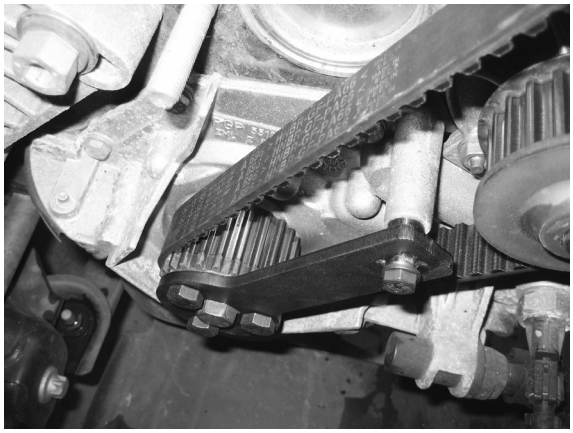
AST4510A

Petrol Engine Twin Camshaft Setting/Locking Tool Kit

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.



Applications:

FIAT 1.2 16v. & 1.4 16v. Twin Cam Petrol engines in

FIAT

New 500	Panda	Punto
Grande Punto	Idea	Linea
Palio Weekend	New Bravo	Stilo
Brava/Bravo	Marea/Weekend	

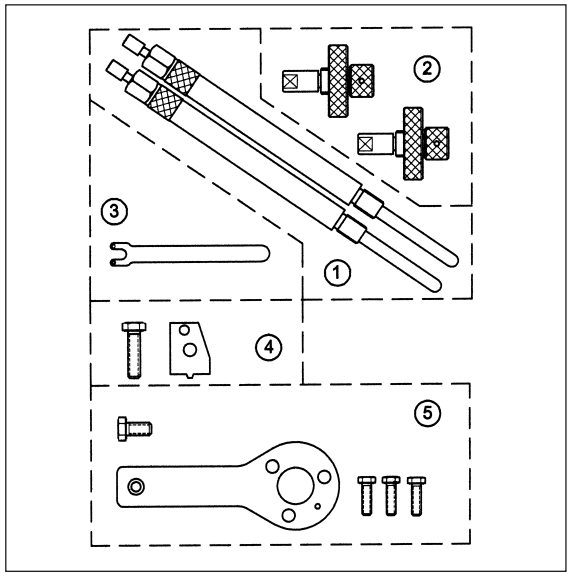
LANCIA

Ypsilon	Musa

1.2 16v. - 176 B9.000, 182 B2.000, 188 A5.000

1.4 16v. - 843A.1000, 169A3.000, 192B2.000, 198A1.000, 198A4.000, 199A6.000

Additional AST Tools required:
AST4844 Sprocket Holding Tool



Kit contents/spares

Item	Part Number	Description
1	AST4511	Piston Positioning Tool Set (Pair)
2	AST4512	Camshaft Setting Tool Set (Pair)
3	AST4513	Belt Tensioner Adjuster
4	AST4911	Camshaft Sprocket Locking Tool
5	AST4951	Crankshaft Locking Tool
--	AST4510A-84	Case + Insert

The Fiat 1.2 16v. engine was introduced in 1997 with the 1.4 16v. version released in 2003.

A number of engine variants now exist and timing belt replacement procedures, and timing tools used, differ across the range and are dependant upon the engine variant/engine code.

All the 1.2 16v. engines detailed below have the same procedure and use the same timing tools from Kit AST4510A.

For 1.4 16v. engines detailed – most have the same, or similar procedure but have different timing tool requirements. The tools are included in Kit 4510A,

AST4510A Kit covers all the engine variants/codes detailed.

Timing belt replacement

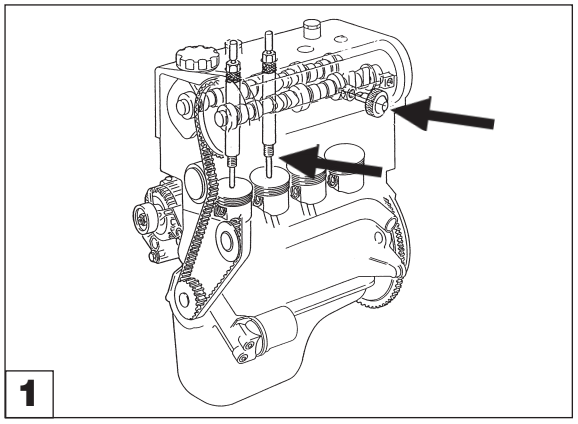
Section 1: 1.2 16v. – 179B9.000, 182B2.000, 188A5.000 and 1.4 16v. 843A1.000

Section 2: 1.4 16v. – 192B2.000, 198A1.000, 198A4.000 and 199A6.000

Section 3: 1.4 16v. – 169A3.000

SECTION 1:

1.2 16v. - 179B9.000, 182B2.000, 188A5.000
1.4 16v. - 843A1.000



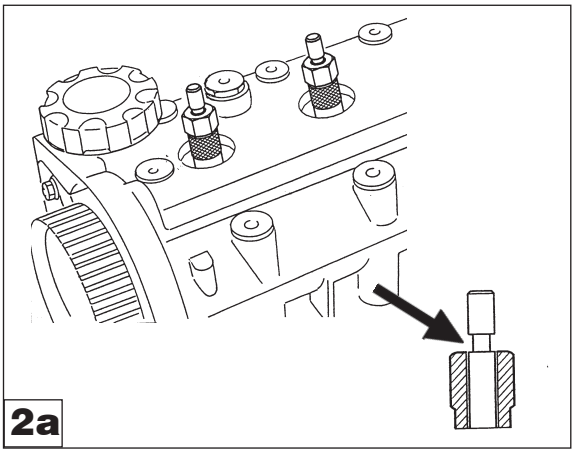
General

On this group of 1.2 & 1.4 16v. engines, timing is checked, and belt replacement carried out, by positioning the height of all four pistons in line, by using AST4511 Piston Position Tools (Pair) in No.1 and No. 2 cylinders. The camshafts are 'set' in position by AST4512 Camshaft Setting Tools (Pair), entering through the sides of the camshaft housing and locating into "timing slots" in the camshafts.

The camshaft sprocket must be released and free to turn on the camshaft when fitting a new belt. Belt fitting order as follows - Crankshaft Gear, Water Pump, Camshaft Sprocket, Tensioner.

For the new belt, the tensioner is initially positioned at maximum using AST4513 Adjuster.

The camshaft sprocket bolt is then tightened and all setting/locking tools removed. The engine is turned by hand, two revolutions. The tensioner is adjusted so that its marks align. The engine is turned by hand again and the Piston Position and Camshaft Setting Tools refitted to check that the engine timing is correct.



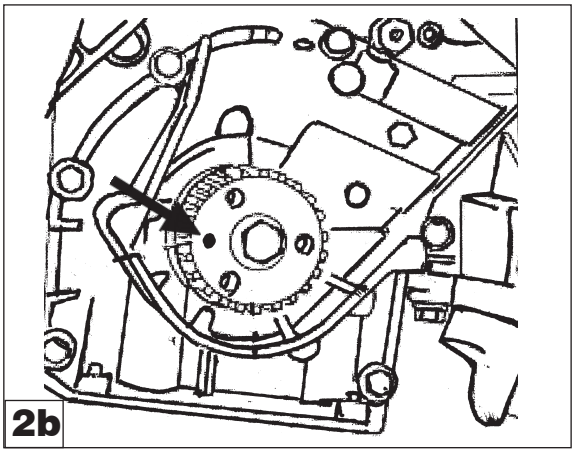
AST4511 Piston Position Tools

AST4511 Set comprises 2 x Positioning Tools which are used to establish the crankshaft/engine timing position, which is correct when all four pistons are in line with one another.

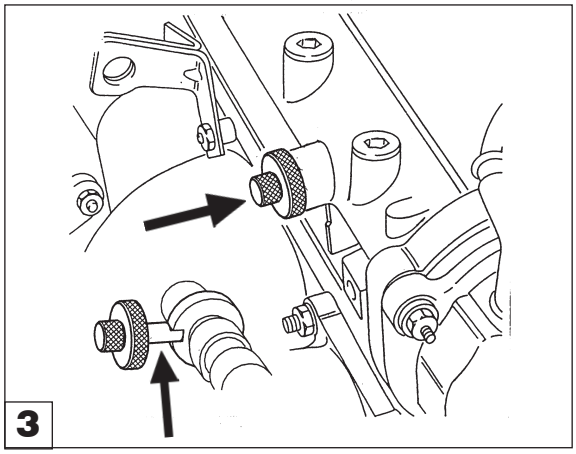
AST4511 Main Bodies are screwed into the spark plug holes of No.1 and No. 2 cylinders.

Remove spark plugs and screw the main body of each tool **fully** into the spark plug holes, taking care not to over-tighten. Carefully slide the Indicator Pins into the bodies to rest on top of the pistons, with grooves uppermost (on top).

The crankshaft must be turned slowly, in the direction of normal engine rotation, until the bottom of the grooves on the Indicator Pins are visually in line with the top of the Main Bodies. When both tools achieve this position, the pistons will be in line with one another, **ie. halfway through their stroke and No.1 cylinder piston MUST be descending (inlet stroke).**



IMPORTANT: Check that the crankshaft is in correct timed position – the reference pin on the crankshaft gear must be positioned level with, **but on the opposite side to**, the RPM sensor
Check that camshaft "timing slots" are in line with the side entry holes in the camshaft housing (see AST4512).



AST4512 Camshaft Setting Tools

AST4512 Set comprises 2 x AST4512 Setting Tools which screw into the side entry holes situated on the sides of the camshaft housing.

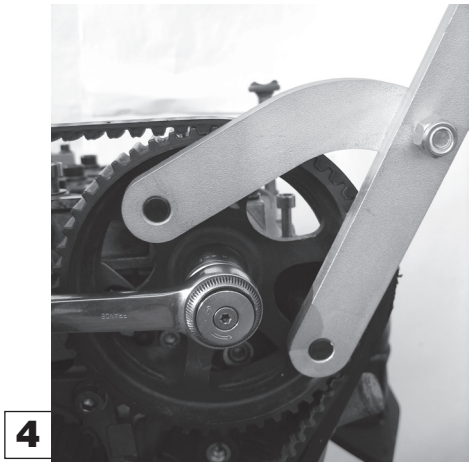
Each camshaft has a 'timing slot' which, when positioned and retained in line with the 'timing hole', provides the correct timed position for the camshaft.

Remove the sealing plugs from the camshaft housing. Visually check that the camshaft 'timing slots' are in line with the entry hole and insert AST4512 Tools, holding the centre spindle steady whilst screwing in the main body of the tool.

Check that the crankshaft is in timed position, slacken tensioner bolt and remove the old timing belt.

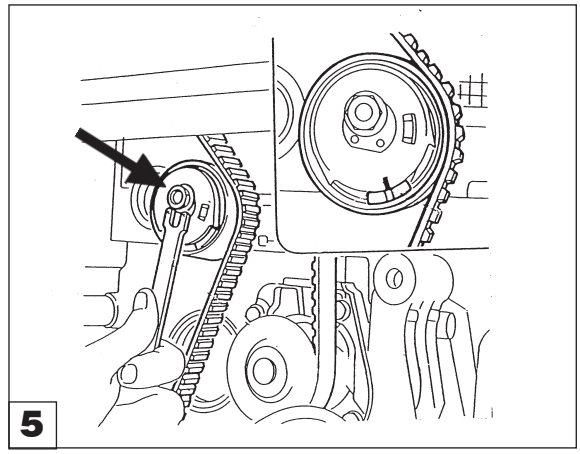
Release and replace the camshaft sprocket bolt with a new bolt. Screw in the new bolt finger-tight allowing the sprocket to turn on the camshaft, but not tilt.

WARNING: Do not use AST4512 Setting Tools to counter-hold when releasing/tightening camshaft sprocket. Use Holding Tool AST4844 -Additional Tool – not included in Kit.



AST4844 *Sprocket Holding Tool – Additional Tool not included in kit*

Fit new timing belt.



AST4513 Tensioner Adjuster - Timing Belt

AST4513 is a special 'peg' wrench and locates into the two holes in the tensioner, to carry out belt tension adjustment.

After fitting a new belt the tensioner is initially set at maximum tension.

Fit a new camshaft sprocket bolt and counter-hold the camshaft sprocket whilst tightening the bolt.

Remove all timing tools.

Turn the engine over, by hand, returning to timed position. Using AST4513 adjust the belt tensioner so that the tensioner marks align.

Fit the Piston Position and Camshaft Setting Tools to check that the engine timing is correct.

SECTION 2

1.4 16v. – 192B2.000, 198A1.000, 198A4.000 and 199A6.000

General

The timing belt replacement procedure is basically the same as described in Section 1, **EXCEPT** for engine codes **192B2.000** and **199A6.000**, Fiat instructions show that cylinders No.3 and No.4 are used for Tools AST4511 to establish crankshaft timed position.

The same timing tools as for 1.2 16v. (Section 1) are used on this group of engines, **PLUS an extra tool.**

For these engines, Fiat additionally introduced the requirement of locking the camshaft sprocket when removing and installing the sprocket bolt - A particular necessity when VVT (variable valve timing) is fitted, as there is no other means of counter-holding the camshaft sprocket when releasing the sprocket bolt during the belt replacement procedure. This additional tool is AST4911 Camshaft Locking Tool.

AST4511 Piston Position Tools

Fit AST4511 Piston Position Tools in appropriate cylinders.

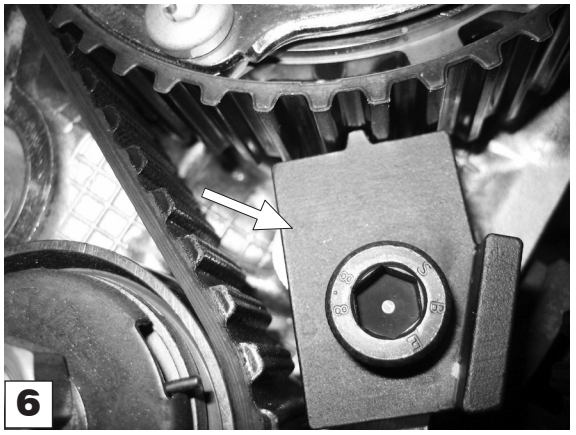
The crankshaft must be turned slowly, in the direction of normal engine rotation, until the bottom of the grooves on the Indicator Pins are visually in line with the top of the Main Bodies. When both tools achieve this position, the pistons will be in line with one another, **ie. halfway through their stroke and No.1 cylinder piston MUST be descending (inlet stroke).**

IMPORTANT: Check that the crankshaft is in correct timed position – the reference pin on the crankshaft gear must be positioned level with, **but on the opposite side to**, the RPM sensor

Check that camshaft "timing slots" are in line with the side entry holes in the camshaft housing (see AST4512).

AST4512 Camshaft Setting Tools

Remove the sealing plugs from the camshaft housing. Visually check that the camshaft 'timing slots' are in line with the entry hole and insert AST4512 Tools, holding the centre spindle steady whilst screwing in the main body of the tool.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AST4911 Camshaft Sprocket Locking Tool

AST4911 Locking Tool is bolted to the engine and locates in to the teeth of the camshaft sprocket in order to "lock" the sprocket when releasing and tightening the camshaft sprocket bolt.

Fit AST4911 Locking Tool to the engine, as shown in Fig 6. , and firmly secure in place using the bolt provided in the AST4510A Kit.

Slacken the timing belt tensioner nut to release tension off the belt and remove the old belt.

If VVT (variable valve timing) is fitted, undo the camshaft sprocket bolt cover and remove it. **NOTE:** Be prepared for oil to leak out.

Release and replace the camshaft sprocket bolt with a new bolt. Screw in new bolt finger-tight allowing the sprocket to turn on the camshaft, but not tilt.

IMPORTANT: Remove AST4911 Sprocket Locking Tool

Fit the new timing belt.

After fitting a new belt the tensioner is initially set at maximum tension using AST4513 Tensioner Adjuster.

Re-fit AST4911 Camshaft Sprocket Locking Tool to the engine, and firmly secure in place using the bolt provided in the Kit.

Tighten the camshaft sprocket bolt and remove **all** timing tools.

Turn the engine over, by hand, two revolutions. Adjust belt tension so that the tensioner marks align.

Turn the engine over by hand again and fit the Piston Position and Camshaft Setting Tools to check that the engine timing is correct.

SECTION 3

1.4 16v. – 169A3.000

General

The timing belt replacement procedure is basically the same as described in Section 2, **EXCEPT** for this engine (169A3.000), AST4511 Piston Position Tools are replaced by new tool AST4951 Crankshaft Locking Tool to establish crankshaft timed position.

AST4512 Camshaft Setting Tools, AST4911 Camshaft Sprocket Locking Tool and AST4513 Belt Tensioner Adjuster are still used in exactly the same sequence and procedure as detailed in Section 2.

IMPORTANT: Check that the crankshaft is in correct timed position – the reference pin on the crankshaft gear must be positioned level with, **but on the opposite side to**, the RPM sensor

Check that camshaft "timing slots" are in line with the side entry holes in the camshaft housing (see AST4512).

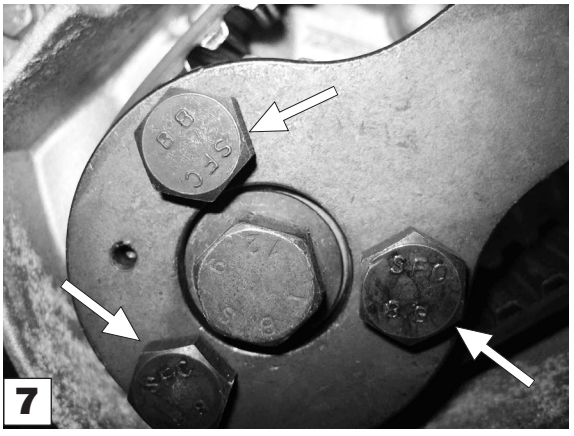
With the camshafts in timed position, fit AST4512 Camshaft Setting Tools (Pair) through the sides of the camshaft housing and locate into "timing slots" in the camshafts.

Check that the crankshaft is in timed position, slacken tensioner bolt and remove the old timing belt.

Fit AST4911 Locking Tool to the camshaft sprocket and release and replace the camshaft sprocket bolt with a new bolt. Screw in the new bolt finger-tight allowing the sprocket to turn on the camshaft, but not tilt.

IMPORTANT: Remove AST4911 Locking Tool.

Fit the new timing belt.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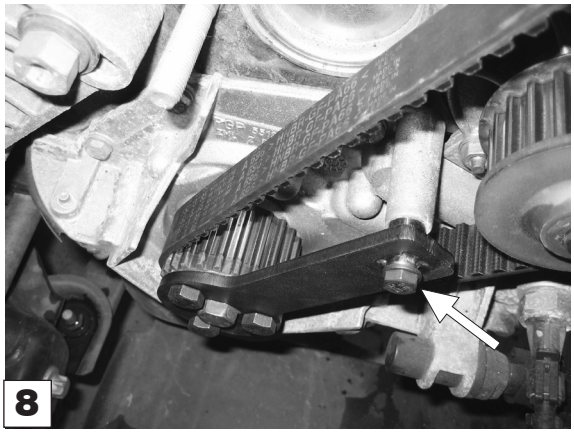

AST4951 Crankshaft Locking Tool

Fit AST4951 Crankshaft Locking Tool on to the crankshaft gear. Secure AST4951 Locking Tool to the crankshaft gear using the 3 bolts provided in the AST4510A Kit, and secure the Tool to the engine, as shown in Fig. 8.

The timing belt tensioner is initially set at maximum tension using AST4513 Tensioner Adjuster.

Fit AST4911 Camshaft Sprocket Locking Tool to the engine, as shown, and firmly secure in place using the bolt provided in the Kit.

Tighten the camshaft sprocket bolt and remove **all** timing tools.

Turn the engine over, by hand, two revolutions. Adjust belt tension so that the tensioner marks align.

Turn the engine over by hand again and fit the Crankshaft Locking Tool and Camshaft Setting Tools to check that the engine timing is correct.

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