MOTOR CYCLE MECHANICS

OCTOBER 1976 30p

WIN A 400 YAMAHA COMPETITION DETAILS INSIDE

IS DAVE TAYLOR
WHEELIE MAD?

HONDA 750 ENGINE REBUILD

HOW TO SERVICE THE KAWASAKI Z400/750

TUNING THE HONDA 400

SUZUKI GT 380 TEST

EURO-TESTING THE GUZZI 850s

SIMPLE SERVICE

KAWASAKI 400/750 FOUR-STROKES

THERE is a malicious rumour going around that some Japanese bikes are incredibly complicated to service so when I went down to Kawasaki UK to get the gen on their four stroke twins I was surprised to find that the service procedure was so straight forward.

On the other hand there are certain items of adjustment where it is incredibly easy to get into a mucking fuddle and do unthinkable horrors to your engine's internals. The answer is to hurry slowly on these dodgy points and if you are in any doubt leave it alone and seek experienced help. Having frightened off most owners from attempting a service I could pack up and go home but as that would leave four blank pages in the mag I propose to cover the Z400 first in detail and then go on to the 750.

It is best to start the service after a short run when the oil will be warm and therefore flows that much more readily. After throwing yourself to the ground alongside your trusty steed you will observe the oil drain plug nearest the front wheel. Only use a good fitting ring spanner on this or there is a very real possibility of rounding it off. After draining the oil the drain plug should be re-fitted and tightened up, do not leave it until later or you might leave it out altogether. If you have not already rolled your sleeve up now is the time to do it as the next job is always a mucky one. The oil filter has to be removed from the underneath and there is no way that you can remove it without lubricating your arm at the same time. The best method to employ here is to loosen the centre bolt and then allow the oil to run into a catch tank only removing the filter after the oil has stopped dripping.

ENGINE OIL

Going by the book you should now fill the engine with 10/40 oil but as this is not that easy to get, as yet, you can use 20/50 multigrade, 3 litres being the exact amount. The sight window is only a low warning level check and will be covered completely after filling the engine so do not worry, you have not over filled the engine.

Armed with a good cross head screwdriver, preferably a "T" bar type you can remove all the covers in one go to save time, there are two for the tappet adjusters, one for the clutch and one for the points. Having exposed the tappet adjusters to daylight you cannot actually adjust the tappets until you remove the plugs on either side thus providing somewhere to stick your feeler(?). Be very careful when refitting these, as they are very easy to shear off in the head. At this stage it is wise to remove the spark plugs so that the engine can be turned over with a ring spanner on the points end of the crankshaft. Having selected a nice long ring spanner for this operation and positioned it on the end of the crankshaft you must continually remind yourself that this engine runs BACKWARDS. This is necessary as the primary drive is by direct chain so that the gearbox would otherwise run backwards. Five reverse gears may have some dubious advantage on a combination but it's not very clever on a solo.

The Z400 is somewhat prone to leaking head gaskets and if you have to pull the head down make sure that the engine is cold, this also applies to the tappet adjustment. This does not mean that you have to sit around all day waiting for the thing to go stone cold, as long as you can hold your hand on the head without getting first degree burns it is cold enough. If you do have to torque the head down this must be done in number order from one to eight, after removing the petrol tank.

Using the ring spanner that is still hanging from the end of the crankshaft turn the engine (backwards) so that the right hand cylinder is on its compression stroke, then peeking through the hole in the points back plate align the T mark (see pic) opposite the lug. You can now set the tappets on the right hand cylinder.

The gap is altered to the required four thou by screwing the adjuster in or out and then locking it in position. A word of warning here, on the end of the adjuster there is a centre punch mark positioned to one side of the screwdriver slot, this half of the adjuster must always face inwards. This tappet adjustment will take some time until you get used to doing them as when you lock the adjusting nut the gap will alter even though the centre screw is held. The answer is to always finish turning the screw on a tightening movement. If you overtighten then back right off and start again. The directions for tightening etc are marked on the head as + or −. Now turn the engine through 360° and reset the engine to the T mark, then adjust the left hand tappets.

If you think that the tappet adjustment is confusing it will soon appear relatively simple compared to the cam chain adjustment. This is one of those jobs that is very easy to do and even easier to do wrongly. The Book states that after removing the chain tensioner cap and O ring between the front of the barrels the engine is turned over with a ring spanner until the plunger in the centre of the adjuster is in its innermost position. The push rod guide is then unlocked and screwed in until flush with the plunger. The plunger should at no time protrude beyond the guide.

This seems quite straight forward until you try it and find that the cam lobes, as they go over max lift, pull the chain about and alter the tension. This causes the plunger to flick in and out as the cam chain tension varies and

By Dave Walker

appears to even confuse the experienced fitter. If you should overdo the adjustment then in a short time the rubber will be stripped off the slipper tensioner and it will cost you around £40 labour to have a new one fitted. The answer is, if in doubt, leave it on the slack side rather than tight.

The ignition side of the engine is the next item to tackle and this really is quite simple only having

1 Drain the oil when it is still warm so that it flows freely, don't forget to refit the drain plug.



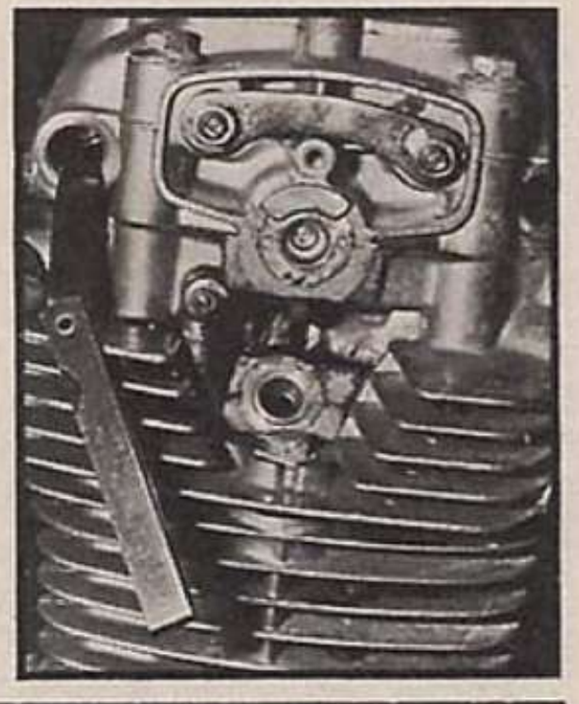
2 Yuk! there is no way to avoid this mucky hand on every other service when the filter must be changed.



3 The engine is set to the T mark as here to adjust the tappets. The F mark is for ignition timing.

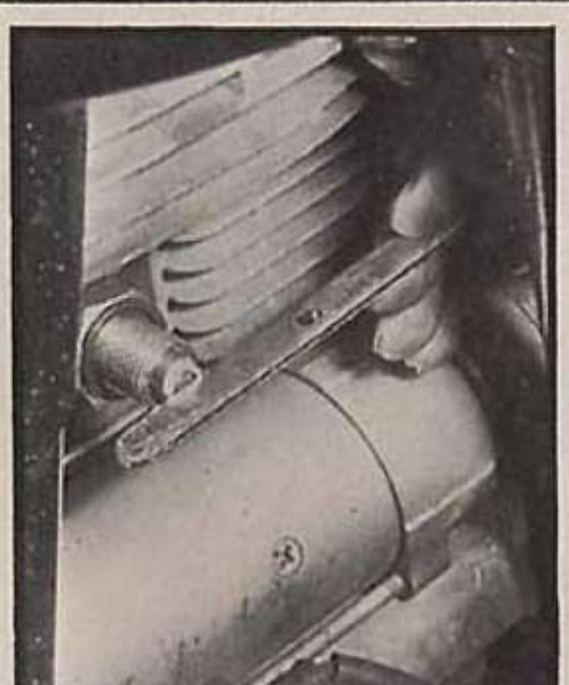


4 Tappet adjusting screws seen here are marked + and −, note the Dots on each screw face inwards.





5 The dreaded cam chain adjustment! Take great care not to over adjust this, it could cost you plenty.



6 Cam chain adjuster must be set so that the centre pin is just level with the outer adjusting nut.



7 Don't loose this sealing rubber or the plugs short out in the wet. It is illegal to remove the metal shroud.



8 Throttle cable settings should be made at the carb end. Do not over adjust the closing cable.

one set of points. The first job is to inspect the point faces to see if they are worth gapping. Any small spots of roughness can be cleaned off with a points file NOT wet and dry paper. With the points at maximum lift the gap is set to 0.35mm or if you have a dwell meter to 185/195 degrees.

Having set the gap correctly there are two ways to do the timing, static or with a strobe light. In either case you use the F mark visable through the points back plate. For static timing the points must be just opening with the F mark lined up with the lug on the engine. The better method is to use a strobe light lining up the marks as before. One small point to watch for here is that after moving the back plate to set the timing the three locking screws must be tightened, before the final check, as this can alter the timing. Having set the timing on idle the auto advance is checked by bringing the engine revs up above 3000 and checking that there are now two lines opposite the fixed lug. All that is now required before refitting the points cover is to put a couple of drops of oil on the pad that lubricates the contact breaker heel.

On the engine side of the service there is now only the carb balance and adjustment to attend to. I am not going into this in detail as I do not want to tempt the inexperienced owner into having a go at the carbs, you will only end up pushing the bike round to a dealer for him to sort out. For those readers that have a fair amount of experience with carb adjustments the vacuum gauge take off point is just above the throttle spindle and the pilot screws just below, they are sensitive to $\frac{1}{32}$ of an inch of movement.

Before moving on to servicing the cycle parts just a word about the spark plug caps fitted to these bikes. The reason that the plug caps leak in wet weather is that the sealing rubber in the centre of the cap goes missing and the water finds its way inside the cap. If the rubber is there the cap will work as it should. It is ILLEGAL to remove the outer metal case from this suppression cap.

With the engine side of the service finished you can turn your attention to the cycle parts. Starting at the front of the bike and working towards the rear. The spokes can be checked for tension by pinging them with a small metal object (not a hammer) and make sure that the valve caps are in place. The brake pad wear can be checked by pressing your nose against the disc and visually checking the thickness of the pad, a thin red minimum wear line is marked on all Kawasaki pads. The rear brake has an indicator for the brake lining wear. If you have to fit new pads do not split the caliper but remove it from the fork leg or take out the wheel. Pads are marked A and B for inner and outer.

Still down at the front wheel check the mudguard stay between the fork legs as this also acts as a brace and can effect the handling if loose. Tyre

wear is an obvious check. The front fork oil should be changed every 2500/3000 miles and is drained from the 10mm bolt at the bottom of the fork leg and filled at the top (after removing the top nut). Do one side at a time and pump the forks to remove all the old oil. Use TQF auto transmission fluid 150/170cc in each leg.

After putting the top nuts back on the forks check the stem head clamp bolts, only with a torque wrench. These are designed to break on impact and if you overtighten them they could stretch and one day break on the road and catapult you over the handlebars! Keeping to the top of the fork area check the steering head bearings by pulling to and fro on the fork legs, there should be no movement. But the bars should still be free enough to fall from side to side under their own weight. They can be adjusted by slackening off the centre pinch bolt and loosening the top centre nut, then adjusting the bearing preload with a C spanner. Recheck after tightening all clamps.

This brings us to the clutch cable and push rod adjustment. The cover for the push rod adjuster should still be off the bike and close to hand (unless you have lost it by now) and this can be set after the cable has been slackened right off at both adjusters. Unlock the outer nut and screw in the rod until resistance is just felt, then back off one half a turn and lock up. Next set the handlebar adjuster at 5/6mm out to ensure a smooth pull at the inner cable, ie not rubbing against the outer sleeve. Last of all set the centre cable adjuster to give one eighth inch play at the handlebar lever. At the other end of the handlebar brake lever has an adjuster and locknut to pre-set the free play in the brake lever, allow at least $\frac{1}{8}$ inch play.

The throttle cable should be adjusted at the carb end making sure that the closing wire has sufficient play to avoid bending the carb bracket if the twistgrip is forced closed. One point that is often overlooked on this machine is that of greasing the rear swinging arm, this has to be pumped with grease until it can be seen squeezing from the end bushes, if not they soon wear and upset the road holding.

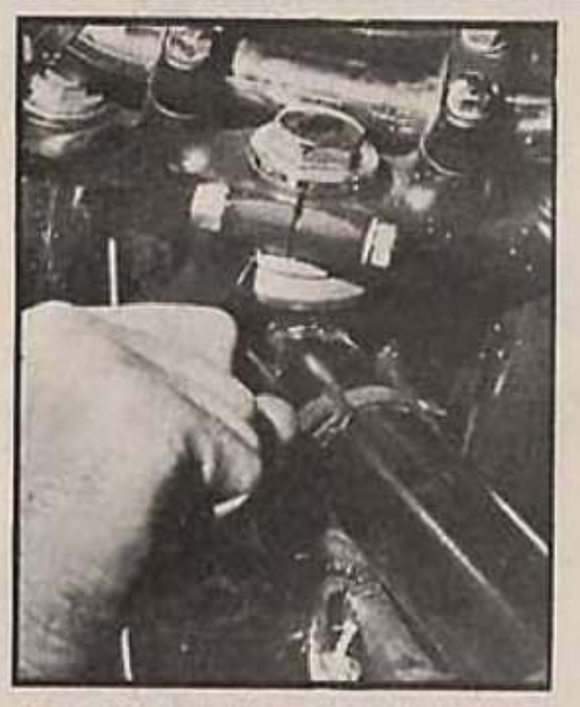
Other than the common sense



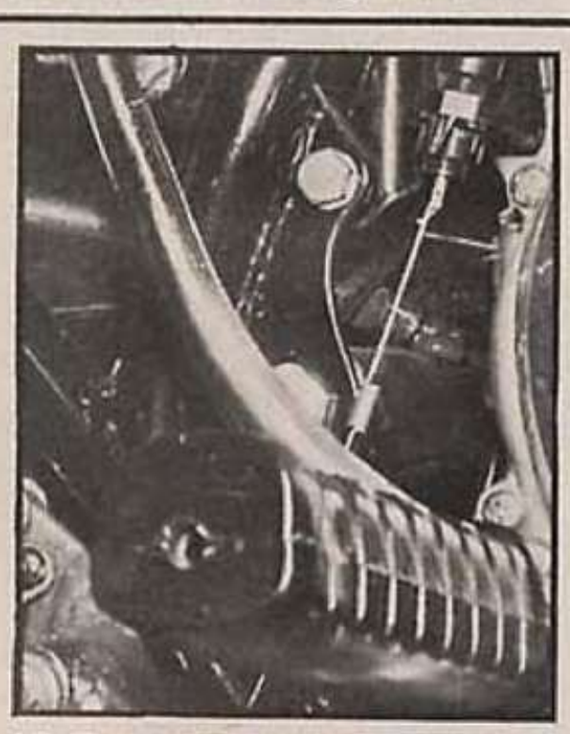
9 After adjusting the clutch push rod a squirt of chain lube will help stop the nylon cam sticking.



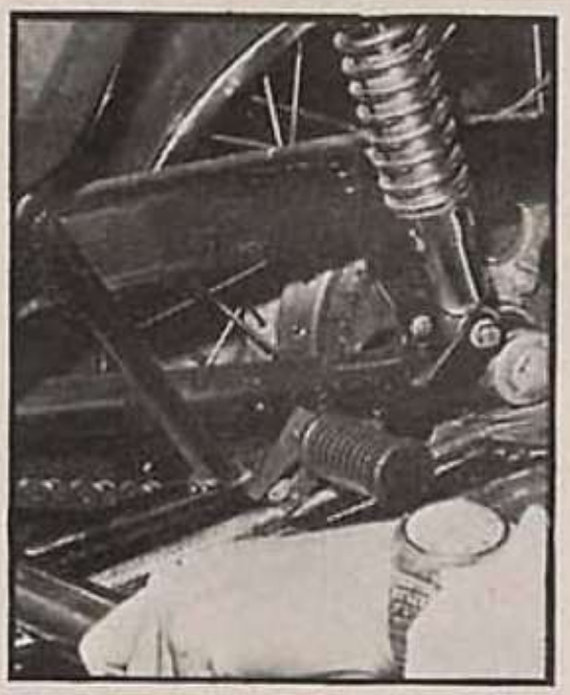
10 It is vital that you only use a torque wrench when checking the tightness of the top yoke pinch bolt



11 A "C" spanner adjusts the steering head bearings, tighten the pinch bolt and top nut afterwards.



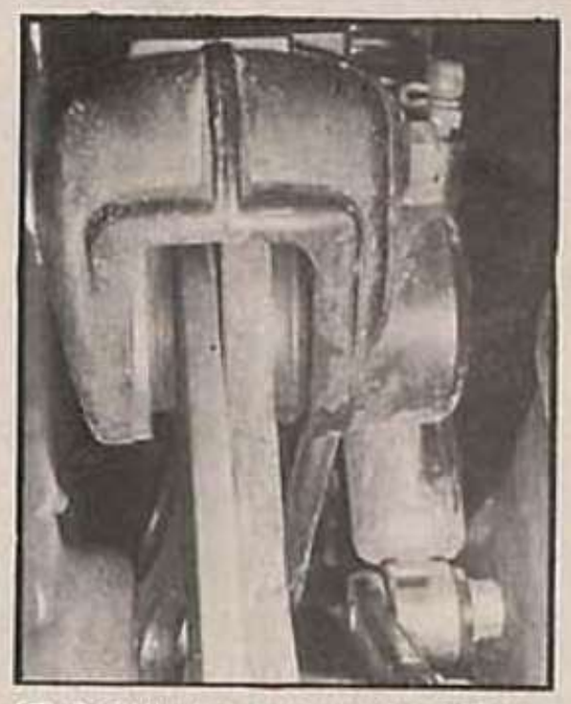
12 This point is often overlooked, grease the swinging arm until you can see the grease coming out.



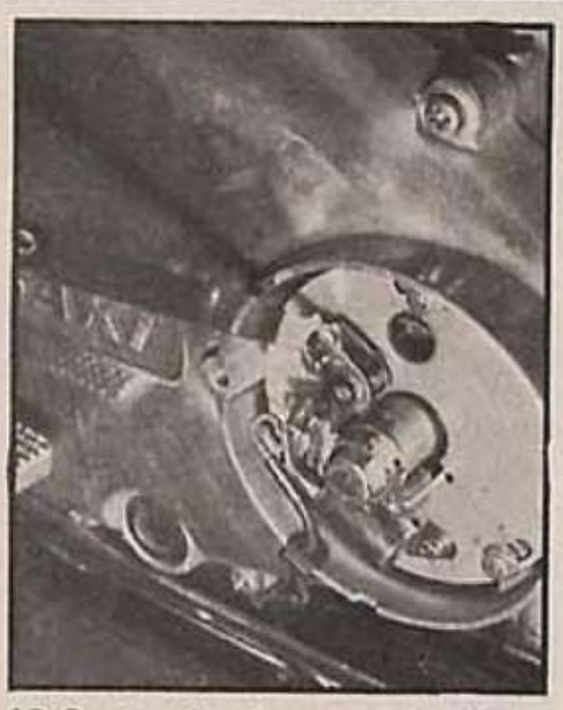
13 After adjusting the drive chain tension as shown here the main nut is fully tightened.



14 Check that these main cables have not been run under the engine mounting lug or chain cuts through.



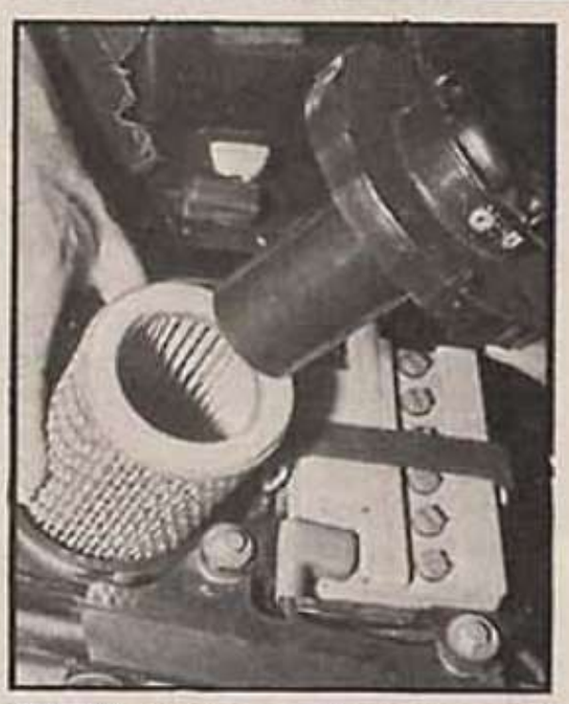
17 Rear brake pads on the 750 are clearly visible, wear line on the left, (worms eye view).



18 Contact breaker assembly is the same for both models, contact point gap is set to 0.3 to 0.4mm.



19 Ignition timing by strobe light. The F mark should line up on idle and the double lines on full advance.



20 750 air cleaner, check at regular service intervals, it's easy to forget hidden under the seat.

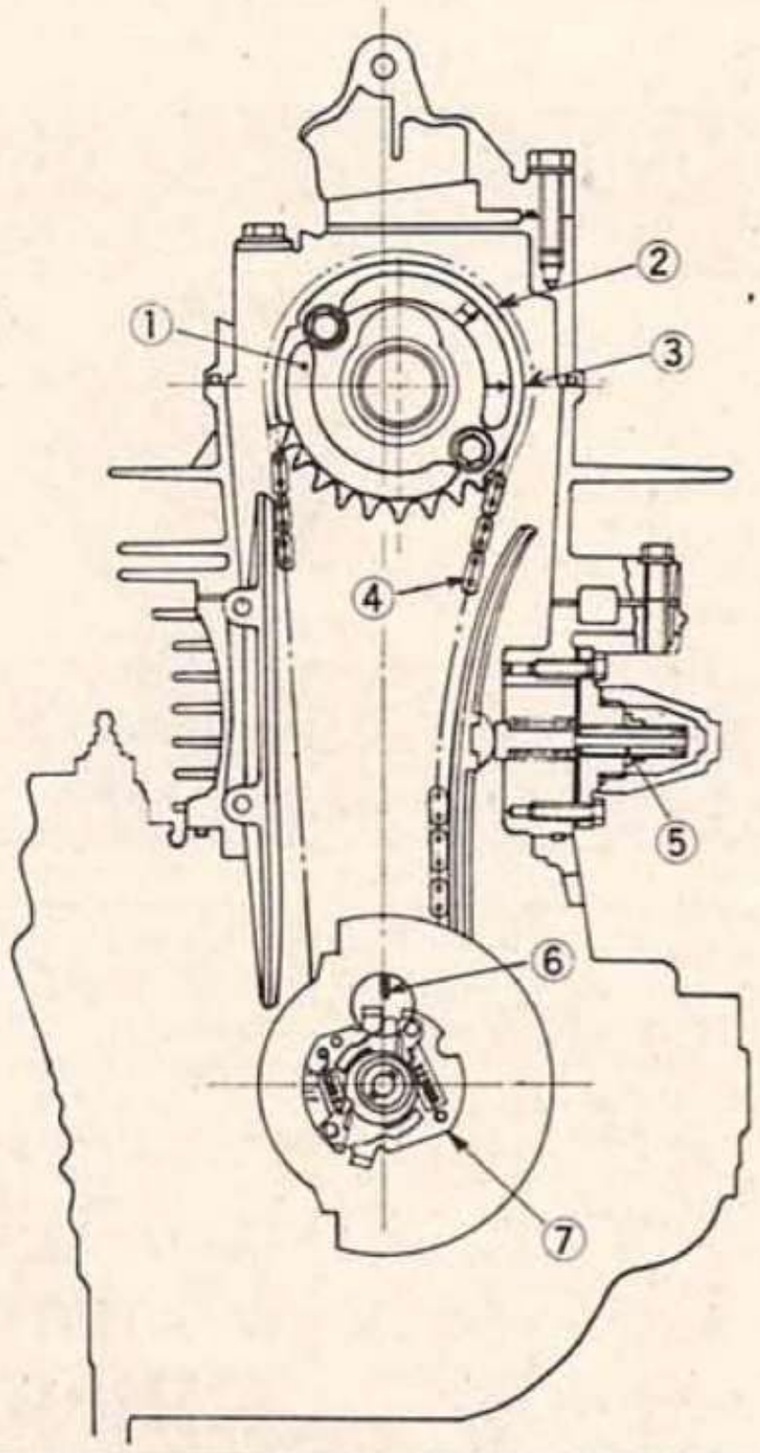
FOUR~STROKES

checks such as wheel tightness and chain adjustment etc that covers the service for the Z400 range.

The main difference between the 750 and the 400 is in the valve operation ie the 750 having twin overhead camshafts but the method for adjusting the chain tension remains the same (bloody awkward). The oil filter is attended to at the same intervals but is located on top of the crankcase at the near side and is fitted with a drain plug. Since the tappet adjustment is carried out by the bucket and shim method and a special tool is needed for this operation it is best to confine yourself to just checking the gaps and let a dealer do any shimming that may be required. Ignition timing is exactly the same except that the full advance does not come in until 3900rpm.

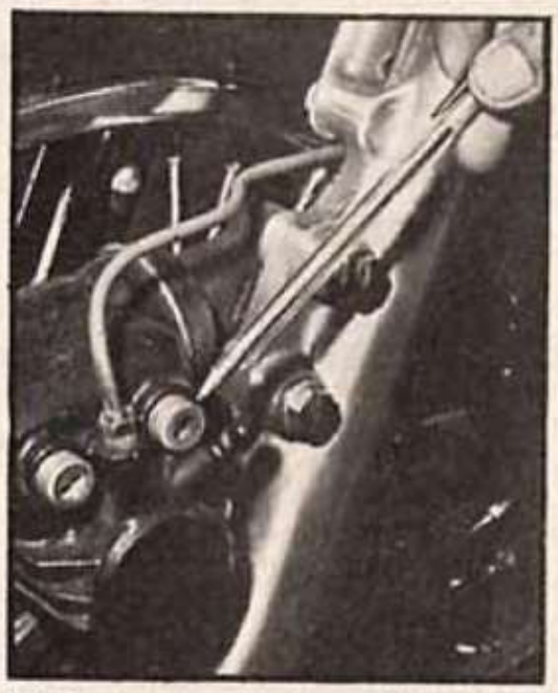
The rear brake is a disc on this model and the pads are inspected in the same manner as the front. One last item that should be on your check list but may not be obvious is the battery breather pipe. This must discharge clear of the bike and have a free run as any kinks will cause a build up of pressure that could cause the battery to explode!

While not having the power and sports image of the Kawasaki two strokes the big twins should give long and reliable service provided that they are serviced at regular intervals. ■

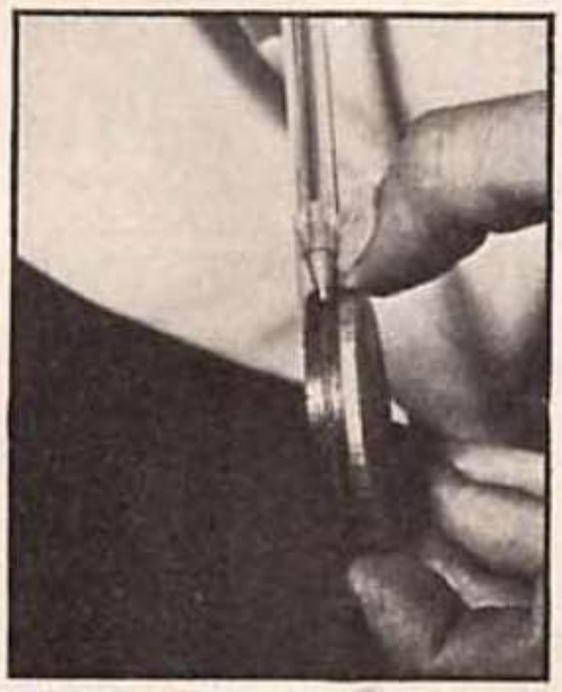


This section drawing is of the 400 engine showing the cam chain and it's adjuster. The same type of adjuster is also used on the 750. It is vital that the adjustment is not overdone, if in any doubt leave it on the slack side or take it to an expert. If you do make a mess of this adjustment the result is, apart from leaving lots of bits of rubber inside your engine, that you will have to strip the unit down and fit a new tensioner and possibly chain.

Key: 1 Camshaft sprocket; 2 TDC mark; 3 Camshaft timing mark; 4 Camshaft chain; 5 Chain tensioner; 6 Timing mark; 7 Auto timing advancer.



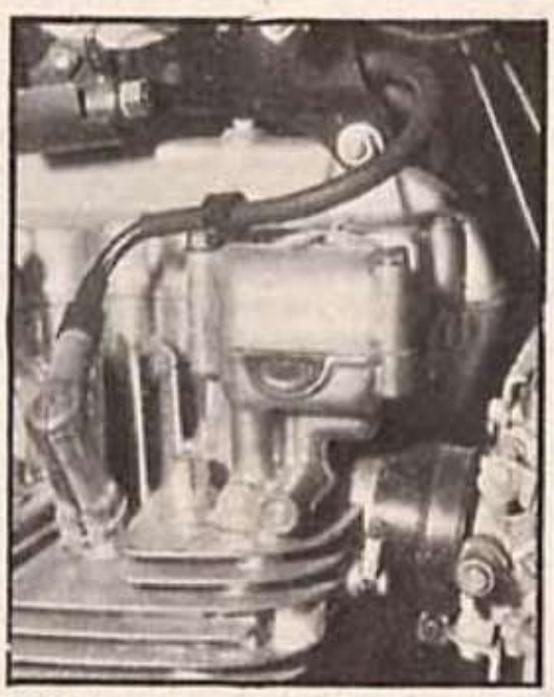
15 Do not touch these Allen bolts. To renew the pads take out wheel or remove/caliper from forks.



16 This thin red line donates the minimum pad thickness, don't let your pads wear below it.



21 Rear disc brake on the 750 has its own master cylinder. Battery breather on left also needs checking.



22 Not a service item, the tappets on the dohc motor need a special tool to replace the adjusting shims.

SERVICE INTERVALS

PERIODIC MAINTENANCE

OPERATION

	EVERY 1500/2000 MILES	EVERY 3500/4000 MILES
Change engine oil	●	
Replace oil filter		●
Adjust brakes	●	
Adjust drive chain	●	
Check, adjust clutch	●	
Check, adjust carbs	●	
Check spokes	●	
Tighten nuts and bolts (general)	●	
Clean and set plugs	●	
Adjust camshaft chain	●	
Check/Adjust throttle cables	●	
Check/Adjust steering play		●
Check valve clearance		●
Adjust points/check timing	●	
Clean air filter/replace	●	
General lubrication (cables etc)	●	
Check tyre wear	●	
Check/Adjust drive chain	as required	
Check brake wear		●
Change fork oil	●	
Change brake fluid	once yearly	

DATA

Engine oil	10/40 multigrade
Front forks	SAE 5/20 or auto trans fluid.
Tyre pressure	Front 27 Rear 28 (750 28/32)
Points gap	0.3 to 0.4mm
Plug gap	0.7 to 0.8mm
Timing	See text.
Torque	Fork pinch bolt 18/22 ft lbs
	Cylinder head 8mm 18/22 ft lbs
	6mm 8/10 ft lbs.