



**7** Remove the 8mm bolt from the top rear half of the timing belt cover. This will enable the cylinder head to be removed. Crack from the inside out, the ten Torx E12 head bolts. Store in sequence if you want to re-use them (see Rebuild Tips) and remove the head.



**9** Remove the front crankshaft pulley bolt and pulley. Then remove the bottom timing belt cover, fitted with three 8mm bolts. Remove and discard the timing belt.

way through from the top of the block to the base. The VVC engine features twin inlet camshafts – each cam is split and linked via a connecting rod. The VVC mechanism can be found on the outer part of the inlet camshafts, attached to the cylinder head.

Working on a VVC is similar to its 1.8 standard cousin. Set aside six to

## Parts and Prices

from Mike Satur

Reconditioned 1.8 VVC engine –  
from £1,762 exchange

### Parts for 1.8 VVC

Front timing belt	£37.60
Rear timing belt	£29.38
Head gasket	£30.55
Camshaft cover gasket	£17.63
Camshaft oil seals (each)	£4.70
Water pump	£47.00
Standard 31.5mm inlet valve	£17.63
Standard 27.5mm exhaust valve	£17.63
Set of pistons and liners	£646.00
Steel locating dowels	£1.47
High tensile camshaft pulley bolt kit	£11.16
Head bolts	£70.50
Upgraded head gasket and steel locating dowels	£30.55
New VVC assembly (each)	£387.75
Reconditioning for VVC assembly	POA

Camshaft pulley locking tool is available from Franklin Tools for £8.17. Part number 10489.



**8** Remove the engine oil dipstick tube. This is fitted with two 8mm bolts at the base and one 13mm bolt for the steady bar bracket. Renew the gasket fitted – this has been known to leak oil.



**10** Remove the rear top timing belt cover, fitted with two remaining 8mm bolts – one at the front and one at the rear that goes into the water pump housing.

eight hours for a head gasket, two hours for a water pump and one to two hours for changing the two timing belts. A thorough stripdown of an engine should take half a day and the same amount of time to rebuild it.

Typical problems with the VVC and standard K-series include the usual alloy corrosion if anti-freeze is omitted from the coolant. Head gaskets can blow, usually around the head to block locating dowels. Standard dowels are made of plastic on early models and can perish or wear, increasing the amount of head to block movement.



**11** Undo four 8mm bolts for the water pump and one 13mm bolt which includes a locator for the timing cover. The water pump may need a gentle tap with a plastic hammer to break its seal to the engine block.

## VVC Problems

**Porous heads and blocks** – caused by poor casting and made worse by a lack of anti-freeze.

**Head gasket** – can blow across the front, either side of the locating dowel. See Rebuild Tips on how to avoid this.

**Head locating dowels** – standard items are made of plastic and can perish and increase the head to block movement. See VVC Modifications for fitting steel dowels.

**Oil leaks** – typical leaks include the camshaft oil seals and around the VVC housing. The base of the engine oil dipstick tube can also leak, usually cured with a new gasket or by re-tightening the bolts (see Step 8).

**Loose camshaft bolts** – can work loose or shear. Look for damage to the bolts, camshaft pulleys and locating roll pins. Always fit new ones

**Water pump** – locating dowels come loose and fall into timing belt causing lots of damage. Mike Satur recommends peening the dowels to prevent them falling out

**VVC bearings** – internals of VVC housing can wear causing diesel-like rattle. The only solution to this is to either rebuild the VVC mechanism (specialist job) or replace it.

**Exhaust studs** – manifold studs can strip the threads in the aluminium head upon removal. Extract all studs from head and clean them. Any worn threads in the head on the exhaust side can be refitted using the longer section of the stud into the head.

**Noisy top end** – can be caused by sticking camshaft followers. This may be the result of burring around the edges of the head where the camshaft followers are fitted. The camshaft followers can also become pitted or break.

Mike Satur recommends fitting steel locating dowels.

Oil pressure build up next to the locating dowel at the front of the engine can force oil into the sump. Modify the head gasket (see Rebuild Tips) or fit an upgraded head gasket from Mike Satur.

Camshaft bolts have also been known to be troublesome, working loose and damaging the ends of the cams and cam timing can be lost causing damage to the valves. High tensile bolts can be fitted to help avoid this. Similarly, the water pump has been known to lose its locating



**12** Remove the oil pump, fitted with nine 8mm bolts. All bolts are of equal length, except for the one fitted at the top left. Renew the gasket and rubber o-ring oil seal. To dismantle pump if required, undo two Torx screws underneath the gasket.