

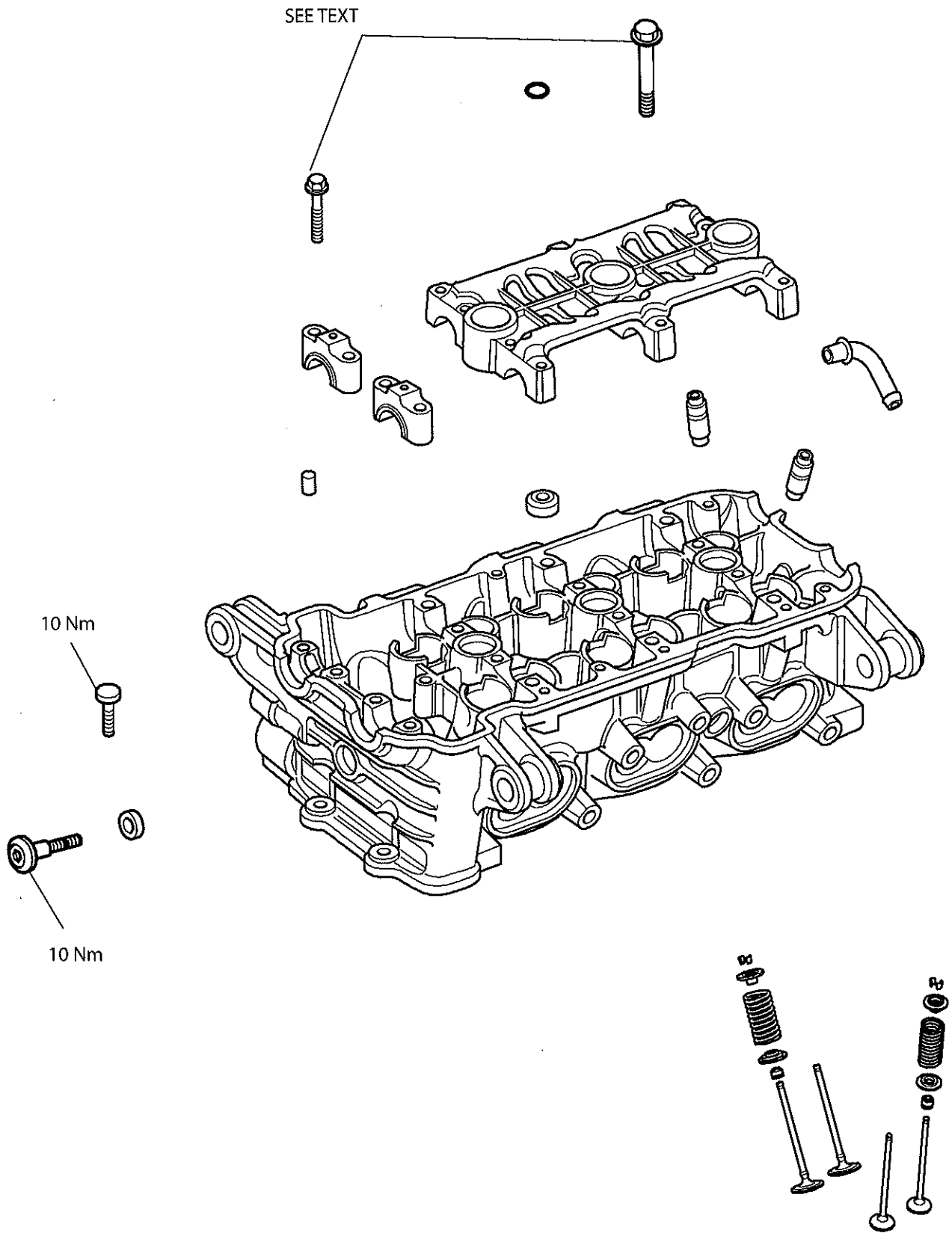
3 Cylinder Head

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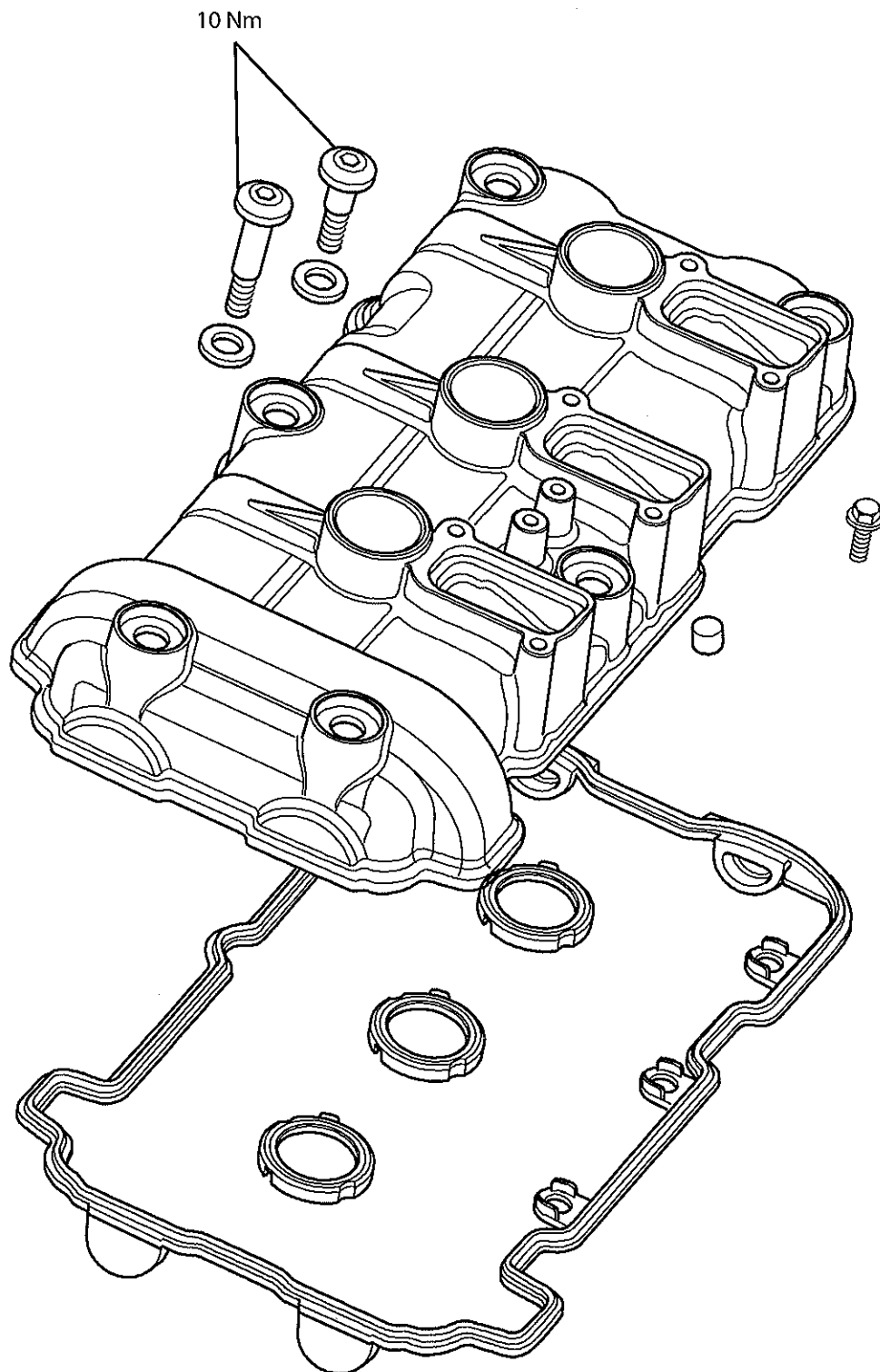
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Cylinder Head

Exploded View - Cylinder Head and Valves

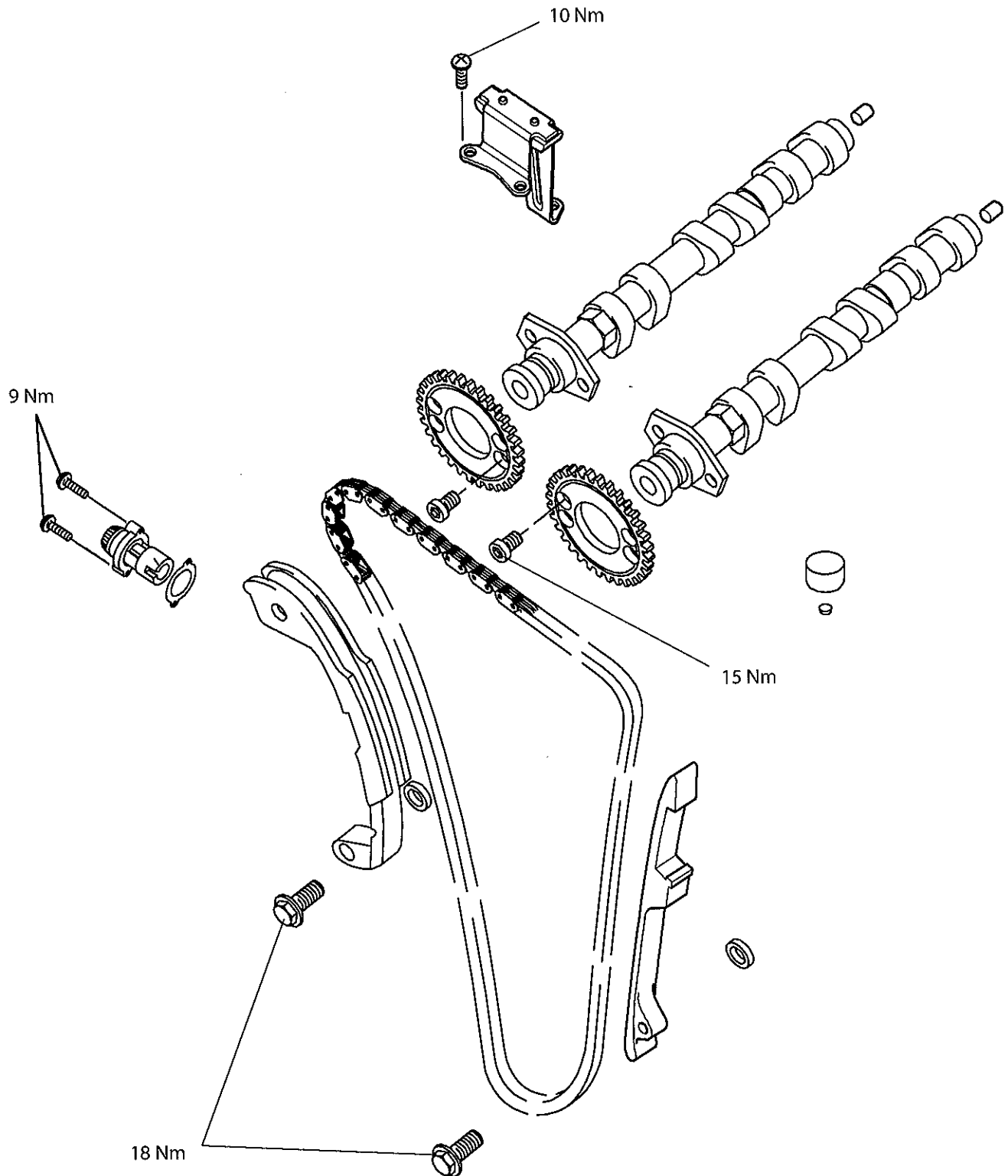


Exploded View - Cam Cover



Cylinder Head

Exploded View - Camshaft and Camshaft Drive



Cylinder Head Description

The engine is fitted with an aluminium alloy cylinder head, which carries the camshafts, valves and spark plugs. The cylinder head is cast as a single entity and various components are permanently added after machining.

The camshafts run directly in the head without separate bearings. Valve clearances are adjusted by changing variable thickness shims which sit between the valve tappet bucket and the valves.

The camshafts are driven by a silent-type chain. The cam chain is tensioned by a spring loaded device fitted in the cylinder head, and is guided by two rubber blades.

Oil is supplied to the head by an external feed pipe which is situated at the right hand rear side of the head. Once supplied to the head, the oil is distributed along internal drillings within the head casting and camshaft.

Single valve springs are used to close the inlet valves and single springs to close the exhaust valves. These valve springs have close wound coils at one end to assist in the prevention of valve bounce at high engine speed and to give a smooth valve actuation. When assembling the cylinder head it is important that the close wound, colour coded ends of the springs are fitted downwards (towards the piston). Both the tip and seating face of the valves are hardened to give a long service life.

Due to the methods used to assemble the valve seat and valve guides to the head, these parts cannot be replaced.

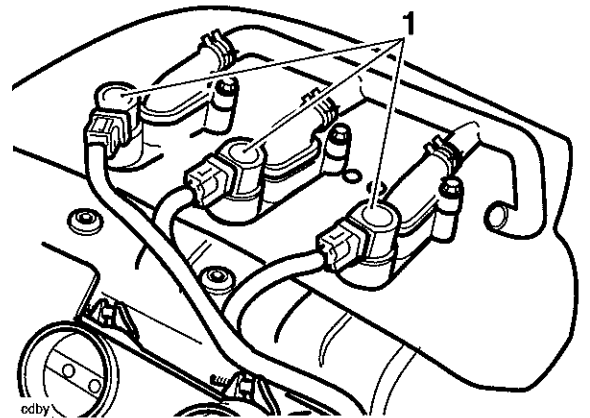
Caution

In any of the following operations which necessitate the removal or disconnection of the cam chain, NEVER turn the engine without the cam chain and tensioner correctly fitted and adjusted. In the disassembled condition, the pistons will contact the valves if the crankshaft is turned, causing severe engine damage.

Cam Cover

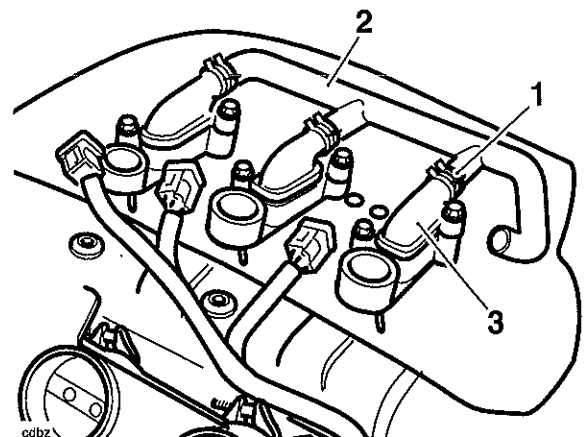
Removal

1. Remove the seat (see page 16-8.).
2. Disconnect the battery, negative (black) lead first.
3. Remove the side panel assembly (see page 16-9).
4. Remove both lower fairings (see page 16-11).
5. Remove the fuel tank (see page 10-87).
6. Remove the airbox (see page 10-92).
7. Remove the ignition coils from the head by pulling them upwards.



1. Coils

8. Detach the secondary air injection hose from the reed valves on top of the cam cover (see page 10-111).

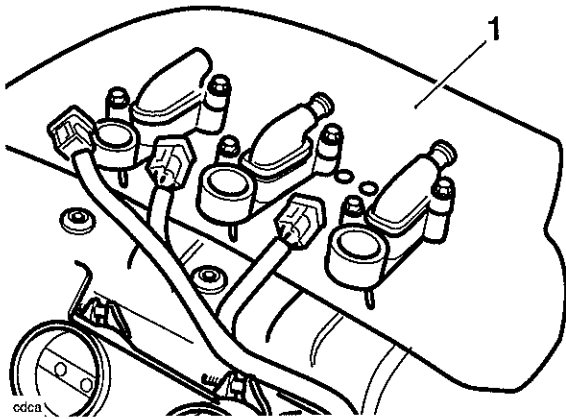


1. Spring-close hose clip
2. Secondary air injection hose
3. Reed valve assembly

9. Release the throttle cables at the throttle bodies (see page 10-97).

Cylinder Head

10. Release the clips securing the air deflector shield, then remove the shield.

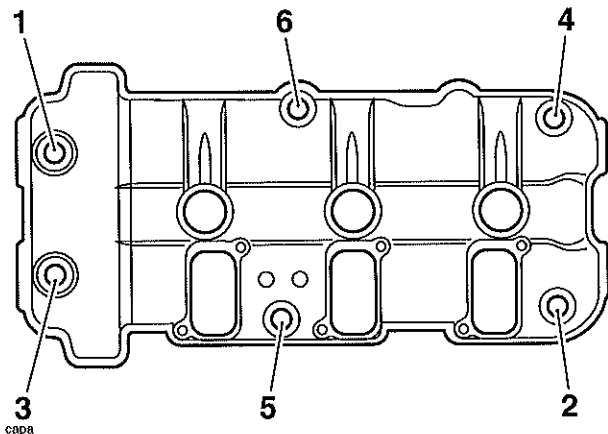


1. Air deflector shield

11. Progressively release the cam cover bolts in the sequence shown below.

Note:

- Two longer bolts are fitted at the end adjacent to the cam chain.



Cam cover bolt release sequence

12. Ease the water hoses to allow the cover to be removed from the left hand side of the motorcycle.



Caution

Never use a lever to remove the camshaft cover from the head.

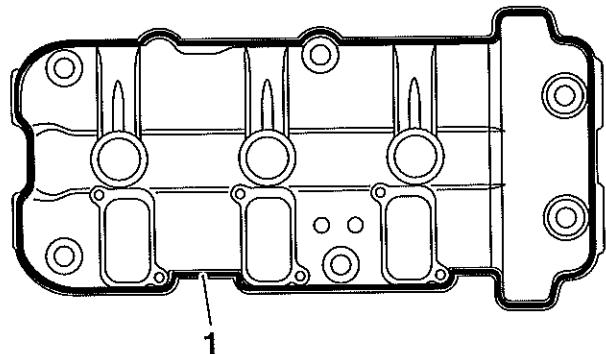
Using a lever will cause damage to the head and cam cover which could lead to an oil leak.

13. Remove the cam cover gasket and plug tower seals. If necessary, recover the dowels from the secondary air injection holes in the head (these may come away in the cover or gasket).

14. Remove any residual oil from the front of the head using a syringe or lint free cloth.

Installation

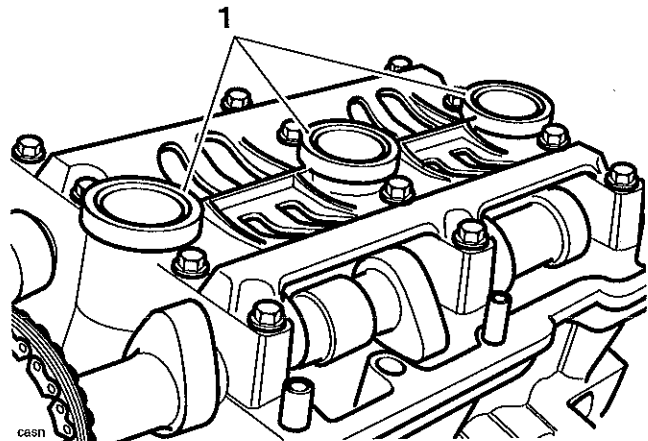
1. Check the condition of the cam cover gasket and plug tower seals. Replace as necessary.
2. Check the condition of the cam cover bolt seals. Replace as necessary.
3. Fit the cam cover seal to the groove in the cam cover.



capb

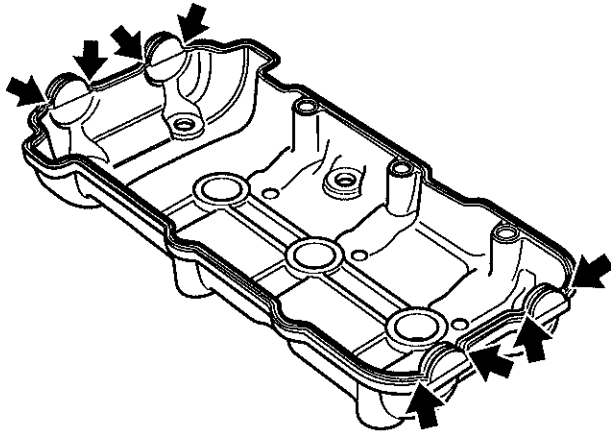
1. Cam cover seal groove

4. Fit the plug tower seals to the cam cap ladder.



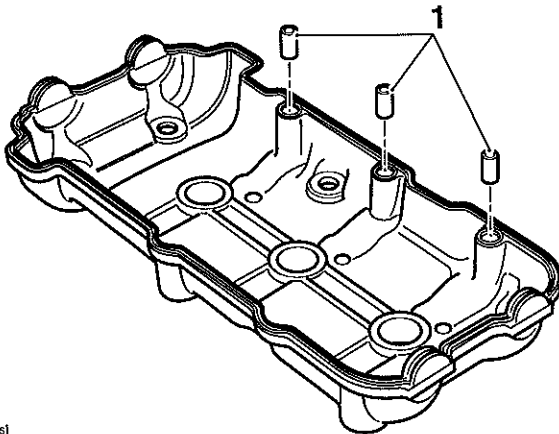
1. Plug tower seals

5. Apply silicone sealer to the areas arrowed in the diagram below.



casl

6. Fit the cam cover, ensuring that the gasket and seals remain in the correct positions.
7. Refit the dowels to the cam cover before locating it to the head.

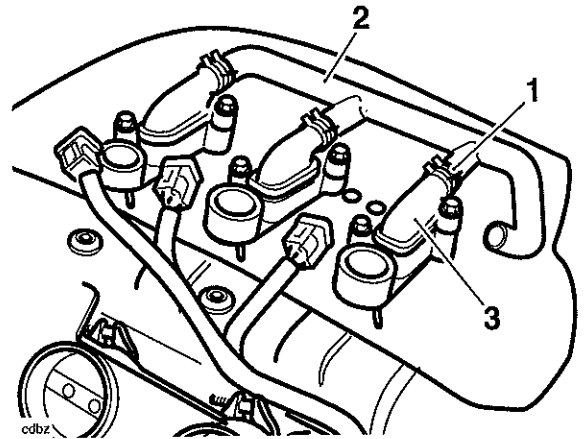


casl

1. Dowels

8. Fit the cam cover screws and screw seals, then tighten until finger tight.
9. Finally, tighten the cam cover screws, in same order as for removal, to **10 Nm**.
10. Refit the air deflector shield and retain with the clips.
11. Refit the throttle cables and adjust (see page 10-98).

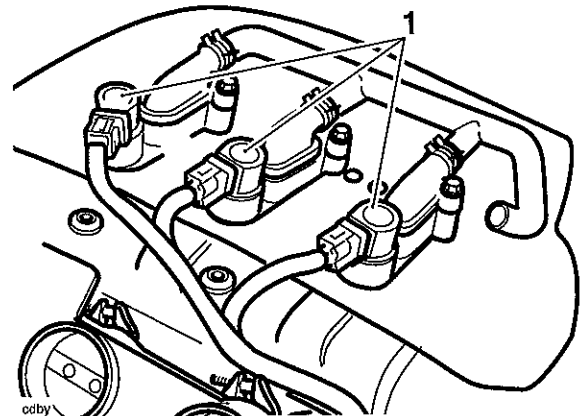
12. Refit the secondary air injection hose to the reed valves (see page 10-113).



odbz

1. Spring-close hose clip
2. Secondary air injection hose
3. Reed valve assembly

13. Fit the ignition coils and reconnect.



odby

1. Coils

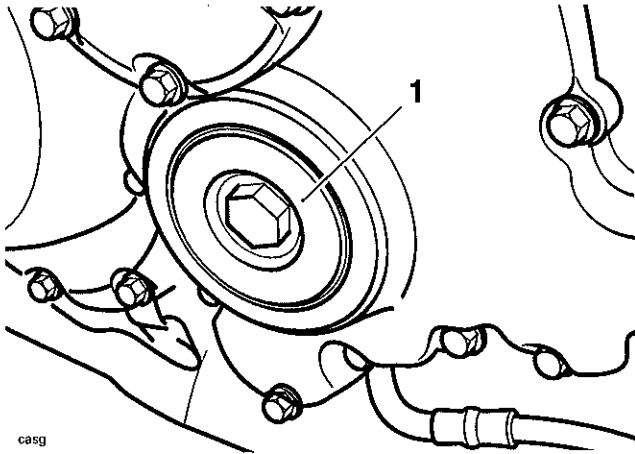
14. Refit the airbox (see page 10-93).
15. Refit the fuel tank (see page 10-88).
16. Refit the lower fairings (see page 16-12).
17. Refit the side panel assembly (see page 16-10).
18. Reconnect the battery positive (red) lead first.
19. Refit the seat (see page 16-8).

Cylinder Head

Cam Chain Tensioner

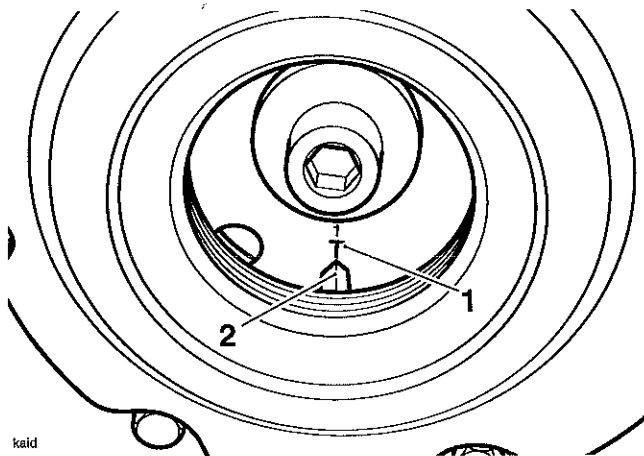
Removal

1. Remove the cam cover (see page 3-5).
2. Remove the inspection plate from the right hand crank cover.



1. Inspection plate

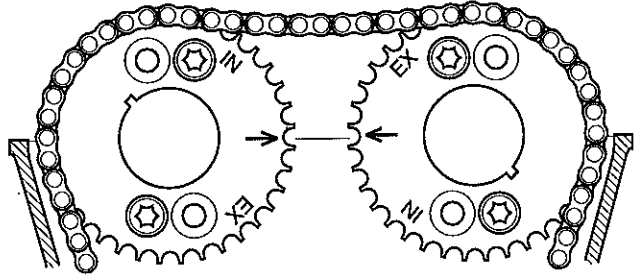
3. Rotate the crankshaft clockwise (the normal direction of rotation), using the bolt fitted to the end of the crankshaft. Stop rotation when number 1 cylinder is at top dead centre (TDC), that is when the 'T1' mark on the sprag clutch aligns with the line at the bottom of the cover.



1. 'T1' Mark
2. Marker line

Note:

- In addition to the 'T1' mark alignment, at TDC, the alignment marks on the camshaft sprockets will point inwards at a point level with the joint face.



gaaa

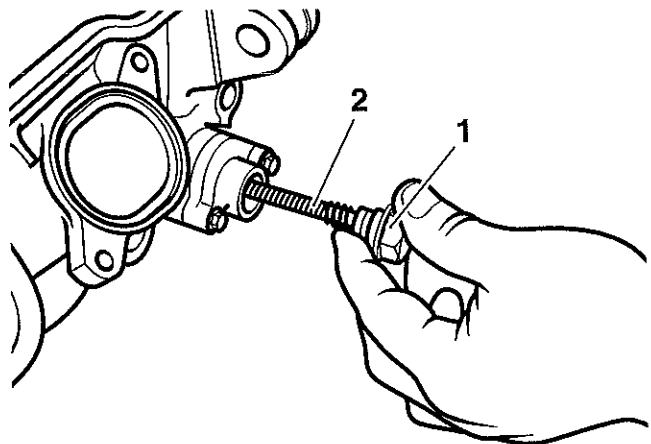
Camshaft to Cylinder Head Alignment Marks

4. Place a suitable wedge between the tensioner blade and crankcase, to hold the cam chain taut during removal of the tensioner.

Warning

The tensioner centre nut is under spring tension. Always wear hand, eye and face protection when withdrawing the centre nut and take great care in order to minimise the risk of injury and loss of components.

5. Carefully remove the centre nut from the tensioner and withdraw the tensioner spring.

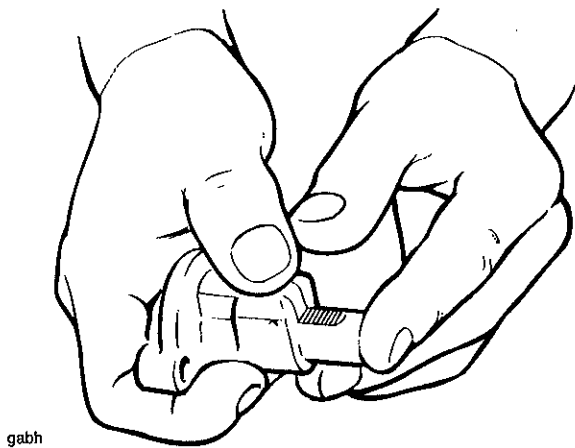


1. Centre nut
2. Spring

6. Remove the bolts securing the tensioner to the cylinder head. Remove the tensioner and gasket.

Installation

1. Check that number 1 cylinder is still at top dead centre (TDC).
2. Ensure that the wedge fitted earlier is still holding the tensioner blade in contact with the cam chain. Check that the camshaft timing marks point inwards and are level with the joint face of the head.
3. Set the tensioner plunger onto the first tooth of the ratchet (i.e. minimum extension) by manually lifting the tensioner pawl.



gabh

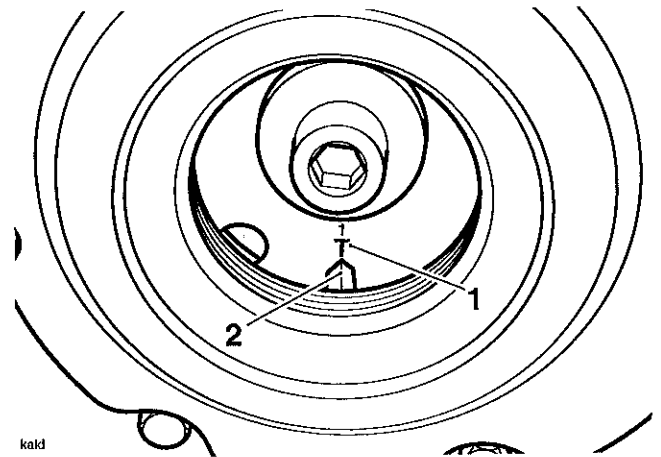
Tensioner Plunger Set-up

4. Fit the tensioner, complete with a new gasket, to the cylinder head and tighten the retaining bolts to 9 Nm.

Note:

- If fitting a new tensioner, observe the following:
 - Remove the new tensioner assembly from the packaging. On examination, it can be seen that the tensioner nut will not be tightened fully into the tensioner body and that the tensioner 'nose' (i.e., the part which actually contacts the chain rubbing strip) is fully retracted into the housing.
 - Prior to assembly into the engine it is necessary to disassemble the tensioner nut, washer and spring. To do this without damaging the internal components, turn the tensioner nut at least a half turn clockwise (i.e. tighten it further into the housing) until the plunger springs outwards. The tensioner nut can then be withdrawn safely without causing internal damage to tensioner components.
5. Remove the tensioner blade wedge, taking care not to move or damage the tensioner blade.

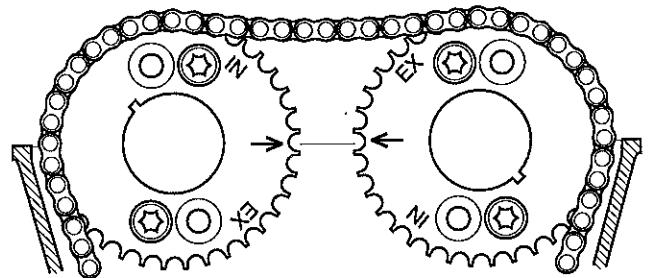
6. Fit a new sealing washer to the centre nut. Using finger pressure only, push the ratchet section of the tensioner into firm contact with the tensioner blade. Refit the spring and centre nut to the tensioner. Tighten the centre nut to 23 Nm.
7. Check that the tensioner plunger is correctly located in the middle of the tensioner blade when viewed from above.
8. Rotate the engine through 4 full revolutions, and reset number 1 cylinder to TDC. Ensure that the 'T1' mark on the sprag clutch aligns with the line at the bottom of the cover.



kald

1. 'T1' Mark
2. Marker line

9. Check that the camshaft timing marks align as illustrated below.



gaaa

Camshaft to Cylinder Head Alignment Marks

10. Re-check tensioner plunger location against the tensioner blade.
11. Refit the cam cover (see page 3-6).
12. Check the O-ring in the crank cover inspection plate. Renew as necessary.
13. Refit the crank cover inspection plate, tightening it to 18 Nm.

Cylinder Head

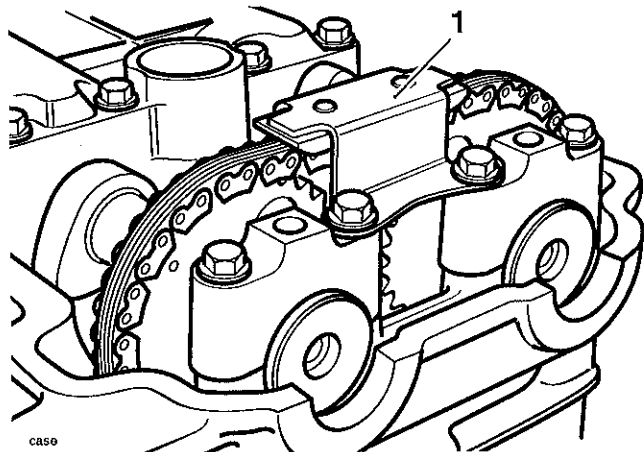
Camshafts

Removal

1. Remove the cam chain tensioner (see page 3-8).

Note:

- It is not necessary to remove the cam chain completely.
 - Each camshaft and sprocket is removed as an assembly.
 - Before commencing work, ensure the crankshaft T1 mark is in alignment with the line in the crank cover inspection plate.
2. Remove the cam chain top pad from the cam caps and cylinder head.



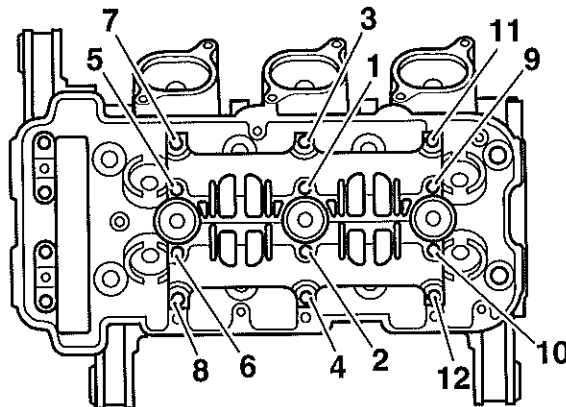
1. Cam Chain Top Pad
2. Cam caps

3. To ensure that all components are refitted in the same positions as prior to removal, mark the position of each cam cap and the orientation of the cam bearing ladder in relation to the head.

Note:

- A laundry marker or similar may be used to mark the cap positions.
4. Progressively release each of the remaining fasteners securing the individual cam caps to the cylinder head.
 5. Remove the caps.

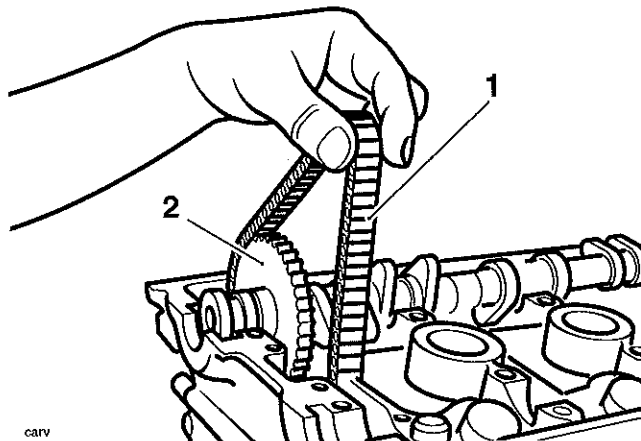
6. Progressively release the bolts securing the cam cap ladder to the head in the sequence shown below.



caqm

Cam ladder bolt release sequence

7. Remove the cam cap ladder and collect the dowels (if loose) and spark plug tower O-rings.
8. Lift the cam chain from the exhaust camshaft sprocket and remove the exhaust camshaft.
9. Repeat the procedure for the inlet camshaft.

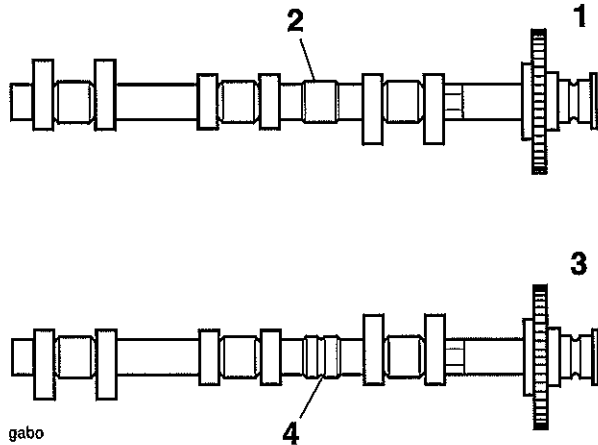


carv

1. Cam chain
2. Inlet camshaft

Note:

- The inlet and exhaust camshafts are different. They can be identified by a plain section in the centre of the exhaust cam and a groove in the same place on the inlet cam.



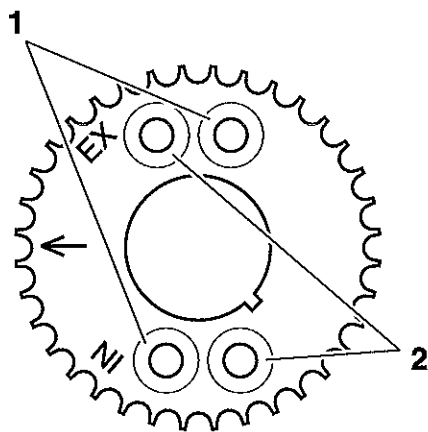
1. Exhaust Camshaft
2. Plain Section
3. Inlet Camshaft
4. Grooved section

Camshaft and Bearing Cap Inspection

1. Inspect the camshaft sprockets for damaged and worn teeth. Replace as necessary.

! Caution

The same sprocket is used for both inlet and exhaust camshafts. To attach the sprocket to the different camshafts, different bolt holes are used. Never fit a camshaft sprocket to a camshaft using incorrectly identified bolt holes. Severe engine damage will result from incorrect attachment.



1. Inlet Camshaft Bolt Holes
2. Exhaust Camshaft Bolt Holes

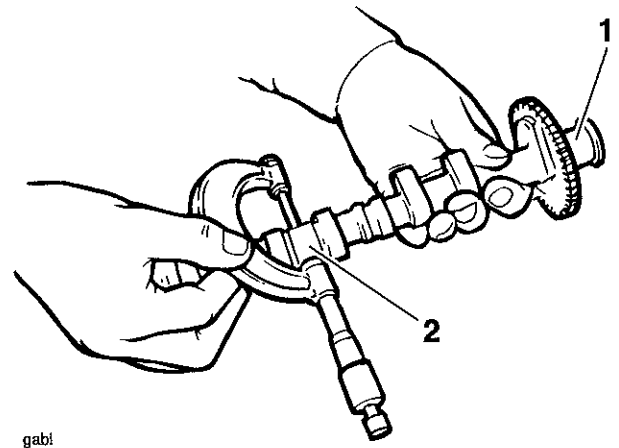
2. Measure the camshaft journals with a micrometer. If any journal is outside the specified tolerance, replace the camshaft.

Outrigger Journal Diameter

Standard:	22.953 - 22.956 mm
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Standard Journal Diameters

Standard:	22.93 - 22.96 mm
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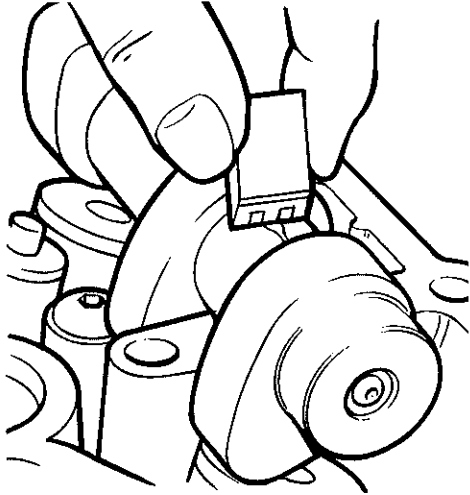
1. Outrigger Journal
2. Standard Journal

3. Examine all camshaft and camshaft bearing caps for excessive wear and damage, paying particular attention to the outrigger caps.
4. Check the journal-to-head clearances, using 'Plastigage' (Triumph part number 3880150-T0301) as follows:
 5. Ensuring that the camshaft sprocket alignment marking is located as for removal, assemble one camshaft to the head and progressively tighten the bearing caps and cam cap ladder to **10 Nm**.
 6. Remove the cam cap and cam cap ladder using the bolt release sequence given earlier. Wipe the exposed areas of both the camshaft journal and a single cap or cap area of the ladder.
 - Apply a thin smear of grease to the journal and a small quantity of silicone release agent to the cap.
 - Size a length of the Plastigage to fit across the camshaft journal. Fit the Plastigage to the camshaft journal using the grease to hold the strip in place.
 - Refit the cap and cam cap ladder then evenly and progressively tighten all the camshaft cap and ladder bolts to **10 Nm** in the correct sequence (see camshaft installation).
 - Release the cap bolts and remove the cap/ladder. Using the gauge provided with the Plastigage kit, measure the width of the now compressed Plastigage.

Cylinder Head

Note:

- The camshaft caps and ladder are unique to each cylinder head and are, therefore, not available individually. If a camshaft cap or the ladder is worn or damaged, the complete cylinder head must be replaced.



Measuring The Compressed Plastigage.

- Calculate the journal clearance using the Plastigage chart supplied with the Plastigage kit.

Camshaft journal clearance, Standard

Standard:	0.040 - 0.091 mm
Service limit:	0.13 mm

Camshaft journal clearance, Outrigger

Standard:	0.044 - 0.068 mm
Service limit:	0.13 mm

- If the clearance measured is within the specified tolerance, remove the cap/ladder and clean off all traces of Plastigage. Assemble the camshafts.

Note:

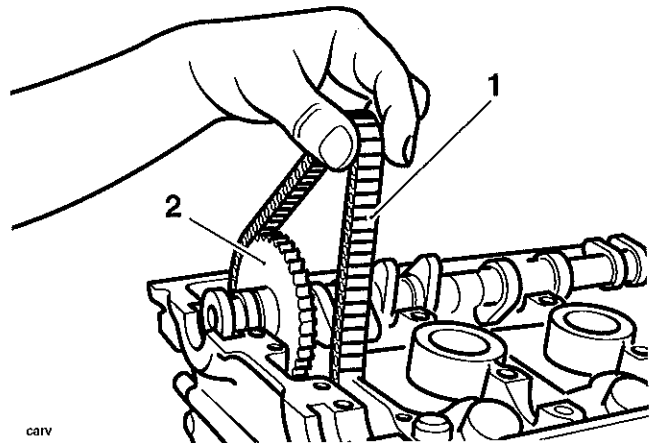
- If the measured clearance is outside the tolerance, and the camshaft journals are within tolerance, the cylinder head must be replaced.

Caution

Although Plastigage is oil soluble, all traces of the material must be removed to prevent blockage of the oil drillings and resultant engine damage.

Installation

- Thoroughly clean the camshafts and journals. Inspect the ends of the camshafts for correct fitment of the sealing plugs. Lubricate the camshafts with clean engine oil before fitting to the head.
- Locate each camshaft to the head ensuring the camshafts are correctly identified (inlet and exhaust) and are also correctly located over their respective valve banks.
- Working on one camshaft at a time, locate the cam chain over the cam sprocket. Position the camshaft in the same position as for removal before attempting to fit the caps and ladder (that is, with the timing marks on the camshaft sprockets level and pointing inwards, and with the 'T1' mark on the sprag clutch in alignment with the line at the bottom of the cover).



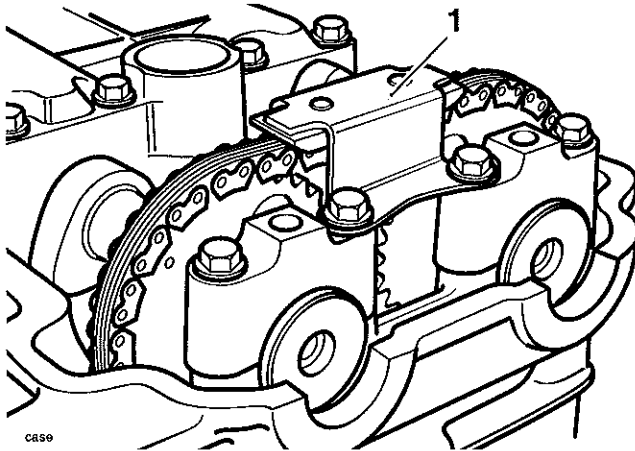
- Cam chain
- Inlet camshaft

- Repeat the procedure for the other camshaft.

Caution

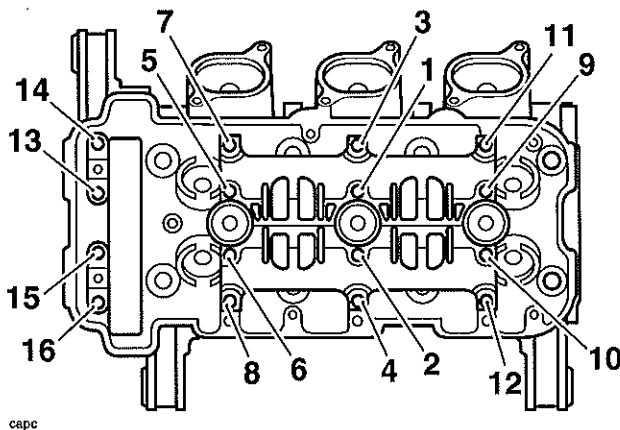
If the camshafts and caps/ladder are fitted without first aligning the timing marks on both the crankshaft and camshaft sprockets, the inlet and exhaust valves will contact each other causing damage to both the head and the valves.

- Assemble the cam caps, dowels, cam ladder and top pad in the same location and orientation as prior to removal.



1. Cam Chain Top Pad

- Fit and evenly tighten the cam cap screws to **10 Nm**, in the sequence shown below.



Cam-cap and ladder bolt tightening sequence

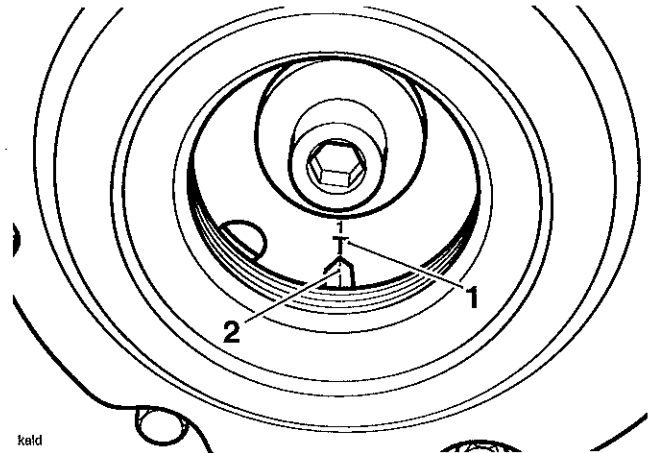
- Before fitting the cam chain tensioner, ensure that each camshaft rotates freely. Do not rotate either camshaft by more than 5°.

⚠ Caution

If any components have been renewed, the valve clearances must be checked and adjusted. Running with incorrectly adjusted valve clearances may cause excess engine noise, rough running and engine damage.

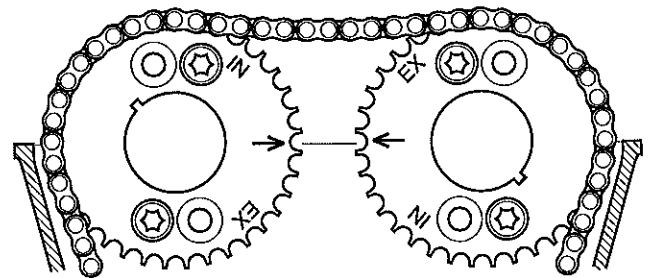
- Assemble the cam chain tensioner using the instructions given earlier in this section.

- Rotate the engine through 4 full revolutions, and reset number 1 cylinder to TDC. Ensure that the 'T1' mark on the sprag clutch aligns with the line at the bottom of the cover.



- 'T1' Mark
- Marker line

- Check that the camshaft timing marks align as illustrated below. Rectify any misalignment before proceeding.



Camshaft to Cylinder Head Alignment Marks

- Check the valve clearances. Adjust as necessary (see page 3-14).
- Refit the cam chain tensioner (see page 3-9).

Valve Clearances

Camshaft, valve, valve shim and valve seat wear affects the valve clearances. The effect of this wear is to change the gap between the camshaft and tappet bucket, causing engine noise and improper running. If the valve clearances become too small, permanent damage to the valve and valve seat will take place. If the valve clearance becomes too great, the engine will become noisy and will not run correctly.

Cylinder Head

Valve Clearance Measurement

Note:

- Valve clearance measurement must be carried out with the engine cold.

1. Remove the cam cover (see page 3-5).
2. Remove the spark plugs to reduce compression resistance when turning the engine.
3. Select a high gear and, using the rear wheel, turn the engine until a pair of camshaft lobes are positioned pointing away from the valves.
4. Using feeler gauges, measure and record the clearances for this pair of valves only.
5. Repeat the process until the valve clearances for all valves have been checked.

NOTE:

- If the measurement does not fall within the specified range, adjustment must be made.

Note:

- The correct valve clearances are in the range given.

Inlet:	0.10 - 0.20 mm
Exhaust:	0.20 - 0.30 mm

Caution

If the valve clearances are not checked and corrected, wear could cause the valves to remain partly open, which lowers performance, burns the valves and valve seat and may cause serious engine damage.

6. Record the measured valve clearances on a chart similar to the example shown.

Typical Valve Clearance Chart

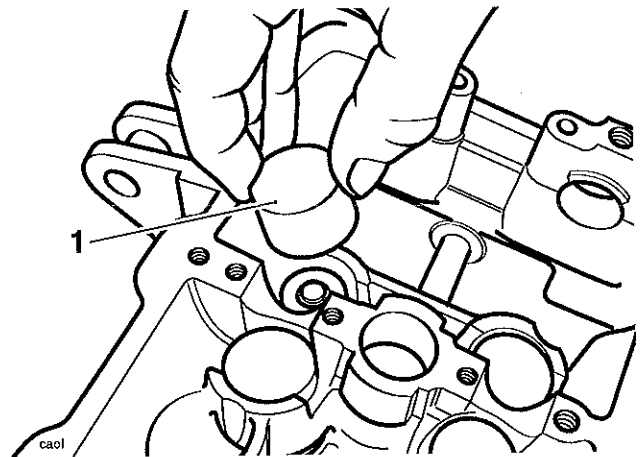
Inlet Valve No.	Gap Measured
1	as measured (mm)
2	as measured (mm)
3	as measured (mm)
4	as measured (mm)
5	as measured (mm)
6	as measured (mm)
Exhaust Valve No.	Gap Measured
1	as measured (mm)
2	as measured (mm)
3	as measured (mm)
4	as measured (mm)
5	as measured (mm)
6	as measured (mm)

Valve Clearance Adjustment

Note:

- To adjust the valve clearances the camshafts must be removed. Follow the camshaft removal procedure (see page 3-10).

1. Remove the camshafts (see page 3-10).
2. Remove the tappet bucket from the cylinder head.

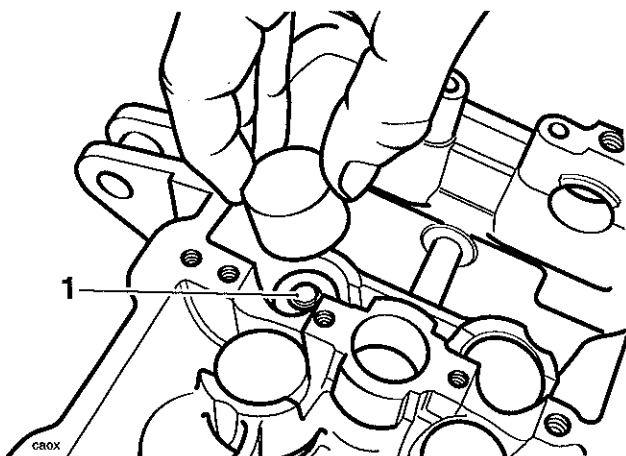


1. Tappet bucket

Note:

- The shim may withdraw with the tappet bucket.

- Remove the shim from the valve head.



1. Shim

- Measure the original shim, using a micrometer and select the appropriate new shim as required.

Clearance too small:

- Fit a thinner shim.

Clearance too large:

- Fit a thicker shim.

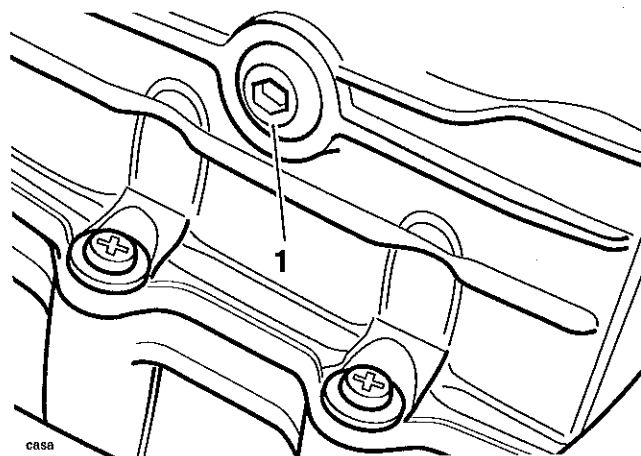
Note:

- Shims are available ranging from 1.70 mm to 3.00 mm in increments of 0.025 mm.
- Fit the new shim to the valve head.
 - Lubricate the tappet bucket(s) with a 50/50 solution of engine oil and molybdenum disulphide grease.
 - Refit the tappet bucket.
 - Refit the camshafts (see page 3-12).
 - Re-check all valve clearances.
 - Repeat the procedure if the valves require further adjustment.

Cam Chain

Removal

- Remove the camshafts (see page 3-10).
- Remove the starter gear cover (see page 7-20).
- Remove the right hand crank cover (see page 7-20).
- Remove the sprag clutch and drive gear (see page 7-20).
- Remove the bolt from the centre of the cam chain housing in the cylinder head.



1. Centre Bolt

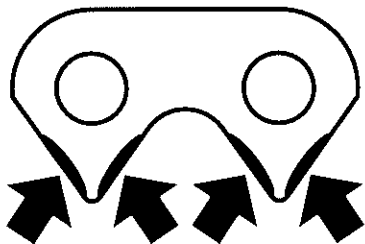
- The cam chain is removed from inside the head-space or through the crankcase, after first detaching the chain from the crankshaft gear.

Cylinder Head

Inspection

Visual in-situ checks can also be made as follows:

1. Check for significant blue discolouration of the chain plates indicating excessive heat build-up.
2. Examine all pins for signs of rotation.
3. Check for cracking or deep scratching of the chain plates.
4. Check for severe wear of the inner plates as indicated in the diagram below.



ccrv

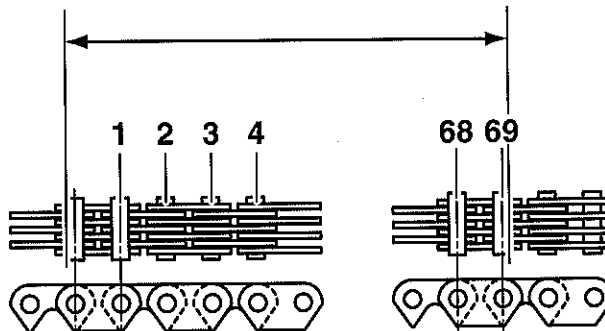
For a more thorough check, proceed as follows:

1. Remove the chain from the engine.
2. Suspend the chain from a pin or hook with a 13kg weight attached at the lower end.



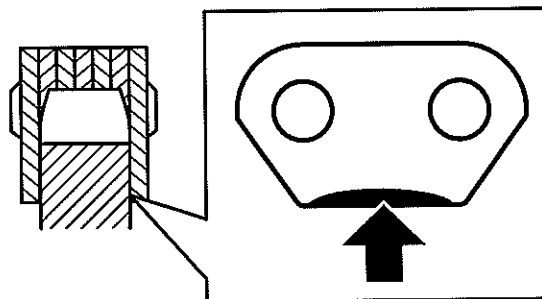
cajs

3. Measure across 69 links as shown in the diagram below. If the chain is within limits, the measurement should be no longer than 147.63 mm. Measurements beyond 147.63 mm indicate that the chain must be replaced.



cajt

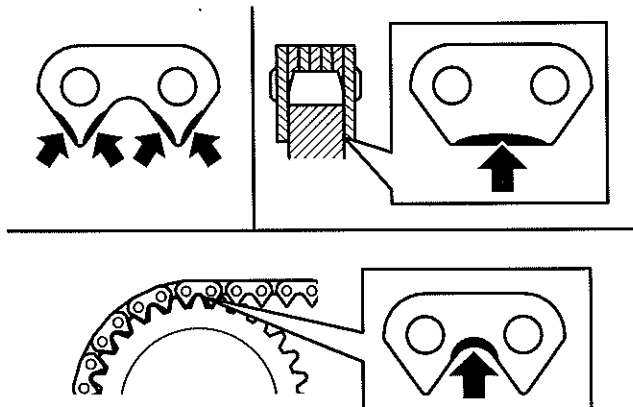
4. Check for severe wear of the inner surface of the outer plates at the side-contact points with the sprocket teeth.



ccru

5. Check for signs of stiffness or kinking.

6. Check for severe wear of the plates in the area shown below.



caju

If any of these symptoms are evident, the cam chain must be replaced.

Installation

1. Fit the cam chain and locate the lower end around the crankshaft gear.
2. Refit the bolt to the centre of the cam chain housing in the cylinder head, tightening to **10 Nm**.
3. Refit the camshafts (see page 3-12).

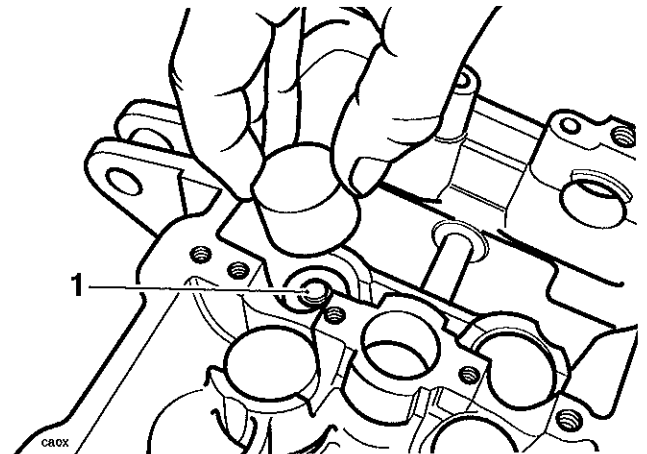
Cylinder Head

Removal

Note:

- The rubbing blades for the cam chain protrude from the crankcase such that removal of the head while in the frame is made extremely difficult and may lead to damage to the head, rubbing blades and frame.

1. Remove the engine from the frame (see page 9-2).
2. Remove the camshafts (see page 3-10).
3. Note the position of all tappet buckets and shims such that they can be refitted in the same positions. Remove all the tappet buckets and shims.



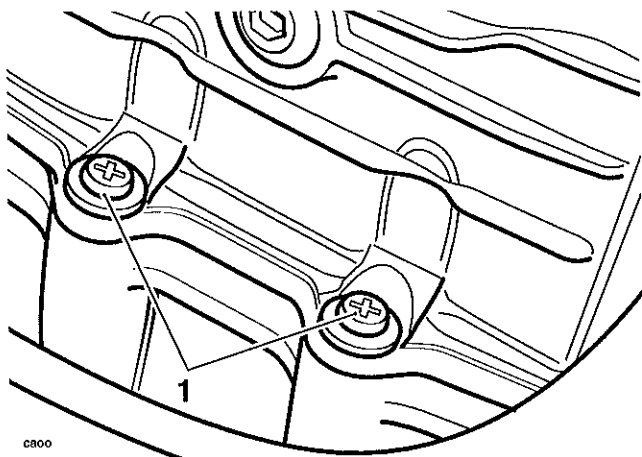
1. Shim

Note:

- To prevent the tappet buckets and shims from becoming mixed, place the shim and tappet together in a marked container. The components must be refitted in their original positions.

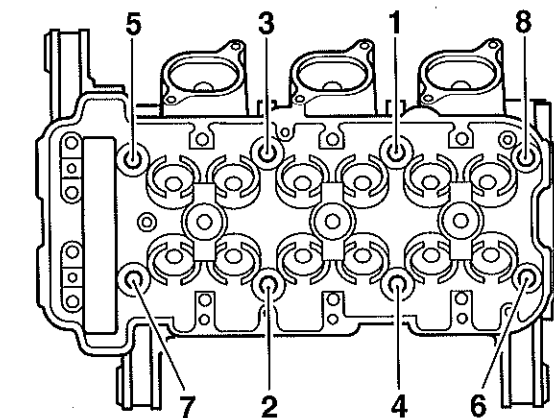
Cylinder Head

4. Release the screws securing the outside of the cylinder head to the upper crankcase.



1. Cylinder head to upper crankcase screws

5. Progressively release the cylinder head bolts in the order shown below.

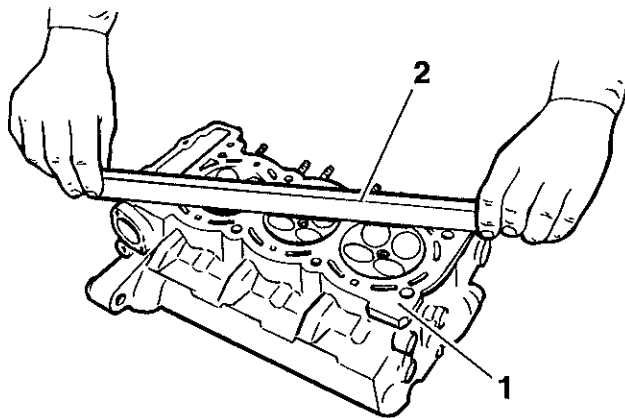


Cylinder head bolt release sequence

6. Lightly tap the cylinder head with a rubber mallet to break the seal of the gasket.
7. Lift the head directly upwards until clear of the cam chain rubbing blades

Inspection

1. Thoroughly clean the surface of the head and check for damage and pitting of the combustion chambers.
2. Using a straight edge, check the cylinder head gasket face for warp which could lead to gasket failure. Replace the head if warped.



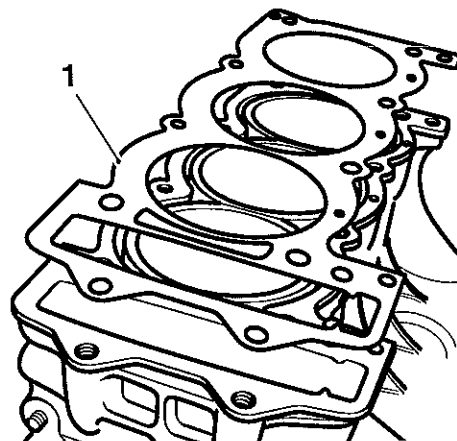
1. Straight edge

2. Cylinder head gasket face

3. Check the cam chain rubbing blade. Renew if worn or damaged.

Installation

1. Thoroughly clean the upper faces of the crankcase taking care not to damage the mating surfaces.
2. Fit a new cylinder head gasket ('top' marking uppermost) ensuring that the head to crankcase location dowels are correctly in place.



1. Cylinder Head Gasket

3. Ensure that the cylinder head face is completely clean.
4. If removed, install the cam chain rubbing strips.

- Carefully lower the cylinder head over the cam chain and rubbing strips and locate the head onto the dowels.

⚠ Caution

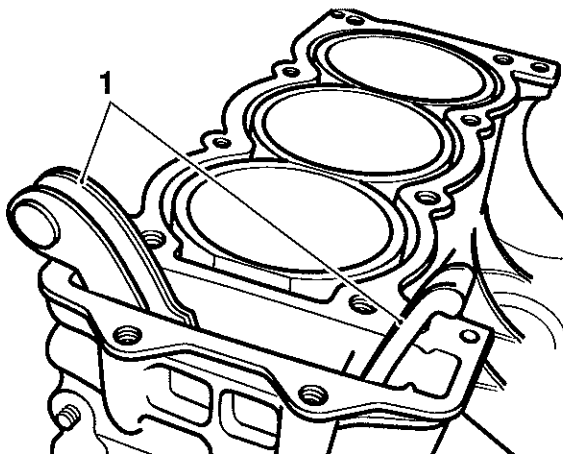
Using the correct procedure to fit and tighten the cylinder head bolts will ensure the long term reliability of the cylinder head gasket.

Clean each bolt, paying particular attention to the threads and under-bolt-head areas. If any of the threads or bolt-head areas are damaged, replace the bolt(s).

Lubricate the threads with engine oil, and then wipe clean with a lint-free cloth leaving minimal oil on the threads (that is, almost dry to touch).

Tighten the bolts using the three-stage procedure given below.

Failure to observe these important items may lead to engine damage through a damaged head gasket.



cars

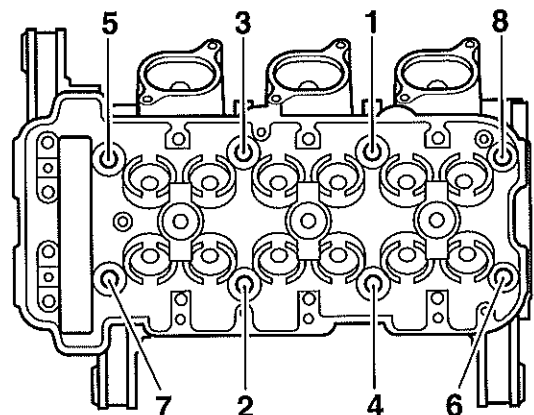
1. Rubbing strips

- Fit the bolts to the head and tighten until finger tight. The head bolts are finally tightened in three stages. This is to ensure that the cylinder head gasket seals correctly to the head and crankcase. The three stages are as follows:

Note:

- For stages A and B of the head bolt tightening operation, a torque wrench of known, accurate calibration must be used.
- A:** Tighten the head bolts, in the same numerical sequence used to release the bolts, to 20 Nm.
- B:** Tighten the head bolts in the same numerical sequence used to release the bolts, to 35 Nm.

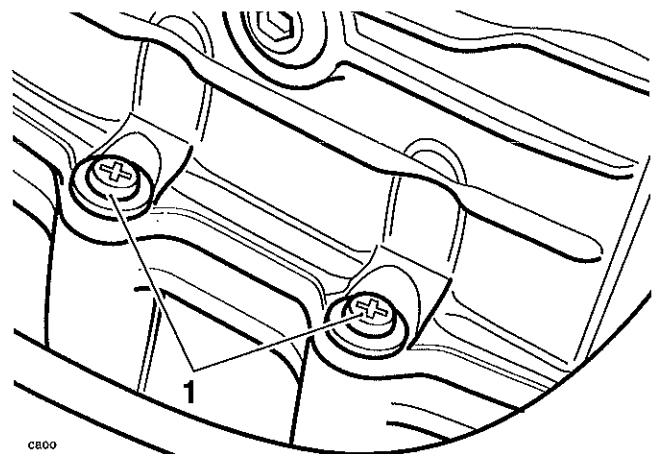
- For the final torque operation, which again is carried out in the same numerical sequence used to release the bolts, a 'torque turn' method is used. The bolts must be turned through 90° to reach the final setting. To accurately gauge the 90° turn, use service tool 3880105-T0301 as follows:
- Fit the tool between the torx socket and the drive handle and locate the torx drive to the head bolt. Pick an increment point on the torque turn gauge which aligns with a suitable reference point on the head. Tighten the bolts until 9 of the 10° gauge increments have rotated past the chosen point on the head.



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Cylinder head bolt tightening sequence

- Fit the screws securing the side of the cylinder head to the crankcase and tighten to 10 Nm.



CB00

1. Cylinder head to upper crankcase screws

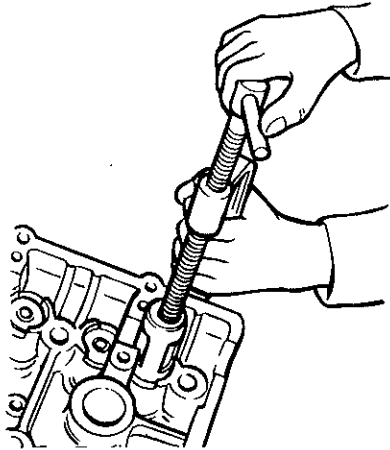
- Clean and lubricate the tappet buckets with clean engine oil and refit the buckets and shims in the same locations from which they were removed.
- Refit the cam shafts (see page 3-12).
- Install the engine to the frame (see page 9-5).

Cylinder Head

Valves and Valve Stem Seals

Removal from the Cylinder Head

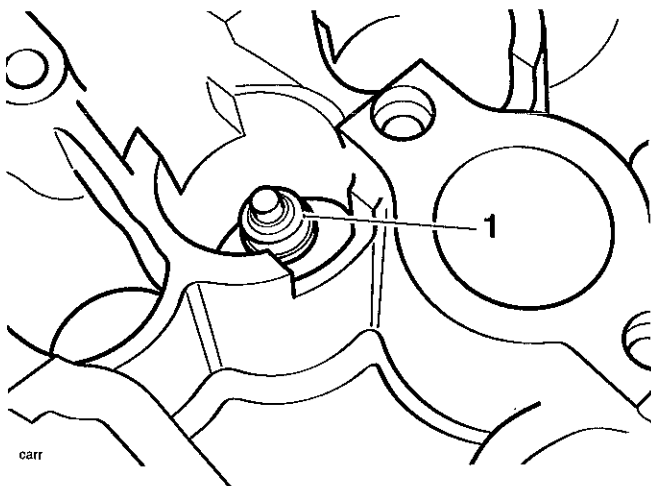
1. Remove each valve from the head using a valve spring compressor. The compressor must act on the top cup to allow removal of the valve collets.



gadh

1. Valve Removal

2. Once the collets are released, remove the following items:
 - collets
 - valve spring cap
 - valve spring
 - valve stem seal
 - spring platform
 - valve (de-burr before removal)

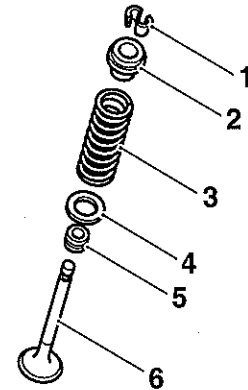


carr

1. Valve stem seal

Note:

- Ensure inlet and exhaust valve components do not become mixed.



1. Collets
2. Valve spring retainer
3. Valve spring platform
4. Valve spring base
5. Stem oil seal
6. Valve

Installation

1. Apply a thin coat of molybdenum disulphide grease to the valve stem.
2. Install the valve into the valve guide and refit the spring platform to the valve spring recess in the head.
3. Fit the valve stem seal over the valve stem and, using a suitable tool, press down fully until the seal is correctly seated over the valve guide.

Note:

- During fitment of the valve stem seal, two distinctly different degrees of resistance will be noted when the seal is correctly fitted.
- Firstly, press the seal down the valve stem until the lower side of the seal comes into contact with the valve guide. Greater resistance is felt at this contact point and further gentle pressure is then required to locate the seal over the top end of the valve guide.
- On application of this pressure, the seal can be felt to positively locate over the top face of the valve guide. Once correctly positioned, the seal cannot be pushed down any further.



Caution

Incorrect fitment of the valve stem oil seals could lead to high oil consumption and blue smoke emissions from the exhaust system. Do not use excessive force in fitting the seal as this may break the seal ring.

4. Install the valve spring over the valve stem.
5. Compress the valve spring ensuring that the spring is compressed squarely to prevent damage to the valve stem and cylinder head.
6. Fit the valve collets ensuring correct collet location in the spring cap and valve as the spring compressor is released.



Caution

Always check for correct location of the valve collets during and after assembly. If not fitted correctly, the collets may become dislodged when the engine is running allowing the valves to contact the pistons. Any such valve to piston contact will cause severe engine damage.

Valve to Valve Guide Clearance

If the valve guides are worn beyond the service limit given below, the cylinder head must be replaced.

Valve Stem to Guide Clearance

Inlet:	0.010 - 0.040 mm
Exhaust:	0.030 - 0.060 mm

Valve Guides

If a valve guide is found to be worn beyond the service limit, the complete cylinder head must be renewed.

Valve Face Inspection

1. Remove any carbon build-up from the valve head area. Examine the valve seat face, checking in particular for signs of cracking or pitting.

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