

KAWASAKI



ZX750 (ZXR750) UK '89 to '96

ZX750 (Ninja ZX-7) US '89 to '95



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Kawasaki ZX750 Fours Service and Repair Manual

by Alan Ahlstrand
and John H Haynes Member of the Guild of Motoring Writers

UK models covered

Kawasaki ZX750H (ZXR750). 748 cc. 1989 and 1990
Kawasaki ZX750J (ZXR750). 749 cc. 1991 and 1992
Kawasaki ZX750L (ZXR750). 749 cc. 1993 to 1996
Kawasaki ZX750K (ZXR750R). 749 cc. 1991 and 1992
Kawasaki ZX750M (ZXR750R). 749 cc. 1993 and 1994

US models covered

Kawasaki ZX750H (Ninja ZX-7). 748 cc. 1989 and 1990
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Kawasaki ZX750K (Ninja ZX-7R). 749 cc. 1991 and 1992
Kawasaki ZX750M (Ninja ZX-7R). 749 cc. 1993 and 1994

Note: This manual does not cover the ZX750P (Ninja ZX-7R) or ZX750N (Ninja ZX-7RR) introduced in 1996

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Kawasaki

The Green Meanies

by Julian Ryder

Kawasaki Heavy Industries

Kawasaki is a company of contradictions. It is the smallest of the big four Japanese manufacturers but the biggest company, it was the last of the four to make and market motorcycles yet it owns the oldest name in the Japanese industry, and it was the first to set up a factory in the USA, Kawasaki Heavy Industries, of which the motorcycle operation is but a small component, is a massive company with its heritage firmly in the old heavy industries like shipbuilding and railways; nowadays it is as much involved in aerospace as in motorcycles.

In fact it may be because of this that Kawasaki's motorcycles have always been quirky, you get the impression that they are designed by a small group of enthusiasts who are given an admirably free hand. More

realistically, it may be that Kawasaki's designers have experience with techniques and materials from other engineering disciplines. Either way, Kawasaki have managed to be the factory who surprise us more than the rest. Quite often, they do this by totally ignoring a market segment the others are scrabbling over, but more often they hit us with pure, undiluted performance.

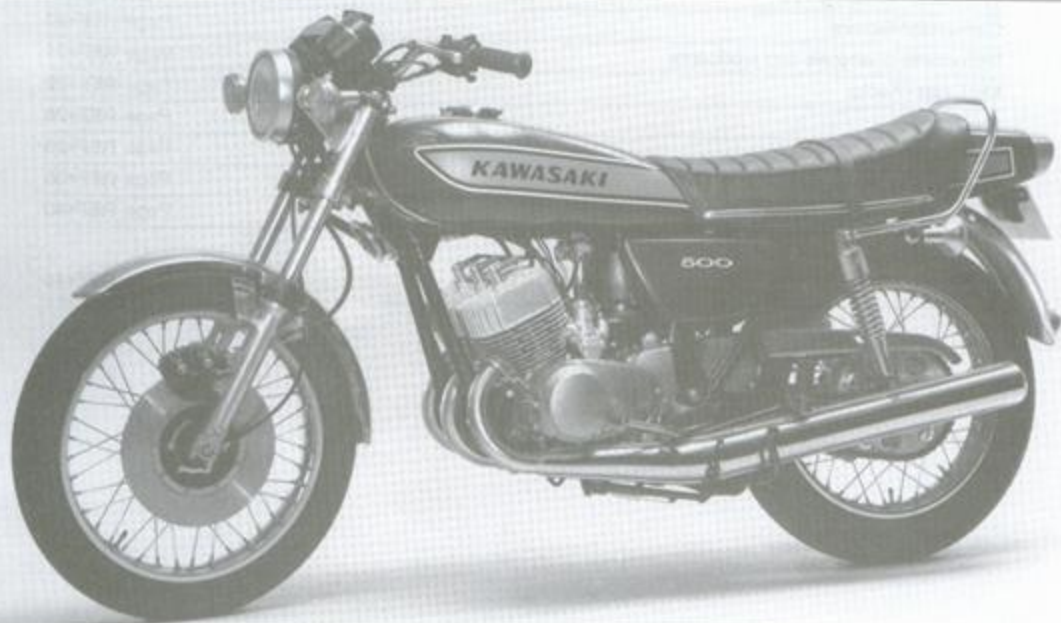
The origins of the company, and its name, go back to 1878 when Shozo Kawasaki set up a dockyard in Tokyo. By the late 1930s, the company was making its own steel in massive steelworks and manufacturing railway locos and rolling stock. In the run up to war, the Kawasaki Aircraft Company was set up in 1937 and it was this arm of the now giant operation that would look to motorcycle engine manufacture in post-war Japan.

They bought their high-technology

experience to bear first on engines which were sold on to a number of manufacturers as original equipment. Both two- and four-stroke units were made, a 58 cc and 148 cc OHC unit. One of the customer companies was Meihatsu Heavy Industries, another company within the Kawasaki group, which in 1961 was shaken up and renamed Kawasaki Auto Sales. At the same time, the Akashi factory which was to be Kawasaki's main production facility until the Kobe earthquake of 1995, was opened. Shortly afterwards, Kawasaki took over the ailing Meguro company, Japan's oldest motorcycle maker, thus instantly obtaining a range of bigger bikes which were marketed as Kawasaki-Meguros. The following year, the first bike to be made and sold as a Kawasaki was produced, a 125 cc single called the B8 and in 1963 a motocross version, the B8M appeared.

Model development

Kawasaki's first appearance on a road-race circuit came in 1965 with a batch of disc-valve 125 twins. They were no match for the opposition from Japan in the shape of Suzuki and Yamaha or for the fading force of the factory MZs from East Germany. Only after the other Japanese factories had pulled out of the class did Kawasaki win, with British rider Dave Simmonds becoming World 125 GP Champion in 1969 on a bike that looked astonishingly similar to the original racer. That same year Kawasaki reorganised once again, this time merging three



The H1 three cylinder two-stroke 500

companies to form Kawasaki Heavy Industries. One of the new organisation's objectives was to take motorcycle production forward and exploit markets outside Japan.

KHI achieved that target immediately and set out their stall for the future with the astonishing and frightening H1. This three-cylinder air-cooled 500 cc two-stroke was arguably the first modern pure performance bike to hit the market. It hypnotised a whole generation of motorcyclists who'd never before encountered such a ferocious, wheelie inducing power band or such shattering straight-line speed allied to questionable handling. And as for the 750 cc version ...

The triples perfectly suited the late '60s, fitting in well with the student demonstrations of 1968 and the anti-establishment ethos of the Summer of Love. Unfortunately, the oil crisis would put an end to the thirsty strokers but Kawasaki had another high-performance ace up their corporate sleeve. Or rather they thought they did.

The 1968 Tokyo Show saw probably the single most significant new motorcycle ever made unveiled: the Honda CB750. At Kawasaki it caused a major shock, for they also had a 750 cc four, code-named New York Steak, almost ready to roll and it was a double, rather than single, overhead cam motor. Bravely, they took the decision to go ahead - but with the motor taken out to 900 cc. The result was the Z1, unveiled at the 1972 Cologne Show. It was a bike straight out of the same mould as the H1, scare stories spread about unmanageable power, dubious straight-line stability and frightening handling, none of which stopped the sales graph rocketing upwards and led to the coining of the term 'superbike'. While rising fuel prices cut short development of the big two-strokes,



The first Superbike, Kawasaki's 900 cc Z1

the Z1 went on to found a dynasty, indeed its genes can still be detected in Kawasaki's latest products like the ZZ-R1100 (Ninja ZX-11).

This is another characteristic of the way Kawasaki operates. Models quite often have very long lives, or gradually evolve. There is no major difference between that first Z1 and the air-cooled GPz range. Add water-cooling and you have the GPZ900, which in turn metamorphosed into the GPZ1000RX and then the ZX-10 and the ZZ-R1100. Indeed, the last three models share the same 58 mm

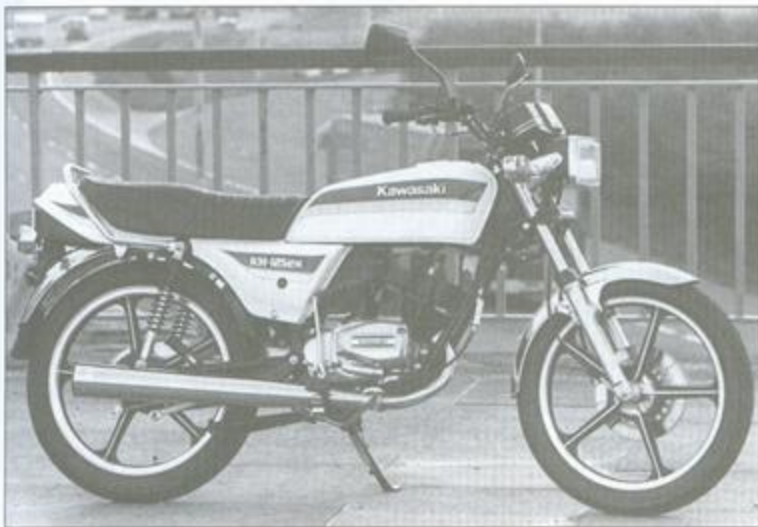
stroke. The bikes are obviously very different but it's difficult to put your finger on exactly why.

Other models have remained effectively untouched for over a decade: the KH and KE single-cylinder air-cooled two-stroke learner bikes, the GT550 and 750 shaft-drive hacks favoured by big city despatch riders and the GPz305 being prime examples. It's only when they step outside the performance field that Kawasaki seems less sure. Their first factory customs were dire, you simply got the impression that the team that designed them didn't have their heart in the job. Only when the Classic range appeared in 1995 did they get it right.

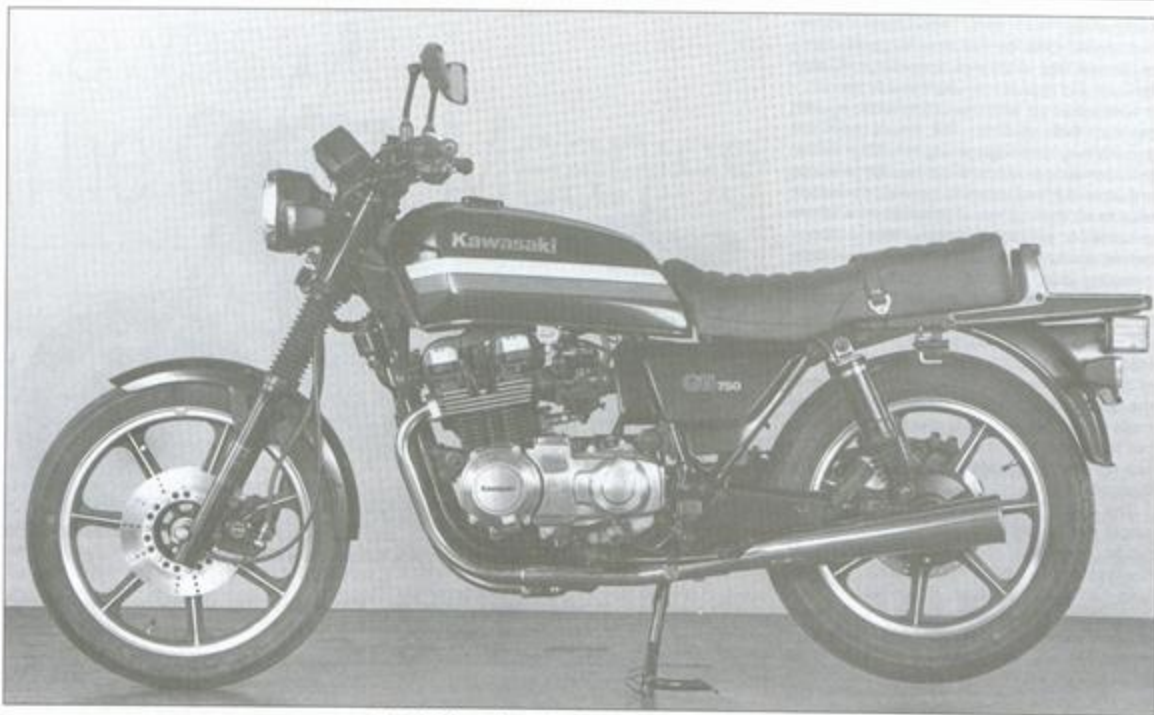
Racing success

Kawasaki also have a more focused approach to racing than the other factories. The policy has always been to race the road bikes and with just a couple of exceptions that's what they've done. Even Simmonds' championship winner bore a strong resemblance to the twins they were selling in the late '60s and racing versions of the 500 and 750 cc triples were also sold as over-the-counter racers, the H1R and H2R. The 500 was in the forefront of the two-stroke assault on MV Agusta but wasn't a Grand Prix winner. It was the 750 that made the impact and carried the factory's image in F750 racing against the Suzuki triples and Yamaha fours.

The factory's decision to use green, usually regarded as an unlucky colour in sport, meant its bikes and personnel stood out and the phrase 'Green Meanies' fitted them perfectly. The Z1 motor soon became a full 1000 cc and powered Kawasaki's assault in F1 racing, notably in endurance which Kawasaki saw as



One of the two-stroke engined KH and KE range - the KH125EX



The GT750 - a favourite hack for despatch riders

being most closely related to its road bikes.

That didn't stop them dominating 250 and 350 cc GPs with a tandem twin two-stroke in the late '70s and early '80s, but their path-breaking monocoque 500 while a race winner never won a world title. When Superbike arrived, Kawasaki's road 750s weren't as track-friendly as the opposition's out-and-out race replicas. This makes Scott Russell's World title on the ZXR750 in 1993 even more praiseworthy, for the homologation bike, the ZXR750RR, was much heavier and much more of a road bike than the Italian and Japanese competition.

The company's Supersport 600 contenders have similarly been more sports-tourers than race-replicas, yet they too have been competitive on the track. Indeed, the flagship bike, the ZZ-R1100, is most definitely a sports tourer capable of carrying two people and their luggage at high speed in comfort all day and then doing it again the next day. Try that on one of the race replicas and you'll be in need of a course of treatment from a chiropractor.

Through doing it their way Kawasaki developed a brand loyalty for their performance bikes that kept the Z1's derivatives in production until the mid-'80s

and turned the bike into a classic in its model life. You could even argue that the Z1 lives on in the shape of the 1100 Zephyr's GPz1100-derived motor. And that's another Kawasaki invention, the retro bike. But when you look at what many commentators refer to as the retro boom, especially in

Japan, you find that it is no such thing. It is the Zephyr boom. Just another example of Japan's most surprising motorcycle manufacturer getting it right again.



The high-performance ZXR750

Return of the Green Meanies

My first ride on a ZXR750 (ZX-7) was at the launch at the Estoril race track in Portugal. Even at the speeds I rode at, one fact was obvious, Kawasaki's super-sports 750 was more road bike than racer, which mattered quite a lot as this was the model that would be the homologation bike for World Superbike racing. As a roadster, it had all you needed; as a racer it had too much weight despite the very sporty looks it inherited – among many other things – from the old F1 racers.

The ZX750H model was the first 750 Kawasaki with an aluminum frame but power was provided by what was essentially a tuned-up version of the old GPX's 68 x 51.5 mm motor. Even those trick looking inlet tubes from the scoops on the front of the fairing merely ducted cool air onto the cylinder head, not into a plenum chamber to feed the intake system slightly pressurized air. The H2 model got few tuning tricks, but looked a lot better for the addition of the big slab-sided swinging arm off the racers to replace the original box-section item.

Sports fans had to wait until 1991 for a really competitive Kawasaki when the J and K models were released. The former was a pure roadbike, the later was a specialized homologation model designed to let Superbike racers use more track-friendly parts – particularly flat-slide carburetors. These same parts tended to make the ZXR750R (ZX-7R) as it was known a complete pig to ride on the road but those carbs, the close-ratio gearbox, single seat, alloy fuel tank and higher state of tune were a great starting point for the racers.

The standard 750 roadbike got more than just the racer's looks. Visually, the first clues you see are the big upside-down front forks and those dummy intake hoses running into



The ZX750L2 model

the frame members. But what you can't see is much more important: under the fairing and housed in a lightened frame lurked a brand new 71 x 47.3 mm short-stroke 749 cc motor with drive to the camshafts moved from the center of the crank to the right-hand side which liberated enough space in the top end to allow the angle between intake and exhaust valves to be narrowed down to just 20°.

Further models followed in 1992, designated L for the roadster and M for the double-R homologation special, but the only mechanical change of any significance was in the official race kit which included inlet parts that made those cosmetic hoses the leading edge of a true ram-air system.

Immediately after the introduction of the 749 cc short-stroke engine, the ZXR750R (Ninja ZX-7R) was a contender for racing honors the world over, despite the basic bike still being much more of a roadster than the

opposition. In 1991 Kawasakis won the World Endurance Championship, the AMA SuperSport 750 Championship and the Australian Superbike Championship. In 1992 the Endurance crown went to Kawasaki again thanks to Carl Fogarty and Terry Rymmer, Scott Russell won the Daytona 200 at record speed plus the AMA Superbike title, but most importantly the American along with New Zealander Aaron Slight won the Suzuka 8 Hours on a ZXR (Ninja), the first time a Green Meanie had won the most important single race in the Japanese factories' calendar. And in 1993 Scott Russell finally overcame his nemesis Carl Fogarty and the bigger, lighter, more powerful Ducati V-twins to win the World Superbike Championship, the first and so far only time a good old, simple in-line four has taken the top title in four-stroke racing. Not a bad record for an overweight road bike.

Acknowledgments

Our thanks to Kawasaki Motors (UK) Ltd. for permission to reproduce certain illustrations used in this manual. We would also like to thank NGK Spark Plugs (UK) Ltd for supplying the spark plug condition photos and the Avon Rubber Company, who kindly supplied information and technical assistance on tire fitting.

Special thanks to Grand Prix Kawasaki/Yamaha/Suzuki, Santa Clara, California, for supplying the bikes used in these photographs; to Mark Woodward, service manager, for arranging the facilities and fitting the teardown into his shop's busy schedule; and to Jim Holly, service technician, for his careful, precise mechanical work and thorough technical knowledge.

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About this manual

The aim of this manual is to help you get the best value from your motorcycle. It can do so in several ways. It can help you decide what work must be done, even if you choose to have it done by a dealer; it provides information and procedures for routine maintenance and servicing; and it offers diagnostic and repair procedures to follow when trouble occurs.

We hope you use the manual to tackle the work yourself. For many simpler jobs, doing it yourself may be quicker than arranging an appointment to get the motorcycle into a

dealer and making the trips to leave it and pick it up. More importantly, a lot of money can be saved by avoiding the expense the shop must pass on to you to cover its labor and overhead costs. An added benefit is the sense of satisfaction and accomplishment that you feel after doing the job yourself.

References to the left or right side of the motorcycle assume you are sitting on the seat, facing forward.

We take great pride in the accuracy of information given in this manual, but motorcycle manufacturers make alterations and design changes during the production run of a particular motorcycle of which they do not inform us. No liability can be accepted by the authors or publishers for loss, damage or injury caused by any errors in, or omissions from, the information given.

Professional mechanics are trained in safe working procedures. However enthusiastic you may be about getting on with the job at hand, take the time to ensure that your safety is not put at risk. A moment's lack of attention can result in an accident, as can failure to observe simple precautions.

There will always be new ways of having accidents, and the following is not a comprehensive list of all dangers; it is intended rather to make you aware of the risks and to encourage a safe approach to all work you carry out on your bike.

Asbestos

● Certain friction, insulating, sealing and other products - such as brake pads, clutch linings, gaskets, etc. - contain asbestos. Extreme care must be taken to avoid inhalation of dust from such products since it is hazardous to health. If in doubt, assume that they do contain asbestos.

Fire

● Remember at all times that petrol is highly flammable. Never smoke or have any kind of naked flame around, when working on the vehicle. But the risk does not end there - a spark caused by an electrical short-circuit, by two metal surfaces contacting each other, by careless use of tools, or even by static electricity built up in your body under certain conditions, can ignite petrol vapour, which in a confined space is highly explosive. Never use petrol as a cleaning solvent. Use an approved safety solvent.

● Always disconnect the battery earth terminal before working on any part of the fuel or electrical system, and never risk spilling fuel on to a hot engine or exhaust.

● It is recommended that a fire extinguisher of a type suitable for fuel and electrical fires is kept handy in the garage or workplace at all times. Never try to extinguish a fuel or electrical fire with water.

Fumes

● Certain fumes are highly toxic and can quickly cause unconsciousness and even death if inhaled to any extent. Petrol vapour comes into this category, as do the vapours from certain solvents such as trichloroethylene. Any draining or pouring of such volatile fluids should be done in a well ventilated area.

● When using cleaning fluids and solvents, read the instructions carefully. Never use materials from unmarked containers - they may give off poisonous vapours.

● Never run the engine of a motor vehicle in an enclosed space such as a garage. Exhaust fumes contain carbon monoxide which is extremely poisonous; if you need to run the engine, always do so in the open air or at least have the rear of the vehicle outside the workplace.

The battery

● Never cause a spark, or allow a naked light near the vehicle's battery. It will normally be giving off a certain amount of hydrogen gas, which is highly explosive.

● Always disconnect the battery ground (earth) terminal before working on the fuel or electrical systems (except where noted).

● If possible, loosen the filler plugs or cover when charging the battery from an external source. Do not charge at an excessive rate or the battery may burst.

● Take care when topping up, cleaning or carrying the battery. The acid electrolyte, even when diluted, is very corrosive and should not be allowed to contact the eyes or skin. Always wear rubber gloves and goggles or a face shield. If you ever need to prepare electrolyte yourself, always add the acid slowly to the water; never add the water to the acid.

Electricity

● When using an electric power tool, inspection light etc., always ensure that the appliance is correctly connected to its plug and that, where necessary, it is properly grounded (earthed). Do not use such appliances in damp conditions and, again, beware of creating a spark or applying excessive heat in the vicinity of fuel or fuel vapour. Also ensure that the appliances meet national safety standards.

● A severe electric shock can result from touching certain parts of the electrical system, such as the spark plug wires (HT leads), when the engine is running or being cranked, particularly if components are damp or the insulation is defective. Where an electronic ignition system is used, the secondary (HT) voltage is much higher and could prove fatal.

Remember...

X Don't start the engine without first ascertaining that the transmission is in neutral.

X Don't suddenly remove the pressure cap from a hot cooling system - cover it with a cloth and release the pressure gradually first, or you may get scalded by escaping coolant.

X Don't attempt to drain oil until you are sure it has cooled sufficiently to avoid scalding you.

X Don't grasp any part of the engine or exhaust system without first ascertaining that it is cool enough not to burn you.

X Don't allow brake fluid or antifreeze to contact the machine's paintwork or plastic components.

X Don't siphon toxic liquids such as fuel, hydraulic fluid or antifreeze by mouth, or allow them to remain on your skin.

X Don't inhale dust - it may be injurious to health (see Asbestos heading).

X Don't allow any spilled oil or grease to remain on the floor - wipe it up right away, before someone slips on it.

X Don't use ill-fitting spanners or other tools which may slip and cause injury.

X Don't lift a heavy component which may be beyond your capability - get assistance.

X Don't rush to finish a job or take unverified short cuts.

X Don't allow children or animals in or around an unattended vehicle.

X Don't inflate a tyre above the recommended pressure. Apart from overstressing the carcass, in extreme cases the tyre may blow off forcibly.

✓ Do ensure that the machine is supported securely at all times. This is especially important when the machine is blocked up to aid wheel or fork removal.

✓ Do take care when attempting to loosen a stubborn nut or bolt. It is generally better to pull on a spanner, rather than push, so that if you slip, you fall away from the machine rather than onto it.

✓ Do wear eye protection when using power tools such as drill, sander, bench grinder etc.

✓ Do use a barrier cream on your hands prior to undertaking dirty jobs - it will protect your skin from infection as well as making the dirt easier to remove afterwards; but make sure your hands aren't left slippery. Note that long-term contact with used engine oil can be a health hazard.

✓ Do keep loose clothing (cuffs, ties etc. and long hair) well out of the way of moving mechanical parts.

✓ Do remove rings, wristwatch etc., before working on the vehicle - especially the electrical system.

✓ Do keep your work area tidy - it is only too easy to fall over articles left lying around.

✓ Do exercise caution when compressing springs for removal or installation. Ensure that the tension is applied and released in a controlled manner, using suitable tools which preclude the possibility of the spring escaping violently.

✓ Do ensure that any lifting tackle used has a safe working load rating adequate for the job.

✓ Do get someone to check periodically that all is well, when working alone on the vehicle.

✓ Do carry out work in a logical sequence and check that everything is correctly assembled and tightened afterwards.

✓ Do remember that your vehicle's safety affects that of yourself and others. If in doubt on any point, get professional advice.

● If in spite of following these precautions, you are unfortunate enough to injure yourself, seek medical attention as soon as possible.

Frame and engine numbers

The frame serial number is stamped into the right side of the steering head and the engine serial number is stamped into the right engine case. Both of these numbers should be

recorded and kept in a safe place so they can be furnished to law enforcement officials in the event of theft.

The frame serial number, engine serial number and carburetor identification number should also be kept in a handy place (such as

with your driver's license) so they are always available when purchasing or ordering parts for your machine.

The following table is a breakdown of the initial frame numbers for each model and year of production:

US and Canada models

Prod yr	Model	Initial frame number
1989	ZX750H1 (Ninja ZX-7)	JKAZXDH1*KA000001
1990	ZX750H2 (Ninja ZX-7)	JKAZXDH1*LA015001
1991	ZX750J1 (Ninja ZX-7)	JKAZXDJ1*MA000001
1992	ZX750J2 (Ninja ZX-7)	JKAZXDJ1*NA013901
1993	ZX750L1 (Ninja ZX-7)	JKAZXDL1*PA000001
1994	ZX750L2 (Ninja ZX-7)	JKAZXDL1*RA020001
1995	ZX750L3 (Ninja ZX-7)	JKAZXDL1*SA030001
1991	ZX750K1 (Ninja ZX-7R)	JKAZXDK1*MA000001
1992	ZX750K2 (Ninja ZX-7R)	JKAZXDK1*NA007001
1993	ZX750M1 (Ninja ZX-7R)	JKAZXDM1*PA000001
1994	ZX750M2 (Ninja ZX-7R)	JKAZXDM1*RA002001

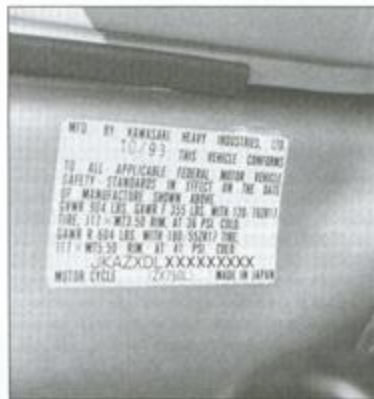
*This digit changes with each motorcycle.

UK models

Prod yr	Model	Initial frame number
1989	ZX750H1 (ZXR750)	ZX750H-000001
1990	ZX750H2 (ZXR750)	ZX750H-015001
1991	ZX750J1 (ZXR750)	ZX750J-000001
1992	ZX750J2 (ZXR750)	ZX750J-013901
1993	ZX750L1 (ZXR750)	ZX750L-000001
1994	ZX750L2 (ZXR750)	ZX750L-020001
1995	ZX750L3 (ZXR750)	ZX750L-030001
1991	ZX750K1 (ZXR750R)	ZX750K-000001
1993	ZX750M1 (ZXR750R)	ZX750M-000001
1994	ZX750M2 (ZXR750R)	ZX750M-020001



The frame number is stamped on the steering head . . .



. . . and displayed on a decal



The engine number is located on the right side of the crankcase

Buying spare parts

Once you have found all the identification numbers, record them for reference when buying parts. Since the manufacturers change specifications, parts and vendors (companies that manufacture various components on the machine), providing the ID numbers is the only way to be reasonably sure that you are buying the correct parts.

Whenever possible, take the worn part to the dealer so direct comparison with the new

component can be made. Along the trail from the manufacturer to the parts shelf, there are numerous places that the part can end up with the wrong number or be listed incorrectly.

The two places to purchase new parts for your motorcycle – the accessory store and the franchised dealer – differ in the type of parts they carry. While dealers can obtain virtually every part for your cycle, the accessory dealer is usually limited to normal high wear items such as shock absorbers, tune-up parts, various engine gaskets, cables, chains, brake

parts, etc. Rarely will an accessory outlet have major suspension components, cylinders, transmission gears, or cases.

Used parts can be obtained for roughly half the price of new ones, but you can't always be sure of what you're getting. Once again, take your worn part to the wrecking yard (breaker) for direct comparison.

Whether buying new, used or rebuilt parts, the best course is to deal directly with someone who specializes in parts for your particular make.

1 Engine/transmission oil level check

Before you start:

✓ Take the motorcycle on a short run to allow it to reach normal operating temperature.

Caution: Do not run the engine in an enclosed space such as a garage or shop.

✓ Stop the engine and support the motorcycle in an upright position on level ground. Allow it to stand undisturbed for five minutes to allow the oil level to stabilise.

Bike care:

● If you have to add oil frequently, you should check whether you have any oil leaks. If there is no sign of oil leakage from the joints and gaskets the engine could be burning oil (see *Fault Finding*).



1 Check the oil level in the window located at the lower part of the right crankcase cover. The level should be between the Maximum and Minimum level marks arrowed.

The correct oil

● Modern, high-revving engines place great demands on their oil. It is very important that the correct oil for your bike is used.

● Always top up with a good quality oil of the specified type and viscosity and do not overfill the engine.

Oil type	API grade SE, SF or SG
Oil viscosity	
Cold climates	SAE 10W/40 or 10W/50
Warm climates	SAE 20W/40 or 20W/50



2 If the level is below the Minimum mark, remove the oil filler cap from the right crankcase cover . . .



3 . . . and add enough oil of the recommended grade and type to bring the level up to the Maximum mark. Do not overfill.

2 Clutch fluid level check



Warning: Brake and clutch hydraulic fluid can harm your eyes and damage painted surfaces, so use extreme

caution when handling and pouring it. Do not use fluid that has been standing open for some time, as it absorbs moisture from the air which can cause a loss of clutch effectiveness.

Before you start:

✓ Make sure you have the correct hydraulic fluid. DOT 4 is recommended.

✓ With the motorcycle supported in a level position, turn the handlebars until the top of the clutch master cylinder is as level as possible.

✓ Before removing the master cylinder cap, place rags beneath the reservoir (to protect the paint from brake fluid spills) and remove all dust and dirt from the area around the cap.

Bike care:

● In order to ensure proper operation of the clutch hydraulic system, the fluid level in the master cylinder reservoir must be properly maintained. If the fluid level was low, inspect the clutch hydraulic system for leaks (see Chapter 1).

● Check the operation of the clutch. If the lever is spongy indicating the presence of air in the clutch line, bleed the system as described in Chapter 2.



1 The clutch fluid reservoir is located above the left front fork. The fluid level is visible through the reservoir. Make sure that the fluid level is above the Lower mark on the reservoir. If the level is low, the fluid must be replenished.



2 To top up, remove the cap retainer plate, the cap, the diaphragm retainer and rubber diaphragm to add fluid . . .



3 . . . and top up to the Upper mark with DOT 4 hydraulic fluid.

3 Brake fluid level checks



Warning: Brake and clutch hydraulic fluid can harm your eyes and damage painted surfaces, so use extreme caution when handling and pouring it and cover surrounding surfaces with rag. Do not use fluid that has been standing open for some time, as it absorbs moisture from the air which can cause a dangerous loss of braking effectiveness.

Before you start:

- ✓ Make sure you have the correct hydraulic fluid – DOT 4 is recommended.
- ✓ With the motorcycle supported in a level position, turn the handlebars until the top of the front brake master cylinder is as level as possible.
- ✓ On J, K, L and M models remove the right side cover to view the rear brake fluid reservoir. On H models the level marks can be seen through the slot in the right side cover.

Bike care:

- In order to ensure proper operation of the hydraulic disc brakes, the fluid level in the master cylinder reservoir must be properly maintained. If the brake fluid level was low, inspect the brake system for leaks.

- The fluid in the master cylinder reservoir will drop slightly as the brake pads wear down.
- Check the operation of the brakes before taking the machine on the road; if there is evidence of air in the system (spongy feel to level or pedal), it must be bled as described in Chapter 7.



- 1 The fluid level is visible through the master cylinder reservoir. Make sure that the fluid level is above the Lower mark on the reservoir.



- 2 If the level is low, remove the cap retainer screw . . .



- 3 . . . unscrew the cap and lift off the retainer and rubber diaphragm. **Note:** Don't operate the brake lever with the cap removed.



- 4 Add new, clean brake fluid of the recommended type until the level is above the inspection window. Don't mix different brands of brake fluid in the reservoir, as they may not be compatible.



- 5 Reinstall the rubber diaphragm and retainer. Install the cap retainer and the cap and tighten its screw securely, but do not overtighten it. Wipe any spilled fluid off the reservoir body.



- 6 Rear brake fluid reservoir location – H models. Unscrew the cap and add fluid as described for the front brake.

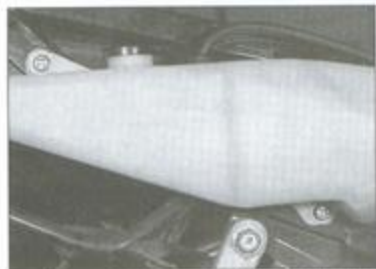


- 7 Rear brake fluid reservoir location – J, K, L and M models. Unscrew the cap and add fluid as described for the front brake.

4 Coolant level check

Before you start:

- ✓ Make sure you have a supply of coolant available (a mixture of 50% distilled water and 50% corrosion inhibited ethylene glycol antifreeze).
- ✓ The engine must be cold for the results to be accurate, so always perform this check



- 1** The coolant reservoir is located behind the right middle fairing panel on H models . . .

before starting the engine for the first time each day. Make sure the motorcycle is on level ground.

Bike care:

- Use only the specified coolant mixture. It is important that antifreeze is used in the cooling



- 2** . . . and under the right rear side cover on J, K, L and M models. The reservoir tank marks should be visible from below and to the rear of the cover.

system all year round, not just during the winter months. Don't top-up with water alone, as the antifreeze will become too diluted.

- Do not overfill the coolant reservoir. The coolant level is satisfactory if it is between the Low and Full marks on the reservoir.
- If the coolant level seems to be consistently low, check the entire cooling system for leaks.



- 3** If the level is at or below the Low mark, remove the filler cap and add the recommended coolant mixture until the Full level is reached.

5 Suspension, steering and drive chain checks

Suspension and Steering:

- Make sure the steering operates smoothly, without looseness and without binding.
- Check front and rear suspension for smooth operation.
- Check that the suspension is adjusted as required.

Drive chain:

- Make sure the drive chain isn't out of adjustment (Chapter 1).
- If the chain looks dry, lubricate it (Chapter 1).

6 Legal and safety checks

Lighting and signalling:

- Take a minute to check that the headlight, tail light, brake light, instrument lights and turn signals all work correctly.
- Check that the horn sounds when the switch is operated.
- A working speedometer graduated in mph is a statutory requirement in the UK.

Safety:

- Check that the throttle grip rotates smoothly and snaps shut when released, and that it does so in all steering positions. Also check for the correct amount of freeplay (see Chapter 1).
- Make sure the sidestand returns to its fully up position and stays there under spring pressure.
- Make sure the engine kill switch works properly.

Fuel:

- This may seem obvious, but check that you have enough fuel to complete your journey. If you notice signs of fuel leakage - rectify the cause immediately.
- Ensure you use the correct grade unleaded or low lead fuel (subject to local regulations) - minimum 91 octane (RON).

7 Tire checks

Tire care:

- Check the tires carefully for cuts, tears, embedded nails or other sharp objects and excessive wear. Operation of the motorcycle with excessively worn tires is extremely hazardous, as traction and handling are directly affected.
- Check the condition of the tire valve and ensure the dust cap is in place.
- Pick out any stones or nails which may have become embedded in the tire tread. If

left, they will eventually penetrate through the casing and cause a puncture.

- If tire damage is apparent, or unexplained loss of pressure is experienced, seek the advice of a tire fitting specialist without delay.

Tire tread depth:

- At the time of writing UK law requires that tread depth must be at least 1 mm over $\frac{3}{4}$ of the tread breadth all the way around the tire, with no bald patches. Many riders, however, consider 2 mm tread depth minimum to be a

safer limit. Kawasaki recommend the following minimum tread depths.

Regular speed	Front	Rear
Up to 80 mph (130 kmh)	1 mm	2 mm
Above 80 mph (130 kmh)	1 mm	3 mm

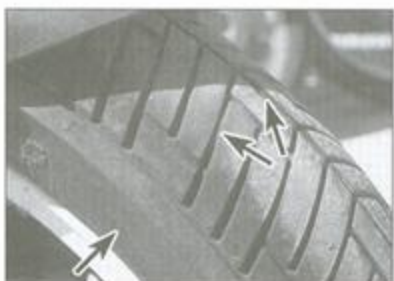
- Many tires now incorporate wear indicators in the tread. Identify the triangular pointer, or TWI marking, on the tire sidewall to locate the indicator bar and replace the tire if the tread has worn down to the bar.



1 Check the tire pressures when the tires are cold and keep them properly inflated.



2 Measure the tread depth at the center of the tire using a tread depth gauge.



3 Tire tread wear indicators bars and location marking on the sidewall (arrows).



4 The tire information label provides tire size, pressure and tread depth details

The correct pressures:

- The tires must be checked when **cold**, not immediately after riding. Note that low tire pressures may cause the tire to slip on the rim or come off. High tire pressures will cause abnormal tread wear and unsafe handling.
- Use an accurate pressure gauge.
- Proper air pressure will increase tire life and provide maximum stability and ride comfort.
- Note that tire pressures vary according to the type of tires fitted – refer to the tire information label on the bike, or if non-standard tires are fitted, refer to the tire manufacturer for the correct pressures.

Tire pressures	H, J and K models	L and M models
Front	36 psi (2.48 bars)	33 psi (2.27 bars)
Rear	41 psi (2.82 bars)	36 psi (2.48 bars)

Chapter 1

Routine maintenance and servicing

Contents

Air filter element – cleaning	19	Evaporative emission control system (California models only) – check	6
Air filter element – replacement	24	Exhaust system – check	15
Air suction valves – check	4	Fasteners – check	16
Battery electrolyte level/specific gravity (H models) – check	14	Fluid levels – check	3
Brake callipers and master cylinders – seal replacement	32	Fork oil – replacement	30
Brake fluid – change	28	Fuel filter – replacement	25
Brake hoses – replacement	34	Fuel hoses – replacement	33
Brake pads – wear check	9	Fuel system – check	20
Brake system – general check	8	Introduction to tune-up and routine maintenance	2
Carburetors – synchronization and idle speed	5	Lubrication – general	11
Clutch – check	10	Routine maintenance intervals	1
Clutch fluid – renewal	26	Spark plugs – replacement	3
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Cylinder compression – check	22	Suspension – check	21
Drive chain – lubrication	1	Throttle and choke operation/grip freeplay – check and adjustment	17
Drive chain – check and adjustment	2	Tires/wheels – general check	13
Drive chain and sprockets – check for wear	7	Valve clearances – check and adjustment	23
Engine oil/filter – change	18		

Degrees of difficulty

Easy, suitable for novice with little experience



Fairly easy, suitable for beginner with some experience



Fairly difficult, suitable for competent DIY mechanic



Difficult, suitable for experienced DIY mechanic



Very difficult, suitable for expert DIY or professional



Specifications

Engine

Spark plugs

Type

US H, J, K, L1, M1 models

US L2, L3, M2 models

UK models

NGK C9E or ND U27ES-N

NGK CR9E or ND U27ESR-N

NGK CR9E or ND U27ESR-N

0.7 to 0.8 mm (0.028 to 0.031 inch)

Gap

Engine idle speed

H models

All except California models

California models

J, K, L, M models

All except California models

California models

1000 ± 50 rpm

1250 ± 50 rpm

1100 ± 50 rpm

1300 ± 50 rpm

Valve clearances (COLD engine)

H models

Intake

Exhaust

J, K, L, M models

Intake

Exhaust

0.15 to 0.24 mm (0.006 to 0.009 inch)

0.20 to 0.29 mm (0.008 to 0.011 inch)

0.18 to 0.23 mm (0.007 to 0.009 inch)

0.25 to 0.30 mm (0.010 to 0.012 inch)

Cylinder compression pressure acceptable range

H and L models

J models

K and M models

Carburetor synchronization (vacuum difference between cylinders)

Cylinder numbering (from left side to right side of bike)

Firing order

139 to 213 psi (9.57 to 14.67 bars)

119 to 185 psi (8.2 to 12.74 bars)

145 to 220 psi (9.99 to 15.15 bars)

Less than 2 cm (0.39 inch) Hg

1-2-3-4

1-2-4-3

1.2 Specifications

Miscellaneous

Brake pad lining thickness	
New	4 mm (0.16 inch)
Wear limit	1 mm (0.04 inch)
Rear brake pedal height	
H models	Approximately 55 mm (2.2 inches) below top of footpeg
J, K, L, M models	Approximately 70 mm (2.8 inches) below top of footpeg
Freeplay adjustments	
Throttle grip	2 to 3 mm (0.08 to 0.12 inch)
Choke cable	2 to 3 mm (0.08 to 0.12 inch)
Drive chain	
Slack	
H models	
Standard	20 to 25 mm (0.79 to 0.98 inch)
Limit	20 to 30 mm (0.79 to 0.118 inch)
J, K, L, M models	
Standard	10 to 15 mm (0.39 to 0.59 inch)
Limit	10 to 20 mm (0.39 to 0.79 inch)
20-link length	
Standard	317.5 to 318.2 mm (12.5 to 12.53 inch)
Limit	323 mm (12.73 inch)
Battery electrolyte specific gravity	1.260 minimum
Minimum tire tread depth	See 'Daily (pre-ride) checks'
Tire pressures	See 'Daily (pre-ride) checks'

Torque settings

Oil drain plug	20 Nm (14.5 ft-lbs)
Oil filter (all except H2 models)	9.8 Nm (87 inch-lbs)
Oil filter mounting bolt (H2 models)	20 Nm (14.5 ft-lbs)
Coolant bleed valve	
H models	9.8 Nm (87 inch-lbs)
J, K, L, M models	7.8 Nm (69 inch-lbs)
Coolant drain bolt	
H models (in cylinder block)	7.8 Nm (69 inch-lbs)
J, K, L, M models (in water pump)	12 Nm (104 inch-lbs)
Spark plugs	14 Nm (10 ft-lbs)

Recommended lubricants and fluids

Engine/transmission oil	
Type	API grade SE, SF or SG multigrade oil
Viscosity	
In cold climates	SAE 10W40 or 10W50
In warm climates	SAE 20W40 or 20W50
Capacity	
H models	
With filter change	3.0 liters (3.2 US qt, 5.3 imp pt)
Oil change only	2.6 liters (2.7 US qt, 4.6 imp pt)
J, K, L, M models	
With filter change	3.5 liters (3.7 US qt, 6.1 imp pt)
Oil change only	3.4 liters (3.6 US qt, 6.0 imp pt)
Coolant	
Type	50/50 mixture of water and ethylene glycol antifreeze containing corrosion inhibitors for aluminum engines
Capacity (including full reservoir tank)	
H1 models	2.0 liters (2.1 US qt)
H2 models	2.3 liters (2.4 US qt)
J, K, L, M models	2.8 liters (3.0 US qt)
Brake/clutch fluid	DOT 4
Fork oil	See Chapter 6

Miscellaneous

Wheel bearings	Medium weight, lithium-based multi-purpose grease
Swingarm pivot bearings	Medium weight, lithium-based multi-purpose grease
Cables and lever pivots	Chain and cable lubricant or 10W30 motor oil
Sidestand pivot	Chain and cable lubricant or 10W30 motor oil
Brake pedal/shift lever pivots	Chain and cable lubricant or 10W30 motor oil
Throttle grip	Multi-purpose grease or dry film lubricant

Note: The pre-ride inspection outlined at the front of this manual covers checks and maintenance that should be carried out on a daily basis. Always perform the pre-ride

inspection at every maintenance interval (in addition to the procedures listed). The intervals listed below are the shortest intervals recommended by the manufacturer for each

particular operation during the model years covered in this manual. Your owner's manual may have different intervals for your model.

Daily (pre-ride)

- See 'Daily (pre-ride) checks' beginning on page 0•10

Every 200 miles (300 km)

Carry out all of the 'Daily (pre-ride) checks' plus the following:

- Lubricate the drive chain (Section 1)

After the initial 500 miles (800 km)

Note: This check is usually performed by a Kawasaki dealer after the first 500 miles (800 km) from new. Thereafter, maintenance is carried out according to the following intervals of the schedule.

Every 500 miles (800 km)

Carry out all of the 'Daily (pre-ride) checks' plus the following:

- Check/adjust the drive chain slack (Section 2)

Every 3000 miles (5000 km)

Carry out all of the 200 and 500 miles (300 and 800 km) maintenance tasks plus the following:

- Clean and gap the spark plugs and replace (if necessary) (Section 3)
- Check the operation of the air suction valves (if equipped) (Section 4)
- Check/adjust the carburetor synchronization and idle speed (Section 5)
- Check the evaporative emission control system (California models) (Section 6)
- Check the drive chain and sprockets for wear (Section 7)
- Check the brake fluid level (Section 8)
- Check the adjustment of the brake light switch (Section 8)
- Check/adjust the brake pedal position (Section 8)
- Check the brake discs and pads (Section 9)
- Check the clutch fluid level (Section 10)
- Lubricate all cables (Section 11)
- Lubricate the clutch and brake lever pivots (Section 11)
- Lubricate the shift/brake lever pivots and the sidestand pivot (Section 11)
- Check the steering (Section 12)
- Check the tires and wheels (Section 13)
- Check the battery electrolyte level (H models only) (Section 14) – see Note 1
- Check the exhaust system for leaks (Section 15)
- Check the tightness of all fasteners (Section 16)
- Check/adjust the throttle and choke operation/grip freeplay (Section 17)

Every 6000 miles (10,000 km)

Carry out all of the 3000 miles (5000 km) maintenance tasks plus the following:

- Change the engine oil and oil filter (Section 18) – see Note 2
- Clean the air filter element (Section 19)
- Check the cleanliness of the fuel system and the condition of the fuel and vacuum hoses (Section 20)
- Lubricate the swingarm needle bearings and Uni-trak linkage (Section 21)
- Check the cylinder compression (Section 22)
- Check/adjust the valve clearances (Section 23)

Every 12,000 miles (20,000 km)

Carry out all of the 6000 miles (10,000 km) maintenance tasks plus the following:

- Replace the air filter element (Section 24) – see Note 3
- Replace the fuel filter (Section 25)
- Change the clutch fluid (Section 26) – see Note 4
- Lubricate the steering head bearings (Section 27)
- Change the brake fluid (Section 28) – see Note 4

Every 18,000 miles (30,000 km)

Carry out all of the 6000 miles (10,000 km) maintenance tasks plus the following:

- Check the cooling system and replace the coolant (Section 29) – see Note 3
- Change the fork oil (Section 30)

Every two years

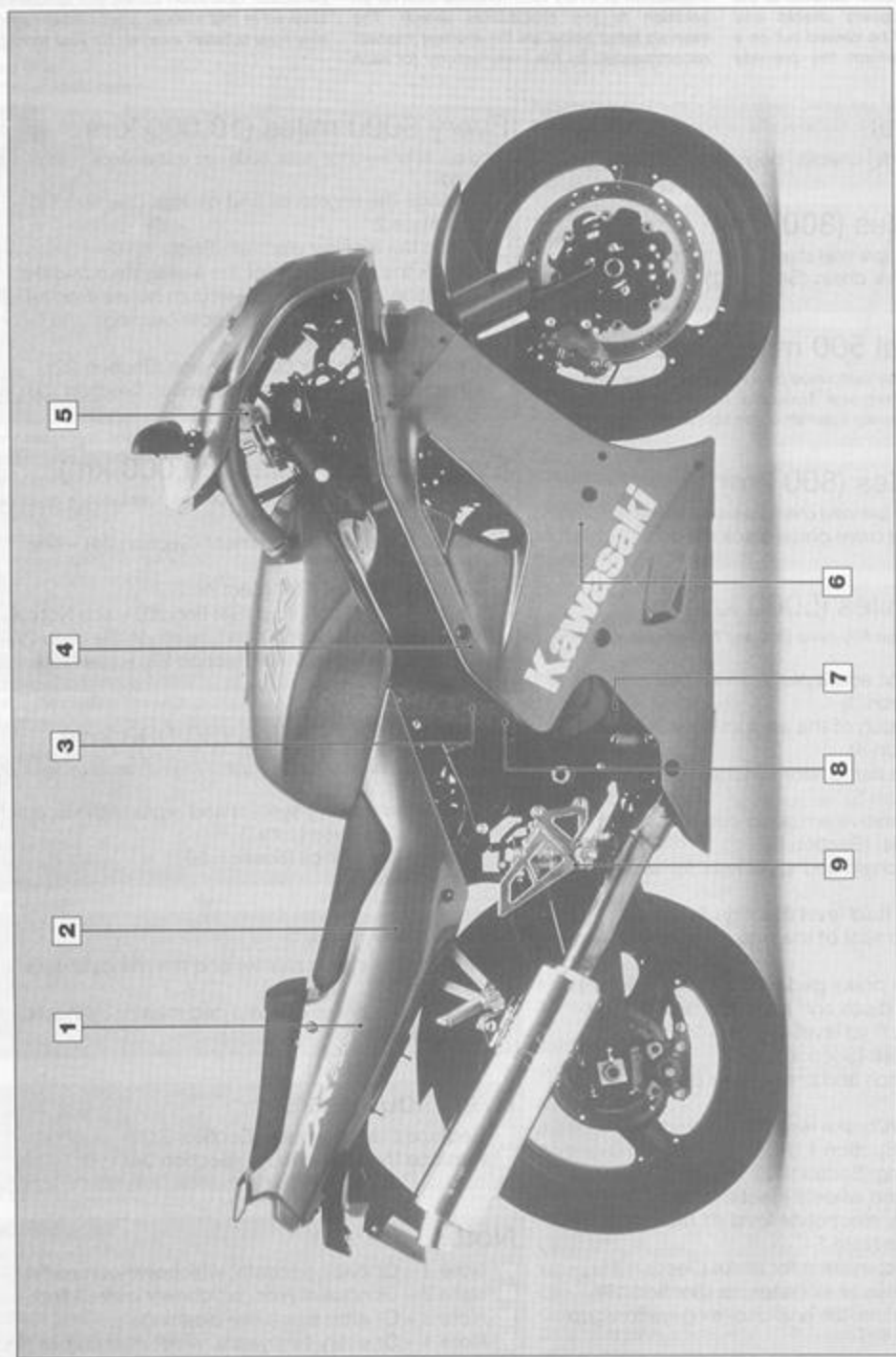
- Rebuild the clutch master and release cylinders (Section 31)
- Rebuild the brake calipers and master cylinders (Section 32)

Every four years

- Replace the fuel hoses (Section 33)
- Replace the brake hoses (Section 34)

Notes

- Note 1 – Or once a month, whichever comes first
- Note 2 – Or once a year, whichever comes first
- Note 3 – Or after every five cleanings
- Note 4 – Or every two years, whichever comes first

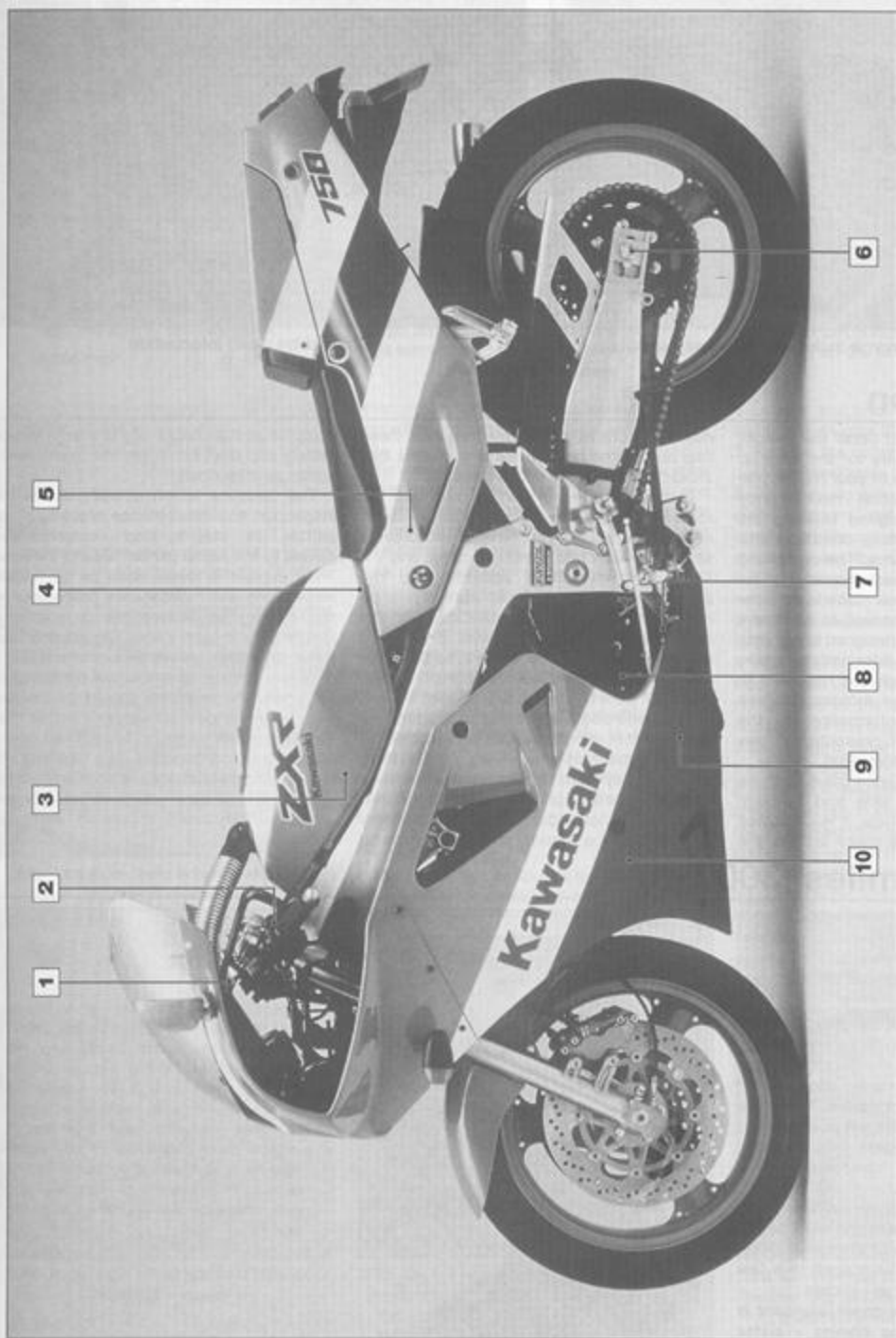


Component locations on right-hand side

- 1 Coolant reservoir (J, K, L and M models)
- 2 Rear brake fluid reservoir
- 3 Idle speed adjuster

- 4 Coolant reservoir (H models)
- 5 Front brake fluid reservoir
- 6 Timing rotor cover

- 7 Engine oil level window
- 8 Engine oil filler cap
- 9 Rear brake pedal height adjuster and brake light switch



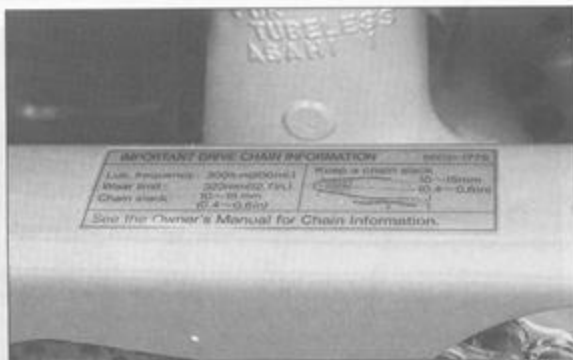
- 1 Clutch fluid reservoir
- 2 Steering head bearings
- 3 Air filter element (L, K, L and M models)

Component locations on left-hand side

- 4 Air filter element (H models)
- 5 Battery
- 6 Drive chain adjuster
- 7 Engine oil filter (H2 models)
- 8 Coolant drain plug and bleed valve on water pump
- 9 Oil drain bolt
- 10 Engine oil filter (H1, J, K, L and M models)



Decals on the motorcycle include oil type and capacity . . .



. . . and drive chain information

Introduction

This Chapter covers in detail the checks and procedures necessary for the tune-up and routine maintenance of your motorcycle and includes the routine maintenance schedule, which is designed to keep the machine in proper running condition and prevent possible problems. The remaining Sections contain detailed procedures for carrying out the items listed on the maintenance schedule, as well as additional maintenance information designed to increase reliability. Maintenance information is also printed on decals, which are mounted in various locations on the motorcycle (see **illustrations**). Where information on the decals differs from that presented in this Chapter, use the decal information.

Since routine maintenance plays such an important role in the safe and efficient operation of your motorcycle, it is presented here as a comprehensive check list. For the

rider who does all his own maintenance, these lists outline the procedures and checks that should be done on a routine basis.

Deciding where to start or plug into the routine maintenance schedule depends on several factors. If you have a motorcycle whose warranty has recently expired, and if it has been maintained according to the warranty standards, you may want to pick-up routine maintenance as it coincides with the next mileage or calendar interval. If you have owned the machine for some time but have never performed any maintenance on it, then you may want to start at the nearest interval and include some additional procedures to ensure that nothing important is overlooked. If you have just had a major engine overhaul, then you may want to start the maintenance routine from the beginning. If you have a used machine and have no knowledge of its history or maintenance record, you may desire to

combine all the checks into one large service initially and then settle into the maintenance schedule prescribed.

The Sections which actually outline the inspection and maintenance procedures are written as step-by-step comprehensive guides to the actual performance of the work. They explain in detail each of the routine inspections and maintenance procedures on the check list. References to additional information in applicable Chapters is also included and should not be overlooked.

Before beginning any actual maintenance or repair, the machine should be cleaned thoroughly, especially around the oil filter housing, spark plugs, cylinder head cover, side covers, carburetors, etc. Cleaning will help ensure that dirt does not contaminate the engine and will allow you to detect wear and damage that could otherwise easily go unnoticed.

Every 200 miles (300 km)

1 Drive chain - lubrication

Note: If the chain is extremely dirty, it should be removed and cleaned before it is lubricated (see Chapter 6).

1 The best time to lubricate the chain is after the motorcycle has been ridden. When the chain is warm, the lubricant will penetrate the joints between the side plates, pins, bushings and rollers to provide lubrication of the internal load bearing areas.

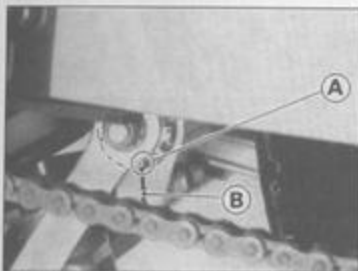
2 Use a good quality chain lubricant and apply it to the area where the side plates overlap - not the middle of the rollers. After applying the lubricant, let it soak in a few minutes before wiping off any excess.

Caution: Make sure the chain lubricant is compatible with O-ring chains - some kinds may damage the O-rings.



Apply chain lubricant to the joints between the side plates and the rollers - not in the center of the rollers (with the bike supported securely upright and the rear wheel off the ground, hold the plastic nozzle near the edge of the chain and turn the wheel by hand as the lubricant sprays out - repeat the procedure on the inside edge of the chain)

Every 500 miles (800 km)



2.2 On H1 models, align the middle mark with the split in the swingarm

A Middle mark B Split



2.3 Push up on the bottom run of the chain and measure how far it deflects – if it's not within the specified limits, adjust the slack in the chain



2.5 Remove the rubber cap (arrow) and the cotter pin (if equipped); loosen the nut on the torque link bolt

2 Drive chain – check and adjustment



Check

1 A neglected drive chain won't last long and can quickly damage the sprockets. Routine

chain adjustment and lubrication isn't difficult and will ensure maximum chain and sprocket life.

2 To check the chain, support the bike securely with its rear wheel off the ground and shift the transmission into Neutral. Make sure the ignition switch is off. If you're working on an H1 (1989) model, make sure the middle mark on the eccentric cam is aligned with the split in the swingarm (see illustration).

3 Rotate the rear wheel and check the bottom run of the chain in several places to find the tightest point (chains rarely wear evenly). At this point push up on the bottom run of the chain and measure the slack midway between the two sprockets (see illustration), then compare your measurements to the value listed in this Chapter's Specifications. As wear occurs, the chain will actually stretch, which means adjustment usually involves removing some slack from the chain.

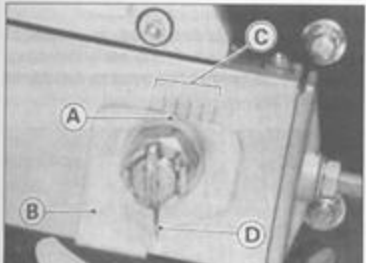
6 Loosen and back-off the locknuts on the adjuster bolts (see illustrations).

7 Remove the cotter pin and loosen the axle nut (see illustration 2.6a or 2.6c).

8 Turn the axle adjusting bolts on both sides of the swingarm until the proper chain tension is obtained. Be sure to turn the adjusting bolts evenly to keep the rear wheel in alignment. If the adjusting bolts reach the end of their travel, the chain is excessively worn and should be replaced with a new one (see Chapter 6).

9 When the chain has the correct amount of slack, make sure the marks on the adjusters correspond to the same relative marks on each side of the swingarm (see illustrations 2.6a through 2.6d). Tighten the axle nut to the torque listed in Chapter 7 Specifications, then install a new cotter pin, bending its ends around the nut to secure it. If necessary, turn the nut an additional amount to line up the cotter pin hole with the castellations in the nut – don't loosen the nut to do this.

10 Tighten the locknuts and the torque link nut securely. Install a new cotter pin in the torque link bolt (bending its ends over to secure the nut) and install the rubber cap on the end of the bolt (if equipped).



2.6a Left side chain adjuster details (H1/1989) models

A Adjuster plate notch C Adjustment marks
B Adjuster plate D Axle nut cotter pin

Adjustment

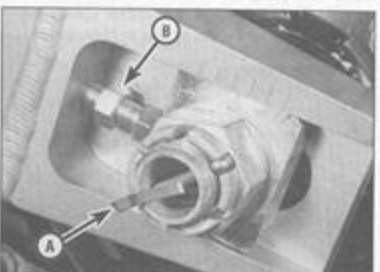
4 Rotate the rear wheel until the chain is positioned with the least amount of slack present.

5 Remove the rubber cap and cotter pin (if equipped) from the torque link-to-rear caliper bracket bolt and nut. Loosen the nut (see illustration).

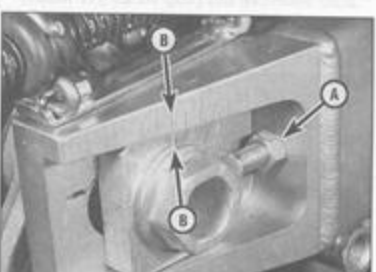


2.6b Right side chain adjuster details (H1/1989) models

A Locknut C Axle
B Adjuster D Torque link nut



2.6c On H2 and J, K, L, M models, remove the cotter pin (A) and loosen the axle nut; the adjuster bolt locknut (B) should be turned back, away from the swingarm



2.6d On the right side, loosen the adjuster locknut (A); use the adjustment marks (B) to make sure both sides are adjusted evenly

Every 3000 miles (5000 km)



3.1 A 16 mm plug socket is required for spark plug removal

3 Spark plugs – replacement

1 This motorcycle is equipped with spark plugs that have a 16 mm wrench hex (see illustration). Make sure your spark plug socket is the correct size before attempting to remove the plugs.

2 Remove the fuel tank (see Chapter 4), then disconnect the spark plug caps from the spark plugs (see illustrations). If available, use compressed air to blow any accumulated debris from around the spark plugs. Remove the plugs (see illustrations).

3 Inspect the electrodes for wear. Both the



3.2a Rotate the plug caps back and forth to break the seal . . .

center and side electrodes should have square edges and the side electrode should be of uniform thickness. Look for excessive deposits and evidence of a cracked or chipped insulator around the center electrode. Compare your spark plugs to the spark plug reading chart on the inside rear cover of this manual. Check the threads, the washer and the ceramic insulator body for cracks and other damage.

4 If the electrodes are not excessively worn, and if the deposits can be easily removed with a wire brush, the plugs can be regapped and reused (if no cracks or chips are visible in the insulator). If in doubt concerning the condition of the plugs, replace them with new ones, as the expense is minimal.



3.2b . . . then pull them off the plugs and check for brittleness or deterioration

5 Cleaning spark plugs by sandblasting is permitted, provided you clean the plugs with a high flash-point solvent afterwards.

6 Before installing new plugs, make sure they are the correct type and heat range. Check the gap between the electrodes, as they are not preset. For best results, use a wire-type gauge rather than a flat gauge to check the gap. If the gap must be adjusted, bend the side electrode only and be very careful not to chip or crack the insulator nose (see illustrations). Make sure the washer is in place before installing each plug.

7 Since the cylinder head is made of aluminum, which is soft and easily damaged, thread the plugs into the head by hand (see Haynes Hint).



3.2c Remove the plug wires (HT leads) from the clips; note the routing so they can be reinstalled in the clips



3.2d The plug wires (HT leads) are labeled according to cylinder number (counting from the left side of the motorcycle)



3.2e If the spark plug didn't stay in the wrench rubber insert, lift it out once it's loose . . .



3.2f . . . a gripping tool like this can be used to pull the plug out of its bore



3.6a Spark plug manufacturers recommend using a wire type gauge when checking the gap



3.6b To change the gap, bend the side electrode only, as indicated by the arrows

HAYNES
HINT

Since the plugs are quite recessed, slip a short length of hose over the end of the plug to use as a tool to thread it into place. The hose will grip the plug well enough to turn it, but will start to slip if the plug begins to cross-thread in the hole - this will prevent damaged threads and the accompanying repair costs.

8 Once the plugs are finger tight, the job can be finished with a socket. If a torque wrench is available, tighten the spark plugs to the torque listed in this Chapter's Specifications. If you do not have a torque wrench, tighten the plugs finger tight (until the washers bottom on the cylinder head) then use a wrench to tighten them an additional 1/4 turn. Regardless of the method used, do not over-tighten them.

9 Reconnect the spark plug caps and reinstall all components removed for access.



4.3 Disconnect the hoses from the air suction valves, then remove the two bolts and lift the valve off the engine

5 Carburetors - synchronization and idle speed

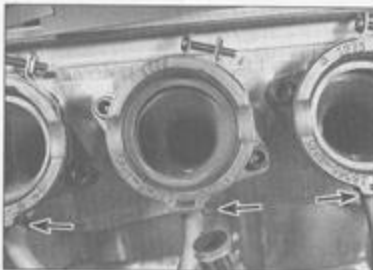


Warning: Gasoline (petrol) is extremely flammable, so take extra precautions when you work on any part of the fuel system. Don't smoke or allow open flames or bare light bulbs near the work area, and don't work in a garage where a natural gas-type appliance (such as a water heater or clothes dryer) is present. If you spill any fuel on your skin, rinse it off immediately with soap and water. When you perform any kind of work on the fuel system, wear safety glasses and have a fire extinguisher suitable for class B type fires (flammable liquids) on hand.

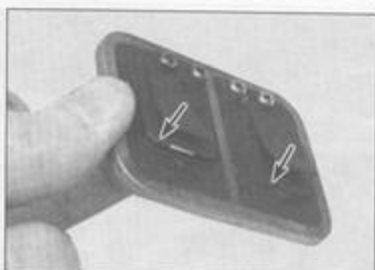
Synchronization

1 Carburetor synchronization is simply the process of adjusting the carburetors so they pass the same amount of fuel/air mixture to each cylinder. This is done by measuring the vacuum produced in each cylinder. Carburetors that are out of synchronization will result in decreased fuel mileage, increased engine temperature, less than ideal throttle response and higher vibration levels.

2 To properly synchronize the carburetors, you will need some sort of vacuum gauge



5.6a Disconnect the hoses (if equipped) from the vacuum fittings - L models (shown) are on the bottom of the intake manifold boots; H and J models are on the top ...



4.4 Check the reeds (arrows) on the air suction valve for damage and carbon build-up

setup, preferably with a gauge for each cylinder, or a manometer, which is a calibrated tube arrangement to indicate engine vacuum.



Warning: Some manometers use mercury as the liquid - since this is extremely toxic, extra precautions must be taken during use and storage of the instrument.

3 Because of the nature of the synchronization procedure and the need for special instruments, most owners leave the task to a dealer service department or a reputable motorcycle repair shop. But if you want to tackle this job, here is how it is done:

4 Start the engine and let it run until it reaches normal operating temperature, then shut it off.

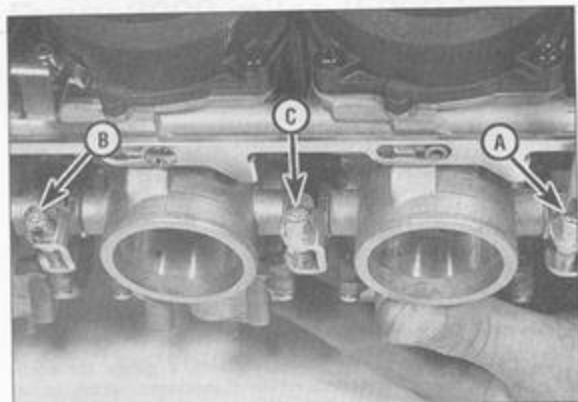
H, J and L models

5 If you're working on an H model, detach the fuel tank and move it back to provide access, but leave the fuel line attached (see Chapter 4). If you're working on a J or L model, remove the fuel tank and air cleaner housing (see Chapter 4). Connect an auxiliary fuel supply.

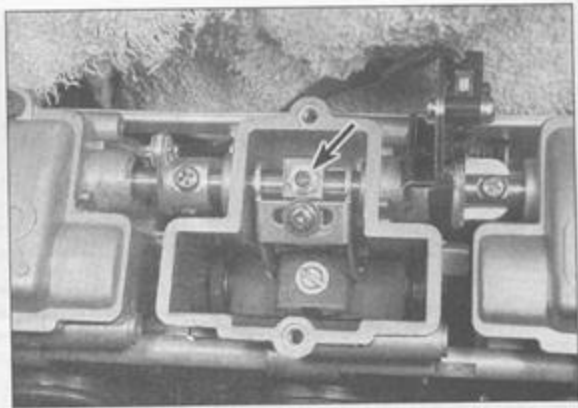
6 Detach the vacuum hoses (if equipped) from the fittings on the carburetor intake manifolds (see illustration), then hook up the vacuum gauge set or the manometer according to the manufacturer's instructions. On models with plugs in the vacuum ports instead of vacuum hoses, remove the plugs and install threaded vacuum hose fittings (see illustration). Make sure there are no leaks in the setup, as false readings will result.



5.6b ... if there are plugs in the vacuum fittings holes, unscrew them and thread in fittings like this (carburetors removed for clarity)



5.9 Adjusting screws for nos. 1 and 2 carburetors (A), nos. 3 and 4 carburetors (B), both pairs (C)



5.21 Loosen the locknut (arrow) and turn the screw to adjust throttle plate position

7 Start the engine and make sure the idle speed is correct.

8 The vacuum readings for all of the cylinders should be the same, or at least within the tolerance listed in this Chapter's Specifications. If the vacuum readings vary, adjust as necessary.

9 To perform the adjustment, synchronize the carburetors for cylinders 1 and 2 by turning the adjusting screw between those two carburetors, as needed, until the vacuum is identical or nearly identical for those two cylinders (see illustration).

10 Next, synchronize the carburetors for cylinders 3 and 4, using the adjusting screw situated between those two carburetors.

11 Finally, synchronize the carburetors for cylinders 1 and 2 to the carburetors for cylinders 3 and 4 by turning the center adjusting screw.

12 When the adjustment is complete, recheck the vacuum readings and idle speed, then stop the engine. Remove the vacuum gauge or manometer and attach the hoses to the fittings on the carburetors. Reinstall the fuel tank and all components removed for access.

K and M models

13 Remove the fuel tank (see Chapter 4) and connect an auxiliary fuel supply.

14 Turn the idle speed screw in about three threads, to the point where it's just about to move the throttle pulley.

15 Start the engine and warm it up. Check idle speed, adjust as necessary and turn the engine off.

16 Remove the air cleaner housing and the carburetors (see Chapter 4).

17 Detach the vacuum hoses (if equipped) from the fittings on the carburetor intake manifolds, then hook up the vacuum gauge set or the manometer according to the manufacturer's instructions. On models with plugs in the vacuum ports instead of vacuum hoses, remove the plugs and install threaded vacuum hose fittings. Make sure there are no leaks in the setup, as false readings will result.

18 Start the engine and make sure idle speed is correct.

19 The vacuum readings for all of the cylinders should be the same, or at least within the tolerance listed in this Chapter's Specifications. If the vacuum readings vary, adjust as necessary.

20 To make the adjustment, remove the top covers from no. 1, no. 2 and no. 3 carburetors, but don't remove the cover from carburetor no. 4 (the carburetors are numbered from the left side of the engine).

21 Loosen the locknut on each balance adjusting screw and turn the screw to synchronize it with no. 4 (see illustration). Turning the screw in closes the throttle.

22 If the carburetors can't be synchronized with the balance adjusting screws, shut the engine off, then remove the carburetors (see Chapter 4).

23 Check the carburetors for obvious contamination which could be blocking jets and passageways and overhaul them as necessary.

24 Look into the throttle bores and check the

throttle valve clearance (see illustration). Set the throttle valve clearances of carburetors no. 1, 2 and 3, using the balance adjusting screws, so they're the same as carburetor no. 4.

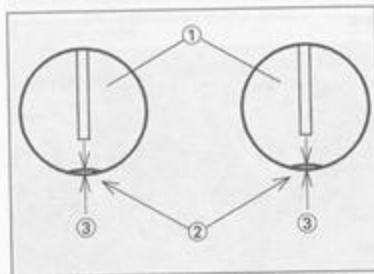
25 Reinstall the carburetors and check synchronization again. If the carburetors still won't synchronize, the pilot screw settings may be at fault. Refer to Chapter 4 for pilot screw removal and adjustment procedures.

Idle speed

26 The idle speed should be checked and adjusted after the carburetors are synchronized and when it is obviously too high or too low. Before adjusting the idle speed, make sure the valve clearances and spark plug gaps are correct. Also, turn the handlebars back-and-forth and see if the idle speed changes as this is done. If it does, the throttle cable may not be adjusted correctly, or it may be worn out. Be sure to correct this problem before proceeding.

27 The engine should be at normal operating temperature, which is usually reached after 10 to 15 minutes of stop and go riding. Support the motorcycle securely upright and make sure the transmission is in Neutral.

28 Turn the throttle stop screw (see illustration) until the idle speed listed in this Chapter's Specifications is obtained.



5.24 All four throttle plates should have the same gap at the bottom

- 1 Throttle plates
- 2 Throttle bores
- 3 Gaps



5.28 Idle speed is adjusted with the throttle stop screw (L model shown; others similar)

29 Snap the throttle open and shut a few times, then recheck the idle speed. If necessary, repeat the adjustment procedure.

30 If a smooth, steady idle can't be achieved, the fuel/air mixture may be incorrect. Refer to Chapter 4 for additional carburetor information.

6 Evaporative emission control system (California models only) – check

1 This system, installed on California models to conform to stringent emission control standards, routes fuel vapors from the fuel system into the engine to be burned, instead of letting them evaporate into the atmosphere. When the engine isn't running, vapors are stored in a carbon canister.

2 Periodic inspection consists of checking the hoses for looseness, kinking or deterioration, and the liquid/vapor separator for cracks or other obvious damage. Refer to Chapter 4 for system details. Drain the catch tank periodically as described in Section 19 of this Chapter.

7 Drive chain and sprockets – check for wear

1 Unbolt the chain guard. Check the entire length of the chain for damaged rollers, loose links and pins. In some cases where lubrication has been neglected, corrosion and galling may cause the links to bind and kink, which effectively shortens the chain's length. If the chain is tight between the sprockets, rusty or kinked, it's time to replace it with a new one.

2 Hang a 20-lb (10 kg) weight on the bottom

run of the chain and measure the length of 20 links along the top run. Rotate the wheel and repeat this check at several places on the chain, since it may wear unevenly. Compare your measurements with the maximum 20-link length listed in this Chapter's Specifications. If any of your measurements exceed the maximum, replace the chain.

Caution: Never install a new chain on old sprockets, and never use the old chain if you install new sprockets – replace the chain and sprockets as a set.

3 Remove the engine sprocket cover (see Chapter 6). Check the teeth on the engine sprocket and the rear sprocket for wear (see illustration). Refer to Chapter 6 for the sprocket diameter measurement procedure if the sprockets appear to be worn excessively.

8 Brake system – general check

1 A routine general check of the brakes will ensure that any problems are discovered and remedied before the rider's safety is jeopardized.

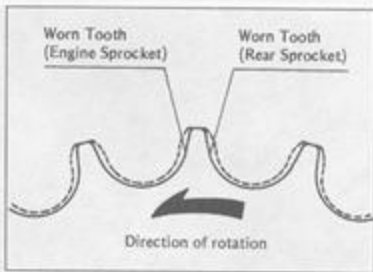
2 Check the brake lever and pedal for loose connections, excessive play, bends, and other damage. Replace any damaged parts with new ones (see Chapter 7).

3 Make sure all brake fasteners are tight. Check the brake pads for wear (see Section 9) and make sure the fluid level in the reservoir is correct (see "Daily (pre-ride) checks"). Look for leaks at the hose connections and check for cracks in the hoses. If the lever is spongy, bleed the brakes as described in Chapter 7.

Brake light switch

4 Make sure the brake light operates when the front brake lever is depressed.

5 Make sure the brake light is activated when



7.3 Check the sprockets in the areas indicated to see if they're worn excessively

the rear brake pedal is depressed approximately 10 mm (3/8 in).

6 If adjustment is necessary, hold the switch body and turn the adjusting nut on the switch body (see illustration) until the brake light is activated when required. Raising the switch will cause the brake light to come on sooner; lowering it will cause the brake light to come on later. If the switch doesn't operate the brake lights, check it as described in Chapter 9.

7 The front brake light switch is not adjustable. If it fails to operate properly, replace it with a new one (see Chapter 9).

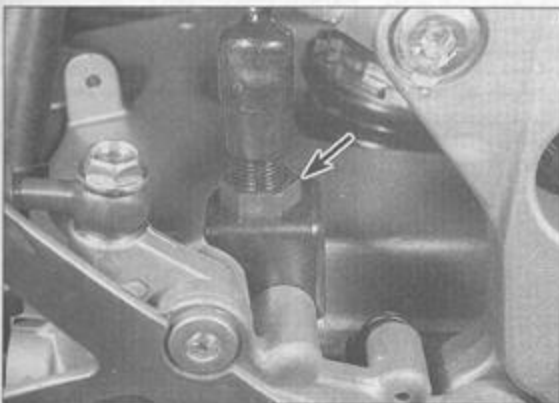
Brake pedal position

8 Rear brake pedal position should be set at the height listed in this Chapter's Specifications. Measure vertically up from the pedal tip to the top of the footpeg.

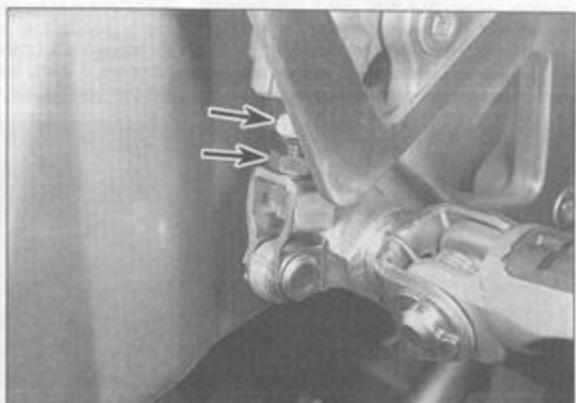
9 If you're working on a J, K, L or M model, unbolt the footpeg bracket and rotate it out of the way (see Chapter 8).

10 To adjust the position of the pedal, loosen the locknut on the master cylinder clevis, then rotate the hex on the master cylinder pushrod (see illustration).

11 If necessary, adjust the brake light switch (see Steps 5 and 6 above).



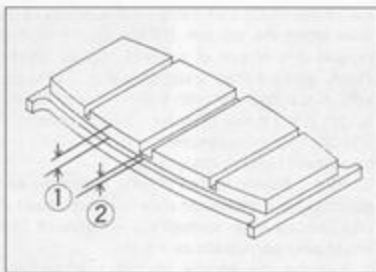
8.6 Hold the switch body so it doesn't turn, and rotate the plastic nut (arrow) to adjust the rear brake light switch



8.10 Loosen the locknut (lower arrow) and turn the adjusting hex (upper arrow) to adjust brake pedal position

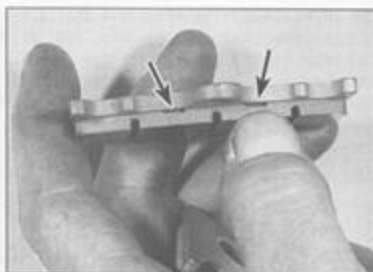


9.2a Remove the screws (arrows) and lift off the pad spring to inspect the front brake pads



9.2b On H models, replace the pads when the friction material is worn to the specified minimum thickness

- 1 Friction material thickness when new
- 2 Wear limit



9.2c J, K, L, M models have wear cutouts (arrows) in the friction material; when the material is worn so that the cutouts are exposed, it's time to replace the pads

9 Brake pads – wear check

1 The brake pads should be checked at the recommended intervals and replaced with new ones when worn beyond the limit listed in this Chapter's Specifications.

2 To check the front brake pads, remove the pad spring so you can see clearly into the brake caliper. The brake pads should have at least the specified minimum amount of lining material remaining on the metal backing plate (see illustrations). Be sure to check the pads in both calipers.

3 Remove the rear brake caliper to check the pads (see Chapter 7). Remove the pad cover (if equipped) to expose the pads (see illustration).

4 If the pads are worn excessively, they must be replaced with new ones (see Chapter 7).



10 Clutch – check

1 The hydraulic clutch mechanism on these models eliminates the need for freeplay adjustment. No means of manual adjustment is provided. However, the distance from the clutch lever to the handlebar can be adjusted with the span adjuster (see illustration).



10.1 Turn the span adjuster to change the clutch lever distance from the handlebar

11 Lubrication – general

1 Since the controls, cables and various other components of a motorcycle are exposed to the elements, they should be lubricated periodically to ensure safe and trouble-free operation.

2 The footpegs, clutch and brake levers, brake pedal, shift lever and sidestand pivots should be lubricated frequently. In order for the lubricant to be applied where it will do the most good, the component should be disassembled. However, if chain and cable lubricant is being used, it can be applied to the pivot joint gaps and will usually work its



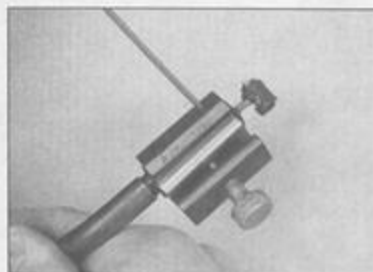
10.2 Look for fluid leaks around the clutch release cylinder and make sure its mounting bolts are tight



9.3 Remove the pad cover (if equipped) from the rear caliper to inspect the pads

way into the areas where friction occurs. If motor oil or light grease is being used, apply it sparingly as it may attract dirt (which could cause the controls to bind or wear at an accelerated rate). **Note:** One of the best lubricants for the control lever pivots is a dry-film lubricant (available from many sources by different names).

3 The throttle and choke cables should be removed and treated with motor oil or a commercially available cable lubricant which is specially formulated for use on motorcycle control cables. Small adapters for pressure lubricating the cables with spray can lubricants are available and ensure that the cable is lubricated along its entire length (see illustration). If motor oil is being used, tape a funnel-shaped piece of heavy paper or plastic



11.3a Lubricating a cable with a pressure lube adapter (make sure the tool seats around the inner cable)

to the end of the cable, then pour oil into the funnel and suspend the end of the cable upright (see illustration). Leave it until the oil runs down into the cable and out the other end. When attaching the cable to the lever, be sure to lubricate the barrel-shaped fitting at the end with multi-purpose grease.

4 To lubricate the throttle and choke cables, disconnect the cables at the lower end, then lubricate the cable with a pressure lube adapter (see illustration 11.3a). See Chapter 4 for the cable removal procedure.

5 The speedometer cable should be removed from its housing and the lower end of the inner cable lubricated with a thin coat of multi-purpose grease.

6 Refer to Chapter 6 for the swingarm needle bearing and Uni-trak linkage lubrication procedures.

12 Steering head bearings – check and adjustment



1 This vehicle is equipped with ball-and-cone type steering head bearings which can become dented, rough or loose during normal use of the machine. In extreme cases, worn or loose steering head bearings can cause steering wobble that is potentially dangerous.

2 To check the bearings, support the motorcycle securely upright and block the machine so the front wheel is in the air.

3 Point the wheel straight ahead and slowly move the handlebars from side-to-side. Dents or roughness in the bearing races will be felt and the bars will not move smoothly. **Note:** Make sure any hesitation in movement is not being caused by the cables and wiring harnesses that run to the handlebars.

4 Next, grasp the fork legs and try to move the wheel forward and backward (see illustration). Any looseness in the steering head bearings will be felt. If play is felt in the bearings, refer to Chapter 6 and adjust them.

5 Lubrication of the steering head bearings should be carried out at the recommended intervals (see Maintenance schedule) and is detailed in Chapter 6.

13 Tires/wheels – general check

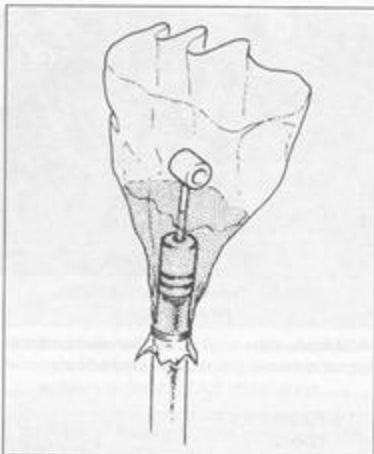


Tires

1 Check the tires carefully for damage, tread depth and correct pressure as described in the 'Daily (pre-ride) checks'.

Wheels

2 The cast wheels used on this machine are virtually maintenance free, but they should be kept clean and checked periodically for cracks and other damage. Never attempt to repair damaged cast wheels; they must be replaced with new ones.



11.3b Lubricating a control cable with a makeshift funnel and motor oil

3 Check the valve stem locknuts to make sure they're tight. Also, make sure the valve stem cap is in place and tight. If it is missing, install a new one made of metal or hard plastic.

14 Battery electrolyte level/specific gravity (H models) – check



Warning: Be extremely careful when handling or working around the battery. The electrolyte is very caustic and an explosive gas (hydrogen) is given off when the battery is charging.

1 This procedure only applies to H models, which use fillable batteries. Later models use maintenance-free batteries, which don't require the addition of water.

2 Remove the seat and both side covers (see Chapter 8). Remove the battery (see Chapter 9).

3 Check the electrolyte level, which is visible through the translucent battery case – it should be between the Upper and Lower level marks.

4 If it is low, remove the cell caps and fill each cell to the upper level mark with distilled water. Do not use tap water (except in an emergency), and do not overfill. Never add electrolyte (diluted sulfuric acid) to a battery in service. If the level is within the marks on the case, additional water is not necessary.



The cell holes are quite small, so it may help to use a plastic squeeze bottle with a small spout to add the water.

5 Next, check the specific gravity of the electrolyte in each cell with a small hydrometer made especially for motorcycle batteries (if the electrolyte level is known to be sufficient it won't be necessary to remove the battery).



12.4 Checking for play in the steering head bearings

These are available from most dealer parts departments or motorcycle accessory stores.

6 Remove the caps, draw some electrolyte from the first cell into the hydrometer (see illustration) and note the specific gravity. Compare the reading to the Specifications listed in this Chapter. **Note:** Add 0.004 points to the reading for every 10° above 20°C (68°F) – subtract 0.004 points from the reading for every 10° below 20°C (68°F). Return the electrolyte to the appropriate cell and repeat the check for the remaining cells. When the check is complete, rinse the hydrometer thoroughly with clean water.

7 If the specific gravity of the electrolyte in each cell is as specified, the battery is in good condition and is apparently being charged by the machine's charging system.

8 If the specific gravity is low, the battery is not fully charged. This may be due to corroded battery terminals, a dirty battery case, a malfunctioning charging system, or loose or corroded wiring connections. On the other hand, it may be that the battery is worn out, especially if the machine is old, or that infrequent use of the motorcycle prevents normal charging from taking place.

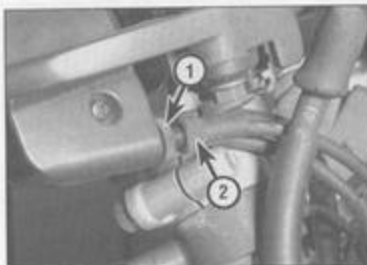
9 Be sure to correct any problems and charge the battery if necessary. Refer to Chapter 9 for additional battery maintenance and charging procedures.

10 Install the battery cell caps, tightening them securely.

11 Install the battery. Be sure to refer to the safety precautions regarding battery installation in Chapter 9.



14.6 Check the specific gravity with a hydrometer



17.3 Loosen the accelerator cable lockwheel (1) and turn the adjuster (2) in or out to obtain the correct throttle freeplay

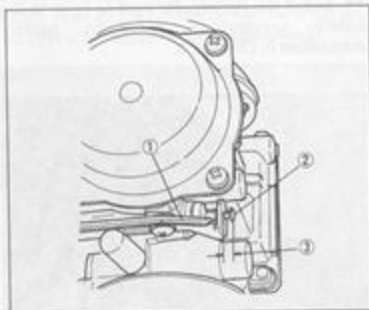
15 Exhaust system – check



- 1 Periodically check all of the exhaust system joints for leaks and loose fasteners. The lower fairing will have to be removed to do this properly (see Chapter 8). If tightening the clamp bolts fails to stop any leaks, replace the gaskets with new ones (a procedure which requires disassembly of the system).
- 2 The exhaust pipe flange nuts at the cylinder head are especially prone to loosening, which could cause damage to the head. Check them frequently and keep them tight.

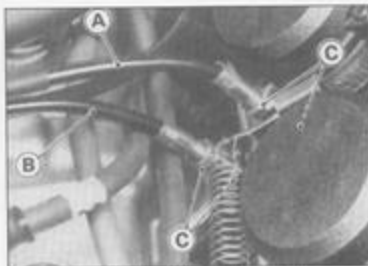


17.8a Operate the choke lever (arrow) to take up cable slack . . .



17.8b . . . and check freeplay at the choke plunger lever

- 1 Choke plunger lever
- 2 Choke plunger
- 3 Freeplay



17.5a Throttle cable details (H models)

- A Accelerator cable B Decelerator cable
C Lockwheels C Lockwheels

16 Fasteners – check



- 1 Since vibration of the machine tends to loosen fasteners, all nuts, bolts, screws, etc. should be periodically checked for proper tightness.
- 2 Pay particular attention to the following:
 - Spark plugs
 - Engine oil drain plug
 - Oil filter mounting bolt (H2 model)
 - Gearshift lever
 - Footpegs and sidestand
 - Engine mount bolts
 - Shock absorber mount bolts
 - Uni-trak linkage bolts
 - Front axle and clamp bolt
 - Rear axle nut
- 3 If a torque wrench is available, use it along with the torque specifications at the beginning of this, or other Chapters.

17 Throttle and choke operation/grip freeplay – check and adjustment

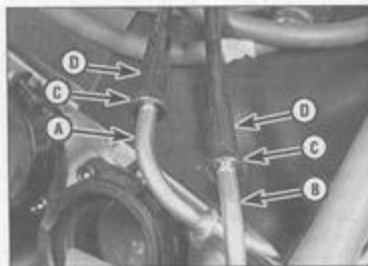


Throttle check

- 1 Make sure the throttle grip rotates easily from fully closed to fully open with the front



17.9 Loosen the lockwheel (right arrow) and turn the adjuster (left arrow) to adjust choke cable freeplay (L model shown; others similar)



17.5b Throttle cable details (J, K, L, M models)

- A Accelerator cable C Lockwheels
B Decelerator cable D Adjusters

- wheel turned at various angles. The grip should return automatically from fully open to fully closed when released. If the throttle sticks, check the throttle cables for cracks or kinks in the housings. Also, make sure the inner cables are clean and well-lubricated.
- 2 Check for a small amount of freeplay at the grip (measured in terms of grip rotation) and compare the freeplay to the value listed in this Chapter's Specifications.

Throttle adjustment

- Note:** These motorcycles use two throttle cables – an accelerator cable and a decelerator cable.
- 3 Freeplay adjustments can be made at the throttle grip end of the accelerator cable. Loosen the lockwheel on the cable (see illustration) and turn the adjuster until the desired freeplay is obtained, then retighten the lockwheel.
 - 4 If the freeplay can't be adjusted at the grip end, adjust the cables at the lower ends. To do this, first remove the fuel tank (see Chapter 4).
 - 5 Loosen the locknuts on both throttle cables (see illustrations), then turn both adjusting nuts in completely.
 - 6 Turn out the adjusting nut of the decelerator cable until the inner cable becomes tight, then tighten the locknut.
 - 7 Turn the accelerator adjusting nut until the desired freeplay is obtained, then tighten the locknut. Make sure the throttle linkage lever contacts the idle adjusting screw when the throttle grip is at rest.

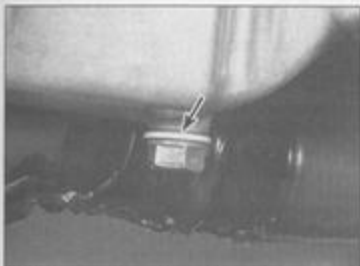
Choke check

- 8 Remove the fuel tank (see Chapter 4). Operate the choke lever while you watch the choke plunger at the carburetor assembly (see illustrations). The amount the plunger lever travels before it contacts the plunger is choke cable freeplay. Compare with the value listed in this Chapter's Specifications.

Choke adjustment

- 9 If freeplay is incorrect, locate the midline cable adjuster (see illustration). Loosen the lockwheel and turn the adjuster to obtain the correct freeplay, then tighten the lockwheel.

Every 6000 miles (10,000 km)



18.6 Remove the oil pan drain plug (arrow) (J through M models shown; H models similar)



18.7a Unscrew the oil filter with an oil filter wrench; the square opening allows a torque wrench to be used for installation . . .



18.7b . . . a chain wrench or strap wrench can be used if the special tool isn't available (H1 model)

18 Engine oil/filter – change

1 Consistent routine oil and filter changes are the single most important maintenance procedure you can perform on a motorcycle. The oil not only lubricates the internal parts of the engine, transmission and clutch, but it also acts as a coolant, a cleaner, a sealant, and a protectant. Because of these demands, the oil takes a terrific amount of abuse and should be replaced often with new oil of the recommended grade and type.



18.10a Check the installation instructions printed on the filter



18.10b Coat the filter gasket with clean engine oil and thread the filter on (H1 model)



Saving a little money on the difference in cost between a good oil and a cheap oil won't pay off if the engine is damaged.

2 Before changing the oil and filter, warm up the engine so the oil will drain easily. Be careful when draining the oil, as the exhaust pipes, the engine, and the oil itself can cause severe burns.

3 Support the motorcycle securely upright over a clean drain pan.

H1, J, K, L and M models

4 If you're working on an H1 model, remove the front lower fairing. If you're working on a J, K, L or M model, remove the lower left fairing panel (see Chapter 8).

5 Remove the oil filler cap to vent the crankcase and act as a reminder that there is no oil in the engine.

6 Next, remove the drain plug from the engine (see illustration) and allow the oil to drain into the pan. Do not lose the sealing washer on the drain plug.

7 As the oil is draining, remove the oil filter with an oil filter wrench (see illustrations). If additional maintenance is planned for this time period, check or service another component while the oil is allowed to drain completely.



18.18a Unscrew the oil filter mounting bolt (arrow) . . .

8 Wipe any remaining oil off the filter sealing area of the crankcase.

9 Check the condition of the drain plug threads and the sealing washer.

10 Coat the gasket on the new filter with clean engine oil. Install the filter and tighten it to the torque listed in this Chapter's Specifications (see illustrations).

11 Slip a new sealing washer over the drain plug, then install and tighten the plug to the torque listed in this Chapter's Specifications. Avoid overtightening, as damage to the engine case will result.

H2 models

12 Remove the left and right lower fairing panels (see Chapter 8).

13 Remove the oil cooler (see Chapter 3).

14 Remove the radiator (see Chapter 3).

15 Remove the muffler/silencer (see Chapter 4).

16 Support the motorcycle securely upright over a clean drain pan. Remove the oil filler cap to vent the crankcase and to serve as a reminder that there's no oil in the engine.

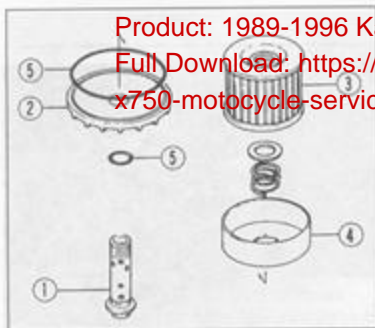
17 Next, remove the drain plug from the bottom of the crankcase and allow the oil to drain into the pan. Don't lose the sealing washer on the drain plug.

18 As the oil is draining, remove the oil filter mounting bolt and lower the filter out of the crankcase (see illustrations). Separate the filter from the mounting bolt, then remove the washer, spring and oil fence (see illustration).



18.18b . . . then lower the filter from the crankcase

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18.18c Oil filter details – H2 models

- | | |
|--|--------------|
| 1 Mounting bolt/
bypass valve
assembly | 3 Oil filter |
| 2 Filter cover | 4 Oil fence |
| | 5 O-ring |

If additional maintenance is planned for this time period, check or service another component while the oil is allowed to drain completely.

19 Clean the filter cover and housing with solvent or clean rags. Wipe any remaining oil off the oil filter cover sealing area of the crankcase.

20 Remove the mounting bolt from the filter cover. The oil filter bypass valve is located inside the mounting bolt. Wash the mounting bolt in solvent and check the bypass valve for damage. If the valve is full of sludge, drive out the retaining pin and remove the spring and steel ball (see illustrations).

21 Clean the components and check them for damage – especially, be sure to check the spring for distortion. If any damage is found, replace the mounting bolt/bypass valve assembly. If the components are okay, reassemble the valve and install the retaining pin.

22 Check the condition of the drain plug threads and the sealing washer. Use a new O-ring on the filter housing when it's installed.

23 Install a new O-ring on the mounting bolt, lubricate the mounting bolt with clean engine oil and insert the bolt through the filter cover. Place the oil fence over the mounting bolt.

24 Install a new O-ring on the filter cover,



18.24 Lubricate the mounting bolt and twist the new filter onto it, making sure the grommets aren't dislodged from the filter



18.20a To disassemble the bypass valve, drive out the retaining pin . . .



18.20b . . . then remove the spring and ball from the mounting bolt

then install the spring and washer. Twist the new filter down the mounting bolt, making sure the rubber grommets on the filter don't slip out of place (see illustration).

25 Guide the oil filter assembly up into the crankcase. Tighten the mounting bolt with your fingers until the filter cover contacts the crankcase, making sure the O-ring on the filter cover stays in its groove and seals properly. Tighten the mounting bolt to the torque listed in this Chapter's Specifications.

26 Slip the sealing washer over the drain plug, then install and tighten the plug to the torque listed in this Chapter's Specifications. Avoid overtightening, as damage to the engine case will result.

All models



Before refilling the engine, check the old oil carefully. If the oil was drained into a clean pan, small pieces of metal or other material can be easily detected. If the oil is very metallic colored, then the engine is experiencing wear from break-in (new engine) or from insufficient lubrication. If there are flakes or chips of metal in the oil, then something is drastically wrong internally and the engine will have to be disassembled for inspection and repair. If there are pieces of fiber-like material in the oil, the clutch is experiencing excessive wear and should be checked.

27 If the inspection of the oil turns up nothing unusual, refill the crankcase to the proper level with the recommended oil and install the filter cap. Start the engine and let it run for two or three minutes. Shut it off, wait a few minutes, then check the oil level. If necessary, add more oil to bring the level up to the Maximum mark. Bring around the drain plug and check for leaks.

28 The old oil drained from the engine cannot be reused. If you have a local refuse disposal company, disposal facility or environmental agency to see whether they will accept the oil for recycling. Don't pour used oil into drains or onto the ground. After the oil

has cooled, it can be drained into a suitable container (capped plastic jugs, topped bottles, milk cartons, etc.) for transport to one of these disposal sites.



Note: It is antisocial and illegal to dump oil down the drain. To find the location of your local oil recycling bank, call this number free.

In the US note that any oil supplier must accept used oil for recycling.

19 Air filter element – cleaning

H models

- 1 Remove the front seat (see Chapter 8).
- 2 Remove the bolts that secure the air filter retainer, then grasp the knob and pull out the filter element (see illustration).

J and K models

- 3 Remove the side covers (J models) or the tailpiece (K models) (see Chapter 8).
- 4 Remove the fuel tank mounting bolts (see Chapter 4). Lift up the fuel tank and pull out the filter element (see illustration).

L and M models

- 5 Remove the side covers (see Chapter 8) and the fuel tank (see Chapter 4).
- 6 Pull the retainer off the slot in the air filter housing and pull out the filter element (see illustrations).

All models

- 8 Clean the filter element in high-flash point solvent. Soak a towel in SAE 30 SE or SF engine oil, then pad the towel on the foam side of the filter element to saturate it with the oil.

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