the flywheel via a datum hole in the gearbox housing (as shown in picture 4).

### AST4772 Flywheel Locking Pin (Opel, Vauxhall, Suzuki)



For Opel, Vauxhall and Suzuki applications the crankshaft timing position is established by locating **AST4772 locking pin** into the flywheel via a datum hole in the gearbox housing. On some gearboxes the datum hole for **AST4772 locking pin** is located at the bottom, as shown in picture 5. However, some variants have a datum hole positioned at the front side of the gearbox. **AST4772 locking pin** incorporates a spring clip which can be attached to a nearby bolt to retain the pin in the datum hole.

### AST4884 Crankshaft Timing Position Tool (gearbox removed) - Associated Tool - not in kits



If it is necessary to separate the gearbox from the engine in order to carry out repair work then a flywheel locking pin cannot be used to position the crankshaft in its 'timed' position.

**AST4884 positioning tool** is used in place of a timing pin and locks the crankshaft with the flywheel removed.

If it is not possible to insert both of the **AST4771 camshaft setting tools** and the appropriate flywheel locking tool then it will be necessary to adjust the engine timing using **AST5086 engine timing adjustment kit**.

**IMPORTANT:** DO NOT use setting/locking tools to hold engine components in position whilst releasing or tightening the sprocket bolts. Counter hold tools **MUST** be used to prevent damage occurring to engine components or the setting tools. Setting tools are for retention of timing position only.

### Engine Timing Adjustment

The crankshaft sprocket and camshaft sprocket/gears are clamped in place using bolts.

Releasing one of these bolts will enable the sprocket/gears to move independently of the camshafts/crankshaft, allowing timing to be adjusted in the relevant area.

### AST5081 Crankshaft Pulley Flange Holding Tool



**WARNING:** The crankshaft central bolt has a **LEFT-HAND THREAD** with a high torque loading.

Remove the four bolts retaining the crankshaft pulley to reveal the pulley flange.

Attach **AST5081 holding tool** to the pulley flange with the three bolts provided. Using a power bar counter hold the flange whilst releasing the centre bolt.

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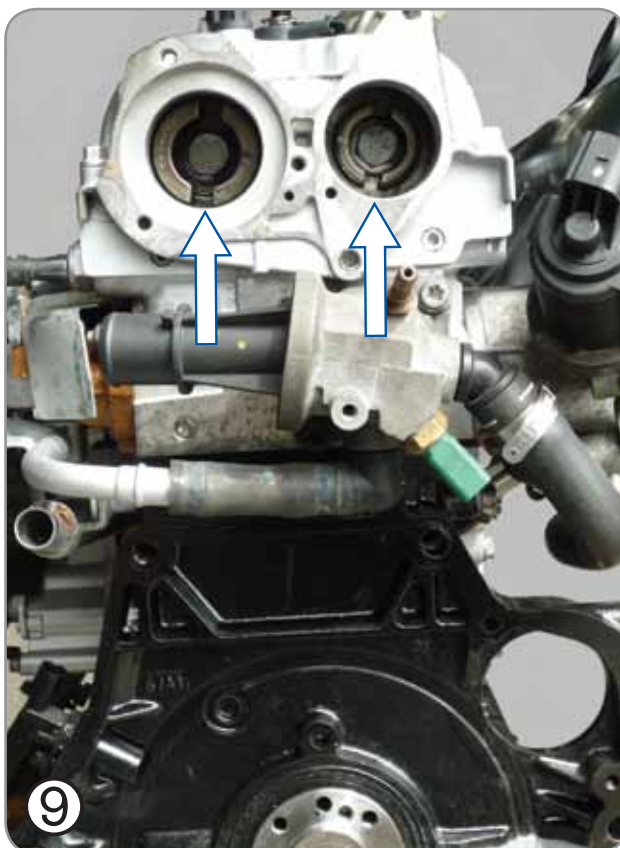


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**AST5082 Camshaft Holding Tool – used in conjunction with AST5081 Crankshaft Pulley Flange Holding Tool**



Attach AST5081 holding tool to AST5082 camshaft holding tool using the three bolts provided (as shown in picture 8).



AST5082 camshaft holding tool locates into the camshaft at the rear of the engine (gearbox end). This requires the removal of the vacuum pump and the high pressure fuel pump.



Fit the assembled tools into the appropriate camshaft. Using a power bar, counter hold the camshaft whilst releasing the central bolt as required.

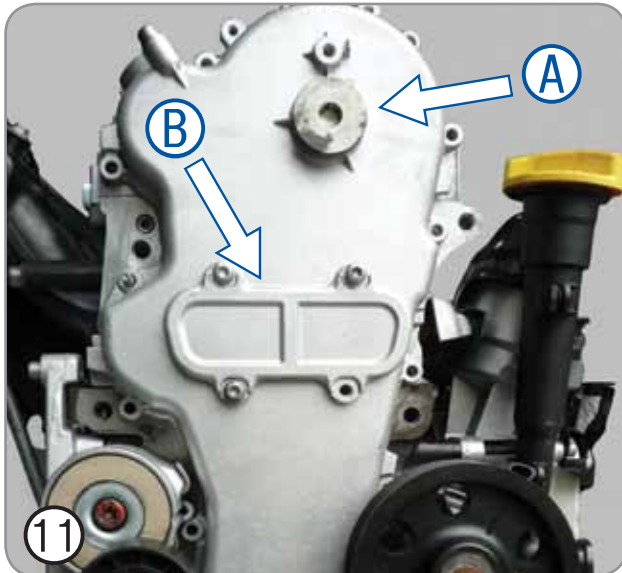
## Releasing the timing chain from the camshaft

The design of the engine allows service work on the cylinder head, camshafts, gaskets etc., to be carried out without removing the turbo, oil sump, front-end timing cover and timing chain assembly.

With the engine 'locked' in its timed position the camshaft sprocket central bolt is removed. The camshaft sprocket and timing chain can now be separated from the camshaft, allowing removal of the camshafts/cylinder head etc. for service work.

**IMPORTANT:** The engine **MUST BE** correctly supported, as it is necessary to remove the engine mounting on the timing chain side to give access to the service hatches in the front cover.

### Service hatches



To provide for cylinder head/camshaft removal without disturbing the front-end timing cover, access to the exhaust camshaft sprocket retaining bolt and the timing chain tensioner is provided via service hatches A and B in the front timing cover.

Unscrew and remove the sprocket service plug A.

Counter hold the exhaust camshaft using an assembly of AST5081 and AST5082 holding tools (gearbox end - see "Engine Timing Adjustment" on page 4) and remove the exhaust camshaft sprocket retaining bolt (timing chain end).

Unscrew the bolts retaining the service hatch cover B and remove the cover complete with gasket.

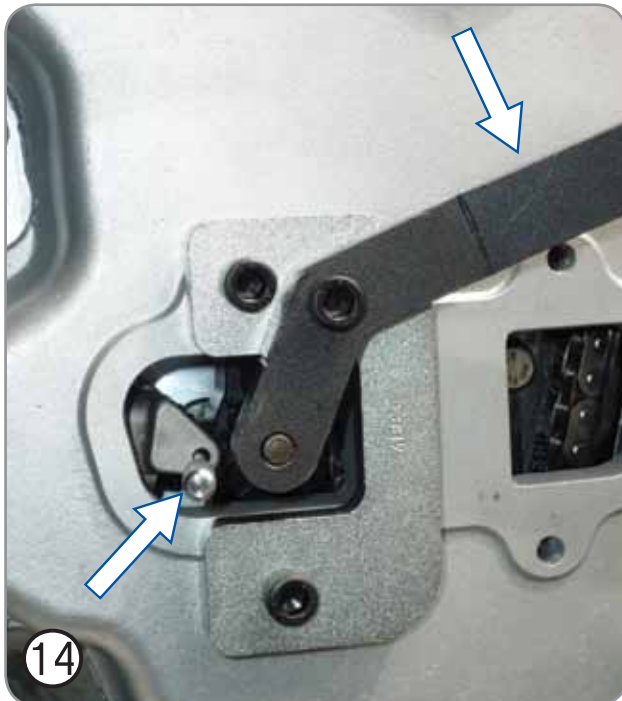
### AST4883 Timing Chain Tensioner Tool



The **AST4883 tensioner tool** is used to retract the timing chain tensioner plunger (via action on the chain guide rail). Fit the **AST4883 tensioner tool** on to the **RIGHT-HAND SIDE** of the **LEFT-HAND** window of the service hatch, securing in place with the two bolts provided, screwing in to the holes for the hatch cover. Ensure that the pin on the end of the lever reacts on the chain guide rail close to the tensioner plunger.



Carefully operate the handle of **AST4883 tensioner tool** in the direction shown removing tension from the chain. Do not apply excessive force, this could cause damage to the plastic chain guide. With the assistance of a magnet remove the camshaft sprocket and chain from the end of the camshaft. The contoured shape of the front cover will retain the sprocket and chain in a location approximate to the end of the camshaft. The camshafts, cylinder head etc., can now be removed for service work.



### Refitting the timing chain to the camshaft AST4489 Tensioner Retaining Pin

Operate the handle of **AST4883 tensioner tool** in the direction shown, compressing the tensioner plunger. Retain the plunger in place using pin **AST4489**.

**WARNING:** If the tensioner plunger will not easily compress, it may be necessary to allow the plunger to fully extend outwards first. Then reapply leverage to the tensioner plunger retaining it in place using **AST4489** pin.

**NOTE:** During initial removal of the camshaft sprocket, the chain links may have kinked at the crankshaft gear, preventing the camshaft sprocket from lifting on to the end of the camshaft. As the crankshaft gear is free to turn it is possible to simply rotate the chain (through the service hatch) to straighten out the chain links as the sprocket is fitted onto the camshaft.

Refit the camshaft sprocket and chain to the end of the camshaft and screw in the securing bolt to finger-tight.  
Remove **AST4489** pin and release the lever allowing the plunger to **extend outwards** and apply tension to the chain.  
Check the plunger is in contact with the chain guide rail.

Using **AST5081** holding tool with **AST5082** camshaft holding tool, counter hold the camshaft and tighten the camshaft sprocket retaining bolt to specified torque.

Refit service hatch plug and cover. Refit timing side engine mounting bracket.

Tighten the crankshaft pulley flange central bolt to the specified torque using **AST5081** crankshaft holding tool to counter hold.

**NOTE:** Central bolt has a **LEFT HAND THREAD**.