Spark Plug Condition Chart

Refer to Chapter 1 for spark plug maintenance

Electrode gap check – use a wire type gauge for best results

Electrode gap adjustment – bend the side electrode using the correct tool

Normal condition – A brown, tan or grey firing end indicates that the engine is in good condition and that the plug type is correct

Ash deposits – Light brown deposits encrusted on the electrodes and insulator, leading to misfire and hesitation. Caused by excessive amounts of oil in the combustion chamber or poor quality fuel/oil

Carbon fouling – Dry, black sooty deposits leading to misfire and weak spark. Caused by an over-rich fuel/air mixture, faulty choke operation or blocked air filter

Oil fouling – Wet oily deposits leading to misfire and weak spark. Caused by oil leakage past piston rings or valve guides (4-stroke engine), or excess lubricant (2-stroke engine)

Overheating – A blistered white insulator and glazed electrodes. Caused by ignition system fault, incorrect fuel, or cooling system fault

Worn plug – Worn electrodes will cause poor starting in damp or cold weather and will also waste fuel

Honda CBR400RR models covered by this manual:

CBR400RR (NC23 Tri-Arm)	399cc	'88 to '99
CBR400RR (NC29 Gull-Arm, FireBlade)	399cc	'90 to '99

Note: This manual does not include the CBR400R Aero, CB-1 or CB400 Super Four.

Whether carrying out a routine service or rebuilding the engine, Haynes *SHOWS YOU HOW* and *SAVES YOU MONEY*.

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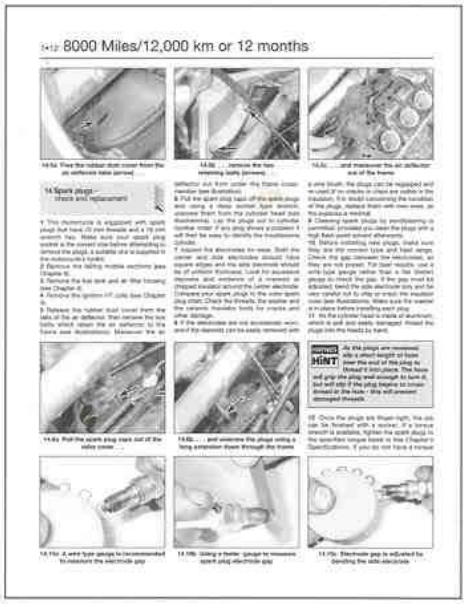

Inside this Manual

- **Honda** history and **CBR** model development.
- A complete step-by-step guide to **servicing** and **routine maintenance**.
- **Engine** and **transmission** – servicing and overhaul.
- **Braking system** – safety checks and repairs.
- **Fuel, cooling** and **ignition systems** explained.
- **Suspension and steering** – adjustment and overhaul.
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The Birth of a Dream

by Julian Ryder

There is no better example of the Japanese post-War industrial miracle than Honda. Like other companies which have become household names, it started with one man's vision. In this case the man was the 40-year old Soichiro Honda who had sold his piston-ring manufacturing business to Toyota in 1945 and was happily spending the proceeds on prolonged parties for his friends. However, the difficulties of getting around in the chaos of post-War Japan irked Honda, so when he came across a job lot of generator engines he realised that here was a way of getting people mobile again at low cost.

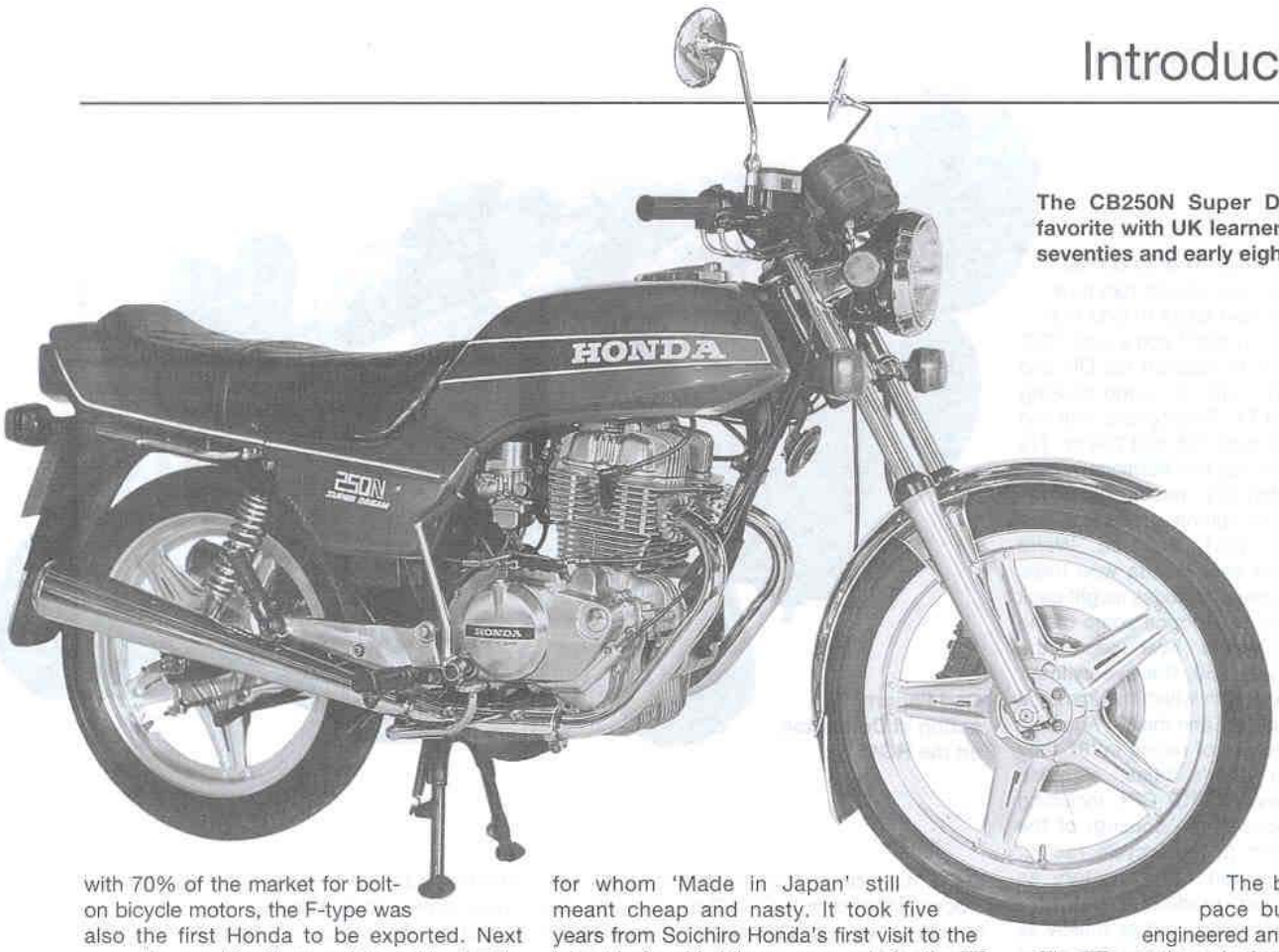
A 12 by 18-foot shack in Hamamatsu became his first bike factory, fitting the generator motors into pushbikes. Before long he'd used up all 500 generator motors and started manufacturing his own engine, known as the 'chimney', either because of the elongated cylinder head or the smoky exhaust or perhaps both. The chimney made all of half a horsepower from its 50 cc engine but it was a major success and became the Honda A-type. Less than two years after he'd set up in Hamamatsu, Soichiro Honda founded the Honda Motor Company in September 1948. By then, the A-type had been developed into the 90 cc B-type engine, which Mr Honda decided deserved its own chassis not a bicycle frame. Honda was about to become Japan's first post-War manufacturer of complete motorcycles. In August 1949 the first prototype was ready. With an output of three horsepower, the 98 cc D-type was still a simple two-stroke but it had a two-speed transmission and most importantly a pressed steel frame with telescopic forks and hard tail rear end. The frame was almost triangular in profile with the top rail going in a straight line from the massively braced steering head to the rear axle. Legend has it that after the D-type's first tests the entire workforce went for a drink to celebrate and try and think of a name for the bike. One man broke one of those silences you get when people are thinking, exclaiming 'This is like a dream!' 'That's it!' shouted Honda, and so the Honda Dream was christened.

1970 Honda C90 OHV-engined model

> 'This is like a dream!' 'That's it' shouted Honda

Mr Honda was a brilliant, intuitive engineer and designer but he did not bother himself with the marketing side of his business. With hindsight, it is possible to see that employing Takeo Fujisawa who would both sort out the home market and plan the eventual expansion into overseas markets was a masterstroke. He arrived in October 1949 and in 1950 was made Sales Director. Another vital new name was Kiyoshi Kawashima, who along with Honda himself, designed the company's first four-stroke after Kawashima had told them that the four-stroke opposition to Honda's two-strokes sounded nicer and therefore sold better. The result of that statement was the overhead-valve 148 cc E-type which first ran in July 1951 just two months after the first drawings were made. Kawashima was made a director of the Honda Company at 34 years old.

The E-type was a massive success, over 32,000 were made in 1953 alone, but Honda's lifelong pursuit of technical innovation sometimes distracted him from commercial reality. Fujisawa pointed out that they were in danger of ignoring their core business, the motorised bicycles that still formed Japan's main means of transport. In May 1952 the F-type Cub appeared, another two-stroke despite the top men's reservations. You could buy a complete machine or just the motor to attach to your own bicycle. The result was certainly distinctive, a white fuel tank with a circular profile went just below and behind the saddle on the left of the bike, and the motor with its horizontal cylinder and bright red cover just below the rear axle on the same side of the bike. This was the machine that turned Honda into the biggest bike maker in Japan



The CB250N Super Dream became a favorite with UK learner riders of the late seventies and early eighties

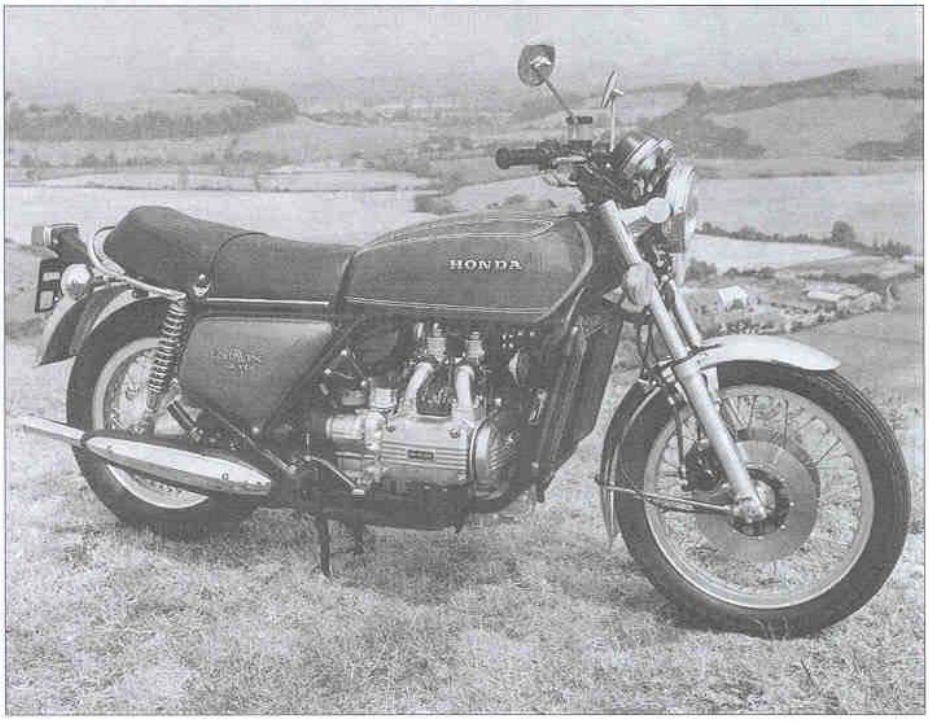
with 70% of the market for bolt-on bicycle motors, the F-type was also the first Honda to be exported. Next came the machine that would turn Honda into the biggest motorcycle manufacturer in the world.

The C100 Super Cub was a typically audacious piece of Honda engineering and marketing. For the first time, but not the last, Honda invented a completely new type of motorcycle, although the term 'scooterette' was coined to describe the new bike which had many of the characteristics of a scooter but the large wheels, and therefore stability, of a motorcycle. The first one was sold in August 1958, fifteen years later over nine-million of them were on the roads of the world. If ever a machine can be said to have brought mobility to the masses it is the Super Cub. If you add in the electric starter that was added for the C102 model of 1961, the design of the Super Cub has remained substantially unchanged ever since, testament to how right Honda got it first time. The Super Cub made Honda the world's biggest manufacturer after just two years of production.

Honda's export drive started in earnest in 1957 when Britain and Holland got their first bikes, America got just two bikes the next year. By 1962 Honda had half the American market with 65,000 sales. But Soichiro Honda had already travelled abroad to Europe and the USA, making a special point of going to the Isle of Man TT, then the most important race in the GP calendar. He realised that no matter how advanced his products were, only racing success would convince overseas markets for whom 'Made in Japan' still meant cheap and nasty. It took five years from Soichiro Honda's first visit to the Island before his bikes were ready for the TT. In 1959 the factory entered five riders in the 125. They did not have a massive impact on the event being benevolently regarded as a curiosity, but sixth, seventh and eighth were good enough for the team prize. The bikes were off the pace but they were well engineered and very reliable.

The TT was the only time the West saw the Hondas in '59, but they came back for more the following year with the first of a generation of bikes which shaped the future of motorcycling - the double-overhead-cam four-cylinder 250. It was fast and reliable - it revved to 14,000 rpm -

The GL1000 introduced in 1975, was the first in Honda's line of Goldwings



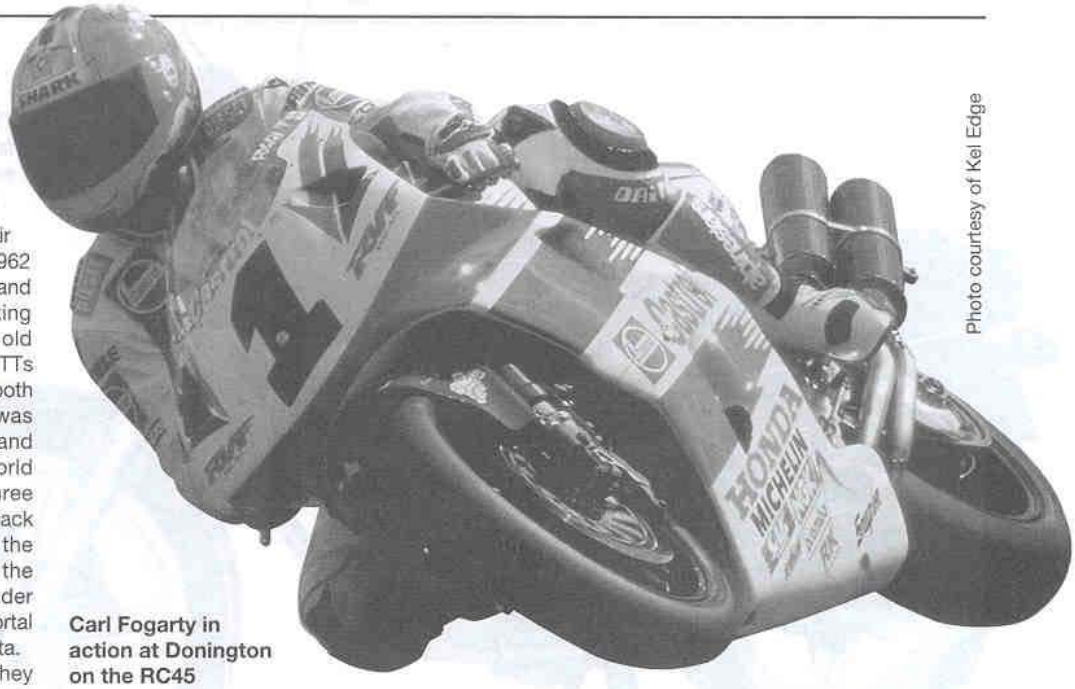


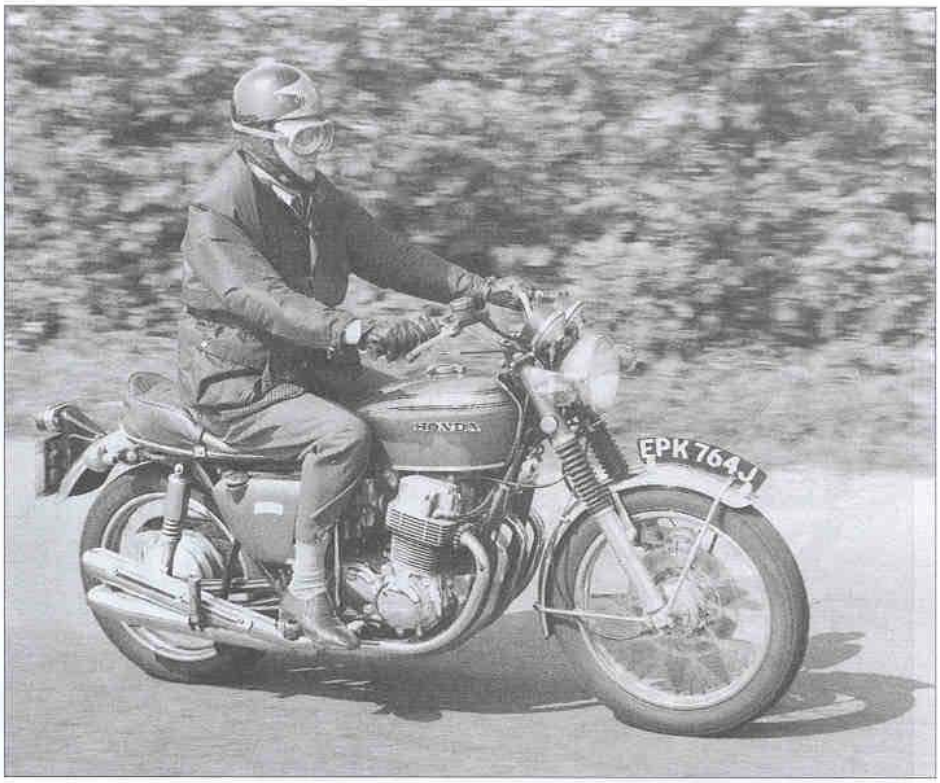
Photo courtesy of Kel Edge

Carl Fogarty in action at Donington on the RC45

but didn't handle anywhere near as well as the opposition. However, Honda had now signed up non-Japanese riders to lead their challenge. The first win didn't come until 1962 (Aussie Tom Phillis in the Spanish 125 GP) and was followed up with a world-shaking performance at the TT. Twenty-one year old Mike Hailwood won both 125 and 250 cc TTs and Hondas filled the top five positions in both races. Soichiro Honda's master plan was starting to come to fruition, Hailwood and Honda won the 1961 250 cc World Championship. Next year Honda won three titles. The other Japanese factories fought back and inspired Honda to produce some of the most fascinating racers ever seen: the awesome six-cylinder 250, the five-cylinder 125, and the 500 four with which the immortal Hailwood battled Agostini and the MV Agusta. When Honda pulled out of racing in '67 they had won sixteen rider's titles, eighteen manufacturer's titles, and 137 GPs, including 18 TTs, and introduced the concept of the modern works team to motorcycle racing. Sales success followed racing victory as Soichiro Honda had predicted, but only because the products advanced as rapidly as the racing machinery. The Hondas that came to Britain in the early '60s were incredibly sophisticated. They had overhead cams where the British bikes had pushrods, they had electric starters when the Brits relied on the kickstart, they had 12V electrics when even the biggest British bike used a 6V system. There seemed no end to the technical wizardry and when in 1968 the first four-cylinder CB750 road bike arrived the world changed for ever. They even had to invent a new word for it: superbike. Honda raced again with the CB750 at Daytona and won the World Endurance title with a prototype DOHC version that became the CB900 roadster. There was the six-cylinder CBX, the first turbocharged production bike, they invented the full-dress tourer with the Goldwing and came back to GPs with the revolutionary oval-pistoned NR500 four-stroke, a much-misunderstood bike that was more rolling experiment than racer. It was true, though, that Mr Honda was not keen on two-strokes - early motocross engines had to be explained away to him as lawnmower motors! However, in 1982 Honda raced the NS500, an agile three-cylinder lightweight against the big four-cylinder opposition in 500 GPs. The bike won in the first year and in '83 took the world title for Freddie Spencer. In four-stroke racing the V4 layout took over from the straight four, dominating TT, F1 and Endurance championships and when Superbike arrived Honda were ready with the RC30. On the roads the VFR V4 became an instant classic while the CBR600 invented another new class of bike on its way to becoming a best-seller.

And then there was the NR750. This limited-edition technological tour-de-force embodied many of Soichiro Honda's ideals. It used the latest techniques and materials in every component, from the oval-piston, 32-valve V4 motor to the titanium coating on the windscreen, it was - as Mr Honda would have wanted - the best it could possibly be. A fitting memorial to the man who has shaped the motorcycle industry and motorcycles as we know them today.

An early CB750 Four



Precision Miniatures

When the grey imports phenomenon took off commercially, it bought to the UK two different types of bike. To understand the difference you must first understand a few basic facts about the Japanese home market, where the vast majority of these machines came from. Firstly, Japan's draconian licensing system effectively restricted riders to 400 cc four-strokes and 250 cc two-strokes. Secondly, the Japanese market is fashion conscious in the extreme. If a manufacturer gets it right then it will sell thousands of units. Get it wrong and your bikes will languish in the showrooms for ever, or until some budding entrepreneur buys them up cheaply and ships them to Europe.

So when the greys started landing, UK motorcyclists were not very surprised to discover that there was a 400 cc model in the CBR range beside the 1000 cc sports tourer and the best-selling CBR600. These were used bikes which those same restrictive laws effectively took off the roads of Japan once they were a few years old. The second type tended to be weird models that had failed Japanese youth's style test and arrived over here hardly used and sometimes even brand new.

Right at the head of the first category was the CBR400RR that first hit Japan's roads in 1988 and instantly stormed to the top of the sales charts. And no wonder. Although the motor was a development of the earlier CBR400 Aero that looked just like an early 'jellymould' CBR, the double-R had gear-driven cams and an aluminium frame as well as a 17-inch front wheel and mouth-watering styling complete with twin-headlamp fairing. Bear in mind that the FireBlade was four years away and the 600 cc CBR had camshafts driven by chains and a tubular steel chassis and you can see why the double-R was such a success. In fact in terms of technology, it was nearer to the RC30 that was launched for 1988 and its 400 cc sibling the NC30, or

NC23 Tri-Arm – the first CBR400RR

VFR400R, as shown by the fact that the 400 cc in-line four also had a factory code: NC23. In fact it was better known as the Tri-Arm, a reference to the sticker on the side of the fairing meant to draw attention to the heavily triangulated swinging arm that looked like it had just been unbolted from a factory racer.

The commercial domination of the Tri-Arm was continued in 1990 by the next generation of CBR400RR, the L-model, the first of the Gull-Arms or NC29. Despite the superficial similarities of the two bikes, the Gull-Arm was a completely new machine whose cycle parts had much in common with the VFR400R including 17-inch wheels front and rear. The motor's cylinders and upper crankcase half were cast in one piece, again before the FireBlade and the CBR600 M-model used the same layout. The bike's name came from the new swinging arm design, again derived from current race-track practice. Instead of the straight, rectangular cross-sectional members, each side of the arm was a single, massive fabrication. On the right side, it had an elbow bend in it to accommodate the exhaust pipe without compromising ground clearance. Again this was copied from Grand Prix practice (despite the real racers being two-strokes) just a year after the design was first seen on the track, and it was this feature that gave the bike the Gull-Arm name.

The smaller bike has regularly been given the same colour schemes as the bigger Blade and has basically remained otherwise unchanged. There have been minor adjustments and the claimed power output has even gone down a fraction and the weight up by a kilogram - just like on the 400 cc V4s.

When the 900 cc FireBlade hit world markets and revolutionised the sports bike market sector in 1992 the Gull-Arm got the same paintwork and even a FireBlade sticker on the fairing. Even though the 400 was the earlier design, it was immediately (or rather lately) christened the Baby Blade and as far as anyone can tell became the best-selling grey import machine in the UK.

Acknowledgements

Our thanks are due to Elliott Motorcycles of Swindon who supplied the machines featured in the illustrations throughout this manual and provided technical literature. We would also like to thank NGK Spark Plugs (UK) Ltd for supplying the colour spark plug condition photos and the Avon Rubber Company for supplying information on tyre fitting.

The introduction 'The Birth of a Dream' was written by Julian Ryder.

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 labour 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.

0•8 Identification numbers

The frame serial number is stamped into the right side of the steering head. The engine number is stamped into the right upper side of the crankcase, directly above the clutch unit. 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 a theft. The carburettor number is stamped into the back of each carburettor.

The frame serial number, engine serial number and carburettor identification number should also be kept in a handy place (such as with your driver's licence) so they are always available when purchasing or ordering parts for your machine.

Identifying model years

The procedures in this manual identify the bikes by model code. The model code (e.g. CBR400RR-L) is printed on the colour code label, which is located on the top of the rear mudguard under the passenger seat. The model code and production year can also be determined from the engine and frame serial numbers in the accompanying table. **Note:** *Do not identify your bike using the date of registration; in some cases, especially where a new bike has been imported into the UK, the registration date will differ considerably from the model code year.*

Model, code and production year	Frame number	Engine number	Carburettor number
CBR400RR-J (1988)	NC23-1020001 to 1036454	NC23E-1020001 to1036510	VG04A
CBR400RR-K (1989)	NC23 1090001 to 1098116	NC23E 1090001 to1098123	VG04B
CBR400RR-L (1990 and 91)	NC29-1000001 to 1010598	NC23E 1300001 to1310636	VP01A
CBR400RR-N (1992 and 93)	NC29-1050001 on	NC23E-1420001 on	VP01A
CBR400RR-R (1994-on)	NC29-1100001 on	NC23E-1500001 on	VP01B

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 shop and the motorcycle dealer – differ in the type of parts they carry. While dealers can obtain virtually every part for your motorcycle, the accessory shop 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 breaker for direct comparison.

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

Unofficial (grey) imports

All CBR400RR models in the UK are unofficial (grey) imports from Japan. The majority are second-hand machines and are allocated age-related licence plates for UK use (the licence plate letter reflects the production year in Japan), although new CBRs are allocated current year UK registration letter plates.

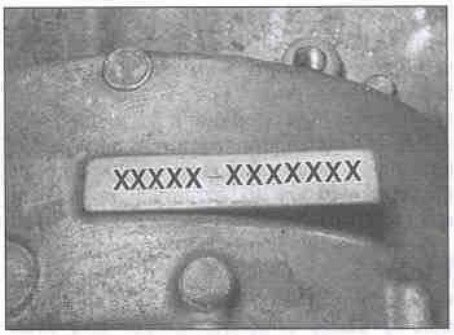
Common changes made prior to sale in the UK are the disabling of the rev-limiter device (or more correctly 'speed-limiter' device), which is fitted to comply with Japanese market regulations. The device is located in the speedometer head and is linked to the ignition control unit to cut the ignition when 180 kmh (112 mph) is reached. The importers have several methods of disabling the device, either fitting a plug-in unit at the speedometer head or ignition control unit, or by modifying the limiter mechanism.

Speedometers calibrated in kilometres (kmh) must have a miles per hour (mph) scale applied. This can be done simply by applying a suitable overlay to the speedometer lens or a more professional approach is to fit one of the replacement dial faces to the speedometer itself. In each case it is important that the correct size overlay or dial face is used.

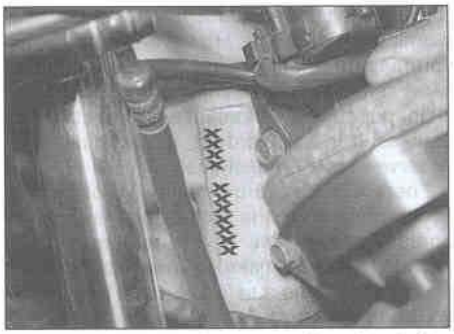
The ratings of certain bulbs (headlight, sidelight, brake/tail light and turn signal lights) differ from those normally used on UK market machines. Of these, the brake/tail light bulbs will most likely have been replaced with the regulation 21/5W UK fitment.

Note that restrictor kits can be fitted to the CBR engines to reduce their power output to 33 bhp (25 kw) to comply with the UK full standard category A licence. Kits can be obtained from and fitted by grey importers.

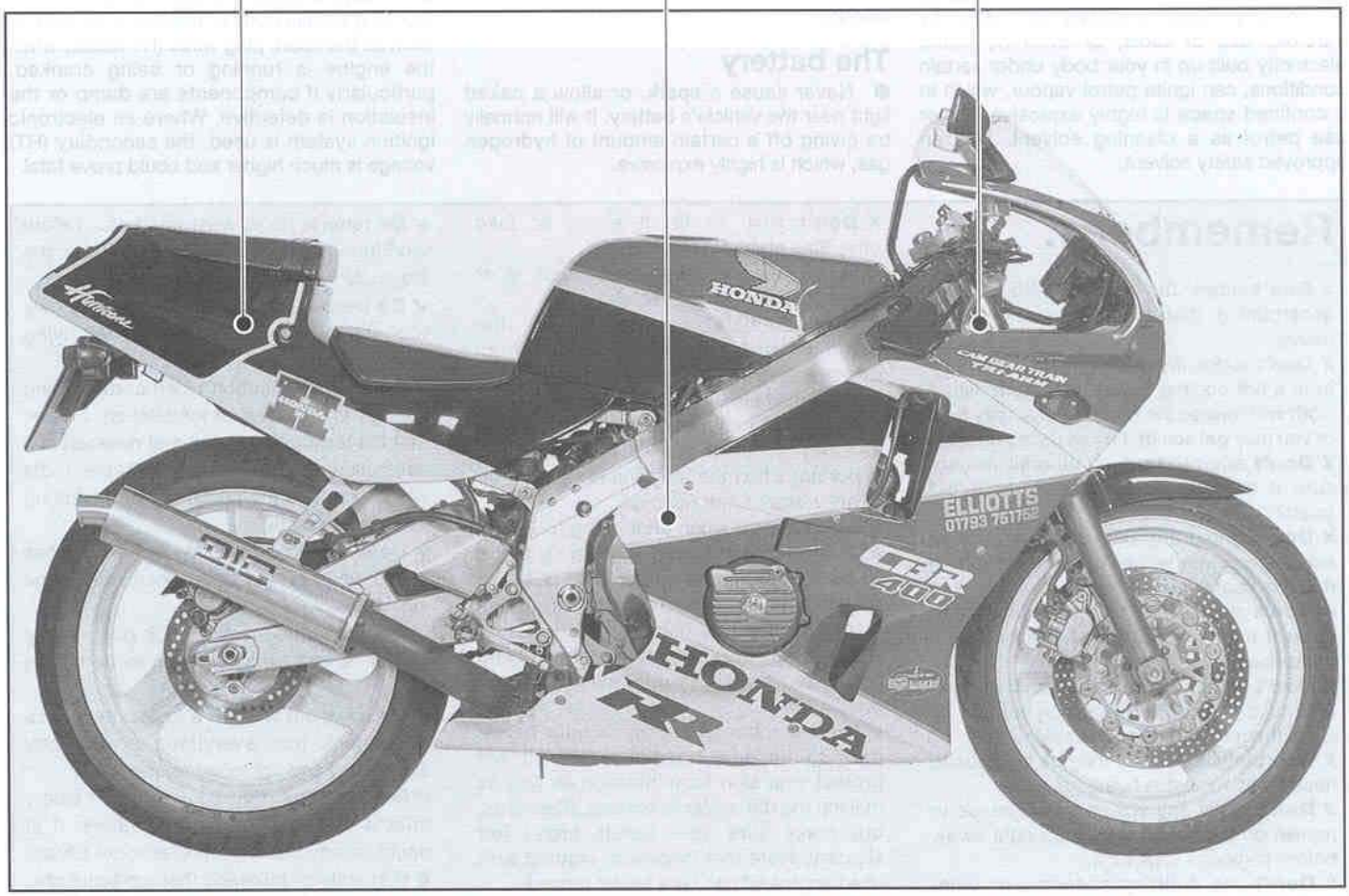
The colour code label is under the passenger seat



The engine number is stamped on the top of the crankcase on the right-hand side of the engine



The frame number is stamped on the right-hand side of the steering head



0•10 Safety first!

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, evenwhen 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...

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

✗ **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.

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

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

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

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

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

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

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

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

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

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

✗ **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.

Note: *The daily (pre-ride) checks outlined in the owner's manual covers those items which should be inspected on a daily basis.*

1 Engine/transmission oil level check

Before you start:

✔ Start the engine and allow it to reach normal operating temperature.

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

✔ Stop the engine and support the motorcycle in an upright position, using an auxiliary stand if required. Allow it to stand undisturbed for a few minutes to allow the oil level to stabilise. Make sure the motorcycle is on level ground.

Bike care:

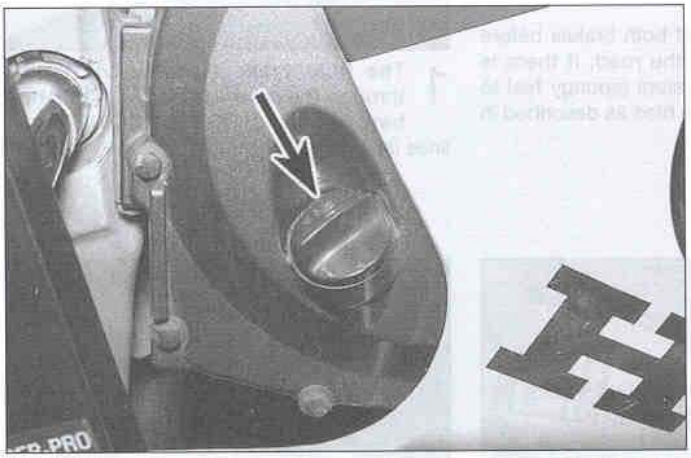
● If you have to add oil frequently, you should check whether you have any oil leaks. If there is no sign of oil leakage from the joints and gaskets the engine could be burning oil (see *Fault Finding*).

The correct oil

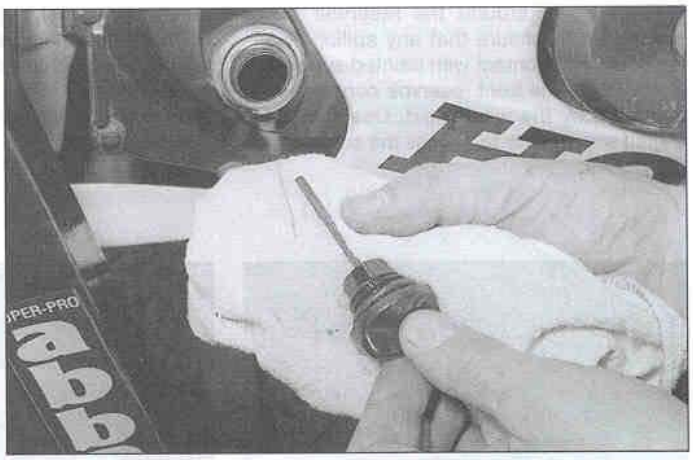
● Modern, high-revving engines place great demands on their oil. It is very important that the correct oil for your bike is used.

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

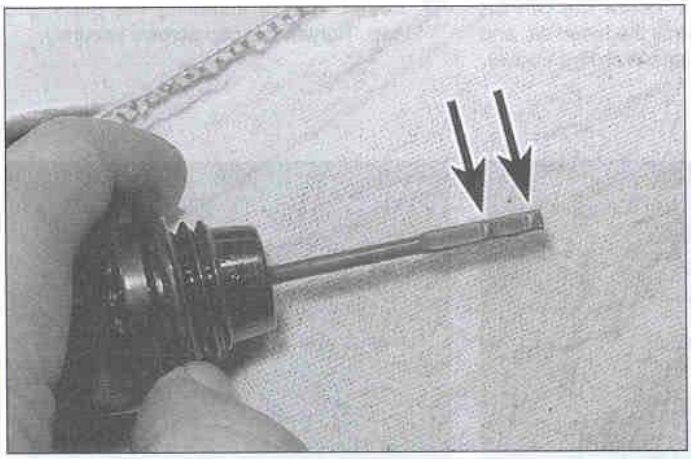
Oil type	API grade SE, SF or SG
Oil viscosity	SAE 10W40



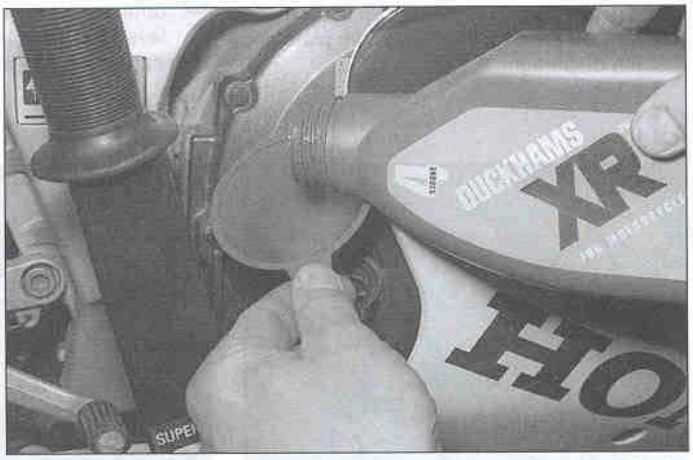
1 Unscrew the oil filler cap (arrowed) from the right-hand crankcase cover. The dipstick is integral with the oil filler cap, and is used to check the engine oil level.



2 Using a clean rag or paper towel, wipe off all the oil from the dipstick. Insert the clean dipstick back into the engine, but **do not** screw it in.



3 Remove the dipstick and observe the level of the oil, which should be somewhere in between the upper and lower level lines (arrowed).



4 If the level is below the lower line, top the engine up with the recommended grade and type of oil, to bring the level up to the upper line on the dipstick. Do not overfill.

2 Brake fluid level checks

Warning: Brake 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:

✔ Support the motorcycle in an upright position, using an auxiliary stand if required, and turn the handlebars until the top of the front master cylinder is as level as possible. The rear master cylinder reservoir is located behind the seat cowling on the right-hand side of the machine.

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

✔ Wrap a rag around the reservoir being worked on to ensure that any spillage does not come into contact with painted surfaces.

✔ Access to the front reservoir cap screws is restricted by the windshield. Use a short or angled screwdriver to access the screws.

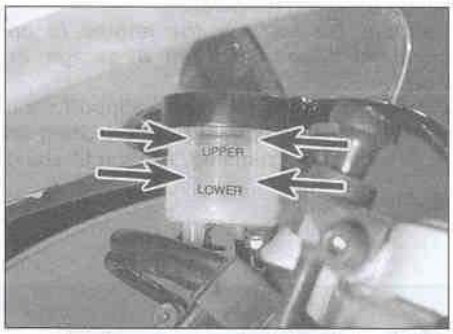
Bike care:

● The fluid in the front and rear brake master cylinder reservoirs will drop slightly as the brake pads wear down.

● If any fluid reservoir requires repeated topping-up this is an indication of an hydraulic leak somewhere in the system, which should be investigated immediately.

● Check for signs of fluid leakage from the hydraulic hoses and components – if found, rectify immediately.

● Check the operation of both brakes before taking the machine on the road; if there is evidence of air in the system (spongy feel to lever or pedal), it must be bled as described in Chapter 7.

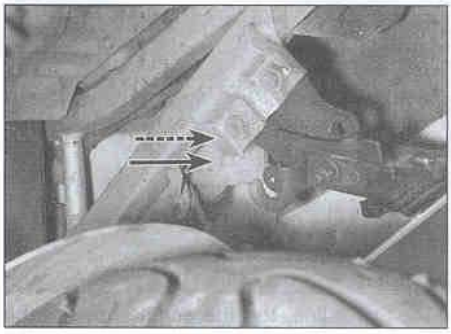


1 The front brake fluid level is visible through the reservoir body – it must be between the UPPER and LOWER level lines (arrowed).

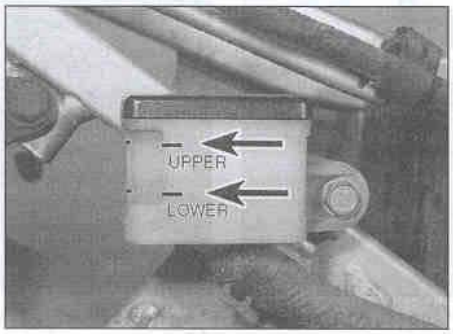
2 If the level is below the LOWER level line, remove the two reservoir cap screws and remove the cap, the diaphragm plate and the diaphragm.

3 Top up with new DOT 4 hydraulic fluid, until the level is just below the UPPER level line. Do not overfill the reservoir, and take care to avoid spills (see **Warning** above).

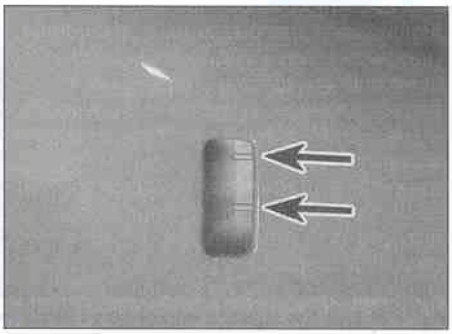
4 Ensure that the diaphragm is correctly seated before installing the plate and cap. Tighten the cap screws securely.



5 On J and K models, the rear brake fluid level is visible by looking across the top of the rear wheel at the window in the rear corner of the reservoir body – the fluid level must be between the UPPER and LOWER level lines (arrowed).



6 If the lines aren't visible, remove the seat cowling (see Chapter 8). The lines are also marked on the outer corner (arrows).



7 On L, N and R models, the rear brake fluid level is visible by looking through the aperture in the seat cowling at the window in the reservoir body – the fluid level must be between the UPPER and LOWER level lines (arrowed).

8 If the level is below the LOWER level line, remove the seat cowling (see Chapter 8). Unscrew the reservoir cover screws and remove the cover, diaphragm plate and diaphragm.

9 Top up with new DOT 4 hydraulic fluid, until the level is just below the UPPER level line. Do not overfill the reservoir, and take care to avoid spills (see **Warning** above).

10 Ensure that the diaphragm is correctly seated before installing the plate and cover. Tighten the cover screws securely, then install the seat cowling (see Chapter 8).

3 Coolant level check

Warning: DO NOT remove the radiator pressure cap to add coolant. Topping up is done via the coolant reservoir tank filler. DO NOT leave open containers of coolant about, as it is poisonous.

Before you start:

✔ Make sure you have a supply of coolant available (a mixture of 50% distilled water and 50% corrosion inhibited ethylene glycol anti-freeze is needed).

✔ Always check the coolant level when the engine is at normal working temperature. Start the engine allow it to reach normal temperature, then stop the engine.

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

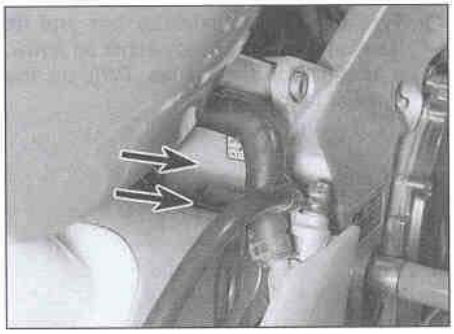
✔ Support the motorcycle in an upright position, using an auxiliary stand if required, whilst checking the level. Make sure the motorcycle is on level ground.

Bike care:

● Use only the specified coolant mixture. It is important that anti-freeze is used in the system all year round, and not just in the winter. Do not top the system up using only water, as the system will become too diluted.

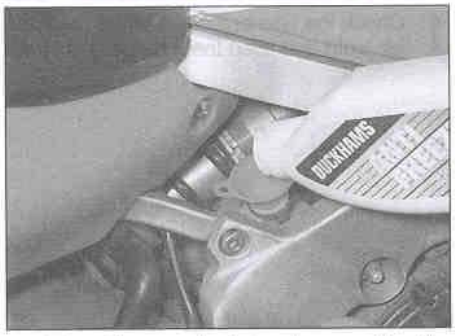
● Do not overfill the reservoir tank. If the coolant is significantly above the UPPER level line at any time, the surplus should be siphoned or drained off to prevent the possibility of it being expelled out of the overflow hose.

● If the coolant level falls steadily, check the system for leaks (see Chapter 1). If no leaks are found and the level continues to fall, it is recommended that the machine is taken to a dealer for a pressure test.



1 The coolant reservoir is located behind the main frame member on the right-hand side. The coolant UPPER and LOWER level lines (arrowed) are on the back of the reservoir (L, N and R models shown).

2 If the coolant level is not in between the UPPER and LOWER markings, remove the reservoir filler cap (arrowed – L, N and R models shown).



3 Top the coolant level up with the recommended coolant mixture, using a funnel to avoid spillage. Fit the cap securely.

4 Suspension, steering and final drive checks

Suspension and steering:

● Check that the front and rear suspension operate smoothly without binding.

● Check that the suspension is adjusted as required.

● Check that the steering moves smoothly from lock-to-lock.

Final drive:

● Check that the drive chain slack isn't excessive, and adjust if necessary (see Chapter 1).

● If the chain looks dry, lubricate it (see Chapter 1).

5 Tyre checks

The correct pressures:

- The tyres must be checked when **cold**, not immediately after riding. Note that low tyre pressures may cause the tyre to slip on the rim or come off. High tyre pressures will cause abnormal tread wear and unsafe handling.
- Use an accurate pressure gauge.
- Proper air pressure will increase tyre life and provide maximum stability and ride comfort.

Tyre care:

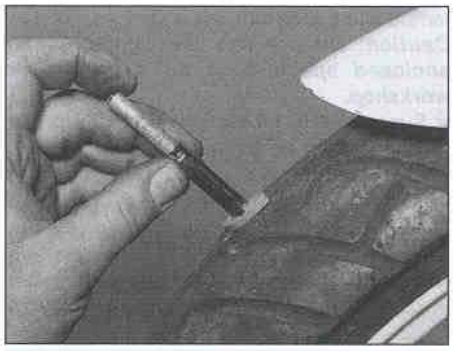
- Check the tyres carefully for cuts, tears, embedded nails or other sharp objects and excessive wear. Operation of the motorcycle with excessively worn tyres is extremely hazardous, as traction and handling are directly affected.
- Check the condition of the tyre valve and ensure the dust cap is in place.
- Pick out any stones or nails which may have become embedded in the tyre tread. If left, they will eventually penetrate through the casing and cause a puncture.
- If tyre damage is apparent, or unexplained loss of pressure is experienced, seek the advice of a tyre fitting specialist without delay.

Tyre tread depth:

- At the time of writing UK law requires that tread depth must be at least 1 mm over 3/4 of the tread breadth all the way around the tyre, with no bald patches. Many riders, however, consider 2 mm tread depth minimum to be a safer limit. Honda recommend a minimum of 2 mm on both tyres.
- Many tyres now incorporate wear indicators in the tread. Identify the triangular pointer or 'TWI' mark on the tyre sidewall to locate the indicator bar and renew the tyre if the tread has worn down to the bar.

Loading	Front	Rear
Rider only	33 psi (2.25 Bar)	33 psi (2.25 Bar)
Rider and passenger	33 psi (2.25 Bar)	36 psi (2.50 Bar)

1 Check the tyre pressures when the tyres are **cold** and keep them properly inflated.



2 Measure tread depth at the centre of the tyre using a tread depth gauge.

3 Tyre tread wear indicator bar and its location marking (usually either an arrow, a triangle or the letters TWI) on the sidewall (arrowed).

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, in all steering positions. Also check for the correct amount of freeplay (see Chapter 1).
- Check that the engine shuts off when the kill switch is operated.
- Check that sidestand return spring holds the stand securely up when retracted.
- Check that the clutch lever operates smoothly and with the correct amount of freeplay (see Chapter 1).

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 fuel – see Chapter 4 Specifications.

Chapter 1
Routine maintenance and servicing

Contents

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

Note: *Models are identified by their production code letter – refer to 'Identification numbers' at the front of this manual for details.*

Engine

Cylinder numbering (from left-hand to right-hand side of the bike)	1-2-3-4
Spark plugs	
Type	
Standard	NGK CR8EH-9 or Nippondenso U24FER-9
For extended high speed riding	NGK CR9EH-9 or Nippondenso U27FER-9
Electrode gap	0.8 to 0.9 mm
Engine idle speed	1300 ± 100 rpm
Carburettor synchronisation – max difference between carburettors	30 mmHg
Valve clearances (COLD engine)	
Inlet valves	0.12 to 0.18 mm
Exhaust valves	
J, K, L and N models	0.17 to 0.23 mm
R models	0.18 to 0.24 mm
Cylinder compression	156 to 213 psi (10.8 to 14.7 bar)
Oil pressure (with engine warm)	71 psi (5.0 Bar) @ 7000 rpm, oil @ 80°C

1•2 Specifications

Miscellaneous

Drive chain slack	
J models	10 to 20 mm
K, L, N and R models	15 to 25 mm
Clutch cable freeplay	10 to 20 mm
Throttle cable freeplay	2 to 6 mm
Tyre pressures and tyre tread depth	see *Daily (pre-ride) checks*

Recommended lubricants and fluids

Engine/transmission oil type	API grade SE, SF or SG motor oil
Engine/transmission oil viscosity	SAE 10W40
Engine/transmission oil capacity	
J and K models	
Oil change	2.9 litres
Oil and filter change	3.1 litres
Following engine overhaul – dry engine, new filter	3.5 litres
L and N models	
Oil change	3.2 litres
Oil and filter change	3.4 litres
Following engine overhaul – dry engine, new filter	3.8 litres
R models	
Oil change	3.0 litres
Oil and filter change	3.2 litres
Following engine overhaul – dry engine, new filter	3.8 litres
Coolant type	50% distilled water, 50% corrosion inhibited ethylene glycol anti-freeze
Coolant capacity	
Radiator and engine	2.0 litres
Reservoir	0.3 litre
Front fork oil	see Chapter 6
Brake fluid	DOT 4
Drive chain	SAE 80 or 90 gear oil or aerosol chain lubricant for O-ring chains

Miscellaneous

Steering head bearings	Lithium-based multi-purpose grease
Wheel bearings (unsealed)	Lithium-based multi-purpose grease
Swingarm pivot bearings	Molybdenum disulphide grease
Suspension linkage bearings	Molybdenum disulphide grease
Bearing seal lips	Lithium-based multi-purpose grease
Gearchange lever/clutch lever/rear brake pedal pivots	Molybdenum disulphide grease or dry film lubricant
Front brake lever pivot and piston tip	Molybdenum disulphide grease or dry film lubricant
Cables	Cable lubricant or 10W40 motor oil
Sidestand pivot	Molybdenum disulphide grease
Throttle grip	Multi-purpose grease or dry film lubricant

Torque settings

Note: *Where a specified setting is not given for a particular bolt, the general settings listed at the beginning apply. The dimension given applies to the diameter of the thread, not the head.*

5 mm bolt/nut	5 Nm
6 mm bolt/nut	10 Nm
8 mm bolt/nut	22 Nm
10 mm bolt/nut	35 Nm
12 mm bolt/nut	55 Nm
6 mm flange bolt with 8 mm head	9 Nm
6 mm flange bolt/nut with 10 mm head	12 Nm
8 mm flange bolt/nut	27 Nm
10 mm flange bolt/nut	40 Nm
Rear axle nut	
J and K models	90 Nm
L, N and R models	95 Nm
Steering head bearing adjuster nut	22 Nm
Steering stem nut	105 Nm
Top yoke fork clamp bolts	
J and K models	11 Nm
L, N and R models	23 Nm
Front brake master cylinder clamp bolts	12 Nm

Note: *The daily (pre-ride) checks outlined in the owner's manual covers those items which should be inspected 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 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'* at the beginning of this manual.

After the initial 600 miles (1000 km)

Note: *This check is usually performed by a dealer after the first 600 miles (1000 km) from new. Thereafter, maintenance is carried out according to the following intervals of the schedule.*

Every 600 miles (1000 km)

- ☐ Check, adjust and lubricate the drive chain (Section 1)

Every 4000 miles (6000 km) or 6 months (whichever comes sooner)

- ☐ Check and adjust the idle speed (Section 2)
- ☐ Check the brake pads (Section 3)
- ☐ Check and adjust the clutch (Section 4)
- ☐ Check the spark plug gaps (Section 5)
- ☐ Lubricate the clutch/gearchange/brake lever/brake pedal/sidestand pivots and the throttle/choke/clutch cables (Section 6)
- ☐ Change the engine oil (Section 7)
- ☐ Clean the air filter element (Section 8)
- ☐ Check the condition of the wheels and tyres (Section 9)
- ☐ Check the cooling system (Section 10)
- ☐ Check the brake system and brake light switch operation (Section 11)

Every 8000 miles (12,000 km) or 12 months (whichever comes sooner)

Carry out all the items under the 4000 mile (6000 km) check, plus the following

- ☐ Change the engine oil and filter (Section 12)
- ☐ Check the fuel system and hoses (Section 13)
- ☐ Check the battery terminals (Section 14)
- ☐ Check and adjust the throttle and choke cables (Section 15)

Every 8000 miles (12,000 km) or 12 months (whichever comes sooner) (continued)

- ☐ Renew the spark plugs (Section 16)
- ☐ Check/adjust the carburettor synchronisation (Section 17)
- ☐ Check and adjust the headlight aim (Section 18)
- ☐ Check the sidestand (Section 19)
- ☐ Check the suspension (Section 20)
- ☐ Check and adjust the steering head bearings (Section 21)
- ☐ Check the wheel bearings (Section 22)
- ☐ Check the tightness of all nuts, bolts and fasteners (Section 23)
- ☐ Change the brake fluid (Section 24)
- ☐ Check and adjust the valve clearances (Section 25)
- ☐ Check the chain and sprocket condition (Section 1)

Every 12,000 miles (18,000 km) or 18 months (whichever comes sooner)

Carry out all the items under the 4000 mile (6000 km) check, plus the following

- ☐ Renew the air filter element (Section 26)

Every 24,000 miles (36,000 km) or two years (whichever comes sooner)

Carry out all the items under the 12,000 mile (18,000 km) and 8000 mile (12,000 km) checks, plus the following

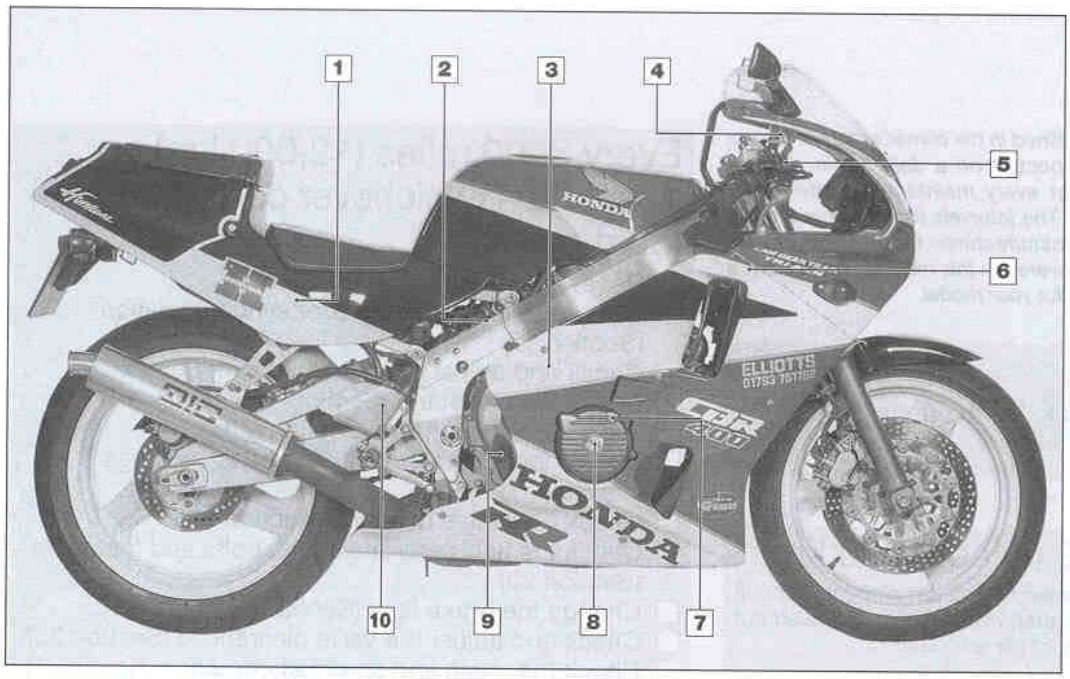
- ☐ Change the coolant (Section 27)
- ☐ Renew the brake master cylinder and caliper seals (Section 28)

Every four years

- ☐ Renew the brake hoses (Section 29)
- ☐ Renew the fuel hoses (Section 30)

Non-scheduled maintenance

- ☐ Check the cylinder compression (Section 31)
- ☐ Check the engine oil pressure (Section 32)
- ☐ Re-grease the steering head bearings (Section 33)
- ☐ Re-grease the swingarm and suspension linkage bearings (Section 34)
- ☐ Change the front fork oil (Section 35)



J and K model component locations on right side

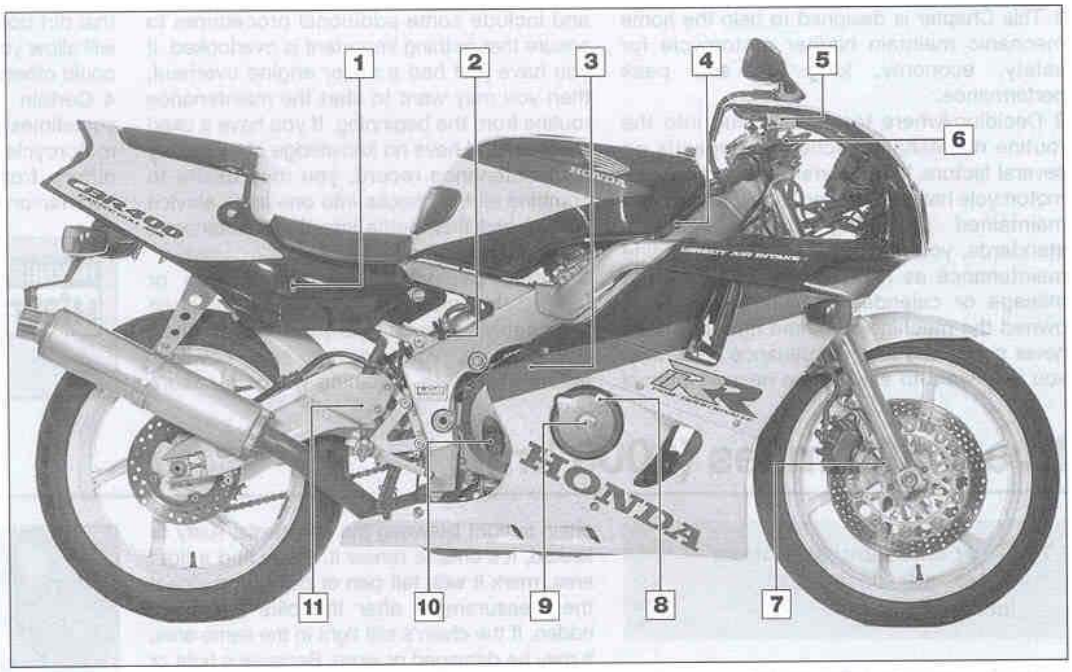
1 *Rear brake fluid reservoir*
2 *Coolant reservoir*
3 *Clutch cable lower adjuster*
4 *Front brake fluid reservoir*
5 *Throttle cable upper adjuster*
6 *Radiator pressure cap*
7 *Timing mark inspection plug*
8 *Alternator bolt access plug*
9 *Engine/transmission oil dipstick*
10 *Rear brake light switch*

J and K model component locations on left side

1 *Clutch cable upper adjuster*
2 *Steering head bearings*
3 *Air filter*
4 *Idle speed adjuster*
5 *Fuel filter*
6 *Battery*
7 *Drive chain adjuster*
8 *Coolant drain bolt*
9 *Engine/transmission oil drain bolt*
10 *Engine/transmission oil filter*
11 *Front fork oil drain screw*

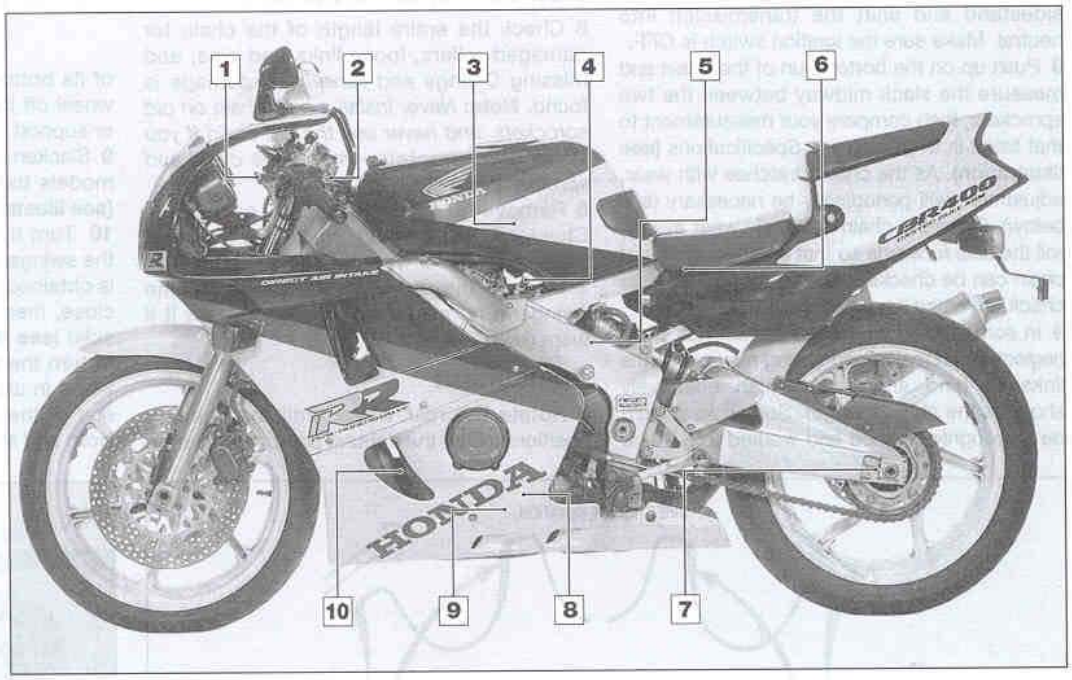
L, N and R component locations on right side

1 *Rear brake fluid reservoir*
2 *Coolant reservoir*
3 *Clutch cable lower adjuster*
4 *Radiator pressure cap*
5 *Front brake fluid reservoir*
6 *Throttle cable upper adjuster*
7 *Front fork oil drain screw*
8 *Timing mark inspection plug*
9 *Alternator bolt access plug*
10 *Engine/transmission oil dipstick*
11 *Rear brake light switch*



L, N and R component locations on left side

1 *Clutch cable upper adjuster*
2 *Steering head bearings*
3 *Air filter*
4 *Idle speed adjuster*
5 *Fuel filter*
6 *Battery*
7 *Drive chain adjuster*
8 *Coolant drain bolt*
9 *Engine/transmission oil drain bolt*
10 *Engine/transmission oil filter*



1 This Chapter is designed to help the home mechanic maintain his/her motorcycle for safety, economy, long life and peak performance.

2 Deciding where to start or plug into the routine maintenance schedule depends on several factors. If the warranty period on your motorcycle has just 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.

3 Before beginning any maintenance or repair, the machine should be cleaned thoroughly, especially around the oil filter, spark plugs, valve cover, seat cowling, carburettors, 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.

4 Certain maintenance information is sometimes printed on decals attached to the motorcycle. If the information on the decals differs from that included here, use the information on the decal.

HAYNES HiNT

Models are identified by their production code letter – refer to 'Identification numbers' at the front of this manual for details.

Every 600 miles (1000 km)

1 Drive chain and sprockets – check, adjustment and lubrication

Check – every 600 miles (1000 km)

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, place the bike on its sidestand and shift the transmission into neutral. Make sure the ignition switch is OFF.

3 Push up on the bottom run of the chain and measure the slack midway between the two sprockets, then compare your measurement to that listed in this Chapter's Specifications **(see illustration)**. As the chain stretches with wear, adjustment will periodically be necessary (see below). Since the chain will rarely wear evenly, roll the bike forwards so that another section of chain can be checked; do this several times to check the entire length of chain.

4 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. Such links should be thoroughly cleaned and worked free. If the chain is tight between the sprockets, rusty or kinked, it's time to renew it. If you find a tight area, mark it with felt pen or paint, and repeat the measurement after the bike has been ridden. If the chain's still tight in the same area, it may be damaged or worn. Because a tight or kinked chain can damage the transmission ouput shaft bearing, it's a good idea to renew it.

Caution: If the machine is ridden with excessive slack in the drive chain, the chain could contact the frame and swingarm, causing severe damage.

Check – every 8000 miles (12,000 km) or 12 months

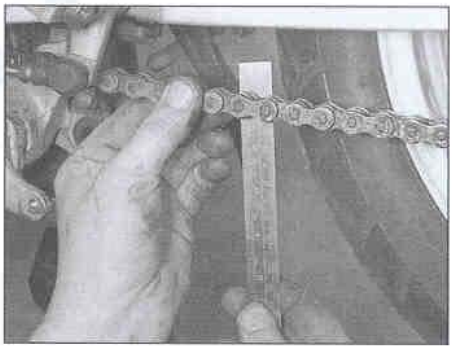
5 Check the entire length of the chain for damaged rollers, loose links and pins, and missing O-rings and renew it if damage is found. **Note:** *Never install a new chain on old sprockets, and never use the old chain if you install new sprockets – renew the chain and sprockets as a set.*

6 Remove the front sprocket cover (see Chapter 6). Check the teeth on the front and rear sprockets for wear **(see illustration)**.

7 Inspect the drive chain slider on the swingarm for excessive wear and renew it if worn (see Chapter 6).

Adjustment

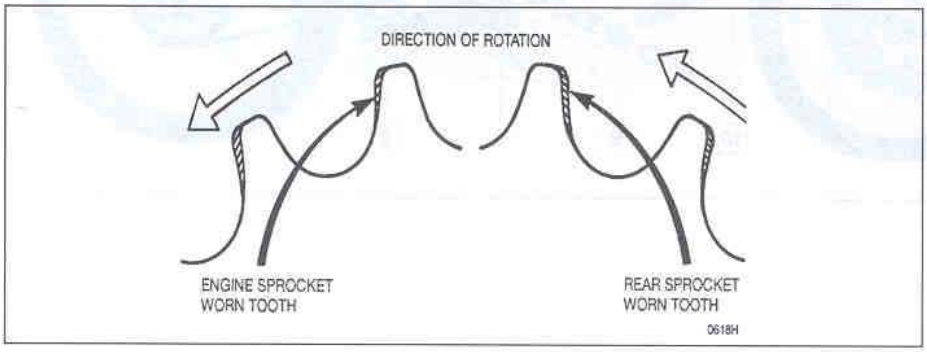
8 Rotate the rear wheel until the chain is positioned with the tightest point at the centre of its bottom run. If available, raise the rear wheel off the ground using an auxiliary stand or support.



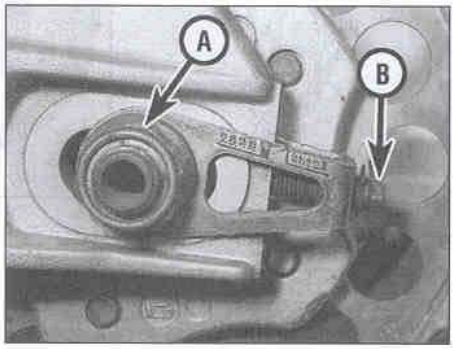
1.3 Push up on the chain and measure the slack

9 Slacken the rear axle nut, and on L, N and R models the locknut on each chain adjuster **(see illustrations)**.

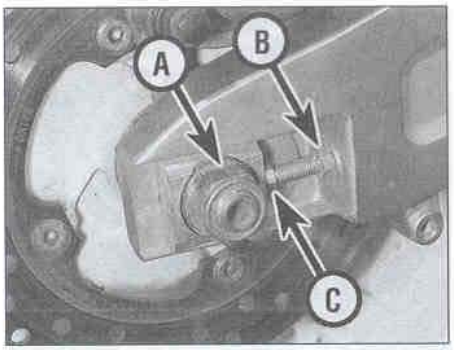
10 Turn the axle adjusters on both sides of the swingarm until the specified chain tension is obtained (get the adjuster on the chain side close, then set the adjuster on the opposite side) **(see illustrations 1.9a and b)**. Be sure to turn the adjusters evenly to keep the rear wheel in alignment. If the adjusters reach the end of their travel, the chain is excessively worn and should be renewed (see Chapter 6).



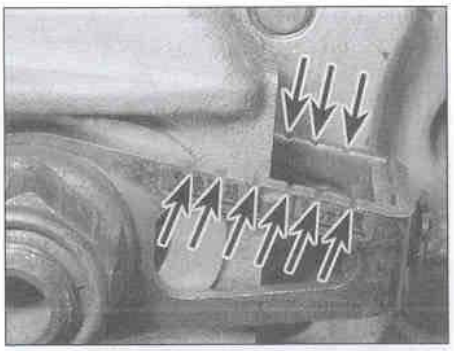
1.6 Check the sprockets in the areas indicated to see if they are worn excessively



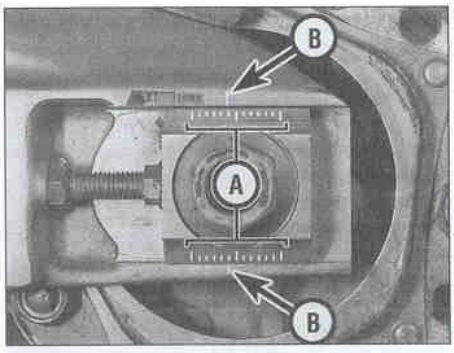
1.9a Rear axle nut (A), chain adjuster (B) – J and K models



1.9b Rear axle nut (A), locknut (B), adjuster (C) – L, N and R models



1.11a Alignment marks (arrowed) – J and K models

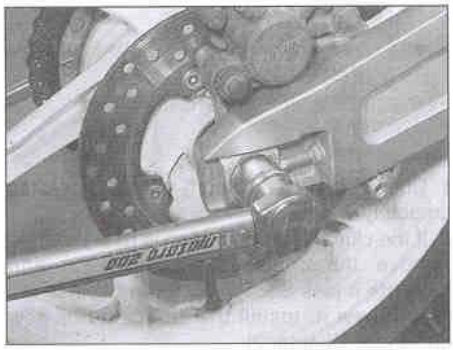


1.11b Alignment marks (A), notches (B) – L, N and R models

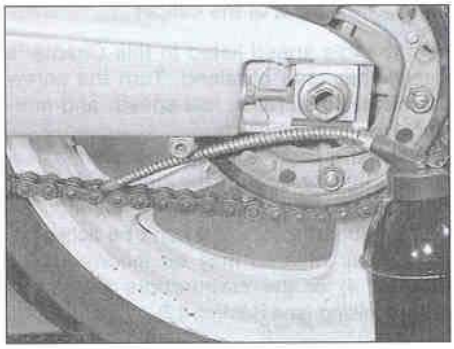
The chain wear decals will also indicate the need for chain renewal.

11 When the chain has the correct amount of slack, check that the wheel is correctly aligned by making sure the marks on each adjustment marker are in the same position relative to the back of the swingarm on J and K models, or the notches in the swingarm on L, N and R models **(see illustrations)**. If there is any discrepancy in the chain adjuster positions, adjust one of them so that its position is exactly the same as the other, then recheck the chain freeplay as described above. It is important each adjuster is identically aligned otherwise the rear wheel will be out of alignment with the front.

12 Tighten the axle nut to the torque setting specified at the beginning of the Chapter **(see illustration)**. On L, N and R models, tighten the chain adjuster locknuts securely.



1.12 Tighten the axle nut to the specified torque



1.14 Apply the lubricant to the chain as described

Lubrication

13 If required, wash the chain in paraffin (kerosene), then wipe it off and allow it to dry, using compressed air if available. If the chain is excessively dirty it should be removed from the machine and allowed to soak in the paraffin (see Chapter 6).

Caution: Don't use petrol, solvent or other cleaning fluids which might damage the internal sealing properties of the chain. Don't use high-pressure water. The entire process shouldn't take longer than ten minutes – if it does, the O-rings in the chain rollers could be damaged.

14 For routine lubrication, 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 better than when cold. **Note:** *Honda specifies SAE 80 to SAE 90 gear oil; if you do use aerosol chain lube ensure that it is suitable for O-ring chains.* Apply the oil to the area where the side plates overlap – not the middle of the rollers **(see illustration)**.

> **HAYNES HINT** ***Apply the oil to the top of the lower chain run, so centrifugal force will work the oil into the chain when the bike is moving. After applying the lubricant, let it soak in a few minutes before wiping off any excess.***

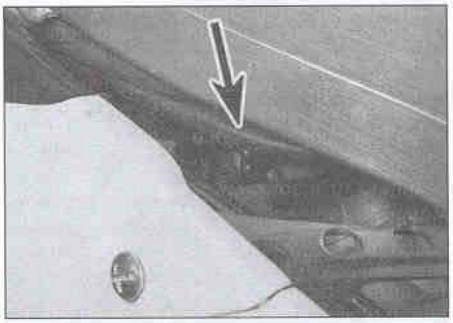
Every 4000 miles (6000 km) or 6 months

2 Idle speed – check and adjustment

1 The idle speed should be checked and adjusted before and after the carburettors are synchronised (balanced) 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 or routed correctly, or may be worn out. This is a dangerous condition that can cause loss of control of the bike. Be sure to correct this problem before proceeding.

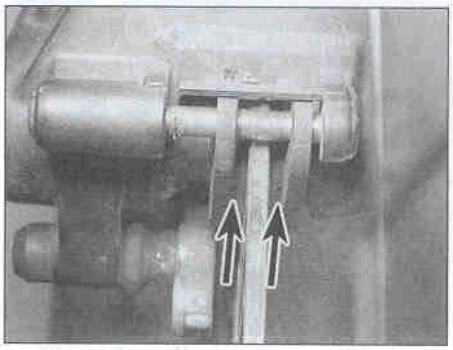
2 The engine should be at normal operating temperature, which is usually reached after 10 to 15 minutes of stop-and-go riding. Place the motorcycle on its sidestand, and make sure the transmission is in neutral.

3 The idle speed adjuster is located under the fuel tank on the left-hand side **(see illustrations)**. With the engine idling, adjust the idle speed by turning the adjuster screw

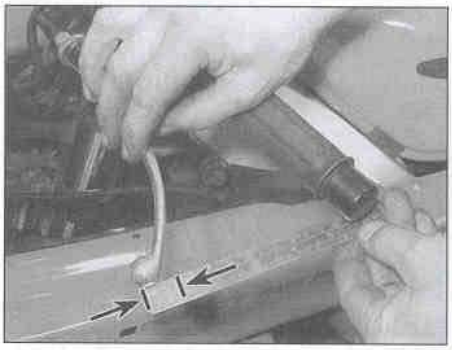


2.3a Idle speed adjuster screw (arrowed) – J and K models

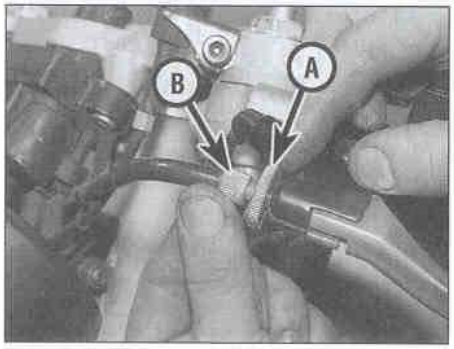
2.3b Idle speed adjuster screw (arrowed) – L, N and R models



3.1 Each pad has a cutout in its friction material which is visible by looking at the back of the caliper



4.3 Measuring clutch cable freeplay



4.4 Slacken the lockring (A) and turn the adjuster (B) in or out as required

until the idle speed listed in this Chapter's Specifications is obtained. Turn the screw clockwise to increase idle speed, and anti-clockwise to decrease it.

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

5 If a smooth, steady idle can't be achieved, the fuel/air mixture may be incorrect (see Chapter 4) or the carburettors may need synchronising (see Section 17).

3 Brake pads – wear check

1 A quick check of the brake pads can be made without removing them from the caliper. The amount of pad wear can be judged by looking at the pads from the rear of the caliper (both front and rear) **(see illustrations)**. A cutout in the friction material indicates the wear limit **(see illustration)**.

2 If either pad has worn down to, or beyond the cutout in the friction material, both pads must be renewed as a set. If the pads are dirty or if you are in doubt as to the amount of friction material remaining, remove them for inspection (see Chapter 7). **Note:** *Some after-market pads may use different indicators to those on the original equipment as shown.*

3 Refer to Chapter 7 for details of pad renewal.

4 Clutch – check and adjustment

1 Check that the clutch cable operates smoothly and easily.

2 If the clutch lever operation is heavy or stiff, remove the cable (see Chapter 2) and lubricate it (see Section 6). If the cable is still stiff, renew it. Install the lubricated or new cable (see Chapter 2).

3 With the cable operating smoothly, check that the clutch lever is correctly adjusted. Periodic adjustment is necessary to compensate for wear in the clutch plates and stretch of the cable. Check that the amount of freeplay at the clutch lever end is within the specifications listed at the beginning of the Chapter **(see illustration)**.

4 If adjustment is required, loosen the adjuster lockring at the top of the cable and turn the adjuster in or out until the required amount of freeplay is obtained **(see illustration)**. To increase freeplay, turn the adjuster clockwise. To reduce freeplay, turn the adjuster anti-clockwise. Tighten the locking ring securely.

5 If all the adjustment has been taken up at the lever, reset the adjuster to give the maximum amount of freeplay, then set the correct amount of freeplay using the adjuster nuts on each end of the threaded section in the cable bracket on the clutch cover on the right-hand side of the engine **(see illustration)**. Remove the right-hand fairing side panel and the lower fairing as required to access the adjuster nuts (see Chapter 8). To increase freeplay, slacken the front nut and tighten the rear nut until the freeplay is as specified, then tighten the front nut against the bracket. To reduce freeplay, slacken the rear nut and tighten the front nut until the freeplay is as specified, then tighten the rear nut against the bracket. Subsequent adjustments can now be made using the lever adjuster only.

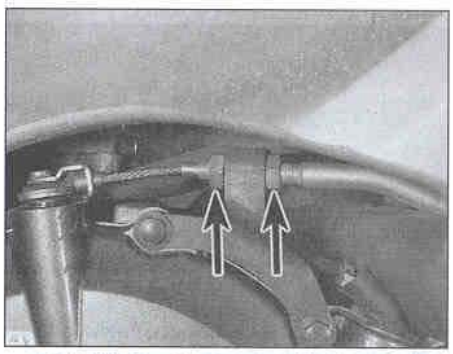
5 Spark plug gaps – check and adjustment

1 Make sure your spark plug socket is the correct size before attempting to remove the plugs – a suitable one is supplied in the motorcycle's tool kit which is stored under the seat.

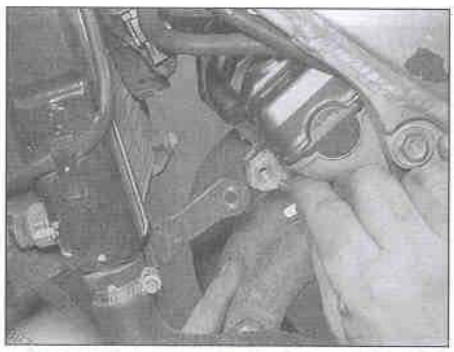
2 To access the spark plugs, remove the fairing side panels (see Chapter 8). Also remove the radiator lower mounting bolt(s), then release the radiator lower hose from its clip and swing the radiator forward **(see illustrations)**.

3 Clean the area around the plug caps to prevent any dirt falling into the spark plug channels.

4 Check that the cylinder location is marked

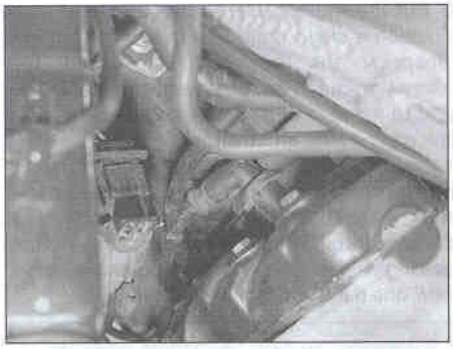


4.5 Clutch cable lower adjuster nuts (arrowed)

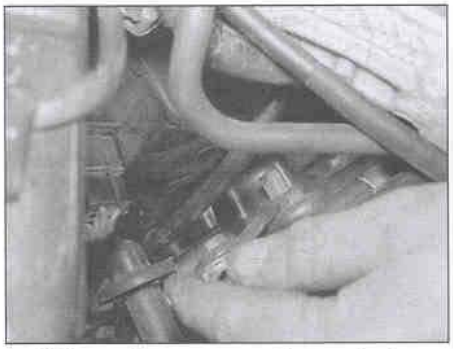


5.2a Remove the lower mounting bolt(s) . . .

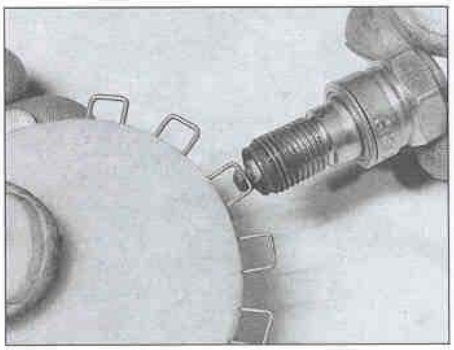
5.2b . . . and pull the hose out of the clip



5.4a Remove the spark plug cap . . .



5.4b . . . then unscrew the spark plug



5.8a Using a wire type gauge to measure the spark plug electrode gap

on each plug lead and mark them accordingly if not. Pull the spark plug cap off each spark plug **(see illustration)**. Clean the area around the base of the plugs to prevent any dirt falling into the engine. Using either the plug removing tool supplied in the bike's toolkit or a deep socket type wrench, unscrew the plugs from the cylinder head **(see illustration)**. Lay each plug out in relation to its cylinder; if any plug shows up a problem it will then be easy to identify the troublesome cylinder.

5 Inspect the electrodes for wear. Both the centre and side electrodes should have square edges and the side electrodes should be of uniform thickness. Look for excessive deposits and evidence of a cracked or chipped insulator around the centre electrode. Compare your spark plugs to the colour spark plug reading chart at the end of this manual. Check the threads, the washer and the ceramic insulator body for cracks and other damage.

6 If the electrodes are not excessively worn, and if the deposits can be easily removed with a wire brush, the plugs can be re-gapped and re-used (if no cracks or chips are visible in the insulator). If in doubt concerning the condition of the plugs, renew them, as the expense is minimal.

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

8 Before installing the plugs, make sure they are the correct type and heat range and check the gap between the electrodes **(see illustrations)**. Compare the gap to that specified and adjust as necessary. If the gap must be adjusted, bend the side electrodes only and be very careful not to chip or crack the insulator nose **(see illustration)**. Make sure the washer is in place before installing each plug.

9 Since the cylinder head is made of aluminium, which is soft and easily damaged, thread the plugs into the heads turning the tool by hand **(see illustration)**. Once the plugs are finger-tight, the job can be finished with a spanner on the tool supplied or a socket drive **(see illustration 5.4b)**. Tighten the plugs an additional 1/4 to 1/2 turn or as directed on the manufacturer's packaging. Do not over-tighten them.

> **HAYNES HiNT** *As 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.*

10 Reconnect the spark plug caps, making sure they are securely connected to the correct cylinder **(see illustration 5.4a)**. Install all other components previously removed.

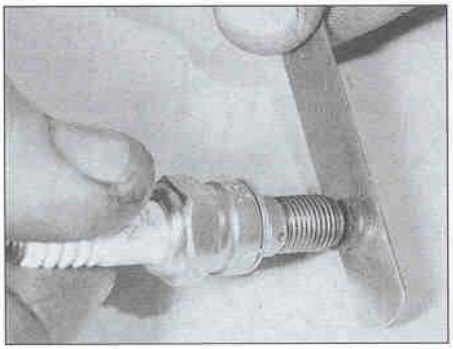
> **HAYNES HiNT** *Stripped plug threads in the cylinder head can be repaired with a thread insert – see 'Tools and Workshop Tips' in the Reference section.*

6 Stand, lever pivots and cables – lubrication

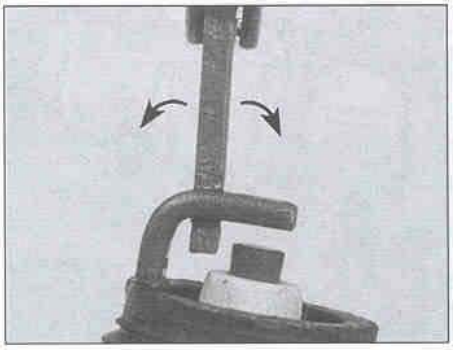
Pivot points

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.

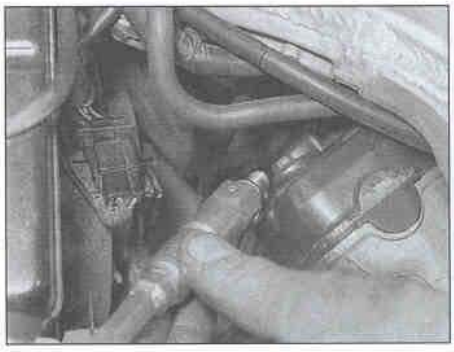
2 The footrests, clutch and brake levers, brake pedal, gearchange lever linkage and sidestand pivots should be lubricated frequently. In order for the lubricant to be applied where it will do the most good, the component should be disassembled. However, if chain and cable lubricant is being used, it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



5.8b Using a feeler gauge to measure the spark plug electrode gap



5.8c Adjust the electrode gap by bending the side electrode only



5.9 Thread the plug in as far as possible turning the tool by hand

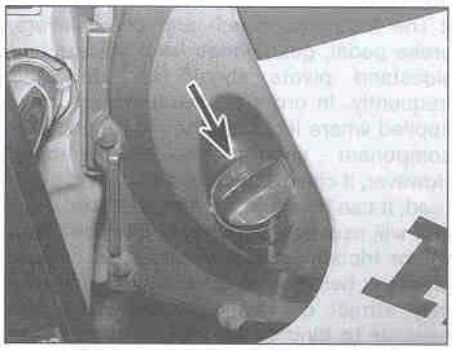
6.3a Lubricating a cable with a cable oiler clamp. Make sure the tool seals around the inner cable

control lever pivots is a dry-film lubricant (available from many sources by different names).

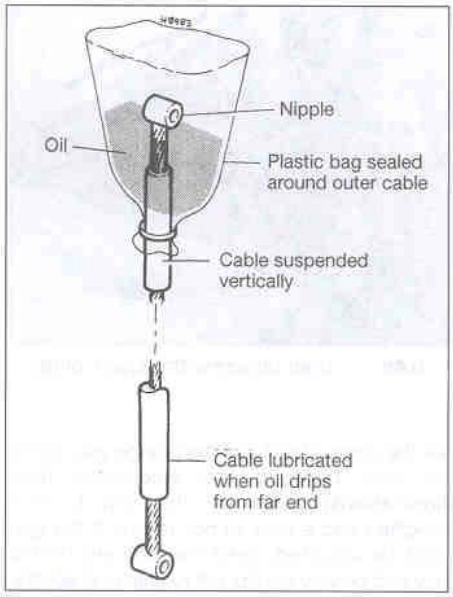
Cables

3 To lubricate the cables, disconnect the relevant cable at its upper end, then lubricate the cable with a cable oiler clamp, or if one is not available, using the set-up shown **(see illustrations)**. See Chapter 4 for the choke and throttle cable removal procedures, and Chapter 2 for the clutch cable.

4 The speedometer cable should be removed (see Chapter 9) and the inner cable withdrawn from the outer cable and lubricated with motor oil or cable lubricant. Do not lubricate the upper few inches of the cable as the lubricant may travel up into the instrument head.



7.3 Unscrew the oil filler cap . . .



6.3b Lubricating a cable with a makeshift funnel and motor oil

7 Engine/transmission – oil change

Warning: Be careful when draining the oil, as the exhaust pipes, the engine, and the oil itself can cause severe burns.

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 changed often with new oil of the recommended grade and type. 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, warm up the engine so the oil will drain easily. Remove the lower fairing (see Chapter 8).

3 Put the motorcycle on its sidestand, and position a clean drain tray below the engine. Unscrew the oil filler cap from the alternator/clutch cover to vent the crankcase and to act as a reminder that there is no oil in the engine **(see illustration)**.

4 Next, unscrew the oil drain plug from the sump on the bottom of the engine and allow the oil to flow into the drain tray **(see illustrations)**. Check the condition of the sealing washer on the drain plug and obtain a new one if it is damaged or worn.

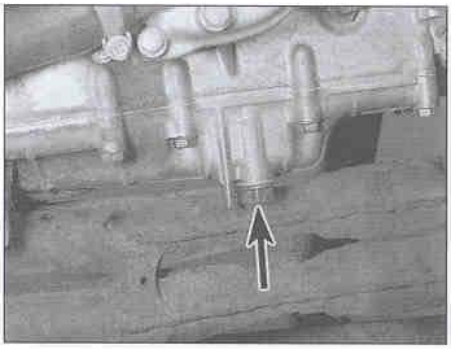
> **HAYNES HINT** ***To help determine whether any abnormal or excessive engine wear is occurring, place a strainer between the engine and the drain tray so that any debris in the oil is filtered out and can be examined.***

5 When the oil has completely drained, fit the plug to the sump, using a new sealing washer if necessary, and tighten it securely **(see illustration)**. Avoid overtightening, as damage to the sump will result.

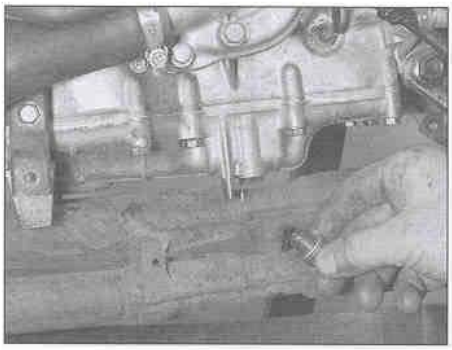
6 Refill the engine to the proper level using the recommended type and amount of oil (see *Daily (pre-ride) checks)*. With the motorcycle vertical, the oil level should lie between the upper and lower level lines on the dipstick (see *Daily (pre-ride) checks)*. Install the filler cap **(see illustration 7.3)**. Start the engine and let it run for two or three minutes (make sure that the oil pressure light extinguishes after a few seconds). Shut it off, wait a few minutes, then check the oil level. If necessary, add more oil to bring the level up to the upper level line on the dipstick. Check around the drain plug for leaks.

> **HAYNES HINT** ***Saving a little money on the difference between good and cheap oils won't pay off if the engine is damaged as a result.***

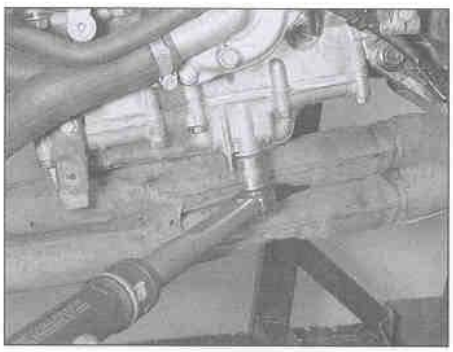
7 The old oil drained from the engine cannot be re-used and should be disposed of properly. Check with your local refuse disposal company, disposal facility or



7.4a . . . and the oil drain plug (arrowed) . .



7.4b . . . and allow the oil to completely drain



7.5 Tighten the drain plug securely

environmental agency to see whether they will accept the used oil for recycling. Don't pour used oil into drains or onto the ground.

HAYNES HiNT ***Check the old oil carefully – if it is very metallic coloured, 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 fibre-like material in the oil, the clutch is experiencing excessive wear and should be checked.***

OIL CARE FOLLOW THE CODE
OIL BANK LINE
0800 66 33 66

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.

8 Air filter – cleaning

Caution: If the machine is continually ridden in continuously wet or dusty conditions, the filter should be renewed more frequently.

1 Remove the fuel tank (see Chapter 4).

2 On L, N and R models, slacken the clamps securing the inlets on the air filter cover to the air ducts **(see illustration)**.

3 Remove the screws securing the air filter cover to the filter housing and remove the cover **(see illustrations)**. Remove the filter element from the housing **(see illustrations)**.

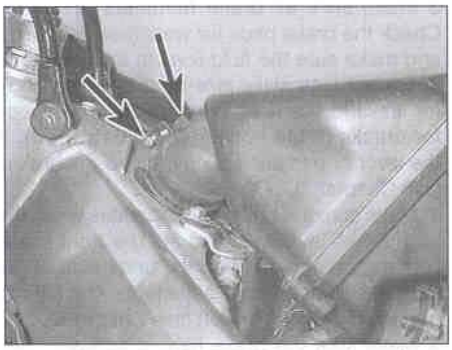
4 To clean the filter, tap the element on a hard surface to dislodge any dirt and use compressed air to clear the element, directing the air from the inside **(see illustration)**.

5 Check the element for signs of damage. If the element is torn or cannot be cleaned, renew it.

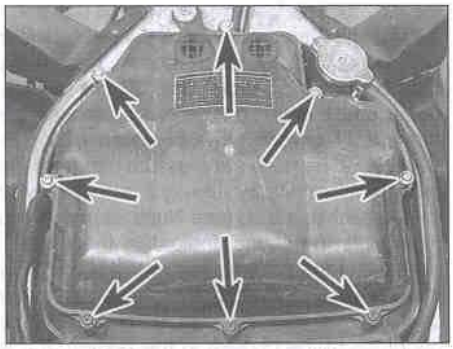
6 Remove the sub-air cleaner element from its housing (mounted on the back of the air filter housing), and clean or renew it as required.

7 Install the new filter by reversing the removal procedure **(see illustrations 8.3c and d)**. Make sure the filter is properly seated, then install the cover. On L, N and R models, make sure the inlets locate correctly onto the air ducts and tighten the clamps **(see illustration)**.

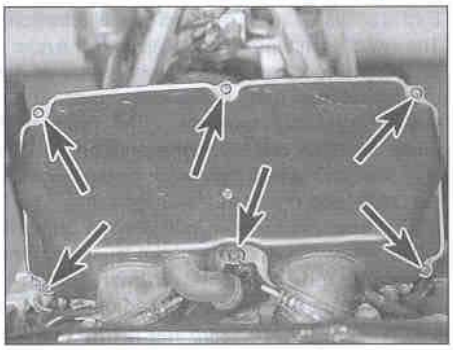
8 Install the fuel tank (see Chapter 4).



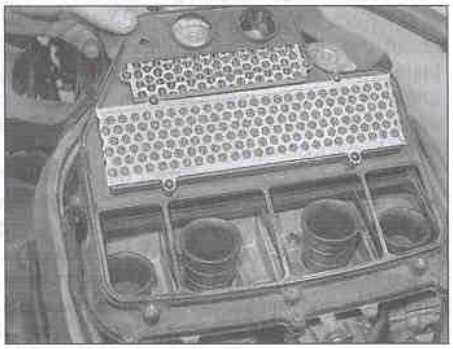
8.2 On L, N and R models, slacken the clamp screws (arrowed)



8.3a Air filter cover screws (arrowed) – J and K models

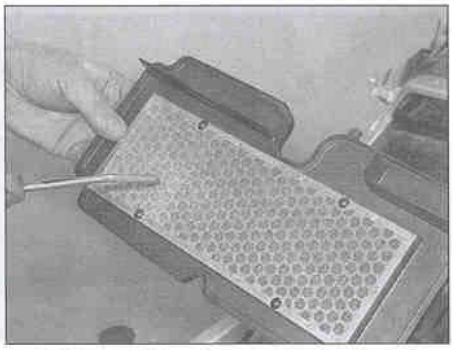


8.3b Air filter cover screws (arrowed) – L, N and R models



8.3c Removing the element – J and K models

8.3d Removing the element – L, N and R models



8.4 Direct the air from the inside out

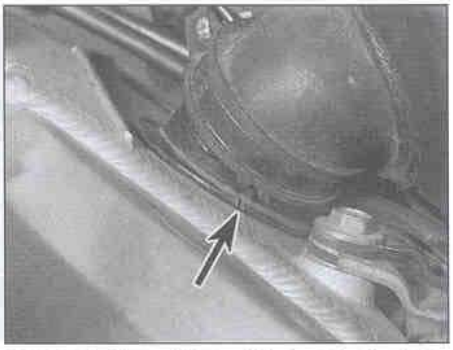
9 Wheels and tyres – general check

Tyres

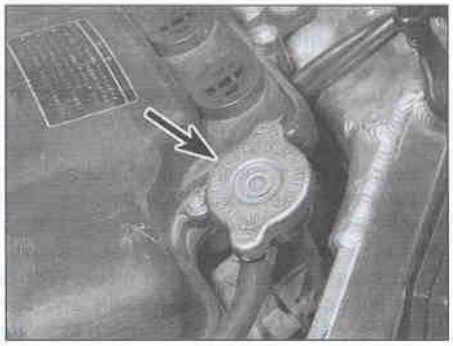
1 Check the tyre condition and tread depth thoroughly – see *Daily (pre-ride) checks*.

Wheels

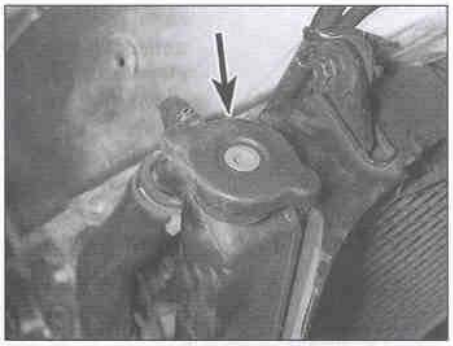
2 Cast wheels are virtually maintenance free, but they should be kept clean and checked periodically for cracks and other damage. Also check the wheel runout and alignment (see Chapter 7). Never attempt to repair damaged cast wheels; they must be renewed if damaged. Check the valve rubber for signs of damage or deterioration and have it renewed if necessary. Also, make sure the valve stem cap is in place and tight.



8.7 On L, N and R models, locate the inlet tabs on the air duct lugs (arrowed)



10.6a Pressure cap (arrowed) – J and K models



10.6b Pressure cap (arrowed) – L, N and R models

10 Cooling system – check

Warning: The engine must be cool before beginning this procedure.

1 Check the coolant level (see *Daily (pre-ride) checks*).

2 Remove the lower fairing (see Chapter 8). The entire cooling system should be checked for evidence of leakage. Examine each rubber coolant hose along its entire length. Look for cracks, abrasions and other damage. Squeeze each hose at various points. They should feel firm, yet pliable, and return to their original shape when released. If they are dried out or hard, renew them.

3 Check for evidence of leaks at each cooling system joint. Tighten the hose clips carefully to prevent future leaks.

4 Check the radiator for leaks and other damage. Leaks in the radiator leave tell-tale scale deposits or coolant stains on the outside of the core below the leak. If leaks are noted, remove the radiator (see Chapter 3) and have it repaired by a specialist.

Caution: Do not use a liquid leak stopping compound to try to repair leaks.

5 Check the radiator fins for mud, dirt and insects, which may impede the flow of air through the radiator. If the fins are dirty, remove the radiator (see Chapter 3) and clean it using water or low pressure compressed air directed through the fins from the backside. If the fins are bent or distorted, straighten them carefully with a screwdriver. If the air flow is restricted by bent or damaged fins over more than 30% of the radiator's surface area, renew the radiator.

6 On J and K models, remove the fuel tank (see Chapter 4). On L, N, and R models, remove the right-hand fairing side panel (if not already done), and, if required for improved access, the trim panel covering the pressure cap (see Chapter 8). Remove the pressure cap from the radiator filler neck by turning it anti-clockwise until it reaches a stop **(see illustrations)**. If you hear a hissing sound (indicating there is still pressure in the system), wait until it stops. Now press down on the cap and continue turning the cap until it can be removed. Check the condition of the coolant in the system. If it is rust-coloured or if accumulations of scale are visible, drain, flush and refill the system with new coolant (See Section 27). Check the cap seal for cracks and other damage. If in doubt about the pressure cap's condition, have it tested by a dealer or renew it. Install the cap by turning it clockwise until it reaches the first stop then push down on the cap and continue turning until it can turn no further.

7 Check the antifreeze content of the coolant with an antifreeze hydrometer. Sometimes coolant looks like it's in good condition, but might be too weak to offer adequate protection. If the hydrometer indicates a weak mixture, drain, flush and refill the system (see Section 27).

8 Start the engine and let it reach normal operating temperature, then check for leaks again. As the coolant temperature increases, the fan should come on automatically and the temperature should begin to drop. If it does not, refer to Chapter 3 and check the fan and fan circuit carefully.

9 If the coolant level is consistently low, and no evidence of leaks can be found, have the entire system pressure checked by a dealer.

11 Brake system – check

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

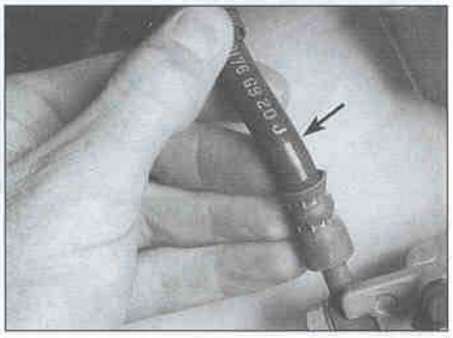
2 Check the brake lever and pedal for loose connections, improper or rough action, excessive play, bends, and other damage. Renew any damaged parts (see Chapter 7).

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

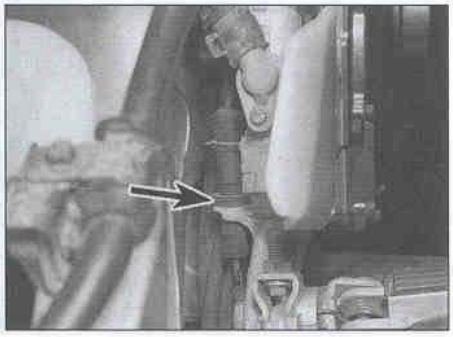
4 Make sure the brake light operates when the front brake lever is pulled in. The front brake light switch, mounted on the underside of the master cylinder, is not adjustable. If it fails to operate properly, check it (see Chapter 9).

5 Make sure the brake light is activated just before the rear brake takes effect. If adjustment is necessary, hold the switch and turn the adjuster ring on the switch body until the brake light is activated when required **(see illustration)**. The switch is mounted on the inside of the rider's right-hand footrest bracket, just ahead of the master cylinder. If the brake light comes on too late, turn the ring clockwise. If the brake light comes on too soon or is permanently on, turn the ring anti-clockwise. If the switch doesn't operate the brake light, check it (see Chapter 9).

6 The front brake lever has a span adjuster which alters the distance of the lever from the handlebar **(see illustration)**. Each setting is identified by a notch in the adjuster which aligns with the arrow on the lever. Pull the lever away from the handlebar and turn the adjuster ring until the setting which best suits the rider is obtained. There are two settings.



11.3 Flex the brake hoses and check for cracks, bulges and leaking fluid



11.5 Rear brake light switch adjuster ring (arrowed)

11.6 Front brake lever span adjuster (arrowed)

Every 8000 miles (12,000 km) or 12 months

Carry out all the items under the 4000 mile (6000 km) check, plus the following:

12 Engine/transmission – oil and oil filter change

Warning: Be careful when draining the oil, as the exhaust pipes, the engine, and the oil itself can cause severe burns.

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 changed often with new oil of the recommended grade and type. 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, warm up the engine so the oil will drain easily. Remove the lower fairing (see Chapter 8).

3 Put the motorcycle on its sidestand, and position a clean drain tray below the engine. Unscrew the oil filler cap from the clutch cover to vent the crankcase and to act as a reminder that there is no oil in the engine **(see illustration 7.3)**.

4 Next, unscrew the oil drain plug from the sump on the bottom of the engine and allow the oil to flow into the drain tray **(see illustrations 7.4a and b)**. Check the condition of the sealing washer on the drain plug and obtain a new one if it is damaged or worn.

> **HAYNES HiNT** ***To help determine whether any abnormal or excessive engine wear is occurring, place a strainer between the engine and the drain tray so that any debris in the oil is filtered out and can be examined.***

5 When the oil has completely drained, fit the plug to the sump, using a new sealing washer if necessary, and tighten it securely **(see illustration 7.5)**. Avoid overtightening, as damage to the sump will result.

6 Now place the drain tray below the oil filter. Unscrew the oil filter using a filter adapter or a strap wrench and tip any residue oil into the drain tray **(see illustrations)**.

7 Smear clean engine oil onto the rubber seal on the new filter, then manoeuvre it into position and screw it onto the engine **(see illustrations)**. Tighten it securely using a filter wrench, or if one is not available, tighten the filter as tight as possible by hand **(see illustration)**.

8 Refill the engine to the proper level using the recommended type and amount of oil (see *Daily (pre-ride) checks)*. With the motorcycle vertical, the oil level should lie between the upper and lower level lines on the dipstick (see *Daily (pre-ride) checks)*. Install the filler cap **(see illustration 7.3)**. Start the engine and let it run for two or three minutes (make sure that the oil pressure light extinguishes after a few seconds). Shut it off, wait a few minutes, then check the oil level. If necessary, add more oil to bring the level up to the upper level line on the dipstick. Check around the drain plug and the oil filter for leaks.

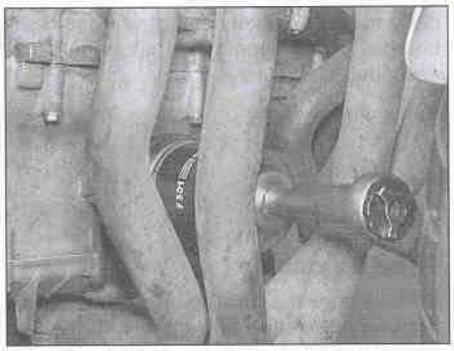
> **HAYNES HiNT** ***Saving a little money on the difference between good and cheap oils won't pay off if the engine is damaged as a result.***

9 The old oil drained from the engine cannot be re-used and should be disposed of properly. Check with your local refuse disposal company, disposal facility or environmental agency to see whether they will accept the used oil for recycling. Don't pour used oil into drains or onto the ground.

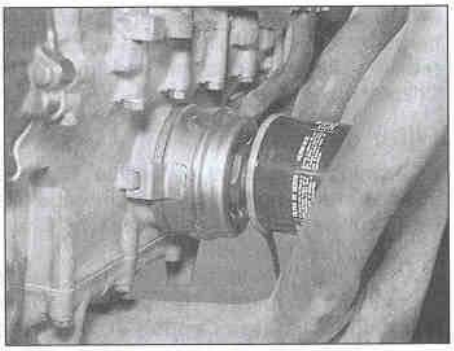
> **HAYNES HiNT** ***Check the old oil carefully – if it is very metallic coloured, then the engine is experiencing wear from break-in (new engine) or from insufficient lubrication. If there are flakes or chips of metal in the oil, then something is drastically wrong internally and the engine will have to be disassembled for inspection and repair. If there are pieces of fibre-like material in the oil, the clutch is experiencing excessive wear and should be checked.***

OIL CARE
FOLLOW THE CODE
OIL BANK LINE
0800 66 33 66

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.



12.6a Unscrew the filter . . .



12.6b . . . and drain it

12.7a Smear the seal with oil and tighten it as described

12.7b Thread the new filter onto the engine

13 Fuel system – check

Warning: Petrol (gasoline) 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 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 a Class B type fire (flammable liquids) on hand.

Check

1 Remove the fuel tank (see Chapter 4) and check the tank, the fuel tap, the fuel pump, the in-line fuel filter and the fuel hoses for signs of leakage, deterioration or damage; in particular check that there is no leakage from the fuel hoses. Renew any hoses which are cracked or deteriorated.

2 If the fuel tap is leaking, tightening the retaining nut and the assembly screws may help (see Chapter 4). If leakage persists, remove the tap and renew the O-ring. If the tap appears blocked, check the filter (see below). If a leakage or blockage cannot be cured, fit a new tap.

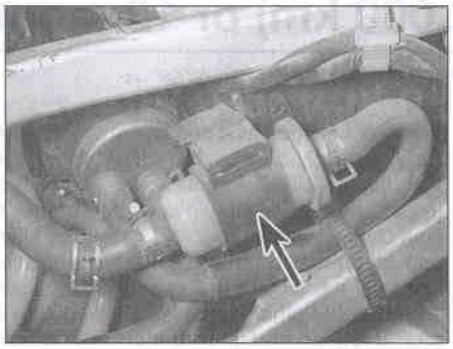
3 If the carburettor gaskets are leaking, the carburettors should be disassembled and rebuilt using new gaskets and seals (see Chapter 4).

Filter cleaning

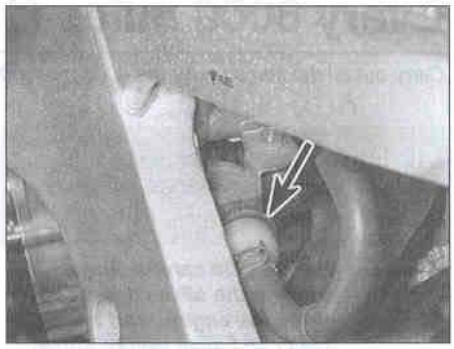
4 Cleaning or renewal of the fuel filters is advised after a particularly high mileage has been covered. It is also necessary if fuel starvation is suspected.

5 A fuel filter is mounted in the tank and is integral with the fuel tap. Remove the fuel tank and the fuel tap (see Chapter 4). Clean the gauze filter to remove all traces of dirt and fuel sediment. Check the gauze for holes. If any are found, a new filter should be fitted (it is available separately). Check the condition of the O-ring and renew it if it is in any way damaged or deteriorated. It is advisable to renew it as a matter of course.

6 An in-line fuel filter is fitted in the hose from the fuel tap to the fuel pump **(see illustrations)**. If the filter is dirty or clogged or otherwise needs renewing, remove the fuel tank (see Chapter 4). Have a rag handy to soak up any residual fuel and disconnect the pipes from the filter. Slip the filter out of its bracket and install the new filter so that its arrow points in the direction of fuel flow (ie towards the pump). Secure the pipes to the filter with the retaining clips. Install the fuel tank (see Chapter 4), turn the tap ON and check that there are no leaks.



13.6a In-line fuel filter (arrowed) – J and K models



13.6b In-line fuel filter (arrowed) – L, N and R models

14 Battery – check

1 All models covered in this manual are fitted with a sealed maintenance-free battery which requires no maintenance. **Note:** *Do not attempt to remove the battery filler caps to check the electrolyte level or battery specific gravity. Removal will damage the caps, resulting in electrolyte leakage and battery damage.*

2 All that should be done is to check that its terminals are clean and tight and that the casing is not damaged or leaking. See Chapter 9 for further details.

3 If the machine is not in regular use, disconnect the battery and give it a refresher charge every month to six weeks, as described in Chapter 9.

15 Throttle and choke cables – check

Throttle cables

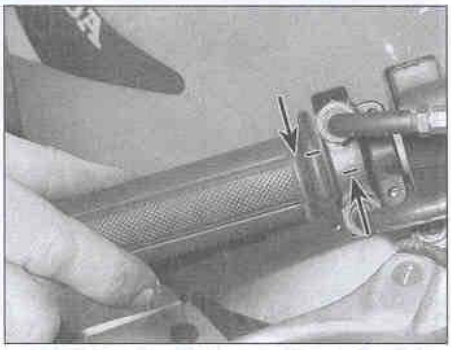
1 Make sure the throttle grip rotates easily from fully closed to fully open with the front wheel turned at various angles. The grip should return automatically from fully open to fully closed when released.

2 If the throttle sticks, this is probably due to a cable fault. Remove the cables (see Chapter 4) and lubricate them (see Section 6). Install the cables, making sure they are correctly routed. If this fails to improve the operation of the throttle, the cables must be renewed. Note that in very rare cases the fault could lie in the carburettors rather than the cables, necessitating the removal of the carburettors and inspection of the throttle linkage (see Chapter 4).

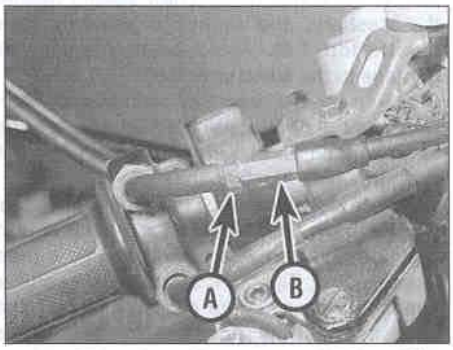
3 With the throttle operating smoothly, check for a small amount of freeplay in the cables, measured in terms of the amount of twistgrip rotation before the throttle opens, and compare the amount to that listed in this Chapter's Specifications **(see illustration)**. If it's incorrect, adjust the cables to correct it.

4 Freeplay adjustments can be made at the throttle end of the cable. Loosen the locknut on the accelerator cable where it leaves the handlebar **(see illustration)**. Turn the adjuster until the specified amount of freeplay is obtained (see this Chapter's Specifications), then retighten the locknut.

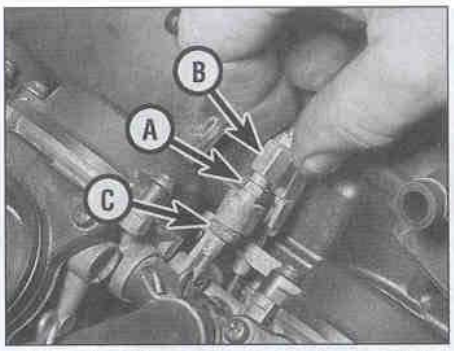
5 If the adjuster has reached its limit of adjustment, reset it so that the freeplay is at a maximum, then remove the fuel tank and air filter housing (see Chapter 4) and adjust the cable at the carburettor end. Slacken the adjuster locknut, then turn the adjuster out, making sure the lower nut remains captive in the bracket, thereby threading itself down the



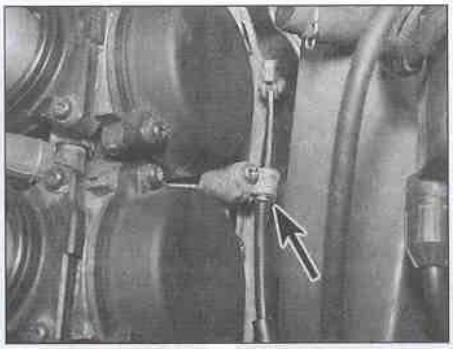
15.3 Throttle cable freeplay is measured in terms of twistgrip rotation



15.4 Throttle cable adjuster locknut (A) and adjuster (B) – throttle end



15.5 Throttle cable adjuster locknut (A), adjuster (B) and lower nut (C) – carburettor end



15.9 Slacken the screw and slide the outer cable end (arrowed) further into the bracket to create some freeplay

adjuster as you turn it **(see illustration)**. Turn the adjuster until the specified amount of freeplay is obtained, then tighten the locknut. Further adjustments can now be made at the throttle grip end. If the cable cannot be adjusted as specified, renew the cable (see Chapter 4).

Warning: Turn the handlebars all the way through their travel with the engine idling. Idle speed should not change. If it does, the cable may be routed incorrectly. Correct this condition before riding the bike.

6 Check that the throttle twistgrip operates smoothly and snaps shut quickly when released.

Choke cable

7 If the choke does not operate smoothly this is probably due to a cable fault. Remove the cable (see Chapter 4) and lubricate it (see Section 6). Install the cable, routing it so it takes the smoothest route possible.

8 If this fails to improve the operation of the choke, the cable must be renewed. Note that in very rare cases the fault could lie in the carburettors rather than the cable, necessitating the removal of the carburettors and inspection of the choke plungers (see Chapter 4).

9 Make sure there is a small amount of freeplay in the cable before the plungers move. If there isn't, check that the cable is correctly installed at both ends – remove the fuel tank and air filter housing to access the carburettor end of the cable (see Chapter 4). If it is, then slacken the choke outer cable bracket screw on the carburettor and slide the cable further into the bracket, creating some freeplay **(see illustration)**. Otherwise, renew the cable.

16 Spark plugs – renewal

1 Remove the old spark plugs as described in Section 5 and install new ones.

17 Carburettors – synchronisation

Warning: Petrol (gasoline) 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 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 a Class B type fire (flammable liquids) on hand.

Warning: Take great care not to burn your hand on the hot engine unit when accessing the gauge take-off points on the inlet manifolds. Do not allow exhaust gases to build up in the work area; either perform the check outside or use an exhaust gas extraction system.

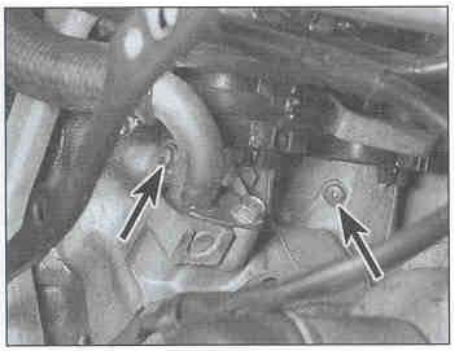
1 Carburettor synchronisation is simply the process of adjusting the carburettors so they pass the same amount of fuel/air mixture to each cylinder. This is done by measuring the vacuum produced in each cylinder. Carburettors that are out of synchronisation will result in decreased fuel mileage, increased engine temperature, less than ideal throttle response and higher vibration levels. Before synchronising the carburettors, make sure the valve clearances are properly set.

2 To properly synchronise the carburettors, you will need a set of vacuum gauges or calibrated tubes (manometer) to indicate engine vacuum. The equipment used should be suitable for a four cylinder engine and come complete with the necessary adapters and hoses to fit the take-off points. **Note:** *Because of the nature of the synchronisation procedure and the need for special instruments, most owners leave the task to a dealer.*

3 Start the engine and let it run until it reaches normal operating temperature, then shut it off. Remove the fuel tank (see Chapter 4).

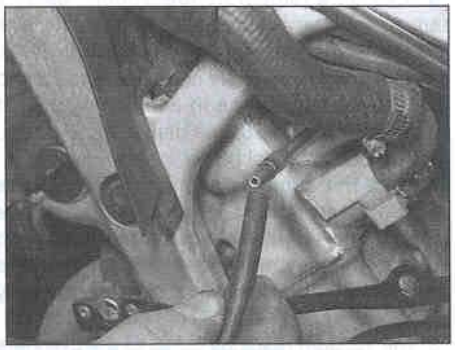
4 On J and K models, remove the blanking screws from the vacuum take-off points on the inlet manifolds **(see illustration)**. Install the take-off adapters provided with the vacuum gauges **(see illustration)**. Connect the vacuum gauge hoses to the adapters **(see illustration)**. Make sure they are a good fit because any air leaks will result in false readings.

5 On L, N and R models, remove the air filter housing and displace the carburettors to access the vacuum take-off points (see Chapter 4) – there is no need to disconnect the cables, though it may be necessary to either detach the fuel hose or displace the fuel pump to provide enough slack. Remove the



17.4a Remove the blanking screws (arrowed) (cylinders 1 and 2 shown) . . .

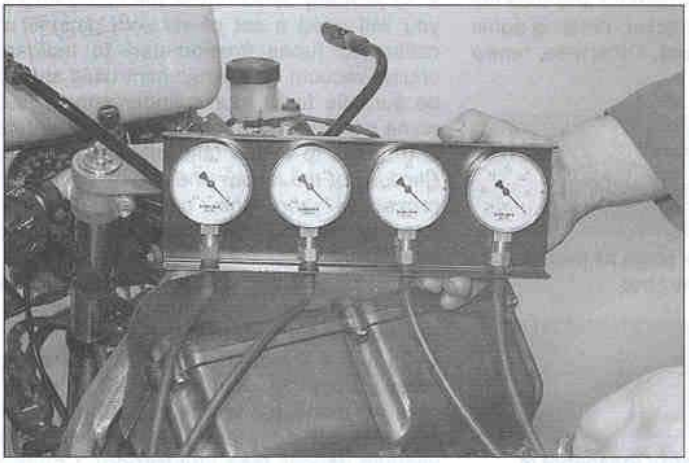
17.4b . . . then fit the adapters . . .



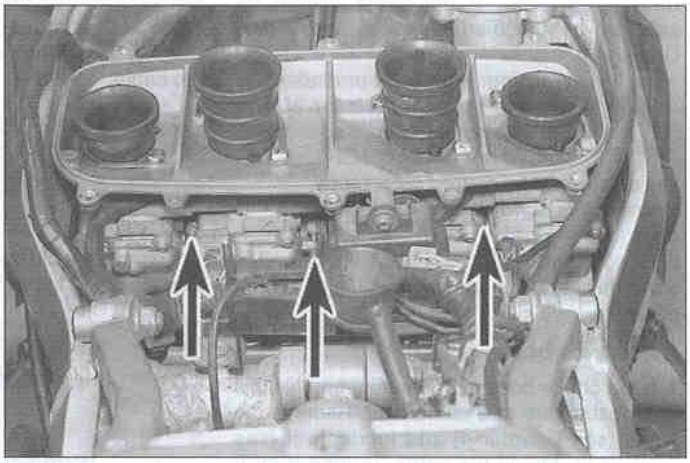
17.4c . . . and attach the hoses

17.5a Remove the blanking caps . . .

17.5b . . . and attach the hoses



17.8 Carburettor synchronisation set-up



17.9a Synchronisation screws (arrowed) – J and K models (air filter housing removed for clarity)

blanking caps from the vacuum take-off points on the inlet manifolds **(see illustration)**. Connect the vacuum gauge hoses to the adapters or take-off points **(see illustration)**. Make sure they are a good fit because any air leaks will result in false readings. Install the carburettors and air filter housing (see Chapter 4).

6 Arrange a temporary fuel supply, using a small temporary tank mounted above the level of the carburettors **(see illustration 17.8)**. Connect the fuel supply hose from the tank to the inlet union on the in-line filter – do not connect it directly to the carburettors or you will by-pass the fuel pump.

7 Start the engine and make sure the idle speed is correct. If it isn't, adjust it (see Section 2). If the gauges are fitted with damping adjustment, set this so that the needle flutter is just eliminated but so that they can still respond to small changes in pressure.

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 **(see illustration)**. If the vacuum readings vary, adjust as necessary.

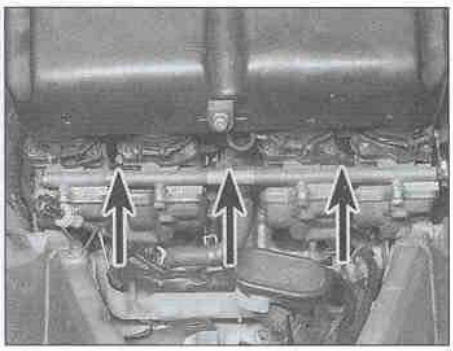
9 The carburettors are adjusted by turning the synchronising screws situated in-between the carburettors, in the throttle linkage **(see illustrations)**. **Note:** *Do not press down on the screws whilst adjusting them, otherwise a false reading will be obtained.* First synchronise the outer left carburettor (no. 1) to the inner left carburettor (no. 2) using the left-hand synchronising screw until the readings are the same. Then synchronise the outer right carburettor (no. 4) to the inner right carburettor (no. 3) using the right-hand synchronising screw. Finally synchronise the left-hand carburettors (nos. 1 and 2) to the right-hand carburettors (nos. 3 and 4) using the centre synchronising screw.

10 When all the carburettors are synchronised, open and close the throttle quickly to settle the linkage, and recheck the gauge readings, readjusting if necessary.

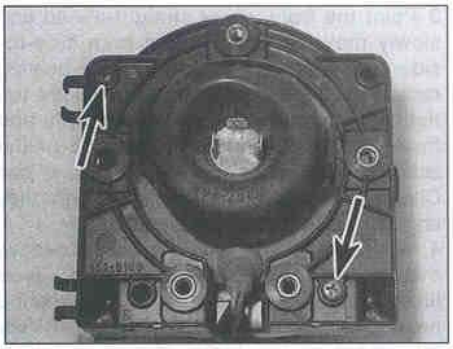
11 When the adjustment is complete, recheck the vacuum readings, then adjust the idle speed by turning the throttle stop screw (see Section 2) until the idle speed listed in this Chapter's Specifications is obtained. Stop the engine.

12 Remove the vacuum gauges and, where used, the adapters. Fit the blanking screws or caps onto the inlet manifolds.

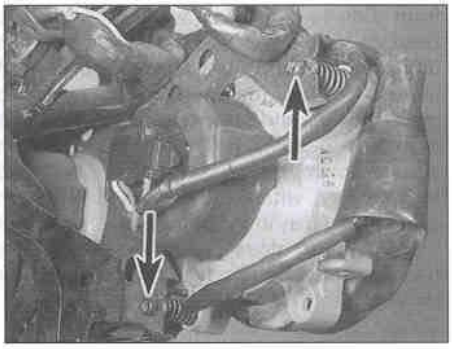
13 Install the fuel tank (see Chapter 4).



17.9b Synchronisation screws (arrowed) – L, N and R models



18.2 Headlight beam adjusters (arrowed) – J and K models



18.3 Headlight beam adjusters (arrowed) – L, N and R models

18 Headlight aim – check and adjustment

Note: *An improperly adjusted headlight may cause problems for oncoming traffic or provide poor, unsafe illumination of the road ahead. Before adjusting the headlight aim, be sure to consult with local traffic laws and regulations – refer to MOT Test Checks in the Reference section.*

1 The headlight beam can adjusted both horizontally and vertically. Before making any adjustment, check that the tyre pressures are correct and the suspension is adjusted as required. Make any adjustments to the headlight aim with the machine on level ground, with the fuel tank half full and with an assistant sitting on the seat. If the bike is usually ridden with a passenger on the back, have a second assistant to do this.

2 On J and K models, vertical adjustment is made by turning the adjuster screw on the top outer corner of each headlight unit **(see illustration)**. Turn it clockwise to move the beam up, and anti-clockwise to move it down. Horizontal adjustment is made by turning the adjuster screw on the bottom inner corner of each headlight unit. Turn it clockwise to move the beam in (towards the centre of the bike), and anti-clockwise to move it out.

3 On L, N and R models, vertical adjustment is made by turning the adjuster screw on the bottom inner corner of each headlight unit **(see illustration)**. Turn it clockwise to move the beam down, and anti-clockwise to move it up. Horizontal adjustment is made by turning the adjuster screw on the top outer corner of each headlight unit. Turn it clockwise to move the beam out (away from the centre of the bike), and anti-clockwise to move it in.

19 Sidestand – check

1 The sidestand return spring must be capable of retracting the stand fully and holding the stand retracted when the motorcycle is in use. If the spring is sagged or broken it must be renewed.

2 Lubricate the sidestand pivot regularly (see Section 6).

3 On J and K models, check the condition of the sidestand rubber. If it is worn down to or beyond the wear limit line, renew it **(see illustration)**.

4 On L, N and R models, the sidestand switch prevents the motorcycle being started if the stand is extended. Check its operation by shifting the transmission into neutral, retracting the stand and starting the engine. Pull in the clutch lever and select a gear. Extend the sidestand. The engine should stop as the sidestand is extended. If the sidestand switch does not operate as described, check its circuit (see Chapter 9).

20 Suspension – check

1 The suspension components must be maintained in top operating condition to ensure rider safety. Loose, worn or damaged suspension parts decrease the motorcycle's stability and control.

Front suspension

2 While standing alongside the motorcycle, apply the front brake and push on the handlebars to compress the forks several times. See if they move up-and-down smoothly without binding. If binding is felt, the forks should be disassembled and inspected (see Chapter 6).

3 Inspect the area around the dust seal for signs of oil leakage, then carefully lever up the dust seal using a flat-bladed screwdriver and inspect the area around the fork seal **(see illustration)**. If leakage is evident, the seals must be renewed (see Chapter 6).

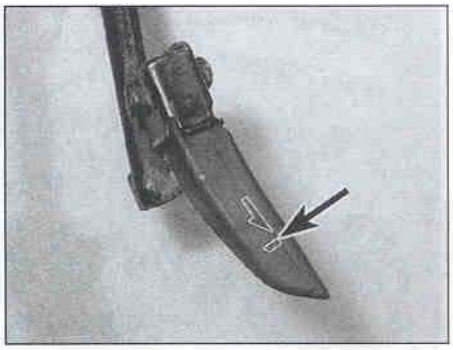
4 Check the tightness of all suspension nuts and bolts to be sure none have worked loose.

Rear suspension

5 Inspect the rear shock for fluid leakage and tightness of its mountings. If leakage is found, the shock should be renewed (see Chapter 6).

6 With the aid of an assistant to support the bike, compress the rear suspension several times. It should move up and down freely without binding. If any binding is felt, the worn or faulty component must be identified and renewed. The problem could be due to either the shock absorber, the suspension linkage components or the swingarm components.

7 Support the motorcycle using an auxiliary stand so that the rear wheel is off the ground. Grab the swingarm and attempt to rock it from side to side – there should be no discernible movement at the rear **(see illustration)**. If there's a little movement or a slight clicking can be heard, inspect the tightness of all the rear suspension mounting bolts and nuts, referring to the torque settings specified at the beginning of Chapter 6, and re-check for movement. Next, grasp the top



19.3 Renew the rubber if it is worn to or beyond the line (arrowed)

20.3 Check above and below the dust seal for signs of fluid leakage

20.7a Checking for play in the swingarm bearings